

# TV TECHNOLOGY™

Vol 10 No 9

September 1992

International Edition

★ ★ ★ PREMIER EDITION ★ ★ ★  
See Page 5

## IBM, Apple to Pursue Multimedia Venture

by Frank Beacham

CAMBRIDGE, Massachusetts Apple Computer and IBM are seeking to move video beyond the passive television screen to a host of new interactive multimedia display devices for use in the home and business.

Through a joint venture known as Kaleida, the two companies are looking to usher in a new type of interactive communications that combines video, sound, text, graphics and animation. The new venture will develop, license and make available specifications and technologies to promote the exchange of multimedia information between a variety of computing and consumer electronics devices.

### Areas of concentration

Kaleida is expected to concentrate initially on two key areas: development of standards for a distribution network; and creation of a universal scripting language that can be used by people without computer programming knowledge.

"Animation, video and sound will proliferate throughout new interactive applications in much the same way graphics and text do today," said Apple's Dr. David Nagel.

The two American computer giants are

now involved in a major recruiting effort to sign up key Japanese and American corporate supporters for Kaleida. The goal is to create a strong alliance that will come together on multimedia standardization, company officials said.

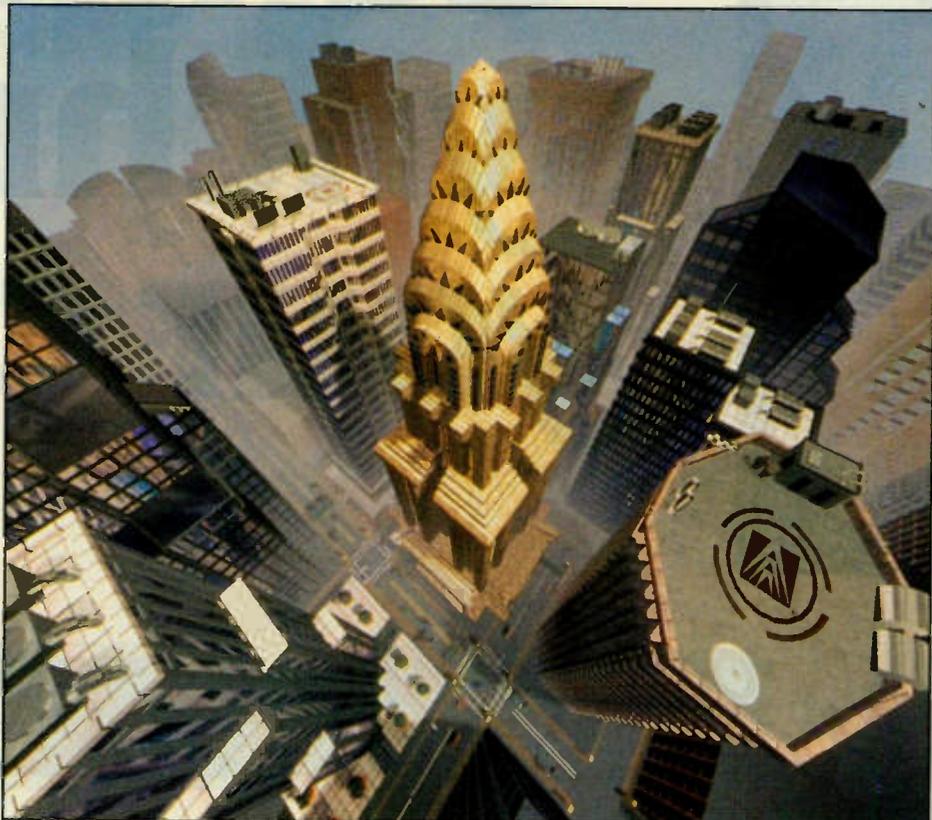
According to Japanese news reports, Sony, Matsushita, Hitachi, Toshiba, NEC and Sharp have been invited to join the project.

IBM and Apple recently selected A. Nathaniel Goldhaber, a 44-year-old California businessman involved in computer networking equipment, to run Kaleida.

Kaleida is entering what could be a highly competitive market. The new venture will compete with multimedia desktop computers from Commodore and planned alternatives from Microsoft, NEC, Fujitsu America and NeXT Inc.

Speaking to a group of international media executives at the Massachusetts

(continued on page 7)



Graphic by Gene Bodio

Bruce Goren reviews the eagerly-awaited Release 2 of Autodesk's 3-D studio. Turn to page 24.

## Standards Conversion: Who Needs It?

"Mario Orazio" is the pseudonym of a well-known engineer who, in his inimitable style, examines the "hows" and "whys" of today's television technologies.

This month he delves into the field of standards conversion.

**SOMEWHERE OUT THERE** You might not have noticed that the place where the most important TV technology research is taking place these days is in standards conversion. I don't care if you've never had to use a standards converter in your life—the key to tomorrow's television is what's happening in standards conversion today.

Hey—I'm an American. Contrary to popular belief, a bunch of us *do* read every now and then, but a lot of the rest of what you might hear about us is usually true. We speak American, and we figure that means everyone else in the world should learn it (or a related language, like English) so they can converse with us. We use ounces to weigh things or measure volumes, we list our heights in feet and inches, and we'll take our heat (or coolth) in Fahrenheit, thank you very much.

### Changing times

So it should come as no big surprise that we make TV shows in NTSC 525/59.94 and could hardly care less about what the rest of you are doing. As you can tell by reading a list of available international satellite facilities a few years back, the American attitude about standards conversion has traditionally been "we're the standard; you do the conversion."

This year, however, things are a bit

different. First of all, like everyone else in the world, we ain't got a barrel of money. I can remember a time when U.S. networks were so filthy rich that they practically used dollar bills as cable ties (actually, if my feeble memory serves correctly, I think dollar bills would have been less expensive than the ties used).

Fact two is that 1992 is divisible by four, which means Olympics. Add facts one and two, and you have two U.S. for the summer—trying to figure out how to shoot sporting events in 625/50 countries without building an island of Little America on site.

Fortunately, the rest of the world—especially the Brits—had been giving the matter of standards conversion some thought for a while.

As I understand it (but what do I know?), standards conversion was invented for the coronation of Queen Elizabeth II of the United Kingdom. At

(continued on page 14)

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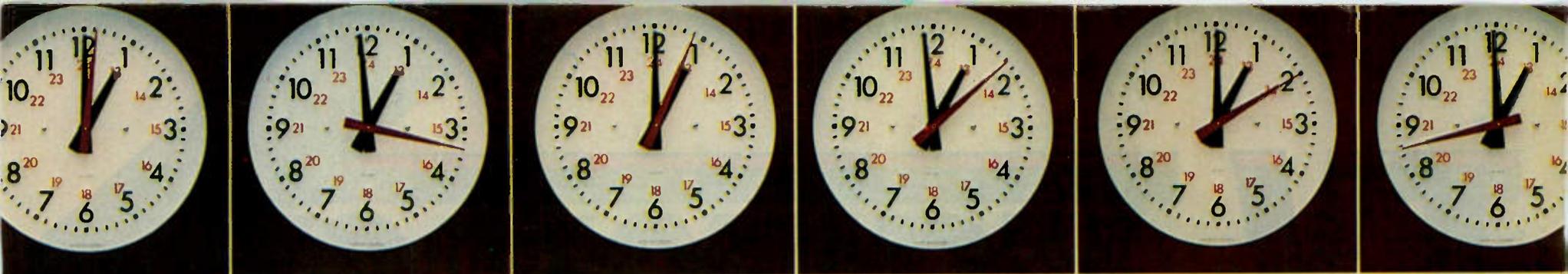
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# Español

Vea Las Páginas 15, 16 y 33



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**ASIA-PACIFIC COALITION**

# Groups Seek Improvement In Dialogue

KUALA LUMPUR, Malaysia Broadcasters from the Asia-Pacific region met broadcast manufacturers in a two-day workshop in Singapore 6-7 June to improve the dialogue between them and to provide the public with more reliable and cost-effective services.

The result was the establishment of a permanent group to carry out the proposals made during the meeting.

The workshop, which involved 45 participants, was organized by the ITU, with the assistance of the ABU (Asia-Pacific Broadcasting Union) Technical Centre and the IABM (International Association of Broadcasting Manufacturers).

The event stressed in particular the problems of developing countries.

Proposals made included streamlining procedures for supplying technical advice and spare parts, sharing information on reliability and providing training.

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Comark

# Comark in Finland

COLMAR, Pennsylvania Comark recently announced it is supplying IOT-equipped transmitters to the Finnish Broadcasting Company.

The order consists of three Comark 25 kW IOT transmitters using NICAM sound and common amplification. These are the first IOT-equipped transmitters to be used in Europe, and also represent the first use of common amplification with NICAM sound.

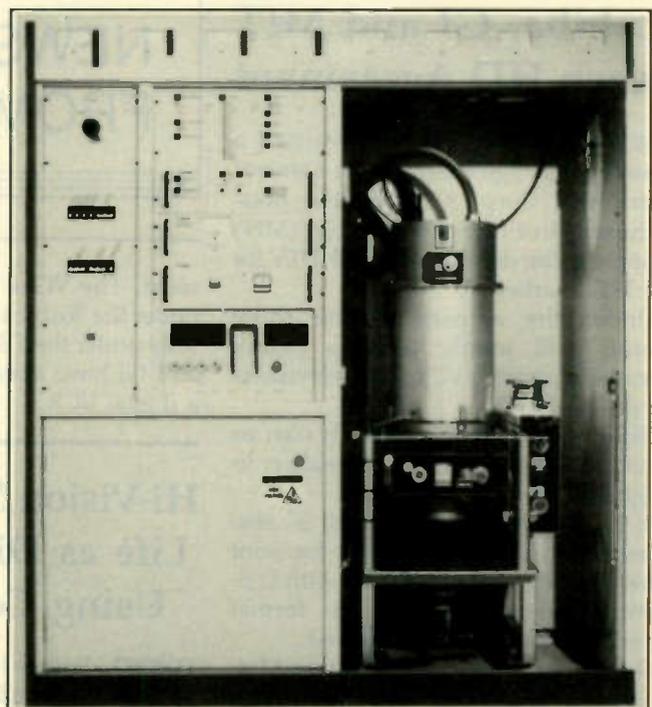
Representatives of Finnish Broadcasting had visited Comark's United States factory to confirm the test performance of the EEV IOT in Comark's common amplification system.

The transmitters, CTT-UE-251Cs, are water-cooled and IEC 215 compliant.

Delivery of the first transmitter to Finland is scheduled for November. The remainder will be delivered by February 1993.

Comark is a Thomson-CSF Company.

For more information, contact Ellen Rainey at Comark: 215-822-0777, FAX 215-822-9129, or circle Reader Service 29.



For more information, contact: O.P. Khushu, director of the Technical Centre at ABU in Kuala Lumpur, Malaysia at +60-3-2823108, FAX +60-3-2825292; H. Hasmet Esen, chief technical advisor at ITU in Kuala Lumpur, Malaysia at +60-3-2822498, FAX +60-3-2825292; or T. McGann, chairman of the IABM in Slough, England at +44-223-242642.

## BUSINESS

# DEC Obtains U.K.'s BASYS

MAYNARD, Mass. Digital Equipment Corp. (DEC), a major U.S. supplier of networked computer systems, has purchased U.K.-based broadcast automation company BASYS Automation Systems for an undisclosed sum.

The acquisition, announced in June, is being called a strategic maneuver by both groups. BASYS is eager to take advantage of DEC's worldwide computer and distribution networks as well as the

advanced digital technology in which the company specializes, while DEC sees the purchase as a way to broaden its scope in video-related technologies, particularly multimedia.

"This is a strategic move for Digital as we pursue an aggressive growth strategy for the media industry, and the broadcast market in particular," said Robert Farquhar, vice president of DEC's Media Industry Business Unit.

BASYS, formerly owned by Independent Television News, will become a wholly-owned subsidiary within the Media Industry Business Unit.

Dave Lyon, chairman of BASYS, said the company will continue to serve the video market as it always has, but will begin to incorporate DEC's advanced computing technologies almost immediately.

One of the developments that should prove significant to the BASYS automation line is voice recognition, Lyon said.

"One of the problems in controlling equipment in the studio is that you have to tie the taping of an event to an actual word the reader is saying," he said. "It's

not good enough to know what line (to begin taping), you have to know what word.

"If a computer can recognize a specific word, we can link the broadcaster's speech to automation systems."

# Judgment in Favor of Snell

LOS ANGELES, California A patent suit brought against Snell & Wilcox by Laser Pacific Corp. was thrown out of court after a U.S. district judge ruled that a Laser Pacific patent was invalid.

