THE PERSONAL VIDEO PRODUCTION MAGAZINE

VIDEO TOASTER® USER

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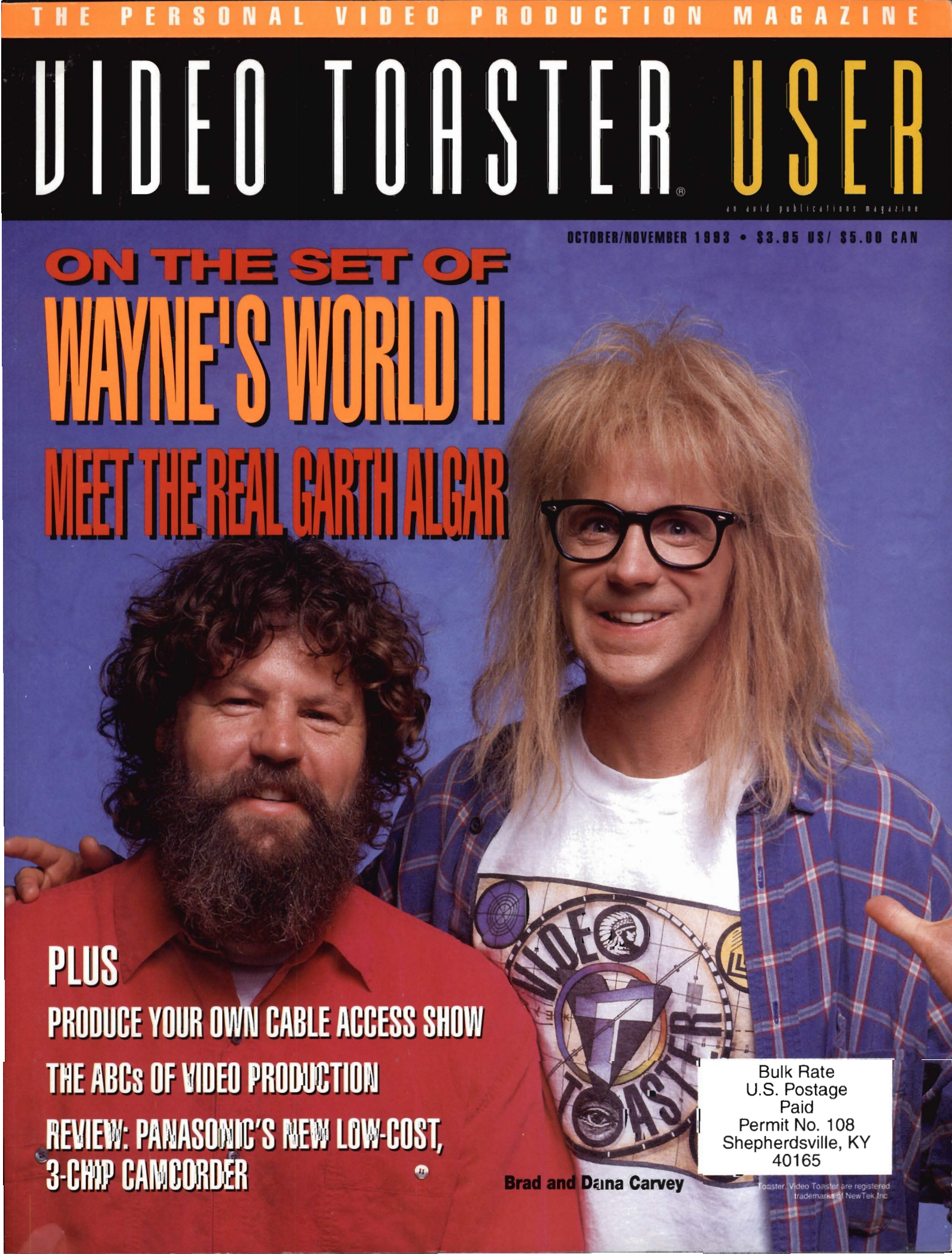

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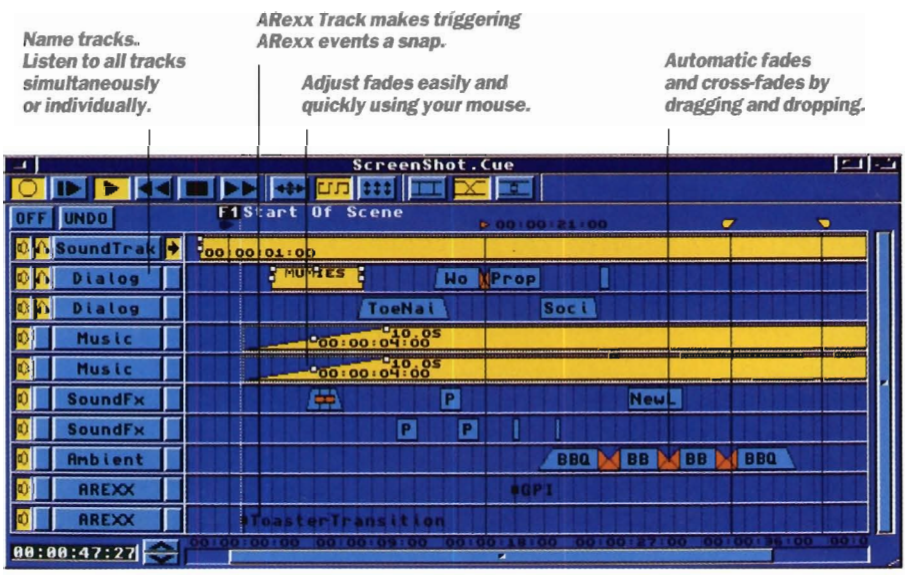

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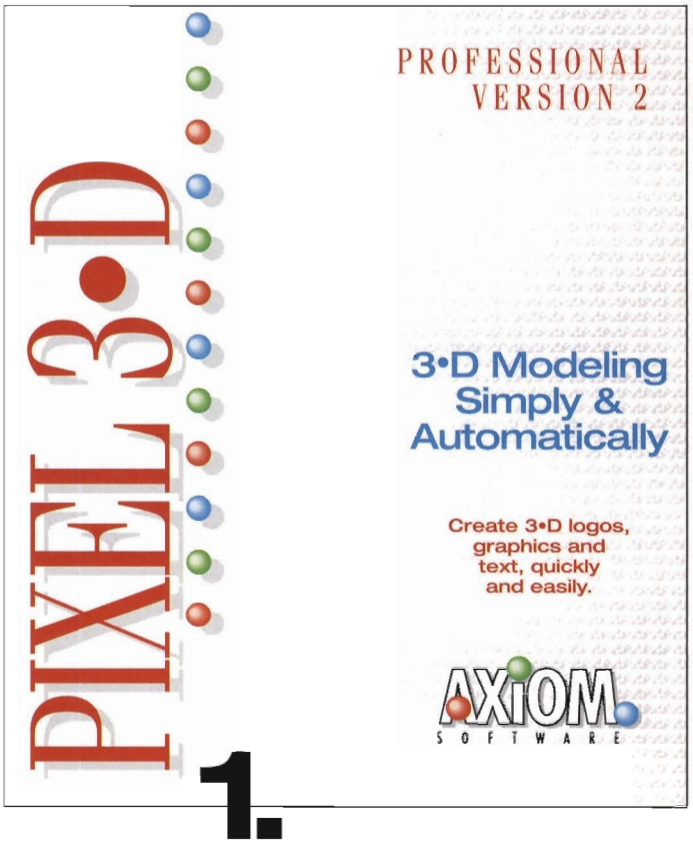

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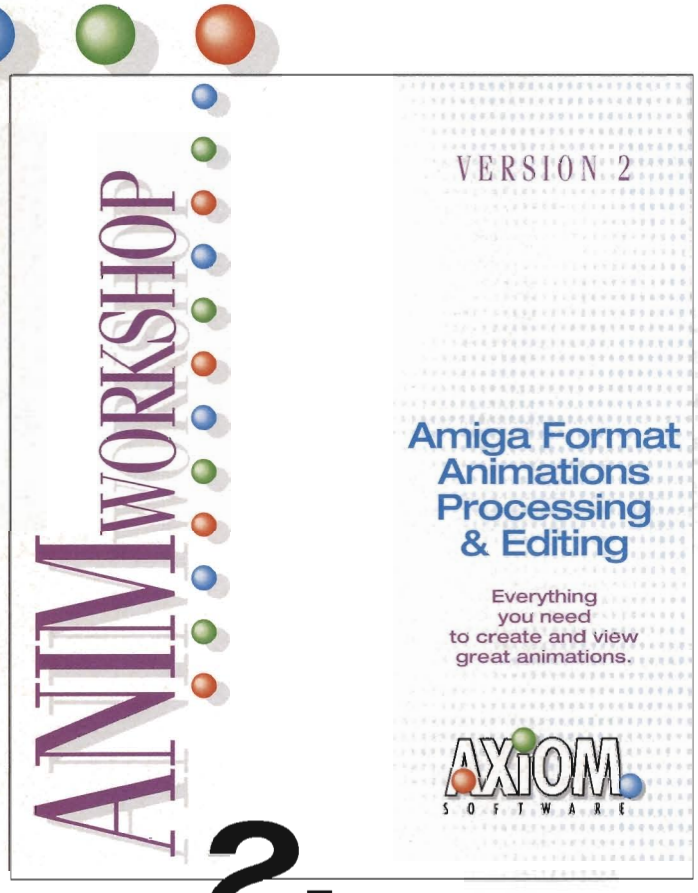

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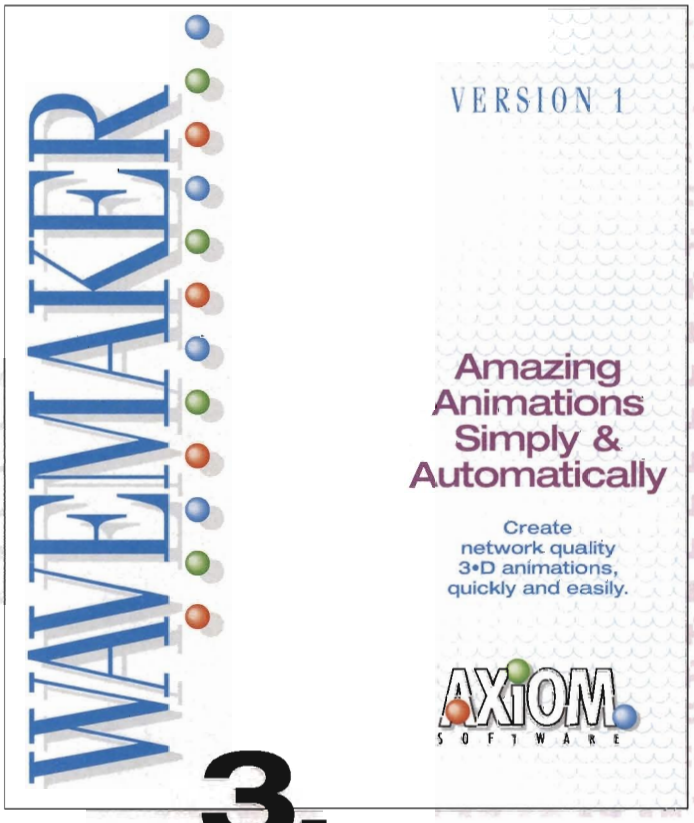

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VIDEO TOASTER USER

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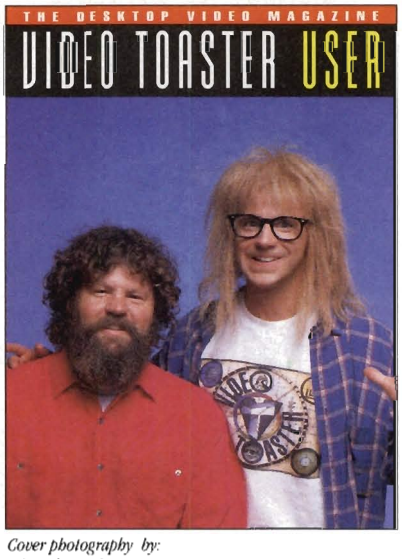

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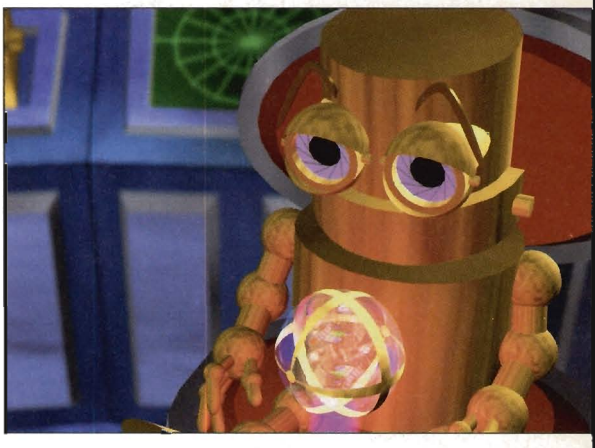
DEPARTMENTS

10 LETTERS
12 NEW PRODUCTS
16 TOASTER TIMES
127 USER GROUPS
128 TOASTER GALLERY
144 DEALER SHOWCASE
145 MARKETPLACE
150 CLASSIFIED
151 ADVERTISER INDEX

FEATURES



78 ROBO JR: MAKING ANIMATION MAGIC
by Dale K. Myers
The creator of the 6.5-minute LightWave animation *Robo Jr* shares his secrets, techniques and advice for good storytelling and making lively animations just like the pro's.

46 THE TOASTER GOES INTERNATIONAL
by Frank Kelly
The Toaster revolution goes worldwide with Prime Image's new Standards Converter/TBC.

54 REPORT FROM SIGGRAPH
by Phil Kurz
Highlights from SIGGRAPH '93: NewTek screams in with a new LightWave rendering engine, plus a look at the tradeshow floor.

60 THE MEN BEHIND THE MACHINE II
by Phil Kurz
Tim Jenison and Paul Montgomery continue their discussion about personal video production, the Toaster 4000 and the introduction of the Video Toaster Screamer.

68 GARTH AND BRAD, THE UNTOLD STORY
by Angela LoSasso
Garth Algar is back for *Wayne's World II*—and he's using a Video Toaster. From the set at Paramount Studios, meet Garth's real-life counterpart, Toaster engineer Brad Carvey.

74 THE ABCs OF VIDEO, PART IV
by Rick Lehtinen
The fourth installment in video problem-solving examines system timing.

COLUMNS

8 **TOASTER TALK**
by Phil Kurz

20 **DEAR JOHN**
by John Gross

28 **TIPS AND TECHNIQUES**
by Brent Malnack

30 **SLICES**
by James Hebert

24 **DR. VIDEO**
by Rick Lehtinen

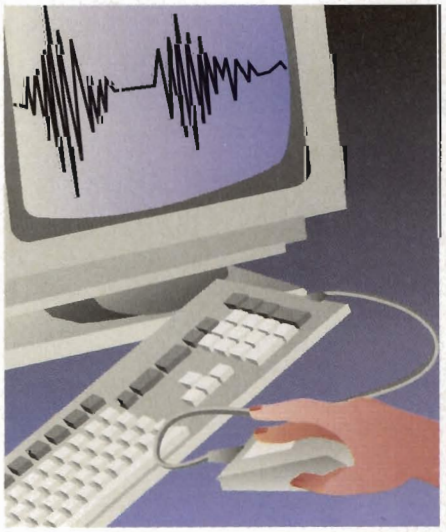
34 **SPECIAL F/X SECRETS**
by Robert McCarthy

38 **SOUND REASONING**
by Cliff Roth

42 **TAMING THE WAVE**
by David Hopkins

112 **CYBERSPACE**
by Geoffrey Williams

152 **LAST WORD**
by Lee Stranahan



REVIEWS & TUTORIALS

84 **PANASONIC AG-3P PALMCORDER**
by Cecil Smith
A review of Panasonic's new S-VHS three-chip camera.

88 **SANYO GVR-S950**
by Tim Doherty
A review of Sanyo's S-VHS animation recorder.

92 **THE PERSONAL TBC IV**
by Tony Gomez
A review of DPS's fourth generation TBC—again priced under $1,000.

96 **BATCH PROCESSING WITH THE VIDEO TOASTER**
by Matt Drabick
A review of two powerful tools for processing LightWave images: MultiFrame and ProControl.

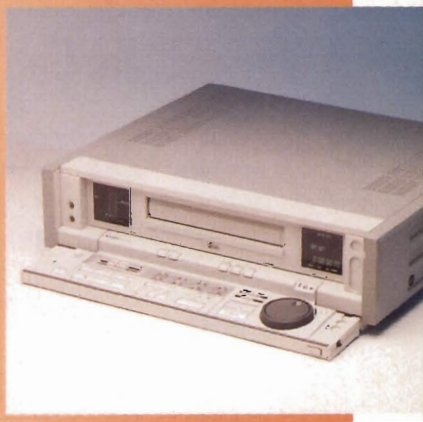
104 **DKB RAM EXPANSION**
by Brent Malnack
A review of DKB's new Zorro III RAM expansion board for the Amiga 4000.

106 **MOVIEMAKER**
by Douglas Nakakihara
A review of Interactive Video Systems's digital audio and video editing tool.

118 **BUILDING GEARS IN LIGHTWAVE, PART II**
by Christian Aubert
Part two of the tutorial explains how to build bearings and their housing in LightWave.

120 **ALL ABOUT MATTES**
by Brent Malnack
A tutorial in how to create static and traveling mattes (excerpt from *Mastering Toaster Technology*).

124 **TRANSFERRING GRAPHICS FROM PRINT TO VIDEO**
by Julian Williamson
A ToasterPaint tutorial.



SUBSCRIBER UPDATE

It has been almost two years since we acquired the *Bread Box* newsletter from Lee Stranahan and began publishing *Video Toaster User*. Since then we have followed the Toaster's meteoric rise and grown from a 20-page newsletter with 300 subscribers to a 150-page magazine with a distribution of almost 60,000 copies per issue. Because of NewTek's increased product development pace—since April, they have released Toaster 3.0, Toaster 4000 and the Video Toaster Screamer—and the growing demand for more and more personal video production information, we have decided it is time to take the next big step and begin publishing *Video Toaster User* on a monthly basis.

The October/November '93 issue that you are now reading will be the last bi-monthly issue of *VTU*. January 1994 will mark the first monthly issue of *VTU* (NOTE: There will be no December '93 issue, but in mid-December, all subscribers will receive a free issue of *VTU's Guide to Personal Video Production*, which will also include a complete listing of all Video Toaster-related software & hardware products and other Video Toaster services.)

Publishing *VTU* more frequently is just one of many ways that we can deliver the valuable personal video production and Video Toaster information you need. In the coming months you will be hearing about other Toaster-information services that we are developing. These will include books, videotapes, special reports, as well as our very successful Lee Stranahan Toaster Training Seminars.

I know many of you have already had the opportunity to benefit from Lee's vast Toaster knowledge. Since mid-July, he has visited over 20 cities and plans to continue his tour on into next year. One of the cities that he will be visiting soon is Honolulu. We have decided to take advantage of this visit by creating a very special Toaster Training event in this exotic city.

We're calling it "Toaster Training in Paradise" and it takes place October 20, 21 & 22 (Wednesday, Thursday, Friday) in a Waikiki beachfront hotel. This will be an expanded edition of Lee's training seminar that will cover many Toaster subjects in far greater depth than his standard seminars. As an added bonus, we have invited *seaQuest* animators, John Gross and Tony Stutterbeim, to provide advanced LightWave 3D modeling and animation training. This convergence of Toaster superstars is truly a one-of-a-kind event. If you are interested in attending this unique Toaster training experience, call Ann Pulley at 1-800-322-2843. I'll look forward to seeing you in Hawaii!

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

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

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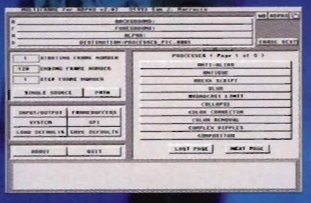
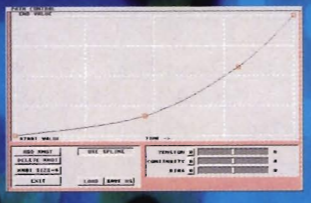
According to Matt Drabick of AVideo magazine, "MultiFrame is a must for Amiga video users who always wanted to apply special effect to their animations using ADPro and MorphPlus but never had the time to learn how to write and execute ARexx scripts."





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- ***Automatic conversion*** *of any supported image format to any other format (including ANIM-5/ANIM-8 and* ***Toaster*** *FRAMESTORE) during processing.*

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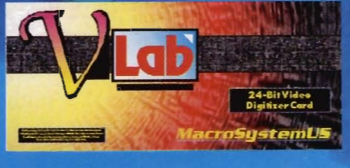

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TOASTER TALK

The Screamer

Changing the LightWave Equation

By Phil Kurz

NewTek's recently-introduced Screamer rendering powerhouse fundamentally changes the animation equation on three counts. It reshapes how people work, who does the work and how much is charged.

If you haven't yet heard, NewTek unveiled the Screamer, a 600 MIPS (million instructions per second) rendering workstation for LightWave, in August. Its price without RAM is $9,995. (Users probably will need between 64 MB and 128 MB of RAM.)

Designed around four R4400 RISC (reduced instruction set computing) microprocessors running in parallel, one red and gray Screamer can do the work of a 40-station 68040-based Toaster rendering farm. While it's impossible to know all of the consequences of this introduction, it seems safe to say that the change that's coming to computer graphics as a result of the Screamer could be as significant as the change the original Video Toaster had on video production.

It's About Time

Although it may be a cliche, it's true: In animation, time is money. The longer a Toaster system spends rendering an animation, the less time it is available to model or animate another project. For that matter, it's not available for any other Toaster task either.

In the past, LightWave animators looked for ways to minimize rendering time because they knew that despite accelerated Toaster systems, rendering could take as much as 75 percent of the total time needed to complete a project. Thus, smart LightWave animators used tricks like shaving polygons off unseen surfaces, limiting the number of light sources and reflections in raytraced scenes and avoiding the use of refraction when possible to keep rendering time to a minimum.

If the Screamer lives up to its billing and is truly 40 times faster at rendering than a single Toaster, the total percentage of time spent on rendering should drop to about 7 percent. Let's look at the numbers. In a 100-hour animation project rendered on a single Toaster, 25 hours would be spent modeling and animating and 75 hours would be spent rendering. Completing that same project with the help of a Screamer changes the equation dramatically. The Screamer should be able to render the same project in just under two hours (1.875 hours, if you must know). The total time to complete the project now becomes about 27 hours. Rendering time represents 6.9 percent of the total time spent on the project, and most importantly, the Screamer has freed up 73 hours that can be devoted to other billable projects.

(By the way, if you don't agree that 75 percent of the time involved in an animation is spent on rendering, plug your own percentage in and run the numbers for yourself. You will find that regardless of the number you use, if you are truthful, the time savings is significant.)

Making LightWave animators more efficient and more profitable is only half the story of how the Screamer should change how people work. The other half shows up when the animation is actually viewed. Because the Screamer is such a rendering speed demon, LightWave animators may choose to add that extra light source and reflection in a raytraced sequence of frames that they previously would have avoided. Without the millstone of rendering time tied around their necks, LightWave animators will be more likely to explore avenues previously avoided.

Who's on First

The Screamer could also set off an implosion in the computer graphics industry. If the Screamer puts super fast rendering into the hands of thousands of LightWave animators around the country, and if it makes each of them three to four times as productive as they currently are, the market pressure workstation-based animation houses will face may be unbearable.

If the laws of supply and demand apply, and I can see no reason why they shouldn't, the Screamer will mean that thousands of new sources of animation—LightWave animators who previously could not compete from a rendering time point of view with the fast workstation crowd—will be available to the market. An abundant supply of animators in the market means that the prices charged for animation should come tumbling down from what's typically charged by the workstation crowd. Think about it, demand for animation would have to grow two to three times to maintain current pricing, and at current pricing there doesn't seem to be a chance that it would.

Doubt that thousands of LightWave animators will have access to Screamers? I don't. Certainly there will be animators who buy their own Screamer. Given that it is affordable, yet still a little expensive for many Toaster owners, it's likely that some LightWave animators will pool their resources and buy one to share. Given its speed, sharing a Screamer isn't an unreasonable notion.

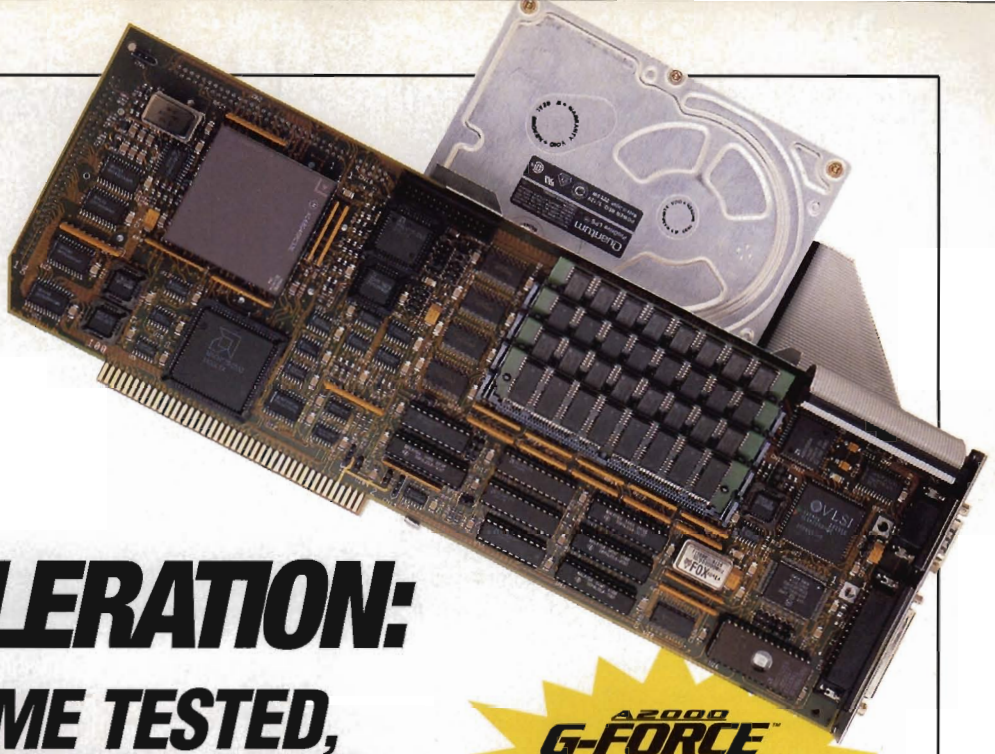
Beyond that, I wouldn't be surprised to see LightWave rendering bureaus popping up around the country. Entrepreneurs with an understanding of the market and a little capital are likely to start these bureaus, bringing the speed of the Screamer to the rest of the Toaster community. Thus, the Screamer is likely to broaden the pool of animators doing high-end work and in turn transform animation rate cards around the country.

Screaming into the Future

My crystal ball is no clearer than anyone else's. However, we have all seen this scenario played out before in the form of the Video Toaster. I can't tell you how many people I heard grousing about the Toaster when it was introduced because it changed the status quo they had learned to love. Those with a little foresight recognized the Toaster for what it is, a powerful and affordable video production tool, and transformed their businesses so that they could benefit from it.

My word to anyone outside the Toaster community who wants to whine or complain that the Screamer will wreck his cozy little world in which clients pay and pay and pay is simple. Forget the comfort. Ignore the cushy. Size up the Screamer for what it is and get ready for the future.

FOR THE AMIGA® 2000 SERIES



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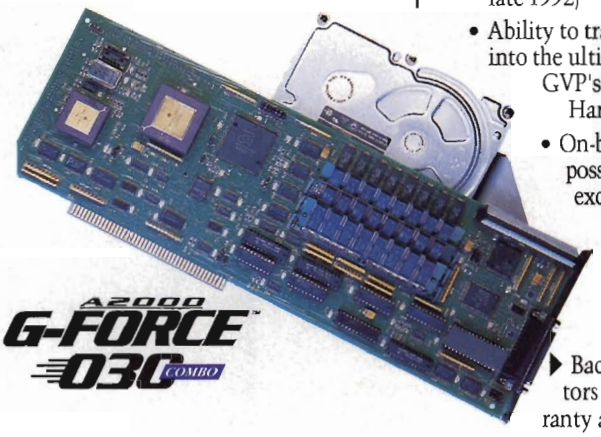

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LETTERS TO THE EDITOR

Dear VTU:

First and foremost let me say, I love your magazine! I have had subscriptions ot other magazines, including PC software and hardware magazines, but never have I enjoyed a subcription so much. I don't even own a Toaster yet (I'm buying a 4000 when I can come up with the money).

However, I have been able to keep up with the technology mostly by reading VTU and going to Lee Stranahan's seminars. I even convinced my employer to buy a couple of Toaster 2000s last year.

I don't know when my subscription ends, and I certainly can't chance it running out, so please add on another 12 issues.

Yours truly,
John W. Chappell
Shaker Heights, OH

Dear VTU:

I just wanted to make a few comments about Bob Anderson's "The Need for Speed" article in the August/September issue. Mr. Anderson makes a couple common mistakes about the Amiga 2000. One, he indicates that for serious LightWave rendering one should have 16 MB of RAM. He fails to point out that a stock Amiga 2000 cannot address more than 9 MB of RAM. You must use an accelerator card that can access its own memory to break this limit.

Second, the Agnus—not Agnes—chip is not a RAM chip nor is it used for image storage. However, one of its functions is to determine the amount of RAM that can be used as chip RAM. If your Amiga only has 1 MB of RAM installed—an A2000's motherboard only has room for 1 MB of RAM—upgrading to a 2 MB Agnus won't do anything (if it will work at all). You must have additional RAM installed. Additional 16-bit RAM is added by plugging a RAM card into one of the expansion slots. For example, if your A2000 had 1 MB of RAM on the motherboard and an 8 MB RAM card installed, you'd have 1 MB of chip RAM and 8 MB of fast with a so-called "fat Agnus" (the original Agnus was limited to 512K). By installing a 2 MB Agnus, you end up with 2 MB of chip RAM and 7 MB of fast.

Also, upgrading to a 2 MB Agnus will not give you any speed improvement. In fact, by reducing the amount of fast RAM, it could actually slow things down if a program is forced to use chip RAM instead of fast. Chip RAM is the slowest type of RAM on the Amiga. The chip RAM speed improvement on an A3000/4000 is due to the 32-bit bus design.

Very truly yours,
Douglas J. Nakakihara
Simi Valley, CA

Bob Anderson responds:

Your first comment regarding the amount of RAM required for serious LightWave rendering is correct, although you *assume* that I meant that you could install more than 9 MB memory on a 68000 Amiga 2000. The point of the article was to suggest ways to speed up your computer. It was not a forum for a highly-technical discussion regarding the nature of the Amiga's DMA. This comment was directed at those people who intend to pursue serious LightWave rendering , and anyone intending to do serious LightWave rendering wuld obviously be using an accelerator (i.e., if you're auto racing in a Yugo, you're not serious).

Your comments regarding the Agnus chip are simply incorrect (although your spelling is on the mark). As I explain in the article (page 84, second column near the top), "There are add-on boards available for the 2000 that upgrade the Agnes (sic) chip to 2 MB." I, of course, was referring to expansion boards like the DKB Megachip 2000 and not hot-wiring the 2 MB chip to the motherboard (by the way, this does work). The article continues: "Adding this chip helps improve the speed of screen redraws, especially in Modeler." This is simply the fact of the matter. I would suggest that you try one of these chips yourself before you draw any conclusions.

Most of the statements in your letter are correct, although they don't seem directly related to any issues brought up in my article. I am confused about your comments regarding the 9 MB barrier, as I never said anything to the contrary. Your explanation of the functionality of Chip RAM is thorough, albeit somewhat lacking in the fact department and also bearing no direct relevance to my article.

If you would like to talk with me directly, I can be reached at NewTek Tech Support: (913) 231-0100.

Thanks for you comments,
Bob Anderson
Manager, NewTek Technical Support

Dear VTU:

We are a group of Commodore shareholders in the Philadelphia area. Our goal is to elect new directors to the Board of Comodore International Limited who can manage the company more effectively than the current board. This company stands to play a major role in both the professional and consumer multimedia markets. With the proper direction, it could produce everything form interactive cable boxes to video production equipment.

Directors for the company are elected on staggered, three-year terms. Two positions are up this year. We are looking for candidates with experience and vision who can bring new life to the company and lead it into the future. We will be soliciting proxies and need to reach all of the shareholders by Saturday, October 30, 1993.

For more information, mail us at:
P.O. Box 8296
Philadelphia, PA 19101
Fax (215) 825-3966
Sincerely,
Michael Levin
(215) 487-0440

Corrections:

In August/September issue, we mistakenly omitted the address and telephone listings of the following companies in product reviews:

The Box (page 95)
Iomega
1821 West 4000 South
Roy, Utah 84067
(800) 4-THE-BOX
Fax (801) 778-3450

Montage (page 106)
Innovision Technology
1933 Davis St.
Suite 238
San Leandro, CA 94577
(510) 638-0800
Fax (510) 638-6453

Image F/X (page 110)
Great Valley Products, Inc.
600 Clark Ave.
King of Prussia, PA 19406
(215) 337-8770
Fax (215) 337-9922

Dear VTU:

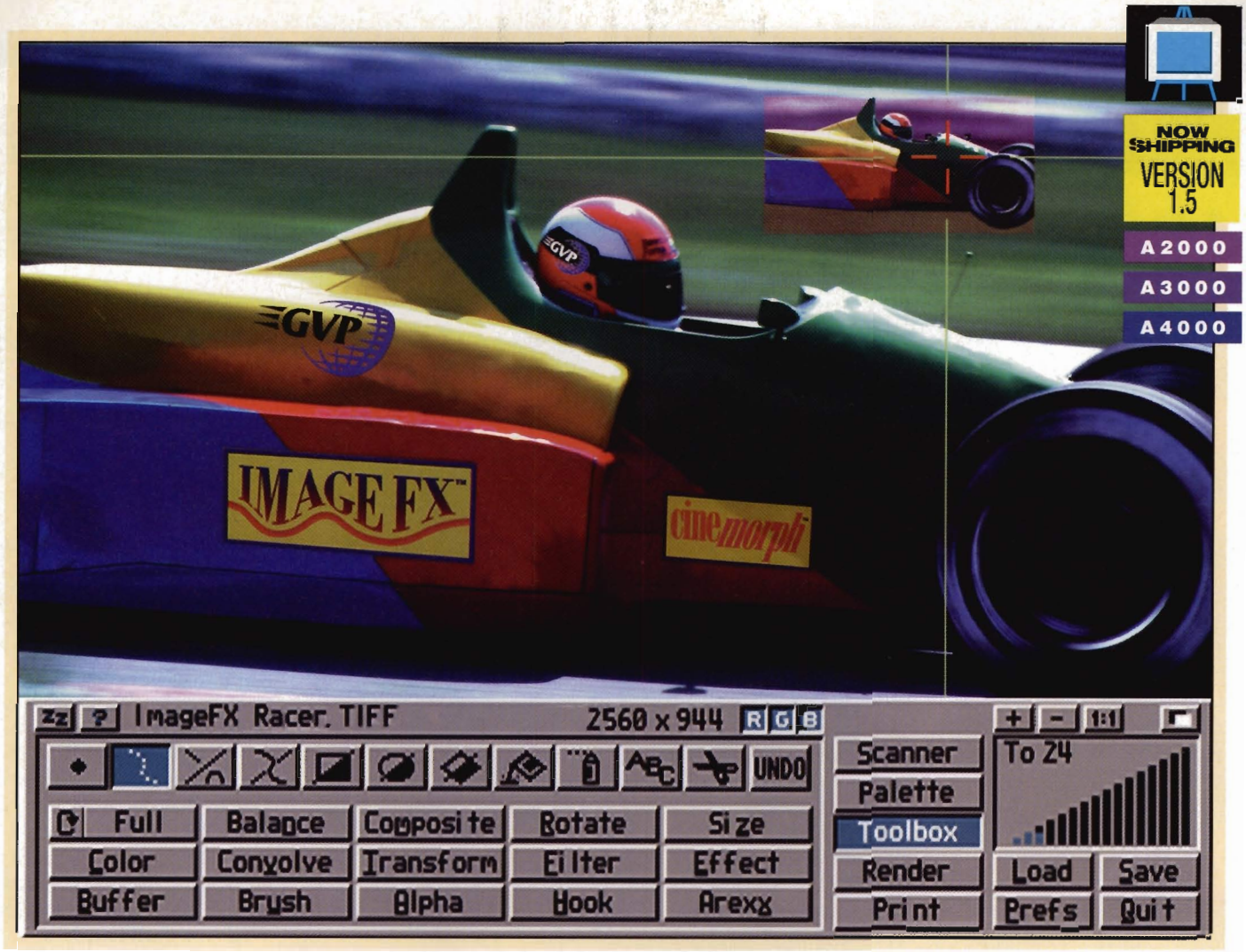
Many thanks for *Video Toaster User*. The August/September issue was instrumental in getting me involved in an arrangement in which myself and two friends are receiving free access to a Toaster 4000 in a production studio!

We anticipate many wonderful projects and want you to know that *VTU* will be a valuable and constant companion. We will support your advertisers at every opportunity!

A "Toast" to the future!
Russ Dillard
Orlando, FL

If you have a comment, suggestion or complaint, we want to know about it!
Send your correspondence to:

Letters to the Editor
Avid Publications
21611 Stevens Creek Blvd.
Cupertino, CA 95014
Fax (408) 725-8035



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"Pro Conversion Pack"	*Included*	$ 90.00
Epson Scanning	*Included*	$ 200.00
TOTALS	**$ 299.00***	**$884.00***

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Undo & Redo	YUV/YIQ Operation

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NEW PRODUCTS

Compiled by Karla Holland

I Scream, You Scream

Featured Product: Video Toaster Screamer

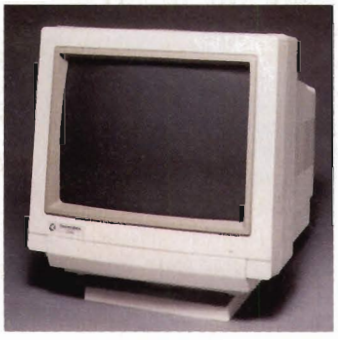
Description: External rendering engine for the Video Toaster.
Price: $9,995
NewTek, Inc.
215 SE Eighth Street
Topeka, KS 66603s
(800) 847-6111; Fax (913) 231-0100

With a hardware design containing four parallel MIPS R4400 RISC processors, the *Screamer* delivers over 600 MIPS system performance. By running each processor at 150 MHz with both internal and external caches, the Screamer reaches 340 SPECMarks. The

Toaster Screamer system comes complete with NTSC video in and out and takes full advantage of the Toaster's LightWave 3D animation system.

Color Multiscan Monitor

Product: 1942
Description: Color multiscan monitor for the Amiga.
Price: $479
Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380
(215) 431-9100
Fax (215) 431-9465



The *1942* color multiscan monitor provides analog RGB (15.75 KHz) and VGA (31.5 KHz) scan modes with support for the Amiga computer's Advanced Graphics Architecture (AGA) custom chip set resolutions. A built-in amplifier and left and right speakers enable the 1942 to provide quality stereo sound. The 14-inch monitor screen has a .28mm dot pitch and is equipped with a tilt and swivel base.

Commodore SCSI-II

Product: A4091
Description: A fast SCSI-II controller card for the Amiga.
Price: $379
Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380
(215) 431-9100
Fax (215) 431-9465

The Commodore *A4091* is a fast, full-size SCSI-II controller card for the Amiga 3000 and 4000 series of computers, with an integrated 3.5-inch drive mount which fits into the Amiga's Zorro III slot. Compatible with SCSI-1 devices, the card also includes internal and external SCSI-II connectors supporting up to seven devices. The fast SCSI-II controller provides transfer rates of up to 10 MB per second. Use of the A4091 in an Amiga 3000 or 4000 system requires a Buster chip Revision K, AmigaDOS 2.04 or higher and supported processor cards.

Fast SCSI-II Controller

Product: Fastlane ZE
Description: Fast SCSI-II DMA controller
Price: $599
Advanced Systems & Software
1329 Skiles St.
Dallas, TX 75204
(214) 239-2000
Fax (214) 821-3464

The *Fastlane ZE* Fast SCSI-II DMA controller expansion device for the Amiga 4000 features a Fast SCSI-II controller with 32-bit DMA access and 32-bit wide memory expansion up to 7 MB/sec (asynchronous) and 10 MB/sec (synchronous) on the SCSI bus.

The transfer from and to the memory can reach maximum speeds of more than 20 MB/sec through the Fastlane's 32-bit wide bi-directional FIFO memories. Fastlane Z3 is designed to operate with any revision of the level 2 SuperBuster bus controller.

Owners of older A4000 models will not have to change the Buster chips soldered onto their motherboard to use the Fastlane's full DMA power. It comes with a caching utility and supports virtually any SCSI device available. It comes with a two-year limited warranty.

Toaster 4000 Expansion

Product: Toaster Toolbox 4000
Description: Expansion box for Toaster 4000.
Price: $369.95
Desktop Video Systems
14121 W. 95th
Lenexa, KS 66215
(913) 782-8888
Fax (913) 492-6908

The *Toaster Toolbox 4000* includes eight expansion slots for Toaster internal peripherals, such as time base correctors, vectorscope and waveform monitors, and sync generators. It includes a heavy-duty internal power supply and cooling fan.

Although designed to be used with the Toaster 4000, Toaster Toolbox 4000 is compatible with all Toaster systems. It's compact in size and is color-coordinated to match the Toaster 4000. The price includes free shipping to anywhere in the continental United States.

Multipurpose TBC

Product: Time Base One
Description: Infinite window TBC
Price: $1,895
Ikon Video Inc.
P.O. Box 421427
San Diego, CA 92142
(714) 731-7507
Fax (714) 731-7509

Ikon Video Inc. announces the release of a new multipurpose TBC, *Time Base One*. It includes infinite window memory, full-frame or field freeze, dual switch selectable

inputs, 5.5 MHz bandwidth, composite and Y/C input and output with full transcoding and an internal black burst generator with BNC

output and genlock input.

The front panel controls provide both preset and manual proc amp adjustments, Sc/H phase adjustment and an operate/bypass switch. The system includes an automatic bypass relay, which operates in the event of power failure.

With the on-board power supply for standalone operation, Time Base One is ideally suited for the Toaster and other desktop video systems where computer board slot space is unavailable.

Wait a Minute!

Product: NV455 Toaster Delay
Description: Video delay box
Price: $386
Television Equipment Associates Inc.
P.O. Box 393
S. Salem, NY 10590
(914) 763-8893
Fax (914) 763-9158

Matthey Electronics introduces the new *NV455*, which has a variable delay range of 310 to 480 nanoseconds (ns) and is switched to within 2 ns with a fine delay screwdriver trim of +/- 1 ns.

The NV455 mounts into Matthey's type 5 NV series panel, which accommodates up to 15 delay boxes. It has broadcast performance and boasts a flat loss of < 2.0 dB, an amplitude ripple of < 0.15 dB, a delay ripple of <20 ns and return loss of >20 dB.

Syndesis 3D ROM

Product: 3D-ROM
Description: CD-ROM 3D Object Library
Price: $199.95
Syndesis Corp.
P.O. Box 65
235 S. Main St.
Jefferson, WI 53549
(414) 674-5200
Fax (414) 674-6363

The Syndesis *3D-ROM* contains models in ready-to-use formats including AutoCAD DXF and 3D Studio, Wavefront .obj, LightWave

and Impulse's Imagine for MS-DOS and the Amiga.

The collection includes more than 12 automobiles, more than 36 aircraft and spaceships, humanoids, furniture, buildings, and many other objects. The disc also contains 400 tileable, wrappable, bitmap image texture maps for coloring 3D models.

3D-ROM includes a cross-referenced catalog of the objects, including background information about the translation process and how the objects can be used in many 3D programs. It works on any CD-ROM-equipped computer platform.

The Little Magic Box

Product: Y/C++
Description: Converts Toaster to Y/C in and out
Price: $699
Prime Image
19943 Via Escuela
Saratoga, CA 95070

The *Y/C++* plugs directly onto the back of your Toaster with no internal disturbance, and uses no space or power from the host computer. It is S-VHS, Hi-8, Betacam, and MII compatible and has a 3-way adaptive comb filter. All inputs and outputs to the Toaster are available at all times.

Soft Rifa-Lite to Go

Product: Rifa-Lite
Description: Portable soft light
Price: $595
Lowell-Light Manufacturing Inc.
140 58th St.
Brooklyn, NY 11220
(800) 334-3426
Fax (718) 921-0303

The *Rifa-Lite* portable soft light is a lightweight, location-oriented unit that features a self-contained halogen lamp centered within a collapsible, high-temperature-tolerant, silver-reflector textile housing. A heat-resistant front diffuser provides efficient illumination with soft shadows.

Best suited for use as a key or fill

source for subjects or backgrounds, the Rifa-Lite sets up and folds up like an umbrella, and its compact, lightweight design makes it portable and quick to set up and strike.

ImageF/X Toaster Module

Product: ToasterFX
Description: ImageFX loading module
Byrd's Eye Software
9001 Northgate Blvd. #135
Austin, TX 78758
(512) 835-4811
Fax (512) 835-1229

Byrd's Eye Software, makers of the ToasterVision package for the Video Toaster, have announced *ToasterFX*, a complement to ImageFX, allowing it to load, save and display directly to and from the Toaster.

ToasterFX modules allow ImageFX to preview and paint within the Toaster.

New Updates

ImageFX 1.5

Product: ImageFX 1.5
Description: Effects software update
Price: $29.95
Great Valley Products
657 Clark Ave.
King of Prussia, PA 19406
(215) 337-8770
Fax (215) 337-9922

MathVISION 2.4-Video

Product: MathVISION 2.4-Video
Description: Custom special effects
Price: $49 for registered owners of MathVISION 2.0
Seven Seas Software Inc.
P.O. Box 1451
Port Townsend, WA 98368
(206) 385-1956

MediaPoint 3.0

Product: MediaPoint 3.0
Description: Presentation creation and sequencing software
Price: $499
Activa International
P.O. Box 2360
1100 DT Amsterdam Zuidoost
The Netherlands
31-0-20-691-1914
Fax 31-0-20-691-5403

"Secrets of the Panasonic AG-1960 and AG-1970"

Product: "Secrets of the Panasonic AG-1960 and AG-1970"
Description: Educational videotape
Price: $39.95
Kingsway Productions
2427 Hart Ave.
Santa Clara, CA 95050
(408) 244-9692

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Phone: (310) 605-6527 Fax: (310) 605-6529

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TOASTER TIMES

A 3D Lifestyle

Steven K. Harris Jr. may be the only actively practicing yuppie to have been born in 1977 who made his real-world dreams come true from 3D.

While attending Smith Jr. High in Charlotte, NC, Harris Jr. was introduced to 3D animation when his father bought an Amiga 2000 and soon after, a Video Toaster 2000. Smith Sr. was quick to lay down the law about *whose* Toaster it was. "He didn't want me messing with it when he first got it. I would play with it while he wasn't home," Smith Jr. remembers.

Three years later, Harris Jr., 16, has his own company, Optical Arts Group, and designs 3D logos and animations. His clients include General Tire, United Dominion, television station WTVI in Charlotte, and Walter Klein Motion Pictures. His design work for *Charlotte Cardiology*, was entered by WTVI in the National Academy of Television Arts and Sciences (NATAS) regional competition in the animator category, making Harris Jr. eligible for an Emmy.

Profile

What motivates Harris Jr. to sit in front of his workstation while his friends are at little league practice? "The work I do is so creative—it really has no limits. The Toaster is so easy to use and has the capabilities of a higher-priced workstation," he says.

Currently, Harris Jr. is using LightWave 3.0 with his original Amiga 2000. "We still don't have an Amiga 4000, because from my experience, the 2000 is slightly faster. But I still may get a 4000 at some point," he says.

Two weeks after his 16th birthday, rather than upgrade his Amiga, Harris Jr. opted to purchase a 1991 Mercedes Benz . When asked why he bought it, he answered in deadpan: "Well, it holds its value and it's a nice car." Spoken like a true yuppie.

—Josh Moscov

Squash, Anyone?

Southern Lights Productions has wreaked havoc on the competition in Chesapeake, VA. By adding the Video Toaster to its full-service production facility two years ago, Southern Lights was able to offer lower prices and effectively garnered the lion's share of low-end video production.

"We were the first production house in the area to use the Toaster," says Bill Green, Creative Director. "Now there are about 15 companies, including high-end production houses, that have incorporated the Toaster—some even offer complete Toaster editing bays." With Southern Lights' head start and consistently low prices for 3D animation, effects and video production, it has managed to stay a step ahead of the competition. "We've pretty much squashed it," Green says. "We are the competition."

An early jump on the competition and low prices (around

An Emmy, for Me?

By Josh Moscov

Foundation Imaging's Ron Thornton, Shannon Casey and Paul Beigle-Bryant won an Emmy for Outstanding Individual Achievement in Special Visual Effects for *Babylon 5*. The threesome was honored at the Creative Arts Awards Ceremony for Prime-Time Emmys at the Pasadena Civic Center Exhibition Hall on Sept. 18th, according to Mark Apostolon, Prime-Time Emmy Awards coordinator for the Academy of Television Arts and Sciences. Episodes from *Star Trek Deep Space 5* and *Young Indiana Jones Chronicles* also won for Special Visual Effects.

Thornton's reaction to the news of his Emmy for *Babylon 5*: "Oh gosh, I'm overjoyed. Being judged like that by your peers is wonderful. The other winners did excellent work too."

While Thornton et all are immensely flattered by the Emmy, Thornton doesn't have time for the pageantry of Hollywood these days since he, his staff, and their 22 Video Toasters are busy working on episode five of 22 for the *Babylon 5* syndicated series. He noted that the episodes will be stocked with arresting LightWave visuals. "Our goal is for each episode to contain as many thematic variations as possible. We just completed an hour episode that had as many shots as the feature-length pilot. This requires having lots of downward weightless space battles and space stations being blown up. We want to minimize the amount of shots that were popular on the original *Star Trek*. You know the ones where the Enterprise orbits orange planet and Enterprise orbits green planet. Those shots have their place but we want the episodes to be exciting."

While the trade papers have been writing about "supposed negotiations" between Warner Bros. and PTEN (the producers of *Babylon 5*)

Courtesy Foundation Imaging

Emmy Continued on Page 17

$500 for a flying 3D logo) aren't the only reasons for Southern Lights' success. Green is also an award-winning videographer. His production of *Who Is It?* was hand-picked by Michael Jackson as a top-three winner in the Michael Jackson MTV music video contest,

Profile

which had more than 4,000 entries. "Since we only had 28 days to enter the completed music video, I relied on DeluxePaint to provide the bulk of the animation sequences and the Toaster for everything else," Green says.

Since the MTV contest, Green has started discussions with Grammy-award winner Bruce Hornsby for a future project and is now represented by the powerhouse talent group Creative Artists Agency (CAA). But even with the whirlwind of success, Green remains down to earth about his future plans, which include writing children's books and more LightWave animations and Toaster productions. "The greatest thing about the Toaster is that it gives me control," Green says. "It's nice to do a video project from beginning to end without needing 10 other people or having to work around their ideas. The Toaster gives the ability for a production to be an artist's project—his alone—taking his vision from concept to finished product."

Bill Green
Southern Lights Productions
808 Live Oak Dr.
Suite 101
Chesapeake, VA 23320
(804) 882-9312

VTU

Emmy Continued From Page 16

to include the series in the media empire's future network television plans, Thornton claims it's all just Hollywood hype for now. But Foundation Imaging is currently building a ride for Warner's amusement park in Australia. Thornton summed up the ride "as very dark and with an underwater volcanic eruption as a theme."

Even with the Emmy award, a large staff and an arsenal of Toasters, Thornton is clear about the thing that has made him successful: working with LightWave 3D. As he says, "The only way anybody gets anything done these days is by pushing the envelope. Luckily, the work I do has been simplified in the last several years by the Toaster and LightWave 3D. It would have been very difficult to do *Babylon 5* without these tools."

In fact, one of the most talked-about scenes of *Babylon 5* (the final pull out of the B5 spaceship near the end) would have been impossible without LightWave. "The challenge there was maintaining the scale of the B5 while giving the world a weightless feeling. We did a lot of camera rotation to reinforce the fact that there is no up or down in space," Thornton said.

Yet of all the visually stimulating shots in the pilot, Thornton had the most fun creating the composite of the flying cameras in the courtroom scene. He enjoyed matching live action lighting elements with computer-generated objects.

With the success of *Babylon 5* and other shows, Thornton believes that LightWave will be used more and more as a high-end animation rendering system. NewTek's new Screamer—a 600 MIPS (million instructions per second) rendering workstation for LightWave—will allow animators to do film-quality or raytrace, television-quality shots. "Everyone wants more power, that's a given. The Screamer will enable us to do shots in a more timely manner. When you're on a tight budget, you can't take four or five hours on one shot," Thornton commented.

When it's all said and done, what really motivates Thornton on a daily basis? In addition to expanding the boundaries of 3D imaging and making more money, Thornton dreams of the day when, with the help of some ARexx coding, he could automate the hundreds of stock shots that are required in science fiction work.

After all, conducting space battles can get boring.

VTU

The Hollywood Insider

By Wil Wheaton

I started in the entertainment industry 14 years ago when I was 7. I got my break at age 13 in the film *Stand By Me*. After that, I was cast as young Wesley Crusher in the TV series *Star Trek: The Next Generation*. After four years on the series, I asked to be let go so I could pursue other avenues to see if acting was really the thing for me.

Sometime after that I discovered the Toaster, and my life was forever changed. Suddenly, the things that I didn't like about the industry didn't matter anymore because I could circumvent them by doing my own videos. Now, I produce videos and make my own TV, which I think is the wave of the future.

In this column, I'll regale you with nifty stories about my personal video production adventures and give you an insider's look at the entertainment industry. My goal this month is to repeal the beige tax.

During my career, I've seen Hollywood through the wide eyes of a child, with the cynicism and confusion of a teenager and the wisdom of an adult. (I'll never admit to that around my parents. Then they'd want me to do my own laundry.)

As a child, I thought making movies was simple. Take your camera, go shoot stuff and presto! You've got a movie. I took that perception and along with my video camera started to make my own little videos out of my house in Sunland, CA.

The ideas for my videos usually came from the picture I was working on at the time or the movie I had seen most recently. While I was working on a picture with lots of stunts, my brother and sister and I were making "Smasho-Crasho: The Stunt Movie" at home. I didn't know it at the time, but I was already part of the personal video production revolution.

We watched that tape over and over again. It was special because we made it ourselves. Those were our ideas we were seeing on TV! True, it was rough around the edges, but we didn't have CGs, switchers or 3D animation then.

That meant that the audience was limited to us (the people who made it) and hapless family members, who we tortured during holiday screenings. Now of course, the technology of personal video production has made it possible for me to do a "Smasho Crasho" movie that will appeal to a much wider audience (well at least to those people who share my particular sense of humor).

Why did I make movies when I got home? Why did I take my work home with me? I wondered about this through my teenage years and realized I did so because nobody was making the movies I really wanted to see. In true teenage fashion, I concluded that "everything else just sucks." This made me angry at the whole world for quite a long time.

Then *Star Trek: The Next Generation* happened. Suddenly I was having a good time as an actor. Star Trek is an example of good television. The writing is good, and the people who make the show really care about it. Gene Roddenberry had his vision and held fast to that through three decades and many efforts by the network to change it. If only all of showbiz worked like Star Trek.

Many productions are the victims of the dreaded beige tax. This heinous concept is best illustrated by the following story as told by Penn Jillette of Penn and Teller fame. "Once there were two people,

Continued on Page 18

Hollywood Insider Continued From Page 17

a computer nerd and a fashion model, who rented two separate Manhattan loft apartments on the same floor." I realize this never happens, but stay with me.