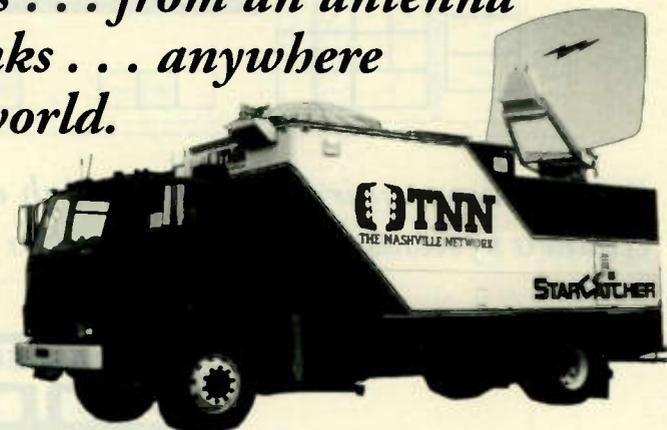
The dispute between the two companies centered around Snell & Wilcox' DEFT (Digital Electronic Film Transfer) system, which Laser Pacific claimed infringed on one of its existing patents.

U.S. District Judge A. Wallace Tashima ruled that, because the Laser Pacific system had been put up for sale more than a year before a patent was applied for, the patent was unenforceable.

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## Toshiba, GI and MIT Reach HD Agreement

TOKYO Toshiba Corp. has reached a fundamental agreement with General Instrument Corp. (GI) and the Massachusetts Institute of Technology (MIT) to assist in the development of HDTV for the U.S. market.

Under the agreement, the three groups will jointly develop digital processing circuits, VCRs and televisions for digital HDTV.

Toshiba is expected to formally sign an agreement through its U.S. subsidiary in August.

It is reported that Hitachi is also proceeding with negotiations for joint development of digital HDTV with U.S. manufacturers. However, no formal agreement has been announced.

Other manufacturers, including Matsushita, Mitsubishi and Sony are proceeding with research and development of digital HDTV.

The agreement between Toshiba and GI/MIT calls for Toshiba to develop products using either of the two HDTV transmission formats that GI and MIT have submitted to the FCC for consideration as a national standard. While GI has already developed prototype HDTV decoders, Toshiba will develop the technology to mass produce them, under license from GI, as built-in decoders for television receivers.

Toshiba will be fully in charge of the production of HDTV VCRs because GI does not have VCR production equip-

# NEWS FROM JAPAN

Researched and compiled by Masakatsu Ueda

ment. The VCRs will probably be sold under the Toshiba brand name, and possibly under the GI name as well. Toshiba and GI have already jointly developed a digital VCR.

## Hi-Vision May Get New Life as Digital Format Using Compression

TOKYO Japan's Hi-Vision HDTV format will not be completely out of date once Europe and the United States adopt digital transmission standards, according to Hisashi Yamada, senior manager of Toshiba Corp.'s Electronics Equipment Laboratory.

Speaking at a technology seminar entitled "Trends of Video Compression Technology," Yamada said Hi-Vision can continue as a digital format by using digital MUSE decoders in consumer receivers.

Currently, full digital hardware is tremendously expensive, so it would be wise to use Hi-Vision as a base to build upon, he said.

Once the digital transformation is

complete, a host of new benefits will arise, including an increase in available channels due to digital compression.

In Japan, where HDTV is transmitted via satellite, terrestrial broadcasters are currently fostering widescreen EDTV because no channels are presently available for a terrestrial HDTV channel.

While Yamada said that digital compression might enable broadcasters to provide multichannel service in the future, he also suggested that broadcasters will probably not be the pioneers of the technology. More than likely, he said, satellite and cable will be the first to start splitting individual channels into multiple carriers.

Digital compression should enable a single TV channel to carry four to five conventional channels, while a single satellite channel could carry as many as 10 NTSC channels or two HDTV channels.

With the standardization of the video compression format known as MPEG 2 expected later this year, Yamada said sample MPEG 2 LSI chips are to be shipped sometime in 1993.

At the seminar, Toshiba demonstrated digital video compressed at 6:1, 16:1 and

the MPEG 2 ratio of 40:1. The 40:1 display showed a slight picture deterioration, but provided a significant increase in recording density.

Yamada said that recording density has already seen a ten-fold increase in the past 10 years, and LSI processing (throughput) has increased a hundred-fold.

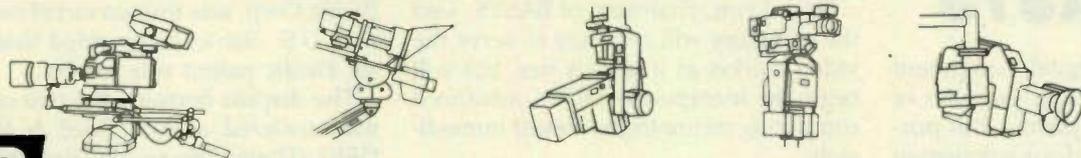
"In the future, because standardization of video compression technology, such as MPEG, is proceeding, many changes can be expected in the video field," he said. "However, restrictions in the social (legal) system will remain, and we cannot define future trends (only) from a technological viewpoint."

## Matsushita, NHK Unveil Plasma Display Panel

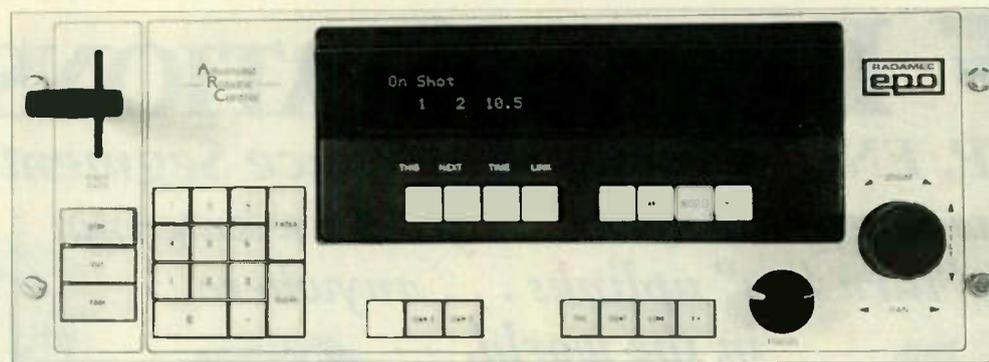
TOKYO Matsushita Electronics and NHK have developed a color plasma display panel (PDP) that is reported to have the brightest plasma display to date.

While the 26-inch, 16:9 PDP panel, which is currently at the prototype stage, is still darker than a CRT, Matsushita officials say their model is the next step toward a practical large-screen PDP. Other areas that need to be improved include increasing the display's usable lifespan to at least 20,000 hours.

Matsushita and NHK were able to increase the brightness of the display by 40 percent by improving the panel structure and electrode designs and by using discharge technology.



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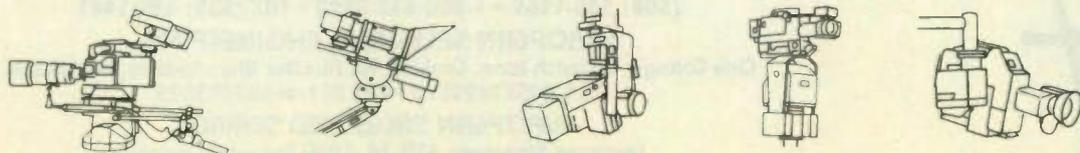


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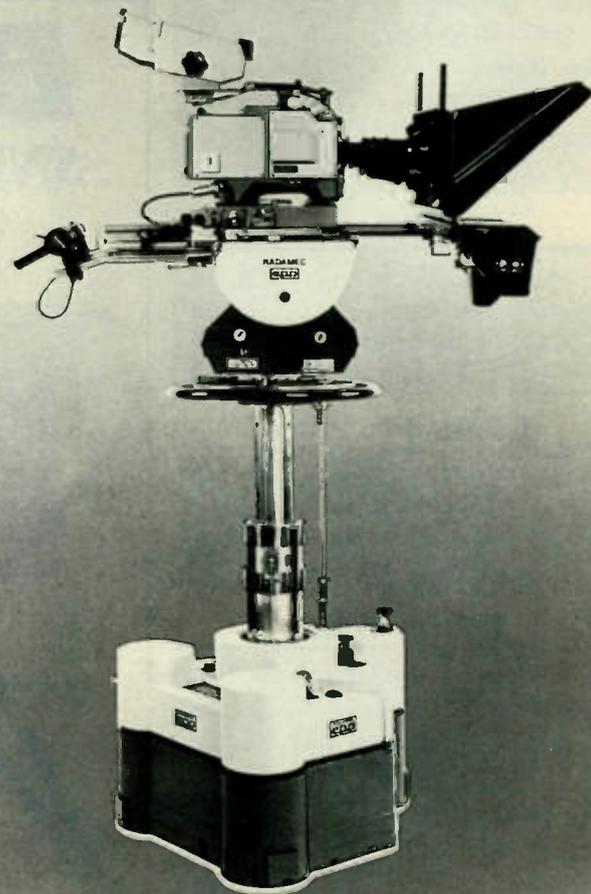


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# Revising the Shape Of Things to Come

by Barry Rebo

NEW YORK When REBO Studio became the first American company to acquire and use high definition (HD) video equipment back in 1986, the shape the future would take seemed perfectly clear. The television industry would see the overwhelming superiority of the New Format, and in a matter of a few years at most, networks and stations would be converting to HDTV in droves.

## GUEST COMMENT

And, too, a single global television standard would finally become a reality. And while we could envision other applications for high definition besides television somewhere down the line, at that particular junction in time the HD road seemed to be pointing toward one goal and one goal only—"Big TV" for one and all . . .

### Crash course

However, a few things have happened in the interim to repaint that picture. For one, there was the little matter of a stock market crash in 1987, and the ensuing confusion about the future of many industries and new technologies, including ours.

Then, in 1988, the U.S. Federal Communication Commission involved itself in the development of an "appropriate" U.S. broadcast standard for HD, and the process was quickly bogged down in a quagmire of bureaucratic red tape. Both

corporate and governmental noses began to be bloodied in the ensuing global economic and political infighting that is still ongoing.

So, awakened by the harsh light of what *is* rather than what *might* have been, our world view of the high definition landscape has been altered. It continues to change. And when all is said and done, perhaps we were naive to think "Big TV" was all that HD could (or should) provide.

In fact, we no longer see high definition as simply a new kind of television. Rather, it is a widescreen, high-resolution visualization tool box, filled with toys applicable to all forms of media—print, computer, motion media, film and, yes, even TV.

### Fueling the fire

A case in point will help illuminate our new perspective on the current and future uses of widescreen, high-resolution electronic media (i.e., HD). We completed principle photography on a show called "Fool's Fire" for the U.S. PBS American Playhouse series. It is a 50-minute drama written and directed by the unique visionary, Julie Taymor. In it, she has constructed a remarkable screen adaptation of an Edgar Allan Poe short story titled "Hop Frog." This production illustrates how, as the technological tool box changes, the way stories are told visually will change as well.

"Fool's Fire" has a great sense of the fantastic, brought about in no small part by its mixture of live actors and life-size animated characters.

The entire production is at once achingly realistic, yet undeniably surreal. To ensure the illusion would carry through, it was necessary to design the special effects in such a way that the most exacting, realistic results could be obtained, while still maintaining a sane budget.

HD was the only answer.

### Successful mix

"Fool's Fire" is notable for being one of the first true marriages of high definition and film media, where both are crucial to and fully integrated in the production. Under the direction of REBO Studio, we worked closely with Julie to decide how HD would be used in portions and what portions would be filmed. It was decided that the live action work would be shot in film, while the special effects work should ideally be done in HD, both for creative and technical reasons.

The special effects shots were composited first in HD, using one of the toys from our rapidly expanding toolbox—a proprietary product of REBO's R&D sister company, REBO Research, called the ReStore. The ReStore is a multi-purpose high definition frame store device based on the Macintosh computer platform.

The finished high definition footage was then transferred to film and became incorporated into the program.

REBO Studio utilized Sony High Definition Facility Inc. (SHDF), located in Culver City, Calif., to transfer selected 35mm film segments to high definition. Thus the finished version of "Fool's Fire"

Welcome to the premier issue of TV Technology's International Edition! Our goal is to provide our readers, broadcast and video professionals, with a valuable source of practical technical operations and product information.