"These two apartments shared a common foyer, which needed a coat of paint. The computer nerd and the fashion model got together to discuss what color the foyer should be painted. 'Green,' said the computer nerd. 'Green?!' The fashion model cried, 'That's so gauche!'

" 'Well, all my friends' rooms are painted green!' the computer nerd retorted. 'I'm sure they are,' snapped the model, 'but my friends will expect magenta.'

" 'MAGENTA?! That figures!' the nerd wailed. 'Well, what about mauve?' the model mused. 'That's too much like magenta,' the nerd complained, 'How about olive drab?' '$#@!,Õ,' replied the model.

"A raging argument ensued in which increasingly conflicting color schemes were considered. Ultimately, the only color scheme they could agree upon was dark beige with light beige trim because 'it doesn't offend anyone.'"

Of course, choosing beige is a disastrous compromise that everybody ends up hating. Just watch reruns of *The Brady Bunch* or look at the carpet of a Motel 6. (They'll leave the light on for you, I'm told).

Here's a scene from a gripping docu-drama that I wrote that shows how the Beige Tax works:

Fade up on a SMOKY HOLLYWOOD PRODUCER'S OFFICE. A PRODUCER sits with his feet crossed on his oversized mahogany desk. A NERVOUS WRITER is sitting in an uncomfortable chair across from him. There is the first draft of an INTERESTING, DIFFERENT SCRIPT in his hands.

PRODUCER: OK kid, pitch me your story.

WRITER (with caution): Well, sir, what I have in mind is a movie that shows the heroic struggle of a black woman to adopt a white child in Georgia during the Great Depression.

PRODUCER: (looks at watch) Uh-huh...What genre?

WRITER: I see it as a tragic drama.

PRODUCER: Do you have any stars attached to this project?

WRITER: (eagerly) Well, the public has preconceptions about stars. I think it might be better if we went with unknowns and let the piece stand on its own.

PRODUCER: (snaps his fingers) Here's what we'll do. We'll change the main character to a man, so we can have <BIG-NAME ACTION STAR> in it and go for the fast food and merchandising tie-ins.

WRITER: (shocked) <BIG-NAME ACTION STAR>?!

PRODUCER: Yes, and we should also add <PRECOCIOUS CHILD STAR> as well. It'll bring in the kids and the families.

WRITER: (slowly) Well, I guess, maybe . . .

PRODUCER: Yeah! I can see it now! We can make <A LARGE SUM OF MONEY> with a fast food tie-in if we get <BIG-NAME ACTION STAR> in it.

WRITER: Well <BIG-NAME ACTION STAR> hasn't done much straight drama...

PRODUCER: So we'll make it an action-adventure-comedy-buddy-cop movie. We've already got <POPULAR DIRECTOR> contracted to do 10 more films for us, and he could do this movie in his sleep.

WRITER: (trying to compromise) I don't know, maybe it would work, I still think it needs to have...

PRODUCER: . . . <LARGE, EXTINCT REPTILES>! That's a great idea! Definitely, the hit of the summer! What do you say, son?

WRITER: (choosing between being a Hollywood writer and returning to work at BurgerWorld, he forgets his integrity) You know, that formula is brilliant after all!

PRODUCER: Thank you, son, I know. That's what got me this big corner office. Can you have it to me by the end of the day?

WRITER: Of course, sir.

The WRITER scurries out of the office to the studio's HOLLYWOOD MOVIE-MAKING MACHINE, enters the HOLLYWOOD FORMULA and produces A BLOCKBUSTER MOVIE SCRIPT.

Ah, I can see the headlines now: See <BIG ACTION STAR> in <BLOCKBUSTER MOVIE>!! More <LARGE, EXTINCT REPTILES> than <RECENT, BLOCKBUSTER MOVIE ABOUT LARGE, EXTINCT REPTILES>!

Not much like the original story, is it? Unfortunately, these *compromises* are a common occurrence at the big studios. I call it playing the game. Fortunately, due to personal video production, scenes like this are rapidly going the way of <LARGE, EXTINCT REPTILES>.

People like you and I are already making our own television, tax-exempt. We won't have to play the game with anyone. (Cue loud, rebellious music) This is what really excites me about personal video production. We're going to take charge of our entertainment. We're going to make sure that beige television is done away with forever. Good shows that speak to us will be taking the place of *Punky Brewster* and *Webster* because we'll make them ourselves.

I used to see this T-Shirt when I was a kid that said, "Wake me up for the Revolution." This is your wake-up call, America.

About the author: Wil Wheaton is AWOL from Starfleet, and was reported living in Topeka, KS, where his activities include producing videos, listening to Primus, cow-tipping and 3D animation.

VTU

Fresh Squeezed Video

Toaster users who have wanted to compress video affordably without creating artifacts in their video should check out the *Feral Effect* TBC/synchronizer from Feral Industries in Mission, KS.

Available as an Amiga- or IBM-compatible board ($1,495) or a one unit high rack-mountable device ($2,295), Feral Effect uses pixel and line interpolation techniques to average picture information so that image compressions remain smooth without line loss.

To compress an image, users select a beginning and final size for the video that's to be compressed and select how long it should take to accomplish the effect. Once the compression move is set up, users can activate the move via a take button. Feral Effect can store up to 10 user-designed compression moves.

The device accepts composite and Y/C video and provides for composite and S-VHS video outputs and genlock and alpha key outputs. The Feral Effect can be controlled via a GPI closure or RS-232 serial control port.

Feral Industries will unveil the new product at the Image World convention at the Jacob Javits Convention Center in New York City Oct. 4-6.

In Sync

Toaster 4000 owners needing a solution to the problem of proper lockup with multi-sync monitors have an answer with the latest offering from PreVue Technologies.

PreVue Technologies founder Ralph Barclay says that the *Sync Strainer* was developed so that any multi-sync monitor that scans at a rate of 15.7 kHz can be used while the Amiga is set to the Toaster's Genlock mode. As he explains, "Prior to the introduction of the Sync Strainer, multi-sync monitors like the Commodore 1960 and 1942 could only be used in high-resolution mode while in the Amiga workbench mode of operation because the Toaster 4000 does not provide the proper H and V drives in Genlock mode. In that mode, the only thing that was available was composite sync."

Barclay went on to say that the Sync Strainer can detect when the Toaster goes into Genlock mode and compensates by making horizontal and vertical drives from the composite sync. It then switches them to the H and V drive lines that go to the monitors.

Introduced in mid-August, the Sync Strainer has a suggested retail price of $59.95

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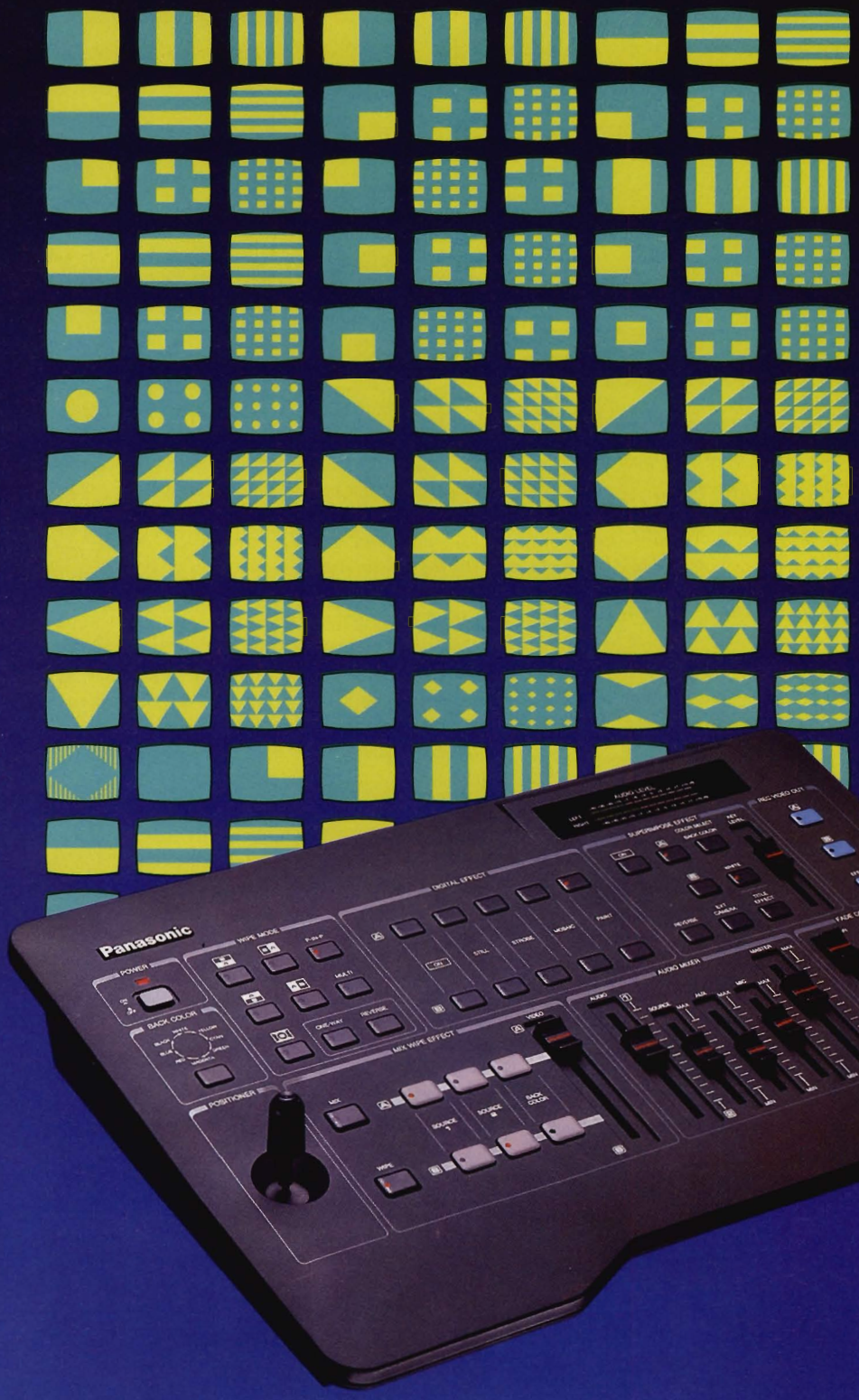

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DEAR JOHN

From Here to There

There's More to Moving Directories than Point and Click

By John Gross

This month's column answers Toaster-related questions from CompuServe and America Online subscribers—two of the nation's best online services. If you do not subscribe to an online service, consider joining one. There is a wealth of information available from people all over the world!

On another note: Starting with the January issue, if your questions for Dear John or Dr. Video are answered in print, *Video Toaster User* will extend your subscription for one year and send you a *Video Toaster User* T-shirt. Send your questions to the street or online address listed at the end of this column or to *VTU*.

Q: I have been trying to use transparent text in Toaster CG. I know it's possible, but so far I have not been able to create transparent text. What am I doing wrong?

Hans Leterana
Los Angeles, CA
via America Online

A: First of all, transparent text can only be created with Toaster CG Version 3.0. If you are using Version 2.0 or earlier, you cannot produce transparent text.

To make transparent text, it is important to remember that the Alpha level of the shadows and border of the selected font need to be *at or below* the Alpha level of the text. The lower the Alpha level, the greater the transparency. This control can be found in the color requester (where you change font, shadow, and border colors).

Q: When I want to make a subject darker or lighter, I use ToasterPaint's fill rectangle or triangle, but usually the effect is too much. Is the darken/lighten level fixed or can it be controlled variably?

George Safirowski
via CompuServe

A: To control ToasterPaint's transparency modes, you simply need to access the transparency panel. If you click on the little icon of the semi-transparent square and circle, ToasterPaint's transparency sliders will be revealed. The two vertical sliders on the screen's right side represent the hot spot and edge transparency levels (hot spot on the left, edge on the right) By lowering these sliders, there will be less of any given effect.

For example, when using the darken mode, lowering the sliders darkens the image less. If you are in colorize mode, the farther these sliders are lowered, the more transparent the colorization. Moving the sliders to the bottom will do nothing to the image. If you are drawing a box and the edge slider is all the way down and the hot spot slider all the way up, the result is a box with blended edges. The opposite is true if you reverse the sliders.

By the way, the hot spot is determined by moving the little box in the area between the two sliders. If you move it to the upper-left corner, your box will have its hot spot in the upper-left corner.

Q: Recently I added a 535MB Fujitsu drive to my Toaster system. The 2.0 software is now residing on a 135MB drive. In preparation for Toaster 4000, I'd like to (A) move all my LightWave 3D objects and image files (which are fairly sizable) to the 535MB drive and (B) leave everything else on the smaller drive.

First, I went into the LightWave (LW) config file with my trusty text editor and changed all the source directories to the new Volume/Drawers, HH0:3D/(etc.).

Of course, at this point I was quite pleased at my deftness, until I tried to load an existing scene file. Another whack with the search/replace text editor functions and all my existing scenes load nicely—except for those objects which use image maps...errr.

Next, a quick stop in ToasterPaint reveals that it can't find the Images directory. Sagging, I move everything over to the 535MB drive and bundle my existing scenes into a directory called "OLD" vowing to fix them later.

So, what have I done wrong? Can the LW files be successfully separated from the main program? Why doesn't changing the paths in the LW config file redirect the output so that the standard "Objects, etc." directories can be retained? Is there a config file for TPaint hiding somewhere? Will T4000 come to my rescue? Sorry for all this explanation for a fairly simple problem. Any ideas?

Thanks,
Trent K. Johnson
ReAnimators Computer Animation
Edmonton, AB Canada
via CompuServe

A: You are on the right path. You can put the Objects and other directories wherever you wish; however, you will most likely run into the problems that you have described.

LightWave looks to specific directories to find objects, images, motions and scenes. These paths can be modified in the LW config file (found in the 3D drawer located within the Toaster drawer). If you do not change to this file, LightWave looks at its default paths, which are the drawers located within the 3D directory (Envelopes, Images, Motions, Objects, Scenes and Surfaces).

Problems arise when you try to load existing scenes. The scene file is a text file that tells LightWave, among other things, where to look for objects. If you have moved all of your objects, LightWave cannot find them. LightWave gives you an opportunity to find them as the scene is loading, but your solution to edit the scene files and add the new path names is a faster approach.

When LightWave loads an object that uses an image map, you will receive a message that it cannot find the image (if you moved it). This will always happen because the image information is saved as part of the object's surface and that is saved in the object file itself. There is an easy solution to avoid this mess.

All you have to do is select the proper path and image file when LightWave says it can't find the image and resave the object. The new object file now will contain the information about where the image is

Continued on Page 22

Rick Carter

Production Design - Jurassic Park
Amblin Productions

"In a project as immense as Jurassic Park, previsualization takes a lead role. We produced animated 3D storyboards with the Video Toaster for the most complex scenes in the film. Those storyboards helped get every department from the model builders to the puppeteers in sync with Steven's vision. I think this shows in the finished film."

Ron Thornton

Visual Effects Director - Babylon 5
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Art Director - SeaQuest
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located. The next time you load that object, you will not be presented with the "Can't find" message. Use this same method if you do not edit the scene file with new object paths. When told that LightWave cannot find the object, you are asked if you wish to use an alternate object. Simply answer yes, and you will be presented with a requester to find the new path of the object. Once all the missing objects have been found, resave the scene. The next time the scene is loaded, you will not have to go through this again.

Regarding your ToasterPaint question, there is no config file for ToasterPaint. TPaint looks for RGBs in the 3D/Images drawer. If you happen to move this drawer, ToasterPaint cannot find it. I can think of two semi-solutions for this.

First, leave an Images directory in the Toaster/3D drawer so ToasterPaint can find it. You can then periodically move the images from here into your other images drawer.

Second, assign images to the new images directory (type this in the TPaint file requester to locate your images). For example: Open a shell and type "Assign IM: HHO:3D/Images" (or wherever the new drawer is located). Then when in TPaint, simply erase the text in the leftmost file string (it will most likely read 'Toaster' and replace it with IM:. This takes you directly to the new images directory. If you choose this route, add your assign command to your User-Startup file so you don't have to recreate it again and again.

Unfortunately, ToasterPaint was not upgraded in the Toaster 3.0/4000 release and can't come to your rescue. Until an upgrade is released, these semi-solutions will have to do.

Q: Is there an easy way to use a lower frame rate for image series used in LightWave? Right now, I'm grabbing every second (or third) frame, and making two (or three) copies of each. I then manually rename them so they run sequentially and then use the series as a sequence of images. This renders fine as 15 (or 10) frames per second and saves a lot of time grabbing, but it requires a lot of work. Is there a better way?

Nate Wahl
via CompuServe

A: Yes. Let's say you wanted to use every other frame of an image sequence. All that's needed is to have every other frame in the same directory (e.g., flyby001, flyby003, flyby005, etc.).

When LightWave uses a sequence map, it uses the last image in memory until it finds the next in sequence. So, if it uses flyby001 for the first frame and then goes on to frame 2 but cannot find a flyby002 image, it will use flyby001 again. In the third frame, it can find flyby003, so it will use that and so on.

This technique can be handy if you have an image sequence you wish to use later in an animation. For instance, let's say you are mapping an image sequence of a fire in front of a house, but you don't want the house to start burning until frame 600 of your animation. All you need to do is have an image named fire001 for LightWave to find on the first frame rendered (assuming you start with frame 1 and you are not using an image offset). The next image in the sequence can then be fire600, which won't be used until frame 600. Chances are you want your fire object to be invisible until frame 600. This way, fire001 can be a black image so it takes up little room.

VTU

John Gross is a Video Toaster graphic artist currently working as an animator on the Steven Spielberg/NBC television series seaQuest DSV. *Send your Dear John questions to: 8615 Chalmers Drive, Los Angeles, CA 90035, or via electronic mail on CompuServe at 71740,2357 or via America Online as Bubastis.*

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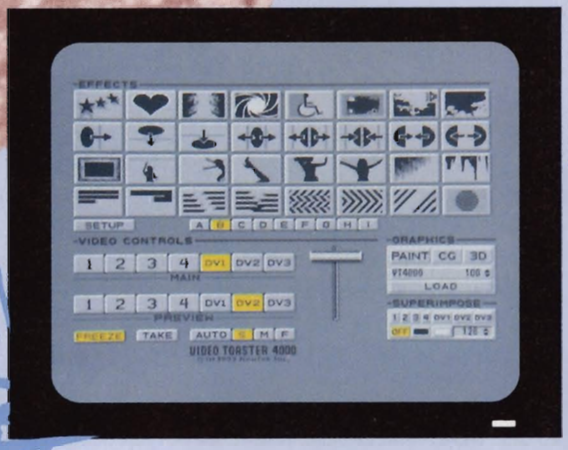

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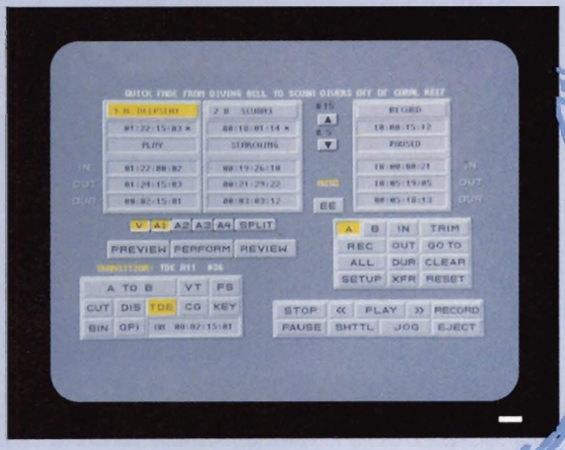

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DR. VIDEO

The Terminator

How to Wipe Out Excess Signal Voltage

By Rick Lehtinen

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

Q: The picture in my Toaster system is mixed up. Everything that is supposed to be white or beige is bright white, and the remaining image looks dark. What gives?

T.G.
Ely, MN

RX: The problem you describe occurs when there is no termination. Without proper termination, the signal voltage is effectively double what it should be.

Video signals are designed to play into a 75-ohm load, and most video equipment includes such terminators. However, some equipment allows users to choose to terminate the signal by providing a switch near the input or two connectors in what is called a "loop-through." To terminate the signal, users connect a terminator, which consists of a precision 75-ohm resistor mounted in a BNC connector, to the second connector. To loop through (daisy chain) to a second device, they run the cable from the second plug. In this instance, the second device must be terminated or looped. Four or five devices can be served in this way.

Some devices, such as the Video Toaster, have no means of coping with the excess voltage. Thus, without proper termination, high-luminance areas, such as whites, lose all detail.

The opposite problem, double termination, results in video that cannot pull itself up out of the mud. Such terminal darkness occurs when a video signal is terminated more than once.

Q: When I run video through a long cable, the colors get weak. I have been told this is due to a problem called "roll off." What does that mean?

D.C.
Rochester, NY

RX: The inductances and capacitances that are distributed along the length of a cable work to attenuate high frequencies in the video signal. For the nerdish, this typically occurs at a rate of 6dB per octave above the cutoff point. The color subcarrier, with its associated color sidebands, is located 3.5MHz above the luminance signal. This means it is the first to suffer from high-frequency attenuation due to excessive cable length, showing degradation before the luminance (black-and-white) portion of the video signal. Hence, the colors seem weak.

The cure is to use shorter cable, better cable or a special tool called an equalizing amplifier, or equalizer. In an equalizer, the video is treated by a filter that nulls out the roll off and pumps up the restored video signal to the correct level.

Q: My Sc/H (subcarrier/horizontal phase) meter says my system works just fine, but the video makes a bump or shift when I go between sources.

T.J.
Topeka, KS

RX: If you have a properly installed Sc/H meter that says your system is working and you still have sync bumps, you might have an unusual failure mode in your Toaster, where the system locks itself up to color field one but writes video on color field three. The cure is to introduce the precise amount of delay into the system by using one of several tools that offer variable output timing.

This assumes that you have properly installed your Sc/H meter. It has been observed that many Toaster owners own Sc/H equipment, but few read the accompanying instructional books.

By the way, the new Toaster has a knob designed to correct Sc/H. It is called the Fine Phase adjust.

Q: When I hook my Toaster to my TV, nothing happens. What's wrong?

S.W.
Dallas, TX

RX: Watch where you hook things up. Do not confuse the TV's video inputs with the VHF or UHF signal input. Your TV set expects to receive a modulated radio signal. It then demodulates this to recover the video and sound. If you hook your Toaster to one of the radio frequency inputs of your TV (usually labeled VHF or UHF), nothing happens. Worse, the video signal might damage the sensitive front end of the TV.

Many modern TVs have provisions to connect a video signal directly from a VCR or laser disc. This avoids modulating the video in the player and demodulating it again in the TV. Although this might require a BNC-to-RCA adapter, your Toaster should connect to this video input without a hitch.

Q: I've read in the Video Toaster manual that the Toaster has an internal delay of 440 nanoseconds. Does this mean the audio and video won't match up properly?

J.K.
Wichita, KS

RX: High marks for deep thinking, but you need not worry too much. Yes, in fact, the Toaster's internal delay of 440 nanoseconds will offset the audio from the video. However, in practice this delay works out to be just a fraction of an inch along *one* TV line. You can't even begin to perceive this offset.

However, if your system includes a TBC and you use the Toaster's

Continued on Page 26

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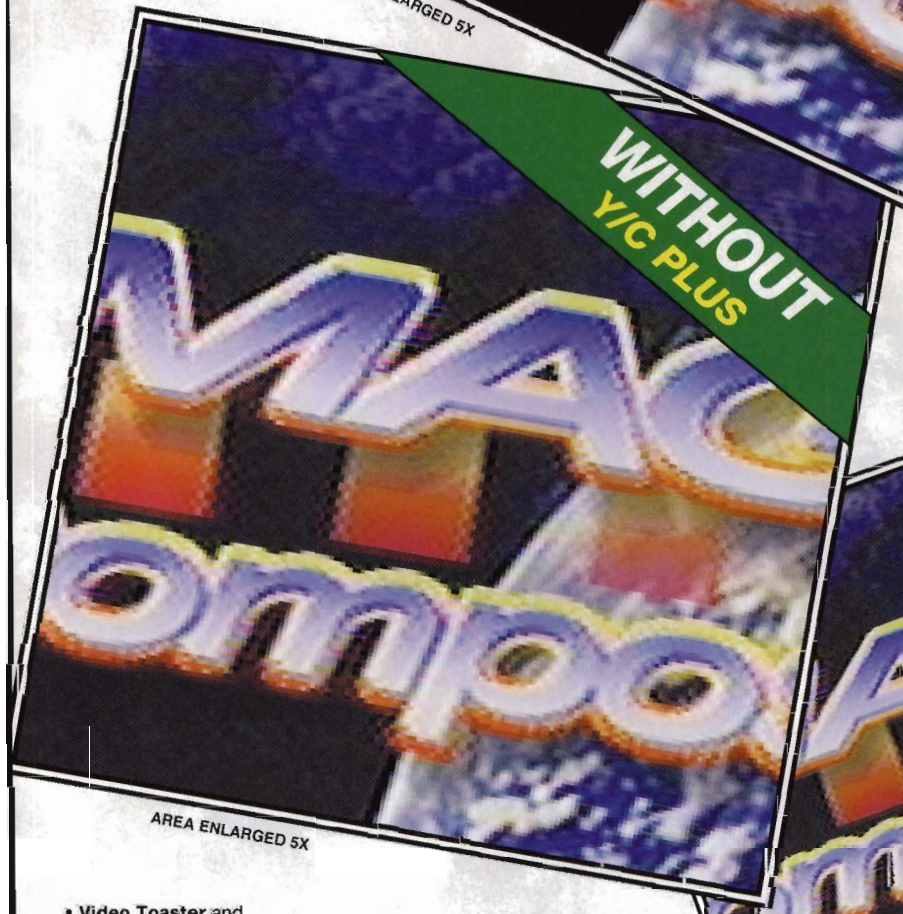

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digital channel, you might end up with a delay of one-or two-tenths of a second. This is detectable.

A cheap cure is to record audio first and then cut the video to it. A more expensive approach is to use a special audio delay that matches the TBC. High performance editing systems can store offsets that help keep audio and video in sync.

Q: Is there an easy way to use my Toaster with an external editor?

A.K.
Troy, AL

Rx: The editing system has the job of making all the videotape machines move to the right places at the right times. When using the Toaster with such systems, you wait until the machines are all in the right places and then pull the fader bar to execute the transition. Better editing systems not only marshal VTRs but also control the Switcher, CG and other devices. To use such editors with the Toaster requires some way for the editor to control the Toaster.

One way is to connect the General Purpose Interface (GPI) output available on most editors to the Toaster's GPI trigger, available on joystick port two. This procedure is spelled out in the Toaster manual. You preset the Toaster with the effect or transition you desire, and it will be fired the next frame after the GPI closes.

One warning: Depending on which Toaster manual version you have, the game port might be shown from the front or the rear, which can be confusing. Be careful to read the pin numbers from the connector itself.

Q: Sometimes when I use a Betacam VTR as a source deck, I get a wavy pattern in my video. It shows up both on the program line and in recordings. I thought "Beta was bettah!"

P.N.
Aberdeen, WA

Rx: The problem you are describing is not unique to the Toaster but can occur in any piece of video production equipment that uses an analog-to-digital converter to digitize its input. (In the Toaster's case, the A/D feeds the digital channel.)

What happens is this: Certain equipment, and apparently some Betacam decks are on this list, put out electrical energy in a frequency band where there shouldn't be any (in this case, the 7MHz to 15MHz range). The A/D in the Toaster, which does not use a great deal of input filtering, attempts to digitize the spurious signals as if they were video. The frequencies are too high to be properly decoded, so the result is noise. The signal is also synchronous (or should be), which causes it to repeat in a predictable pattern on-screen. Lacking better words to describe the effect, some users have dubbed it the "corduroy effect," after the fabric.

The cure is to install a low-pass filter of some kind to eliminate the spurious signals. One of the least expensive is the Lopez (Low Pass) filter offered by Smith Audio Video in Topeka, KS (the same folks that make Y/C Plus).

Q: Why should I worry about all this system timing stuff when my TBC has a HUE control that fixes everything?

R.B.
Simi Valley, CA

Rx: To best answer your question, look at some of your tapes. Do the colors get weird at odd times? Trying to time a system with the HUE knob only works part of the time, and you can't reliably guess which part. The only reliable way to keep colors right and make edits reliably is to make sure your Toaster system is properly timed with respect to all of its input sources.

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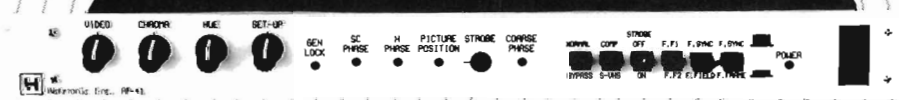

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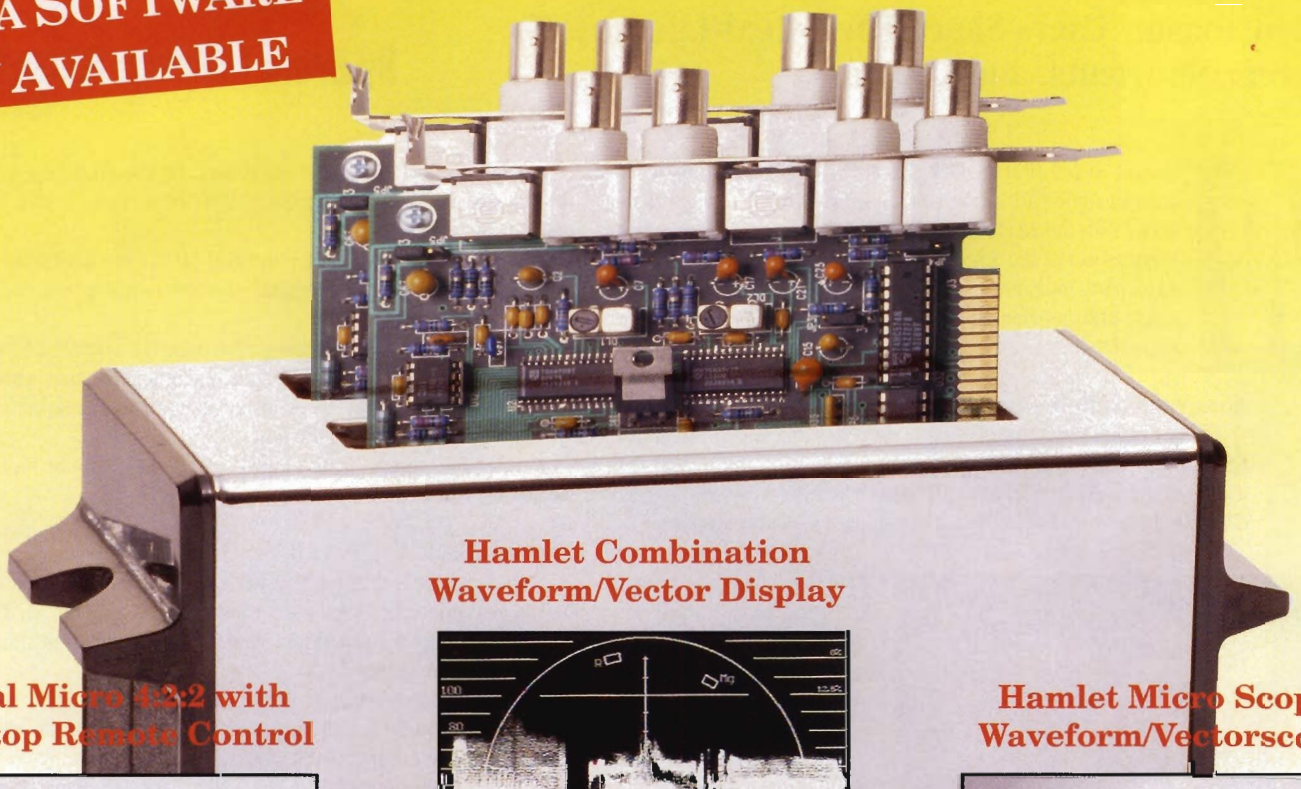

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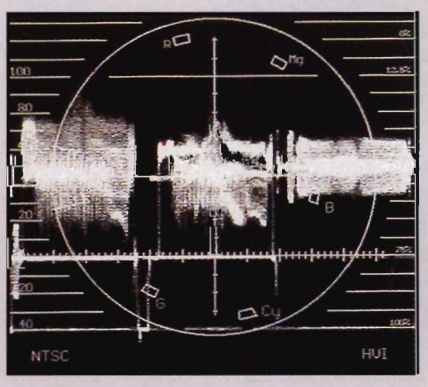

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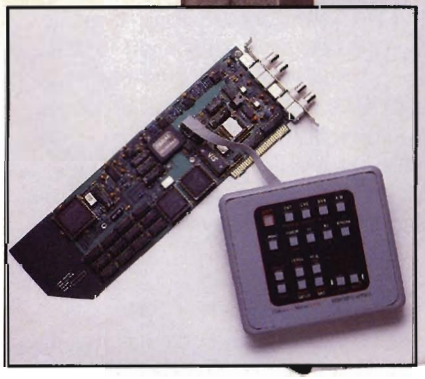
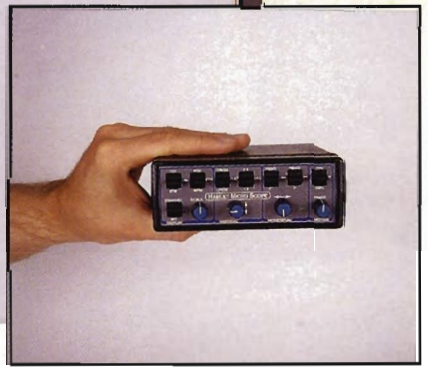


Hamlet Micro Scope Waveform/Vectorscope



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TIPS & TECHNIQUES

Real-Life How-Tos

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

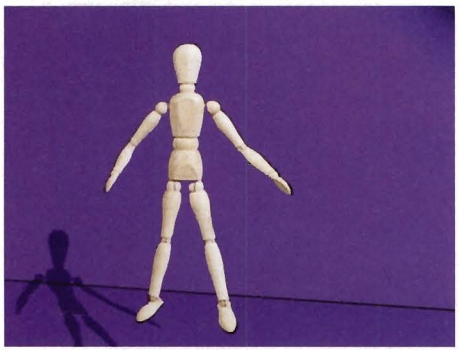
By Brent Malnack

Welcome to our first Toaster Tips & Techniques, a monthly column designed to allow you to share your favorite Toaster tricks with the readers of *Video Toaster User*. Tips can cover every aspect of the Toaster, from LightWave to ToasterCG, how third-party tools are used to solve problems, and even installation and interfacing hints. See the end of the column for more details.

Autotrace Complex Images

Using Pixel 3D to autotrace logos into 3D objects is quite powerful. But what if the image you want to trace is more sophisticated than a logo? I first thought about this after watching Todd Rundgren's *Change Myself* music video. Many of you have probably seen it.

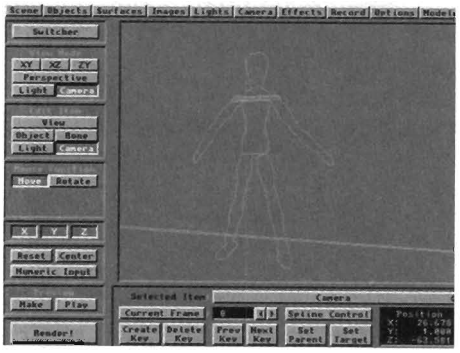
In one scene, a rooster-shaped weathervane spins in the wind. This seemingly simple object was in fact quite complex. The object had a 24-bit image mapped perfectly onto its irregular surface.



Example of complex shape auto-traced with a texture map brush.

To accomplish this technique, find an image with something to cut out. An image of a person works fine. Make sure that the person is completely visible from head to toe in the shot to create a cardboard cutout.

Using the filled polygon tool in ToasterPaint, carefully cut out the brush. If you make a mistake, start over.



The wire-frame image shows the object is truly flat.

Once the brush has been successfully cut out, save it as a brush using the Save command in the Brush menu. While still carrying the brush around, press the *j* key. This brings up a swap screen. Change the paint mode to XOR by holding the right mouse button and selecting XOR from the Mode menu.

Place the brush anywhere, so long as it doesn't get cut off at the top or the bottom of the screen. ToasterPaint should now redraw a perfect, white silhouette on the black background. Save this image using the Save-RGB command from the Picture Menu.

Although the image was white on black, ToasterPaint still saves it as a 24-bit IFF file. Next, the number of colors in the image must be reduced. If you have ASDG's Art Department Professional, load the image and display it with only two colors. (It should still be a 752-by-480 file having been saved from within ToasterPaint.) Save the two-color displayed image.

Load the two-color image into Pixel 3D for the auto-trace procedure. Once the trace is complete, save the resulting object file as a LightWave 3D object.

Load the object into LightWave. Also, load the original 24-bit brush we originally cut out. Select the image as a texture map with Planar Projection in the Z axis. Click on the Automatic Sizing button. This sizes the brush perfectly to the object.

Render the object. Your clipped-out person should look like a cardboard cutout.

Chrome Look

Sometimes in LightWave you want to get a chrome look without having to render the image over a horizon background. First, save a black image. Open ToasterPaint and without painting anything, save the image as *Black.rgb*.

Once the image has been saved, enter LightWave. Load an object with a chrome surface, such as the Teapot object. Once the object has loaded, load the original black image.

The next step depends on the system you are using. If you are using a previous Toaster version, set the image (Black.rgb) to be the Background Image. By default, LightWave renders a horizon backdrop. Those of you with Toaster 4000 or version 3.0 must disable the SolidBackdrop button by clicking on it. This causes LightWave to calculate a horizon as with previous versions.

Next, render the Teapot. It should still reflect the horizon, but will be rendered over a black backdrop. This technique can be particularly useful when setting up reflective materials.

Quotation Rotation

One of the more frustrating problems I used to run into with the Toaster CG was setting up quotation marks around text. There was seemingly no way to reverse the quotes, so they appeared backwards (as open quote marks) at the front of the word.

One night at our Toaster users group meeting, this topic came up. Someone had the solution. With most of the ToasterFonts, the ~ key (tilda key) provides the proper set of quotation marks.

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VTU

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SLICES

The Luminance Keyer

Part III: Mastering Luminance Keying

By James Hebert

This time, our study of the luminance keyer features more imagery than text for a simple reason. The most effective examples of luminance keying need to be seen —not written about.

Thus, you'll find a selection of images that demonstrate the luminance keyer in a variety of situations —both effective and ineffective—to give you an idea of what to expect and what to avoid.

By this time, many of you are likely to be using System 3.0 or the Video Toaster 4000, so I'll use the conventions of the current system software when discussing the luminance keyer. Operationally, the luminance keyer is the same with System 3.0 and the Video Toaster 4000 software. All keying is controlled by the buttons on the Superimpose bus.

System 2.0 users should have no difficulty applying these steps and techniques. The older operating software differs because the luminance keying controls involve both the Overlay bus and the Scissors panel. Another difference is that the key color control toggles through the three settings of black, off and white rather than allowing direct selection of black or white. Otherwise, the basic function of the luminance keyer is the same.

Figure 1 shows a still frame from a live video source connected to the Toaster. This of course can be any acceptable video source (a live or time-base-corrected signal). The source was connected to input 1, which was selected on the Main row.

Figure 2 shows a graphic created in ToasterPaint. This graphic has a black background, several colored brushes and text. The brushes and text have dark-gray outlines and shadows. The graphic is taken from the Demo book included with the 3.0/4000 software. This source image was loaded into DV1, which was selected on the Superimpose row.

Figure 3 shows the two elements keyed together through the Toaster's luminance keyer. For this image, the keyer was set to key on black (the black key button was selected), and the clip level (the brightness cutoff level) was set to a value of 42. Using this value in this situation cut away the darkest portions of the image (the black background), leaving the remainder superimposed over the Main video source.

This is an example of a simple, clean key. A primary video source and an overlay source are selected, the keyer is activated and a proper clip level is set. In a controlled situation such as this, you have the opportunity to select the proper key level before going to tape or calling it up live, so you already know the settings required to create a clean overlay. Furthermore, because the overlay graphic is a still image, you need not be concerned about changing luminance values that could degrade the key. Once the key is up, it remains steady and sharp until you remove it.

Figure 1

Figure 2

Figure 3

Luminance Keying

It's important to point out that this technique is similar to the method commonly used to key an actor or actress over a background. The most-commonly cited example of this type of keying is the local meteorologist who stands in front of a weather map on the evening news.

Most often in this situation a technique called chroma keying is used. In this instance the weather talent stands in front of a solid-color background, often a peculiar shade of blue, and the chroma keyer or switcher with chroma keyer removes that specific shade of blue and replaces it with the keyed graphic, specifically the weather map. The resulting image appears to be the weather talent pointing to various regions of the weather map that looks as if it is behind him.

The Video Toaster's keyer is similar, except it keys off a preset luminance value. Translate the weathercast scenario to the Toaster Switcher, and you get the following: The camera shooting the talent is selected on the Superimpose bus (this is the source that goes on top of the other source). The weather map background is selected on the Main bus (this can be a prerecorded tape, a camera aimed at a map, or a still frame in one of the framebuffers).

The luma keyer would be set to key out either black or white, depending on the background behind the talent. To remove lighter portions of the image, such as a white background, select the white key button. To remove darker portions of the image, such as a black background, select the black key button. Finally, adjust the clip level for a sharp key.

This situation, however, lends itself to the possibility of error, depending upon

Continued on Page 32

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the amount of control you have over the superimposed source. If the talent moves to a portion of the set that is less evenly lit (even if he remains in front of the keyed-out background), the key might break up. Portions of the background could begin to flicker into existence, or worse, portions of the talent might begin flickering out of existence! Because the Toaster keys off the luminance value of the scene, successful keying in a live situation demands careful attention to lighting.

Paint Luminance By The Numbers

You might find it effective to think of luminance keying as a variation of those paint-by-the-numbers kits found at hobby and craft stores. You purchase a set of paints in numbered wells, a couple of brushes and a selection of printed line drawings. Each region of the line drawing contains a number, and you paint the appropriate color in that region to fill in the color image. In a similar manner, the luma keyer treats the video signal as a series of regions containing not the same color, but the same brightness.

Picture two televisions side by side in a room. Each displays a different program. Turn off the color of the screen on the left so that you're viewing a black-and-white TV image next to a color TV image. Separate the black-and-white image into 256 shades of gray from the darkest gray (black) to the lightest gray (white) with all the intermediate shades inbetween, so that you're watching a black-and-white movie.

Now, starting from the dark end of the gray scale, begin removing one shade at a time, moving upward through the shades as they grow in brightness. Replace each shade with the image from the other TV screen, so that you can see the black-and-white footage overlaid atop the color footage.

This is exactly what the Toaster's luminance keyer does. It looks at one image as if it consisted of shades of gray, uses the clip level value to set the cutoff point to one of those shades and removes all shades of gray either above or below that point (based upon either white or black keying) to reveal a second video source beneath. It doesn't matter if the original imagery consists of black-and-white footage or color footage. The keyer always bases its function on the black-and-white data in the video signal.

If you've ever experimented with the luma keyer using two live video sources, you may have created an image like the one shown above. Figure 4 shows a video source connected to the Toaster. This source is connected to input 2. If you luminance key input 2 over input 1 (from Figure 1), the resulting image looks like Figure 5. Not very pretty, is it? Randomly mixing two video sources, neither of which was shot for the purpose of luminance keying, yields a muddy result. The clip level, which carefully cuts out all instances of a certain brightness level, causes various unsightly portions of the image to be removed. Because this footage was not shot with luminance keying in mind, there is no easy way to use it as is.

Figure 4

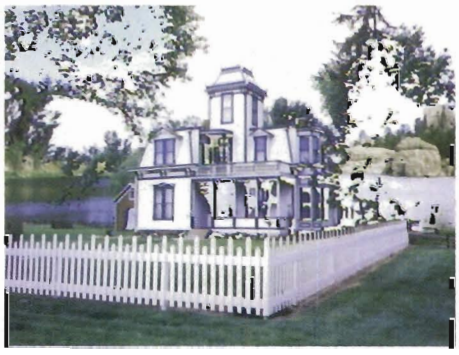

Figure 5

...place white paper in the frame of a window, plop the talent in a chair or behind a desk and select white keying to key live footage into the window frame. A meadow, a charging bull, a rushing wall of water or rolling waves on the ocean are only some of the possibilities.

Of course, if you like such effects, now you know how to create them. For music videos and the like, knowing how to achieve this look can be as important as knowing how to avoid it. You might go so far as to design certain scenes or portions of a set with perfectly white or black elements that you intend to key out. For example, place white paper in the frame of a window, plop the talent in a chair or behind a desk and select white keying to key live footage into the window frame. A meadow, a charging bull, a rushing wall of water or rolling waves on the ocean are only some of the possibilities. Who needs to go on location when you can key?

Over The Shoulder

Another popular use of the luminance keyer involves the over-the-shoulder graphic. This element began as a title card. Then TV pioneers moved on to a separate, keyed title from another camera and next to a screen (behind the news talent). All of these were attempts to put in graphic terms a quick summary of the highlights from the accompanying story. Later, a monitor behind the talent showed the appropriate screen art. Next, it became a square or rectangular graphic box keyed on-screen, then an irregularly-shaped element, a tiny, animated piece of artwork, and nowadays it seems to be a monitor again.

Your first task in creating a keyable over-the-shoulder graphic is to design an element that is appropriate to the program material. The lessons and articles within *Video Toaster User* should help you there. I recommend you design graphics at full-screen or near full-screen size. This makes the creation phase simpler by an order of magnitude. Afterwards, use ToasterPaint's TXMap drawing mode to resize the RGB image down to about 25 percent of the screen size. You also could do this with an image processing application.

Position the element toward the upper-right or left corner of the screen. Finally, and this step is crucial, use the Lighten drawing mode and lighten the area of the screen where the graphic resides. Lighten the element a tiny bit, too. Use the smallest amount you can, so that you do not soften important details by bringing up the black level too much.

Why lighten the image slightly? It's critical that the graphic be somewhat lighter than the surrounding black screen area. The surrounding area will be keyed out because it lies at a different black level, so the keyer will cut this area out

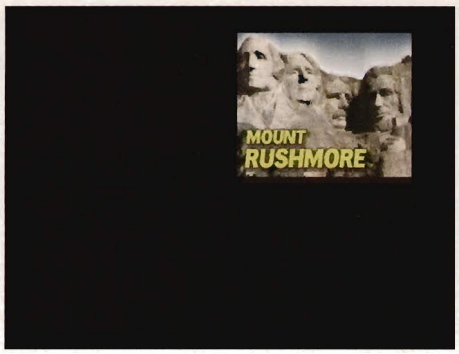

Figure 6

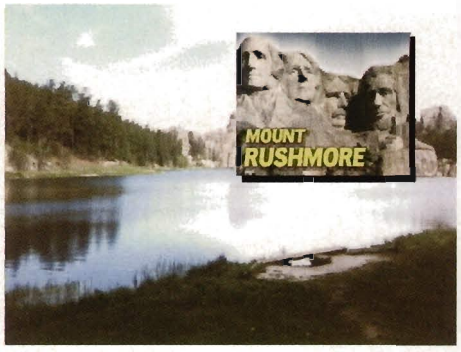

Figure 7

before it reaches the somewhat lighter levels in the graphic. Lighten the graphic so that none of its darker portions will be removed by the key.

Once you have completed designing the graphic, save it as a Framestore from ToasterPaint. Load the image into DV2 (if possible, because DV2 tends to provide cleaner luminance keying), select it on the Superimpose bus, select another video source on the Main bus, and set a proper key level for the over-the-shoulder graphic. Figure 6 shows a paint element in position on the ToasterPaint screen. Figure 7 shows it keyed over the video source from Figure 1.

Another method for achieving this look, and one that is available only to System 3.0/4000 users, is to load the graphic element as a brush into ToasterCG (to a key page). Within ToasterCG you can give it transparency or drop shadows easily. The ToasterCG demo book even has a pre-made page with simple instructions for creating an over-the-shoulder graphic. Even though the directions instruct you to venture into LightWave, fear not. The process is painless and quick, and the results are worth it. If it's your first experience of this powerful 3D program, it will be a positive one.

VTU

James Hebert wrote and edited most of the Video Toaster manual. He divides his time between his infant son Garrett, writing about the Toaster, changing Garrett, writing about the Toaster, feeding Garrett, writing about the Toaster, and sleeping when he can.

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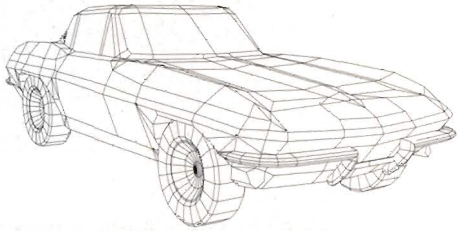

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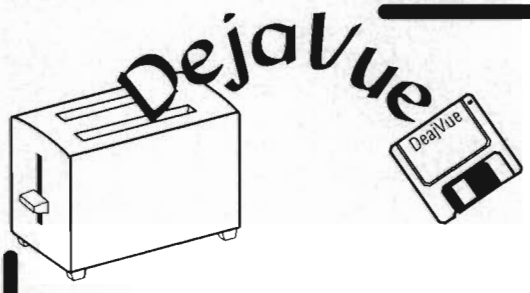

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Taking Aim

Safety Counts with Non-Pyrotechnic Projectiles

By Robert McCarthy

On 1903, Edwin S. Porter of the Edison Company directed the first creative film drama ever made in America. *The Great Train Robbery*, based on the story of Butch Cassidy and the Sundance Kid, ran barely 10 minutes, but in that brief time established a blueprint for countless westerns to follow. Considering how primitive the industry was, *The Great Train Robbery* is a truly remarkable film, employing innovative editing and cinematic techniques. By far the most startling and exciting moment in those few feet of film was the brief image at the end of the movie when the chief villain, played by George Barns, pointed his six-shooter out at the audience and fired.

In the nearly 90 years since those first silent gunshots, millions of bullets, spears, knives, and arrows have punctured thousands of actors—unfortunately, not always safely. As late as the 1930s, danger to the performer was still an everyday reality. In the 1930 film *Little Caesar* starring Edward G. Robinson, a scene takes place where Robinson, as Little Rocco, leans against a brick wall, resting his head inches away from where live rounds from a .45-caliber machine gun are being fired by an expert marksman. Needless to say, no one today would subject a performer to that kind of danger

[Editor's Note: The following special effects devices and methods are to be used with exteme caution. While these effects and devices are simple to produce, the dangers are obvious. Use a professional special effects coordinator. Avid Publications does not accept responsibility or liability for implementation of the devices or methods described herein.]

Knives, Arrows and Spears

Launching Methods: Which launching method to use depends upon the needs of the film, who is shooting, and the range to the target. Arrows, knives, and spears can be launched by slingshots, bungee cords, mouse traps, surgical tubing, knife guns (air- or nitrogen-powered), wireless arrow guns (also air- or nitrogen-powered), wire-controlled arrow guns, or wire-controlled knives and spears. Let's look at the last three devices.

Wireless Arrow Gun: The wireless arrow gun operates on compressed air and fires a free-flying (that is, unguided) projectile. The arrow contains a small piston at the rear that is depressed by the compressed air, thus launching it. It should only be used by people who are excellent shots. See Figure 1.

Wire-Controlled Arrow Gun: Simply stated, wire arrow guns shoot arrows along a wire. They are very similar in construction to a crossbow without the bow. Using a shock cord or surgical rubber to provide the thrust, an arrow (most often hollow in construction) is fired toward its target. The arrow can also have a solid shaft.

The wire is inserted through the center of the arrow and allowed to slide easily in order to enable the arrow to slide smoothly. The fittings on either end of the arrow enhance its smooth flight.

One end of the wire is attached to the bow and the other to a hole in a steel plate that is worn by the actor. Fronting that steel plate is a 1-1/2-inch section of hardwood. It is into this that the arrow will stick. The end of the arrow has two steel prongs at the tip.

When the arrow is shot down the wire, the operator must make sure that the wire is as taut as possible. If the actor is moving, the operator must move along with him or her keeping the proper tension. An excellent example of this technique can be found in the film *Red River*. During the Indian attack on the wagon train, Joanne Dru is hit in the shoulder with an arrow. The effect is both startling and subtle, and heightens the sequence's impact.

This effect can be set up so that as the arrow hits its target, the guide wire is cut and the actor or object can fall naturally. Even during a closeup shot, the wire is almost entirely invisible. The wire can be darkened using gun blueing if greater masking is necessary. See Figure 2.

Making Arrow and Spear Projectiles: There are several different types of special-effects arrows. Two of the most common are hollow arrows and solid-shaft arrows. Either arrow shaft can be used virtually interchangeably except in one particular instance: When an arrow is guided by an interior wire, the hollow shaft must be used. Both require different preparations.

To prepare the solid-shaft arrow or spear to shoot down a wire, install small eyelets on the front and back of the shaft and affix those to the wire. For the hollow-shaft arrow, replace the tip with small brass fittings. Have the holes drilled in the center and put the wire through. Both arrow types are launched the same way.

Wire-Controlled Spears and Knives: When working with spears and knives, a similar wire construction is attached to the plate worn by the actor. A wire is run from the plate through mountings on the projectile and attached to a holding device or stand. A wire knife, wire arrow, or wire spear can also be used with a slingshot. The slingshot can then be used to propel the knife down the wire into the plate. The point of the knife should be cut off about three inches from the tip so that when it hits, it looks as if it has penetrated the target.

Variety Of Knives, Arrows, Spears, and Guns

Non-pyrotechnic projectiles come in various shapes, sizes, and designs, all of which are used extensively in show business.

1. Pop-Out Knives and Arrows: These spring-loaded devices are designed to pop out from beneath a costume. They are masked from the camera and activated by the actor on cue. Split-second timing is crucial so that it appears that the actor has actually been struck by the arrow or knife. Often, however, there is some crossover with regard to timing. This is not especially crucial since much of it can be picked up in the editing room. Additionally, the sequence happens so quickly it is impossible to see the actual action of the arrow or knife in the spring-loaded device. See Figure 3.
2. Rubber Knife: A most familiar prop, a rubber knife is made out of pliable rubber. See Figure 4.
3. Telescoping Knife: The blade of the knife retracts into the handle (or in some cases, the tip retracts into the blade) to simulate penetration. See Figure 5.

Continued on Page 36

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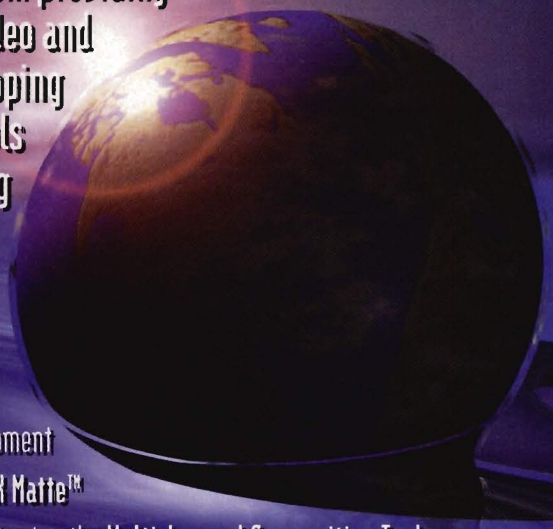

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4. Preplaced Knives, Arrows, and Spears: These devices are permanently mounted onto a plate and strapped to the actor's body. Some have a release mechanism that holds the device to the plate with two small prongs and is released by the actor. Once stage blood is added, you have a victim with a knife sticking into him or her. See Figure 6.
5. Knife Gun: A knife is positioned into the firing mechanism and fired freehand (i.e., without a wire assist) at a person wearing a chest- or back-plate of steel, leather, padding and hardwood (1-1/2-inch thickness). See Figure 7.
6. Reverse Pull: A knife is shot into a wooden plate and attached to a wire. On cue, the knife is yanked out by the operator. In editing, the shot is reversed, making it look as if the knife is going into the actor instead of coming out.
7. Knife Throwing: This is not recommended unless you are an excellent knife thrower. The dangers are obvious! The same methods of padding and protection for the actor are used as previously explained. Caution: Whenever using any of these devices, it is imperative that body armor and protective plates always be used on your actors and stunt professionals. Safety must be a prime consideration.
8. Blood Knife: A perforated tube is attached to the knife's blade. It emits blood when the special effects person activates a release button on the blood pump. The pump pressure can be preset either to trickle or gush.

What A Shot

Recently I worked with Martin Mull on a shoot that required that he be hit with an arrow. I elected to use the wireless arrow gun. The scene called for Martin to be hit and fall into a pond. When he was shot with the arrow he fell into the pond, but we had to redo the shot several minutes later. Naturally, Martin was wearing a steel chest plate with the regulation 1-1/2-inch hard wood lined with leather and sheep's wool padding so that he was well protected. I was about 12 feet away from him when I fired the first arrow. When it came time to redo the shot, I fired again, the director called for a print, and we avoided another retake. A few minutes later Martin bounded out of his dressing room and strode over to me thrusting his protective body armor at me. "Take a look at this!" he demanded, jabbing his finger at the plate.

"What's wrong with it?" I asked somewhat surprised. "Look," he said, "there's only one hole in this plate! You shot two arrows, didn't you?" "Yeah," I said, "but I'm an excellent shot!" The second arrow had gone into the exact same hole as the first. Pure luck, but I didn't tell him that.

If you have any questions about special effects, just fax them to me at (818) 360-1462.

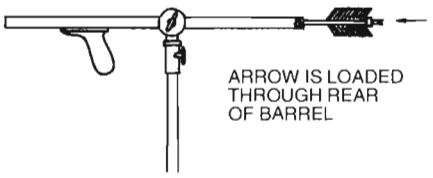


FIGURE 1
WIRELESS ARROW GUN (AIR-POWERED)

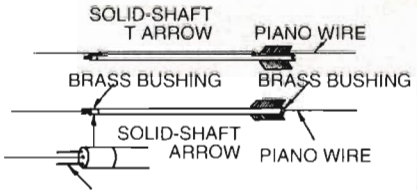


FIGURE 2
WIRE-CONTROLLED ARROW GUN

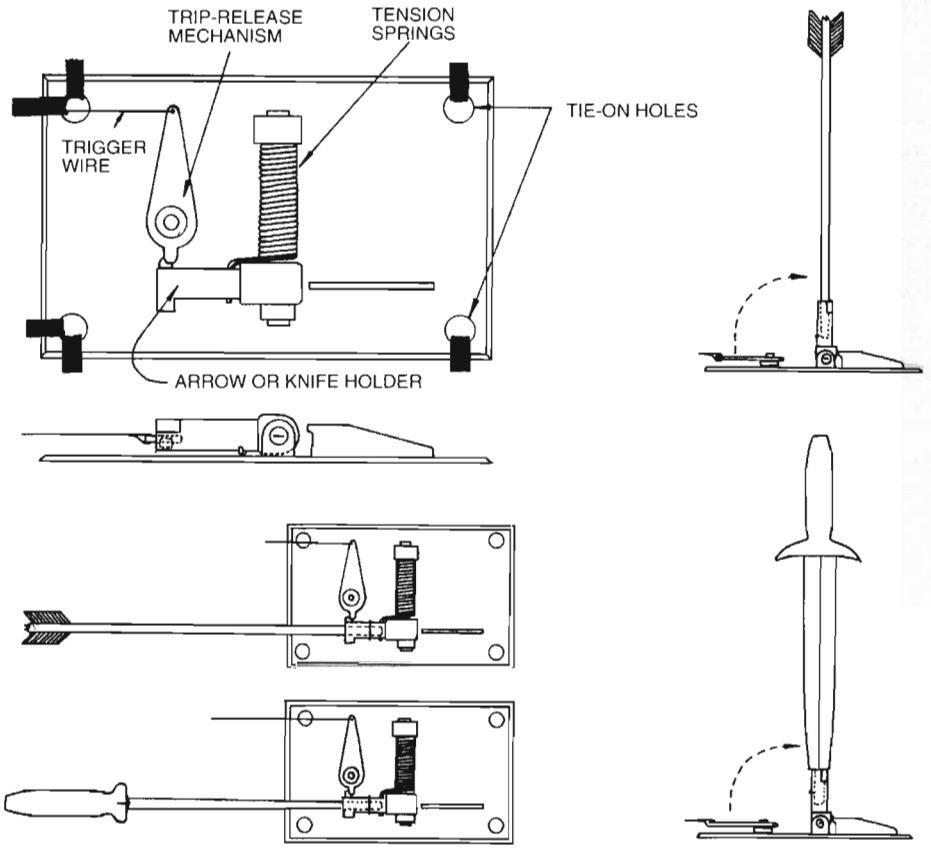


FIGURE 3
POP-OUT MECHANISM AND DEVICES

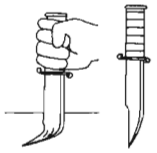


FIGURE 4
RUBBER KNIFE

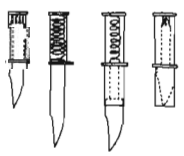


FIGURE 5
RUBBER KNIFE

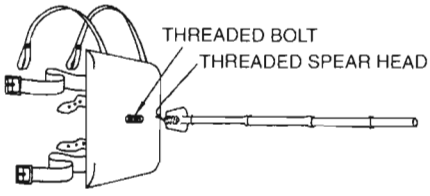


FIGURE 6
PREPLACED KNIVES, ARROWS, AND SPEARS

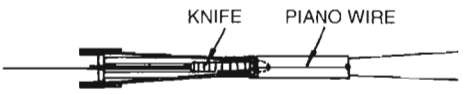
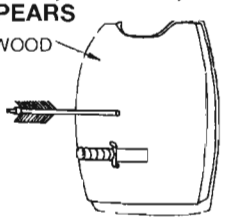


FIGURE 7
KNIFE GUN



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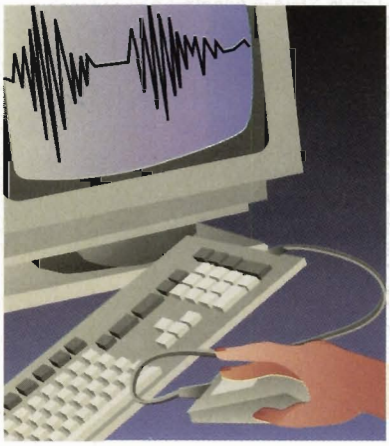
SOUND REASONING

Audio Delays

Keeping Your Audio and Video In Sync

By Cliff Roth

Many Video Toaster users can benefit from a digital delay line. As wonderful as the Toaster is in providing special effects and graphics for your video imagery, these benefits do have a price: time delay. It takes a small amount of time for the video signals to weave their way through the Toaster's circuitry, and a considerably longer time for the signal to pass through a time base corrector (TBC). If left untreated, this delay can create a slight offset in the synchronization of picture and sound, with the picture lagging behind the sound by a tiny fraction of a second.



"...as with many details in the world of video, you can sometimes get in trouble if you assume too much."

The problem of slightly out-of-sync picture and sound is exacerbated when you introduce multigeneration time base correction. If you edit tapes that have already passed through a TBC once, and pass them through a TBC again, the synchronization error accumulates. This can happen if you are layering several Toaster effects on top of each other or if you are putting a program together by first editing segments and then editing the segments onto a single tape.

Numerically, these delays are relatively slight. According to NewTek, the Toaster's own delay is an imperceivable 0.4 milliseconds. But a typical full-frame TBC, like the Personal TBC III from Digital Processing Systems, can create a delay of between half of a field (one twentieth of a second) to a full frame (one thirtieth of a second). Expressed in milliseconds (thousandths of a second) that range is 8.3 to 33.3 milliseconds. *[Editor's Note: For a review of DPS' Personal TBC IV, see page .]*

In a worst case scenario, where a video signal passes through the TBC and Toaster three times and gets delayed by a full frame each time, a synchronization error of more than 100 milliseconds—one tenth of a second—can accumulate. Such a difference is very noticeable. Of course, usually the synchronization problem is less severe—on the order of 10 to 30 milliseconds. Such errors are subtle, but perceivable.

The solution for perfect video/sound sync is to delay the sound by the amount of time that the picture is delayed. Both signals will thus arrive at the VCR or monitor in step with each other.

Professional audio supply dealers sell specialized digital delay lines for this purpose. However, most Video Toaster users can get better value by purchasing a general purpose digital audio effects processor, which can be used as a delay line and also can provide numerous other audio effects.

Such effects units are commonly sold in music supply stores, with prices running from less than $200 up to about $1,000. Good examples include the Roland DE-50 (about $200), the Lexicon LXP-15, the A.R.T. FXR, the Electrovoice DRP-15 Dynacord reverb and the Sony DPS-R7 reverb ($1,335 list). The price differences are generally attributable to the audio quality (frequency response and signal-to-noise ratio), automated MIDI control capability, the availability of two separate processing channels for stereo, the variety of effects available and the amount of memory (translating into the maximum amount of delay) available.

Fortunately, most audio effects processors, including the cheapest models, can delay a signal enough with sufficient quality to compensate for the Video Toaster and TBC time delays. Your choice of which to buy depends on other factors, including your desire for effects such as reverb, equalization, flanging, phase shifting and noise gating. We'll discuss these other effects in more detail in future columns. For now, let's simply say that although intended for processing recordings of musical instruments, these effects are also useful for enhancing ("sweetening") audio-for-video tracks.

Most audio effects processors allow you to dial in the precise amount of audio delay desired, usually in increments of one or five milliseconds.

Clap On

There are two general approaches to adjusting the delay: by the numbers and by subjective feel. To adjust by the numbers, get out the spec sheets for the TBC(s) you're using and any other video processing devices in the signal path, and add up the specified delays. (This approach ignores the comparatively minor delays incurred as the signal goes through cables and patch bays; however, because both video and audio signals travel through cables at nearly the speed of light, they usually encounter similar delays anyway, and they're so slight that they don't affect synchronization.)

Subjective eyeball adjustment of audio delay lines requires using a simple sync marking system, like a cinema clapboard. You can try looking at the lips of people speaking on videotape and listening to their voices, but I have found you can go crazy attempting to adjust sync this way—the more you look at lips and try to guess where perfect sync is, the more confusing it gets.

The clapboard provides a single synchronized event with no ambiguity. A low-budget alternative is to shoot a video closeup of someone clapping hands one time, or slapping a book down on a table. With any of these audiovisual aids, the idea is the same: You're

Continued on Page 40

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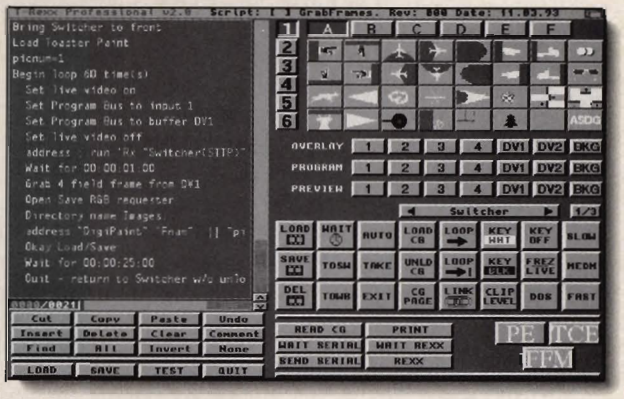

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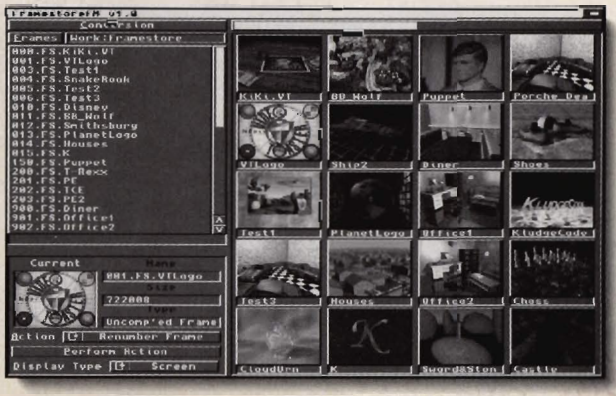

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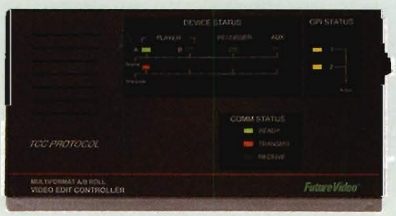

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trying to match the precise moment that the two parts touch (the hinged clapper with the top of the slate, the two hands touching or the book hitting the desk) with the percussive sound that is produced.

Some video engineers like to use a waveform monitor and/or oscilloscope as a visual synchronization indicator, using separate channels for the audio and video signals. However, such an elaborate setup is hardly needed. Instead, simply continue changing the delay line settings and replaying the sync mark on the tape until they seem simultaneous.

You should be sitting within a few feet of the video monitor and speaker as you perform this adjustment. Although both video and audio signals travel through wires at the same speed, once they're converted back to light and sound to travel through the air, they move at very different rates. Whereas the picture on the screen travels to your eyes at the speed of light (about 186,000 miles per second), sound from the speaker travels to your ears at the much slower speed of sound—about 1,130 feet per second, or one fifth of a mile per second.

Sound Travels

This disparity between the speeds of light and sound is the reason why you can calculate how far away a storm is by counting the number of seconds between seeing lightning and hearing thunder (every five seconds indicates a mile of distance). It is also the reason why digital delay lines are so commonly needed for professional sound reinforcement applications.

In setting up an amplifier system for an outdoor concert in which additional speakers are placed some distance from the stage, delay lines are needed to keep the sound in sync with itself. If speakers are placed 130 feet in front of the stage, for example, the sound from those speakers will arrive one-tenth of a second ahead of the live sound from the stage, unless a delay line is introduced.

The same problem can occur in reverse if you're videotaping a live concert from the rear of an auditorium or stadium using a long telephoto lens to substitute for being up close and picking up sound with a microphone from that same location. When you look at the tapes later, you may notice that the sound seems to lag behind the picture. If, for example, you are 260 feet from the stage, the sound will be two-tenths of a second (200 milliseconds) behind the picture. You may be able to use a TBC's inherent time delay to your advantage to compensate by delaying the video signal while leaving the audio untouched (or delaying the audio by less than the video signal delay).

A similar, though less severe problem occurs when using a shotgun microphone for picking up audio. Even if your sound recordist has the best aim and gets excellent audio pickup quality, there will always be a slight time delay based on the distance between the microphone and the person speaking. A distance of only 40 feet creates a delay of about one-thirtieth of a second, which is equivalent to a sync offset of one video frame.

To delay the video by more than the TBC time delay, you'll need to use a separate video delay line—a completely different device from the audio delay line. Or, working on a low budget, you can re-record the signal several times, passing it through the TBC each time to accumulate more delay. However, this tactic also builds up generational loss and is a less desirable approach.

Unlike film soundtracks, which must be mechanically synchronized with the picture during the editing process, video soundtracks come already attached to the picture. Most video producers assume this synchronization is maintained throughout the editing process. But as with many details in the world of video, you can sometimes get in trouble if you assume too much.

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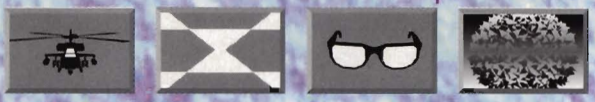

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TAMING THE WAVE

LightWave and Modeler 3.0

New Useful Tools Beyond the Bells and Whistles

By David Hopkins

The Toaster 4000 and NewTek's enhancements to LightWave and Modeler have brought many new cards to the table. Given all the ballyhoo about the ability to play back animations from RAM, the host of spectacular non-transitional effects, the addition of PostScript fonts and all the rest, it's easy to lose sight of some of the less conspicuous, but arguably equally as important, changes to LightWave and Modeler in the 3.0 version.

This month, I'll explore some of the less-trumpeted changes to LightWave and Modeler that might otherwise take you some time to discover and incorporate into daily use. I am finding these enhancements to be every bit as important as the more obvious changes in the Toaster, and I'm sure you will, too.

Show BG Image

Have you ever tried to get an object to come out of a certain place in a background image? Maybe bringing a 3D apple forward from a person's eye? Lining up the apple's origin used to be a painstaking process of moving the apple a little and rendering, moving and rendering, until the correct position is found. No more.

Show BG Image, accessed through LightWave's Options menu, causes a black-and-white rendition of your background image in the background of the Layout. It is only visible when looking through the camera.

Save Alpha Image

An Alpha Image is a black-and-white image (sometimes called a "high-con" for high contrast) that determines what parts of an underlying image will be affected by an operation. For example, imagine you were rendering a spaceship to be composited with live video in an online production situation. (For insight into the term online, see "From Home Video To Home Box Office Part II" by George Avgerakis in the June/July 1993 issue of *Video Toaster User*.) It's more than likely that some areas on your object will be dark or even black. This presents a problem because when the animation is keyed into live video, dark and black areas will become transparent, resulting in see-through holes in your spaceship. Here is where the Alpha Image (or holdout matte) comes into play.

In this example, the Alpha Image is the pure black background with a white cutout of the spaceship. When the white cutout of the spaceship is animated to match precisely the animated fill image, you have created a traveling matte. In this way the Alpha Image reserves a space for the animation by telling the keyer not to key anything in the white area.

In the older versions of LightWave, you could make traveling mattes by rendering your entire animation in color (called a beauty pass) and then rendering the whole animation again with all of the object surfaces set to luminous full-white and no shadows. Of course, this took two complete rendering cycles.

With the latest version of LightWave, simply click on Save Images and set your paths for your full-color beauty frames. Next, click on Save Alpha Images and set a path for holdouts. Both versions of the image will be rendered at the same time, in perfect registration.

Move Pivot Point

Have you ever designed a great-looking object that needed to pivot around a certain point? However, when you designed the object, you didn't build it around the exact dead center for a pivot. If the object is something like a door that's been built in relation to where it fits in an associated house object, you would have to go back to Modeler, move the door, load it into LightWave and move it manually into position.

In the new LightWave, simply click the Move Pivot Point button from the Objects Edit Item list and drag the object wherever you want it. This is one of my favorite new features because it allows for more creative design and less reliance upon mathematical positioning.

Import/Export

Have you ever realized while setting up a scene that one of your objects needs to be changed? This required you to save the object from LightWave (to preserve surface changes), load it into Modeler for a tweak or two, save it from Modeler, delete the bad object from LightWave, load the fixed version and put it back where it belongs. If the object were a part of a hierarchical chain, this would be an even more involved ordeal.

Using LightWave's new Import and Export functions reduces the tedium and the steps. For example, if you were to decide that SlotMachine.lwob was not right, enter Modeler. Click and hold the button marked Import and then locate the SlotMachine.lwob in the pop-up list. Release the mouse. The object is instantly transported into your current Modeler layer. Make your changes, and reverse the process using Export. You can choose to send the object back to LightWave as its own entity or as a replacement for any other loaded object.

Replace Object/Replace Image

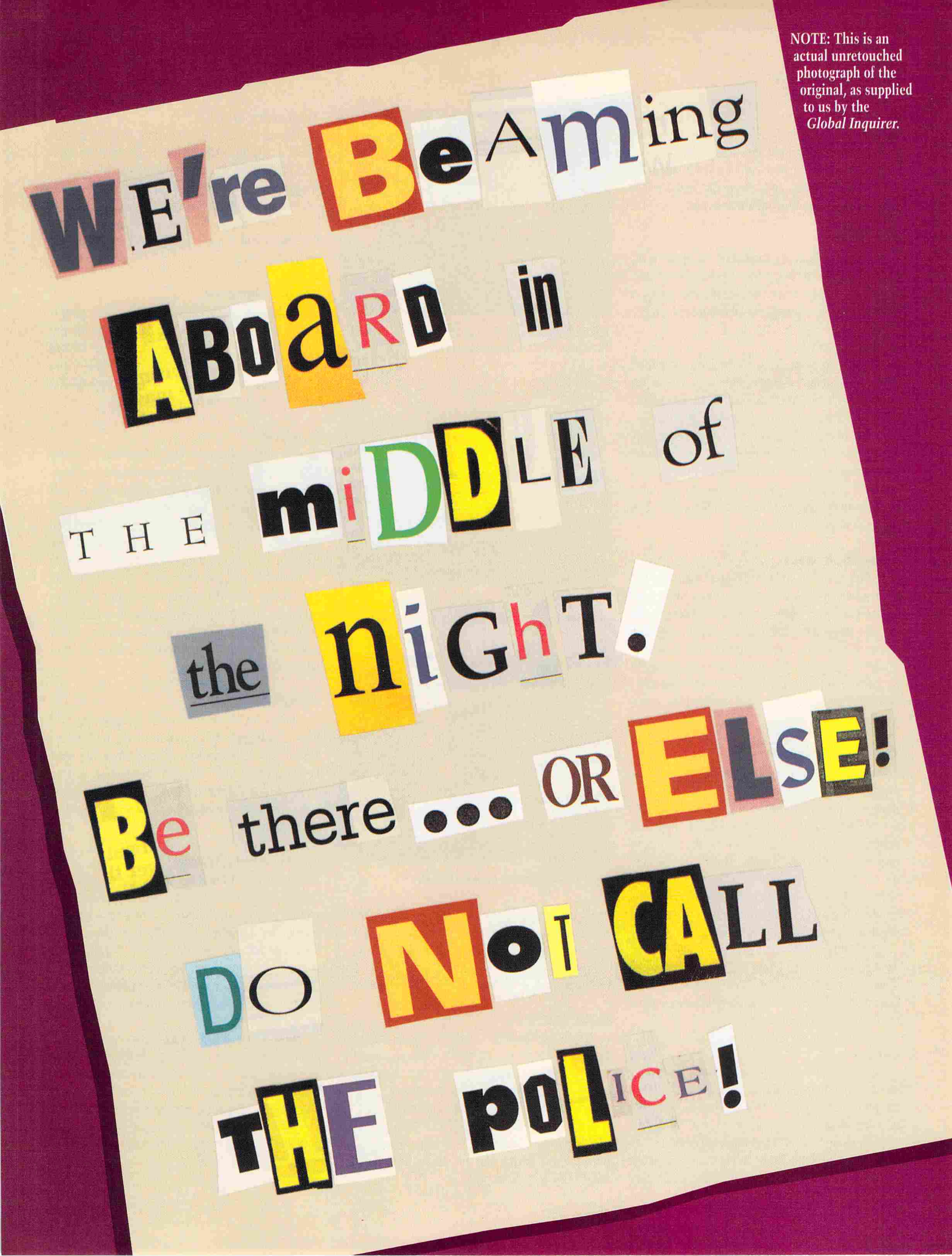
If you design your objects as you work out your animations, it's not uncommon to create 15 to 20 slightly different object files as you proceed. LightWave now allows you to set up a scene using rough objects and to replace the rough objects with progressively more detailed objects as you go. The same is true of images. If you were to replace FractalReflections with another picture of your choosing in the Images area, every use of FractalReflections would change.

Show Motion Path

This new LightWave layout option is handy. Recently, I created an animation that involved weaving the camera through a huge group of TV monitors. At the time, this feature didn't exist, and I spent a great deal of time stepping through my scene making sure that I didn't bump into one of them with my camera. With Show Motion Path, the entire curving path of the camera can be seen so that I can instantly find unwanted collisions.

A bouncing ball illustrates another handy use for this function. Because you can see the path of the bouncing ball, it is possible to

Continued on Page 44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actually see the spline's effect on the motion. Better yet, by moving the Layout to show the frame you wish to alter and holding down the T, C, or B keys on the keyboard, you can adjust the key's tension, bias, and continuity visually. You must try this to appreciate the function.

Luminosity

In the past, luminosity could be either on or off. That's changed with the latest LightWave. Luminosity is now adjustable like all other values. It even allows for various forms of texture mapping.

Clone Object

Maybe you're working on the landscape for a 3D house and need four palm trees to line the driveway. In the previous version of LightWave, this would have required loading each object individually or making them a single object laid out in Modeler. Now load the palm tree, change the attributes, click Clone Object and ask for three clones. This is much faster than loading them from the drive and assures that each clone is identical to the original.

Show Fog Radius

I like the Fog options. I use them to add atmosphere that won't draw attention away from primary objects. Until now, determining the proper Maximum Distance for Fog has been a matter of guessing and rendering. However, with the new LightWave this task has become easier. Simply pop into the XZ view for a top/down look, and there's a dotted-line ring marking the maximum fog distance.

Shift/Scale Keys

Has a client ever asked you to double the duration of your animation after it's been rendered? If it's filled with complicated envelopes and careful timing, it almost seems easier to rebuild the whole thing from scratch than to move all of the key frames. The Scale All Keys option in the new LightWave makes this task much simpler. Using this option, you can double the duration of the animation by letting LightWave do all the grunt work. It works flawlessly.

The Shift Keys option lets certain action, such as a camera move, happen a few frames later than originally specified. This feature more or less scoots the desired range of frames over a specified number of frames.

Center

Modeler is not without its own enhancements, including the addition of Boolean modeling and PostScript text. (I'll explore these topics in detail in subsequent columns). But Modeler's smaller gadgets should not be overlooked.

The Center function is interesting because it causes an object in the current layer to be perfectly centered around the 0,0,0 positions. You'll find this little tool in the pop-up list that accompanies the Macro button in Modeler's Disk menu.

You can use the Center function to center a line of PostScript text side-to-side and top-to-bottom .

Figure 1: A frame from an animation using my Big Rig Truck, motion blur and lens flares.

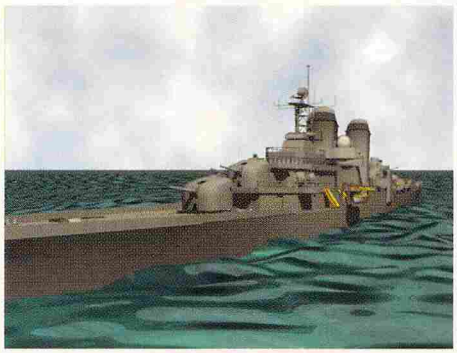

Figure 2: A ViewPoint battleship with displacement mapping used to bring the water up onto the hull.

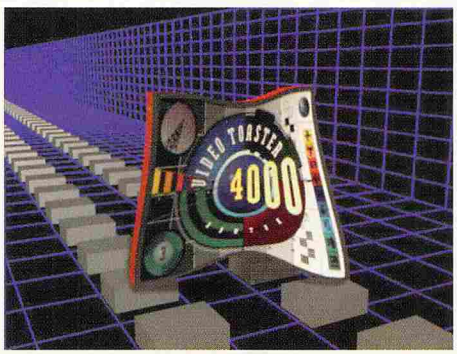

Figure 3: An example of using Bones.

Layer Markers

If you use Modeler properly, you end up with little object scraps scattered throughout the various layers of Modeler. Previously, a problem arose when you had to copy something to paste in another layer and were required to find an empty layer. NewTek solved this problem in a elegant way. Each layer containing data is marked with a tiny star on the button. No star means the layer is empty.

Trajectory Motion

This is another peculiar little Macro. It adds bounce to things. Simply enter a starting position and launch angle, the number of frames, the hang time at the top of the bounce, and Modeler saves a motion file. When that motion file is given to an object, such as a ball in LightWave, the object will bounce away convincingly until it comes to a stop.

Naming Surfaces

Naming surfaces has been simplified. Simply select your polygons, click Surface from the Polygon menu, type in the name and hit return. That's it. Of course, you could have chosen one of the preexisting names from the pop-up list that accompanies the function as well.

Subdivide

One thing I hate in my animations is being able to see polygonal edges on round surfaces. However, often I have generated a sphere and used a portion of it in an object only to discover that I could have used more polygons to produce a rounder edge. I used to have to make a new ball, cut it up and replace the bad sphere with it.

But those days are over. With the new LightWave, I would simply select the problem polygons, use Triple to turn them into triangles, then Subdivide. Simply choose smooth, when asked if this is to be smooth or faceted, and repeat the task as needed.

AutoFit Selected

AutoFit has been enhanced. Imagine that you have a polygon that's causing you problems. Simply select the polygon, hold down the Shift key and press the *a* key. All three views will be zoomed in to display the polygon from a closeup view. No more pressing the < and > keys a few dozen times.

Measurement System

If you need to make a full-scale version of a traditional construction two-by-four, how would you do it? Because a two-by-four is 2 inches by 4 inches (actually the trim size is less, but you get the point), you'd have to do some fancy metric conversion to build it, right? Wrong. Simply change Modeler's Measurement System to English. Now you can work with inches and feet.

These are only a few examples of some interesting new tools found in the latest versions of LightWave and Modeler. If you are serious about LightWave animation, the new Toaster software is a must-have. The tools that have been added can do nothing but improve the results you achieve, and you'll definitely notice the dramatic increase in speed.

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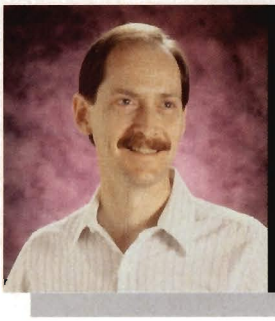

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-Greg Ruuska, Corporate User

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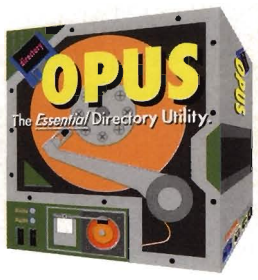

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The Toaster Goes INTERNATIONAL

Affordable Standards Converter Fuels Foreign Interest In The Video Toaster

By Frank Kelly

A crowd had formed in the corner of the exposition hall where a Video Toaster system was on display—nothing too unusual since the Video Toaster attracts so much attention wherever it goes.

What made these Toaster onlookers so unusual was that they came from France, Italy, Germany and England, all countries with video standards that are incompatible with the Video Toaster and other NTSC equipment. Their reason for interest was clear. A small West Coast-based company was showing a cost-effective solution for converting their video standards into NTSC in a Toaster workstation.

Effectively, what Prime Image did at the International Television Symposium in Montreux, Switzerland, was to tap into the worldwide demand for the NewTek Video Toaster by offering a workable solution for converting foreign video standards into a video signal that is compatible with the Toaster.

Standards Conversion Overview

Although many movie watchers around the world can rent major Hollywood films on VHS cassette, they cannot play those tapes in your home VCR. For that matter, a movie viewer in France couldn't play his cassette at the home of an British friend for the same reason.

There are three incompatible television systems in use around the world today, PAL, SECAM and NTSC. Each differs from the next in many ways, including the number of horizontal scan lines in a frame, the number of frames displayed each second and the way in which the color portion of the television signal is encoded. (See "World TV Standards" on page 48 for more detailed technical information.) Add to this complexity, the fact that at least two of the three major standards have several variations, and it is clear that when it comes to video the world is a Tower of Babble.

Until the late 1980s, the cost of devices used by professional broadcasters to convert television signals from one standard to another was astronomical. Some models of standards converters cost as much as $190,000. However, beginning in about 1990, the prices of some units began to tumble due to less-costly computer memory, cheaper analog-to-digital and digital-to-analog converters and competitive market pressures.

So-called low-cost standards converters in the $10,000 to $20,000 range began to appear. These products, aimed at industrial video producers and video shops that specialized in a foreign clientele, were embraced by those seeking lower cost solutions to standards conversion. However, given that a complete basic Toaster system costs roughly $7,000, these lower-cost standards converters were still too expensive to make the Toaster make sense from a financial point of view to potential overseas users.

However, that changed with the introduction of the Prime Image Std/Con TBC ($1,600 list). At the heart of this board-level TBC is the Phillips digital multi-standard decoder chipset used by a number of video product manufacturers, including Feral Industries, Fast Electronics and Matrox. With the help of this chip, a little techni-

cal ingenuity and some smart marketing, Prime Image has been able to position this product as a solution for Toaster fans worldwide who had long admired NewTek's system but were unable to join the personal video revolution because their native TV standards were incompatible. The board accepts NTSC, PAL-M, NTSC 4.43, SECAM, PAL, and PAL-N inputs and outputs the same with exception of SECAM.

Inside Television

Just as standards converters differ in price, they differ in their approach in how they deal with the spatial and temporal differences among PAL, SECAM and NTSC. Appreciating the differences demands a basic understanding of each video standard.

The three television systems in use today use wideband RF channels to transmit pictures and sound to home TV sets. In all three, television pictures consist of two basic components: luminance (or brightness) and chrominance (or color) signals. Each system uses a unique method to encode the chrominance signal with the luminance to make effective use of the spectrum allocated to a TV channel.

The chrominance signal in each system consists of two subcomponents, hue and saturation. Think of hue as the rainbow. It is the division of color along the color spectrum. Saturation in video is synonymous with color purity.

Inside of a television camera, photosensitive devices, such as pickup tubes or CCDs, pick up light energy and convert it into electrical energy. Professional cameras use three pickup devices, one each to collect red (R), green (G), and blue (B) picture information.

The charges picked up by these devices are read out one point at a time via an electron beam that sweeps the photosensitive area left to right and top to bottom in the case of camera tubes or via transfer registers in the case of CCDs. The horizontal scanning frequency of each television system determines when each charge is read out.

Using a technique known as a linear matrix in which specific percentages of the R, G, and B signals are sampled, the luminance (also called Y) signal is created. From here the luminance signal and two color difference signals, that is R-Y (also known as "I" in NTSC parlance) and B-Y (also known as "Q" in NTSC lingo), are encoded along with control pulses for such functions as horizontal and vertical blanking. Then they are transmitted.

At the TV receiver, the signal is decoded and used to drive the red, green, and blue electron guns in the CRT (cathode ray tube) to recreate the picture. In this manner, the signal from the camera controls the electron guns in the TV set so that the image that is sampled is also displayed.

Standard Differences

In NTSC, the I and Q signals are modulated on the single 3.58MHz subcarrier. Other characteristics peculiar to NTSC are 60 fields per second, 525 horizontal scan lines and the standard's own horizontal and vertical scan rates.

In PAL (phase-alternating line), the phase of the R-Y component is alternated by 180 degrees to reduce color distortion and a one horizontal line delay is introduced. In PAL, there are 625 horizontal scan lines and 50 fields per second.

Continued on Page 48

In SECAM (sequential color with memory), a separate subcarrier is used for both color difference signals. As in PAL, the field rate is 50 per second and the number of horizontal scan lines is 625.

Thus, with so many differences among the field rate, the number of scan lines, the horizontal scanning frequency, the vertical scanning frequency and the color encoding schemes among the systems, it is clear that converting from one video standard to another is quite an undertaking.

How They Work

Like TBCs, standards converters perform an analog to digital conversion on incoming video, strip the signal of unstable control pulses and store it in digital field memory. What the converter does with the stored video field or fields to a great degree determines the price and quality of the device.

To date the least expensive models have used a brute force method of standards conversion. In these units, 100 lines of a 625 line PAL or SECAM frame are simply dropped to get to NTSC's 525 line rate. The consequences of this approach are less than desirable, especially if something important happens to be in the 100 lines that were thrown away. In going from NTSC to PAL or SECAM, certain scan lines are repeated—again a problem that can lead to picture distortion.

Similarly, to deal with the temporal differences (60 fields per second vs. 50 fields per second) between NTSC and PAL or SECAM, whole fields are dropped. When going in the other direction, fields are repeated to achieve 60 fields per second. Motion in video frames suffers from this approach.

More expensive converters use more field memory, and with more fields digitally stored, the converter has more options. For example, it can weight its field selection so that the field that is chosen more closely corresponds to the field that should have occurred if the source material were originally shot in the desired standard.

The added memory also more elegantly solves the spatial discrepancies between NTSC and PAL and SECAM. As many as four horizontal lines from four fields can be compared to determine exactly where the new standard's line should be placed.

It should be noted that methods that rely upon such interpolation are not without their own problems. Such averaging of picture information can lead to a softness or blurriness of the image that some find objectionable.

At the highest end of the market, a new method called motion vector interpolation actually predicts the motion of video elements across the screen and predicts what the frame should look like if it had been shot in the desired standard. These converters cost nearly $200,000.

Once the standard converter is finished accommodating the spatial and temporal differences between two standards, the digital image is converted back to an analog signal, control pulses are added and the signal is encoded in the proper standard.

The Toaster Goes International

Toaster Goes International

At the Montreux exhibit, Prime Image demonstrated its Stnd/Con TBC in a Toaster System. Two standards converting TBCs were used on two video input channels to convert a PAL signal to NTSC so that they could be processed by the Toaster. A third standards converting TBC was used at the Toaster's output to convert back to PAL.

Response was so encouraging that Kelper International, a New York-based international equipment distributor, plans to build 1,000 Toaster 4000 systems that use a minimum of three Prime Image Std/Con TBCs for sale in Europe, South America, and the Pacific Rim.

While Prime Image president Bill Hendershot is the first to say that the Std/Con TBC does not provide the level of quality that the most sophisticated $190,000 motion vector interpolating standards converter delivers, it is better, he says, than many of the standards converters selling for $10,000 or more.

"The Std/Con TBC makes use of pass through technology," he says, "that essentially make the conversions transparent." While Hendershot would not discuss all of the details of how the unit works, he did say that the board uses "two-field plus" memory and that some temporal interpolation occurs to handle the difference in frame rates.

When asked about spatial differences, Hendershot was less forthcoming. The Std/Con TBC does not throw away lines, nor does it average or interpolate lines, he says. Hendershot declined discussing the specifics of how the board accommodates spatial differences.

Regardless of the mystery, interest seems to be running high in the board. Prime Image has sold boards in New Zealand and Britain and have received inquiries from India, Taiwan and South Korea, Hungary and Italy. "Ninety-eight percent of

Continued on Page 50

Worldwide TV Standards

NTSC-M
(Canada, Japan and United States)
Lines: 525
Fields: 60
Vertical scans: 59.94 Hz
Horizontal scans: 15.734 kHz
Subcarrier: 3.579545 MHz
Bandwidth: 4.2 MHz
Sound: 4.5 MHz (FM)

PAL-I
(United Kingdom)
Lines: 625
Fields: 50
Vertical scans: 50 Hz
Horizontal scans: 15.625 kHz
Subcarrier: 4.433618 MHz
Bandwidth: 5.5 MHz
Sound: 6 MHz (FM)

PAL-B, G, H
(Continental Europe)
Lines: 625
Fields: 50
Vertical scans: 50 Hz
Horizontal scans: 15.625 kHz
Subcarrier: 4.433618 MHz
Bandwidth: 5 MHz
Sound: 5.5 MHz (FM)

PAL-M
(Brazil)
Lines: 525
Fields: 60
Vertical scans: 60 Hz
Horizontal scans: 15.75 kHz
Subcarrier: 3.575611 MHz
Bandwidth: 4.2 MHz
Sound: 4.5 MHz (FM)

PAL-N
(Argentina)
Lines: 625
Fields: 50
Vertical scans: 50 MHz
Horizontal scans: 15.625 kHz
Subcarrier: 3.575611 MHz
Bandwidth: 4.2 MHz
Sound: 4.5 MHz (FM)

SECAM-L
(France, Russia)
Lines: 625
Fields: 50
Vertical scans: 50 Hz
Horizontal scans: 15.625 kHz
Subcarrier D_R: 4.40625 MHz, 282 horizontal
Subcarrier D_B: 4.25 MHz, 272 horizontal
Bandwidth: 6 MHz
Sound: 6.5 MHz (AM)

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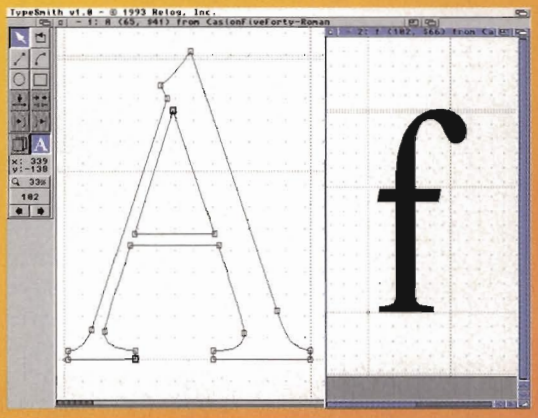
1 Use TypeSmith to end Font Hell



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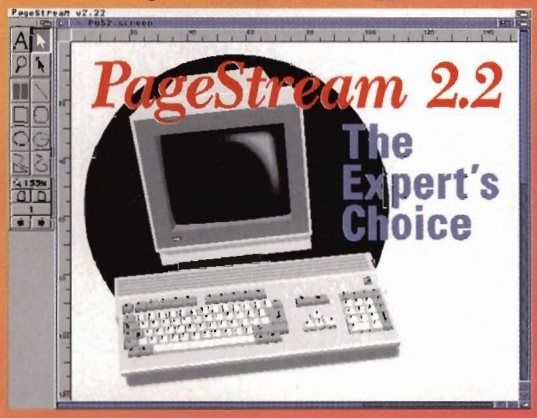
2 Is PageStream on your top 10 list?



- Letters
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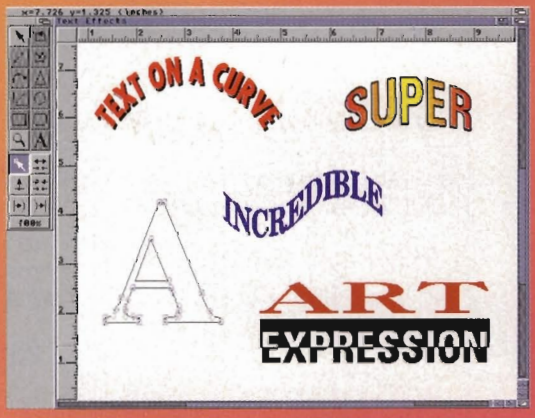
- Brochures
- Ads
- Labels
- Posters
- Newsletters
- Reports
- Resumés
- Magazines
- Cards
- Books
- Anything!

"PageStream is the best." — *Amiga World (Expert's Choice Award, '92)* "Aside from its usefulness for creating 3D objects, PageStream is a GREAT publishing program... become a desktop media mogul." — *Bread Box (Top Ten Toaster Utilities, '92)*

3 Art Expression: Effects Specialist



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the interest overseas has been in using the standards converter with the Toaster," he says.

A Close-Up Look

I recently visited to Prime Image's manufacturing facility in Saratoga, CA. I had the opportunity to meet the people behind the product and examine the TBC-standards converter installed in a Toaster system.

Although I am no engineer and do not feel qualified to form an opinion of the product from that point of view, I am a video producer with my own idea of what looks right and what doesn't. I suspect that makes me a lot like you, and for that matter a lot like most of the people who will look at and potentially buy this product.

Standards conversion has been described as eight parts silicon and two parts magic. It's not a simple matter of running test signals into a device and measuring what comes out. Passing judgment on standards converters is purely a subjective matter. What looks good to you, may not look good to me and vice versa.

So having given you that caveat, let me say that I am as qualified as the next video producer to pass a subjective judgment on what I see.

At the company's facility, I watched a PAL version of a commercially produced video *Who Framed Roger Rabbit* playing back from a PAL VHS deck through the Prime Image standards converter-TBC and into the Toaster. The picture quality was outstanding. However, there appeared to be a slight motion artifact in scenes with horizontal motion. The artifact manifested itself as a slight delay in the on-screen action.

It should be noted that the TBC is available without the standards converter. Even if you aren't thinking of a standards converter, this feature-rich TBC is worth strong consideration if you are in the market for a TBC.

What's Important Here

No one claims that this board-level standards converting TBC is the ultimate standards converter, making use of the latest motion vector interpolation techniques. No one claims that others cannot or will not apply similar technology. After all, the Phillips multi-standard decoder chip is commonly used throughout the industry.

However, it is clear that from the foreign reaction to this product there's a strong desire abroad to take the Toaster revolution overseas.

The Prime Image Std/Con TBC and others that are surely to follow from other manufacturers will help to grease the skids to make personal video production common overseas.

One can only wonder what profound effect personal video production and the freedom that comes with it will have on societies around the globe.

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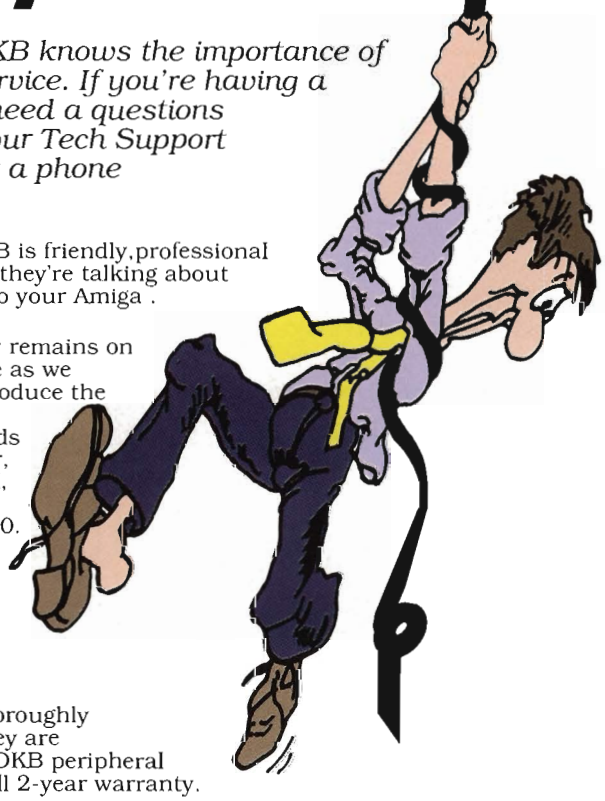

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- The basics of recorders, including various video recording methods and the proper way to make dubs.
- Concepts about the video signal, including sync signals, subcarrier-to-horizontal phase and how to read and use waveform monitors and vectorscopes.
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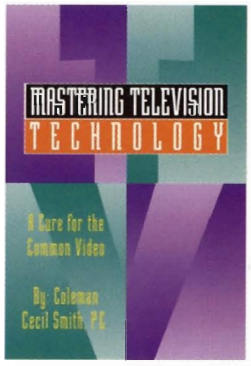

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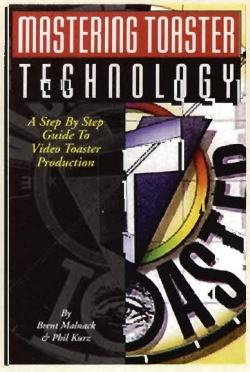

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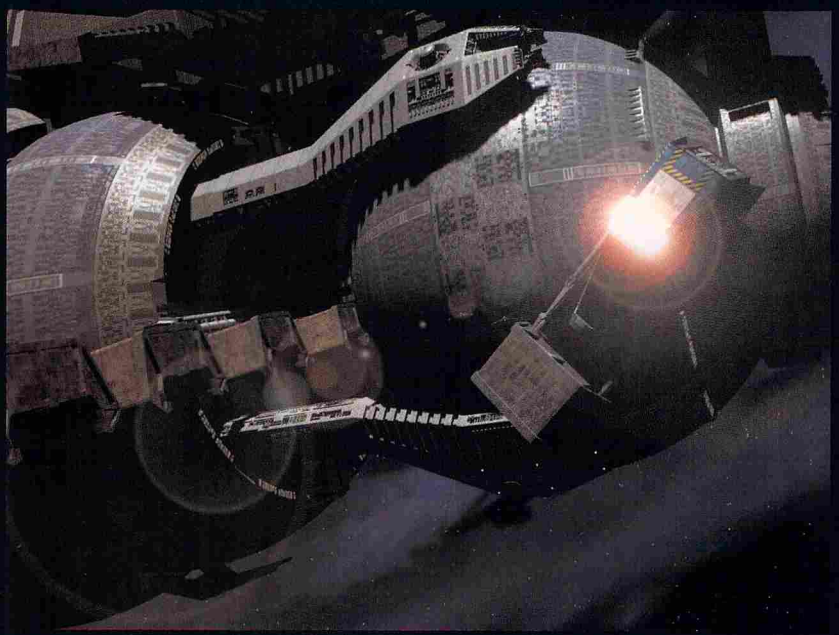

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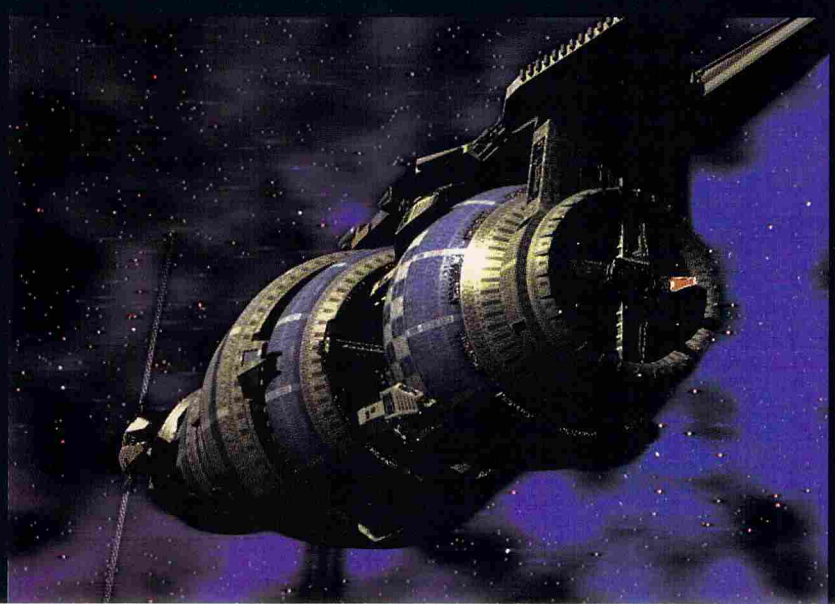

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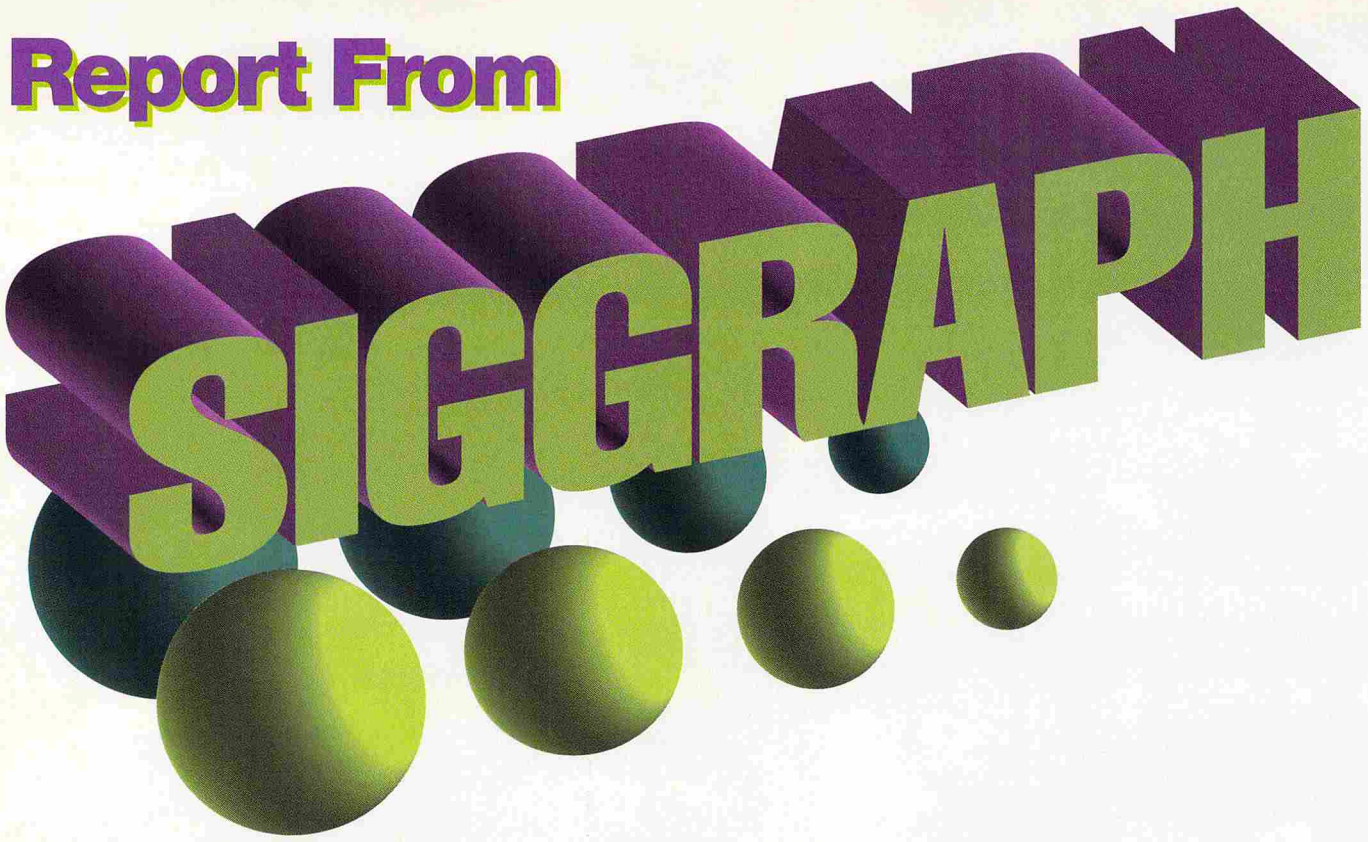


NewTek Screams Into SIGGRAPH '93 With Powerful Rendering Station

By Phil Kurz

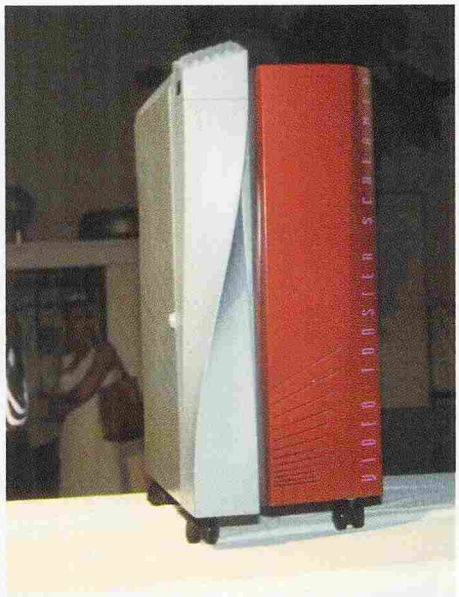
Each year, thousands of computer graphic artists, animators and designers converge on a major U.S. city for a week to learn about the latest techniques and technology to help them in their craft.

The occasion is SIGGRAPH (Siggraph), the Special Interest Group on Graphics, sponsored by the Association for Computing Machinery. This year's event, August 3-5, in Anaheim, CA, promised to be perhaps the grandest Siggraph ever. With all of the attention the computer graphics industry has received over the past few months from the blockbuster film *Jurassic Park* and the hoopla that follows virtual reality wherever it goes—and it always goes to Siggraph in a big way—many expected this year's conference to mark a triumph for the computer industry.

For through its magic, computer graphics had integrated computer-generated dinosaurs with live actors and actresses so seamlessly that audiences nationwide left their theater seats wondering if those dinosaurs just might be real.

Before the convention opened, dinosaurs were expected to take center stage. Naturally, they showed up in a big way at the Silicon Graphics booth where a familiar-looking Discover Park featured a virtual reality pterodactyl ride that sent dinosaur pilots down winding canyons, through narrow castle corridors and beneath the sea. How appropriate for the computer manufacturer that was more responsible for the dinosaurs of *Jurassic Park* than any genetic engineering to build its exhibit around that theme.

However, midway through the show an unorthodox product from an unorthodox company in Topeka, KS, left some Siggraph attendees wondering if the true dinosaurs at the convention didn't come in the form of blue and onyx-colored plastic boxes.



NewTek's Screamer ($9,995) has the rendering power of 40 Toasters.