Every month, TV Technology's International Edition will present a mix of technology news, applications-oriented feature articles and equipment reports geared toward your needs.

TV Technology's International Edition is modeled after the success of the U.S. Edition of TV Technology, now entering its tenth year. In the U.S., TV Technology has become the best read tabloid publication serving broadcast and video professionals.

## A World Premiere

Like the U.S. Edition of TV Technology, TV Technology's International Edition is written by professionals for professionals. Each of our columnists is an expert in his or her field, whether it is videography, audio-for-video, computer graphics, RF or other pertinent subjects.

Our "Buyers Guide" section, which focuses on a different category of equipment each month, features equipment reports written by

the engineers and production people who are using the equipment—people like you. You will also find reports from manufacturers on the latest products and technologies, and a "Marketplace" section full of new products and services.

In all of the equipment-related articles, you will find the telephone and FAX numbers of the manufacturers, as well as Reader Service card numbers, so you can get the product and service information you want when you want it.

Now that you know a little more about TV Technology's International Edition, start reading and enjoy! And please, let us know what you think: we are dedicated to serving to your needs. Write or call us with your comments, suggestions and article ideas. We would like to hear from you.

—TV Technology

will exist in three forms—a 35mm print, a digital high definition tape and a broadcast television version.

### Storytelling changes

It is not difficult to see that there is a marriage being made between video and film. "Fool's Fire" illustrates the nature of how the technology will change the stories that are told.

And while, so far, traditional computers have been the media employed

*. . . perhaps we were naive to think "Big TV" was all that HDTV could . . . provide.*

for the electronic special effects in these rarified, mega-budget films, there is a definite awakening on the part of the film community as to the particularly cost-effective benefits of the film-like resolution and identical 16:9 aspect ratio offered by HD.

In preparation for the coming surge in this type of production work, we are using "Fool's Fire" as a bed for refining some of our production techniques as well as a way of expanding into this realm of video and film.

### Wide is the way

We all run the risk of getting so caught up in formats and technical jargon and the myriad proposed standards for HD production and transmission that it is easy to lose sight of one important fact: all the advanced video systems (both real and proposed), as well as existing film 35mm technology, share the same widescreen 16:9 aspect ratio. As we like to say at the studio, the shape of the world is not round: it is in fact 16:9. And this rectangular, widescreen shape is playing, and will continue to play, an extremely important role in the future of visual imaging.

The producer, the director, the broadcaster, the independent producer as well as the production company should all think widescreen. The medium does not

matter: if you want to shoot film, shoot film; if you want to finish in video, finish in video. But if you have a belief in a product that will have an extended shelf life through the 1990s and beyond, be assured that a widescreen format—in a 16:9 aspect ratio—is the way to go. Do not be limited by yesterday's technological constraints. Paint a picture that fills the entire canvas.

### Other HD uses

The widescreen electronic canvas that HD has made possible is, however, just one piece of the high definition visual equation. The other, equally important piece is image resolution—lots of it. Some may debate whether 1,000-plus lines of on-screen resolution are really all that is necessary to enjoy a sit-com or a game show. But no one denies the value such a capability has for other, non-entertainment areas that require electronic visualization.

For example, REBO Studio is currently doing a lot of work in the medical imaging area. Much of this work will ultimately involve teleconferencing—long-distance learning and/or long-distance medical examinations, where the medical professionals involved are extremely dependent upon the accuracy of the image in terms of texture, color and shape, etc., in order to make a correct diagnosis. The non-entertainment applications for HD come from businesses that, frankly, dwarf the entertainment industry.

For HD to survive in the present, and ultimately thrive in the future, we have to focus on common-sense business applications for the technology in order to justify the investments that have been made and to warrant those that will be required in the near future.

We need to push the imaging industries into the next era of creativity, tempered by financial responsibility. In doing so, we will be in the position to pursue the vision that has been shared by everybody who has ever sat in a darkened room and been thrilled to see a new world appear before their eyes.

Barry Rebo is chairman of REBO Studio in New York City, New York.

## TV TECHNOLOGY

INTERNATIONAL EDITION

Vol 10, No 9 SEPTEMBER 1992

International Director: Marlene Lane  
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Publisher: Stevan B. Dana  
Associate Publisher: Carmel King  
Marketing Consultant: Albert Leon

Ad Coordinator: Caroline Behan  
Circulation Director: Tiana Hickman



TV Technology (ISSN: 0887-1701) is published monthly by Industrial Marketing Advisory Services, Inc., 5827 Columbia Pike, Suite 310, Falls Church VA 22041. Phone: 703-998-7600. FAX: 998-2966. Second-class postage paid at Falls Church VA 22046 and additional mailing offices.

POSTMASTER: Send 3579 forms and address changes to TV Technology, P.O. Box 1214, Falls Church VA 22041. Copyright 1992 by Industrial Marketing Advisory Services, Inc. All rights reserved. For reprints contact the author and TV Technology.

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## SHOW LISTING

Upcoming conventions, meetings and exhibitions:

16-22 September 1992  
photokina '92

Cologne will host this venue for imaging, sound and professional media. More than 1600 exhibitors from 30 countries are expected, and 500 of those will be manufacturers of professional film, video, sound, lighting and projection systems. For more information, contact Messe-und Ausstellungen, Ges.m.b.H. Köln, Messeplatz 1, Postfach 210760, W-5000, Köln 21, BRD, or call +49-221-821-0, FAX +49-221-821-3415.

30 September-2 October 1992  
CAPER '92

This international show, to be held at the Autopista Center in Buenos Aires, Argentina, will feature television, cable, satellite and radio equipment. It is organized by the Argentine Chamber of Radio, Television, Cable and Satellite Equipment Suppliers and Manufacturers. For more information, contact CAPER at +54-1-42-2673, FAX +54-1-814-2650.

17-20 February 1993  
Electronic Media Indonesia '93

Professional sound, film, video and lighting equipment will be displayed at this new exhibition, to be held in Jakarta. The show will take place in conjunction with Communications Technology Indonesia 93, a telecommunications and business communications show. For more information, contact PT Pamerindo Buana Abadi at +62-21-325-560, or FAX 62-21-331-223.

19-22 April 1993  
International Association of Broadcasting

IAB will hold its 23rd General Assembly in Las Vegas, Nevada, in conjunction with the National Association of Broadcasters convention. For more information, contact Dr. Hector Oscar Amengual, telephone +598-2-48-81-29.

# IBTS Heralds New Technology

By Alan Carter

**MILAN, Italy** The seventh annual International Audio, Video, Broadcasting and Telecommunications Show (IBTS), 15-19 October in Milan, opens as the Italian government is set to assign network and local frequencies.

Broadcasters are anxiously awaiting to learn their fate, and equipment manufacturers and program syndicators are watching for a new boom in the Italian TV market.

However, based on the past record of inaction and political upheavals of the country, the decision could be delayed again. Another new government is being organized, and the minister of the PTT, who sets policy, was not named.

### State of affairs

Italy literally has thousands of radio and television stations on the air. The frequencies have become quite cluttered since the Italian Constitutional Court deregulated broadcasting about 15 years



ago and stations began broadcasting in an open market. The frequency plan, designed under a law approved in 1990 but yet to be enacted, would establish nine private national TV networks and between 500 to 600 local and regional networks. The resulting number of stations is estimated between 1,000 to 2,000. All this is in addition to the three chains of the state broadcaster, RAI.

## The show, to be held at the Milan Trade Fair in Lacchiarella, also incorporates MediaTech '92 (MEM) for conferences and seminars.

However, that allocation plan could change depending on who is named the new PTT minister.

This is an opportune time for IBTS, which has grown into an international exposition and convention. The show, to be held at the Milan Trade Fair in Lacchiarella, also incorporates MediaTech '92 (MEM) for conferences and seminars.

The IBTS exposition spans 20,000 square meters. Products on display will cover

categories such as: workstations, including a wide array of hardware and software; TV transmission equipment; professional equipment for audio/video; multimedia-orientated developments; and computer animation and computer graphics.

MEM, in only its second edition, will feature seminars and lectures covering such topics as "TV and the Computer." Discussions will center on desktop broadcasting: creating videos, the proliferation of formats, manipulating images and desktop editing systems.

"Network Images" will review TV video graphics, analyzing the latest examples of promos, logos, chromatic codes, tone and quality of film inserts, and the image of presenters. Another MEM seminar will focus on the organization, function, construction and management of local TV and radio stations. A final program will review the European production and programming market as related to technological developments. Topics will include: computer animation, 16:9 HDTV, interactive television, digital media and computer graphics.

For information on IBTS and MediaTech '92, contact the organizers in Milan at +39-2-4815541, FAX +39-2-4980330, or write Via Domenichino, 11-20149 Milan (Italy).

Alan Carter is the international editor of Radio World, sister publication to TV Technology.

## Thomson Appoints New CEO

**CEDEX, France** Henri Magnan was recently appointed chief executive officer of Thomson Tubes Electroniques, a subsidiary of Thomson-CSF.

Magnan joined CSF in 1965, and then the submarine acoustics laboratory (DASM) at Cagnes sur Mer in 1967. In 1981 he became director of the Technical and Development departments, and in 1990 was appointed CEO of Thomson Sintra Submarine Activities.

Thomson manufactures electron tubes for TV and radio broadcasting, satellite communications, military electronics, medical diagnostic imaging, and more.

## Changes At Jampro

**SACRAMENTO, California** Jampro Antennas has appointed Frederico Pantsios as director of Latin American sales.

Pantsios has over 10 years of experience in broadcast, beginning in the field as transmission project manager for Radio Caracas TV Network in Caracas, Venezuela, and later becoming a broadcast engineering consultant for Latin America at IBC Enterprises. Most recently he was a senior antenna and sales support engineer for Harris Allied in Quincy, Illinois.

Pantsios holds a Masters Degree in Electromagnetics from the University of Colorado in Boulder, and is an active member of the IEEE Broadcast Society.

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# IBM, Apple Announce Venture

(continued from page 1)

Institute of Technology's Media Lab, IBM's Robert L. Carberry, who is involved in setting up the Kaleida project, said there is need for a new worldwide multimedia standard that will cross multiple platforms for use in homes as well as businesses. He touted the compact disc as an excellent distribution medium that is available today.

"Compact disc technology today is large, but tremendously understated," he said. "We are interested in establishing a level of interface interaction that will generate programs that are a cut above any that we see in the marketplace today."

Carberry said IBM and Apple see multimedia as "an excellent business opportunity when we look at the natural forces of the marketplace." But he added that standards are sorely needed.

## Multimedia communications

Once those standards are set and distribution systems are in place, Carberry said, multimedia could become a preferred communications vehicle for entertainment, advertising and education.

"The lifeblood of advertising is how to get something in front of a person for 10 seconds and have them remember the message," he said. "We think multimedia can accomplish this goal."

Another goal of Kaleida, he said, is to make the programming of multimedia so simple that a product brand manager can create his or her own multimedia presentation.

An authoring tool and language currently in development, called Script X, will allow multimedia producers without computer science backgrounds to write programs, Carberry said. Writing a multimedia program with Script X, he said, will be similar to writing a simple stage play.

"You call actors onto a stage . . . they interact with other things. They move around under the direction of a director, and they have varying backdrops," he said. "The author is able to draw upon a wider set of content."

## Library access

Easy access by multimedia creators to libraries of program content will be a key feature of Kaleida, Carberry said. He noted that program content, as opposed to application software, represents about 80 percent of multimedia production costs today. Video and sound materials used to make programs must be recycled into multiple programs in order to keep production costs down, he said.

One way that Kaleida may transcend platforms is by separating program content from the computer application. Carberry used an audio analogy to explain the concept:

"We could have an infinite amount of music stored in audio form," he said. "One could navigate through, and listen to various sequences of it. Or, we could ship the sheet music down the network, and present it as an application, and have a synthesizer actually create the musical sounds."

## Multimedia logjam

The Kaleida effort seeks to break the logjam holding back multimedia production. With no current standards, it is

risky for producers to create expensive programs. Kaleida, with the backing of major electronics manufacturers, seeks to create a standard, along with distribution networks for the data.

Consumer use of an IBM-designed multimedia interface received a major test this summer at the Expo '92 Worlds Fair in Seville, Spain, Carberry said. Some four million people used 33 IBM interactive multimedia kiosks as computer-age information stations. User feedback from the Seville tests will be used to design Kaleida, he said.

The Seville information stations are

tied together on a local area network to data servers that provide video, text, voice and touch-control feedback. Users can leave messages for others, make restaurant reservations and get a variety of information.

A tiny television camera at each kiosk enabled visitors to take their own pictures and attach the digitized images to their voice messages before sending them to other members of their parties.

"If you want(ed) to make a restaurant reservation, you could navigate through the fair, see the outside of the restaurants, see the menu, get a snapshot of the

food, see the interior of the restaurant, decide where you want to sit, and then make a reservation," Carberry said.

In addition to the information kiosks, Apple and IBM expect Kaleida to have a major application in a new generation of miniaturized handheld multimedia computer displays that use compact disc software. Carberry used Sony's Data Discman and Bookman players as examples of such devices.

Apple and IBM will contribute resources, as well as license their multimedia technology to the new venture. Kaleida's board of directors, composed of an equal number of Apple and IBM representatives, will name an executive staff at a later date.

The new company will be headquartered in the San Francisco, California area.



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The Art of Image Control

# How Long Does Tape Last?

Videocraft examines the basics of video production, providing information on subjects ranging from camera battery life to location sound recording to tape life, discussed here.

Frank Beacham is a New York-based writer, director and producer.

Tape manufacturers do not like to discuss it and few videomakers bother to ask the question: How long does a videocassette last? Most of us operate on the assumption that the tapes we record today will

play back far into the future. But how long can we expect that tape to reliably store and recall our programs?

The truth is, unfortunately, that videotape is not forever. Unlike motion picture film, which can last for decades, videotape is a far more fragile medium.

No magnetic recording medium is permanent. Those ribbons of cobalt ferric oxide or metallic particles inside the plastic shell of a videocassette represent very new technology.

Professionals have had only 20 years of experience with traditional oxide tapes, and the newer metal tape, introduced with the Video 8 format in 1985, is still in its infancy.

## Opened to study

So how long does a videocassette last? Traditionally, tape manufacturers have waffled on the question. Users have been offered some general storage tips and assurances that the issue is not a matter for serious concern. But now, thanks to a new internal study by Sony in Japan, a tape manufacturer has gone on the record with a specific estimate on the life expectancy of its videotape products that should shatter any illusions that video is forever.

Sony's research, which applies to both consumer and professional grades of videotape, was conducted in Japan with the company's Betacam system, the only video recording format that can use either oxide or metal tape formulations.

One of the purposes of the study, Sony noted, was to compare the archival stability of the

The durability of both the new high performance metal tape and traditional oxide tape was extensively tested by Sony in environmental chambers set at varying temperature and humidity levels. The researchers wanted to find out how environmental conditions affect oxidation, magnetic properties,



by  
Frank  
Beacham

## VideoCraft

RF output, video signal-to-noise and dropout level.

### The test

In order to see how wear affected the RF output of tape, Sony ran cassettes through 500 playback and rewind cycles at a slow 1/30 speed on a Betacam

noted this was no surprise because the materials in metal tape are superior to oxide when it comes to thermal and mechanical stress loss.

The Sony report concluded that the life expectancy of any tape—metal or oxide—depends on decomposition of its chemical components, such as plastic base film, binder polymers, back-coating materials, lubricants and dispersing agents. Heat and moisture accelerate degradation of these organic materials in both oxide and metal tape formulations, the report said.

### Environmental concern

So what is the bottom line? How long does Sony tell us we can expect a videocassette to last? Since environmental conditions are the key to the tape's chemical stability, Sony's answer is based on storage conditions. If the user keeps tapes at a constant temperature between 15 degrees and 25 degrees

C and at a relative humidity level of 40 to 60 percent, Sony predicts both metal and oxide tape formulations will last 15 years without significant degradation.

It is important to note the word "constant" when speaking of the environment in which tapes are stored. To prevent expansion and contraction of the base film, Sony recommends there be little fluctuation in temperature or humidity.

Because most of us do not always occupy such ideal temperature and humidity-controlled environments, the 15-year figure might be a bit unrealistic for the average user.

For important, irreplaceable tapes, Sony tape product manager Les Burger recommends that videographers make protection copies—preferably to a

**Unlike motion picture film, which can last for decades, videotape is a far more fragile medium.**

newer metal tape against traditional oxide formulations. "Some people in charge of tape libraries are seriously concerned about the archival stability of metal videotapes, because, essentially, metal materials have problems with chemical instability and corrosion," Sony said in its preface to the report.

### Energetic metal

The newer metal tape, which has a protective outer surface that wraps around and protects the metal particles, offers performance improvements over oxide tape in three areas: magnetic energy, reduced spacing loss and lower modulation noise.

Metal tape's magnetic energy is four times greater than oxide tape. Metal tape's mirror-finished surface reduces spacing loss (a gap between the head and the tape), thus producing higher output from high frequencies.

And metal tape has a higher carrier-to-noise ratio (C/N), the ratio between the output level and the noise level with which a frequency is recorded and played back. A higher C/N usually means less noise and a better picture.

### VCR.

The result, according to the Sony study, is that both metal and oxide tape, when stored under environmental conditions of 25 degrees C and at 50 percent relative humidity "are very stable and have no change

**Under the rewind durability tests, Sony found metal tape to have less RF output degradation than oxide.**

in video electromagnetic performance." Even under 16 weeks of high temperature and high humidity—45 degrees C, 80 percent relative humidity—the degradation of the video's electromagnetic performance was less than 0.6 dB at worst.

"And this value would not affect the picture quality during playback," Sony said. However, at this high temperature, the dropout level quickly doubled in the 16-week period.

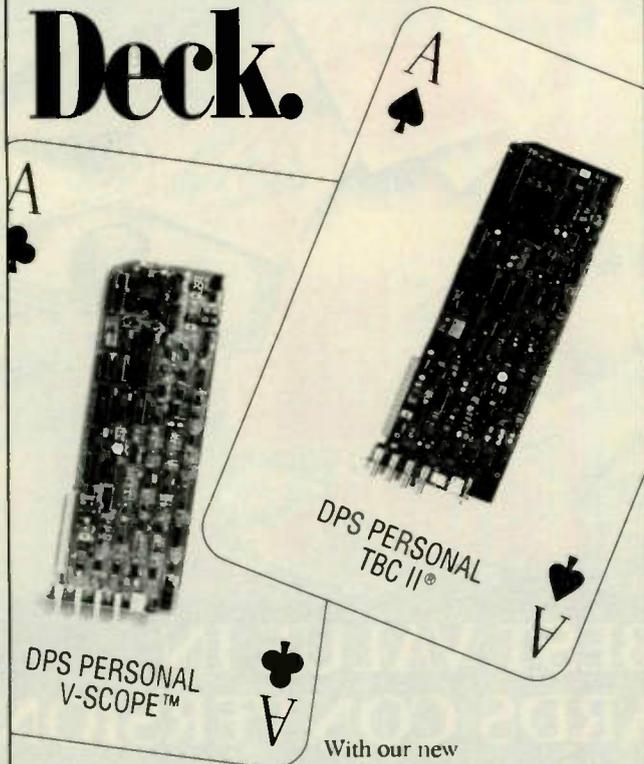
Under the rewind durability tests, Sony found metal tape to have less RF output degradation than oxide. After 500 cycles, the degradation of oxide was 2.3 dB and metal was 0.6 dB. Sony

digital format—from the master tape every three to five years. These copies, though down a generation, will at least provide insurance against any deterioration or failure of the original master. Burger also recommends winding important tapes at least once a year.

So do not buy into the illusion that video is forever. The only way to preserve your productions for the future is to be smart, careful and make backups at regular intervals.

Frank Beacham is a New York-based writer, director, producer. Contact him at 163 Amsterdam Ave., #361, New York, NY 10023.

# We're Stacking The Deck.



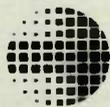
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# A Close-Up on Camera Lenses

*Focus on Videography covers all aspects of shooting good video. Subjects discussed include the wise use of camera controls, lenses and helpful shooting techniques.*

*John Premack is an award-winning videographer and chief cameraman for WCVB-TV in Boston, Massachusetts.*

This month, we will take a close-up look at a part of the camera most videographers seem to take for granted: the lens.

The lens is used to grip the camera and to focus on an image, and it is overlooked almost as often as it is looked through.

The first thing we encounter on an ENG lens is the lens hood. If it is not there, it should be. Usually made of hard rubber, the hood's primary function is to protect the lens against hard knocks and to minimize damage to other photographers' heads when shooting in a pack.

The front of the lens also is a great catcher for the raindrops, mud, salt spray, snowflakes and desert sand that tend to accumulate on news shoots. When there is a spot in the shot, harried news videographers are often likely to wipe the lens with whatever is close at hand—their fingers, the back of a glove or a shirttail.

The result is a few clean shots at the expense of a scratched front element.

## Lens filter

That is why we should find a clear filter under the lens hood. Attached either to the lens hood mounting ring or directly to the front of the lens, this easily-replaced, optically neutral glass protects the delicate surface of the front element from bad weather and the abuses of man. No lens should be without one.

The lens hood and the filter are attached to a movable set of lens elements known as the focusing group. On most lenses, focusing is accomplished by rotating the entire lens group, screwing it in and out along threads in the lens barrel.

Some of the newer ENG/EFP lenses feature internal focusing: the front element group moves in and out but does not rotate when the focusing ring is turned. This means that anything attached to the front of the lens—for instance, a lens hood or a polarizing filter—will maintain its orientation. Hoods designed for internal focusing lenses are often rectangular, which makes them more effective at blocking glare than the circular hoods.

## Pistol grip

If you turn the camera over to inspect the underside of the lens, you will notice a set of holes containing threaded, stainless steel bushings. These are mounting points for a pistol grip, available

as an accessory from the manufacturer.

A pistol grip offers a range of adjustments that accommodate different body sizes and convenient remote control of zoom and recorder start functions. It makes handheld shooting much easier.

But while it may be a pleasure to work handheld, a pistol grip can also be a liability. The lens mounting points are intended to be a convenience, but manufacturers would do their customers a favor by eliminating them.

This is true because the grip, when attached to the bottom of the lens, becomes a lever by which forces applied to the lens are multiplied. Swinging a 15- or 20-pound camera by a handle attached to the lens or setting it down so the camera's weight is borne by the lens subjects this precision optical system to a considerable amount of unnecessary stress.

You can quickly fatigue metal and loosen a lens in its mount by attaching a pistol grip directly to the lens. If you want the convenience of a pistol grip without subjecting your lens to needless abuse, use a bracket that mounts the pistol grip to the camera body.

## Buttons and switches

When shooting without a pistol grip, the videographer's fingers rest atop a series of buttons and switches. These controls and their associated electronics are all contained within the servo housing mounted alongside the lens barrel. This enclosure, which doubles as a handgrip, provides a reasonably weather-tight home for the motors, gears and electronic circuits that control the zoom and iris functions.

Along with a zoom rocker and remote recorder start button, a lens has switches that select iris mode and control what you see in the viewfinder and a lever to disengage the zoom motor. Trim pots, which adjust iris speed and stop points, are accessible under rubber covers, as are connectors for remote zoom and focus controls.

Two switches, located atop the housing, control the iris. The first switch selects manual, automatic or remote. (The remote setting is only used when the camera is connected to a camera control unit, allowing the video operator to manually adjust the iris.)

The second iris control switch, a momentary push-button, overrides the first, engaging the automatic iris function for as long as it is held down.

Most lenses leave the factory adjusted to set the iris as quickly as possible when the automatic button is pressed. This rapid response time—desirable only if

you engage the auto iris between scenes—causes unsightly iris bounce when bright objects flash through a scene. As a result, the only time most videographers shoot with the iris in automatic mode is when they forget to switch it off!

A little experimenting with the setting of the "speed" trim pot should allow you to slow the re-



by  
John  
Premack

## FOCUS ON

## VIDEOGRAPHY

sponse time, effectively sedating a hyperactive iris and allowing it to respond smoothly when lighting conditions change and your hands are busy with the focus and zoom controls.

## Return video

Another push-button, usually located at the rear of the zoom rocker, engages the camera's return video function. Depending on the camera and recorder being used, pressing this button may either switch to concurrent playback of the recording as it is being made or black out the viewfinder.

On most Betacams, pressing the return video button when the recorder is in pause causes the last few seconds of the previous scene to be rewound and played back in the viewfinder. Many news videographers routinely engage the return video function any time the camera is powered up with a partially shot tape in the recorder. The subsequent playback automatically cues up the tape for a back-space edit (a scene change that will play back without breakup, eliminating lock-up problems in the editing room).

Moving further back on the lens, you will encounter a small handle located just below the videographer's nose. This lever engages the built-in extender, a popular and useful option for lenses used by news videographers. Rotating this lever flips a magnifying lens into the path of the image, effectively doubling the focal length of the lens. The extender is useful when you cannot get close enough to your subject. Its only drawback is that it reduces the light transmission capability of a lens.