NewTek Inc. sent LightWave users into a virtual frenzy when it announced the *Screamer*, a 600 MIPS (million instructions per second) rendering workstation for $9,995. (RAM for the Screamer is extra.) The company claims the Screamer, which uses four R4400 RISC (reduced instruction set computing) microprocessors working in parallel, will outperform a $160,000 Silicon Graphics Onyx (that's the refrigerator-sized computer) or the new Indigo 2 ($20,000) and "delivers twice the rendering power" of a Cray I supercomputer.

Whether or not the performance and price of the Screamer send the Silicon Graphics systems packing for Computer Geriatric Park, one thing is undeniable: The Screamer has irreversibly changed the 3D computer graphics industry. It has set in motion a series of events that likely will shake the world of computer animation as much as the Video Toaster shook the video production arena.

***Video Toaster User* Magazine joined other exhibitors with a popular booth at Siggraph '93.**

Nearly 3,000 people jammed into NewTek's Siggraph party, including Todd Rundgren (inset).

The NewTek Party

NewTek's announcement of the Screamer was quite a surprise. The company chose at the last moment to keep its large trade show booth at home and send a small contingent of employees to man a booth that it shared with *Video Toaster User* magazine. The conspicuous absence of the large booth with the massive crowds it tends to attract led to speculation on the part of a number of exhibitors about the fate of NewTek.

The speculation only added to the anticipation that NewTek would announce something of major importance at its Siggraph party. By the night of the party, it was clear that NewTek had piqued the interest of thousands.

About 3,000 people went through the turnstile Wednesday night at the Movieland Wax Museum, site of the NewTek party. As the line snaked its way along the outer wall of the museum, eager partygoers chatted about what they might expect. Upon entering the museum, people were seated next to a wax figure of George Burns, photographed and then sent down the twisting path that leads through the museum.

Thousands gathered in the courtyard outside the museum, joined every few minutes by small groups of people fresh off the parade down paraffin alley. While no one was quite sure why, inflatable figures of Edvard Munch's "The Scream" stood conspicuously on the dance floor and throughout the courtyard.

As night fell, the crowd would understand. At dusk, the partygoers were directed into a makeshift outdoor auditorium behind the courtyard. Soon all 600 seats were filled, so people lined the aisles, climbed nearby trees and sat on a two-story flight of steps to get a glimpse of the stage. There on a table being carefully watched by two plainclothes security officers, stood a tall object hidden from view by a white sheet.

Go on with the Show

Actor Wil Wheaton, who plays Wesley Crusher on *Star Trek The Next Generation*, opened up the evening with a spirited description of his interest in video production. He related how he was told to, "Shut up and say your lines kid," when he tried to express his ideas about how a scene should come together. Wheaton called for a change in how television is put together, saying that the networks and large production companies are losing their stranglehold on what is produced and how it's done.

Despite audio problems that plagued the event all night, Wheaton introduced NewTek president Tim Jenison and vice president Paul Montgomery. The pair took the stage several times, introducing a number of tapes, including the *Toaster 4000* tape, two new music videos, *Property* and *Fascist Christ*, by Todd Rungren, and the six-and-a-half-minute-long LightWave animation, *Robo Jr* by Dale Myers.

Rungren's *Property* music video made extensive use of displacement mapping, a new feature available with the Toaster 4000 and 3.0 software, while the use of Bones, another new LightWave feature, was evident in the form of walking crucifixes in *Fascist Christ*.

Perhaps the most impressive LightWave animation shown at the party was the public debut of *Robo Jr* (*See* Robo Jr: Making Animation Magic *on page 78, for a detailed look*). *Robo Jr* tells the story of a mischieveous young robotic space alien that leads the U.S. Air Force on an exciting chase while his parent searches for a thirst-quenching slug of motor oil.

The cartoon is significant for a number of

Continued on Page 56

reasons. First, it shows just how powerful LightWave can be in the hands of someone who is both well-versed in the program and the elements of good storytelling, namely character, plot and pacing. Second, it points out the major limitation of LightWave: rendering time. Despite using ingenious shortcuts designed to keep rendering time to a minimum, Myers spent 10 months creating the 3D cartoon. Third, the cartoon demonstrates that LightWave is helping to push an entirely new group of animators, who come from diverse backgrounds, to the fore.

At the end of the presentation, Montgomery and Jenison unveiled the Screamer, and the crowd erupted in applause and cheers as the words "four R4400 RISC processors running in parallel," "600 MIPs" and "150 MHz" echoed out over the crowd. Many in the audience rose to their feet and some ran forward for a better view.

Standing in its red and gray sculpted tower-style housing, the Screamer embodied what so many LightWave animators had wanted for so long: rendering speed. To quantify the computing power of the workstation, Montgomery said that one Screamer can do the work of 40 68040 Toasters in a LightWave rendering farm.

While NewTek may have intended the Screamer for power LightWave users, initial response from the crowd gathered at the party indicated that many Screamers are likely to end up in the garages, bedrooms and attics of LightWave animators across the country. Several of the party guests expressed interest in pooling their resources and sharing a Screamer, while others were making plans to purchase their own.

Perhaps one partygoer leaving the presentation summed it up best: "Finally, somebody has made the kind of rendering speed I need affordable."

Back at the Convention

While the Screamer grabbed most of the NewTek-related interest at the show, several other new products intended for LightWave animators debuted at Siggraph.

Sanyo unveiled its *GVR-S950* S-VHS recorder. *[Editor's Note: For a review of the Sanyo GVR-S950, please turn to page 88.]* The deck was designed with a built-in single-frame animation controller to serve the needs of desktop animators. While Sanyo identified animators as its primary target for this machine, third-party support from manufacturers such as TAO (Editizer), RGB Computer (AmiLink) and most recently Diaquest has pushed the deck toward video editing applications as well. The machine can be controlled via an RS-232 and RS-422 serial cable.

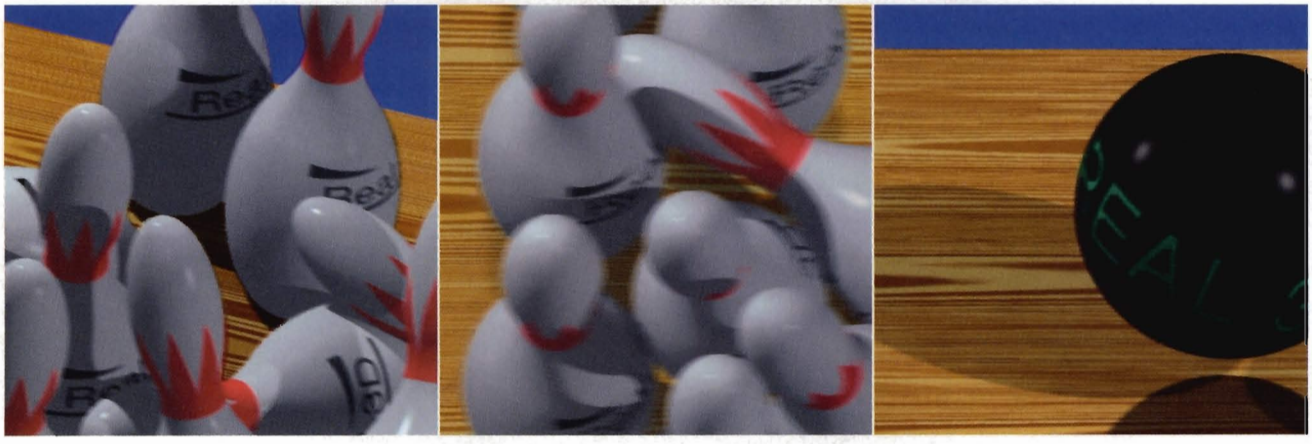
By pricing the GVR-S950 at $2,995, Sanyo has positioned the deck in a niche between the Panasonic 1970 series of S-VHS machines and the Panasonic 7750 series. With an internal SMPTE time code reader/generator, built-in two-channel audio and video switcher and video playback processor, the center-loading deck delivers 420 lines of resolution with a 55 dB signal-to-noise ratio.

When asked about the wisdom of introducing a tape-based solution for animation recording in the age of digital disk recorders, Wayne Kennedy, general manager of Sanyo's Industrial Video Division, said that videotape continues to hold a great advantage over disks when it comes to the amount of storage that is available. For that reason, interest in the GVR-S950 should remain high despite developments in disk storage, he said.

Digital Processing Systems showed software enhancements for its *DR-2150 Personal Animation Recorder* (PAR $1,995). The product now supports both audio and video hard-disk recording and playback through the addition of the SunRize Studio 16, a 16-bit audio board. When configured in this way, the system allows playback of animation, compressed video and audio. With the addition of a Horita TRG-50 SMPTE time code reader and generator or the SunRize board, the enhanced PAR can be integrated into an editing system as an audio and video source with about five minutes of storage when used with a 540 MB hard disk, usually the Seagate ST 3600A ($850). This version of the PAR also supports a 50 percent increase in the

Continued on Page 58

It takes intelligence to...



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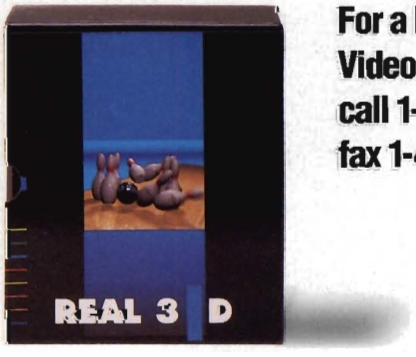

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RGB Computer & Video showed its *ToonLink* animation controller. ToonLink is available as a $200 add-on for existing AmiLink users, or can be purchased independent of AmiLink for $1,600 to $1,795, depending upon configuration.

Syndesis showed a CD-ROM filled with 3D objects, called *3D-ROM* ($199.95). It contains objects in LightWave, Impulse Imagine, AutoCAD DXF and 3D Studio and Wavefront .obj formats. The 3D-ROM contains numerous objects, including automobiles, aircrafts and spaceships, humanoids, furniture and buildings, and 400 tileable, wrappable bitmap image texture maps.

RealSoft showed its *Real 3D V2* animation package for multiple platforms including the Amiga. Real 3D comes with particle animation, collision detection, inverse kinematics and skeleton control. Priced at $699 for the Amiga version, Real 3D V2 also provides a full-featured 3D modeling, rendering, and animation capabilities.

Positron Publishing showed a working prototype of its Dynamic Motion Module software for LightWave 3D. With an introductory price of $99.95, the software allows LightWave animators to create motion paths for objects by assigning mass, direction of travel, and velocity information to objects. The program automatically creates the key frames in the animation based upon the laws of physics. Dynamic Motion Module also performs collision detection and object interaction.

Fade to Black

Long after the popularity of dinosaurs fades and our society moves onto some other craze, the impact of Siggraph 1993 will be felt. Just as NewTek set the video industry on its ear with a low-cost, high-quality CG, paint system, still store, DVE known as the Video Toaster, it looks poised for a repeat performance with the Screamer in the computer graphics market.

It is impossible to predict all of the ramifications of the Screamer's introduction. However, the big picture is clear: Rendering power has never been so inexpensive.

In an industry that has seen one mighty player fall after another as new technology brings with it improved price/performance, the implications of the Screamer are clear. A cheaper rendering engine means less money will be charged for rendering services. Fewer dollars for rendering means fewer dollars to service debt for those who have financed high-ticket 3D animation systems. Slower loan payments mean unhappy bankers. Yes, the landscape of 3D looks as if it may have changed forever at Siggraph. The Screamer did its best to see to that.

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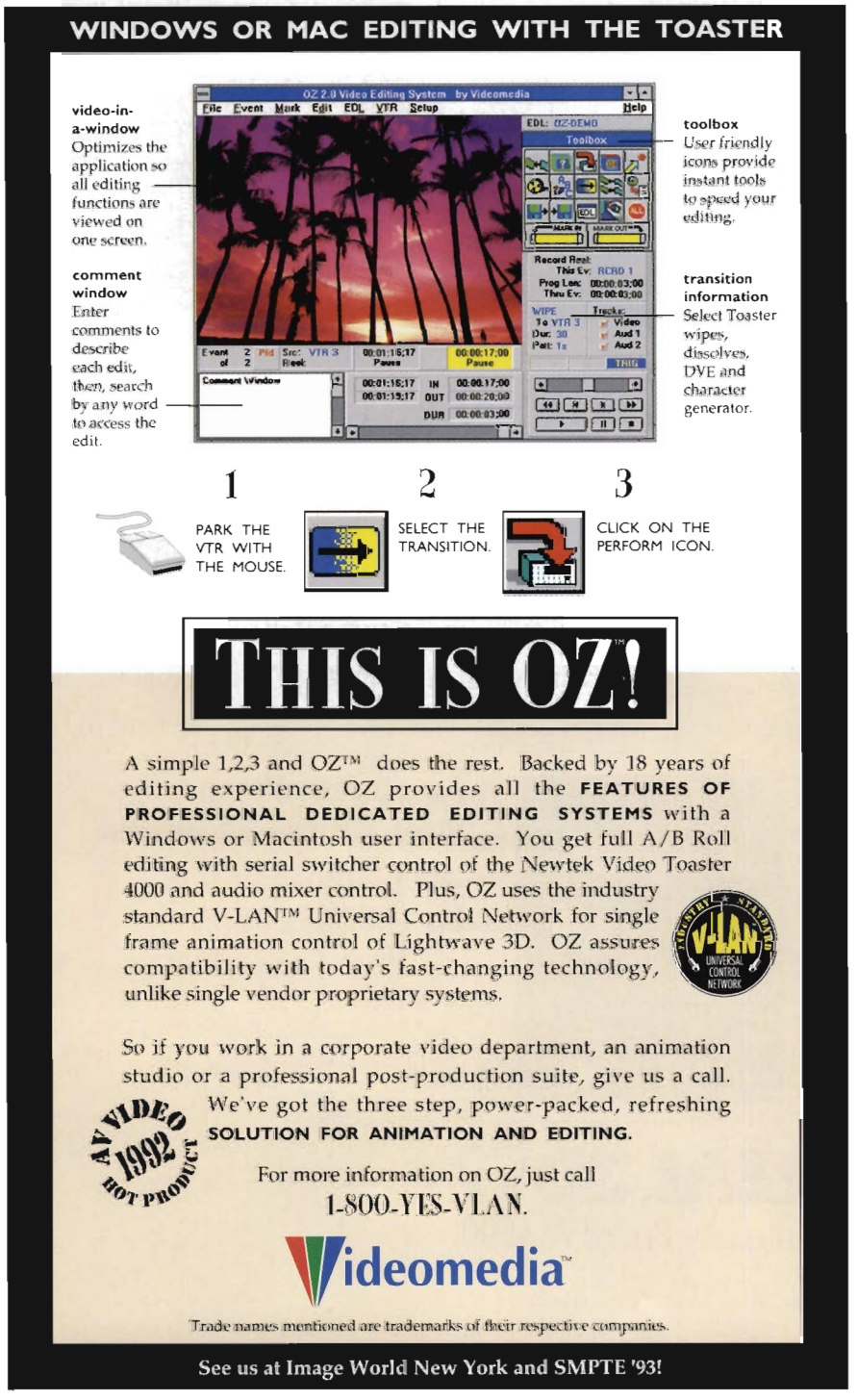

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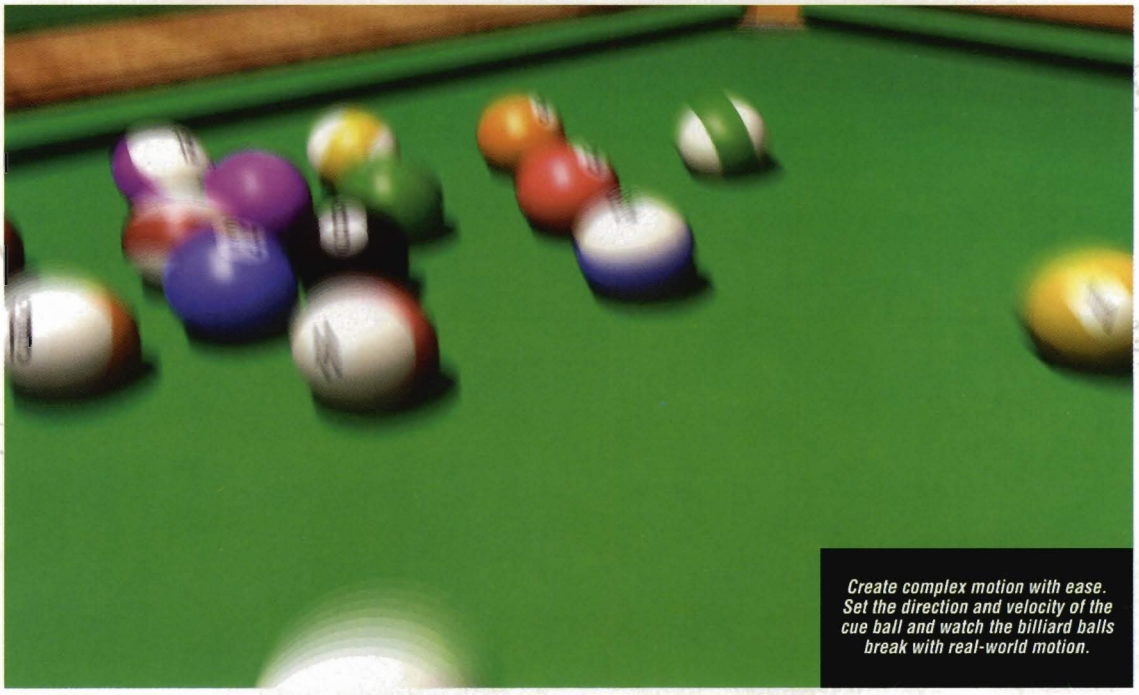

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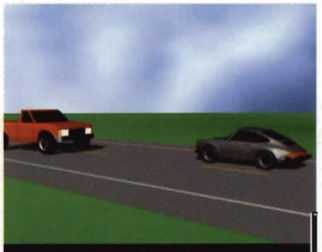
Working with the Dynamic Motion Module is as simple as telling the program how much an object weighs, how fast it's moving and its direction of travel. Then sit back and let the computer define the motion and interaction of the objects in the scene. When it's finished, the Dynamic Motion Module delivers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



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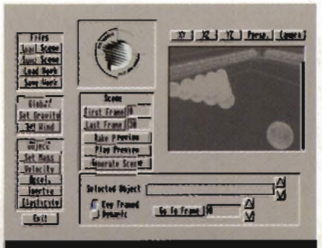

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The Men Behind The Machine II

An Interview With Tim Jenison and Paul Montgomery The Fathers of The Toaster

By Phil Kurz

It's six o'clock. Time for a dinner break. Out behind the NewTek building, company president Tim Jenison and some of his programmers have gathered for a little fun.

Jenison hops on his motorized skateboard, buzzes past the gathering crowd and is flanked by another of his programmers. The pair skillfully maneuver around the parking lot, dodging sewer grates and potholes. Soon they shut down their motors and coast to a stop by the back door. They put away their toys, hop in their cars and race off to dinner.

I climb in NewTek vice president Paul Montgomery's car, a low-swept, red Ferrari. Winding our way down the streets of Topeka, KS, Montgomery is clearly pleased as he discusses the company's latest product introduction: the Screamer, a 600 MIPS RISC processor-based LightWave rendering workstation.

Speaking of the Screamer, Montgomery tells of how the product has captured the imagination of the video and film community since its introduction at the SIGGRAPH convention in August. He tells war stories from the convention and relates how Silicon Graphics—the granddaddy of the computer graphics market—reacted to the news of the Screamer.

We pull into the parking lot of a local bowling alley. Located on the floor above the lanes is one of the finer restaurants in Topeka. We climb the long flight of stairs, are seated at our table, and dive headlong into a two-hour discussion of the Toaster 4000, the Screamer and the future.

Video Toaster User: *You've said that one of your main goals in releasing the Toaster 4000 was to make the Toaster easier to use. With the resounding success of the original Toaster, why make it simpler?*

Tim Jenison: We wanted the Toaster to be encouraging to people when they first started using it. We wanted them to feed on their own achievement in making their videos. We wanted them to get instant results so that they would be motivated to explore deeper. You can go as deep as you want in the Toaster. You can go as deep as writing your own code in LightWave if you want to generate some new life form or something.

But the important thing is that on the surface, if you are a casual user just getting involved in the video production business for the first time, there are all sorts of incredible things you can do with just the push of a button, and then as you go on and get tired of those things and want to do more, the Toaster can do it.

Paul Montgomery: Our favorite user is a composite of all the users out there. We call him "Busy Guy." Busy Guy has a job to do, doesn't have all day and wants to make a cool video. Busy Guy is not going to want to go in and model a Lamborghini, but he would like a Lamborghini in the video.

So everything in the Toaster is aimed at giving Busy Guy tools he can use to turn out network-quality video without the effort that goes into making real network-quality video. So this Toaster is one step in that direction, and future software versions will be more of a step in that direction.

VTU: *Does the ability to play back animations in real-time from RAM, rather than having to go out and buy a single-frame animation controller and an expensive videotape recorder, reflect the simpler, cheaper philosophy?*

TJ: That was the killer of 3D, and 3D was arguably one of the most exciting and potential-filled parts of the Toaster, because you can do anything in LightWave that you can imagine if you have the time and the talent.

Of course, the problem was that the single frame recorder threw a monkey wrench into the whole thing. I mean a guy could scrape up the money to buy a Toaster. It's in the price range of a personal computer, which many people buy for casual reasons. But once you get into the tens of thousands of dollars, it limits it to a very small, elite audience.

A lot of people out there wanted to use 3D in the worst way, but all they could do was generate still frames, and that's cool. You can make neat images, but to make movies you either had to buy, rent, or borrow an industrial VCR and a single frame controller.

So, the new display mode on the Toaster 4000 was made possible by performance increases of the Toaster card and the Amiga 4000. What it lets you do is render your animations into the computer's memory and then play them back in real time.

PM: The other thing is the new digital video effects are more like the sort of thing you do on a Quantel Harry. One of the ways we describe it here is that we have pulled a lot of the Toaster power to the surface so that more people can access it.

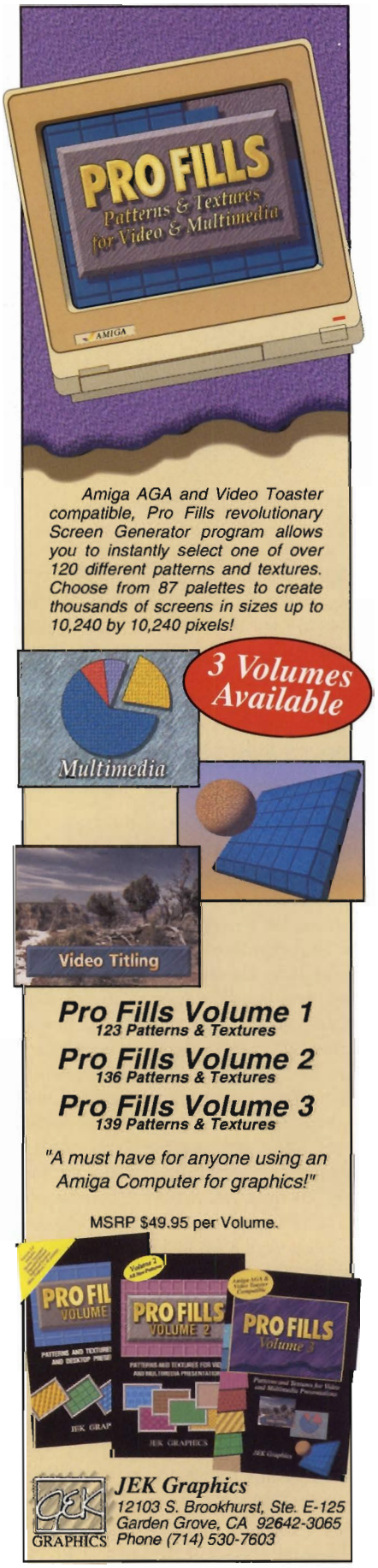
VTU: *Many of the new, non-transitional switcher effects are visually stunning. If someone were to create them by traditional methods it would take hours on expensive postproduction equipment. Does the decision of including these effects reflect your desire to give Busy Guy access to the best of what he sees on TV?*

PM: If you were to go into a big post house in Los Angeles, the person responsible for the amazing television graphics has trained on his equipment for years, commands a huge salary, and could do this stuff in his sleep.

Well, there are 12 of those guys that I know of in the world, but everyone still wants the same kind of graphics that they see on network television.

We determined that the only way to do those is to do most of the work for people so that we are creating the content, the amazing graphics. We have taken out about 100 steps so that the users can take a few steps and add those graphics to

Continued on Page 62



The Men Behind The Machine II

their videos. The future direction of the Toaster is more like that, too.

VTU: *That is an example that feeds the concept of personal video production?*

TJ:: Exactly. It's not enough to replicate what's in a control room at Channel 9. Nobody can use that stuff without being at it full-time. You have to take home and memorize two- or three-inch-thick manuals.

That's not for an ordinary person. We are not assuming the users are dumb, but they have a life. They have other things to think about, and if it takes two weeks of hard work to get a result out of the Toaster, we wouldn't sell the things.

PM: It's an incredible job, and everyone at NewTek is driven to make the best possible product. Everyone wants it to be network quality. Everyone wants the Toaster to be not only as good, but better than the other systems out there.

In some areas we are there, and in some we are not. But that's the goal, to have the best product, to have people say, "I choose Toaster," not because it's inexpensive or it is easy to use, but because it produces the best results of all the equipment.

We have to devote our entire life to making the thing easy enough for people to use. It is no easy task to do that. It is far easier to make a system that you need to go to college for eight years to learn than it is to make a system that one guy in a bedroom can make work within a few hours.

VTU: *Won't TV professionals then see the Toaster as a threat?*

PM: The networks aren't so negative anymore. We hear more and more about affiliates and networks using the Toaster. They resisted it at first. Toaster 2.0 is changing their mind. Toaster 4000 is changing their mind even more.

We think we will be in most every station this year. It's inexpensive enough where they really can't refuse it, and it is powerful enough now to where they can really use it.

TJ: Obviously, a lot of Toasters went to TV professionals, and they knew exactly what to do with them. A lot of people say, "Gee, didn't the TV professionals have a lot of that equipment before? Didn't they have these big quarter of a million dollar post suites?"

The answer is that there are a lot more people in television than there are suites. Just because you know how to use a suite doesn't mean you can march in with your raw tape and start editing. You have to pay the $300 an hour just like the next guy. Somebody has to pay off that equipment.

In the early days, Paul and I would meet these people, and we would start to call them Brians—the Brian factor. We met a guy named Brian in Omaha. He was a television professional, and we were expecting a lot of these TV professionals to be defensive about the Toaster and feel threatened by it.

Brian was the first one we met who was ecstatic about it. He said, "I am going to quit this job, set up a studio in my garage and make my own TV. I know how to make TV. That's what I do, and with this I can afford it. I can get into business and compete with my boss."

That has turned into a major factor in the market.

VTU: *It's clear from looking at the Toaster 4000 that some of the non-transitional effects and switcher patterns are just plain fun to watch and use. Does the fact they are fun reflect anything about NewTek, itself?*

TJ: We are a company based on the love of toys. We have a line item in our monthly budget for the toy store that has to be spent, and so we have to go to the Toys R Us dutifully every week or so and buy more toys.

PM: With *Jurassic Park*, everyone is into the dinosaur toys.

TJ: I of course have the complete Barney collection. I'm just kidding. But Alcatraz (the R&D lab of NewTek's) is a cross between a college dorm and an R&D lab.

PM: MIT Media Lab meets Animal House.

TJ: And I think everyone here likes fun a lot more than getting a particular productive job done. So, if you had to choose between making the Toaster really fun to use or adding some feature that's on a Cray, they would choose the fun one every time.

VTU: *You recently introduced the Screamer LightWave-rendering supercomputer. Who do you see as its typical user?*

PM: The Screamer was designed for the LightWave guy who gets pretty serious. If you look at our Hollywood users, most of them started out as a normal Toaster guy. They weren't famous 3D people.

They were normal Toaster guys who loved the Toaster for a few reasons, and started using 3D and got good enough. As they evolved, they started to network a whole bunch of Toaster systems together. When we reached 40 Toasters networked together at *seaQuest*, it was like, "Well, where do you go from there? Do you have 80 Toasters?"

So the idea was our users—sort of like the ascent of man—as they evolve up they can find the horsepower they need when they need it. The option of networking 40 Toasters together was a bit much and a lot of management hassle. The Screamer, of course, is the power of 40 Amiga systems.

TJ: I think I had to change my opinion a little bit after the (SIGGRAPH) party (where the Screamer was introduced) because of the way virtually everyone there reacted to it. We tended to think in terms of the *seaQuest*s, *Babylon 5*s and Amblins of the world using Screamers, because they are ones who are using all of these

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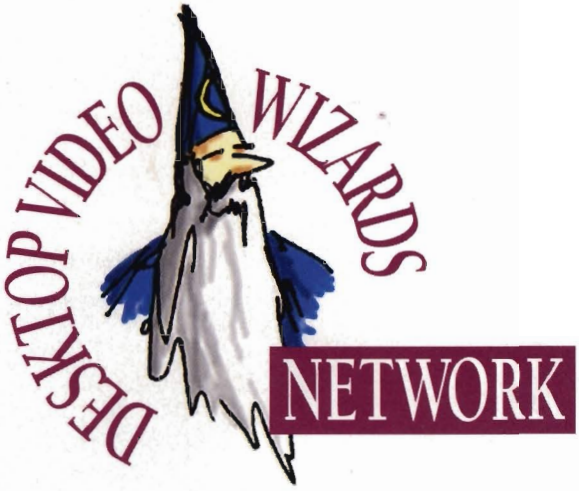

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multiple Toasters right now.

But there were just a lot of normal Joes sitting around at the party saying, "OK, three of us are going to go together and buy one of these." Or, "I think we can swing this." There were guys and gals who use a single Toaster, who were saying, "OK, now I can take on the world with this thing," which is true.

And I think that anytime anything gets more than 10 times cheaper, major change comes out of the woodwork. It's going to be exciting to see what happens.

PM: To me, the most exciting thing is the demand. Our phones have been ringing off the hook with people who want Screamers. We are getting purchase orders in, and dealer interest is tremendous. People are very excited about it. So what I hope happens is that you will have more people doing *Babylon 5*s, *seaQuests* and *Jurassic Park*s now from their house.

To network 40 Toasters together is not only expensive, it's difficult enough to discourage most people.

VTU: *Why did you choose to base the $9,995 Screamer on four R4400 RISC processors? Why not one?*

TJ: That was the sweet spot for costs. By putting four processors together in one machine, we got a much better performance per dollar. It's possible to use a single processor, but bang for the buck, four is the best way to go.

PM: This product does not mean that we aren't going to do less expensive versions for more people. It's just that the problem that needed to be solved now was that someone who is getting very serious about LightWave needs a lot of power.

If you look at the Silicon Graphics way of looking at systems similar to this, they sell a system with four R4400 processors for $160,000. The only difference between their system and ours is that ours runs a little bit faster.

A render farm in our NewTek vocabulary is 10 68040 Amigas networked together. When we reached 40 '040s, that seemed like the kind of power you would need to do some really serious work, such as *Jurassic Park* or *seaQuest*. So we wanted something that could take on that kind of stuff.

The interesting thing is that the really high-end people who want to buy these Screamers, want to buy 10 and network them together. So the joke is that they will be back in the same boat they were in before, but their power is going to go up. They ask, "How many can we network together?" The answer is the sky is the limit.

VTU: *Do you expect a migration of animators away from expensive animation packages, such as SoftImage and Alias, to LightWave because of the speed and affordability of the Screamer?*

PM: We will probably get some people from the Silicon Graphics world who would like to do more serious work. So the answer is yes, there are a lot of people who will now choose the Toaster over some of these other systems because of the price/performance value.

So the kind of guy who is going to go out and do a particular job will look at Silicon Graphics, perhaps. He will look at the Toaster and may look at some other personal computer platform. I think he will choose Toaster now because it is far and away the fastest way to get high-quality graphics done.

In terms of the quality of LightWave software, in terms of its feature set, LightWave is up with the high-end 3D packages. The problem was power. An '040 just can't compete with a fast RISC processor. Now with that problem out of the way, I think we will take away a lot of people who were looking at other systems.

TJ: I mentioned before *(Editor's note: See Part I of the interview in August/September* Video Toaster User*)* the baby duck syndrome, where they are attached to their mother. And it takes a dramatic thing to break them away, and this is a very dramatic thing.

We are seeing hard-core Alias and Wavefront users seriously considering LightWave, or they are seeing the writing on the wall, somebody is going to eat their lunch.

VTU: *Relations seem to be at an all-time high between Commodore and NewTek, what accounts for that change of heart?*

PM: Well, I think that what accounts for it is that the Video Toaster has become a big success, and not only in sales and the growth of NewTek but perceptually. The term people use to describe NewTek is a compelling application, and that's something the Amiga has never had.

We have met with the higher ups there, and they are very encouraged with the results of the Toaster, marketing and what they are seeing as a good growth in that segment for them. They were a general purpose computer and the Toaster is kind of a birth of a new industry. As their general purpose computer sales have declined the Video Toaster sales are starting to make up for some of those.

TJ: The compelling application for the Mac was desktop publishing. To launch a new technology, there has to be something very alluring about it, or nobody will buy it. People like to do things the old way.

So as long as Mac pitched themselves as just another way to run a spreadsheet and so on, it didn't do very well. A lot of people have forgotten that Mac was really on the ropes before desktop publishing hit, and that made it a thing to contend with.

It's been quite a while since the Amiga has been on the market with a very successful compelling application. That's what it is at this stage of the game for the Amiga.

PM: The people left at Commodore are really the good people who cared about the technology all along. There were some people who were in there for a while who were not as into the technology, somewhat maybe upset by being called a "Toaster box" and things of that nature.

I think everyone left there is pretty much based in reality, and they see what the potential is for this new market. So I think that that's part of the change, too. The departure of some Commodore guys, who were never the biggest NewTek fans, was a good thing for improving our relations. Relations are now very positive, and we are having conversations with Commodore on a daily basis.

VTU: *It appears that Commodore may be having some serious problems. What plans have you made to protect the Toaster should Commodore's position continue to weaken, or even if they close up shop.*

PM: Commodore is in far better shape than anyone else out there thinks. We have been hearing rumors of their demise since 1985, and they are no closer to demise now than they were then. I think the whole situation has been blown way out of proportion. That's just the nature of rumors.

VTU: *The Screamer came out of the blue. What other surprises are being cooked up at Alcatraz or NewTek in general?*

TJ: Well, it wouldn't be a surprise if we told you.

PM: There's always a lot of stuff in development at NewTek. There are a lot of products that people need, we just need to get them out. What people are seeing in the Screamer and what they will see in future products, is that we've been busy with over the past three years.

They've seen 2.0 and then recently Video Toaster 4000. But that's not all that we've been working on. I think that people who think the release schedule of new products at NewTek is about 14 months will be very surprised over the next 18 months. We will have a lot of releases and a lot of new technology. We will continue to solve problems by giving Toaster users the things that they would like to see.

VTU

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Garth & Brad

The Untold Story

How the Toaster Appears in *Wayne's World II*

by Angela LoSasso

Garth Algar is a nerd. But he's a cool nerd—if there is such a term. The shy, techno-wizard metal head, better known as the sidekick to Wayne Campbell in Paramount Pictures' and *Saturday Night Live*'s immensely popular *Wayne's World*, has an identity that clicks with people who understand what it's like to be on the fringe of mainstream society (even mainstreamers appreciate him, which helps explain over $165 million in worldwide box-office).

In *Wayne's World II*, to be released in early December, Garth again symbolizes hope for an entire generation of computer nerds. He's the guy no popular high school girl would be seen with. However, this time around there's a twist. Garth is older, on his own and hooking great looking babes not with his machismo, but with his genius and passion.

This genius is of major significance to Video Toaster fans because in *Wayne's World II*, the Video Toaster takes center stage. While the Toaster has made waves in Hollywood with behind-the-scenes use in productions, such as *Jurassic Park*, *seaQuest*, and *Babylon 5* among others, nowhere is its purpose more successfully trumpeted than on-screen in *Wayne's World II*.

Just like a NewTek brochure, Wayne and Garth are just a couple of regular guys who make TV (their public access cable show *Wayne's World*). With Garth's interest in video and technical gadgetry and lack of big-time funds, it's only natural for him to know about the Toaster, right?

"Well, we're (Wayne and Garth) putting on a concert, and we use the Video Toaster to make a lot of the advertising and posters and stuff,"

Photo: Elliott Marks

Garth Algar (Dana Carvey) and his real-life counterpart, Brad Carvey (left).

Photo: Elliott Marks Courtesy Paramount Pictures

Wayne Campbell (Mike Myers) and Garth Algar (Dana Carvey) team up again in *Wayne's World II*. In the sequel, the kings of public access TV move into an abandoned doll factory where they build their own TV studio—complete with a Video Toaster.

says Dana Carvey (Garth), star of *Saturday Night Live* and *Wayne's World I and II*. "And I wear a Video Toaster T-shirt, because it's part of the character."

The Garth/Toaster Connection

It's common for actors to research their characters thoroughly. Some spend months in the library, others hang out with their real-life counterparts and still others shed all aspects of celebrity and go incognito as cops, bartenders or whatever.

So it would make sense that Dana Carvey endlessly sought out public access talk show hosts, computer nerds, metal head music video producers and other technical advisors on his path to discovering the Video Toaster. NOT!

All Dana did was talk to his brother Brad—a guy, according to Dana, who has "the ability to make a nuclear reaction out of a paper clip."

Brad Carvey isn't a metal-head, nor is he a nerd. Brad, you see, is one of the initial designers of the Video Toaster and Garth's real-life counterpart. Well, sort of.

"Brad was always fixing the dryer or the washing machine if it broke down," Dana says. "But we had no tools. [Our family] was always blown away. 'Brad you fixed the dryer with a but-

Garth & Brad Continued on Page 70

Real-World Wayne and Garths

While *Wayne's World II* is a fictional story, there are real-life Waynes and Garths filling the cable TV airwaves with shows ranging from local news and talk shows to agriculture, music videos, gardening and more. Wherever there's public interest in a topic, there's most likely a public access or personally-produced show—or, at least, there soon will be.

The history behind public access television is this: When a cable TV company contracts with a city or locality to provide service for profit, it is basically receiving a legal monopoly. In return for granting a monopoly, the city receives fees, a dedicated channel for broadcasting local government meetings, and a channel dedicated for public access programming (in larger markets, some cable agreements also provide studios, production equipment and satellite trucks and feeds). In other words, you and I, the public,—the Waynes and Garths—have access to a television channel. And even better, an inexpensive, yet powerful production tool makes our public access shows as visually glamorous and exciting as the network variety (the Video Toaster).

After watching an Amiga-related program on Multnomah Cable TV's (MCTV) public access channel and deciding he could do better, Steve Herring, of Portland, OR, started his own public access show. *Cyberspace*

Real-World Continued on Page 72

Garth & Brad

Photos courtesy Billie and Lori Carvey.

Brad Carvey, Video Toaster engineer, left; Brad, the techno wonder child, right.

ter knife. You're only six years old. That's amazing!'" he continues. "He'd say something like 'Yeah, I fixed the dryer. It'll never break down again.' Garth is based on that sort of personality—sort of ingenious, can fix things, and make things very creatively.

"That's why in the first movie I consulted with Brad about Garth's stun gun. It's impossible to make a battery-powered stun gun. So Garth uses that in the movie," Dana explains.

"Another thing about Garth is that Brad loves bad science fiction films and horror films, so Garth likes that too. And Brad likes Coke, hamburgers, junk food and red rope licorice, so Garth likes that stuff, too.

"Brad is sort of the guy around the house with the computer games," Dana continues. "He always had a soldering gun, and he always had some kind of electronic kit around. So he is Garth.

"That's also why in this movie [*Wayne's World II*] I made Garth the computer guy," Dana says. "Because, in the first movie Garth says, 'We can bounce it off SatCom 7, etc.' That was all based on something Brad would try to do."

Brad the Engineer

Brad Carvey studied engineering at Sacramento State University. Graduating is not something he considers a major accomplishment because "school was just something I had to get through so I could become an engineer," he says. Without studying for final exams his entire academic career, Brad averaged As in his computer and video classes and Cs in others.

All the while, he designed his own computers and wrote his own operating systems. It was his interest in computers and video that led to NewTek.

If not for a strange twist of fate, Brad Carvey might never have met NewTek president Tim Jenison and vice-president Paul Montgomery. Montgomery and Carvey were drawn to the same computer dealership in Cupertino, CA by the news that the first Amiga had arrived. Outside the shop after store hours, the two struck up a conversation and became friends.

"When I first met Brad," says Montgomery, "he looked pretty much like every other Silicon Valley nerd that I had met. He had the beard, the flannel shirt, the blue jeans, the Birkenstocks. But when he talked, he had comedic timing. He was very funny and very interesting to talk to."

Through Montgomery, Carvey met Jenison, who recognized that, in his own words, "he was part of the core of a group of hard-core Amiga aficionados." Jenison realized that Carvey understood the Amiga, and at the suggestion of Montgomery invited him to help develop a video effects device for the Amiga.

Huddled around a table at a local Topeka, KS, pizzeria in spring 1987, Carvey and Montgomery watched as Jenison sketched a block diagram of

Continued on Page 72

DANA CARVEY ON THE PERSONAL VIDEO REVOLUTION

VTU: Your work from *Saturday Night Live* has brought you fame and opportunities. This and network shows in general are what NewTek targets as what everyday people can accomplish production-wise with the Toaster—i.e., personal video production. Do you see the "Toaster people" realistically making big inroads to network TV, and how do you feel about it?

DANA: Yeah. Oh sure. It's gonna be used on *seaQuest*.

VTU: With the expectation that TV is moving towards 500 channels, somebody has to produce that programming.

DANA: They're gonna use the Video Toaster.

VTU: So you see it exploding along those lines?

DANA: ... I know from the people I meet—Todd Rungren, he's a Toaster guy; a lot of famous people, networks, TV stations and Steven Spielberg—it seems to have really gone into the mainstream over the last few years. People really know it now.

VTU: What do you think of your brother's role with the Toaster? Is this typical Brad?

DANA: He was always good at making things work, I'll tell you that. If the VCR was broken or the TV or anything, he could always get it to work.

What he does well is that he's still like a kid inside. He really is. He's very enthusiastic. And I think that's what propels him. That's probably why Tim Jenison wanted him to help develop

the first prototype—because he wanted someone who could really make things work. And that's one of Brad's talents.

I'm real proud of him. I think it's wonderful that he had anything to do with something that's this amazing and revolutionary. I'm very happy for him. And I'm kind of blown away. I've had people come up to me and say, "You're Brad Carvey's brother?"

VTU: Would the Church Lady consider the Video Toaster a tool of the devil?

DANA: Yes. [Dana in the Church Lady's voice]: Well, well, well, making Satan images. Isn't that special. Tim Jenison, Paul Montgomery, and Brad Carvey. Well, well, well. Might as well be Lucifer, Beelzebub and the Beastmaster.

VTU: Did Brad have Kim Basinger-type babes chasing him around like Garth does in *Wayne's World II*?

DANA: Not that I can recall. But Tim Jenison and Paul Montgomery, they're like the Dave Clark Five.

VTU: The Dave Clark Five?

DANA: You know, I understand they have their fans—male and female.

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the Toaster on the back of a place mat.

"Tim was talking about how Brad could implement part of the Toaster's design," recalls Montgomery. "Even then as it was happening, the moment felt historic.

"I sat there not understanding what these guys were talking about, and I remember the light bulb going off over Brad's head as Tim explained how the Toaster would work. It was a super cool moment."

Jenison put Carvey to work developing a wire-wrapped prototype of the Toaster with the goal of showing a working model at Comdex, the largest computer convention in the nation. While Jenison knew what he wanted Carvey to achieve in the logic design of the Toaster, he wasn't ready for the Carvey's eccentricities.

"Brad's house at the time had a secret laboratory—just like you read about," Jenison says. "To get into the lab, you had to go through the hall closet. So, you would walk into the closet, shut the door and open the back of the closet and walk into his lab."

Living on Carvey's favorite food—brownie ice cream sandwiches and fresh squeezed orange juice—Jenison, Carvey and software designer Steve Kell worked around the clock debugging the prototype to get the Toaster to Comdex. On the third day of the convention, after working nights in their hotel room, the honeymoon suite at the Vegas Chalet complete with Cupid's posterior plastered in the window, Jenison, Kell and Carvey solved the prototype's remaining problems, making possible the product's launch.

Through it all, Carvey's humor and drive got the development team over the rough spots. "He's the funniest engineer on earth," says Jenison.

"He was the comic relief. He kept everybody sane. You couldn't really take things too seriously if Brad was around. He would grab a guitar and start improvising, making up his own words. He's also able to go into sort of an insane work mode. He is able to concentrate on something through these long sleepless periods."

While Montgomery and Jenison acknowledge that they see these eccentricities in the Garth Algar character, they say that Brad's brother Dana also mimics some of his sibling's endearing physical characteristics.

"Brad comes through in that sort of funny smile that Garth does," Jenison says. "Brad's smile is sort of a chipmunk's smile. You can't see it (very well) under the beard, but that is definitely Brad's smile."

Garth and Brad

Wayne and Garth, the boys from cable access Channel 10, the most famous representatives of personal video production take their biggest collective step: They move out.

In *Wayne's World II*, Wayne and Garth are "sans parent," according to Dana. Their new babe-lair loft is a converted, abandoned doll factory in downtown Aurora, IL, which also serves as the TV studio for *Wayne's World*.

In the movie, somebody technical had to set up their new warehouse TV studio (for their public access show). That person is Garth. "It had to be inexpensive technology that works for real TV," Brad says. "That's how the Toaster gets worked into the script. It's a natural for Garth to know about the Toaster because he's so technical." The message is that the Toaster is "technology that young people can use and do a lot with."

Brad should know. And to help get the message across, to add a spectrum of Toaster reality to the set, Brad "dressed" Garth's room. Creating an ambiance similar to what he's accustomed to working in, Brad dressed Garth's workbench with a Toaster, a Toaster 4000 mouse pad, lots of wires, lots of reference material (including *Video Toaster User* magazines) on the desktop and shelves, assorted tools and gadgets and even some grimy fingerprints. Overhead on the surrounding walls is a Video Toaster 4000 poster, and concert and album posters from rock bands, such as Megadeath and Aerosmith. It's exactly what you'd expect Garth's room to look like.

Just how much of Brad is in Garth Algar? "Part of that personality thing that comes in is that I was always kind of embarrassed to say anything," Brad says. "Like they [his family] would say to me, 'Whaddya working on?' and I'd say 'I'm workin' on this thing that detects cancer with sound waves.' I thought, 'They don't care.' And they'd say, 'Oh, that's good.'

"Dana started picking up on my way of saying, 'Oh, hi, how ya doing?'," Brad continues. "And also I was far more shy then. It's only been since I started working that I'm less shy. Especially talking about things that I know about."

So Dana, is Brad a nerd like Garth? Is there anything wrong with being a nerd? "Garth *is* a nerd," Dana explains. "I would just say Brad is very eccentric. There's certainly nothing wrong with being a nerd," Dana says. "Nerds tend to do better later in life. The worst thing you can do is peak in high school."

Thank goodness. What kind of world would it be if eccentrics like Brad, visionaries like Jenison and Montgomery, and cool nerds like Garth hadn't looked past the confines of mainstream society? I shudder at the thought. Party on Brad. Party on Garth.

VTU

Angela LoSasso is Managing Editor of Video Toaster User Magazine. *Contrary to industry innuendo and her Hollywood assignments, she is not collecting high-profile stories for her portfolio in pursuit of a* People *magazine editorial position.*

Real-World Wayne and Garths (cont.)

3D, a technology-oriented news magazine, was created about a year ago with friends Steve Williams and Ed Pierce.

"We decided to try it (producing their own show)," Herring said. The threesome contacted the cable company, fulfilled MCTV's pre-broadcast requirements (an introductory course on studio techniques, equipment operation and broadcast rules), and they were off.

Herring and friends use the Toaster during their live tapings at the MCTV studios. "We use framestores, the CG, and the Switcher for roll-in tape with its really cool transitions," Herring said. "The Toaster really helps us because [MCTV's} switcher doesn't allow us to do the things we want to do. We're going to try use the Toaster as a chroma key switcher—something MCTV says is impossible to do with three cameras. We're going to make it possible."

And so goes another real-life Wayne's World team, ready to take on the networks, and eager to break down longstanding broadcast barriers—with a little help from the Video Toaster.

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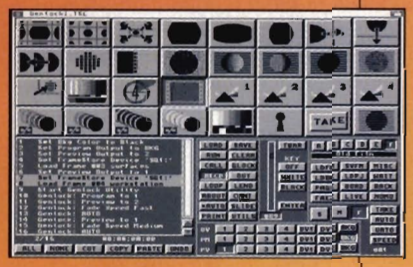

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ABCs of Video, Part IV: about system timing

By Rick Lehtinen

[Editor's note: This is the fourth installment in a series of video articles by Rick Lehtinen. The ABCs of Video, Parts I, I, and III appeared respectively in the October/November '92, December/January, and August/September issues of Video Toaster User.*]*

Video switching is one of the strongest points of the Video Toaster. With nearly 300 transitional patterns standard and the capability for programming others, the Video Toaster offers more flexibility than nearly any other available production device.

The process of getting video signals aligned in time for the switcher to switch among them is called *system timing*. Video Toaster users need to know something about system timing to get the best video quality from their systems. To skip this important part of video culture is to risk disappointment with your edited video projects.

The first three parts of this series described the color video signal and its embedded synchronizing signals. We now tackle the problem of combining—or mixing together—several video signals.

The overarching theme is this: *System timing is set properly when all of the video sources arrive at the inputs to the Video Toaster in step with each other and stay that way throughout a production.* (See Figure 1.)

Proper system timing allows the Toaster to select video from any input without difficulty because the incoming video signals arrive at the same time and speed. If any of the input sources arrive too soon or too late, a condition described as *out of phase*, the Toaster might not be able to process the signal properly. The result may be shifts, pops, unexplained changes in color and other degradation to the signal that mars the edited video.

Although it might seem at first to be a confusing science, system timing is really not very mysterious. The most important thing you need is an understanding of the basics, and this is easily obtained.

Divide and Conquer

System timing can be broken into at least three component parts. First comes *stability*, that is keeping the video stream regular with respect to time. Next is *genlock*, keeping all the video signals going at the same rate. Finally comes *timing* or phasing, in which each video signal is correctly positioned in time with respect to its neighbors.

We can explore the subtle differences between stability, genlock and phasing through use of an analogy. As football season is upon us, we will discuss video system timing in terms of halftime shows and marching bands.

Guide Right! Column Down!

Anyone who has marched in a band knows that you must stay directly behind the person in front of you at all times. At the same time, you must keep in line with those to your left and right. You must hold this relationship whether you are marching, marking time or even doing a dance step. This stability of marchers is accomplished by standardization (8-to-5, or eight steps to five yards), by drill and repetition and by quality of band personnel. Those who cannot keep in step can't stay in the band.

It is the same with video equipment. Each horizontal line must last 63.5 microseconds, and each second there must be 15,729 of them. If equipment can't produce video of these specs, it is hard to make it part of your Toaster setup. It can't play along and might make the rest of the equipment look bad.

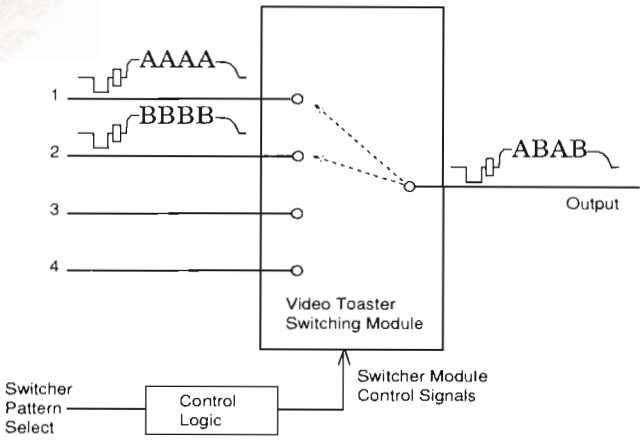

Figure 1: A video switcher operates by switching between selecting portions of various input signals. When the system is working properly, there are no seams and the video transitions take place invisibly. If there are system timing errors, transitions may be noisy and accompanied by horizontal shifts and color changes.

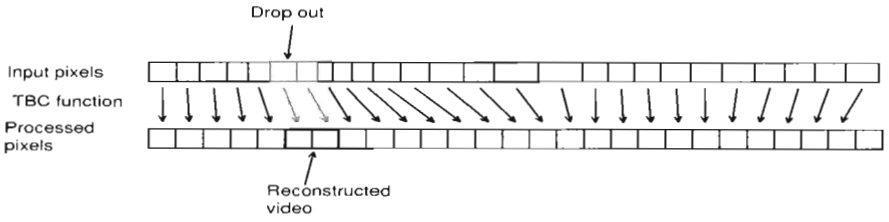

Figure 2 – ABCs August 93

Figure 2: A time base corrector strips the pixel information of the incoming video signal and re-maps it onto a time-stable video signal. This might require interpolation or other advanced processes. A TBC also can act as a drop out compensator. If a section of the input video is missing, the DOC synthesizes a replacement to conceal the error.

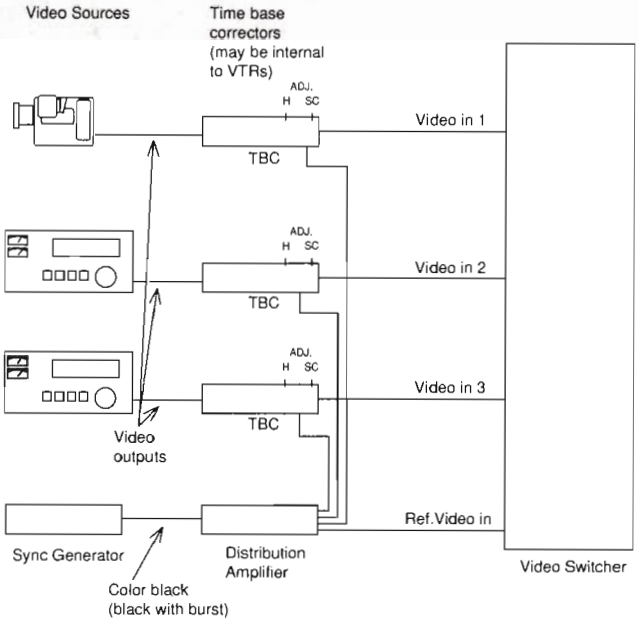

Figure 3: A video system consists of video sources, time base correctors (if needed), a reference video distribution system and a switcher. The reference video distribution system consists of a source of stable video (usually the color black output of a sync generator) and a distribution amplifier. The adjusters for horizontal and color subcarrier allow the regulated and stabilized video signals to be aligned in time at the input to the switcher.

Of course, one can never stay exactly in line with all fellow band members all of the time. There is always a little bit of give and take, a little joggling ahead or behind, perhaps some shuffling of the feet.

It is the same with the video signal. Unfortunately, many lower-priced video devices are sloppy marchers. VTRs are some of the worst offenders. Look at some of the problems a VTR must contend with: The videotape can stretch or change shape during playback, resulting in faster and slower video lines. The reel servos that control the motors that supply and take up the tape can also fluctuate. If they flutter faster, then slower, trying to keep within an acceptable range, they may impart minute variations to the video signals. The rotary drum that spins the heads is also subject to instantaneous speed fluctuations. The tape alternately sticks and slows, loosening its grip, allowing it to race until the servo reigns it in. Each of these factors contribute to what are called *time-base errors*.

On the football field, although at any given instant several of the band members might be slightly out of alignment, the band's overall formation appears to be precise. This is because of the wonderful integrating property of the human eye. It interpolates what it sees and compensates for minor errors.