The last controls, at the very rear of the lens, are the back fo-

cus adjustment clamp and the macro focusing lever. Both control the position of the macro lens group. The macro focusing lever allows the videographer to temporarily change this setting when it is necessary to focus on an object closer than the lens' nominal minimum focusing distance. Once the macro lever is moved from its detente position, focus is adjusted using the zoom and macro controls in concert. The conventional means of focusing, rotating the front section of the lens, has little effect when macro focusing is engaged.

Many videographers have accidentally discovered that failure to return the macro lever to its detente setting results in out-of-focus wide shots and causes scenes that appear sharply focused to turn to mush when zooming.

This back focus error, the nemesis of many videographers, also occurs if the macro lens group is not properly adjusted when a lens is first mounted on a camera or if the adjustment clamp loosens over time. This macro lens adjustment is critical: it aligns the lens to the camera to ensure that the image remains in focus throughout the zoom range.

Unfortunately, back focus problems are often difficult to spot in the viewfinder and may only become apparent when the tape is screened on a full-size monitor. Minor back focus errors that go unnoticed when shooting

outdoors or at long focal lengths can ruin shots made in low light or at wide-angle settings, because the lens is less tolerant of back focus error at short focal lengths and wide aperture (f-stop) settings.

## Making adjustments

Fortunately, back focus can be quickly readjusted, even in the field. If your shots do not stay in focus as you zoom or are soft at wide angle, first check to see that the lens is secure in the camera bayonet mount and that the macro focusing lever is in its detente position.

If the problem persists, switch the lens to manual iris and open it to maximum aperture. It may be necessary to use filters or the camera's electronic shutter to avoid over-exposure. Zoom the lens to maximum telephoto, focus on a nearby object and, while looking through the viewfinder, zoom out until the image begins to go out of focus.

Now, loosen the back focus clamp set screw and rotate the collar back and forth to obtain the sharpest image. Temporarily tighten the clamp, zoom in, refocus and repeat the procedure several times until there is no change in focus as you zoom out.

Finally, tighten the back focus clamp and recheck to ensure that nothing slipped as you applied that final twist to the set screw.

*John Premack has been chief cameraman at Boston, Massachusetts station WCVB-TV for 17 years, covering stories on a daily basis. He may be reached at +1-617-433-4199.*

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# The Time Is Now for R-DAT

Audio Technology examines the trends and developments in audio for video production and transmission.

The column is produced by audio expert Randy Hoffner, who is currently director of research and development at NBC Labs in New York.

The story of R-DAT as a consumer format is well known. It was introduced in Japan in 1987, and, while it has not been a runaway success there, handheld "DAT-man" recorders can be purchased in Tokyo.

United States record companies, afraid their copyrights were in jeopardy (perfect digital "clones" of compact discs could be made using R-DAT), mounted an aggressive campaign against the introduction of consumer R-DAT in this country.

After protracted negotiations, a compromise agreement was reached with the inclusion of "copy once" inhibition in the R-DAT recorder. This permits a single digital R-DAT copy of a compact disc to be made, but does not permit copies to be made from that copy.

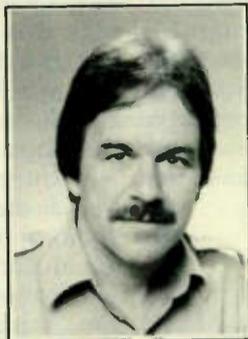
## Not yet a household word

With this safeguard, consumer R-DAT recorders are on the market in the United States, but they are not yet making their way into every household. The high cost of the hardware and the cassette, and the absence of pre-recorded R-DAT software, have relegated this format to the high-end consumer.

Audio professionals have found many uses for R-DAT, and it promises to totally replace the use of analog cassettes in many sectors of the professional audio world. Moreover, refinements have made R-DAT a viable format in audio-for-video as well.

Let us review the characteristics of the R-DAT system. An R-DAT recorder resembles a small video cassette recorder. It records on metal tape that is nominally four millimeters wide. Linear tape speed is 8.15mm per second, or about 0.33 ips

(inches per second), which is about one-fifth the linear speed of analog cassette tape. The slow linear tape speed facilitates shuttling at around 200 times play speed: a two-hour tape may be shuttled end-to-



by  
**Randy Hoffner**

## AUDIO TECHNOLOGY

end in less than 60 seconds.

Two scanner diameters are specified for R-DAT. The large scanner is 30mm in diameter with a 90 degree tape wrap, and this drum is used on the home or studio type of machine. For portable machines, a 15mm diameter drum is used with a 180 degree tape wrap. Both scanners rotate at 2,000 rpm and employ azimuth recording without guard bands.

No control track is used on R-DAT recordings, but automatic track finding (ATF) data is recorded twice in each helical track.

R-DAT machines record and play at the professional digital audio sample rate of 48 kHz and also at the 44.1 kHz sample rate of compact discs. Sixteen-bit linear quantization is used, making this a very high quality audio recording format, equal to or better than the compact disc.

## Time code solution

To be a useful audio recording format for video, video time code must be recorded. R-DAT has its own time code imbedded in

the subcode (the non-audio data recorded on tape along with audio data). R-DAT time code is based on the 2,000 rpm scanner rotation speed and bears no simple mathematical relationship to any video frame rate.

But, as a result of the work of several manufacturer and user organizations, a standard format for the incorporation of video and film time code on R-DAT tape has been developed. This standard calls for the recording of time code on tape in the subcode region in a format independent of a particular type of time code (SMPTE 59.94 Hz, EBU 50 Hz or film's 24 fps), with conversion to/from any of the three on input and output.

In this way, external time code may be fed in and recovered as SMPTE, EBU or film time code. The recorder is transparent to the type of time code being input or output, because regardless of the input or output format, the same data goes on tape. Because the time code is recorded and read with the rotary scanner, it may be read while the tape is stationary, and because of redundant recording, it may be read with reasonable accuracy even at very fast search speeds.

## Editing considerations

Using this R-DAT time code format, the machines may be used in a time code chase mode in a video editing environment.

The R-DAT format has a characteristic that can be problematic in editing, resulting from the fact that the system uses azimuth recording without guard bands. Instead of separating adjacent helical tracks with buffer zones of unrecorded tape area, or guard bands, R-DAT, like VHS, uses an azimuth offset technique to isolate the signals of adjacent tracks. Instead of being perpendicular to the longitudinal dimension of the helical track, as in Figure 1, the gap of one of its two heads is oriented at an azimuth 20 degrees clockwise from the perpendicular, while the other head's gap

is oriented at an azimuth 20 degrees counterclockwise from the perpendicular, as in Figure 2.

This means that each track's azimuth is offset 40 degrees from the adjacent track on either side of it. When a playback head reads signal from a track oriented similarly to its gap, full pickup of that signal is achieved, but pickup of the out-of-phase adjacent track signals is greatly attenuated and crosstalk is reduced to a very low level. Thus no guard bands between tracks are necessary, and unrecorded tape surface area is minimized.

In its pass, the R-DAT record head lays down a track one and a half times as wide

Figure 1. Head gap perpendicular to longitudinal dimension of track

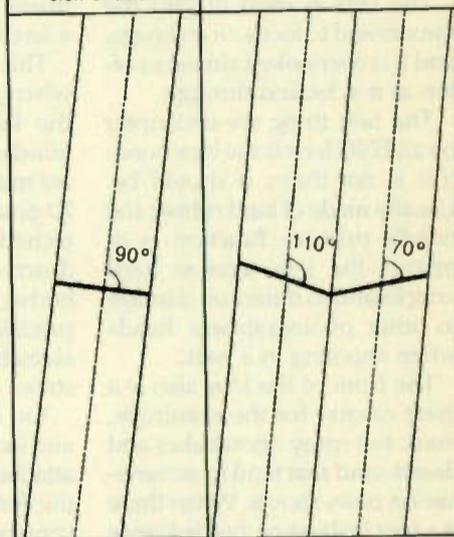


Figure 2. Head gap azimuths offset  $\pm 20^\circ$  from perpendicular

as the final track will be, and the next head's pass overwrites one-third of that track. This process continues throughout the recording. This creates guard-bandless recording.

## Point by point

The problem that arises in editing is that when an insert edit is performed, a track discontinuity is created by the partial overwriting of the area where insert recording starts. The severity of this problem may be enhanced by multiple inserts at the same point on the tape.

The manufacturers of professional R-DAT recorders have "engineered in" some measures to prevent or minimize this problem. The severity of the problem may be reduced, for instance, by increasing the accuracy of edit point location. Multiple edits using a video-frame-accurate location technique on the R-DAT tape are potentially more damaging than if digital audio-frame-accuracy is used to locate that same point, because there are about 60 video frames in a second vs. 48,000 digital audio samples.

Like all other digital tape media, professional use of R-DAT is enhanced by the presence of a buffer memory with the capacity to contain several seconds of audio. The presence of such a buffer provides instant start capability, with output of good audio instantly upon starting the machine. It also facilitates precise trimming of audio edit points and multiple rehearsals of an edit before it is actually performed.

It has been a long time coming, but professional R-DAT recorders and editing systems are now available on the market. This versatile audio format can now be fully exploited in video production.

Randy Hoffner is director of research and development at NBC Labs. He may be reached at +1-212-664-4733.

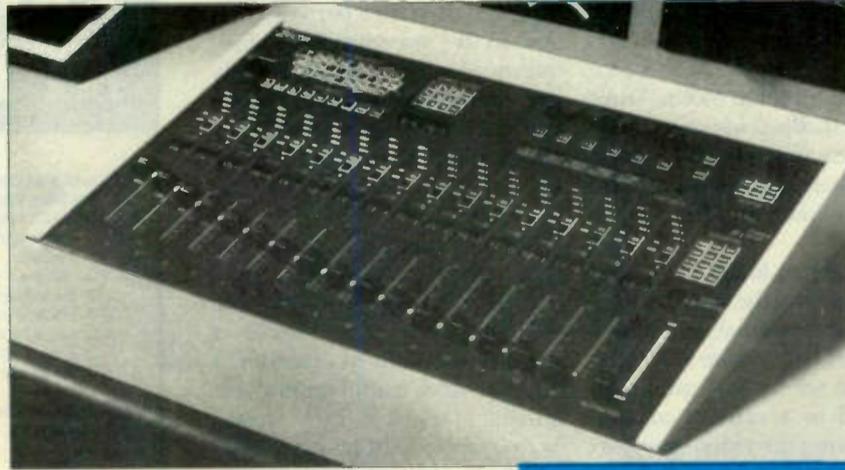
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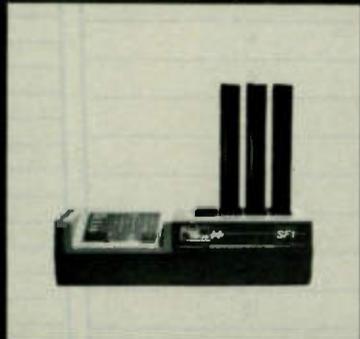
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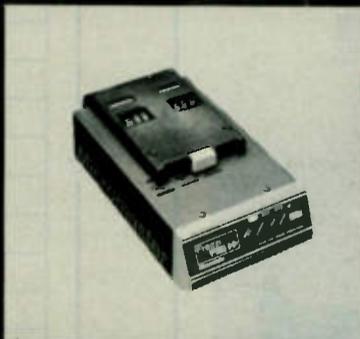
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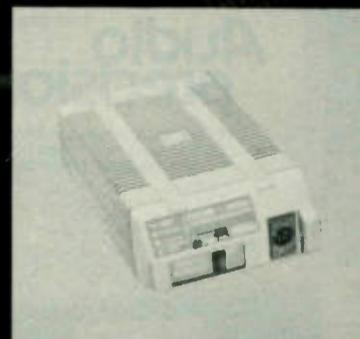
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# The Mighty Role of Multitrack

Audio for Video offers sound advice and explores the latest developments and techniques in this area of post production. The column is contributed by audio expert Ken Hahn, who co-founded Sync Sound, an audio post production house in New York City.

Multitrack audio plays an integral role in audio-for-video post production and is the foundation of the audio recording



by  
Ken  
Hahn

**AUDIO FOR  
VIDEO**

business as it exists today. Its use continues to increase and evolve but it is often taken for granted.

"Multitrack" refers not only to an audio format and the associated machine, but also to the process of using this format. Audio can be recorded and played back on a multitrack machine, an operation referred to as multitracking. For the purposes of this article, I will limit my comments to traditional analogue mul-

titrack techniques, which are those that use tape.