It is the same on a video monitor. When all the lines are printed to the screen, the eye integrates the image. The image on the monitor looks fine, not because the signal arrives in good shape, but because the eye is very forgiving. This is why time-base errors are rarely visible on a monitor.

However, unlike the adoring parents in the stands, the video switcher cannot look past any errors. The switcher cuts between the incoming video signals much as a flag bearer marches between the band's rows. If an instrumentalist is out of place, he or she likely gets bonked by the pole of a waving banner. If time-base errors throw a given video line out of tolerance, it gums up the works, causing a video hit, shift, or bounce.

Cleaning up a band's performance requires practice. Cleaning up the video signal requires a special instrument called a time base corrector (TBC).

A TBC gets rid of inconsistencies in a VTR signal by first sampling the incoming video and recording the data in a memory array. It then pastes the stored video onto a stable sync signal. The resulting output signal is time stable. (See Figure 2.) A TBC also provides the important function of *drop out compensation*. When minute imperfections or dirt on the tape surface momentarily separate the tape from the video head, the signal goes away for an instant, or drops out.

Note that it takes more than merely reclocking the video to make bad video into good video. The degree of accuracy with which a TBC positions the samples on the new sync is a measure of the quality—and to an extent the cost—of a TBC.

Step In Time

Next, let's worry about the tempo of the video signal. Everybody has to play at precisely the same speed to have a harmonious result. Now, if you have ever performed in a halftime show, you know that the way *not* to keep the beat is to merely listen to the drummers down the field. This is because it takes time for the drummers' sound to reach you. If you try to keep time to the drummers, you add a delay into your part that leaves you sounding off beat to an observer in the stands.

What is needed is an independent reference, something that helps you keep time regardless of what you hear the other performers doing. In marching bands, this reference is called the drum major. The big baton and the bright white gloves give every instrumentalist a chance to keep the beat, regardless of their position on the field.

In a video system, the drum major's role is filled by the reference video distribution system, sometimes called the sync distribution system. A sync distribution system consists of a reference source, often a sync generator with a black burst output, and a distribution amplifier. This is shown in Figure 3.

The sync generator or reference video source

Continued on Page 76

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ABC's of Video Continued From Page 75

provides the fundamental signal to which all the others align themselves, lock up, or genlock. (In practice today, nearly every facility uses a video signal for genlock purposes. In earlier times, facilities used a sync signal, not a reference video.)

Concert Pitch!

Even if everybody on the field is playing at the same tempo, the notes from players across the field arrive slightly later than the players next to the stands. This is because it takes time for their sounds to propagate across the field. It is sometimes prudent for the rearward marchers to anticipate the beat, or play just a little ahead. This way their sound arrives in time with the other instruments.

As we mentioned at the outset, the goal of video system timing is for all the sources to arrive at the switcher input at same time. We can't push electrons, so anticipating the beat is out. Instead, we usually delay some of the sources so they match up with sources that lag a little. Most of the video sources suitable for use in Video Toaster setups include controls for adding such delay. Often this is called the H-phase, or horizontal timing control.

Fine Tuning

One thing more, it goes without saying that each performer must hit the correct note. But as any performer knows, it is easier to hit notes than to hit them right. If the instrument is even a little flat or sharp, it sounds out of tune.

It is the same with video. In addition to the horizontal timing that corresponds roughly to hitting the right note, there is the more subtle timing required to make the subcarrier phases match. Fortunately, color phase timing is accomplished in the same manner as H phase, by adding slight delays to the signal. Subcarrier phase is so delicate that one acceptable way to adjust it is to snip a few inches off the video cable. This difference in cable length is often enough to bring a system into phase.

As explained in the last installment, there is a precise relationship between horizontal phase and color phase. This is called the Subcarrier-to-Horizontal (SC/H) phase.

Measuring Up

In this article we have discussed the need for system timing and the nature of the adjustments we make to ensure it. We have not yet discussed how to measure errors in system timing, nor how to perform the alignments. There are two reasons for this. First, it often requires the user to borrow some test equipment. Second, the Video Toaster is a special case among switchers. A generic discussion just won't do. In our next installment, we will use all these buzz words and some spiffy video test equipment to get the kinks out of our basic Toaster setup.

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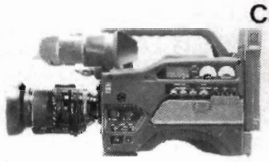

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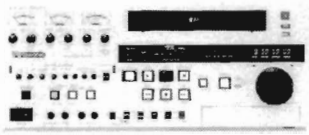

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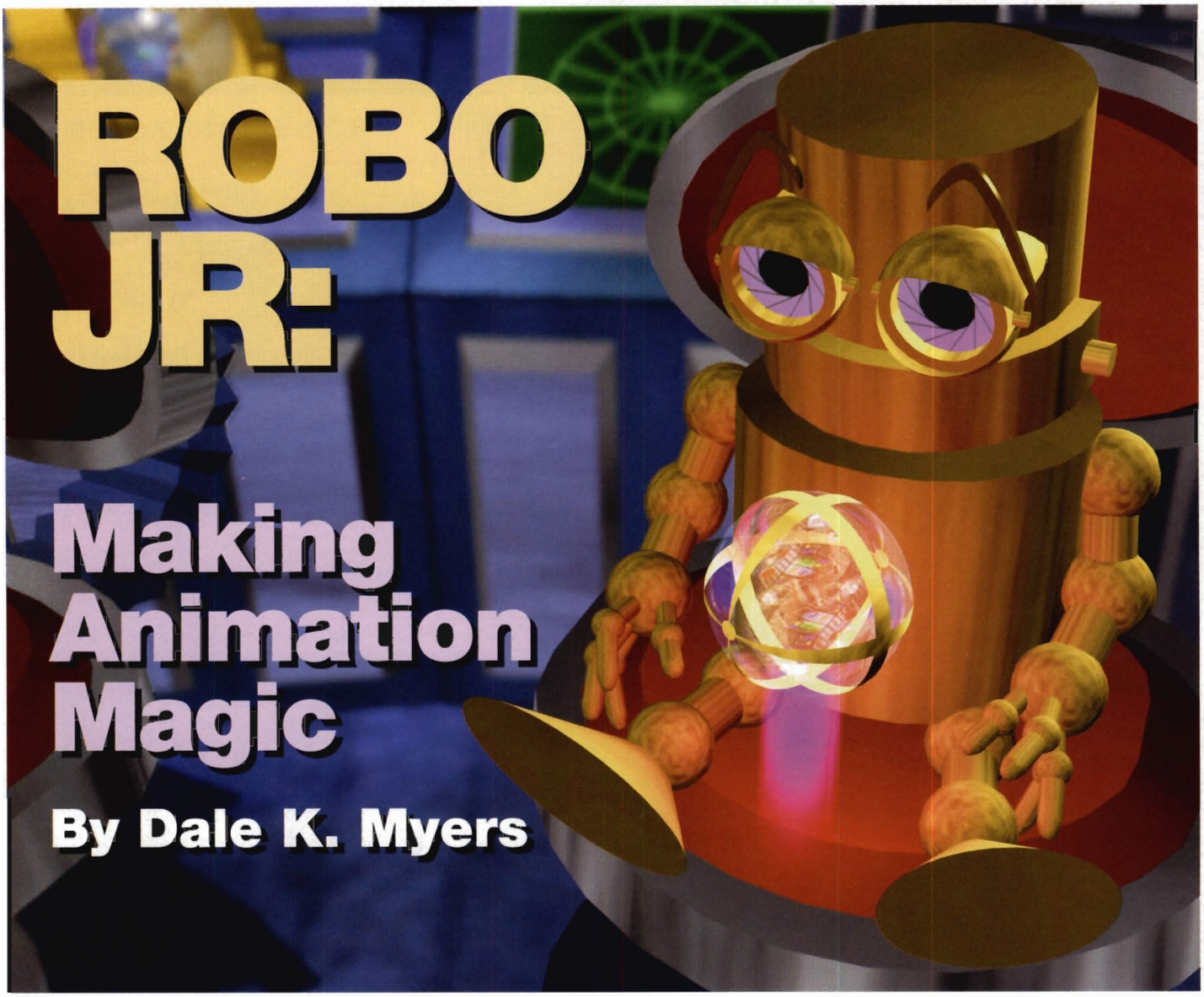
ROBO JR:

Making Animation Magic



By Dale K. Myers

(Editor's Note: Robo Jr *is a six-and-a-half minute animation produced, directed and animated by Dale K. Myers. Myers spent more than 10 months to complete the project. He used LightWave 3D, LightWave Modeler, ToasterPaint, Art Department Professional, DeluxePaint IV, DCTV, PixelPro 3.0, and VistaPro 3.0.*

More than three-quarters of the project was rendered over seven months on one machine: an Amiga 2000 equipped with an '040/25 MHz accelerator and a 1.2 gigabyte hard drive. Final images were transferred to an Abekas A-60 digital disk recorder via an Exabyte tape drive and mastered on D2 digital videotape.)

Forget whiz-bang effects. Put away the chrome spheres. Burn the storyboard of the endless flying camera sequence. If you want to get the attention of the pros in the world of computer animation, concentrate on these three words: story, character and technique.

I heard them spoken often at SIGGRAPH'93 in Anaheim, Calif., by representatives of the biggest names in computer animation: Pixar, Walt Disney Pictures and Industrial Light and Magic (ILM). "We're all just filmmakers who happen to use computers as a tool," said Douglas Kay of ILM to a packed audience of SIGGRAPH attendees, "so let's tell stories."

That's what I decided to do in early 1992 and the result is a six-and-a-half minute 3D character animation called, *Robo Jr.* Since its release in August 1993, *Robo Jr* has garnered accolades from a half-dozen Hollywood producers and a spot in NewTek's Video Toaster 4000 demo reel.

Storylines and Characters

Your animations can become attention grabbers too if you focus on an interesting story populated with engaging characters. The story idea should be simple. Boil it down to its essence.

When developing your story concept keep in mind this basic premise: Great stories spring from great characters, not the other way around. Avoid trying to plug a character into a preconceived storyline. Characters who constantly find themselves reacting to their environment quickly become boring and two-dimensional. Wind up your character with personality and let him go. In most cases he'll find a better story than the one you had in mind.

Remember, short is best. Trim the concept to the tightest possible layout. Today's audiences are sophisticated and can quickly get ahead of you, which is the original sin of storytelling. A tight storyline helps prevent this from happening. Take your time. Work it out. No matter how good your technique you can never compensate for a weak storyline.

Storyboards

I spent three weeks laying out *Robo Jr.* refining the characters and storyline and creating the storyboards (a shot-by-shot version of the entire production drawn on paper). Your animated story needs the same preparation. Continuity, pacing, screen direction and eye control, in short every visual detail, should be planned in advance.

Don't be in a hurry to get through this stage of the production. This is the anchor that will hold your animation together. It guides you and keeps you on track. Unlike traditional filmmaking, the animation process requires that your

Figure 1

Figure 2

idea be shot and edited on paper before one pixel is rendered.

There can be no mistakes, no sloppiness and no story holes without cost. Look at the storyboard as more than a blueprint of the film. It is the film.

Animation as Cinema

As Kay said, you're the "filmmaker" who happens to use a computer as a tool. Brush up on film techniques: continuity, camera angles, cutting, close-ups and composition. I highly recommend, *The Five C's of Cinematography: Motion Picture Filming Techniques Simplified* by Joseph V. Mascelli, A.S.C. Although out of print, you can still find this book in better libraries.

Other good subjects to read up on include: scriptwriting, lighting techniques, still photography, cel-animation and special effects. All of these subjects are directly related to your role as "storyteller." Invest an hour or so a night in your education. You'll find it pays to master the art of storytelling.

Being armed with a terrific story idea and great characters is only half the battle. The next step is to put on the hat of the technical magician and apply the art of illusion. Your computer is the box of magic tricks where anything is possible. Here are a few tricks and techniques I used in *Robo Jr* that you can use to fool your audiences and save time along the way.

Multilayer Animation

One of the principal techniques used throughout *Robo Jr* is the concept of multi-layered animation. This is an age-old idea borrowed from the world of 2D cel-animation. The concept is simple: Only redraw that which is moving. The advantage: No quality loss while tremendously speeding up creation time.

A perfect example of the power of this technique appears early in *Robo Jr.* The scene calls for a high overhead shot of the interior of the flying saucer. Robo Senior jumps out of his chair and ambles towards the transporter platform. (See Figure 1.) This three-second shot contained about 40,000 polygons, texture and transparency maps and some fractal mapping. Initial rendering tests returned times near one hour per frame.

The first step in turning this scene into a multi-layered animation was to split the scene into two files: a foreground and a background scene. First, the entire scene file was loaded into LightWave's Layout screen. Second, Robo Senior and the rotating flight chair objects were eliminated from the scene.

Third, the revised scene was saved under a new file name: Scene4_BKD. This would be the new background scene file. Fourth, the original scene file was reloaded into Layout. This time, everything except Robo Senior, his flight chair, all lights and the camera were eliminated from the scene. Fifth, this new version was saved as Scene4_FGD. This would be the new foreground scene file. Because the light and camera positions saved with the foreground scene were identical to the background scene, the lighting and viewpoint would match when the two scenes were combined.

With the scene properly split into background and foreground versions, it was time to turn the largely static background into a living world of flashing lights.

First, I loaded the background file, Scene4_BKD and adjusted all of the panel lights and their corresponding glows to be on. The scene was then rendered and saved to my hard disk as BKD_V1. Second, I readjusted all of the lights and glows to be off. Again, the scene was rendered and saved, this time as BKD_V2. Third, I entered ToasterPaint and loaded BKD_V1.

Fourth, I switched to the Spare screen and loaded BKD_V2. Fifth, I selected the RubThru function and created a new version of the background images where some buttons and glows were turned on while others remained off. I saved this new version to the hard disk as BKD_A .

Additional versions of the background with varying button patterns were created in a similar manner. These were saved to disk as, BKD_B, BKD_C, and BKD_D. In step six, I used ASDG's Art Department Professional along with FRED, the company's animation FRame EDitor, to create a 30-frame looping sequence where background image BKD_A dissolved to BKD_B to BKD_C to BKD_D and back to BKD_A.

I was now ready to complete the scene. First, I loaded Scene4_FGD into LightWave's Layout screen. Second, the newly created 30-frame loop was loaded as an Image Sequence. Third, I

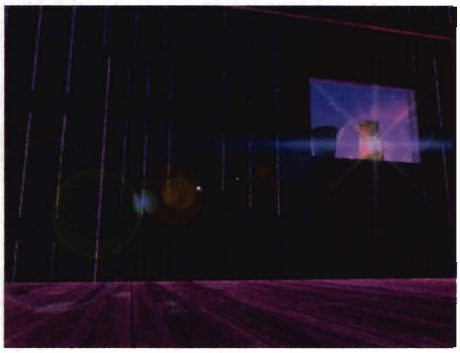


Figure 3

Figure 4

Figure 5

clicked the Images menu where Loop Sequence was selected and the Sequence Loop Length was set to 30. This would cause the sequence to repeat indefinitely once the 30th frame was reached. Fourth, I clicked on the Effects menu where the image sequence just loaded was identified as the Background Image.

With Motion Blur and Antialiasing selected,

Continued on Page 80

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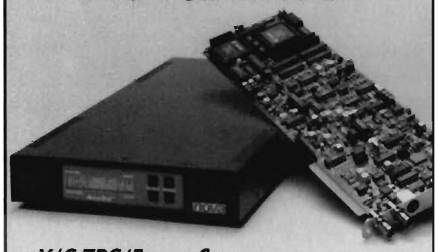

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ROBO JR:

the final scene turned in rendering times of less than three minutes per frame! The techniques used in this three-second sequence alone saved nearly 80 hours of production time.

Applying these same concepts throughout the production of *Robo Jr* easily turned a multi-machine, multi-person project into something practical and manageable for a one-machine, one-person animation shop.

Cinematic Effects

An additional benefit of using multilayer animation techniques with LightWave is the ability to add sophisticated cinematic effects like depth-of-field and rack-focus shots. These types of effects allow the filmmaker to control where the audience is looking—to force the eye to see exactly what is important, when it becomes important. This is an extremely powerful storytelling process and has been used extensively throughout the history of cinema. I used both effects in *Robo Jr* but found the rack-focus effect particularly useful in one of the last shots of the film.

Creating a Rack-Focus Shot

The scene called for an over-the-shoulder shot, with Robo Junior in the right foreground and Robo Senior positioned at left-center in the background. Robo Senior has just slugged down a quart of motor oil and turns to start up the saucers engine.

While Senior gets busy at the controls, Junior turns to the camera and winks at the audience with his eyebrows. This scene is very lively, with a lot of color and motion happening in all areas of the frame. I wanted the audience to concentrate on Robo Senior at the head of the shot, then switch attention to Robo Junior as he peeked around the chair.

To create the effect, I split the scene into three versions. First, a looping background sequence was created that consisted of the control panel minus the one crystal control lever Robo Senior would grab. ToasterPaint and ADPro were used again to create flashing lights on the control panel.

Next, the looping sequence was used as a Background Image for the second layer of the scene that consisted of Robo Senior, his chair, and the control lever he was to grab. Once rendered, I had a six-second sequence that had all of the elements of the final shot except the foreground, namely Robo Junior and his chair. Before adding that in a final pass, I needed to prepare the rack-focus effect.

The first step was to take the six-second sequence already produced—Robo Senior and the flashing control panel—and create a blurred version of it. This was accomplished by using ADPro's Blur Operator, which was passed over each frame of the sequence 10 times. I automated the process by writing an ARexx script that was called up through FRED's Invoke ADPro function.

Once I had two versions of the sequence—one normal, the other blurred—I again used FRED to create a third sequence that would begin normally, then dissolve over 45 frames to the blurred sequence. The point at which the dissolve began was timed to coincide with the point where Robo Junior turned in his chair. With the rack-focus effect complete, it was time to finish the scene.

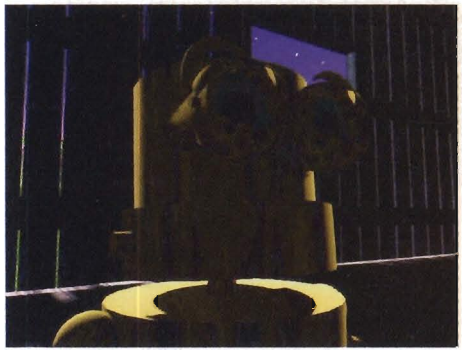

Figure 6

Figure 7

I loaded the portion of the scene that contained the foreground objects: Robo Junior and his chair. The Image menu was selected and the recently completed rack-focus background effect was loaded in as a Sequence and used as the Background Image source. The last layer of the shot was then rendered. (See Figure 2.) The entire process took a little longer to do than a single pass, yet ultimately was responsible for the success of the scene.

Staging and Lighting

Two key ingredients of the storytelling process are staging and lighting. Staging is the art of designing the scene layout so that the drama is heightened as the scene progresses. Lighting is generally used to sway audience emotions with color and contrast. Often, the two concepts work together to electrify what would

Continued on Page 82

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ROBO JR:

otherwise be a dull scene.

In a particular sequence in *Robo Jr*, Robo Senior waltzes into a barn and promptly receives a whack in the head with a rake. The scene begins with the audience viewpoint from inside a rather dark barn. (See Figure 3.) The door flings open and Robo Senior stands peering inside. (See Figure 4.) Only the light from the open doorway illuminates the interior. As Robo Senior strolls in, the camera view suddenly changes, revealing a rake on the floor directly in Senior's path. (See Figure 5.)

Before Robo Senior can spot it, the door behind him closes and the scene goes dark. A few quiet seconds pass and then we hear the rake handle swing up and strike its unwitting victim. LightWave's Light Envelope and Object Surface Morphing functions helped make this sight gag possible.

Ambient light for the scene began at zero (when the door was closed) and was raised to 25 percent with the door fully open. The ambient light was animated throughout the scene with an Envelope to give the effect of light spilling into the barn through the open doorway. As the door swung shut, the Ambient Light Envelope was quickly returned to zero. The default setting for ambient light is 25 percent. This figure should always be adjusted when creating a new scene. Experiment with it. You'll achieve much more dramatic lighting effects with this figure cut in half or eliminated altogether.

Robo Senior's metal reflective body would have glowed-in-the-dark had not Object Surface Morphing been applied to his body when the door closes. At that point, Robo Senior's body surface was morphed to a nonreflective version that had been hidden behind the camera. The same was true of Senior's irises, which were also surface morphed to a luminent version as his eyes light up. (See Figures 6 and 7.) The flashlight eyes effect was achieved by Parenting semi-transparent luminent cones to Robo Senior's eyes. A transparency map on the cone itself created the falloff effect as the beams move farther away from the irises.

Edge Transparency factors of 7 percent also were applied to the beam cones. Two lights were positioned at the center of the pupils and the Central Glow lens flare effect was activated. Envelopes were added to each cone and Squash techniques were applied to create the blinking effect as Robo Senior looks around the darkened barn.

2D in a 3D World

Sometimes while creating effects, we can forget we have access to our box of magic. Just because we've created a three dimensional world doesn't mean we can't have two dimensional elements. Remember, as long as the audience is fooled, anything goes!

Figure 8

Figure 9

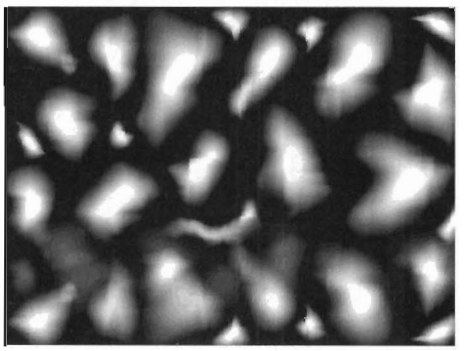


Figure 10

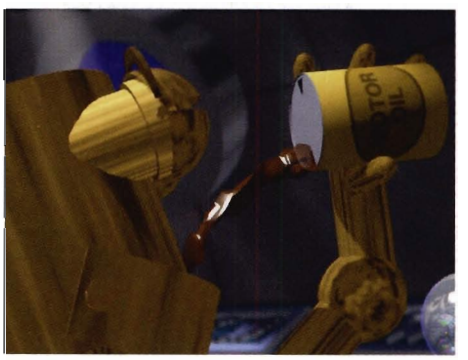


Figure 11

The two radar control operators that appear in *Robo Jr* are a perfect example of crossing between the realm of 2D and 3D and also allowed me to make a Hitchcockian cameo. (See Figure 8.) This effect was created by grabbing several still frames of myself, first, seated in a chair and second, standing. There were two versions of each, one looking left the other right. These images were loaded into ToasterPaint and turned into black silhouettes on a white background. (See Figure 9.)

The 24-bit ToasterPaint images were converted to a two-color image using ASDG's ADPro and the resulting images were loaded into Axiom Software's PixelPro where they were turned into flat single polygon objects. Each was then loaded into LightWave Modeler and positioned in separate layers. The seated-looking-left version was reduced to the minimum number of points necessary and saved as seated_Left. The seated-looking-right version was then brought up as a background layer and used as a template to guide the manipulation of seated_Left, which was transformed point-by-point into seated_Right.

Because both versions now contained the same number of points, the Object Morph function could be used to create motion. The same process of point-by-point manipulation was done for the standing version.

For the final shot, the flat objects were positioned in the control tower so that they were perpendicular to the camera's viewing plane. It was then a simple matter to perform object morphs on both versions, using Envelopes, to get them to appear to be looking right and left at irregular intervals.

Liquid Effects

Another technique you might find useful for liquid effects is the one I used in creating the pouring motor oil. After modeling a column of liquid that consisted of many segments, I used the Twist and Bend functions in LightWave Modeler to get an arcing column of oil. Entering ToasterPaint, I created a screen full of small white patches on a black background. (See Figure 10.) This pattern was then loaded into LightWave Images and selected as a cylindrical Object Displacement Map whose velocity travels the length of the column very quickly. The result is the frothing liquid Robo Senior guzzles down near the climax of the film. (See Figure 11.) I added a few extra drips as the liquid comes to an end to give the effect a little polish.

The Power In Your Hands

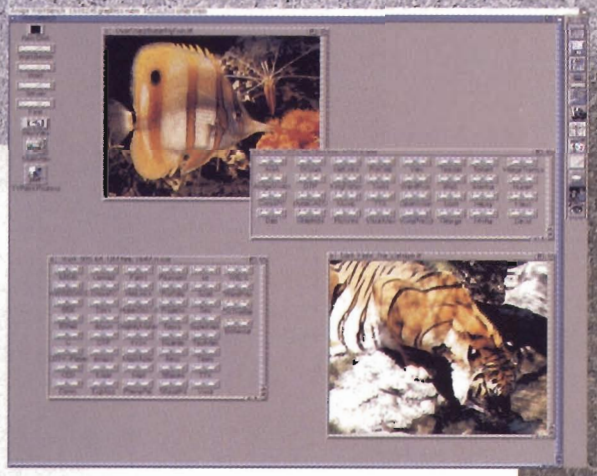
The methods used in the production of *Robo Jr* prove that high-quality computer animation for broadcast is practical and cost-effective using desktop production tools. The key to creating worthwhile animations is to anchor your techniques in a good story with captivating characters. How you intertwine those three elements will determine your value as an animator. The tools are in your hands.

VTU

Picasso II

Retargetable Graphics* have arrived!

24 bit graphics for your Amiga®



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

Picasso II RTG (Retargetable Graphics) means *Incredible New Graphics Power for your Amiga.*

Providing greater resolutions and more speed than AGA systems and the ability to run system friendly AGA software, the Picasso II is a next generation graphics display system. Your Amiga will be able to run all the latest software at resolutions up to 1280 x 1024 with 256 colors on screen. The Picasso II also supports custom screen modes with up to 16.7 million colors at resolutions as high as 800x600.

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

The Picasso II RTG emulator is completely integrated into the system. Imagine being able to run the latest software packages like ProPage 4.1, PageStream 2.2, Cygnus Ed 3.5, Deluxe Music Construction Set 2.0, AmigaVision Professional and many others at resolutions up to 1280x1024 and up to 256 colors. All system friendly Amiga software packages will be able to take advantage of the new screen modes offered by the Picasso II.

Picasso II RTG means *Hi-Performance.*

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

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

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

Picasso II RTG means *Maximum Compatibility.*

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

Picasso II AutoSwitch means *One Monitor.*

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

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

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

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Panasonic AG-3P Palmcorder

By Cecil Smith

Panasonic recently introduced the model AG-3P S-VHS palmcorder intended for the prosumer, or as Panasonic calls it, the *Pro Line* market. This new three-chip camera represents a considerable step up from the usual single-chip cameras normally targeted for this market.

Autofocus

The Panasonic AG-3P lens is coupled with an autofocus circuit that examines the center of the picture for sharp transitions. In evaluation, I found that the autofocus function was slow to pull the picture into focus. Focusing changes that were needed quickly or that occurred outside the center of the picture were not necessarily sensed and corrected with reasonable speed.

Autofocus, once allowed to settle down, maintained sharp focus to distances as close as 4.5 inches with the lens at the maximum wide-angle focal length and about 2.5 inches with the lens at the maximum telephoto focal length. Of course, autofocus can be defeated, but the viewfinder limits the effectiveness of manual focus. (More about this later.)

It's in the Chips

Three imaging chips produce color that is considerably more accurate than a single imaging chip. A single chip must time-share among red, green, and blue filtered light (and various combinations thereof). A three-chip camera uses one imaging chip for red, another for green and a third for blue. Without the need for time-sharing among the primary colors, saturated colors in the real scene appear more saturated in the video picture when imaged by a three-chip camera.

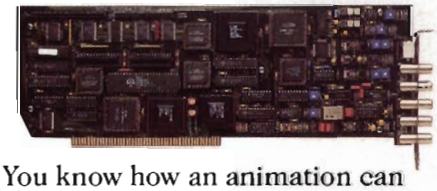
The Panasonic AG-3P uses three one-third-inch CCD (Charge Coupled Device) image sensors to detect the image. This is considerably smaller than the half-inch and two-thirds-inch (diagonal measure) sensors used in cameras designed for the professional market. Despite the small size of these sensors, the camera portion of this palmcorder (measured through the video output connector without any tape) produces a measured 475 TVL (television lines) of limiting horizontal resolution, sharp enough for many applications. In comparison, most professional cameras (with larger sensors) produce pictures with a limiting horizontal resolution between 700 and 800 TVL.

The Panasonic AG-3P uses interline transfer CCD image sensors, where imaging elements are interspersed with paths for charges to follow. A common problem with interline transfer CCDs is light streaks downward from super-bright objects. When an interline CCD is overloaded with light and thus with electrical charge, the excess charge tends to spill out from one transfer register to the next, resulting in noticeable streaking. This is even true of cameras intended for the professional video market. The AG-3P effectively suppresses the streaks in all but the most extreme conditions.

As shown in Figure 1, the three CCD image sensors are glued to a prism assembly that is used to split the light into three paths and three colors. In three-sensor cameras, three glass prisms split the light into three paths:

Continued on Page 86

Save Your Animation From Being Eaten Alive.



You know how an animation can take on a life of its own. Sometimes it takes forever. Or it costs too much. Or a tape machine mistakes it for lunch.

The DPS Personal Animation Recorder™ solves these and other animation-production problems. For just $1,995, it gives you the reliability and capabilities of systems costing thousands more.

A plug-in AMIGA® card, the Personal Animation Recorder functions as a single-frame recording deck. With it, you can digitally record your animation onto a dedicated hard disk* and play it back in real time. Which means you can create 3-D animation without the expense and aggravation of tape decks. The Personal Animation Recorder will even genlock to your system.

Because the Personal Animation Recorder operates in a totally digital environment, you won't be bothered with the time base error, jitter, skipped frames, or botched edit points you encounter with traditional animation recorders.

Since your animation is recorded in a component digital 4:2:2 format, you can produce an infinite number of first-generation tape copies. Plus, the Personal Animation Recorder features outputs for true component analog video (Betacam®, MII®), composite and S-Video (Hi8®/S-VHS).

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Panasonic AG-3P Continued From Page 84

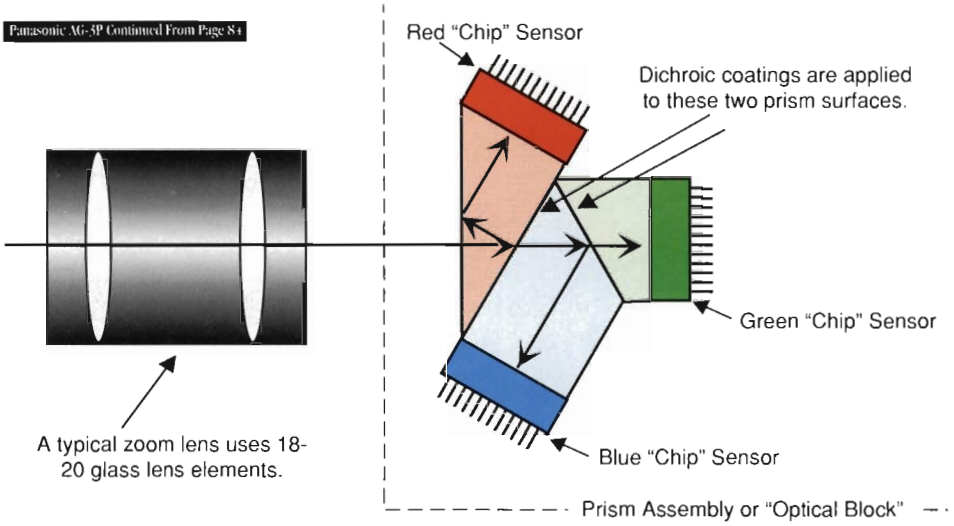


Figure 1: Three-Chip television camera optical paths

The colors are separated by dichroic coatings applied to selected surfaces of the prisms in the assembly.

Once you get past the optics, you go through the encoding and signal amplification necessary to form the signals into usable condition. The video signal processing circuits in the AG-3P output both a composite NTSC-encoded output signal and separated luminance and NTSC-encoded chrominance signals (Y/C). These circuits also provide the image stabilization with a measured loss of resolution to 400 TVL.

The built-in microphone's pickup pattern changes with the zoom. When the lens is zoomed all the way in to the maximum telephoto focal length, the microphone pickup pattern is very narrow to focus in on the sounds within the picture. When zoomed all the way out to the minimum wide-angle focal length, the microphone pickup pattern is wide. This feature may be switched off when the technique doesn't produce the desired result.

Another feature in the audio processing circuits changes the frequency response of the circuits as the lens is zoomed in and out. When the lens is zoomed in, the signal is passed unchanged. When zoomed out, the bass low-frequency components of the signal are attenuated to reduce background noise. When the lens zoom/microphone pickup pattern coupling is disabled, coupling between the lens focal length and the equalization applied to the signal is turned off.

To record the signal, the AG-3P adheres to the S-VHS/Hi-Fi/C videotape format. The S-VHS video format accepts a Y/C signal for recording and uses heterodyne processing of the chrominance portion. This processing can record video signals with a respectable limiting horizontal resolution of 400 TVL in the separate luminance channel and a signal-to-noise ratio greater than 45 dB. (These numbers are typical of most S-VHS transports.)

The audio processing with the AG-3P recording system records hi-fi audio with a frequency response of 50 Hz to 20 kHz and a signal-to-noise ratio greater than 41 dB. Normal linear audio recording passes 80 Hz to 8 kHz of audio signal. Using hi-fi audio channels makes the editing an audio signal more difficult than using the normal audio channels—loss of a precious generation of the video signal is commonplace. (This is true of all hi-fi systems, not only S-VHS, where the audio signal is mingled among the video signal during recording.)

There are some automatic circuits in the AG-3P that are activated to protect the tape, the video heads, and the battery. After five minutes in the shooting pause mode, the unit automatically enters a recording lock mode where the tape remains in contact with the video heads, but the electronics fall into a standby mode. (This feature, which cannot be defeated, makes it inconvenient to use the camera while adjusting lighting or framing the shot.) After 48 hours in the recording lock mode, the unit automatically turns off power. To resume shooting from the recording lock mode requires momentarily powering-down the camera.

The viewfinder is a 0.7-inch LCD display. I found the LCD viewfinder difficult to use for anything but framing because of the low resolution. I couldn't determine when the image was in focus and had some difficulty seeing some of the function icons that are displayed. The limited viewfinder resolution and the cranky autofocus system on the lens conspire to make the AG-3P difficult for an operator to consistently produce sharply-focused images—you're never quite sure.

The battery charger/AC power supply that is a standard accessory with the AG-3P has a handy automatic discharge/recharge cycle. Panasonic recommends that every third charging of the battery should be preceded by a complete discharging to reduce problems associated with battery memory.

Overall, the Panasonic AG-3P camera is a step-up from the run-of-the-mill, single-image sensor cameras found in the prosumer market.

A Walk Through the Camera

Starting with the zoom lens and built-in microphone, I worked through the camera following the path taken by the video and audio signals. With this in mind, I started with the optical properties of the lens and the acoustic properties of the microphone. Then I looked at the conversion of the scene into a video signal (imaging) and the conversion of sound into an audio signal. Then I looked at the video and audio signal recording processes and followed it all up by looking at the viewfinder.

At a list price of $3,300, you can look at this camera as a high-end prosumer or a low-end professional camera. The limitations of the autofocus system, the viewfinder and the automatic power-down features notwithstanding, the camera can produce better color pictures that are considerably prettier than pictures from other prosumer cameras. Well worth a look!

VTU

Company Mentioned:

Panasonic
One Panasonic Way
Secaucus, NJ 07094
(800) 528-8601

Panasonic AG-3P

Standard Accessories:

AC Adapter/Battery Charger (AG-B7P)
Charge/Discharge feature to reduce problems with battery memory
Charging Time: approx. 120 minutes
Input: 120 Volts AC 50/60 Hertz 25 Watts
Output: 6 Volts DC 11.8 Watts when operating Palmcorder
6 Volts DC 1.3 Amps when charging battery
DC Input Cable
Battery Pack: VW-VBS2E 6 Volts 2.4 Amp-hours
Maximum Shooting Time: approx. 60 minutes
Button-type battery for storing date and time in memory: (SB0078 or CR2032)
Cassette Adapter: to play S-VHS C cartridges in a standard S-VHS player
Battery for the Cassette Adapter
Audio Cable
Video Cable
S-Video Cable
Shoulder Strap
System Case

Specifications:

Lens:
Focal Length: continuous from 6mm to 60mm, giving a 10:1 zoom ratio
Two-speed zoom rate from wide-angle to telephoto or vice versa
Speed of f1.6 (at 6mm wide-angle) to f2.7 (at 60mm telephoto)
Automatic Iris Control
Automatic Focus Control
37mm filter diameter
Attached Lens Cap

Imaging:
Three one-third (diagonal) interline-transfer CCD sensors
4:3 (normal) or 16:9 (wide-screen) selectable aspect ratio
Minimum Required Illumination:
8 lux [0.19 foot-candle] with gain boost off
1 lux [0.74 foot-candle] with 8dB of gain boost
Standard Illumination of 1,400 lux [130.11 foot-candle]

Data:
Date and Time only

Microphone:
Stereo Zoom Microphone
Pickup pattern altered when zooming.
Equalization applied to signal generated by the microphone is altered when zooming.
A plug inserted in the external microphone connector "EXT MIC" disconnects the internal microphone.

Recording and Playback System:
S-VHS and VHS formats on tape in compact (C) cassettes
Four video heads to provide SP (30 min. per cassette) and SLP (90 min. per cassette) modes of S-VHS-C and VHS-C recording and playback
Limiting Horizontal Resolution: > 400 TVL in the SP S-VHS mode and >250 TVL in the SP VHS mode
Video Signal-to-Noise Ratio: >45dB in SP mode (S-VHS and VHS)
Audio Signal-to-Noise Ratio: >41dB in SP mode (S-VHS and VHS)
Audio Frequency Response:
Hi-Fi: 50Hz-20kHz
Normal: 80Hz-8kHz
Index signals (VISS) for players capable of Index Search or Intro.

Scan functions
An index signal is automatically recorded when first recording after attaching a fresh battery pack or inserting a new tape. An index signal is also recorded when starting recording after the recorder has been in the play mode.

Viewfinder:
0.7 inch color LCD display
Tilt range is from 0 degrees (horizontal) to 90 degrees (looking into the top of the camera).

Indications:
Low and Exhausted Battery
Button Battery Exhausted
Recording
S-VHS SP; S-VHS SLP; VHS SP; VHS SLP recording mode.
White Balance and Black Balance for 5100 Kelvin (Outdoors, clear sky lighting), 3100 Kelvin (Halogen lighting), Mercury Vapor (or white fluorescent lighting), or manual
Automatic Shutter Speed
Automatic Exposure Lock
Manual Focus
Manual Iris Value
Shutter Speed Indication
Depth of Field
Image Stabilization
Digital Zoom
Digital Wipe
Digital Mix
Gain Boost (x4, x8)
Snapshot (5 seconds) being recorded
Rewind
Fast Forward
Still Playback
Tape Counter with memory
Elapsed Time
Tape Length Indication
Remaining Tape Time (flashing "R" when running, time shown only during the last two minutes)
End of tape
No tape cassette or play-only tape cassette
Dirty Video Heads
Dew Sensor
Date and Time (recorded on tape; also available during pause)

Inputs
Microphone In (M3 connector), expecting minus 70dB signal level at 4.7 kOhm (4,700 Ohm) impedance

Outputs
Video Out (Phono connector)
S-Video Out (S-Video connector)
Audio Out (Phono connector) @ -8dB signal level at 47kOhm (47,000 Ohm) impedance, unbalanced configuration
Headphone Out
RF DC Out

Control:
Average Power Consumption of 9.9 Watts
Environmental operating range from 32-104F (0-40C)

Dimensions:
[140 mm (W) x 122 mm (H) x 228 mm (D)]
Weight is approx. 1.97 pounds (895 grams) without battery pack

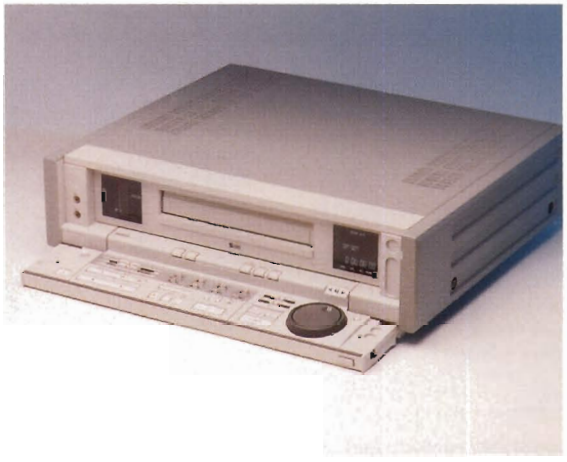
Sanyo GVR-S950

Desktop Animation Has Never Been Easier

By Tim Doherty

Computer animation has not been the same since NewTek introduced the Video Toaster. Prior to LightWave 3D, convoluted software kept artists at bay, while expensive hardware made in-house animation available only to large, high-budget production companies.

NewTek changed all this by offering an affordable system that included the most interactive, user-friendly 3D software ever designed. Almost overnight, computer animation fell to within reach of independent animators and small video companies. That reach has been steadily shrinking.



The most expensive component of a Toaster desktop animation system, the single frame recorder, is beginning to drop in price as well. Last year, Sony introduced the EV0-9650, a $5,600 industrial Hi8 VTR designed specifically for computer animation. At the National Association of Broadcasters convention last April, Digital Processing Systems debuted its Personal Animation Recorder, a disk-based system designed to replace the VTR and priced (including hard drive) at less than $3,000. [Editor's note: See Tim Doherty's review of the Personal Animation Recorder in the August/September issue of Video Toaster User.]

The newest entrant into this small but growing arena of animation-specific recorders is from Sanyo. The GVR-S950 is an industrial-quality Super-VHS (S-VHS) recorder with a difference. It has a built-in BCD single frame animation controller and is priced at $2,995.

A First Look

The GVR-S950 is not much larger than many consumer S-VHS decks. In fact, it looks much like a top-of-the-line home VCR. The controls are located on the inside of the flip-down front panel. Functionally arranged, they present the video user with a familiar assortment of buttons and adjustments. The jog shuttle dial allows shuttling of seven times normal speed or stepping through the video frame by frame. Edit buttons permit you to perform manual edits, though the deck is primarily designed for computer control.

Sliders labeled "Picture Creative" are proc amp (processing amplifier) adjustments for the color level and tint. Audio levels also are set via sliders. There are switches or buttons for sync select (external or video); source select (video in 1 or 2, and audio in 1 or 2); remote or local control; video level; hi-fi on or off; frame servo on or off; S-VHS on or off; and control track or longitudinal time code. The deck does not support VITC time code.

A meter to the left of the tape bay displays audio levels, while a window to the right shows the current time code position and VTR configuration. The deck also features two on/off power buttons to prevent accidental shut off.

The rear of the unit contains two input and one output set of connectors each for audio, hi-fi, S-VHS and composite video. In addition, there is a sync input, an audio monitor output and a switch for setting audio channel 2 to time code or audio. Of course, there is also a remote plug. The GVR-S950 has built-in RS-232 and RS-422 interfaces.

BCD Control

Oklahoma City-based BCD makes some of the most popular single frame controllers available and has long been a favorite of mine. Users familiar with the BCD will be right at home on the GVR-S950.

The popular BCD Amiga Freedisk, distributed with BCD controllers, is included with the tape deck. Aside from some name changes —it is now called the Sanyo Freedisk, and the BCDComm now goes by the SANComm moniker— the utilities are identical.

BCD controllers employ an easy-to-understand four-character language that can be executed from a terminal program or from within LightWave. For example, from a terminal program, to make a one frame edit at time code position 3:00:00 (three minutes, zero seconds, zero frames), type three commands: EDIN: 10000 (edit in at one minute); EDOT: 10001 (edit out at one minute, one frame); followed by EDIT to execute the edit. The command APND 1 will then append the edit one frame at a time.

Controlling the deck from within LightWave is a simple matter of typing in a few such command strings. After clicking on the SANSETUP.BAT file, which sends a setup string to the GVR-S950, enter a starting point by typing EDOT: 20000 (or whatever tape position you wish) in the Record Setup window.

In the Record Command window, type APND 1 to add to the edit one frame at a time. Enter a record delay of 15, a first-frame delay of 30, then click on Recording. LightWave and the deck will do the rest. For those who require greater flexibility or prefer working with a point-and-click interface, Amazing Computing's Transporter program works nicely with the GVR-S950. Transporter allows you to add or delete frames, set loops or reversals, and otherwise customize your script. I found it best to pre-render my animation sequences to SyQuest cartridges, then use Transporter to control the recording.

Evaluation

The GVR-S950 performed nicely under computer control. The deck's picture quality was good. Signal-to-noise ratio is 55dB, which is excellent. Single framing was flawless, as I would expect from a BCD-controlled device.

Continued on Page 90

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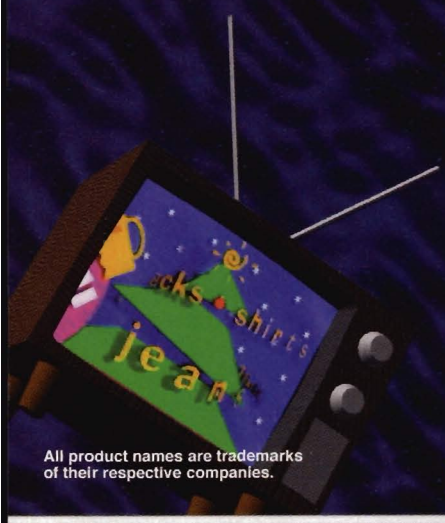

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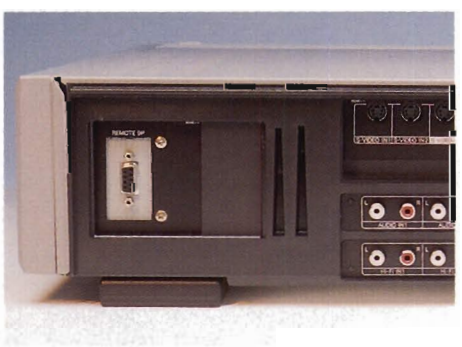
STUDIO LIGHTING

Sanyo GVR-S950 Continued From Page 88



Front and back views of the GVR-S950.

I had a problem when trying to do manual insert edits using the edit buttons. The deck pre-rolled but stopped before executing the edit. Without an operator's manual, I was unable to correct the problem, but found an easy solution by using the SANcomm terminal utility to program the edit points via computer.

The deck also had an annoying problem of powering down if I repeatedly shuttled forward and backwards in succession using the jog shuttle dial.

I cannot help but compare the GVR-S950 to Sony's Hi8 animation VTR, the EVO-9650, because both units can record single frame from LightWave with only a cable (the Sanyo has a built-in controller, and the Sony does not require one).

The GVR-S950 seems less sturdy and responsive than its Hi8 counterpart because of its partly plastic casing. I also detected some sluggishness in the jog shuttle dial.

However, Sanyo's VTR has superior signal-to-noise ratio —55dB vs. 45dB. Although the EVO-9650's adjustable luminance and chrominance noise reduction help to improve its video quality, the Sanyo deck still is superior.

The GVR-S950 is easier to control from within LightWave. However, I recommend that anyone using either deck be make use of the Transporter. In that case, they are on equal footing. Both have a built-in SMPTE time code generator/reader.

The Sony Hi8 deck also has a built-in frame buffer, which can be used not only to grab images from the computer, but also to stabilize tape playback so that no TBC is required. The Sanyo does not have a built-in TBC and cannot be used as a Toaster source without one.

On the other hand, the Sanyo has dual input audio and video switchers. Overall, Sony's Hi8 VTR is the best-constructed unit and has more features —but it also costs significantly more. The GVR-S950 has an edge in signal-to-noise ratio and of course it is S-VHS, which is the more popular editing format. At $2,995, it is now the least-expensive tape-based option for single frame animation. I therefore expect that this will become a popular choice for the desktop animator.

VTU

Companies Mentioned:

Amazing Computers
1441 E. Fletcher Ave.
Tampa, FL 33612
(813) 977-6511

BCD Associates
128 N.W. 67th St.
Oklahoma City, OK 73116
(405) 843-4574

Digital Processing Systems Inc.
11 Spiral Drive, Suite 10
Florence, KY 41042
(606) 371-5533

Sanyo Fisher Corp.
Industrial Video Division
1200 West Artesia Blvd.
Compton, CA 90220
(310) 605-6527

Sony Electronics Inc.
Business and Professional Group
3 Paragon Drive
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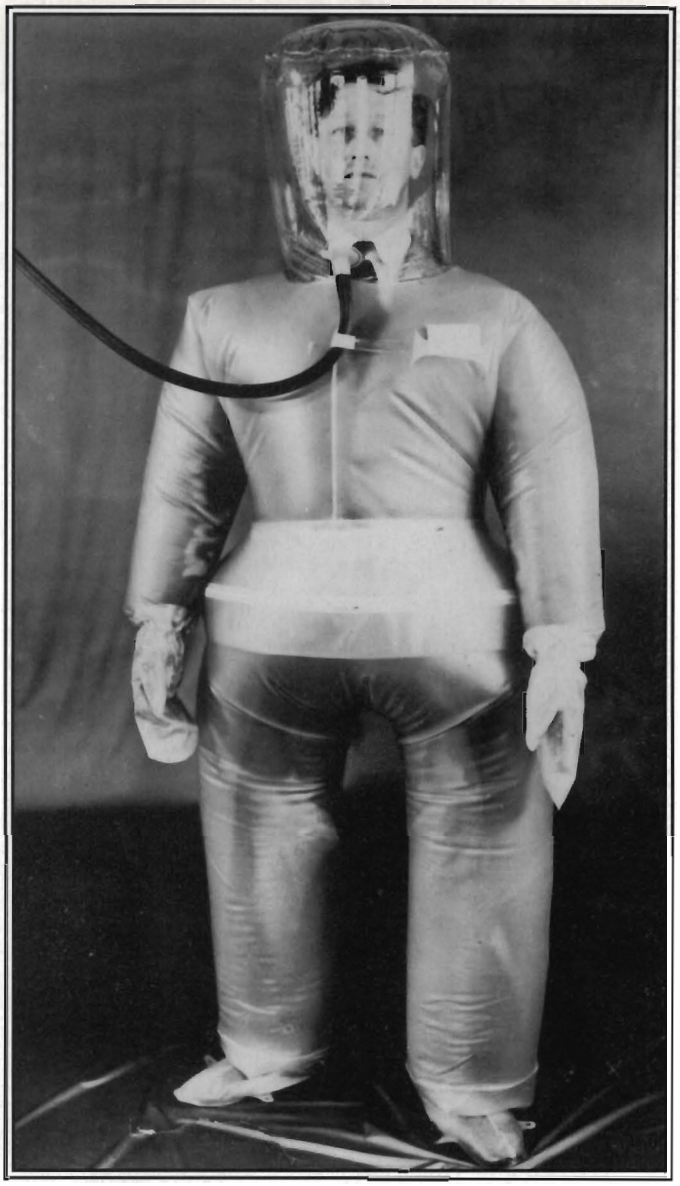

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REVIEW

The Personal TBC IV

DPS' Component TBC Card

By Tony Gomez

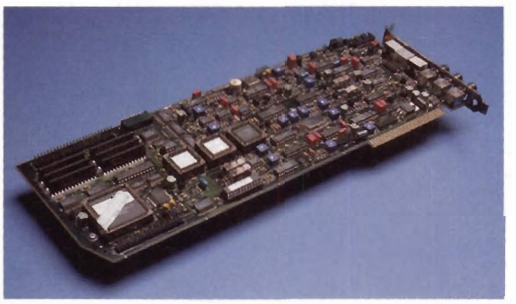
For several years, Digital Processing Systems has produced innovative, affordable video accessories for personal video producers. Its landmark Personal Time Base Corrector has now evolved into a fourth-generation product, the Personal Time Base Corrrector IV (P-TBC4).

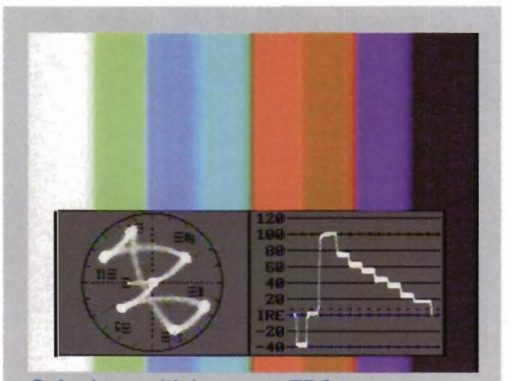
Unlike the previous board-level TBCs from DPS, this unit relies upon 4:2:2 digital sampling and separate digital paths for each component of video (Y, R-Y and B-Y) through the time base corrector. As a result, problems such as excessive ringing in areas with fine detail, have been eliminated.

At the heart of the P-TBC4 is the same Phillips digital decoder chip that has found its way into a number of desktop video products, including time base correctors from Feral Industries, Prime Image, and video workstations, such as the Fast Electronic Video Machine and Matrox Studio.

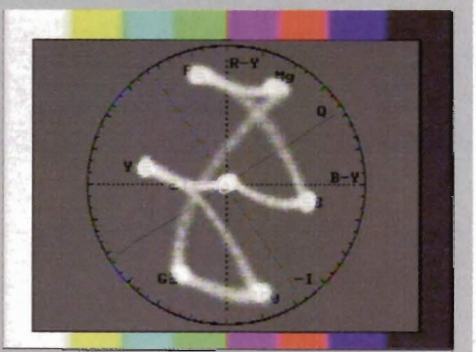
The new P-TBC4 can be used in systems with existing DPS products, such as the P-TBC3/P-TBC2 TBC cards and the Personal V-Scope.

The product brings new features to the personal video producer and is particularly well-designed for the Video Toaster environment.





Color bars with incorrect TBC proc amp adjustment on the TBC IV.



Color bars with good TBC proc amp adjustment on TBC IV.

Hardware Setup

Like its predecessors, the P-TBC4 can be software-controlled via the serial port of the Amiga (or PC compatible), or hardware-controlled through the use of an external RC-2000 remote control panel. Most users are likely to use the provided software control, but there are some applications where the RC-2000 external TBC controller would be more desirable because of its buttons and knobs for real-time signal control.

The serial baud rate of the card must be set to match your host computer before the card is installed. The factory default setting is 31,250 BPS. If you're using an Amiga serial expansion board (or running the software from a PC), the alternate 9600 BPS setting is used.

In any A/B-roll personal video production suite, two time base correctors are necessary—one for each video source. For the software to control individual TBCs, a unique address must be set for each TBC card. For example, in my A/B-roll system, the first TBC4 card is address No. 1 (address switches in the up position). The second TBC card was set for address No. 2 (address switches in the down position).

A 25-pin to nine-pin DIN cable is used between the computer's serial port and the P-TBC4 card. When using more than one TBC card, the serial RS-232 signals on each card must be daisy-chained between cards. This is accomplished via the provided three-wire linking cables and the RS-232 three-pin connectors on each card to be linked. Connect a link between the RS-232 THRU connection on the first P-TBC4 and the connector marked INPUT on the other TBC card. Finally, if the DPS Personal V-Scope is used (and it's highly recommended), it too should be linked to the final TBC card in the system.

Rather than using the external serial cable, users can connect the P-TBC4 to the Amiga's internal serial port on the motherboard via a provided 12-inch internal serial cable. The cable should be linked to the RS-232 connector. On the P-TBC4's rear-connecting plate, the connectors from top to bottom are: S-Video IN, Multi Serial IN, TBC S-Video OUT, Composite Video IN, TBC Composite Video OUT, and Gen-Lock IN. The S-Video connectors are the standard four-pin, mini-DIN connectors, and the remaining video connectors are professional BNC type.

Software Installation and Control Screen

To work with the Video Toaster, the P-TBC4 control software must reside in the same drawer as your Video Toaster program. This is easily done by selecting the P-TBC4's INSTALL icon, which automatically copies the required files into a special drawer called TBC-IV. Double-clicking on the TBC-IV icon brings up the P-TBC4 software control screen.

The P-TBC4 Amiga control screen has four basic areas: video processor controls for setup and use of the video processing amplifier; V-Scope controls for use with the Personal V-Scope; TBC-IV file control; and video mode

Continued on Page 94

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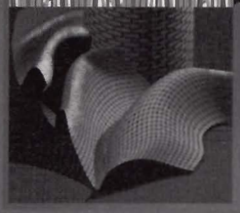

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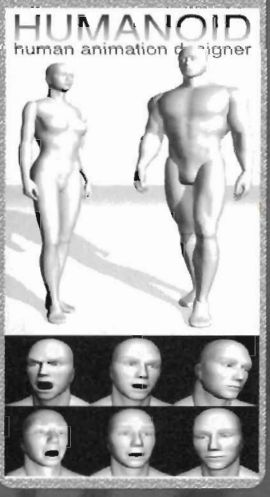

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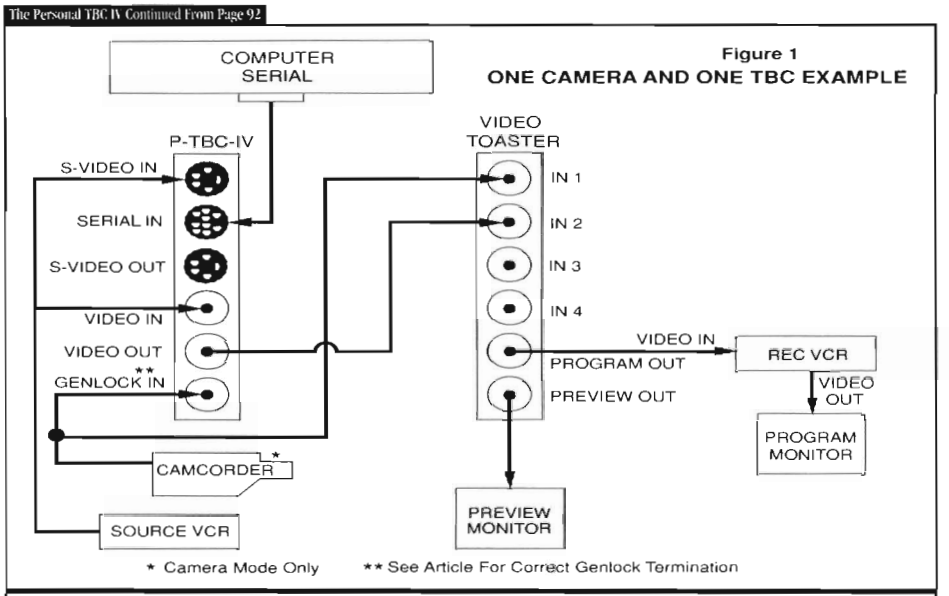

Figure 1
ONE CAMERA AND ONE TBC EXAMPLE

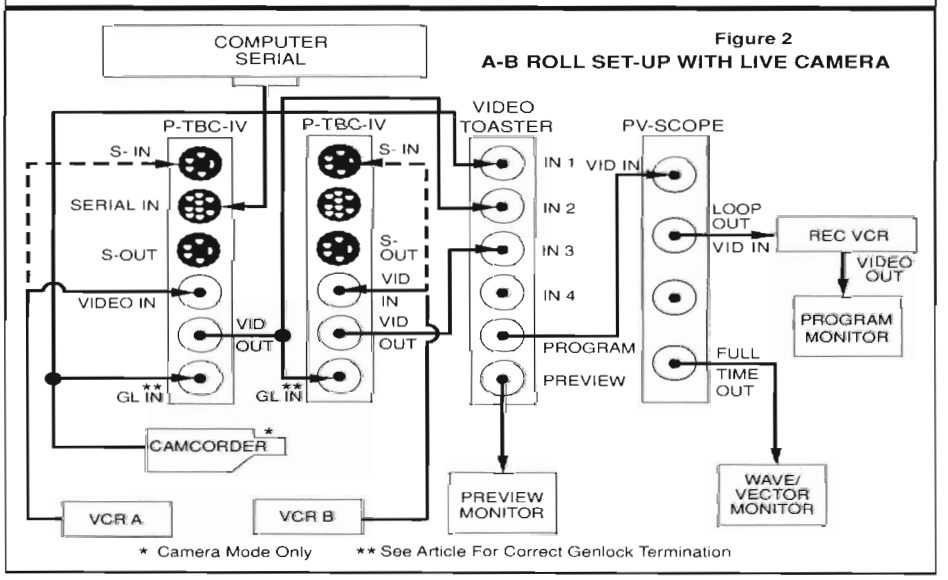

Figure 2
A-B ROLL SET-UP WITH LIVE CAMERA

control. The user manual describes each area in detail, but a short summary here would be useful.

Video Processor Controls

Five processing amplifier (proc amp) slider controls are available. The Video slider adjusts brightness or luminance. Black sets the darkest areas of the video. Chroma adjusts the color saturation. Hue sets the tint or hue, and H-POS allows slight horizontal picture adjustments. Each proc amp adjustment is easily performed and can be calibrated with the help of DPS's Personal V-Scope card.

The board also allows 10 proc amp settings per chosen TBC to be stored in and recalled from memory. This feature is particularly useful when editing with multiple source tapes. With this feature, custom proc amp settings for each scene can be set and stored for later recall during online editing. Up to four TBCs can be controlled.

V-Scope Controls

The V-Scope controls command the DPS Personal V-Scope display modes, allowing waveform, vectorscope, or combination displays.

P-TBC4 File Controls

The latest Personal TBC provides for numerous file controls, including CONTROL.SWITCHER. This control provides direct access to the Toaster's switcher. The WORKBENCH control switches directly to Workbench. The KEYBOARD control is a hot key control of the P-TBC4, while the Toaster's switcher is on-screen. The LOAD/SAVE TBC control loads and saves custom P-TBC4 settings. The PREFERENCES control brings up a Preferences window for individual genlock adjustments.

Video Mode Controls

The P-TBC4 has a powerful set of video mode controls. The card's big claim to fame is a rock-solid freeze frame. The freeze frame can be captured either from the Control Screen or through the right Amiga hot key.

The GPI trigger is a unique feature that allows users to perform a freeze frame with an external mechanical switch. This feature requires a special DPS cable.

STROBE is a sliding gadget that creates a variable frame playback rate. The FILM Mode button emulates the slower 24 frames per second (fps) film frame rate with a grainy look of film.

ROUTER is used with DPS's new Personal Video Routing Switcher card. BALANCE adjusts scenes that where improperly white-balanced during shooting.

One Camcorder/One VCR

For the Video Toaster's switcher to function properly, each video source must be synchronous. In this scenario, the camcorder simultaneously feeds Toaster input No. 1 and the P-TBC4's genlock (synchronizing) input. This assures that the TBC4's video output to Toaster input No. 2 is in perfect sync with the camera's output. Remember, the video from the camcorder must be live, not recorded video, so that the system has a stable reference.

The playback VCR's S-Video or composite video output must be connected to the P-TBC4's video input. The TBC's time-base-corrected composite video output signal then feeds Toaster input No. 2.

Feeding the camcorder to both the Toaster input No.1 and the P-TBC4's genlock input normally would be impossible. Usually, video signals cannot be sent in two different directions at once without severe signal loss or without the use of a video distribution amplifier. The P-TBC4 control software corrects this with a switchable termination setting on the genlock input, which increases its internal termination impedance to a non-interfering value, allowing the camera signal to pass on unimpeded without signal loss to Video Toaster input No. 1.

Other important genlock preference adjustments for the P-TBC4 are video input type and horizontal and subcarrier timing control. The video input cycle gadget selects between composite and S-Video. Use S-Video if your sources are Hi-8 or S-VHS, and composite if otherwise.

The HORIZ (Horizontal timing) control gadget synchronizes the P-TBC4 to its genlock input, which in this case is the camcorder's live video output. The control moves the picture horizontally in large steps. Too large an offset results in severe picture distortion.

The SUB (subcarrier timing) gadget adjusts the phase of the color video subcarrier in small steps. The best way to preset these HORIZ and SUB controls is with a pre-recorded tape of color bars, easily made with the Video Toaster. Record at least one hour of bars. Then play back the bars and observe the P-TBC4's composite output display while adjusting the HORIZ and SUB gadgets. It probably will be necessary to adjust the HORIZ and SUB gadgets and the HUE gadget on the video processor panel until the bars look right when compared to your Toaster's original color bars.

Other genlock preference mode settings you

will want as defaults are genlock termination: 75 ohm OFF (75 ohm not highlighted); genlock auto/slave: AUTO (unless the Personal Animation Recorder is used); Narrow/Wide Vertical Blanking: WIDE; Burst (on for standard color output); Hot Switch (on provides an automatic freeze frame of your source if the video signal is disrupted); Chroma Filter (on reduces chroma noise).

The Y/C delay controls are unusual for a card-type TBC in that they provide for correcting the inherent delay (color smear) between color and brightness levels in "color-under" recording systems (S-VHS/U-Matic). Y/C Delay control is possible for both the horizontal and vertical direction.

Through the use of the video processor and genlock preference controls, the taped bars will play back correctly. Now substitute the source material videotape, and the system should be in the ballpark. Chances are, all you'll need is some fine tuning on the proc amp controls (HUE) for good rendition of flesh tones and proper brightness and color levels.

The user manual has detailed explanations of proc amp and genlock Preference controls. This entire process is easier and far more accurate if the Personal V-Scope is used while setting up the P-TBC4 because the calibrating will be done to a known reference as displayed on the P-VScope.

The Toaster's Program Output should feed the Personal V-Scope, and its full-time output is used to monitor the signals. It's important to note that in each of these two examples, the camcorder must provide a stable video reference signal (not a videotape) for the Video Toaster and the P-TBC4.

It is essential that the camcorder be used in the camera mode only, where the video signals are the most stable. Also, turn on the camcorder before booting up the Video Toaster and P-TBC4 control software.

Finally, after all video sources are properly timed and adjusted, it is possible to switch between sources and perform transitions between the camera source (input 1) and the videotape playback source (input 2).

Save the TBC settings with the proc amp Store button so that they can be recalled later.

A/B-Roll System With Live Camera

The A/B-roll setup adds more functionality to the previous single camcorder/single VCR equipment configuration. As before, the camcorder feeds Toaster INPUT1 and the first P-TBC4 genlock input. The difference is that the first P-TBC4's video output feeds the second P-TBC4's genlock input and the Video Toaster INPUT2. The second P-TBC4's video output feeds Toaster INPUT3. Thus, each TBC card is synchronized to the camera source, meeting the Toaster's input sync needs.

Remember that each P-TBC must have a unique address. As in the first scenario, for each VCR source a tape of color bars should be played back and timed with its respective TBC. Look in the P-TBC4 manual for a unique hot-key procedure to time tape playback with the Toaster's own color bars. The uniqueness stems from the fact that a Toaster horizontal split-screen effect between its own internal bars and taped bars is stopped midway. Then hot keys adjust the timing and phase of the taped bars to match the Toaster's internal bars. Finally, with each videotape source correctly timed against Toaster bars, the Toaster is ready for A/B-roll editing. (An A/B-roll edit controller must be added to complete the picture).

Gateway To PAR

Aside from all of the powerful features of a full-fledged time base corrector, the P-TBC4 also provides a unique video gateway to the optional DPS Personal Animation Recorder (PAR) System. A 50-pin Component Video Exchange (CVE) bus allows video processed by the P-TBC4 to be recorded in real time on the PAR's hard disk.

Thus, sequences from live camera or videotape can be transferred in real time and digitally recorded to the PAR hard disk for later frame-by-frame rotoscoping or random access video still store.

The Final Analysis

The new P-TBC4 marks a significant improvement over previous models not only because of its 4:2:2 sampling and Y/C video signal inputs, but also because there are time base corrected Y/C video outputs. This makes possible high-quality, direct recordings to S-VHS or Hi-8 videotape in the Y/C mode. The P-TBC4's composite video output is also high in quality, providing the Video Toaster with excellent video source material.

The video modes now include an extremely stable freeze frame, which can be captured from a hot key or through software control. The strobe mode has professional adjustable frame rates. Video producers who want to obtain professional strobe effects or mimic the look and feel of film, have an extremely powerful tool at their command.

The Personal TBC IV works extremely well with all versions of the Video Toaster, including the version 3.0 software upgrade and the complete Video Toaster 4000. After installation, the P-TBC4 software places a handy DPS button alongside the superimpose bus for easy access to the P-TBC4 control software.

Finally, if you are a serious animator and need to digitize live or videotaped images in real time, the ability to connect with the optional Personal Animation Recorder should be reason enough to own the P-TBC4.

If you need a card-type TBC for your Video Toaster, you should give the DPS P-TBC4 serious consideration.

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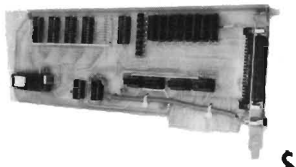

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Batch Processing With The Video Toaster

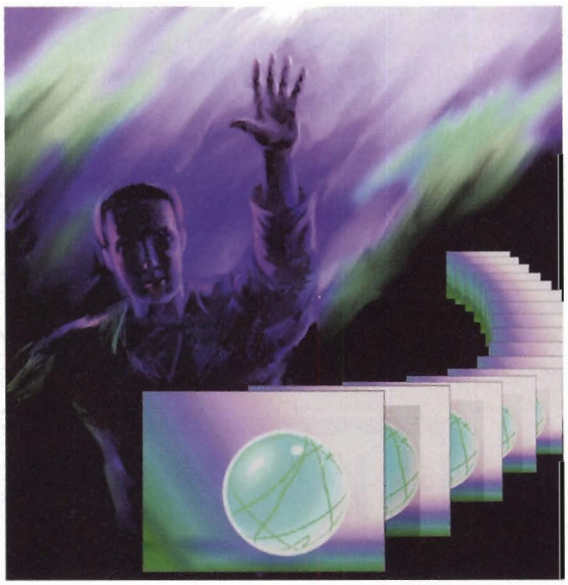
By Matt Drabick

As good as the Video Toaster is for creating video special effects, there are times when it would be nice to use the image-processing power of Art Department Professional (ADPro) and MorphPlus from ASDG to process images created with LightWave or even sequentially-grabbed frames from videotape.

Until recently, applying an effect to a sequence of frames using ADPro and MorphPlus has required the ability to write and execute ARexx scripts, something many Toaster users don't know how to do. Fortunately, two programs are now available that allow easy batch processing without requiring the user to be a programmer.

MultiFrame ($129.95) from MacroSystem US and ProControl ($90) from ASDG provide batch processing for the masses. Not surprisingly, because both programs are designed to work with ADPro and MorphPlus, they operate in a similar manner. The image or images to be processed, the specific effect or process to be used, and the output formats are selected by the user. The creation and execution of the proper ARexx script is then automatically performed by the software.

Essentially anything that ADPro and MorphPlus can do can be addressed by MultiFrame and ProControl. This includes loading non-Toaster images created with Caligari or Imagine and even images created on other computer platforms and saved as TGA (TARGA) or PICT files. Images can be scaled automatically, cropped and flipped, or converted to gray-scale versions. For Toaster users who first render and save all of their frames to hard disk before performing single-frame recording, batch processing can be used to create a Deluxe Paint animation for previewing the real animation before dumping the 24-bit frames to their VCR or optical disc recorder.

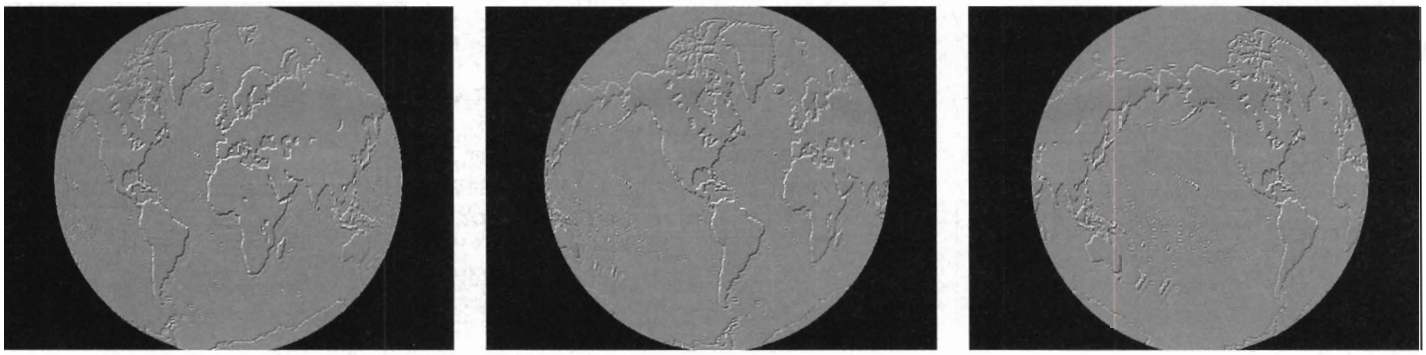


Fortunately, two programs are now available that allow easy batch processing without requiring the user to be a programmer.

Recently, ADPro has been upgraded to version 2.3 ($299) and can now read and write Video Toaster framestores without requiring a Toaster. Other improvements include several new operators for creating special effects, such as rotating and twirling images, pulling an image in towards itself to create a gravity effect, displacing pixels (when used with the median filter and appropriate convolve operators) to create an oil painting, impressionist and fresco versions of images, and even simulating techniques used in printing, such as half-toning.

The Sentry Utility

A new utility called Sentry is included. It waits for each frame to be rendered,



A map of the world from Pixel Perfect24 image library (Digital Design Group) was rolled to the right using MorphPlus, then embossed using ADPro, then wrapped around a sphere using MorphPlus.

Continued on Page 98

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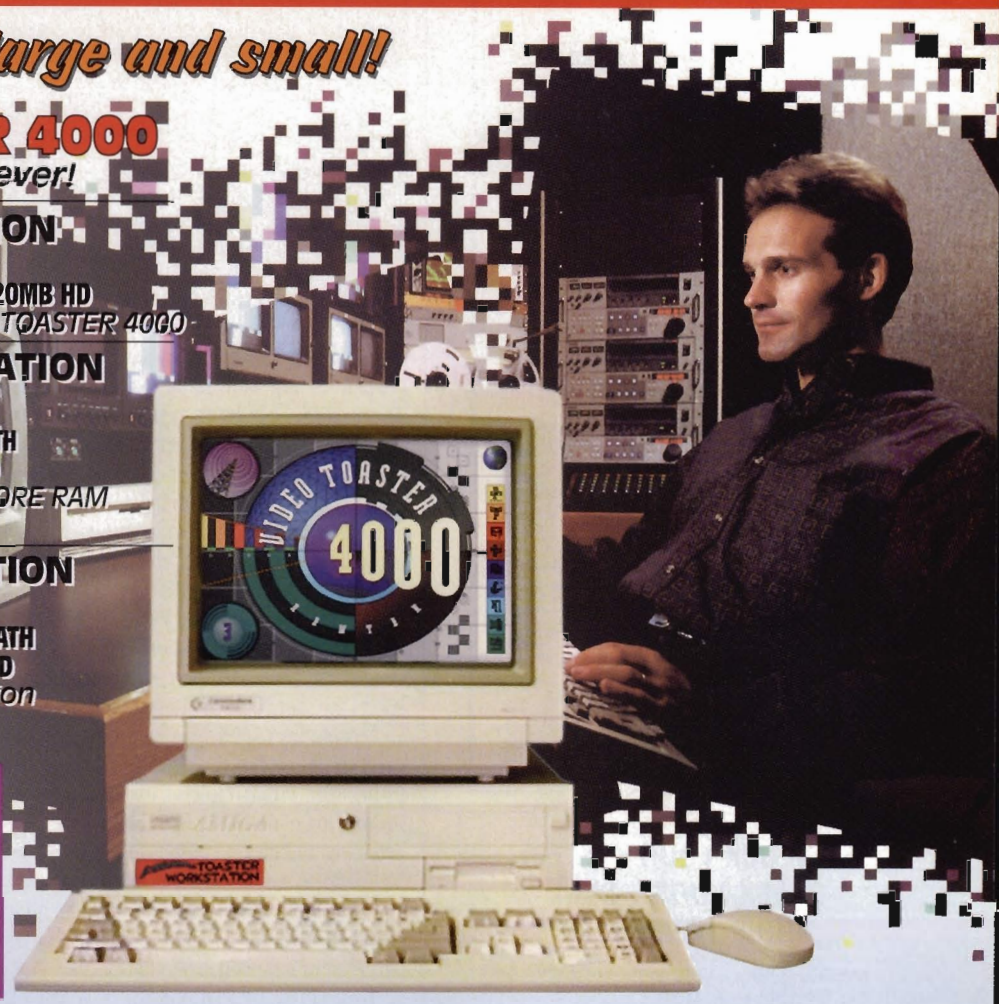

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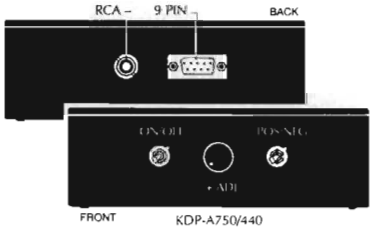

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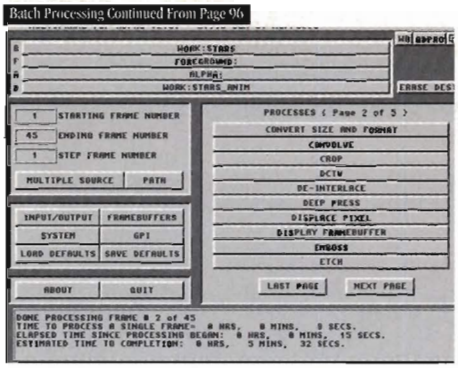
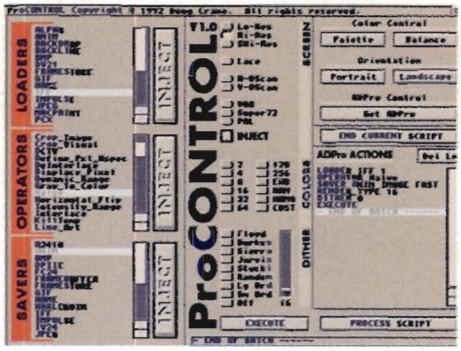
Batch Processing Continued From Page 96



MultiFrame's menu screen.



ProControl's interface screen.

immediately processes the frame using ADPro with the desired effect, and records it to videotape. A new animation standard called ANIM-8 has been created for use with 32-bit machines, such as the Amiga 3000 and 4000. It provides for increased compression of Amiga animations with significantly faster and smoother playback. The ANIM-8 standard also can be used with the Amiga 4000 for creating 8-bit and HAM8 animations from 24-bit images. Finally, with the addition of the Professional Conversion Pack ($90) from ASDG, other file formats such as PICT, PICT2 (commonly used with the Apple Macintosh), TGA and TIFF images can be loaded and saved. ADPro also now sports the same user interface found in MorphPlus.

MorphPlus ($295) can be used as a standalone product or combined with ADPro to perform morphing and video special effects. Like ADPro, MorphPlus offers basic functions, such as scaling, cropping and image compositing. Images also can be made to appear as if they were underwater. They can have ripple patterns or waves added, be moved through the X, Y, and Z axes, rolled on- and offscreen or wrapped around a sphere.

You will want a minimum of 6 MB of RAM when performing batch processing with 24-bit images. Even more memory is needed for complex effects, such as ripple patterns when used with MultiFrame. That particular effect can require 12 MB to 16 MB of RAM. An accelerated CPU (68030 or 68040) is also a good idea for the fastest possible rendering times. A large hard drive for loading and saving images is also a good idea. ARexx must be installed and running as well. ProControl works with Workbench 1.3 or higher, but MultiFrame requires at least Workbench 2.04.

While the two programs use different-looking interfaces, the process of performing batch processing is the same. ProControl makes minimal use of pull-down menus. MuliFrame uses a main menu screen with buttons for accessing other control screens. MultiFrame's main menu screen is used for selecting the source image or images, the number of frames to be processed, the particular process to be used, and where the processed frames should be saved. With a few exceptions, MultiFrame can perform only one operation at a time. For example, to move a sequence of frames across the face of a sphere, users must first process the frames using the roll operator and save them to the hard drive, then reload the same frames and use the sphere operator.

However, with ProControl it's possible to use any of the effects found with ADPro and MorphPlus and simultaneously perform scaling, convert a color image to gray scale or a gray-scale image to color. Both ProControl and MultiFrame can create Amiga animations with a locked palette to prevent color shifts. Batch processing can be aborted at any time during the process. Both background and foreground images can be composited together and alpha channel files can be used to create traveling mattes.

Spline-Path Control Window

A unique feature found with MultiFrame is the spline-path control window. Instead of applying a linear or equal amount of an effect to each frame in the sequence, MultiFrame can vary the amount of processing over time. Using the previous example, the spline-path window can be adjusted to move the frames slowly across the screen for perhaps the first 15 frames, then suddenly begin to move them with increasing speed. Both acceleration and deceleration can be simulated. MultiFrame also provides an easy way to add complex ripple patterns to images. While multiple ripple patterns can be added for a stunning effect, rendering time will increase accordingly.

For those Toaster users who have another video display card installed in their system, MultiFrame can display images for preview, using DCTV from Digital Creations, Firecracker24 from Impulse, Harlequin from Haitex Resources, or Retina from MacroSystem US. Images can be displayed before and after processing. To save on rendering time, images don't have to be displayed at all.

MultiFrame requires that file names have an extension using a period or delimiter and a numerical value, such as pix.0001. Fortunately, if you want to process a sequence of frames that don't have a period and a numerical extension as part of the file name, MultiFrame can automatically add them.

While it doesn't have the spline-path function that MultiFrame offers, ProControl offers control over the Sentry function found with ADPro 2.3. Unlike MultiFrame, multiple scripts can be linked together to perform more than one process at a time upon a sequence of frames. Nor does

ProControl require that a period and numerical extension be added to file names.

Besides adding image-processing effects to Framestores, MultiFrame or ProControl can be used with ToasterVision from Byrd's Eye Software to create your own custom Toaster wipes. Twenty-four-bit LightWave animation frames can be easily converted into a DPaint animation using either program with ADPro or MorphPlus and then loaded into the WipeMaster utility found with

While the two programs use different-looking interfaces, the process of performing batch processing is the same.

ToasterVision. The DPaint animation can then be converted automatically into custom-made Toaster wipes. Finally, while MultiFrame and ProControl don't offer a way of individually painting each frame by hand, basic rotoscoping can be performed on images that have been sequentially framegrabbed. Imagine taking some stock videotape footage of a talking head, digitizing several seconds worth of that footage onto your hard drive and using ADPro's antique operator to add a sepia tint to age the footage.

Whatever ADPro and MorphPlus are capable of doing to a single frame can now be painlessly and effortlessly performed over a sequence of frames. Both MultiFrame and ProControl proved to have essentially the same features and capabilities. MultiFrame provided a few extra touches, such as spline-path control, easily-created complex ripples and the ability to preview images using certain Amiga 24-bit display devices. VTU

Companies mentioned:

ADPro, MorphPlus and ProControl
ASDG
925 Stewart St.
Madison, WI 53713
(608) 273-6585

MultiFrame
MacroSystem US
17019 Smugglers Cove
Clinton Township, MI 48038
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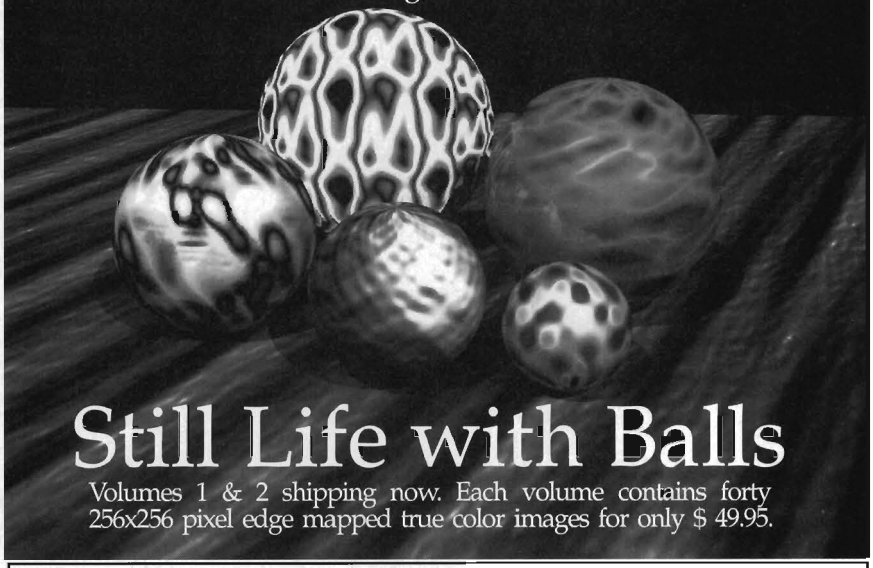

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TAO

EDITIZER 2.0

PC-Based Edit Controller

The TAO Editizer 2.0 is a hardware/software combination video edit edit controller that runs on Windows 3.1 and supports both Prosumer and Professional equipment. The Editizer comes complete with integrated Windows-based software for VCR control, A/B Roll Editing, tape logging, EDL management andd EDL import/export. The Editizer supports virtually every protocol including Sony Control L, Panasonic 5-pin, RS-232 parallel and serial. It has 3-VCR control, an auxiliary serial port and multiple GPI triggers. It has switcher control for the GVG-100, WJMX-50, Toaster and will control most of the otrher devices in your suite.

Hardware Features:

- Three VCR control ports for true A/B roll. Each VCR port can support a different protocol. (For example, you can use a Panasonic AG-1960 as "A" source, Sony EVS-3000 as "B" source and JVC BR-S822 as record VCR).
- Built-in SMPTE Longitudinal (Audio) Time Code generator with external and internal video sync.
- Three multi-speed SMPTE Longitudinal time code readers.
- Auxiliary serial port for full control of Newtek Video Toaster, GVG 100, and Panasonic WJ-MX50 switchers.
- MPC Audio and MIDI support for embedding sounds and MIDI sequences in your EDL.
- DPS TBC II & III support – you can control two personal TBC cards and the Personal V-Scope from a serial port.

Software Features:

- VCR Control – up to three VCR controllers on-screen simultaneously. Jog and shuttle control. You can use either your mouse or keyboard.
- Tape Logging – Multi-event search, copy directly into edit list, multiple log windows may be opened simultaneously, log files or selected events may be printed to a window.
- Multi-event control/can handle up to 16,000 events. Interactive graphical "Time Line" window. Split audio editing, cut/copy/paste events. Preview, Perform, Review. Automatic and manual EDL ripple.
- Time code generator in Drop/Non-Drop frame.
- Optional support for AutoDesk 3D Studio, Lightwave 3D.

HORITA

TG-50 Time Code Generator

- Generates SMPTE in drop or non-drop frame
- Jam sync mode jams to TC input and outputs new TC
- Makes burned-in SMPTE time-code window dub
- Simple on screen preset of time code and user bits
- Compatible with all 1/2", 3/4" and 1" tape formats
- Battery operation allows portable field use

TRG-50

Has all features of TG-50 *Plus:*

- Reads and displays SMPTE time-code from 1/30 to over 10x play speed
- Reads forward and reverse

TRG-50PC

Includes TC-TOOLKIT Tape Logging Software Package

- **Has all the features of the TRG-50 *Plus* -**
- "Two-way" communications with IBM compatible PC using RS-232 serial port. No plug-in cards required, log in field using portable PC
- TC-TOOLKIT with six time-code programs
- Includes serial cable, DB-9/DB-25 adaptor, 3-1/2 and 5-1/4 disks

BSG-50 Blackburst & Sync Generator

The BSG-50 provides an economical means for generating the most common RS-170A video timing signals used to operate various video switchers, effects generators, VTRs, cameras, video edit controllers, and other professional video equipment.

- 6 BNC video/pulse outputs
- Outputs can easily be configured to meet specific user and equipment needs
- 4 black-burst, 4 sync, and 2 subcarriers available
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- Separate buffer for each output provides maximum signal isolation
- 0dB, 1KHZ sinewave audio one output
- DC powerable tor use in the field
- An unusually versatile black-burst, sync pulse. and audio tone generator.

FutureVideo

EC1000 PRO Series • EditLink 2200 Series

EditLink 3300 Series

Since 1986 Future Viceo has been a recognized leader in the manufacture of desktop videotape edit control systems. Whether you need a "stand-alone" controller (EC1000 PRO Series) or a PC-based controller (EditLink 2200, 3300 Series) Future Video's award-winning line up with the latest features and advances in desktop videotape editing has a controller to fit your needs.

STANDARD FEATURES:

- Using low-end industrial VCRs like Panasonic AG-1960, AG-1970 an accuracy of 2 frames is achieved. With same VCRs and time code 1 frame accuracy is achieved.
- Any of Future Video's controllers can edit between any combination of VCRs equipped with Panasonic 5-pin serial remote terminal (AG-1960, AG-1970) and over 100 consumer and prosumer camcorders and VCRs equipped with Sony Control-L (LANC) serial remote terminal.
- They each perform four editing modes - Quickly and precisely executing Assemble, Video Insert, Audio Dub and Audio/Video Insert editing modes.
- True E-E (Electronic - Electronic) Preview - insert edits with certain VCRs may be previewed in true E-E model allows all e d i t s to be "rehearsed" before they are performed) ensuring correct placement of each scene in your production.
- They provide fast and accurate editing by using both the player (source) and Record (edit) VCRs or camcorders to their pre-roll position.
- Upgradability - All models may be factory-upgraded (certain models may be field upgraded) to higher model specifications within the same series. As your needs evolve, your edit controller can grow with you.
- Reliability - All FutureVideo edit control products carry a full 1 year parts and labor limited warranty. FutureVideo products are precision engineered and manufactured - with pride - in the USA.

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 or WJMX-50. GPI trigger can also be used to set off second source VCR so you can do semi-auto A/B roll while doing your effects on-the-fly with a switcher like Panasonic WJMX-12.

EC1000 PRO MKII

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

Additional Features:

- 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 2200

- EditLink 2200 is a plug-in card edit controller. A PC-based card that transforms your IBM PC/AT/386/486 compatible into a powerful videotape editing workstation.
- Has all the features of the EC1000 Pro MKII plus it also controls selected RS-232 industrial VCRs like the FVC BRS-605 and Panasonic AG-5700.
- Use with Future Video's Powerful EditList Manager 2000 software or other compatible 3rd party application software like the Matrix Personal Producer to complete your system.
- Has programmable GPI trigger for timed turn on, torn off, or pulse. So now your transitions can be set anytime and not just at the edit points.

EditLink 2200/TC& TCG

2200/TC • Same exact card as EditLink 2200 Plus has professional SMPTE time code reader built-in.

2200/TCG • Same exact card as EditLink 2200 TC Plus generates as well as reads professional SMPTE time code.

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.
- The advanced EditLink 3300 provides easy upgradability using the latest FLASH memory technology. This feature allows adding new functions and new VCR compatibility by downloading the upgrade from your PC to the controller.
- 13 different LED's for monitoring status
- Provides three external programmable GPI triggers.
- EditLink 3300 connects to your computer via a built-in RS-232 serial port. It is platform independent so it will work with AMIGA, MACINTOSH or IBM.

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Hand-Held Systems

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- 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 549.95
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  151 VR/HT handheld system 139.95

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The Azden Pro Series brings you high performance VHF wireless at a price you can afford. Built around a two-channel design they allow selection of a frequency for the cleanest signal - delivering clean, reliable RF performance for up to 250 feet.
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- Unique new receiver which allows you to use any two Pro Series mics simultaneously.
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- 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)
- 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.
- **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.

AG-460
2-CCD S-VHS Camcorder

Features:

- 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
- Black & white Audio/Video Fade-in & Fade-out
- 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/ Character Generator direct connection capability
- Includes Panasonic metal system case

WV-F250B
3-CCD Color Video Camera

The WV-F250B provides the flexibility needed for truly professional performance. Its high density 1/2" CCDs deliver outstanding horizontal resolution of 750 lines. It bas a high S/N ratio of 60dB and consistently outputs high image quality with low smear. Has component output plus Y/C output for compatibility with VHS, S-VHS, MII, Betacam and virtually any type of VCR - for truly outstanding professional performance in ENG/EFP, studio and dockable (camcorder) type applications. The WV-F250B combines advanced technology with ergonomic design and operating convenience to fulfill the demands of the ever expanding professional video world.

Features:

- 3 FIT (Frame Interlined Transfer) CCD chips with 380,000 pixels each deliver 750 lines of horizontal resolution.
- High signal-to-noise ratio of 60dB enable consistent recording with low vertical smear level and outstanding sharpness of details.
- Advanced electronic shutter with variable speeds from 1/60 - 1/2000 of a second.
- Rugged aluminum die-cast body is resistant to shock and vibrations, makes it ideal for outdoors, including ENG/EFP.
- High resolution 1.5" viewfinder with character display and zebra level plus a host of other information.
- Built-in SMPTE color bar generator for accurate colors of your monitor. Date and time are also recorded on the color bars.
- Docks to S-VHS, MII, and Betacam, can also be connected to VHS, Beta and 3/4" models.

Panasonic
Broadcast & Television Systems

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. This is not a consumer camcorder. 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 manufactured by laminating thin layers of amorphous metal featuring magnetic characteristics far superior to those of conventional ferrite heads. This results in the video signal being recorded with extreme fidelity. 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.

AG-1970
S-VHS Hi-Fi Editing VCR

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

7000 SERIES EDIT SYSTEM
An S-VHS Editing System Truly Designed To Meet The Needs Of Professionals

AG-7650
S-VHS SOURCE PLAYER

AG-A770
MULTI-EVENT EDIT CONTROLLER

AG-7750
S-VHS EDITING VCR

The Panasonic AG-7650 S-VHS source player and AG-7750 Editing VCR share many professional features to deliver outstandin S-VHS picture quality, editing accuracy, versatility and reliability.

AG-7650 & 7750 Features:

- Built-in Digital TBC/DNR (Time Base Corrector/Digital Noise Reduction) eliminates even small amounts of jitter, skew and color blurring. The precise time base correction is invaluable for A/B roll editing and helps maintain high picture quality through multiple tape generations.
- High-precision aluminum die-cast chassis and extra large impedance roller is used to assure exceptionally stable transport with very low jitter.
- Advanced AI capstan servo control featuring a capstan spindle three times larger than conventional. This provides for high speed search at 32x normal speed.
- Both have RS-422A 9-pin serial interface - the standard control protocol for professional broadcast components. This allows compatibility between other serial control systems. They also have 34-pin parallel connectors to maintain compatibility with older Panasonic components.
- Equipped with two Hi-Fi stereo audio channels plus two linear audio channels with Dolby NR.
- Both use 3-pin XLR audio jacks for increased reliability. The AG-7750 features a 3-position input level selector to assure high-quality sound during recording.
- Professional 7-pin dub input and outputs keep the quality of your video during editing and through multiple generations.
- Optional AG-F700 SMPTE time code reader/generator card lets you perform LTC/VITC (Longitudinal/Vertical Interval) recording and playback for highest precision editing.

AG-A770 Features:

- Advanced design for easy control and smooth editing results, separate jog/shuttle dials and easy to read adjustable display.
- Multi-event editing - stores up to 128 single-cut events in memory for automatic editing.
- Built-in RS-422A 9-pin serial interface board lets it control almost any professional edit system.
- Split audio editing capability. Lets you enter audio and video edit points separately.
- Built-in GPI trigger allows centralized control of total-system operation.

NRG

LIGHT AND POWER SOLUTIONS FOR THE SERIOUS VIDEOGRAPHER

CAMPAK

NRG's powerful solution to short camcorder run times: 3-5 hours of camcorder power in a palm-sized pack

- 12 Volt DC output jack
- Ultra-light weight (38 oz.) and compact palm size
- Spring steel clip securely fastens Campak on waistband, pocket, belt or optional Campak belt
- Cigarette lighter style output adapts to any camcorder
- Highest-density Nicad cells provide 4 amps of power
- 2500 charge/discharge cycles for years of reliable service
- Includes overnight charger and soft case

CAMPAK PROFESSIONAL

Same features as CAMPAK Plus:

- 13.2V
- 4-Pin XLR output connector
- Available in 12V or 13.2V version offers 20% longer runtimes when used with industrial equipment that shuts off at a higher voltage level, by allowing the pack to fully discharge.

PERPETUAL POWER BELT SERIES

NRG power belts are the ultimate power solution. Made in the U.S.A. they provide the power to run lights, camcorders and decks free from the fear of shutdown. Advanced ultra-high density Nicad power cells provide the lightest weight and longest service life of any power products made. Advanced features such as dual power outputs, power indicator high-speed charger, solar panels and high-current cables combine to form the world's most advanced power system.

880 Power-Pro +

- High capacity 10-AMP removable Nicad power pack (Also capable of fast charge)
- 2500-cycle cell life provides low cost per cycle
- 5-step multi-color power indicator display and electronic circuit protection for connected equipment.
- Dual input system allows pack interchange without shutdown
- Weighs just 4.9 lbs. for all-day comfort
- Charge in under 2 hours with the optional 650 charger
- Available dual output configurations include cigarette lighter, 4-pin XLR in any configuration
- Includes belt base, 10-amp Power Pack & 600 series charger

970 POWER MAX

Same features as Power-Pro + Plus:

- Designed for high-current applications requiring long run times
- Highest capacity 14-AMP 12 Volt or 13.2 Volt power packs. 13.2 Volt offers 20% longer runtimes when used with equipment that shuts off at a higher voltage level/eg. industrial decks and dockable units).
- Rugged high-grade, heavy duty black leather belt base
- Power-Max weighs a comfortable 7.5 lbs.
- Multi-color 5-step power indicator display
- Dual inputs for pack changes without equipment shutdown
- Dual outputs include cigarette lighter and 4-pin XLR in any combination.

NRG ON-CAMERA LIGHTING

Mite Lite

- Pocket-sized lighting wonder. 35 watt light designed to achieve maximum light coverage in an ultra-compact package.
- 35-watt quartz -halogen bulb with dichroic light multiplier reflector (Also optional 20 & 30 watt bulbs available)
- Disperston grid for broad light coverage
- Ultra compact lighthead
- Virtually indestructible, light weight milled aluminum construction
- Provides light coverage comparable to much higher wattage bulbs

505 Versalite Pro

- Front housing snaps open for instant bulb exchange
- All-metal construction for years of use and abuse
- Dichroic-coated bulbs assure accurate color
- Unique dispersion grid eliminates hot spots and reduces subject complaints.
- AC/DC capability in unmatched bulb wattage ranges, 20-200 watt DC and 150-300 AC, and patterns (flood, med. flood, spot).

NEW! Lite-Rite

- Lets you instantly adjust the light intensity to any one of 80 levels from 100 watts down, providing instantly the right light requirements for any shooting situation
- Can also raise power level to give subjects a chance to accustom themselves to the increased light
- Colored graphic display indicates remaining light run time
- Eliminates changing hot bulbs in the middle of an event
- Dramatically extends run-time, using right amount of battery power

Power Station Series

Designed to replace expensive original-manufacture AC power supplies, the affordable new NRG 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.

- Worldwide voltage selection
- Detachable worlwide cordset
- 4-pin or cigarette lighter outputs
- High current output
- Rugged steel case
- Convenient carrying handle

12560-1 Single output, cigarette lighter	CALL
12560-4 Single output, 4-pin XLR	CALL
129100-11 Dual cigarette lighter outputs	CALL
129100-14 Dual outputs, 1 cigarette lighter, one 4-pin XLR	CALL
129100-44 Dual 4-Pin XLR Outputs	CALL

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JVC GY-X2

3-CCD S-VHS CAMCORDER

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

PROFESSIONAL SONY S-VHS SYSTEM

SVP-9000
S-VHS Hi-Fi Player

and

SVO-9600
S-VHS Hi-Fi Player/Recorder

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

They both feature:

- Using the S-VHS format, they deliver superb picture playback and recording. With newly developed Digital Y/C separator maintained picture quality even in composite.
- Newly developed video cross talk canceller eliminates color blur providing more accurate color and sharper images.
- Four channel audio system – Two Hi-fi channels with a dynamic range of 90dB & 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 virtually instantaneous.
- Search dial allows picture search from -10 to +10 times normal speed.
- Automatic repeat an automatic rewind can be accomplished with Programmed operation.
- Soft pause for gentle tape operation.
- There is a TIMER switch for either REC or PLAY (SVBP-9000 PLAY only) when selected automatically executes the selected mode when the power is turned on. This function 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 preveotive care of the tape heads.
- For secure connections, they employ a locking connector for S-Video input and output terminals.
- Both feature SYNC IN for synchronizing with other video sources
- The SVO-9600 features sensor recording. When video signals are input to the SVP-9600, it automatically starts recording.
- Both are 19" EIA rack mountable plus both have adjustable front controls.

Optional Interfaces:

- **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).

CALL FOR PRICES

SONY

BUSINESS AND PROFESSIONAL GROUP

EVW-300
3-CCD Hi-8 PROFESSIONAL CAMCORDER

Sony's video Hi-8 camcorders have been well acclaimed for their ability to capture high quality images in field applications. Their compactness, lightweight, high mobility and long recording time are definite advantages of shooting in the video Hi-8 format. Now Sony introduces the latest addition to its Hi-8 camcorder series the EVW-300. The EVW-300 is a complete one piece camcorder which includes a variety of innovative and advanced operational features. So, whether your shoots require basic recording capabilities or premier performance, the EVW-300 offers a wide range of features and remarkable recording quality to best suit your needs.

Features:

- Equipped with three high density 1/2" IT Hyper HAD image sensors. Combining this advanced CCD technology with advanced optical technology an excellent sensitivity of F8.0 at 2,000 lux, high S/N of 60 dB, and over 700 lines of horizontal resolution is achieved.
- Provides high quality PCM digital stereo and single channel AFM Hi-Fi recording. Has XLR balanced audio connectors with LINE/MIC switching
- 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) – with conventional professional video cameras white balance has to be adjusted before shooting every time the light source is changed. With ATW, white balance is automatically corrected by control of the microprocessor in real time when ATW is turned on so 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 Function.
  AGC (Automatic (Gain Control) – in addition to manual Gain up the EVW-300 has AGC which 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.
- In addition to the automatic adjustments the EVW-300 features auto white balance, auto black balance and black set-up level. With this and three-position color temp conversion filters you can shoot in almost any lighting conditions.
- Selectable Gain-up from 1 dB to 18 dB in 1 dB steps for Mid & High positions.
- Clear Scan function – provides a variety of selection of shutter speeds ranging from 60-200 Hz allowing recording of almost any computer display without flicker.
- Compact, lightweight (12 lbs with NP-1B battery) ergonomic design provides well balanced and extremely comfortable operation.

EVO-9700
DESK-TOP EDITING MACHINE

Editing recorded video segments together into a well-produced professional program has long been considered a creative option only for those with large budgets and extensive technical expertise. Now Sony breaks with this misconception by introducing a revolutionary editing machine, the EVO-9700. This innovative machine is designed to be simple to use.
And it is packed with sophisticated capabilities to bring the creativity of the professional editing suite right to your office desk. The EVO-9700 is comprised of both a video Hi8 player and a recorder housed together in a one-piece compact body. Its desk-top design and ergonomic configuration offer advantage in space and operation.

Although very easy to operate, a range of versatile editing features such as video/PCM audio insertion, program edit, preview, review, slow motion/freeze edit, and title recording capabilities are integrated into the EVO-9700.

Features:

- Compact dual deck design – total weight 26 lbs.
- Built-in 8mm Time Code Reader/Generator for absolute frame accuracy
- Two PCM + monaural AFM audio tracks
- Does all edit modes – Assemble, Video Insert, and Audio Dub all automatically.
- Up to 99 scenes can be stored in memory including 25 pages of title information
- Preview/Review Function – confirm the appearance of a program before and after an edit. You can monitor the results of a simulated or actual edit
- Built-in Digital Chrominance Noise Reducer – improves chrominance S/N ratio for superior dubbing quality
- Tape Jitter/Skew Corrector – field memory used in the noise reducing process also at same time eliminates jitter to give clear, stable pictures (Using EVO-9700 with Video Toaster requires no TBC.)
- Slow Motion/Freeze Edit – noiseless 1/5 times normal speed slow motion pictures and a clear freeze frame can be played back during editing
- JOG/SHUTTLE Dial – frame accurate picture search from -17 to +19 times normal speed
- One monitor editing capability – press the P in P button and pictures from both the player & recorder can be viewed simultaneously on a single monitor – no need to use two monitors
- Separate PCM and AFM audio level volume controls
- S-video in/out connectors
- Supplied Title Keyboard – titles, captions and any other info can be created and recorded onto moving pictures. Freeze picture or background color (7 different colors, four character sizes are available)
- Includes RM-E9700 Edit Controller – Quick Edit, Program Edit, Video & Audio insert are controlled from the supplied RM-E9700 controller.

Canon L1 Hi8

VL Mount System

The Right Lens for Every Scene

Now you can have the kind of creative versatility previously only enjoyed by the professional filmmaker. Interchangeable lenses let you pick the perfect lens for any situation – from wide angle to telephoto. With optional EOS adapter VL use Canon EF 35mm lenses (over 30 different lenses available) on the L1 while retaining autofocus and autoexposure Plus when used with the L1 the local length of EF lenses is multiplied by 5.4 times, so when a 300mm telephoto lens is used, it becomes on the L1 an incredible 1600mm super telephoto. A further advantage is that only the optically perfect central portion of the lens is used for absolutely stunning image quality.

Features:

- Hi-8 Hi-fi stereo, Piezo Auto Focus, Digital effects, audio/video fade in/fade out, hi-speed shutter self-timer, interval timer, tilting and date functions.
- Includes 8-120mm (15-1) zoom lens with 8-blade iris for unprecedented f-stop control. (Delivers beautiful soft focus effects when desired.)
- Optional 2x converter retains optimum image quality while conventional teleconverters cause optical glitches at certain points in the zoom range.

YOUR SOURCE FOR BETACAM

•Dockable Recorders •Editing Players
• Dynamic Tracking Players
• Editing Players/Recorders

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.
- Genlock capability allows synchronization with other cameras. Also full calibration functions are built-in as well as color bar generator.
- Built-in 8mm time code generator records an absolute address to every frame. Provides precision editing of 0frame accuracy
- Has AFM audio channel separation characteristics for professional quality post-production.
- High-performance back electret condenser mic records to all three audio tracks. Also has low cut filter that eliminates wind noise.
- Sports very low power consumption. The TSC-200 draws only 16 watts per hour allowing 100 minutes of recording time with a single NP-1B battery.

TSC-200P Package includes:
TSC-200, Canon 13:1, servo zoom lens, tripod adaptor and custom carrying case.....**CALL**
TSC-200/PC17 Package includes:
TSC-200, Canon 17:1 servo zoom lens, tripod adaptor and custom carrying case.....**CALL**

COLOR PRESENTATION MONITOR

SONY

PVM-1340 (13")

- Dynamic Picture circuitry adjusts gain to achieve better contrast in bright highlights and dark shadows.
- Auto white balance uses beam feedback circuit to maintain stable and accurate white balance.
- Line A or B, VTR (8-pin) analog RGB and Y/C (S-Video) inputs.
- Better than 450 lines horizontal resolution
- Switchable color temperature - 6500˚K for broadcast standard, 9300˚K for the most pleasing picture
- Blue only mode switch for ultra-precise color and hue adjustment
- Built-in speaker for audio monitoring (4 audio inputs)
- Standard EIA 19" rack mount capability.

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B&H PHOTO-VIDEO

TOASTER PERIPHERALS

NEW! I.DEN **TBCard II**

- ...Broadcast quality infinite window time base correction and synchronization from any video source
- TBCard plugs directly into Amiga (perfect for the Toaster) 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
- Now features S-video in and out **649.00**

I.DEN **IVT-7**

DIGITAL TIME BASE CORRECTOR/ FRAME SYNCHRONIZER

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

The KitchenSync

Dual Channel TBC

- Two complete infinite window time base correctors on one IBM AT/Amiga compatible card
- Plugs into any IBM AT or any Amiga 2000 or 3000 PC slot
- Works with any video sources including consumer VCR's and camcorders
- Use more than one Kitchen Sync linked together to synchronize even more channels.
- S-VHS and Hi-8 compatible. Has S-video input with option for S-video out
- Complete 100% accurate sync generator built-in. Totally regenerates all sync and blanking signals.
- Absolute 100% broadcast quality output
- Built-in Proc Amp with Hue, Saturation, Contrast and Brightness adjustments
- Advanced sync output – useful with any VCR capable of taking an Advanced Sync in.
- Completely digital design – no Pot adjustments necessary. The Kitchen Sync is completely microprocessor controlled and easy to adjust **1299.00**

DIGITAL PROCESSING SYSTEMS INC.

DPS VT-2500 Personal TBC III

The VT-2500 Personal TBC III is a third generation TBC card from DPS - the market leader in broadcast quality time base correction.

Features:

- Composite and S-video inputs. Interfaces virtually any VCR, laser disc or camcorder to production switchers and computer video systems like the video Toaster.
- Special effects including Rock Solid Freeze (field and frame mode). Variable Strobe, Forced Monochrome are standard.
- Can be installed in any Amiga 2000/3000/4000 series or in any IBM PC compatible. Also includes DPS Personal Series software. Includes Amiga and Windows versions.
- The TBC III is also compatible with the RC-2000 remote control. The RC-2000 allows you to mix and match TBC II, III cards, DPS-230 rack mount TBC, and the Personal V-SCOPE.
- Backed by two year warranty. **729.00**

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.
- Backed by two year warranty **749.00**

NEWTEK

VIDEO TOASTER SYSTEM 2.0

Production Switcher

The Video Toaster Switcher is a broadcast quality production switcher which lets you perform cuts, fades, dissolves, key and color effects between any of 7 sources including 4 video inputs, two true-color high resolution frame buffers and a background matte generator. A separate overlay channel gives you the ability to key images or live video over the switcher during transitions. The switcher's graphic design makes it simple to learn and use while providing access to all the Toaster's breakthrough capabilities.

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
- Linear keyer
- External GPI trigger
- 256 level adjustable luminance key
- Automatic or manual (T-bar) control of transitions
- Soft edge wipes
- 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. Toaster Luminance Key does all this and more:

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. Many Toaster Digital Effects are not possible on any other device including whips, zoom trails, and the "Transporter". 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	Stats	Trajectories
Slide	Shatter	Puzzle	Analog Trails
Dissolve	Mirrors	Mosaic Tiles	Digital Trails

Character Generator

ToasterCG is the only desktop video system in the world that can create YIQ-encoded, 35ns (nanoseconds) high-resolution titles. ToasterCG makes adding text to your presentations simple. Among the many powerful tools included are:

- Over 40 standard anti-aliased fonts
- 16 million-color fonts including brass, chrome, and rainbow to create dazzling graphic displays.
- 24-bit smooth color gradations
- Variable outline & shadows
- Choice of drop or cast shadows
- Variable-speed crawling and scrolling of text

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. You can also overlay graphics on incoming video or over either frame buffer.

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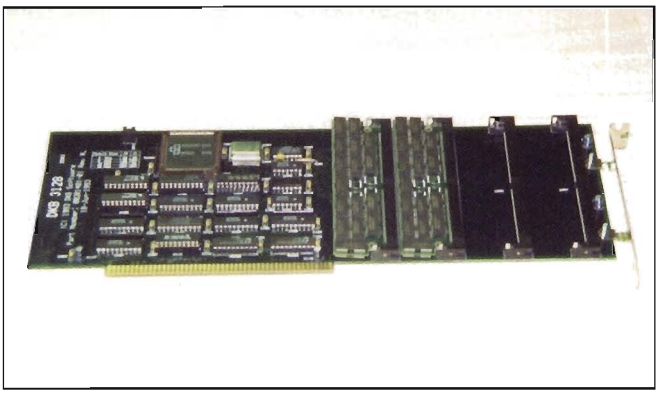
DKB RAM Expansion

By Brent Malnack

With the release of the Toaster 4000 comes the need for more RAM. In the past, Amiga 2000-based Toasters could run comfortably on a 9 MB system. Not anymore. NewTek has added some nifty new features this time around that tend to eat up RAM quickly.