The primary function of the multitrack machine is to record and play back audio. In order to do this it must be properly interfaced and integrated with other equipment. Provided the audio has been input to the machine in the required electrical form and an appropriate recording medium is used, the multitrack machine will output audio in a form nearly identical to what was input.

Multitrack audio can be used to record and play back various audio elements on separate tracks. These individual tracks can later be combined or mixed. In typical audio post production, separate elements such as dialogue, voiceover, music and sound effects are edited and recorded onto a multitrack audio tape. These elements are then combined to produce a balanced mix.

While my intent is to examine how the multitrack audio format is used in audio post production, those not familiar or comfortable with the term "multitrack" will not benefit from the discussion unless some background is provided. For those already familiar with the topic, this column can serve as a review of the role of multitrack audio and how it relates to audio-for-video.

#### Short, revolutionary history

Analogue multitrack audio has only been in existence since the mid-1960s. In its short history it has revolutionized the

audio recording business. Originating in the field of music recording, analogue multitracking was subsequently embraced by the video industry and now is even being welcomed by some in the film community, where multiple strands of sprocketed magnetic film are used to serve the same purpose.

The term multitrack implies the use of more than one track. By definition this can mean there are as few as two, but normally the term refers to more than four or as many as 48 tracks on a single medium.

Multitrack audio uses tape not unlike that used for video recording. This multitrack tape is supplied in an open-reel design. Standards exist that specify the

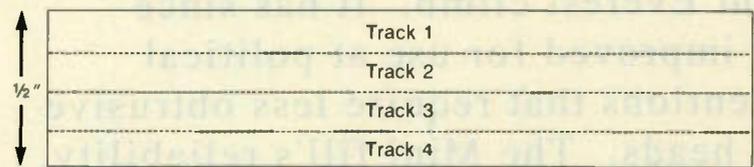
number of tracks available on the format. (An example of a four-track multitrack tape configuration is shown in Figure 1.) The tracks are assigned numbers, beginning with 1 at the top of the tape. Other examples of common professional formats are: 1/4" two-track, 1-inch eight-track or 2-inch 24-track.

#### Do not turn it over

Professional tape recording practices suggest recording all tracks in the same direction. It is not recommended to "flip the tape over" and record other material in the opposite direction, as is done on consumer audio cassettes. Open-reel tape and equipment will allow it, but it should only be done in extraordinary situations, with extreme care.

The reason it is necessary to specify the number of tracks on a tape is that there may be more than one possible number of tracks for a given tape width.

Figure 1. 1/2" 4-Track Tape



exact tape dimensions and other characteristics that enable compatibility.

#### Specifications

Likewise, specifications exist for the manufacturer of the multitrack machine. These include the number of tracks, their size and their location for each tape width.

Reels of tape are referred to by their width measurement. Some standard widths of professional analogue tape are 1/4 inch, 1/2 inch, 1 inch and 2 inches. The thickness of most professional tape is 1.5 mil, although 1 mil is used in some special situations. (The thinner tape provides longer continuous recording time but sacrifices audio quality and is therefore not normally recommended.)

Multitrack audio tape is available on either 10 1/2-inch (the most common), 7-inch or 5-inch reels. The length of a 1.5mm tape on a 10 1/2-inch reel is about 2,500 feet (or 750 meters). This allows for approximately 30 minutes of continuous recording at 15 ips (inches per second).

Multitrack audio configurations are usually referred to by the tape width and

For instance, a 2-inch multitrack tape can accommodate either 16 or 24 tracks. (See Figure 2.) Even though 2-inch tape is used to record either 16 or 24 tracks, the two track configurations are not compatible. The tape width is the same, but the track designations and alignments are not.

The physical space allotted for 24 tracks across a 2-inch tape is less for each individual track than the space allotted for 16 tracks across that same 2-inch tape. Track 1 on both the 16- and 24-track format are at the top of the tape and occupy approximately the same physical space. However, track 12 on a 16-track format tape has nothing in common with track 12 on a 24-track format tape, with the exception of the "label." As one could imagine, putting a 16-track tape on a 24-track machine and recording on it can be disastrous.

#### Custom formats

Further clarification of tape configurations is also necessary because a given number of tracks can be configured onto

(continued on page 26)

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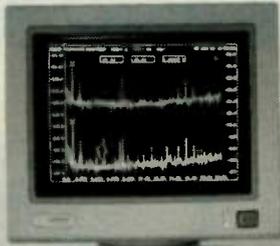
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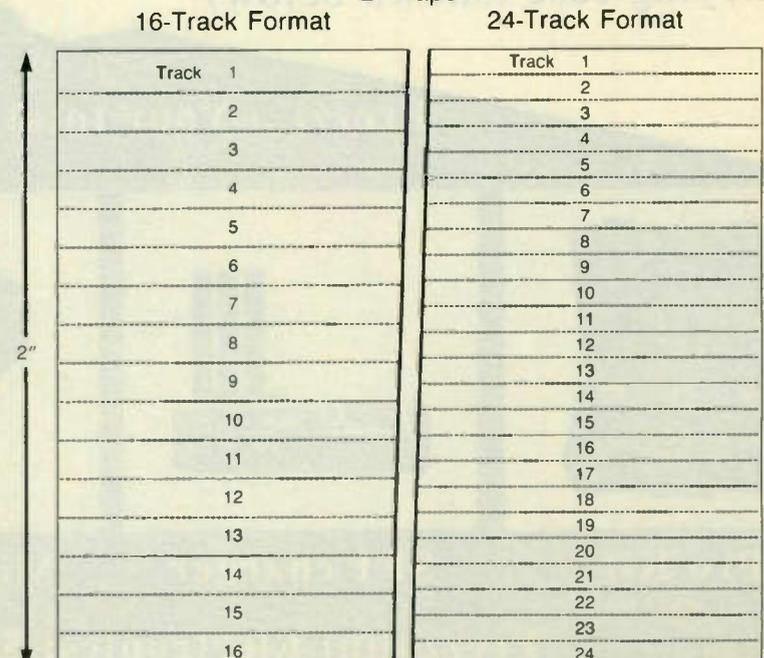
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Figure 2. 2" Tape



# Tips for Transmitter Maintenance

RF Technology covers all aspects of television transmission, including antennas, transmitters, towers and cables, as well as maintenance and operation.

The column is written by RF expert Doug Lung, who is vice president and director of engineering for the Telemundo Group of stations based in Miami, Florida.

This month, I will cover some RF odds and ends, and also

## RF Technology by Doug Lung

share some tips on TV transmitter maintenance and operation.

However, first the news . . .

EEV has been swapping out the prototype versions of its IOTs with final production run tubes. This will give them a standard IOT in the field. WOUC-TV's (Cambridge, Ohio) Rick Ervin filled me in on the swap taking place at his station. To quote Rick:

"Tube replacement was quite easy, and I took lots of pictures of the assembly. . . . There are a lot more parts than with klystrons. EEV changed the cathode cooling from water to forced air because (I have been told) they have not seen much heat dissipation in that area. Plus there are some other minor changes in the cavities. I am still impressed with the technology and the support I am getting from Comark. I hope the IOT technology really has better life than what we have been seeing out of our Varian 953H klystrons at our flagship station, but only time will tell."

Note that Rick is comparing the parts count on the IOT with the Varian 953H integral cavity klystrons. Talking to EEV, I confirmed there are fewer parts to disassemble with the IOT than with the conventional or MSDC/ESC external cavity klystrons.

### Research pays off

During my research, I found a lot of interesting information on TV receiving antennas. Jasik's "Antenna Engineering Handbook" (McGraw-Hill, 1961) has a chapter by Yuen T. Lo on TV Receiving Antennas. While somewhat dated, it is the most comprehensive discussion of TV receiving antenna design that I have found. Look it up to get information on V-beam and rhombic designs for wideband, high-gain antennas.

I found Mr. Lo's antenna gain numbers interesting. Because manufacturers tend to count every piece of tubing as an "element" instead of counting actual active elements, it is tough to compare models. Mr. Lo found the measured gain (with refer-

ence to a tuned dipole) of an all-channel VHF yagi, using a tri-pole driven element and five parasitic elements, to be 3 dB at low VHF and from 6 dB to 9 dB at high VHF, with the higher channels showing more gain. At UHF, he shows that a single bow-tie corner reflector has a gain between 8 dB and 12 dB, increasing with frequency. A two-bay bow-tie gives 8.5 dB to 12.5 dB gain.

### A decade hence

About 10 years ago, Radio Electronics did a study of consumer TV antennas. I do not remember if it covered VHF antennas, but the results of their tests on UHF TV antennas support Mr. Lo's findings. They found that the Channel Master parabolic with a twin bowtie feed was the best UHF antenna, followed by eight-bay and four-bay bowtie/reflector designs and then the corner reflector.

In the study, UHF all-channel yagis exhibited wide variations in gain over the UHF TV band—on some channels gain was less than 1! I was disappointed when the U.S.-based electronics store, Radio Shack, discontinued its corner reflector antenna, which I remember sold for under US\$20. I had found it worked better than most yagi antennas and was smaller and sturdier than the four-bay bowties.

Every now and then I get a report of a viewer who claims to receive every TV station from the transmitting site except ours. My first recommendation is to disconnect the antenna lead-in and try again. Usually, an "all-channel" antenna or lead-in is the problem.

### Transmitter masters

Now onto another subject: "Zen and the art of transmitter maintenance." Perhaps you have noticed some engineers can walk up to a dead transmitter and

## Misadjustment of the exciter or tube can turn a happy, easygoing transmitter into a troublemaker.

within minutes identify the problem and have the transmitter back on the air. You have also probably noticed these engineers do not have their transmitters go off the air too often.

What is their secret? Start talking to them about their transmitter and I bet you will find they talk about it like a person, saying things like "It missed me" or, if it is running well, "It is happy." That gives a clue to the secret.

Knowing how the transmitter works, the logic flow and the interlock locations is certainly important. But knowing when the transmitter is unhappy can be just as important.

While my comments here will be familiar to many of you, I hope they will help some engineers who are getting into transmitter maintenance for the first time.

### Stalking the blues

How do you know if your transmitter is unhappy? Here are some clues: Is it struggling to make power? Is the sync less than 39 ire units? Does it have large spikes on it? Is it impossible to get linearity looking good? Is the output power erratic?

Here are some solutions: Reduce power until the transmitter can both make sync and produce video with reasonable linearity.

## How do you know if your transmitter is unhappy?

Viewers will never see the difference between 100 percent power and 85 percent power. If the GM complains, remind him of what happens when the transmitter is unhappy—more down time! This might also be a good time to ask for that new exciter or transmitter upgrade.

Also, check the power meter calibration. It may be off. If the power is erratic, a line voltage regulator may be needed, or, if reflected power changes wildly, there may be a problem with the diplexer, transmission line or antenna. Check the diplexer reject load—many transmitters will continue to work if this fails but are not very happy about it.

Misadjustment of the exciter or tube can turn a happy, easygoing transmitter into a troublemaker. Unfortunately, most transmitter maintenance is done in the middle of the night when the mind usually is not in top form. The technique here is to go slowly and leave yourself a way out. Linearity correctors in TV exciters are especially tricky to adjust: they can change power level and affect lower sideband response.

If you find an adjustment is so touchy that even the slightest change makes the signal go out of tolerance, find out why that is so before proceeding. Usually, this is caused by another adjustment that is not set right.

In exciters, I have learned from experience that the RF levels within the exciter are critical. Use a spectrum analyzer to set levels inside the exciter to the proper level before starting a major adjustment. Check them again af-

ter adjustment to make sure they are still correct. If the RF level is too low into a linearity corrector, you will not be able to get the correction at black that you need. Conversely, if it is too high it may become unstable and difficult to adjust.

### Know your transmitter

Finally, get to know your transmitter. When adjusting an exciter, that means knowing how the adjustment will change when the exciter drawer is inserted back into the transmitter or when the tube has warmed up. Spend some time listening to and smelling the transmitter. That is the only way you will be able to catch the sound of a fan bearing starting to go bad or the smell of a resistor overheating.

Record all of the meter readings, or, better yet, use a grease pencil to mark the meter glass

cleaning schedule and full visual inspection of the transmitter and cooling system as well as monitoring the operation of the transmitter under power, looking for hot spots in the RF system and cooling and any unusual smells or sounds.

Depending on the size of your transmitter, this may take four hours or more. Do not forget that all mechanical components are important, including those on the air conditioner outside.