"If you intend on taking advantage of the Toaster 4000's animation playback capability, the DKB 3128 appears to be the best way to go."

LightWave Animations

The Toaster 4000 gives users the ability to play back animations in real time. The Amiga 4000 motherboard can accommodate a maximum of 18 MB of RAM. With a fully-loaded machine, approximately six seconds of animation can be displayed.

DKB To The Rescue

DKB, long noted for producing quality Amiga expansion products, has a solution. The DKB 3128 is a Zorro III expansion board that occupies a slot in the 4000. Up to 128 MB of RAM can be placed on the board, allowing a maximum of 50-plus seconds of animation playback.

The board I received for this review had 32 MB of RAM (to expand to the maximum 128 MB, larger RAM modules are used).

I saw no signs of slowdown when the animation passed from the motherboard RAM to the DKB RAM. In fact, the transition was so smooth during the entire testing period, I could not determine when it was entering the new RAM.

Aside from animation playback, this RAM board may be put to use with many RAM-hungry applications, such as ASDG's Art Department Professional. Multitasking becomes easier as well.

Costs Going Up

Unfortunately, the well-publicized fire that destroyed a resin plant in Japan has sent the cost of RAM up enormously. This makes this board a bit more expensive than when I first received it (this is by no means DKB's fault; the entire computer industry is feeling the crunch).

With no RAM, the board's suggested retail price is $374.95. Before the fire, 4 MB of RAM could be obtained for around $145. This price has probably doubled; however as time passes and new sources of resin become available, prices are sure to make their way back down.

Even at current prices, this board can be considered a good bargain for new animators. For far less than the price of a single frame controller and VTR, enough RAM could be added to handle 10 seconds of animation. As an animator, I can tell you that 95 percent of the animation work I do is less than 10 seconds long.

Installation of the board is simple. By removing the Amiga 4000's case, the DKB 3128 can be plugged into one of the available expansion slots. Unlike the Amiga 2000, slots are sparse in the 4000, and with the board and a Toaster installed, there are only two remaining slots. Still, if you intend on taking advantage of the Toaster 4000's animation playback capability, the DKB 3128 appears to be the best way to go.

More DKB Stuff

Although the animation playback capability of the Toaster 4000 is useful, it needs to be put in perspective. For wedding and event videographers and industrial producers, the HAM 8 playback should be sufficient.

Animators at the broadcast level will probably want to record frames in the traditional manner to tape, or use the DPS Personal Animation Recorder. This is because the HAM 8 playback uses fewer colors and lower resolution than the Toaster output quality itself.

Still, the HAM 8 playback should be useful for test renderings, or when the desired format requires broadcast quality. Side by side with tape recorded animations, the differences are visible on diagonal lines as aliasing occurs.

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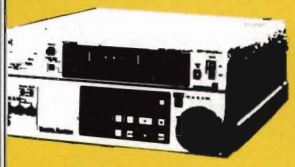

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REVIEW

MovieMaker

Affordable Non-Linear Digital Editing

By Douglas Nakakihara

Interactive Video Systems (IVS) is shipping an affordable non-linear digital audio and video editing product for the Commodore Amiga. With MovieMaker ($895), it's possible to play LightWave animations at 30 frames per second (fps) with 16-bit stereo sound.

The product can be used to create, edit, and playback animations with instant access to any frame or frames. This allows you to record a complete version the first time an animation is committed to tape. Using any NTSC or PAL Amiga screen mode, playback speeds of 30 fps or greater are possible.

Although MovieMaker's output is not broadcast-quality, it is a valuable tool in a professional pre-production environment. Quickly rendered 3D animations can be edited and tested with an audio track before being rendered in broadcast quality. Storyboarding also can be a breeze with MovieMaker because it allows static or animated sequences to be added quickly.

IVS's Perisound 16 audio board, included with MovieMaker, handles the audio chores. Frame-accurate editing is featured with 30, 25 and 24 fps SMPTE and 16mm and 35mm film foot-frame time bases supported.

Why MovieMaker?

Prior to MovieMaker, inexpensive alternatives to playing back animations full-screen at 30 fps with audio directly from a hard disk were limited. The Digital Processing Systems Personal Animation Recorder, recordable laserdiscs, and single-frame videotape recorders can tackle the video side, but they are more-costly solutions. The Video Toaster 4000's animation playback is great, but you only get a few seconds unless you add extra RAM.

Prior to MovieMaker, inexpensive alternatives to playing back animations full-screen at 30 fps with audio directly from a hard disk were limited... For productions that don't demand broadcast-quality output, such as home, demo, and industrial productions, the uses for MovieMaker are wide open.

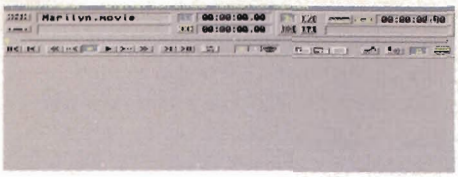
For productions that don't demand broadcast-quality output, such as home, demo, and industrial productions, the uses for MovieMaker are wide open. The major problem users encounter is acquiring the source images from live video. Real-time framegrabbers are not yet affordable. However, MacroSystemUS' VLab might be the answer with its IFR system that can effectively capture 30 fps using multiple passes of a videotape.

Hardware Requirements

Digital Creations' DCTV is the display of choice for MovieMaker. It provides millions of colors while still maintaining a compact file size. A DCTV with optional RGB converter setup allows use of a single RGB monitor, as opposed to using an RGB and composite monitor. MovieMaker automatically converts 24-bit IFF images to DCTV format.

MovieMaker requires no additional special hardware besides a hard drive for basic operation. However, to achieve optimum performance the system hard disk must support a high data transfer rate. This differs from disk access speed, which is the normal yardstick for rating hard drives. How often a drive does a thermal recalibration, which can cause playback glitches, is also an issue. IVS has found that certain Micropolis drives work best and offer MovieMaker packages bundled with an approved drive. A nice utility comes with MovieMaker to test your system's performance.

At least one separate partition must be set up on your hard drive to store the images and audio for MovieMaker's use. Other partitions can be used for normal Amiga operations, so the entire hard drive does not have to be dedicated to MovieMaker. Be forewarned that even with DCTV images, at 30 fps you're going to need



MovieMaker's word processor-like control, makes it easy to arrange playback of frames in virtually any order you want.

storage on the order of 100 MB per minute of playback time. You'll also need storage space for the source files before they are imported into the MovieMaker partition. A one gigabyte drive is probably the minimum for serious MovieMaker use. Fortunately, the prices of these drives have fallen dramatically.

The SCSI controller is also important. The one built into the A3000 works well using AmigaDOS 2.1, and of course IVS's own controllers are more than up to the task. Unfortunately, the A4000's IDE controller is too slow. However, now that Commodore has introduced the A4091 ($379) SCSI-2 controller for the Zorro III slot, MovieMaker should be able to perform using AGA display modes.

Sounds Like

On the audio side, the Perisound 16 AES software provides basic editing tools. Each audio sample is a single-stereo sample, as opposed to two separate samples. This currently precludes working with each channel separately. IVS included just enough features in AES to get MovieMaker shipping—enhancements are undoubtedly planned.

Although IVS chose to use incompatible file formats, an as-yet-unwritten utility could make it possible to use the multitrack and mixing capabilities of SunRize Industries' AD516 sound card and software to create a stereo sample for later playback on the Perisound 16.

Performance

Images transferred to the MovieMaker partition provide a database for building a movie. Audio can then be added to these frames. With word processor-like control, it's possible to make a movie by arranging the playback of these frames in virtually any order you want, including repeating frames. It is possible to make as many movies from the image database as you want. The editing tools are both easy to use and precise.

Right now, 30 fps playback is achievable for resolutions up to overscanned hi-resolution non-interlace (about 704 by 232) using three-bit plane DCTV images, but this could change with a SCSI-2 equipped A4000. Three-bit plane DCTV images can be grainy when viewed individually, but at 30 fps the perceived quality is better.

I've found that the DCTV output is more than acceptable for all but the most demanding situations and probably equals the picture quality the average person is used to seeing on their own TV. Additionally, the 16-bit sound adds so much to the overall effect, it almost seems to enhance the picture quality. IVS has done a tremendous job in this initial release of a ground-breaking new product.

VTU

Companies Mentioned:

Interactive Video Systems
14804 Beach Blvd.
La Mirada, CA 90638
(714) 228-2040

Digital Creations
P.O. Box 97
Folsom, CA 95763-0097
(916) 344-4825

MacroSystemUS
17019 Smugglers Cove
Mount Clemens, MI 48038
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SunRize Industries, Inc.
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Continued on Page 108

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Movie Maker Continued From Page 107

Interleaved Frame Recording with VLab

By Douglas J. Nakakihara

MovieMaker only offers a solution to the playback problem. If you're creating LightWave animations, this may be all you need. However, wouldn't it be great if you could somehow get non-computer-generated video into MovieMaker?

At various trade shows, IVS often demonstrates MovieMaker with a lengthy clip from the motion picture *Back to the Future*. The company digitized the movie a frame at a time from a laserdisc using DCTV. If there were only an affordable 30 frames per second (fps) framegrabber, think of how much time could have been saved.

MacroSystemUS's framegrabber VLab offers this ability although it doesn't do it in real time.

VLab provides a feature called Interleaved Frame Recording (IFR). Basically, this technique involves capturing frames out of order. However, by making multiple passes at the video source, eventually all 30 frames for each second are captured. This sounds impossible, but IFR works flawlessly even using an inexpensive consumer grade VCR. Furthermore, no additional hardware, such as a time base corrector, is needed.

The Key

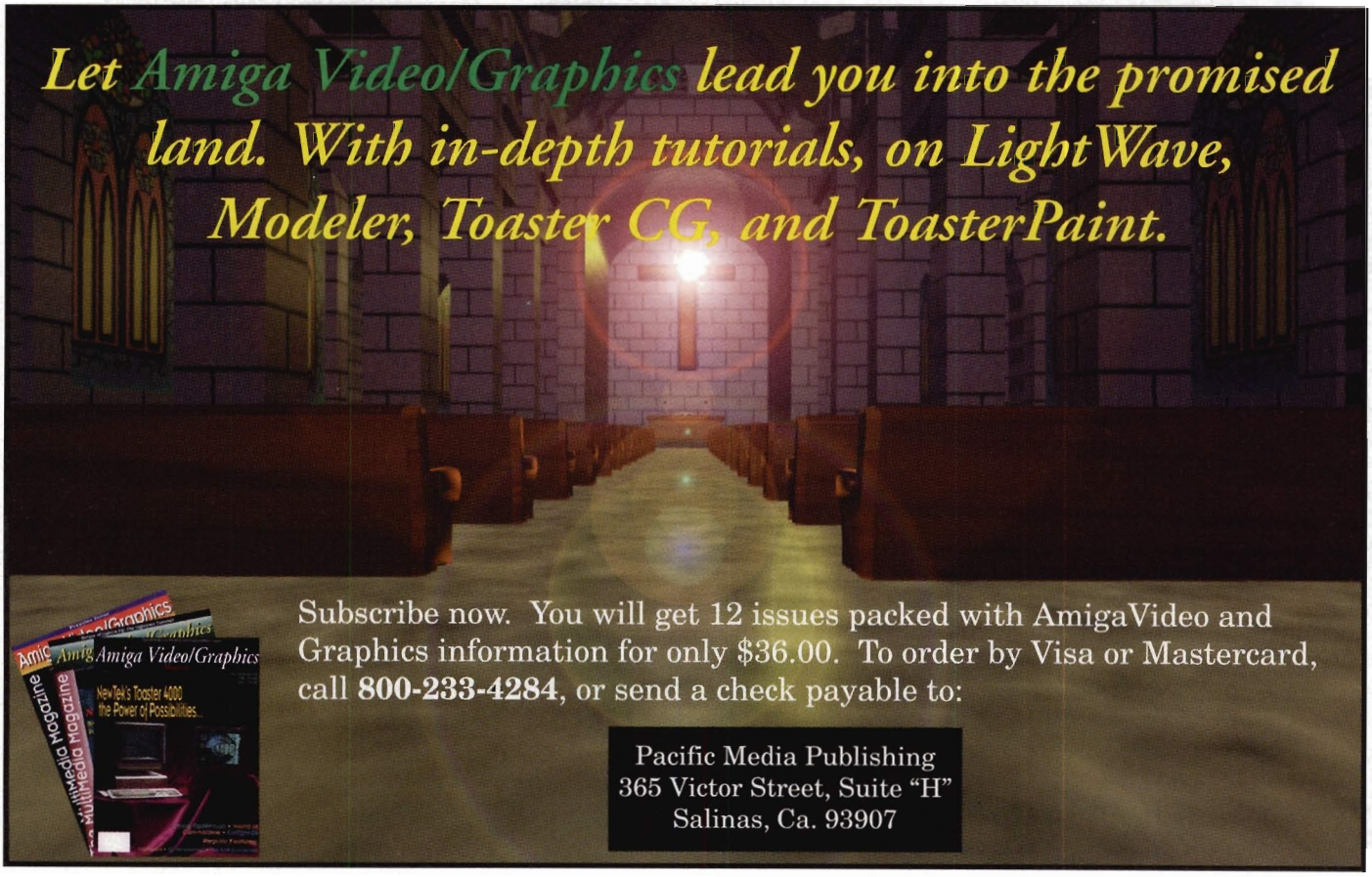
The cornerstone to IFR is the ability to locate a particular instant on a tape that can be recognized every time the tape is played. This moment on the tape is referred to appropriately as a key frame. Using the key frame as a reference point and time as a measuring stick, VLab can accurately grab frames to one-thirtieth of a second at any point beyond the key frame.

To illustrate how IFR works, see the example of a time line in the box on the next page.

Once VLab has found a key frame, a click of a button at the start of the scene sets it calculating the time between the key frame and the first frame to be captured. In the example, the scene starts 1-17/30 seconds after the key frame. The end of the scene is defined not by time, but by how many frames are to be captured. In the example, the scene is 62 seconds long (63.17 less 01.17). At 30fps, 1,860 frames will have to be captured.

When the key frame, start of scene, and number of frames to capture are set, simply rewind beyond the key frame and play the tape again. At the start of the scene, VLab begins capturing frames. At the end of the scene, simply rewind and play it again.

The key frame appears to be selected based on an abrupt change in the video signal. I have noticed that VLab often selects the moment there is a cut to a different scene as the key frame. After a while, it becomes possible to



predict where the key frame will be by looking at the video. This is important because it allows you to minimize the time between the key frame and the start of the scene, which in turn will decrease the overall time needed to capture all of the frames.

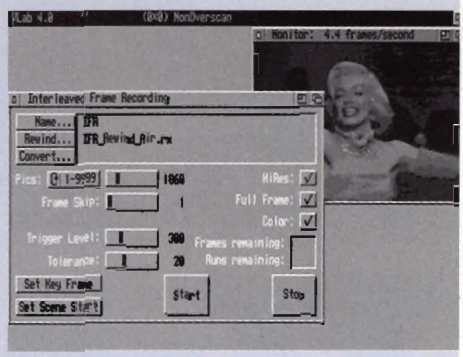
Automated Rewind

Obviously, the rewinding process can become tedious, but there is a way to automate the process. A product from Geodesic Designs called AirLink ($50) can learn your remote's rewind and play infrared signals. These can be triggered via ARexx. Provisions to do this are built right into IFR and sample ARexx scripts that come with VLab. AirLink and VLab work perfectly together. Simply push a button and walk away!

AirLink's capabilities go way beyond this application because it can control virtually anything that uses an infrared remote.

IFR also will work with any video source that you can rewind and play repeatedly, such as a laserdisc or camcorder. VLab is also great for capturing still frames. It includes real-time color, contrast, luminance and gamma controls as well as luminance, chromance and noise filters. If you have a Retina card, also from MacroSystemUS, you can monitor the incoming video in 16-bit color. VLab also features its own monitoring windows that can appear on the VLab interface.

Perhaps the best feature is that VLab fits into any Zorro II/III slot and does not require the video slot. Thus, it is completely compatible with the Video Toaster. MacroSystemUS offers VLab in three different flavors. One comes with two composite inputs ($499.95), another adds a Y/C input ($599.95) and an external version is available for the A500, A600, and A1200 ($549.95).



VLab has a monitoring window that can appear on the VLab interface.

Seconds.Frame	00.01	01.17	63.17
Videotape	<Key frame—	<Start of Scene>	————<End of Scene>

What Else?

The captured frames also can be mapped onto LightWave objects. Just think how impressive an animation would be with that effect! Remember the final *Babylon 5* shot where the "camera" pulls away from the station as you see live action through the window? That was done with captured video frames mapped on an object.

I have the feeling that once the MovieMaker/VLab combo gets into the hands of users, we are going to see some incredible videos. MTV might have its hands full!

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Company Mentioned:
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Lee Stranahan could easily be called the "World's Smartest Toaster Guy." Shortly after purchasing one of the first Video Toasters, Lee quit his day job and, with his wife's endorsement, took on the task of learning the Toaster inside and out. Along the way he started the first Toaster User Group and, Bread Box, the first Toaster newsletter (Bread Box became Video Toaster User.) His knowledge of the Toaster became so extensive that NewTek asked him to write the tutorials for the Toaster 2.0 manual. He is the author of "101 Toaster Tricks" and the host of the successful *Desktop Images* series of Toaster training videotapes. Lee could also be called the "Most Traveled Toaster Guy" as he has criss-crossed the country to present his Toaster workshops to over 1,000 satisfied Toaster users.

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CYBERSPACE

LightWave 3D

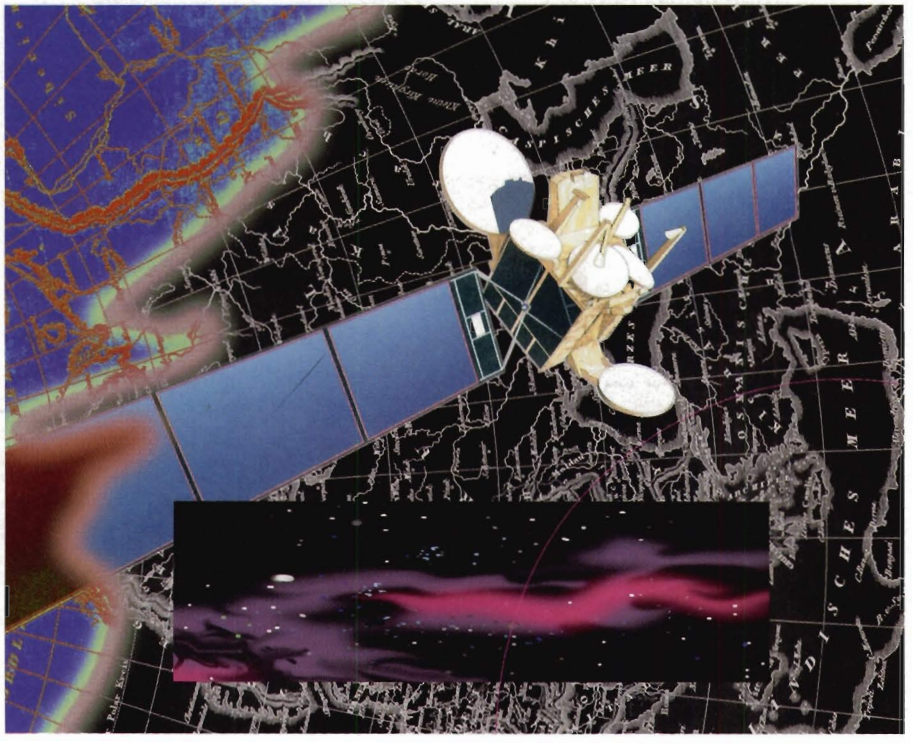
Helpful Public Domain and Shareware Software

By Geoffrey Williams

Cyberspace is the fictitious computer-generated realm found in Cyberpunk novels, but with LightWave we can create our own computer-generated realms limited only by our imaginations. This time we'll focus on LightWave and its public domain and shareware utilities.

Other than objects and textures, there are few LightWave-specific utilities. However, with LightWave 3.0's fully implemented ARexx port, utilities can talk directly to and control LightWave. I predict the release of some awesome stuff in the near future. Until then, here is what I have found after an extensive search of the bulletin boards across the United States.

Lou Wallace, editor of *Desktop Video World*, composed an ARexx script called *Lurker*. It sits in the background and waits for LightWave to render a 24-bit file. After rendering, Lurker grabs the file, JPEG compresses it using Art Department Professional, then deletes the original 24-bit file. You can set the JPEG compression level, and the number of frames. Lurker can also be used with any program that renders 24-bit files.



Although not really utilities, commercial product demos can be found for almost everything, giving a better knowledge of the product before you buy. One of the more unique LightWave commercial products is called *FDPro Flight Recorder* from Jaeger Software. It uses *Fighter Duel Pro*, a flight simulator which generates object and camera motion paths. If you would like to see a sample path, it can be found as FRDEMO_LIGHTWAVE.LHA in your LightWave directory. It includes objects and the flightpath for an aircraft flying a complex series of maneuvers.

If you already have FDPro Flight Recorder, you might look for Flight Tools. I found a very early release by Ross MacGregor, which was not quite finished, but by the time this article is published, there will most likely be an updated version. While the interfaces may not be finished on all of the modules, there is still some interesting stuff, like the ability to add gunfire to your LightWave animations. Yet to be implemented is flap motion. Finally, there is *Tactical*, a very slick Workbench 2.0 program that displays an instant animated preview of your flightpaths with many options. Tactical has a finished interface, which allows you to adjust the size of the planes (because FDPro was originally designed as an aircraft dueling game, you can have two interacting aircraft), see the traces of their paths, adjust the view and scaling, as well as the playback speed and frames using VCR like controls.

Generating Textures

While tons of textures are available, I found a few utilities that generate them on the fly. If you don't mind buttons labeled in German (without English instructions), check out *Texture Generator* by M. Vitolini. It's not too difficult to figure out what the buttons, sliders and gadgets do. It generates square textures in 128, 256 and 512 pixel sizes. Originally written for Imagine, the program requires you to pop the Texture into Art Department Professional, ImageFX or Image Master to convert it to IFF24. You can make some interesting textures, and it is fun to experiment.

If you don't mind the 160x100 pixel limitation of Alex Deburie's MapTrix demo version, you can have a lot of fun with it. The registered version offers full-sized bitmaps and animation capability. It generates images using a variety of options. There are several basic categories: Midpoint, Harmony, Random, Fractals and Process. Each one of these has several sub-options. For example, Harmony offers a choice of Harmony 2, Harmony Marble, Radiate and Waves. Waves has seven different mode settings and two Scale and Two Amplitude boxes for entering values. You can generate an almost endless number of different patterns, and the number of options in this utility is staggering.

You can use either a regular display (but no AGA yet), or DCTV, and the pictures can be saved in up to eight bits (256 colors). You can also further modify the images using a 3x3 or 5x5 Convolve, Ruffian, Emboss and Resize. If using the standard Amiga display, you can hit the tab key to see some dazzling color cycling. You can stop the color cycling at any point and save the picture that way. Besides producing textures that can be used for wrapping, it is also quite a bit of fun to play with.

Continued on Page 114

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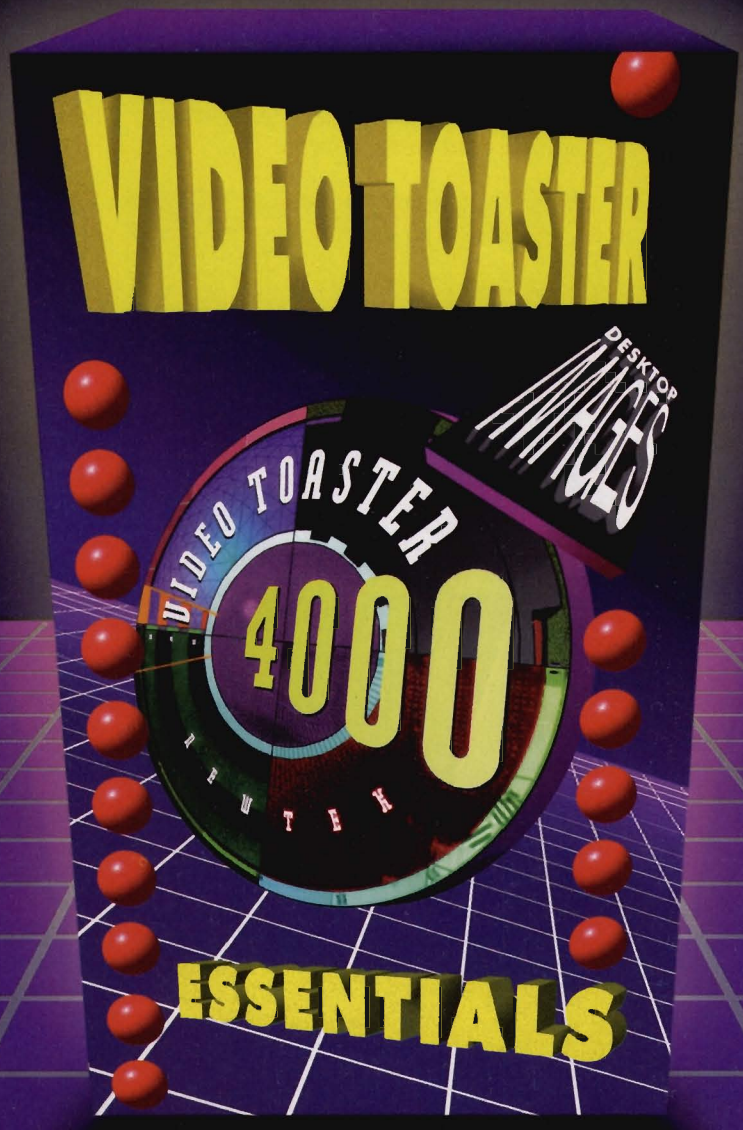

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UVSurf by Nicolas Dade is for those with a mathematical bent. You can input formulas and have them rendered as 3D objects in the TTDDD format (which Pixel 3D can easily convert into something LightWaveable). It recognizes the functions +, -, *, /, ^ (power), abs, sign (-1, 0 or 1), sqr, max (of two numbers), min (same), sin, cos, tan, asin, acos, atan, exp, ln, hsin, hcos, and htan. It also recognizes the constants *e* and *pi*, and the variables *u* and *v*. It comes with a set of formulas for a bumpy wave, Enneper's surface, Moebius strip, Roman surface, Snails, Zeeman bracelet, helix, torus, diffraction patterns and a number of simple and complex surfaces.

Particle Animation

Once you've entered the formulas, you can render the object in a number of ways, including dots, wireframe and simple shaded surfaces. The rendered object can be rotated along the x, y and z axis, and you can pop back to the formula screen for making changes. It's a bit awkward to use, but it does some neat stuff.

One of the capabilities that most of us want is particle animation—the ability to manipulate many tiny discreet objects. Two utilities help accomplish this.

The first is Mark S. Drummond's *ParticleGen*. It generates object files of single vertex polygons when loaded into LightWave 3D. These objects are random vertices scattered throughout a cube of space. They can be loaded into LightWave and morphed into other "solid" objects, giving the appearance of random particles forming into complex shapes. I've seen this used very effectively for text where the particles fly in to form the letters.

The doc file also mentions a morphing technique you can use to create real fractal bumps in a surface. There is a lot of room for experimentation.

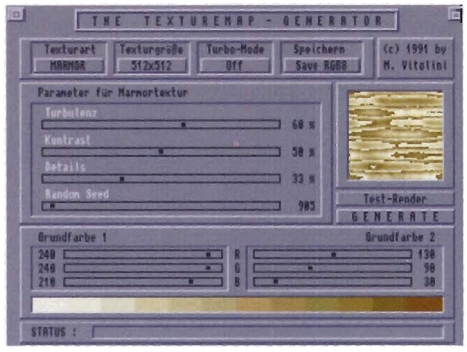
Jason Linhart and Chris Minshall wrote *Movement- Particle Fountain* as an internship project to simulate the launch of a standard projectile according to physical equations and constants. It creates a launch simulation and then modifies a LightWave 2.0 scene file to include the new object motions.

This makes a lot of very exciting effects possible. The included tutorial lets you make Beethoven lose his lunch, but there are many more aesthetically pleasing applications. The authors suggest fountains, waterfalls, explosions, rain and bouncing objects. There are many other possible effects.

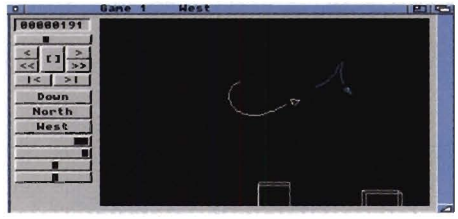
You have quite a bit of control. The launch types include point, linear, planar, disc and ring (from the outside edges of a disc). The objects can stop at the end of their path, reset to their original location or flow continuously. You can set launch angle and direction, as well as launch velocity and frame dispersion. You can even set a dissolve envelope for each launched object.

Movement-PF does not do actual collision detection, but it can do simulated collision detection with the ground. This makes effects like a bounce possible, and you can set the bounce percentage. This part of the program is still being modified and does not always work exactly as expected.

Ultimately, you would want to combine the effects of both these programs, although I haven't quite figured out how. However, even by themselves, they are must-have utilities that greatly expand the capabilities of LightWave. I put these two at the top of my list.



Texture Generator by M. Vitolini.



FD Pro Flight Recorder by Jaeger Software.

3D Bulletin Boards

I enjoy hunting down programs on the different BBSs across the country. It's like a digital treasure hunt, and you never know what you can find. The hard part is finding a BBS that has information and utilities related to your interests. For LightWave users, I have a couple of good boards that are well worth the call.

One of the best LightWave BBSs is Obstacle Illusion (616) 791-2109. There are almost 200 downloadable LightWave object and scene files, 60 texture and surface map files, lots of utilities, objects in other formats and pictures and animations. It's run by Ron Kramer, a dedicated LightWave user, and the active message section is frequented by the likes of Tony Stutterheim, Mark Thompson, Mark Randall and Todd Rundgren.

This board is also the home of the national Video and Amiga-Video message bases, for which Ron Kramer is the moderator. Your local BBS may carry these messages, which link you up to people across the country and places as far away as Australia.

Another excellent board for the 3D enthusiast is Studio Amiga (817) 557-2111. Besides the usual utilities, Studio Amiga has divided its file sections into numerous object types. While they support objects in Imagine, Sculpt and Real 3D formats, they also have LightWave objects in such categories as airplanes, animals, buildings, furniture, food, people, plants, spacecraft, vehicles, and a dozen other categories.

This board also has an active message section, with people such as Allen Hastings, Louis Markoya and John Foust. Jody Reimers runs the board, and it is definitely worth a visit.

It looks like Foust is going to put together a CD-ROM of objects. The CD is planned for a collection of PD files that he has gathered. His main motivation is to give people objects they can translate into the format they need using his Interchange Plus object conversion program marketed by Syndesis. I imagine that the objects will be for a variety of programs (probably even some from PC land), but if you have Interchange Plus or Pixel 3D (and you should have one of them), conversion to LightWave will be no problem.

By the way, if you start collecting a lot of objects and scene files, you'll go through a lot of hard drive space very quickly. There is a commercial utility called *PowerPacker* (distributed by Jump Disk in the United States) that I have used to compress both objects and scene files. For scene files, I typically save 75 percent in disk space. For example, the demo scene that comes with the Particle Fountain started out at 663k and was reduced to 181k. Objects also reduce dramatically. However, it does not effectively compress 24-bit pictures or framestores. It does work well on fonts, including PostScript fonts, with a savings of about 60 percent. That might be quite useful with the 250 PostScript fonts that come with the Toaster 4000.

There is a public domain program called *PowerPacker Patcher* (PP) that can be run as a background task. Whenever you attempt to load a PowerPacker compressed scene file or object, it is automatically decompressed for you. Another utility, *PPLoadSEG*, can be used to load compressed fonts automatically.

As usual, if you don't have the time to hunt these utilities down, I'll send you a disk with Lurker, FRDemo, Flight Recorder Tools, Texture Generator, MapTrix, UVSurf, ParticleGen, Movement-PF, PP, and PLoadSeg.

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The indispensible collection of utilities for Video Toaster users. Version 2 of the Toaster Toolkit breaks all barriers for harnessing creative control over your Toaster Environment--allowing for presentation professionalism limited only by your imagination. You raved about Version 1, break free of the mundane with these new and improved power tools of Toaster Toolkit 2.0: **•Color Font Converter - New! •FXToAnim - New! •Toaster Sequence Editor •Toaster Project Editor •AnimtoFX •FrameStore Compressor.**

Special Introductory Price! T5060 **$149.95**

BUY WITH CONFIDENCE FROM ATOMIC TOASTER!

Atomic Toaster Catalog has over 20 years of video production experience behind us. We have been servicing Video Toaster users since Day One with unrivaled technical support, a catalog so informative we receive referrals from NewTek, and innovative seminar training. Now that we have joined forces with **DevWare Video**, you will be able to count on our creative support and in-depth knowledge of all products for the Video Toaster--combined with DevWare's product purchasing power and abilities to fulfill your orders quickly!

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

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

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

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

The Professional Animator "Besides using the Toaster as an all-around production tool, I need to create corporate, industrial, and commercial animations. My work has to be broadcast quality and I must have the power to compete with other top competitors in the field."
Solution: Amiga 4000/040, Video Toaster 4000, 18MB RAM, 780 MB Hard Drive, 1084s Monitor, DPS Personal Animation Recorder, Nucleus Single Frame Controller, Pixel 3D Professional 2.0, Art Department Professional 2.3, Morph Plus, ADP Tools Professional (animation processor), Dynamic Motion Module (motion detection module), Vista Pro 3.0 (landscape generator), Toaster Toolkit 2.0, Crouton Tools. Options might include: DPS Personal TBC IV for rotoscoping applications. Call for pricing!

The Editor "My goal is to create a complete edit suite based around the Video Toaster. I need to perform A/B roll video editing, create graphics and animations, as well as record narration, edit sound effects and synchronize music with video."
Solution: Amiga 4000/040, Video Toaster 4000, 18MB RAM, 380 MB hard drive, 1084s Monitor, Pride Integrated A/B Roll Editing System, SunRize AD516 (8-track digital audio), TRexx Professional, Montage (character generation software), Roll'em (teleprompting software). Call for pricing!

We sell and support all Toaster-related software (see specials listed on the next page) as well as products from NewTek, SunRize Industries, Interworks, Pride, Digital Creations, Blue Ribbon Soundworks, RGB Video, Digital Processing Systems, Nucleus, Prevue, Macrosystems, GVP, JVC, Panasonic, Sony, Roland, Yamaha, Alesis and many others.

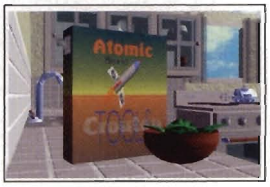
Do you want to know about the Video Toaster revolution and what it can mean for you? Call Atomic Toaster Catalog.

INTRODUCTORY OFFER THROUGH NOVEMBER 30, 1993 - $270 VALUE!

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

Crouton Tools: The Scene Machine Module #1

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



Crouton Tools lets you add power tools like Studio 16, AD Pro, TRexx Pro, Personal SFC, AmiLink, Pixel 3D Pro, Bars & Pipes Pro, SuperJam!, ToasterVision, Toaster Toolkit, and many others - to your Toaster. Put all of these programs a mouse click away--as if they were part of your Toaster's functions! Add Crouton Tools and move easily from program to program. Just like LightWave and ToasterPaint, all of your favorite Toaster-related software can now be part of your whole system. Crouton Tools can even be modified using TRexx Professional and/or Toaster Toolkit 2.0.

System Requirements: Workbench 2.0 or higher, Video Toaster 2.0, 7MB or more of memory, 2MB chip memory, TRexx Pro and Toaster Toolkit 2.0 helpful also. Special Introductory Sale Price! T5012 **$64.95**

VIDEO TOASTER 4000

•Realtime playback of your animations in 256,000 beautiful colors!
•Full-color animated wipes with transparencies and shadows!
•New CG software supports Postscript type 1 and Compugraphic outline fonts!
•LightWave 3D software has been completely optimized for the 68040 processor and features over 250 new photo-realistic features! V5050

ALL THIS FOR JUST...$1949!

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

SUNRIZE INDUSTRIES AD516

This amazing hardware locks to SMPTE code for effortless Audio-Video synchronization.

Comes complete with Studio 16 2.0; 16-bit editing software. This outstanding package will add Professional Digital Sound to your video, music and radio productions. Comes complete with our "**Audio Production for the Video Toaster**" videotape! T5066 **Only $1229!**

SunRize INDUSTRIES

SMPTE Output

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

T5067 **$159.95**

MONTAGE Only $324.95!

24-Bit Graphics Breakthrough for the Video Toaster from Innovision Technology. Your definitive solution for video titling, image composition, and effects presentation for the Video Toaster!

Features: Incredible Real-Time Font Scaling! Not available anywhere else! •Stunning Text Attribute Options • 24-Bit Graphics Imaging •Powerful Transition Capabilities • Complete Text Editing Control • Professional Enhanced Video Output.

The solution you need to maximize your creative output with your Toaster! T3053

MONTAGE FONTS I T5015 **$124.95**
10 exciting professional typefaces.

MONTAGE + MONTAGE FONTS 1 BUNDLE
T5055 only **$419.95**

Video Toaster Resource:

Call for System Design information, Creative and Technical Support
(801) 466-7330
Call for Orders: (800) 879-0759

DevWare Video

ADPTools 2 Professional

Only $139.95

ADPTools Pro is to Art Department Professional what LightWave 3D is to the Video Toaster!

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

•Spline-based keyframe animation for control of each parameter of any ADPro operator. •Real-time Animation Preview •EFX Matte can apply an operator's process selectively to an image •Multi-layered Compositing Tool •Create AGA animations with special effects and DVE transitions •Includes new custom operators designed especially for animation •Power Residue Sequencer generates fractal special effects. •Stereo imaging •Also includes Sequence Tool, Master List Tool, and Project Management Tool. T3600

Requires Art Department Professional V 2.3+.

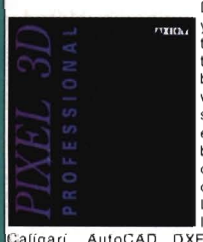
ADPTools 1.5 T3055 **$59.95**

Powerful image/animation tool for ADPro users. Perform complex image processing tasks in a few mouse clicks. Convert files, preview LightWave and other 24-bit animations, process images for use in interactive-multimedia productions--all automatically!

Pixel 3D Professional 2.0

only $125.95

Makes 3D modeling simple! Considered essential by LightWave 3D users everywhere. Create useful 3D objects, including text and logos. Load from or save your work into most 3D object formats.



Digitize and clean up your logo/artwork, then use Pixel 3D Pro to convert the IFF bitmap to a 3D object where it can be smoothed, edited, extruded, and even beveled. Save it in one of these 3D object formats: LightWave 3D, Imagine, Turbo Silver, Caligari, AutoCAD DXF, Sculpt 3D, 3D Professional, Draw 4D and 4D Pro, Videoscape, Wavefront or Digital Arts. A must-have! T1036

ANIM Workshop T3078 **$55.95**

ANIM Workshop provides you with tools for processing/editing your Amiga format animations. Cut, copy and paste frames within an anim or from one anim to another. Process LightWave 3D images and create animations you can play on any Amiga!

Pixel 3D Professional + ANIM Workshop

TRexx Professional 2.0

Only $139.95

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

Create sophisticated scripts without any knowledge of ARexx. All ARexx tools are connected together creating a fully integrated system. Quickly and easily manage large quantities of Toaster Framestore images. Create your own ActionFX and OrganicFX to produce custom results for demanding clients. Use TRexx's unique Real Time Mode to develop scripts in a fraction of the time it used to take. Provides powerful batch processing tools which save time and disk space. Includes support for AmiLink, Art Department Pro, BCD-2000A, DQ-Taco, MediaPhile, MorphPlus, PC-VCR, Personal SFC II, Personal TBC III, Pixel 3D, SunRize Studio 16 and VISCA. T1180

Interchange Plus 3.0

Only $139.95

Newest release from Syndesis! ***Now includes three high-end Converters for Wavefront, AutoCAD DXF and 3D Studio formats - previously sold separately for almost $600!*** These are in addition to the Converters for formats such as LightWave 2.0, Imagine (PC and Amiga), Turbo Silver, Sculpt, VideoScape, PAGErender, Vista DEMs, Imagemaster ISHAPES and CAD-3D.

Version 3.0 has new features like an ARexx scripting interface making it easy to control complex conversions, even more (72) InterFonts including 49 new fonts from ARock Software's Masterpiece InterFonts collection, and enhanced support for the Toaster 4000. "Select All" and "Smart select" buttons have been added to the interface. With a single keystroke, "smart select" automatically adds all recognizable 3D model files to the Selected File list. The new LightWave Converter now has support for a nearly unlimited number of points per polygon and saving models as scenes or objects. The new InterFont Converter makes smoother shapes, representing curves with a minimum of points.

Syndesis 3D-ROM New! T5053 **$149.95**

Dynamic Motion Module

Only $99.95

The easiest, most accurate way to animate with LightWave 3D!

New Release from Positron Publishing. Dynamic Motion Module lets both animation novices and experienced animators rely upon the laws of physics and computing power of the Amiga to automatically define and create real-world motion and object interaction in LightWave animations. Tell the program how much an object weighs, how fast it's moving, and its direction of travel. Then sit back and let your Amiga define the motion and interaction of the objects in the scene. Many other features which make it perfect for all animation tasks! T5053

Home Manager Pro T4035 $29.95

Organize your life with this indispensible information manager!

Home Manager Professional contains the following modules:

•Address Book •Appointment Calendar •Area Codes •Contacts Database •Inventory •NotePad •To Dos •All areas have - alarm clock, online help, extensive search, palette control, full printing, uniform display of date and time.

OctaMED Professional V. 5

Newest Release Only $69.95

"OctaMED was already by far the best MIDI and sample sequencer about - now it's even better." **CU Amiga.**

92% Rating and CU Amiga's Top Rated Award

Over 100,000 sold! •Fully updated for Kickstart 2.+ •64 MIDI tracks •On-line hypertext instruction • Menu-driven interface •Named blocks •Redefinable keys and mouse buttons •Generic slide function •Improved control over sample editor effects •Autosave option.

In addition, the pitch changer has optional anti-aliasing. The volume boost has an optional 100 per cent limiter to avoid distortion. The filter has a further adjustable parameter, and the mix function allows you to alter the relative volumes of the two sounds. Its standard features are easier to use than ever!

•8 channels of audio using the Amiga's own built-in audio hardware •Powerful sampling software to create your own instruments! •Standard music notation display mode. Compose and edit using tracker or stave formats •OctaMED will print out all blocks in a song, complete with play list, instrument names and tempo information.

Requires Kickstart 2+ and at least 1MB RAM.

OctaMED Professional 4 T4001 **$39.95**

If you are more budget conscious or only have Kickstart 1.3, this is the version for you. Still has all of the basic features which made OctaMED a worldwide best-seller!

Cocoon T5056 $89.95

A Powerful Morphing System, at an Affordable Price!

Cocoon is a full-featured, professional morphing system. You can use it for dual image morphs, single image warps, or sequential morphs. Transition curves are user-definable and morphing speed can be finely controlled using alpha channel images. Advanced image compositing is built in. Cocoon's unique features: built-in virtual memory to conserve RAM, full control over the transition rate of each pixel using alpha channel images, automatic variable level transparent color compositing, ability to composite with any background being transparent, interface displays source and destination images in color, and automatic image scaling. With Cocoon, you can load any IFF image, including AGA formats, and save frames as 24-bit, HAM, HAM-8, or 16-level grayscale.

Cocoon works on any Amiga with 3MB of RAM or more. 8MB are required to render high resolution morphs. Hard drive required with less than 4 MB, highly recommended otherwise.

Graphics Workshop V1.01

Only $34.95

Re-introduced and available at a killer price! Graphics Workshop has a huge toolbox, graphics effects, page flipping and moviepath animation. **Features** include a 10-brush library, gray-scaling, line art generation, true anti-aliasing, true polygon generation (3-22 sides), rays, four-point curves, brush masking, color replacing, rub-thru drawing, pattern library with pattern draw, automatic, normal and half-brite shadows, gradient fill, wrapping, variable speed air brush, two types of stenciling, 3-D perspective, and much more! Originally available from Holosoft Technologies. Compatible with all Amigas and versions of AmigaDOS. T4007

Montage 24 T5068 $279.95

New from Innovision Technology! Produce network-caliber titles and graphics in 16 million colors! Works with most popular 24-bit graphics cards (NTSC & PAL) such as ImpactVision 24 or OpalVision. Like Montage for the Video Toaster, you can produce razor-sharp, anti-aliased titles with real-time "Click & Drag" font scaling. You can also create a wide array of color effects such as embossing, gradient fills, transparency and soft cast shadows, as well as 24-bit backgrounds with gradient spreads, translucency blending, beveled boxes and wallpaper and tile effects. Many more features!

Montage Fonts 1 T5015 **$124.95**

Montage 24 +Montage Fonts 1

Great Value! T5069 **$369.95**

HomeBuilders CAD *Deluxe*

Only $79.95

Includes: Contractor's Upgrade, HomeBuilders Library 1 and DeckBuilders CAD Design and Estimating System for Decks. From a room addition to a cluster of condos; HomeBuilders CAD makes it easy to design, change and estimate your next project. Features include: •20 acre drawing area. •Accuracy to 1/60th inch. •Supports buildings over 200 stories high. •Over 300,000 layers. •Over 60 predefined doors and windows. Drawing features: PAN, ZOOM, ROTATE, COPY, ADD TEXT, AUTO-DIMENSIONING, UNDO, and TOPOGRAPHY.

View plumbing and electrical components separately. Automatically generates wire frame FRONT, REAR, and SIDE elevations. Spreadsheet-style cost editor. Calculates material, labor and overhead costs. Displays or prints cost summary or detail. Calculates backfill and excavation costs. Easy-to-use documentation. Contractor's Upgrade allows you to have up to 1000 items (instead of 450) per layout. Library 1 is a library of furniture and custom kitchen cabinets. AmigaDOS 2 compatible. Requires 2.5MB of RAM. Original list price of over $400.00! T4032

HomeBuilders CAD 2

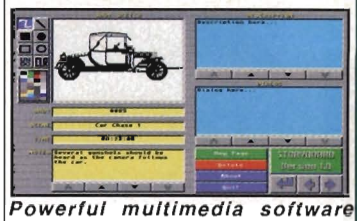
Only $59.95

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

HomeBuilders CAD *Upgrade*

T4032u **$16.95**

Helm T5050 $99.95



Powerful multimedia software which will allow you to easily create interactive presentations. Fantastic value for the price!

Helm is an authoring system and a powerful graphics program for the user with little interest in the effort or the technical know-how that software development usually requires. It will handle the more difficult chores and let you concentrate on the creative part of the design. You can rapidly create interfaces by drawing buttons, textfields, imagefields, and other objects on the screen. The objects can be connected to preprogrammed actions or user-created scripts that access sophisticated procedures for handling databases, music, sounds, pictures, animations, text, and visual effects. The process is so easy that even complete novices can create powerful applications in minutes. In Helm, these are called books.

Artists and multimedia specialists will appreciate Helm's graphic tools: user-defined brushes, multiple paint styles, image scaling, palette manipulations, histograms, edge detection, halftoning, mosaics, color effects, and customizable filters. Helm is useful for applications in education, entertainment, reference, business and science.

"...an extremely powerful program...Helm features screen and brush wipes-something CanDo can't do - it is a fine interactive multimedia creator...at a list price of $129, it's a steal!" (July 12 Microtimes)

Helm supports all Amigas 500-4000 and Kickstart 1.3 or higher.

Roll'em T5013 $69.95

Use your Amiga 500 or 1200 as an automatic teleprompting and titling program, powerful enough to satisfy your most demanding professional applications. Includes well-documented manual with easy-to-follow examples. Still credits or titles are possible. Can be operated from the computer or remotely via joystick or foot pedal. From Designing Minds.

AsimVTR T3050 $53.95

Record your animations to your hard drive, as well as move, save, and load frames. Combines both frame-accurate editing functions with real-time playback speeds. Has VCR-like control panel in playback mode. Can also be used as a display tool and with ARexx commands, as a dedicated storage device. Great Value! Your other choice is to spend hundreds more! Playback speed is dependent on hard drive configuration. From AsimWare Innovations.

Desktop Video Software

Broadcast 3D Fonts Mstr Packs	TCall	ea $83.95
Broadcast Titler II	T1161	$215.95
Broadcast Titler II Super Hi-Res	T3051	$265.95
Broadcast Titler II Font Pack 2	T1162	$95.95
Cinnamon Toast Fonts I or II	TCall	ea$61.95
Kara Fonts Vol I-IV	TCall	ea$61.95
Masterpiece Toaster Fonts	T3052	$89.95
Pro Fills Vol I (JEK)	T1175	$35.95
Pro Fills Vol II (JEK)	T1176	$35.95
ProVideo CG II (Shereff)	T1163	$109.95
ProVideo Post (Shereff)	T1177	$139.95
Scala Home Video Titler	T1101	$89.95
Scala Multimedia 210 (AGA OK)	T1198	$265.95
Texture City CDROM (100 txtres)	T5016	$119.95
ToasterF/X	T5017	$125.95
Toaster Textures (50 Textures)	T5059	$59.95
ToasterVision	T1165	$125.95
Video Director (Gold Disk)	T1116	$127.95
Video Toaster User Kbd Ovlys	T3054	$27.95
WaveWriter (Unili)	T5061	$73.95

DEVWARE VIDEO has the largest selection of videos and books - below is just a sampling. ***SPECIAL!*** Order any 3 videos and receive The Amiga Video absolutely FREE!
(Bundles count as one selection.)

SPACE WARS & OTHER ANIMATIONS

Space Wars & Other Animations V4027 **$19.95**
(Pictured above) Superb animations from Tobias Richter, one of Europe's best Amiga animators. Centerpiece is Space Wars, 8000 frames spanning 7 entertaining minutes with original soundtrack by Norwegian musician Bjorn A. Lynne. Space Wars' stunning, ray-traced animations took 5 Amigas over 4 weeks to render. 40 minutes

ANIMATION - ENTERTAINMENT

Computer Animation Festival New Release!
Miramar brings you 21 award-winning computer animations mixing humor, adventure, song and fantasy into 45 entertaining minutes. Also includes Todd Rungren's "Change Myself" video...which was done using the Toaster's LightWave 3-D software. V2035 **$18.95**

The Mind's Eye A compelling look at the universe, utilizing the talents of over 300 top computer animation artists. 40 minutes. V2043 **$16.95**

Beyond the Mind's Eye Best Seller! This one is even better than the original! Soundtrack by Jan Hammer. 40 mins. New Low Price! V2044 **$16.95**

History of the Amiga V2042 **$15.95**
Listen to the trials and tribulations which Jay Miner, R. J. and Caryn Mical, Dale Luck, Carl Sassenrath, Dave Needle and the rest of the original "Los Gatos gang" went through. 45 minutes.

Chronos (Miramar) V2045 **$16.95**

MONEY-SAVING BUNDLES!

Art Department Pro + ADPTools Professional T5057 **$269.95**
Montage + Montage Fonts 1 T5055 **$429.95**
Pixel 3D Professional + Anim Workshop T5058 **$164.95**
AMOS Professional/Compiler T5024 **$93.95**
ToasterVision + Video Guide to ToasterVision T3092 **$159.95**
DPaint 4.1 + DPaint IV Vid. Guide T3071 **$119.95**
DPaint 4.1 + Adv. Tech/Dpaint IV T3072 **$119.95**
DPaint 4.1 + Both DPaint IV Vid's T3073 **$135.95**
Imagine 2.0 + Understanding Imagine 2.0 Book T3066 **$199.95**
Imagine 2.0 + Imagine 2.0, The Detail Editor Video T3094 **$199.95**
DCTV T3501 **$289.95**
DCTV + Killer Graphics Vol I & II T3507 **$325.95**
DPaint IV Video Guide + Adv. Tech V2062 **$32.95**
Killer Graphics: DCTV Vol I & II V2091 **$49.95**
Killer Graphics: DCTV Vol I, II, III V4045 **$69.95**
Adita Video - Any 3 (specify) V2093 **$79.95**
Adita Video - All 7 Videos V2094 **$169.95**
Sony EVO-9700 Training I & II V4012 **$49.95**
Animation Videos Vol. I & II V2079 **$19.95**
Amiga Animation Hollywood Style, Animation 101, How To Animate Videos V4022 **$46.95**
History of the Amiga, How To Animate, Animation Vol. I & II Sale! V2089 **$44.95**
Mind's Eye, Beyond Mind's Eye V2084 **$29.95**

ANIMATION/GRAPHICS SOFTWARE

Aladdin 4D (Adpsec) T2031 **$255.95**
Art Department Pro 2.3 (ASDG) T1160 **$149.95**
Art Expression (SoftLogik) T2032 **$135.95**
Bars & Pipes Professional 2 T1183 **$224.95**
Brilliance (Digital Creations) New! T5019 **$149.95**
Caligari 24 (Octree) T3056 **$245.95**
CanDo (Innovatronics) T1193 **$129.95**
Cocoon (DevWare Video) New! T5056 **$89.95**
DeluxePaint IV 4.1 T1031 **$95.95**
DeluxePaint IV AGA T3058 **$109.95**
Directory Opus 4 (Innovatronics) T1032 **$63.95**
Distant Suns 4.1 (Virtual Reality) T1096 **$61.95**
Essence for Imagine 2.0 T5020 **$47.95**
Helm (Eagle Tree) New! T5050 **$99.95**
Hypercache Pro T5026 **$37.95**
ImageMaster (Black Belt) T3059 **$135.95**
ImageFX (GVP) T3060 **$259.95**
Imagine 2.0 (Impulse) T1174 **$179.95**
Morph Plus (ASDG) T1087 **$144.95**
Panorama Picture Perfect Fractal Landscapes T5021 **$55.95**
Professional Draw 3 (Gold Disk) T1095 **$125.95**
Quarterback Tools Deluxe T5027 **$75.95**
Real 3D Professional v2 T5044 **$389.95**
Scenery Animator 4 T5022 **$59.95**
SuperJam 1.+ T1185 **$87.95**
SyncPro T1184 **$179.95**
Triple Play Plus T5028 **$169.95**
Vista Pro 3 T1097 **$59.95**
Voyager 1.1 Sky Simulation T1182 **$63.95**
Will Vinton's Playmation (Hash) T1068 **$289.95**

DESKTOP VIDEO

The Basics of Video New Release! Classroom-based from Alpha Video explains video signals, tape formats, cameras and video recorders. V4018 **$24.95**

Understanding S-VHS New Release! What S-VHS really is, how it fits into your system and how it can improve your video productions. V4019 **$24.95**

Video Signals and the Toaster New Release! This will provide you with an in-depth examination of how the Toaster accepts and processes video signals. An invaluable tape for anyone working (or intending) with the Toaster. V4020 **$24.95**

Alpha Video 3 Bundle (above) V4021 **$69.95**

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

The AG-450 Companion V4017 **$36.95**

Canon L-1, LX-100 Camcorder V4013 **$34.95**

The Digital Mixer Companion Vol. I Elite Video will teach you how to get the most from Panasonic's AVE5 or MX10/12 digital video mixers, including how to use them as dual channel, time-based controllers for input to your Video Toaster system. 75 mins. V4014 **$36.95**

The Digital Mixer Companion Vol. II Learn how to do effects with your mixer which shouldn't be possible, but are -- with Elite Video's secrets. V4015 **$36.95**

Digital Mixer Companion I & II V4016 **$64.95**

Sony EVO-9700 Basic Training Tape Volume I. Learn all about every function, operation and trick for the Sony EVO-9700. Includes tons of information not in the manual. 50 mins. V4010 **$27.95**

Sony EVO-9700 Advanced Training Tape Vol. II Advanced: window, synced & timecode dubs, multi-track audio, single frame recording, use of external equipment for titling and A/B roll editing. V4011 **$27.95**

Sony EVO-9700 Training Series I & II Both Basic Training and Advanced Training. V4012 **$46.95**

Producing TV Commercials for Profit
With sample contracts V4034 **$54.95**

ANIMATION - INSTRUCTIONAL

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

Amiga Animation -- Hollywood Style Learn classic Hollywood,Disney-style techniques using DeluxePaint IV and Disney Animation Studio, from renowned Amiga animator, Gene Hamm. Especially for artists who are computer novices and computer users who don't draw with a mouse. 30 minutes-V2051 **$19.95**

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

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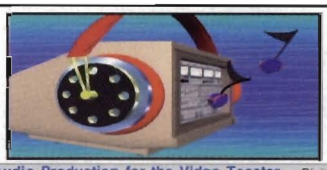

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TUTORIAL

Building Gears in LightWave, Part II

By Christian Aubert

In Part One (August/September, *Video Toaster User*), we built the gears and shafts needed to render the Gears picture. Now it's time to build the bearings and their housings and set them in motion. As in Part One, all numeric data is in millimeters (mm), unless otherwise noted. Keyboard shortcuts or numeric equivalents will be used as much as possible. I recommend that you find an empty layer and load the gear and shaft made in the first part of this tutorial, so you can use it as a reference point.

The Bearings and Housing

The bearing is made of a simple ball, 40 percent of the original GearShaft size with enough subdivisions to allow for extreme closeups (see Figure 1). The ball is rotated 90 degrees (Figure 2) on the X axis, so that it can spin on the Z axis (banking), the same as the GearShaft to which it will later be attached.

Once you have built the bearing and saved it, move it up 80mm on the Y+ axis. By putting the bearing and GearShaft in the background layers. Using the Points function in the Polygon menu and making those points into a polygon, you should be able to create a shape similar to that in Figure 3. It should contain the bottom half of the bearing without constraining it too much.

Now that we have the basic shape, it has to be refined to a smoother, more curvaceous shape, (that's the tricky part). Divide the polygon into triangles with the Triple function, and then subdivide it twice. Remove the points inside the poylgon, and the extra points that lie on both horizontal edges, leaving just an outline. Select all points, then press *x* to cut them, and *v* to paste them in the same layer. Now select all remaining points in clockwise order and press *p* to make them into a polygon.

If you are using a version of LightWave that supports the smoothing function, you can simply select the points that define the edges of the polygon, and press *M* to smooth the shape (Figure 4). Otherwise, you can smooth the shape by moving the extra points. Try to move symmetrical points so that your object doesn't look lopsided. When you are finished, the polygon should look somewhat similar to that in Figure 5. Save that polygon as HousingShape.

All that remains as far as modeling goes is extruding that polygon. Extrude once as in Figure 6 to give the InnerHousing, and once as in Figure 7 to give the OuterHousing, that is one fourth cutaway. Both of these objects should be saved separately.

Adding Surfaces

Unless you came up with a better backdrop color setup after experimenting with the first part of this tutorial, you should use the default settings because the picture makes extensive use of environmental reflection to determine the objects' colors. Whenever a surface attribute is not mentioned, you should leave it to its default setting. The housing's Diffuse levels should be set to 50, Specular to 100 and Reflection to 20. The bearing's diffuse levels should be set to 0, Specular to 100 and Reflection to 40. Both bearings and housing have Glossiness set to Medium and Smoothing turned On. This gives a nice metallic look to your objects. You also can add some fractal noise to the reflection levels to make them a bit less perfect.

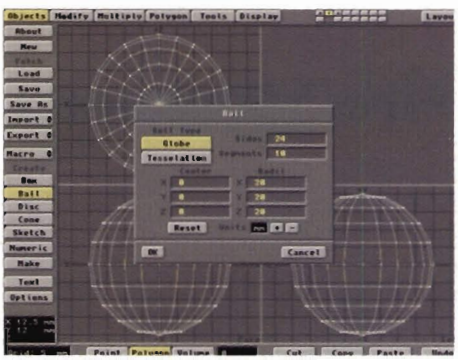

Figure 1

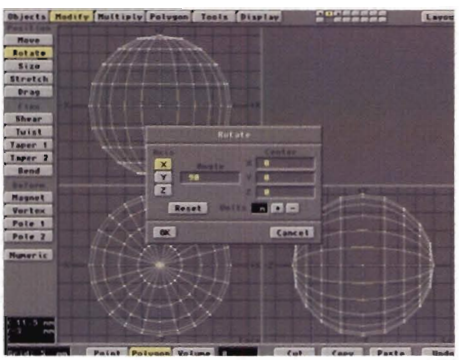

Figure 2

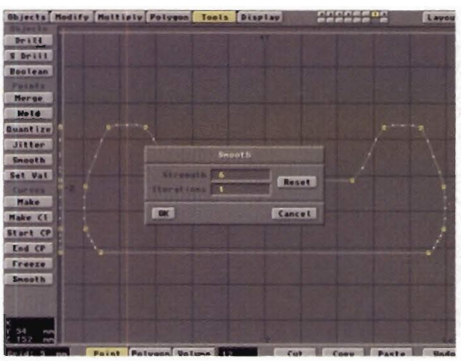

Figure 3

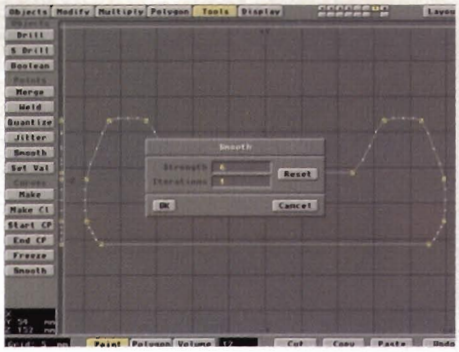

Figure 4

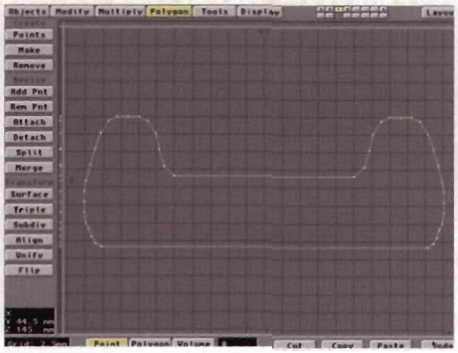

Figure 5

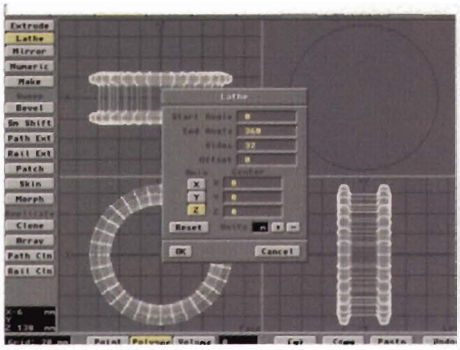

Figure 6

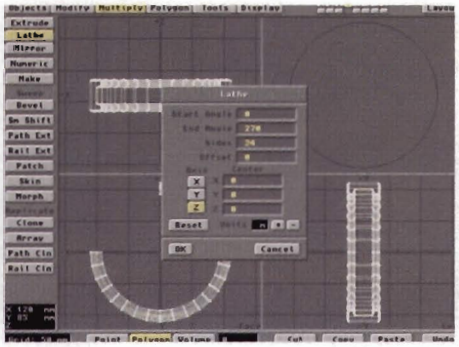

Figure 7

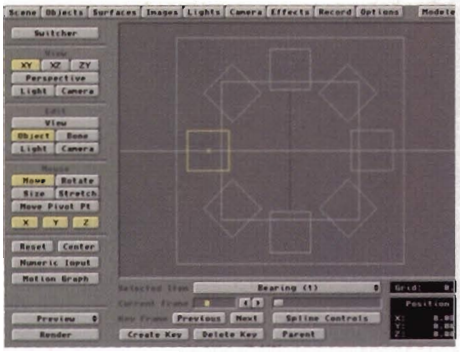

Figure 8

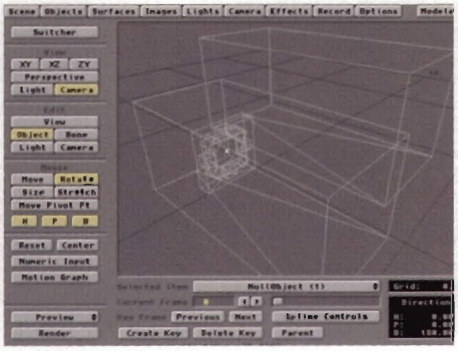

Figure 9

Layout

Load the scene you built in the first tutorial to add the final parts of the project. Load the InnerHousing and set its parent to GearShaft. If you built your object like mine, you should need to move it by about 200mm on the Z axis. Do the same with the OuterHousing, but don't set its parent to GearShaft, or it will spin when you set it in motion. Don't forget to create keyframes for all your objects.

Now load a Null Object and a Bearing. Set the Bearing's parent to Null Object, and the Null Object's to InsideHousing. Move the Bearing by 80mm on the X axis, putting it just inside the groove on the Housing. Repeat this procedure seven more times, every time adding 45 degrees of rotation on the Banking axis. Always set the Null Object's parent to Null Object(1) instead of InsideHousing.

This elaborate setup allows you to spin the GearShaft at a set speed, spin the Bearings around the Housing at a different speed (by spinning the Null Object (1) around its Banking axis) and have the Bearings spinning on themselves at still another different speed. Figure 8 shows Bearing (1) highlighted, and the *x* in the middle represents its axis of rotation, allowing it to spin on itself while the Null Object to which it is attached lets it spin around the GearShaft. This is much easier done than said, so go ahead and give it a try. You should end up with a scene similar to Figure 9.

If you are having any trouble with this setup, try it some other way. If you don't use null objects, you will probably end up with many of bearings in the same place, or bearings that spin around the Housing but not on themselves, or some other kind of problem that makes your animation look weird.

This animation example illustrates the use and need for null objects. You should study objects around you to make your own 3D creations look better, but you should also study the examples that NewTek has provided. They are a great source of knowledge.

Christian Aubert is a freelance computer graphics artist. He has been focusing on 3D graphics for the last five years.

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All About Mattes

How to Create Static and Traveling Mattes

By Brent Malnack

[Editor's note: The following is a excerpt from Mastering Toaster Technology, *a how-to guide to using the Video Toaster.]*

To create a static matte, you will need a Toaster system with 9 MB of RAM and a video source. To make a traveling matte, you will need a Toaster system with 9 MB of RAM, an animation controller and an A/B-roll edit system with a third source or an A/B/C-roll editing system.

One of the more complicated processes in computer animation is placing the animation over live video. It is also a process that requires a fair amount of sophisticated equipment. In this article, you will learn how mattes are created and how to put them to use.

Like other switchers, the Video Toaster has a built-in luminance keyer. Because it is possible to key a graphic over video, it would be logical to assume that the Toaster could key animations over video as well. This is partly true. However, unlike still image, animations contain various degrees of luminosity. As animated objects move about, the level of light hitting them is likely to change. This change in the light prevents keying the animation cleanly over video.

Think of a matte as a hole cutter essential for inserting a still graphic or animation into a video sequence. To use a traveling matte in video requires three rolling source machines. One machine plays the matte animation, a second plays the full-color animation, and the third plays the video footage over which the animation is to be keyed.

"Think of a matte as a hole cutter essential for inserting a still graphic or animation into a video sequence."

If you only have an A/B-roll system, it is possible to use the matte technique described in this article. However, the video source must be either a live video camera or a VTR under manual control. Before creating a traveling matte, it's instructive to examine how to work with a static matte. Unlike a traveling matte, a static matte requires only one video source.

Creating Static Mattes

Step 1: Create the graphic to be keyed over the video.

Load LightWave. Next load the SpaceFighter object that came with the Toaster 2.0 software. It can be found in the Space directory within the Objects directory. Enter Layout. Select Camera View. Click on the Rotate button. Click on the Object button in the Edit Item menu. The object should be ready for rotation. Click on the *P* and *B* buttons under the Mouse Function menu. This allows only heading rotation, which is rotation around the Y axis. Rotate the object until the Heading direction equals -50. Deselect the *H* button by clicking on it. Click on the *B* button. Using the right mouse button, rotate the object until its Bank direction equals 55. Bank is the rotation around the Z axis. Create a key frame at frame 0. Exit Layout.

Press F10 to render the object. Don't worry that the ship has been rendered over a horizon. The background will be eliminated with the matte. Once the frame has been rendered, exit LightWave and load ToasterPaint. Grab the frame from the DV1 buffer by using the Grab 1 function under the Prefs menu. This is found by holding the right mouse button down and moving the mouse to the right until the Prefs menu becomes activated.

Lower the mouse pointer over the Grab1, highlighting Four, and release the mouse button. While the image is being grabbed, the screen will flash for about 30 seconds. Save it as a framestore into your framestore directory. Exit ToasterPaint.

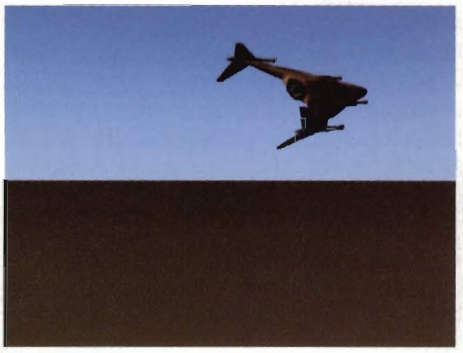
Step 2: Load the matte surface.

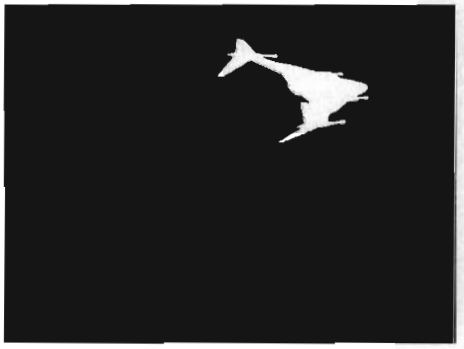
Return to LightWave. The SpaceFighter should be where you left it. Now it's time to load in the matte surface. (If you followed the hard drive installation instructions found on the install disk of the Mastering Toaster Technology software, you'll find a Matte and MatteSmooth in the Surfaces directory.) To create your own matte surfaces, follow these directions.

Find a surface for the SpaceFighter that has smoothing activated, such

as SpaceFighter-Fairing. Set the Surface Color to R=255, G=255, B=255. Activate the Luminous button.

If the Diffuse setting appears italicized, click on the Diffuse button and then the Texture button. Free the texture map by clicking on the Free Texture button at the bottom of the screen. Similarly, if the Specular setting appears italicized, click on the Specular button, click on the Texture button and then click on the Free Texture button.





The different steps of a traveling matte.

Click on the rename surface button, clear out the current name with the Del key and type in MatteSmooth. Click on the OK button. Click on the SaveSurface button. Type in MatteSmooth. Click on OK. Advance to the next surface name by clicking on the up/down arrow to the right of the Current Surface window until a new surface name appears. (If it displays Default, click again.) Examine the surface attributes to see whether or not smoothing is active. If it is, click on the LoadSurface button and fine Matte-Smooth. The surface attributes should now change to match that of the MatteSmooth surface just created.

Continue to change the surfaces one at a time until you find a surface without the Smoothing function activated. This will be SpaceFighter-EngineGlow. Load the MatteSmooth Surface. Click on the Smoothing button to deactivate the function. Save this surface as Matte. From now on, load either the Matte surface or the MatteSmooth surface depending upon how the object originally was set.

Once all of the surfaces have been set, activate the Zenith ColorOnly button in the Backdrop Control Panel. Set the ZenithColor to R=0, G=0, B=0. Press F10 to render the image. After the image has rendered, exit LightWave. Make sure that the background rendered as a solid black and the SpaceFighter is solid white.

Load ToasterPaint and as with the full-color rendering of the SpaceFighter, grab the matte rendering by holding down the right mouse button, positioning the cursor over the Prefs menu, lowering the mouse pointer over the GRAB1, highlighting Four and releasing the mouse button.

Make sure to select the framestore directory where the full-color frame was saved and save the Matte frame into that directory.

Step 3: Place the image over video with the matte.

Load the System 2.0 Project unless you have Toaster Toolkit software from the Byte Factory and have added the ArtCard effect to a project.

Select a live video source in the Toaster. For this example, assume it's channel one. Load the full-color rendering of the SpaceFighter into DB2. Temporarily select DV2 on the Program bus and select DV1 in the Preview bus. Select the ArtCard effect (bank F, row 4, column 6). Load the matte frame into DV1. Next select DV1 in the Overlay bus, channel 1 in the Program bus and the DV2 in the Preview bus.

By doing so, the matte frame is used to cut a hole for the SpaceFighter. Remember that the full-color rendering of the SpaceFighter has a horizon behind it, so it would not have been keyable if it had been rendered over a black background. Rendering it on a white background would have made the ship a better candidate for luminance keying. However, the black edge around the fighter would have been visible as would have the fringing sometimes associated with luminance keying. The highlights on the tail of the SpaceFighter also would be troublesome

Continued on Page 122

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All About Mattes Continued From Page 121

because they would have allowed underlying video to bleed through the highlight unless the clipping level was set precisely.

Traveling Mattes

To create a traveling matte, a similar procedure is used. The only difference is that instead of rendering a still image and a still matte, the entire animation is rendered in full color and also rendered as a matte. To create an animated matte, follow the procedures used to make a static matte, except render each frame of the animation as a matte.

It is important to render the matte animation in the same resolution as the full-color animation. Users of the LightWave Professional software should use the same level of antialiasing on both the full-color animation and the matte. LightWave's polygon edge detection makes the antialiasing of the matte a quick process.

Step 1: Record matte and full-color animation in the same manner.

Record the first frame of the full-color animation to tape for three seconds. Depending on the animation's content, record about 10 seconds of the last frame of the animation. Take note of the procedure you use when recording the full-color animation and follow it exactly for the matte animation. Stripe the matte tape and the full-color tape with the same time code. Begin recording the matte animation and the full-color animation at exactly the same time code address. This will make posting the finished piece much easier. However, if striping both tapes with the same time code numbers is impossible, write down the starting and ending points for both the matte and full-color animations.

Record traveling mattes on a separate tape from the full-color animation. Otherwise, a dub of the matte needs to be made, somewhat slowing down the production process. If you are using various formats of tape machines, record the matte on the lesser video format. For example, if your editing suite consists of one 3/4U-SP and two BetaSP edit decks and a single 3/4U-SP record machine, use the BetaSP decks for the full-color animation and the source video and the 3/4U-SP edit deck for the matte.

Step 2: Locate in and out points for A/B/C-roll editing.

To use traveling mattes, every VTR must be frame-accurate. The edit controller used to assemble the traveling matte, the full-color animated frame, and the video source must be capable of A/B/C-roll editing. This means that the editor must roll three source machines and the record deck simultaneously.

For this tutorial, set up the Toaster so that the video source over which the animation will be keyed is in Toaster channel 1, the full-color animation is in Toaster channel 2, and the matte animation is in Toaster channel 3.

Find the scene over which the animation is to be keyed and mark its in and out points. Next, mark the in and out points of the full-color animation. Finally, mark the in and out points of the matte animation that correspond to the in and out points of the full-color animation. The starting and ending frames of the full-color and matte animations must match exactly if the matte is to work properly.

Step 3: Set up the Switcher and perform the edit.

Select the video source in the Program bus, in this case, channel 1. Select the full-color animation in the Preview bus, in this case channel 2. Select the ArtCard effect from the Toaster switcher. Finally, assign the Overlay bus to the matte animation, in this case, channel 3. Perform the edit. The animation should appear cleanly keyed over the source video.

Limitations

Because the Toaster does not have a true third bus, there is no way to fade a still graphic or animation in or out while it is being keyed with the ArtCard effect. With this in mind, create an animation where the first frame contains no objects. This means that it is necessary to fly the logo or objects into the shot. Otherwise, the logo or objects appear as a take from a cut. If the logo or objects stay on screen, leave them there. Otherwise animate the scene so that the logo or

objects fly off-camera. The Toaster's alpha channel cannot be used to face a logo or object into and out of scenes because it is accessible only from ToasterCG.

If the objects in the animation contain transparent surfaces, they will not be transparent over the video source when using a matte. However, they will be transparent in relationship to other elements in the animation. For example, if a 3D glass logo flies onto the screen over a 3D car object, the car will be visible through the glass logo. Throughout the animation, the logo remains transparent. However, when it is not in front of the car, the background that is visible through the object will be the background against which the logo was originally rendered in LightWave.

Recall the SpaceFighter graphic used in the tutorial on static matte creation. It was rendered over the blue and brown horizon, but the matte cut a hole for only the SpaceFighter. To a viewer, the matte removed the background. However, if the SpaceFighter would have been transparent so that the horizon background was visible through it, the background also would be visible when the SpaceFighter was keyed over video.

It isn't wise to set transparent surfaces for objects that are to be keyed over video unless they look good over video. Test how the objects will appear by rendering a single frame from the animation along with the matte for that frame. Follow the procedure used earlier to place the still graphic over the video scene. Doing so should reveal whether or not the background against which the objects have been rendered needs to be changed.

Match Color and Lighting

One common mistake made with matte animation is color and light matching. When setting up an animation to be keyed over video, many animators prepare the surface colors and lighting of the object over a black background. Because the background will not be visible, these animators mistakenly believe it is not important to specify a background color. Nothing could be further from the truth.

Sometimes keyed animations appear to intrude upon the video. Although it is important that the animation be noticed, it is equally important that it complements the video over which it is being keyed.

The best way to prepare lighting and surface colors for keyed objects is to grab a frame of video from the scene where the animation will appear. Use the framegrab as a background image in LightWave. Take note of lighting angles, color saturation, hue and brightness of the background image. Try to match these with LightWave. It's amazing how color and light matching can enhance the final product.

Other Matte Information

Although creating traveling mattes requires a lot of equipment, it does not have to belong to the animator. Most animations are not posted where they are created. Most broadcast-level post-production houses have the ability to work with traveling mattes. In addition, more sophisticated switchers are able to dissolve the animation in and out of the background video as it is keyed. They should also have the unique capability of creating a transparent drop shadow around your objects.

Provide your clients with two tapes: one with the full-color animation and the other with the matte.

A/B-Roll Traveling Mattes

It is possible to key a full-color animation using an A/B-roll system. However, this approach has limitations. It requires that the animation be keyed over video from a camera or a manually- controlled tape machine. In this setup, the in and out points are marked for the animation, matte and the record machine. However, the video source machine must be started manually at the correct time. The downside to this technique is that it may take a few tries to get it right.

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Transferring Graphics From Print to Video

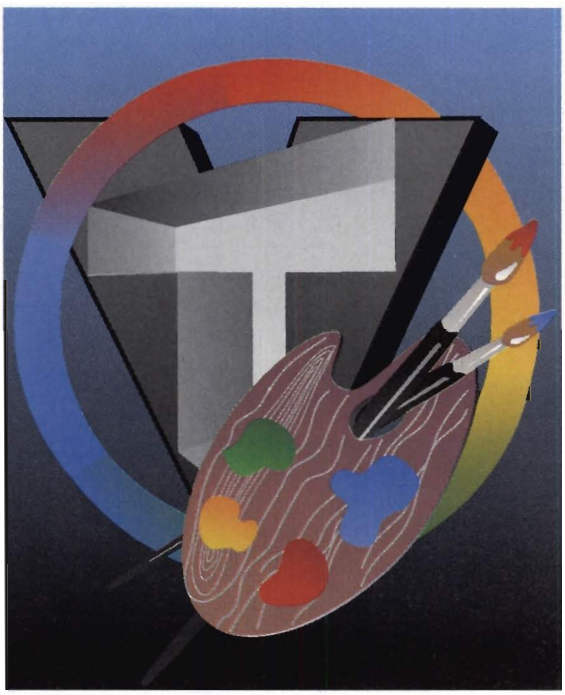
By Julian Willamson

Transferring logos and other high-contrast graphics from print to video presents a unique challenge to Toaster users. Impossible or difficult to reproduce manually, they're usually placed on video, frozen on one of the framebuffers, and imported to ToasterPaint. But further manipulation of the graphic often presents immediate problems. During the import process, both the original, sharp one-color lines and background blur, and become mottled with multiple colors. This scattered random color incorporated into the graphic prevents either flood-filling the image with color, or effectively using the No Background function to cut a brush for superimposition over other ToasterPaint backgrounds.

A typical cure (if you don't own third-party image processing software) involves lengthy pixel-by-pixel cleanup by hand (manually changing every pixel to a solid color) in order to use the Flood Fill and No Background tools effectively. The following method involves minimal pixel editing—enabling you to clean up graphics in less time and render them in high contrast.

Before we get started, let's examine two functions and their limitations. As you may recall, the Flood Fill button works by changing all adjacent same-color pixels to a selected color. The hitch: "same colors" only include colors within 16 color units of each other. Unfortunately, shades of color (the random color in your graphic) not within this range do not flood fill, resulting in many scattered pixels outside the flood fill tolerance range.

The No Background feature functions similarly: No Background excludes from the brush any color within a 16-unit range of that which is selected. This enables you to easily cut out graphics without tediously drawing around the edges, and also enables you to create a brush with holes in it. For instance, if you select white for the No Background color, and you cut a rectangle-shaped brush around a solid-black donut on a white background, the donut alone becomes your brush. To increase your exasperation, the same scattered random color that prevents an effective flood fill also prevents you from cutting a good No Background brush. The out-of-range pixels clutter the brush with pixels that did not drop out using the No Background function.



"The following method involves minimal pixel editing—enabling you to clean up graphics in less time and render them in high contrast."

These steps easily eliminate the out-of-range colors:

First step: Light the graphic evenly. If you have only one light, aim it as close to 90 degrees with the graphic as possible. If you have two lights, put them on opposite sides, at approximately 45 degrees from the graphic. This saves you time later, especially if your graphic is printed on textured paper.

Step two: From the Switcher screen, freeze the image. Enter ToasterPaint, and import the frame using a four-field grab, under the Prefs menu. You now have an image with multiple shades of colors, useless for flood filling and the No Background function (see Figure 1). Select the magnify tool to look at the image closely.

Step three: Under the Mode menu, select Colorize. Make the current color white, then press *w*. Colorize mode uses the luminance (brightness) values on-screen, but the chrominance (color) value selected. Selecting white eliminates the chrominance values in the graphic transforming them into shades of gray. (For more on Colorize mode, see page 22 in the ToasterPaint section of the Toaster manual.) Pressing *w* renders current settings to the entire screen (see Figure 2).

Step four: Under the Palette menu, select B&W. This gives the screen a strange, false color effect. Next, pick Remap under the same menu. This redraws the screen, making it look the same as at the end of step three, except for the color strip, which con-

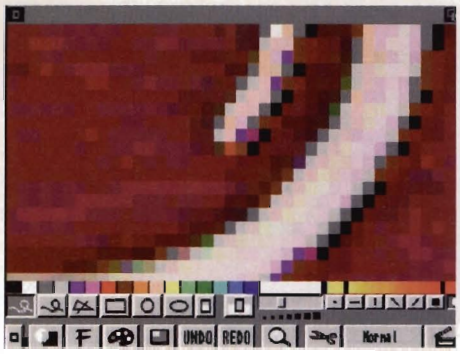


Figure 1

Figure 2

Figure 3

Figure 4

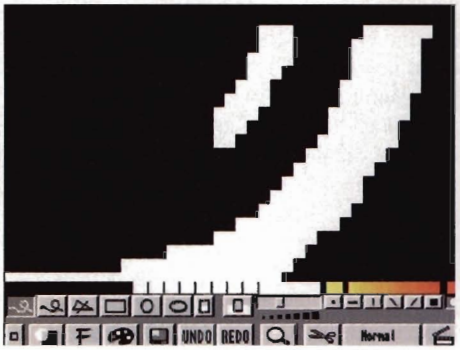


Figure 5

Figure 6

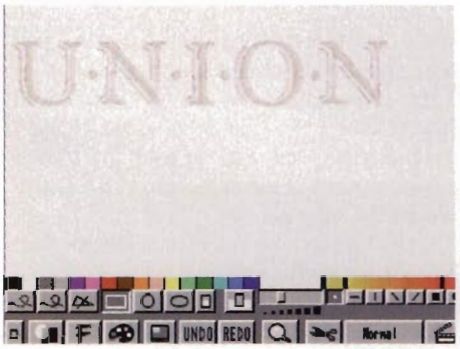


Figure 7

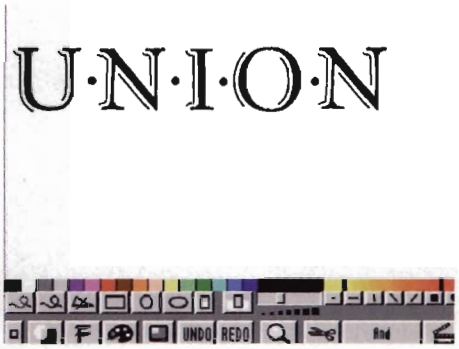


Figure 8

"Now your new graphic's flexibility shows."

tains only shades of gray (see Figure 3). Return to Normal mode.

Step five: Choose black as the current color. Under the Palette menu, select Copy Color. Then copy black into the color register (one of 16 on the Color Strip) just to the right of blackest black. Continue copying black into the registers, progressing toward the brightest white on the right. Gradually, the darker portion of the graphic solidifies to black, and the edges of the graphic delineate more clearly. If you copy color to a register and small black dots appear all over the lighter portion of the image, or the lines block up or close in, then you have gone too far. If this happens, select white and copy white into the register that caused the problem (see Figure 4).

Step six: Select white, then copy into all the remaining color registers (to the right of the last black register). As you go, the lighter part of the graphic gradually solidifies to white. Select the magnify tool and look at the graphic up close. Notice that all pixels are either completely black or completely white (see Figure 5). Wait to manipulate your graphic; your palette only contains two colors, and if you default it, the image reverts to multiple shades of gray.

Step seven: Pick the background color of your graphic (either solid black or solid white) as the current color. Select the color from either the far right or far left color register, not from offscreen. Choose the one-pixel brush, the rectangle and the scissors tool (see Figure 6). Under the Palette menu, select Copy Color. Move immediately to the Brush menu and select No Background. Draw a rectangle around your newly-created high-contrast graphic. At this point, you should have a high-contrast logo as your brush. Under the Brush menu, in the Swap submenu, select Copy this brush.

Step eight: Under the Palette menu, select Default palette. Choose any of the drawing tools (the brush disappears), white as current color, and press *w* to clear the screen to white (see Figure 7).

Step nine: Go to the Brush menu, select the Swap submenu, and release the mouse button on Restore swap brush to recall your brush. Notice that the brush changes to multiple off-colors. If you placed the brush on the page at this point, in the Normal mode, it appears as multiple shades of gray, as it was before you began changing the color registers in step four (see Figure 8). You may wonder: What have we accomplished? Only this: In making the logo only solid black and solid white, you effectively cut a cleanly-shaped brush, free of the out-of-range pixel clutter.

Step 10: Select black as a color, then And mode under the Mode menu. And mode uses the shape of the current brush, but not the colors (see page 22 in the ToasterPaint manual section). Place the brush. This results in a high-contrast graphic over white, with the full-palette range available to you for flood filling. (See Figure 9.) Switch back to Normal mode.

Step 11: If your graphic contains a great deal of straight lines, you may want to do some minor pixel cleanup around the edges (see Figure 10).

Now your new graphic's flexibility shows. Since you have a complete color palette, try flood filling a section of your logo. It should look perfect—a complete fix for the problems encountered with an unmodified grabbed graphic. You may modify the logo lines or the spaces between them with any color you want. You may even use white as part of your graphic, if you

Continued on Page 126

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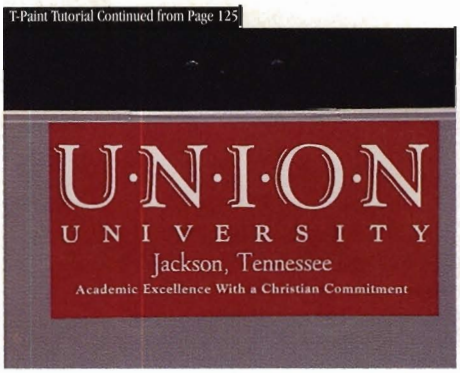

Figure 9

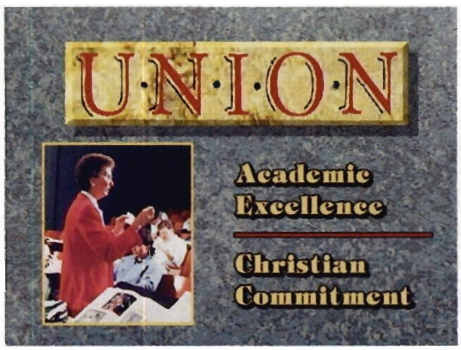

Figure 10

flood fill the background with a color not used in your graphic. Using no background, you could now recut the brush. It appears in sharp high contrast, and includes any color you might have added. Unlike the first brush we cut from the page with the modified palette, this brush is usable in normal mode with the Default palette. Save this brush to disk, and you can use it at any time with ToasterPaint images.

Hints: If you are texture mapping, and you want to preserve the aspect of the brush, hold down the Alt key at the same time you are using the left mouse button to map the image. Beware: Holding down Alt causes the screen to lock at the edges. If this happens, simply release the key, scroll the screen, and depress it again before releasing the left mouse button.

Try using Range mode for flood filling. If appropriate, it can lend depth to the graphic. Select a bright version of the color you want to use for one end of the range, and a darker version for the other end.

If you have access to a waveform monitor, then adjust your camera to create the highest contrast possible in order to start off with a better grabbed image. Adjust the iris until your waveform monitor reads 100 ire (maximum white), and adjust the master pedestal until the dark parts of the image rest at 7.5 ire (maximum black). This effectively stretches the contrast of a graphic printed on cream-colored paper, or in brown.

VTU

Julian Williamson is the video engineer and lab instructor at Union University in Jackson, Tennessee. He trains students to use the Toaster for live broadcasts, short-form documentaries, and in-house productions.

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Corey Petree
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WV Video Toaster Users Group
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South

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Arkansas Toaster Users Group
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6:00 p.m.

Club Toaster
St. Petersburg/Clearwater/Tampa
Larry Bragg
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6p-9a M-TH, 6p,F-9a,M
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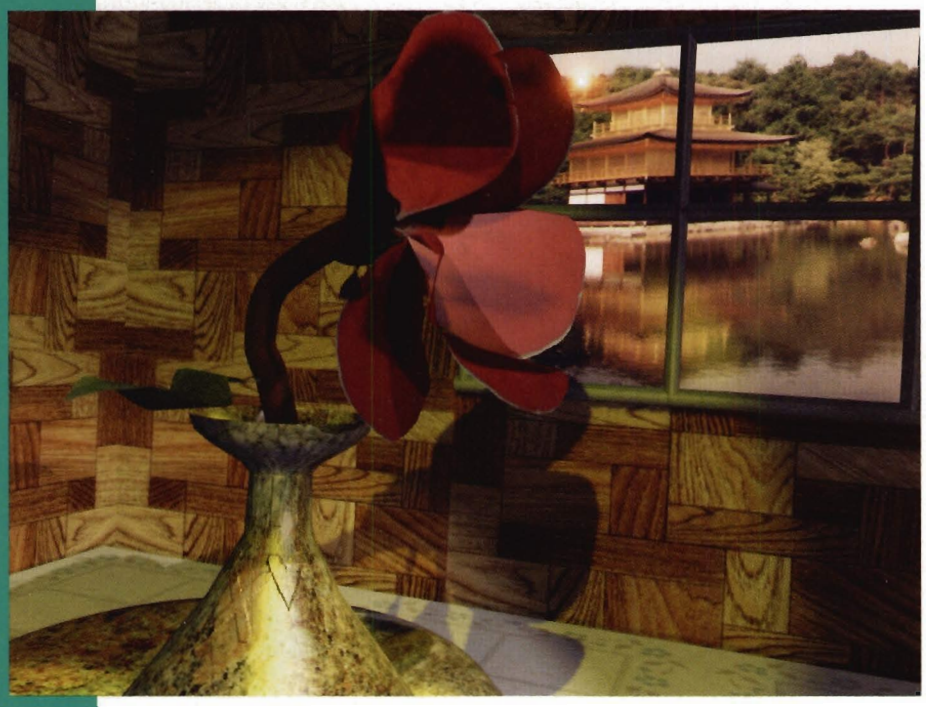
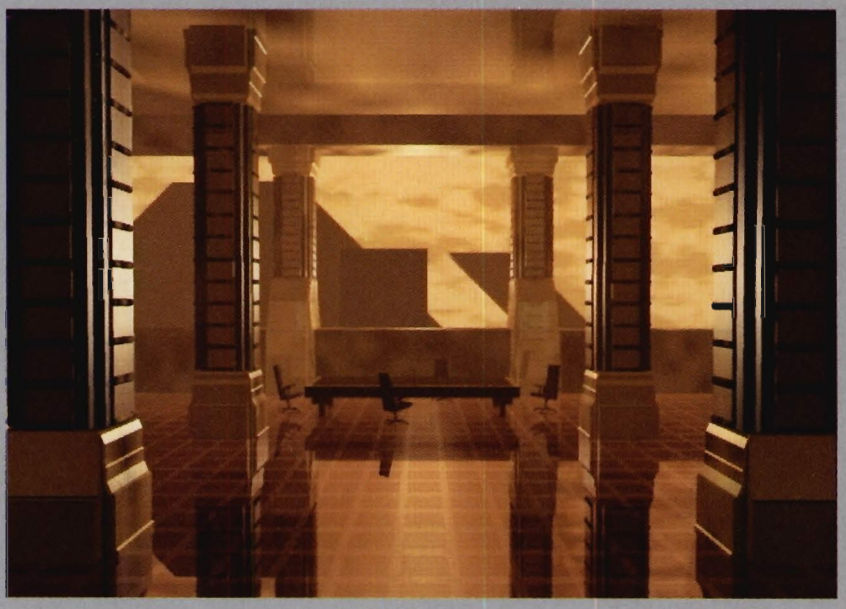
Continued on Page 145

TOASTER GALLERY



James Linehan

This image was created by James Linehan of San Jose, CA-based JLC Video (408) 268-2634. All objects were created with LightWave 3.0's Modeler and rendered with LightWave 3.0 on a Video Toaster system. The Bones function was used for the flower petals. The entire project took about 25 minutes using an Amiga 2500 with a 68040 and 16 MB RAM.



David Jones

ArcAngel was created on an Amiga 2000 ('030, 16 MB RAM). The station and background where modeled and rendered in LightWave 2.0, except for the nebula which was created with DCTV Paint. *BladeRoom* was also created with LightWave 2.0, except for the Pillars which were done using Pixel 3D's Bitmap Extrusion functions. This is Jones' rendition of the room from Ridley Scott's film *Blade Runner*. *The Station* was modeled in LightWave 3D, the nebula was created using DCTV Paint, and the planet and moon surfaces were done with Texture City Professional Images.

Glen Carr

A freelance artist based in Yorba Linda, CA, Carr can be contacted at (714) 777-9078.

He used LightWave 3D to produce the background, case and amber egg for *DNAmber.* The figure, image placement using RubThru, blur, and some touch-ups were done in ToasterPaint. For *Sea Turtle*, Carr took a video grab from his brother's underwater footage. The border was made in ToasterPaint, then imported into LightWave as a background where the type was placed. Created in LightWave 3D, *Flower's* background is a grab from a photograph that was manipulated using RubThru, shading, etc. in ToasterPaint.

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Computer Cafe

Computer Cafe used LightWave 3D and an '040/2000 to create this ad for west-coast restaurant chain Fosters Freeze Food & Fountain. The commercial has 15 seconds of 3D animation along with a series of live-action product shots.

All the characters dance to a Chubby Checker-like tune called Twister.

Contact Jeff Barnes or David Ebner
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Dan Young

These two images to the right are submitted by 19-year old Dan Young, an amateur computer artist in Nanaimo, BC, Canada.

Art Museum was created piece-by-piece in LightWave and took 28 hours and four minutes to render on an Amiga 2000 with an '040 28 Mhz board.

Space War is a LightWave/ToasterPaint combo and was created and rendered (including modeling of the ships and planet) in approximately 20 hours.

If you're wondering why the images are signed as "Kossatz," Young adopted his grandfather's surname for his artist's name as a tribute to the grandpa he never met.

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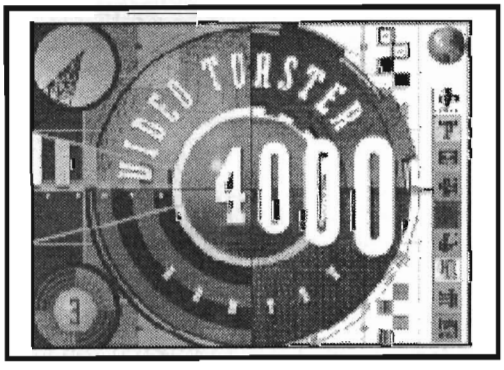

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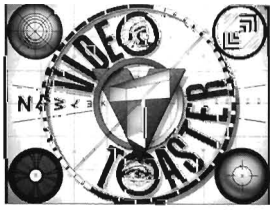

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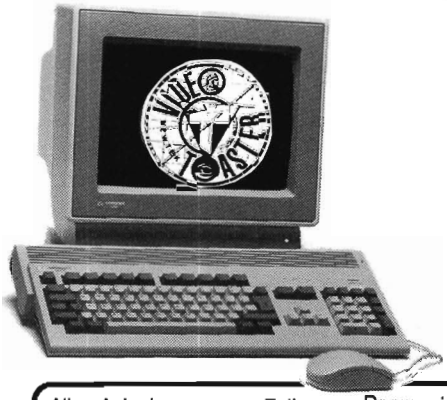

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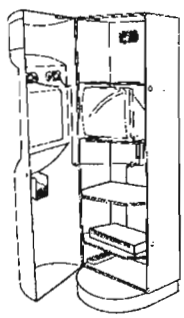

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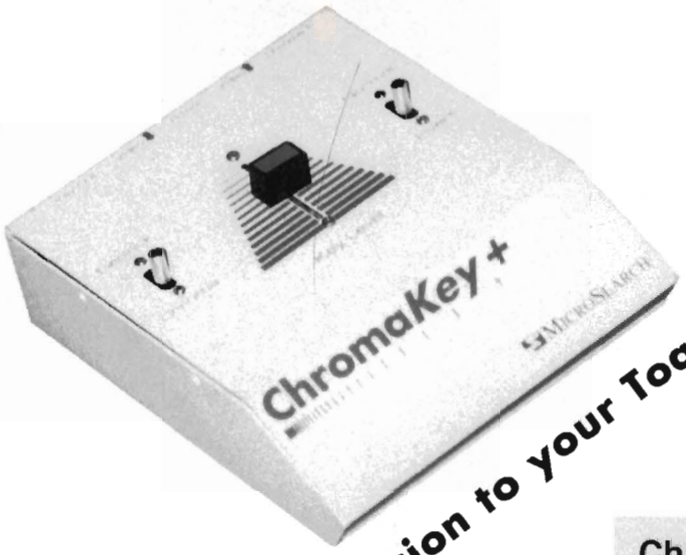

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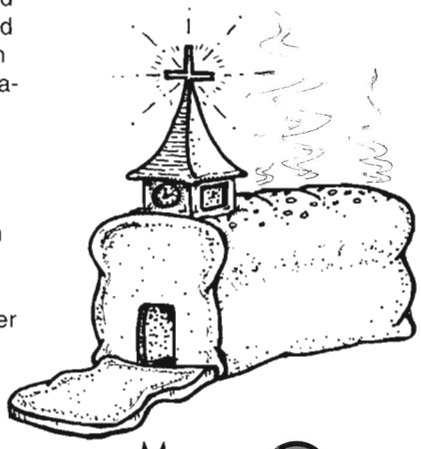

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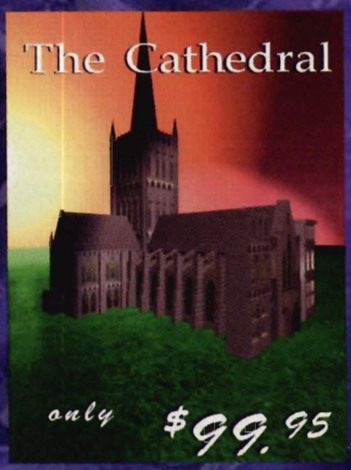

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Continued from page 127

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We would like to hear from you! If your Video Toaster User Group is not here, and you would like to be included in this listing, please send meeting times, locations, a calendar of upcoming special events, and featured guest speakers to:

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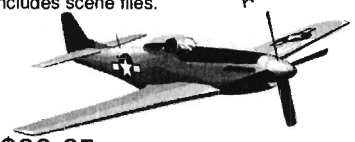

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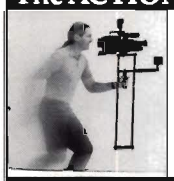

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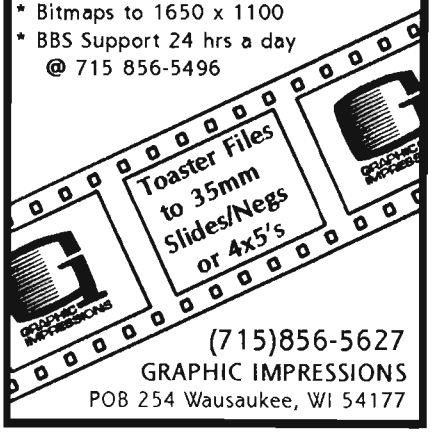

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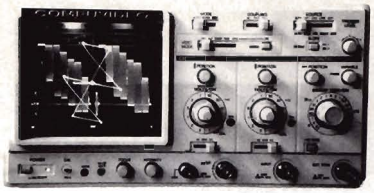

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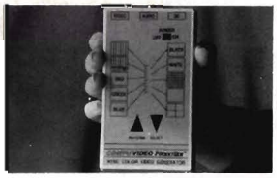

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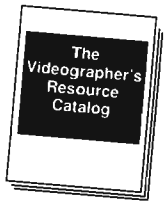

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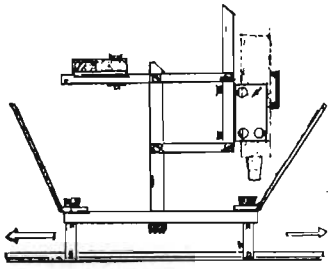

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These companies have advertised their product or service in this issue.

A+ Development	149
ACS Computers, Inc.	133
Action Graphics	146
Advanced Media	119
Advanced Video	139
Adwar Video	137
AJS & Associates	145
Alpha Video	91
Ambitious Technologies	146
Ami-Ware Multimedia	142
Amigo Business Computers	138
Anti-Gravity	93
Armato's Pro Video	138
ASDG	39
AVID Publications	123
Axiom Software	2,3
B & H Photo-Video	100-103
Castle Computer Systems	143
Cave Productions	149
Centennial Video Systems	81
Center Video Industrial Co., Inc.	77
Circuits & Software	147
Classic Video Products	146
Columbia Video Services	149
Compuhelp Computers	131
Computer Basics, Inc.	97,140
Computer Room	132
Computer Video Associates	133
Computer Works	135
Creative Equipment	76
Custom Supply	130
Davis Audio Visual	132
Desktop Images	113
Desktop Video Systems	37
Desktop Video Wizards Network	43,64-5
DevWare Video	73,115-117
Digital Arts	133
Digital Creations	67
Digital Design Solutions	137
Digital Processing Systems	C3,85
Dimension Technologies	144
Discount Video Warehouse	105
DKB Software	50
Earobic Digital Systems	35
Electronic Connection	149
ESE	95
Expert Services	83
Filmclips, Inc.	142
Foundation Imaging	52-53
FutureVideo	40
Grafx Computing	146
Graphic Impressions	146
Great Valley Products	9,11
Hammond Photographic Services	148
Heifner Communications	56
Hi-Tech Trading Co.	145
Horita Co.	98
Hotronic, Inc.	26
HT Electronics	130
Industrial Color Labs	147
Infinite Solutions	139,144
Infotronics	132
InnoVision Technology	87
INOVAtronics	45
Interworks	101
IOMEGA	22
J & C Repair	145
James Grunder & Assoc./	
Feral Industries	27
JEK Graphics	62
Kingsway Productions	147
Kipp Audio Visual	136
Lauren Media Productions	149
Left Hemisphere	148
MacroSystemUS	7
Mannikin Sceptre Graphics	99
Markertek	148
Matrix Productions (Pro Wipes)	147
Media Quest Studios	142
Mega Bytes	140
Michael's Video Magic	149
Micro R & D	145
Microsearch	141
MicroTech Solutions, Inc.	134
Models in Motion	148
Motion-Media Design Group	146
Mr. Hardware	149
Musi-Q Productions	80
New York Camera & Video	139,146
NewTek, Inc.	C4,21
NOVA Systems	80,121
NRG Electromotive Research	90
Nucleus Electronics	99
On Video	89
Overscan Images	146
Pacific Media Publishing	108
Panasonic Company	Insert,19
Patchworks	148
Picture This...Productions	119
Positron Publishing, Inc.	51,59
Premier Software	148
PreVue Technologies	33,76,126
Pride, Inc.	63
Pro Video Production	131
Quorum Advertising	109
RealSoft International	57
RGB Computer & Video	23
Ring Software	134
Russell Hunter Group	140
Safe Harbor Computers	140
Sanyo	14-15
School for Videotape Editing	148
Slipped Disk	136
Soft-Logik Publishing	49
Spectrum	147
Studio Spectrum	132
SunRize Industries	C2-01
System Eyes Computer Store	137
T.S. Computers	131
Technical Aesthetics Operations, Inc.	29
The Computer Room	121
The Graphics Lab	41
The Music Bakery	145
Toaster Crustaceans	122
Unili Graphics	31
United Media	90
Ventura Video Productions	131
VFX Video	143
Video Law Services	148
Video Toaster User Presents	110-111
Video Vision Assemblers	149
Video Wizard	135
Videomedia	58
Viewpoint	33
Visual inspirations	149
Viz Tech	147
Warm and Fuzzy Logic	71
Y/C PLUS, Inc.	25,98

LAST WORD

Looking at the Future

There's a World of Opportunity for Visionaries

By Lee Stranahan

I can see the future, and so can you. Before you get yourself all worked up, forget your tarot cards, don't bother checking your horoscope and stop throwing those bones. Anyone keeping up with technology has this ability to prognosticate, or so you'd think.

It's becoming apparent that the fallout from the National Association of Broadcasters (NAB) convention has obstructed the view of many. Some can't even see beyond the edge of their noses. In some ways, this isn't surprising, because there is a revolution in the offing here, and as someone who understood the revolution game once said, "If you're going to make an omelette, you're going to have to break a few eggs." What surprises me, though, is that the eggheads who are going to be broken really should know better.

One of the big issues discussed at NAB was the coming tidal wave of cable TV channels. With compact affordable satellite technologies and new types of cable TV systems, it's a certainty that you and I will have hundreds of channels to choose from within a couple of years.

...because there is a revolution in the offing here, and as someone who understood the revolution game once said, "If you're going to make an omelette, you're going to have to break a few eggs."

Now, unless your brain's been in deep freeze for the past year or so, this is not news. The mainstream media has covered this story extensively, national magazines have done cover stories on it, and it's been mentioned in the pages of trade publications (including *Video Toaster User*) dozens and dozens of times. Even my mom knows what's coming down the pike—but a lot of the pundits at the NAB show were skeptical.

One of the big issues among the NAB intelligentsia was, amazingly enough, production costs. You see, making television costs a lot of money. You need to buy $20,000 cameras, $50,000 switchers, $15,000 character generators, gazillion dollar graphics boxes, and so on and so forth. By the time you've bought this equipment, you've spent many thousands of dollars. With such a hefty investment required, few will be able to afford making the programming to fill these theoretical channels.

It's an argument that was made a number of times. I heard it in speeches, I read it in the NAB daily news, and I saw it mentioned after the convention in press coverage of the show. It came down to this: Few people can afford TV production equipment. Therefore, little programming can be made, and without programming there won't be all of these channels. A nice, neat argument.

Knock, knock, knock...hu-llo?!!?

Did any of the people making these statements walk the show floor? Were they teleported directly to the speaker's podium, causing them to bypass the cool, inexpensive new gear being shown? I just don't understand.

Equally amazing to me was the "Duh—what will be on these channels?" argument. One speaker's cute little barb typified this attitude. While discussing the possibility of 500 channels, he held his hands up in front of the projector light. "This is channel 499," he said, "the shadow puppet channel."

Har dee flipping har.

Let me give you an analogy here. Imagine for a moment that through some combination of technological limitations and government control, the number of print media had been limited for as long as anyone could remember. There were some regional newspapers, and a handful of books published every year, but there were only a dozen magazines.

When you went to the newsstand, all of your choices were laid out for you. Your 12 choices didn't have much diversity of opinion, and the content all tended to be aimed at the lowest common denominator. With so few publications for so many people, the magazine publishers had to cast a wide net.

Things change. New technology, someone proposes, would allow for the possibility of hundreds of magazines. Affordable printing technology and new distribution channels make it possible. No sooner is this suggested, though, than criticism begins to appear.

Who will produce these magazines? After all, publishing is risky, and it would be difficult to find people with a combination of talent, energy and financial means. Plus, these magazines will need writers, editors, art directors—all difficult jobs that not many people have the talent to fulfill. Furthermore, what will all of these magazines be about? Who will read them? Will they be any good? "Here's magazine number 499—Shadow Puppet User."

We know better. Maybe it's hard for these pundits to conceive of these channels because they can't actually *see* them right now. It takes vision and imagination to see things that don't exist yet but one day will. In fact, if you ask me what these channels are going to be, I'd have to be honest with you. I don't know all of the details. Nobody does, yet.

However, what I do know is that these hundreds of channels are coming, and they're going to change the way you and I watch television. I also know that for some of you, this new information frontier will represent an opportunity that's never existed before—an opportunity to produce TV programming that's far more varied, complex, and specialized than most of what's on the air today. It'll also be an opportunity for many to make money and work in an exciting and creative field.

There are apparently a number of people in the broadcast world today who haven't yet come to grips with the future and the opportunity that it brings. That's OK—there will be more room for those with vision. The fact is, the future is coming whether you're ready for it or not. I hope to meet you there. VTU

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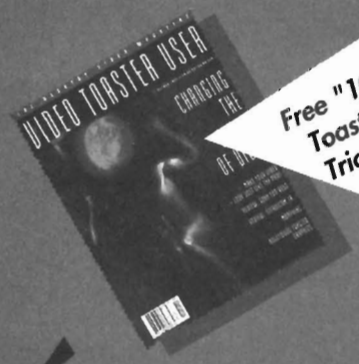

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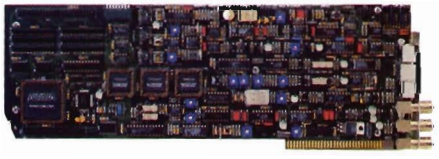

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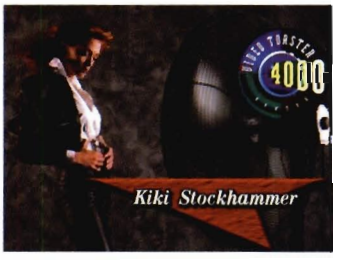

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