Here is hoping you and your transmitter have a long, happy relationship!

### "Palm-top" computer

A few final notes: I found out about an interesting product from Hewlett Packard, the HP95LX "palm-top" computer. While not an RF product, it is one of those things that is ideal at remote sites. The HP95LX includes a serial port. It is good for programming those new pieces of test gear with RS-232 ports. I have tested my calorimetric power calculation program on it and it runs fine.

The HP95LX has a 40-character screen, but it can be scrolled to view the full 80x25 line DOS screen.

Doug Lung is vice president and director of engineering for the Telemundo Group of stations. He may be reached by calling either his Los Angeles, California (+1-818-502-5739) or Miami, Florida (+1-305-884-9664) office. If he is on the road, the Los Angeles number's voice mail gives his current number. Ideas, circuits, tips, rumors, news, whatever—if it applies to RF, he is interested in hearing from you!

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# Conversion: The Crowning Touch

(continued from page 1)

that time, the U.K. had 405 scanning lines per frame, Germany had 625, and France had 819. I guess the French and Germans wanted to watch to remind themselves that the Queen was descended from their people.

## The last granny

Anyway, I guess the line conversion worked, because the Brits adopted 625 lines themselves and converted to 405 "until the last granny gave up on the last old telly," as it was explained to me. Then someone got the brilliant idea to exchange programming with us colonists of the similar dialect. Going from 625 lines to 525 wasn't too tough, but going from 25 frames per second to 30 was, and, until this year, it was never terribly successful.

Lookee: Suppose someone throws a ball. In one 625/50 frame it's on the left and in the next it's on the right. If a 525/59.94 frame happens to coincide with the left frame, that's a fairly easy line conversion, but that guarantees that there will be another 525 frame before the 625 frame with the ball on the right. You can do all the linear arithmetic you want, but you ain't gonna come up with the ball in the right place. The best converters would actually give you two balls, a lightish one on the left and a darker one on the right. Blech!

Okay, I lied chauvinistically. Everything didn't change this year. Oki came out with a motion compensating standards converter a few years back. Here's

the deal: You look at one frame and then look at the next and see what's moved. Then you figure out how it moved, where it moved, and how fast it moved. Then you figure out where it would've been in the 525 frame you have to invent. Then you invent the frame. Then you start all



by Mario Orazio

## Masked Engineer

over again for the next frame. And it's just that simple!

My chauvinism comes in because this year CBS got hold of some Vistek standards converters with vector motion compensation, and NBC got Thomson to build some using a slightly different technology (as for why Thomson, I got a theory relating to the fact that NBC used to be owned by RCA, but when GE bought RCA they traded the latter's consumer electronics business to Thomson for some medical stuff). Anyway, each network used both its own and the other network's standards converters for their Olympics coverage, and everyone seemed quite happy with the results.

## A giant leap

Whoop-de-doo. So Americans got to watch the Olympics

again. Big deal. The standards converters ain't perfect. Certain patterns don't make it through the process intact, and I ain't too sure I'd like to convert a program containing already converted segments, but that's just nitpicking. The industry took a giant leap this year, but who cares? Like I said at the beginning, Americans usually don't

give a hoot about standards conversion, and maybe you don't either.

## Inventing frames

AVS adopted the Thomson technology in its Cyrus converter, and Snell & Wilcox went

24 to 25, so the traditional 625/50 solution has been to run film through telecines at 25 fps. Everyone's voice gets higher pitched, the pacing is faster, and you get to go to sleep that much sooner. With motion compensation, 24 fps film can at last be shown at 24 fps (and those of us from 525/59.94 countries can get rid of our famous "3-2 pull-down").

I ain't done yet. Everyone talks about video compression these days. Heck—that's easy. Lookee: I'll just compress a sentence here: Ijstcmprsasntnchr. The trick is in the decompression.

Ampex and Sony (in DCT and Digital Betacam) say they can do a 2:1 compression real easy. Heck—of course they can! But, with motion compensa-

**...standards conversion with motion compensation isn't just standards conversion—it's magic...**

tion, so can you. If you want to give a two hour recorder a four hour capacity, just record every other frame and let motion compensation do the rest. A lot of folks are already doing animation by letting computers fill in the stuff between key frames. And, if HDTV requires four times the information of non-HDTV, how would it be if we recorded just one out of every four HDTV frames and let motion compensation do the rest?

During Wimbledon, this year, the BBC used the same technology in Snell & Wilcox's converter to turn ordinary slow motion into the beautiful, fluid motion you might have expected from something like Sony's three-times-normal speed Super Motion system. Think of it as standards converting from video at maybe five frames per second to normal PAL at 25. As long as you are making up frames, why not make up four instead of one? If the motion compensation knows how and where everything moved, it doesn't have much trouble sticking made-up frames anywhere.

## The big picture

Here's another simple task. Let's finally get 625/50 countries to watch Hollywood movies the way they were meant to be seen. In America, we shoot at 24 frames per second. It ain't easy to standards convert from

verting from 525 to 625 involves a line rate upconversion). They create something from nothing spatially instead of temporally. Omigosh! I think I've just hypothesized a day when ordinary VHS cassettes turn into HDTV (actually, Yves Faroudja already demonstrated just that at the National Association of Broadcasters convention in Las Vegas this year).

Okay, maybe I'm getting a bit carried away, but I find the prospects amazing. I've personally cranked the speed of Snell & Wilcox's slo-mo system down to around 50:1. The results ain't perfect when you have to make up 49 out of every 50 frames, but they ain't half bad even at that extreme a case. Let me put it this way: I've seen much worse stuff broadcast.

And, yeah, there are other bugs to work out, too, even at lower levels of compensation. The systems as they exist today are nothing short of remarkable in being able to deal with simultaneous zooms, pans, tilts, and complex object motion, but there are times when the systems need to deal with something other than mere motion.

When someone sticks her hand in front of her face, the face didn't move—it just got hidden. A zoom out reveals whole new worlds of things that weren't in the last frame. And it sure would be nice to have some artificial intelligence that knows what balls, hands, and zooms are.

I'm hopeful. I bet you will be amazed at what's available by the time Prince Charles gets crowned.

Mario Orazio is the pseudonym of a well-known television engineer who wishes to remain anonymous. Send your questions or comments to him c/o TV Technology.

## Imagine the possibilities

There's also a bunch of up-converters out there (just con-

## Technology Tip for Equipment Mounts

by Larry Albert

When mounting equipment on an existing wall, positioning the required mounting holes accurately is difficult, especially if the wall is concrete or cement block.

Center punching makes it easier to drill holes where you want them, not just nearby. If yours is like most facilities, you probably cannot always find that expensive center punch. Or maybe you just do not want to use it for marking concrete.

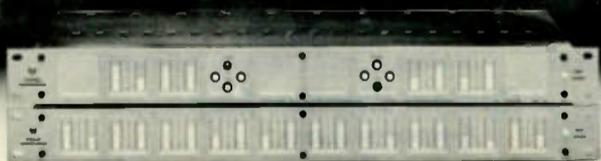
Here is a cheap solution to

the problem: Get a masonry nail and drive it into the wall. Remove the nail. You now have a pilot hole to guide the drill bit.

Masonry nails can be bought, by the pound, at most hardware stores. The price keeps you happy (even if one gets lost or damaged), and the extras will also do a fine job of center punching metal.

Larry Albert is a U.S. television engineer who believes cheap engineering is an acceptable term and is a self-professed "cheapskate." He can be reached at +1-502-762-4664.

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por David Rochlis  
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Al realizar cambios en nuestro departamento a fin de realizar un mayor número de funciones en nuestra empresa, uno de los ingredientes más importantes en nuestro Departamento de Video es el suministro de gráficos de alta calidad, con efectividad de costos para nuestra clientela.

Habíamos recibido gráficos de video como parte de nuestro servicio de transferidora, pagando a otras empresas hasta US\$200 la hora. Creíamos que podíamos prestar un mejor servicio a un costo menor para todos, excepto los gráficos más complejos para nuestras producciones.

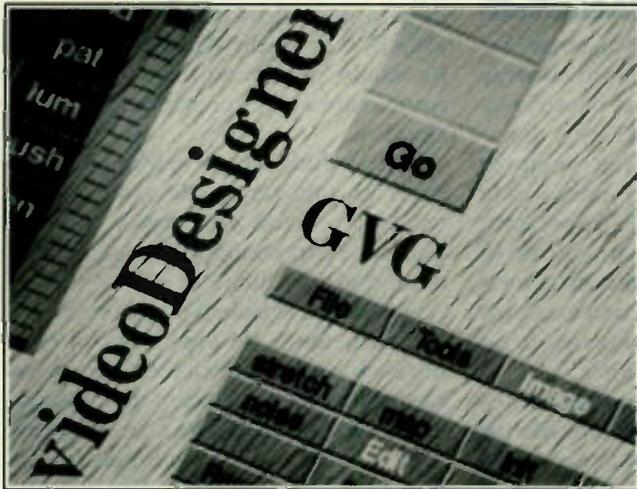
¿La solución? Un sistema gráfico con base en CPs. Muy bien, en el mercado existen muchos sistemas de gráficos para video basados en CP, Mac, y Amiga. Pero nuestro grupo ha estado usando gráficos "caja de pinturas" (paintbox) de instalaciones de transferidoras durante años. Nuestro personal reaccionaba negativamente a estos sistemas tradicionales basados en CPs, por estar acostumbrado a producir gráficos de alta

calidad en un período corto.

Hace dos años hablamos con Dubner sobre una Fábrica de Gráficos (Graphics Factory). La configuración que queríamos costaba más de US\$90.000, una cifra inalcanzable.

### Una alternativa prometedora

En otoño del año pasado Dubner se aglomeró con su empresa matriz y se convirtió en Grass Valley Groups Graphics Systems Division (GVG-GSD).



Habíamos oído que Grass Valley estaba trabajando en un sistema de gráficos basado en CPs y uno de nuestros productores principales, junto con nuestro ingeniero, se trasladaron a Paramus N.J. para echar un vistazo. Los resultados parecían prometedores.

El sistema consistía de dos tableros de gráficos Grass Valley y programas en paquete que operaban en una CP 386 o 486.

Ofrecimos nuestros servicios como "lugar de prueba beta" para el producto y el sistema llegó a fines de marzo.

El nombre oficial del sistema es videoDesigner. La configuración del sistema consiste en una CP Gateway 486 con 8MB de memoria, un "hard drive" de 200MB SCSI, monitor VGA, un excitador desmontable para Syquest (Syquest removable media drive), una placa de dibujo inalambrica con sensibilidad a presión Wacom 12x12, y los tableros videoDesigner Grass Valley y paquete de programas. El costo total era de unos US\$13.000 (que no incluye un monitor de 20 pulgadas Conrac NTSC que ya teníamos).

Aunque nosotros mismos habíamos configurado y montado el sistema, Grass Valley está estableciendo una red de 16 distribuidores con experiencia en la configuración con CP.

Grass Valley anuncia el sistema, que se ofreció a la venta en la última convención de NAB, como el primer sistema de gráficos basado en CPs presentado por una empresa de difusión. Esto tal vez no sea tan trivial como parece, porque la empresa que respalda este producto se encontraba en un punto crítico en su selección. Grass Valley conoce el negocio de "video" y el producto cumple con su cometido.

El videoDesign es un sistema total a colores con una paleta de 16,7 millones de colores. La entrada y salida de video es una combinación analógica y D-2 digital. Actualmente estamos captando imágenes de Becacam, 1 pulgada, y una cámara.

El sistema ofrece numerosos instrumentos de pintura, dibujo y diseño. Pedimos a cuatro artistas gráficos externos que lo revisaran y evaluaran y sus comentarios fueron sumamente favorables.

El sistema se parece al sistema Dubner Turbo Paint, pero es aun más veloz.

### Importaciones y exportaciones

Un artista independiente que trabaja en nuestro sistema estuvo sumamente impresionado con los 70 efectos disponibles en Image Paint. Grass Valley ofrece esto como una opción de programa para modificar rápidamente una imagen con efectos de "pintores."

Otro aspecto muy deseable es la posibilidad de importar y exportar imágenes a una variedad de plataformas de computadoras. Hace poco exportamos una vista fija captada como archivo TARGA para ser usada en una estación de Silicon Graphics que operaba un programa de modelación 3-D desarrollado por GE. Con la última versión del programa Grass Valley ha añadido apoyo de archivo directo para imágenes Video Toaster junto con otros formatos de archivos de apoyo incluyendo GIF, JPEG, TARGA, TIFF y la serie K de Grass Valleys Dubner y Graphics Factory.

Hasta la fecha, Grass Valley nos ha prestado un apoyo excelente cuando les hemos llamado con preguntas sobre el

sistema. El consenso de nuestro personal es unánime: con el videoDesigner continuaremos produciendo gráficos de alta calidad para nuestras producciones de video, a un costo más bajo para nuestra clientela. Es un gran producto a un precio fantástico.

David Rochlis es productor principal de video de GE-GESD en Moorestown N.J. Su teléfono es el 609-486-5588.

Las opiniones expresadas en este artículo son únicamente las del autor. Para obtener mayor información sobre videoDesigner, llame a Evelyn Bronson al teléfono 201-845-8900 o marque el No. 9 en la Reader Service.

## Media Methods Relies On AmiLink for Editing

by Paul Smolen and Terry Dyke  
Media Methods

AUSTIN, Texas AmiLink from RGB Computer & Video (Riviera Beach, Florida) is a software-based edit controller that runs on the Amiga personal computer. It joins a growing trend in video production, one that sees more and more functions moving from traditional hardware into computer software. The payoff is increased ease of use, greater flexibility and lower price.

AmiLink is a telling example of where this trend may be leading. Together with NewTek's Video Toaster and some fairly basic video hardware, an individual or group of modest means can now own a sophisticated on-line editing and post production facility. Before long, the much-heralded idea of "desktop video" may become a fact of life.

It is not quite here, though. Video Toaster, for example, does require an external time base corrector, which is a stretch for small budgets; and the price tag on AmiLink's professional version is \$6,000—inexpensive compared to what it replaces, but not quite consumer league. However, somewhere between the professional high-end and the consumer level, there is the so-called "prosumer"—a growing middle ground

whose potential opens up greatly with the availability of these cost effective production tools.

### No muss, no fuss

A natural candidate for this league is the local cable TV facility. Indeed, it was in just such a setting that we tested AmiLink, and word spread quickly among

## USER REPORT

the producers there. If you have ever tried, for example, to coax an A-B roll out of very basic equipment, you will appreciate the way AmiLink lets you get this done with a minimum of fuss.

The fact is, software is generally just easier to use than hardware. AmiLink's user interface follows the Windows/Macintosh style, with pull-down menus, on-screen "buttons" and a pointing device such as a mouse or trackball.

The on-screen "control panel" shows three VTR status windows, two for the source decks and one for the record deck. Each window consists of a series of time readouts that show the in-point, out-point and duration for the cut. You deal directly with these readouts to set the edit points, pointing to each readout in turn and then

(continued on page 17)

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# MATROX A LA VANGUARDIA

por Bruce Goodchild-Wood  
Gerente de Video Graphic  
Forefront Graphics Corp.

**DOWNSVIEW, Ontario, Canadá** Los cambios que se han suscitado en los últimos 18 meses en gráficos para computadoras y en productos para la producción de videos para computadoras personales, han sido nada menos que milagrosos. Con toda esta publicidad con bombo y platillos, es fácil perder de vista los beneficios y las posibilidades que presentan algunos de estos productos.

Un ejemplo que viene al caso es la tarjeta video Matrox Illuminator 16 que, para muchas personas, no representaba más que un clon barato de un tablero Targa. A pesar de ser completamente compatible en registro con un Targa 16, es capaz de muchas otras cosas, que continuarán creciendo en importancia.

## Versatilidad

Las recientes revisiones de los modelos ISA del tablero han extendido aun más su capacidad. En la nueva versión, llamada Rev. 3, un modulo estabilizador video permite la captación de una imagen aprovechable de fuentes inestables de video tales como de camaras tipo "Zapshot." Las funciones de conmutación incluidas en el modelo Rev. 3 también permiten la selección de entrada A o B de Y/C 3,58 ("S") o NTSC.

¿En términos prácticos, cuál es el significado de toda esta capacidad? Un tablero con indicador de imágenes de gráficos capaz de integrarse en cualquier computadora compatible con IBM, que funcione bajo cualquier sistema de operación. Las aplicaciones de programas (software) abarcan desde hojas electrónicas (spread sheets) y procesamiento de texto a CAD, multi-medios y video.

## INFORME DE LOS USUARIOS

En Forefront Graphics usamos los tableros Illuminator primordialmente para la creación de gráficos para video, títulos y presentaciones. Hemos determinado que uno de los mejores programas (software) para esta aplicación es el Inscribe de Image North Technologies. El Inscribe, aunque no es un producto que se encuentra en el mercado para las masas, tiene una excelente reputación para los profesionales en radio y en tarjetas Targa y Vista.

Sin embargo, existen versiones específicamente para los tableros Matrox Illuminator. Las versiones Matrox del Inscribe toman en cuenta las adaptaciones para efectos especiales de estos tableros. En el tablero 1024, el Inscribe opera en resolución 640x480 comparado a la resolución de 512x480 de los tableros Targa. También hemos determinado al

compararlos uno con el otro, que preferimos la calidad video de ciclo completo (pass through) y la configuración de los programas (software) del Matrox Illuminator.

## En casos Imprevistos

Hemos determinado que, una vez que se aprende a configurar y usar el Illuminator Matrox, pueden derivarse muchas aplicaciones, simplemente cambiando las configuraciones y/o los excitadores.

En una emergencia, uno de nuestros ingenieros tomó mi computadora video de pintura-gráficos para usarla con AutoCAD, y al añadir Windows y Corel la ha usado para comprobar una nueva combinación de impresor a colores y excitador.

No hay duda de que el Matrox Illuminator es una tarjeta de gráficos muy compleja. Tiene numerosos puentes (jumpers) para configurar los parámetros de entrada y salida.

Si va a usar el tablero para la aplicación de grabaciones de video, los puentes instalados en la fábrica tendrán que ser cambiados. La instalación del Illuminator en una computadora no es una tarea fácil y se complica aun más si hay numerosos dispositivos o elementos que compiten por el espacio de la memoria básica. Aun los más entendidos en computadoras deben tomarse el tiempo necesario para leer las instrucciones de instalación con sumo cuidado.

La mayoría de los problemas que hemos encontrado han sido resueltos al modificar la administración de la memoria y al mantener una secuencia específica de los eventos en los archivos autoexec.bat y config.sys. Afortunadamente existe un buen elemento de apoyo.

## Ultima novedad

Por un costo de menos de US\$200, Matrox ofrece paquetes de programas denominados HotDVE. HotDVE permite al usuario trabajar con más de 45 transiciones distintas entre una fuente viva única y un separador de imágenes de ciclos (frame buffer image) similar a las funciones del DME 450 de Sony.

Constituye un método que controla con gran exactitud el sfumado de la imagen, la solarización, el efecto de mosaico, el destello electrónico, la clave de croma, y las imágenes múltiples. Para las aplicaciones de DOS, el HotDVE es sencillo de operar y puede ser activado por GPI. Cuando se usa con el sistema de edición Sony EVO 9700 Hi8, se puede convertir un dispositivo simple de corte recto de edición en un paquete de producción de alta calidad para transiciones y efectos especiales.

Estos efectos especiales también han sido integrados en un programa que está a punto de ser lanzado al mercado por Future Video de Laguna City, California. El programa, denominado EDL 2000FX simultáneamente controla los VCR con una lista de edición compatible a CMX por cualquiera de las líneas de controladores compatibles de Future Video, activando los efectos y las transiciones en el Matrox Illuminator.

## El Productor Personal

De gran interés para los que usan Windows, Matrox hace poco introdujo un paquete revolucionario de programas

Veamos algunas de estas capacidades:

1. Entrada y salida RGB NTSC Y/C 3,58 (senal S-VHS/Hi8 con clave de croma (chromakey), superposición, y captación de imágenes).

2. Ventanas video de tiempo real, lo que significa una compresión de una pantalla video completa en 1/2 1/3 1/4, 1/5 1/6, 1/7, y 1/8 del tamaño normal, ya sea horizontal o verticalmente o ambas, con excelente calidad.

3. Salida a monitores VGA o NTSC

4. Configuraciones de presentación visual, ya sea en uno o dos monitores VGA.

5. Resoluciones de presentaciones visuales variables. El tablero 512 (0,5 meg) tiene capacidades de resoluciones pixel de 512x480 y 512x400. El tablero 1024 (2 meg) tiene capacidad de hasta 1024x768 SVGA de presentación visual y 640x480 con una salida de NTSC/Y/C

6. Operación bajo Windows, usando un excitador opcional Windows

7. Compatibilidad con 3D Studio y AutoCAD, pudiendo realizar operaciones CAD de captación de imágenes y superposición video

8. Operaciones bajo OS/2 con un excitador opcional OS/2.

9. Modelos ISA y MCA (microcanal) en versiones NTSC y PAL.

denominados Personal Producer, que combina la aptitud del tablero Matrox Illuminator con control de Windows, compatible con un tablero audio y control de VCR.

Personal Producer es el primer programa de su clase que controla gráficamente los elementos de la producción de video de la misma manera que el programa de publicación de escritorio. Cada etapa post-producción se representa en una serie de pantallas sencillas y lógicas que controlan cada uno de los elementos de producción.

Incluye la selección de "clips" de video y de audio, y de transiciones, pantallas de títulos y la importación de gráficos de otras fuentes. Todos los elementos luego se presentan en una línea de tiempo a múltiples niveles que permite al usuario modificar y controlar la secuencia de cada evento. Este producto promete simplificar la parte técnica de la producción de un video, para que pueda ser operado por cualquier persona que tenga un cierto conocimiento de computadoras.

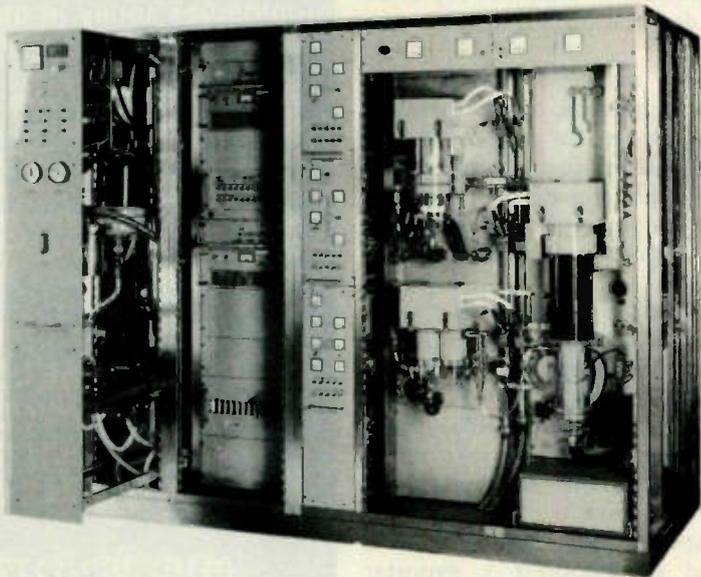
Bruce Goodchild-Wood es gerente de gráficos de video de Forefront Graphics, distribuidor especializado en productos video y gráficos a base de computadoras. Ha trabajado en la industria de producción de video por más de 20 años, y en los últimos siete años ha trabajado en sistemas computerizados de producción de video.

Presta servicios de consultoría en equipo y programas de producción de video y dicta cursos de videografía intermedia en la Facultad de Educación Continua en Mohawk College, Hamilton Ontario, Canada.

Para mayor información, envíe un FAX a Marc Nadeau al 514-685-2853 or marque el No. 28 en la Reader Service Card.

## PRECISION AND RELIABILITY

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# Media Methods Relies on AmiLink

(continued from page 15)

typing in the desired value.

Depending on how you set the points, the program can calculate either the duration or the out-point for you. Alternatively, you can roll tape to the desired location and set the point that way. When the edit is performed, the current tape location is automatically entered as the new in-point.

## Strangely familiar

The Edit Control Group in the lower right-hand part of the screen handles the VTR transport control; it consists of a familiar-looking array of buttons for play, fast forward, rewind and the like. You can even activate a shuttle by clicking the right mouse button and using the mouse or trackball as a shuttle knob.

There are on-screen controls for other familiar edit functions. With the Edit Execution Panel in the lower left of the

*One of the nicest options AmiLink gives you is that of automating your entire edit.*

screen, you select the source audio 1 through 4, video-only, or video/audio; after you set up an edit, you can then preview it, perform it or review it.

Other controls do cuts, wipes, dissolves and keys, as well as split edits. You can also select an effect for the NewTek Video Toaster to perform, if that is installed.

The screen layout varies according to function: in "Cuts Only" mode, there is only one source-deck window; in "A-B Roll," there are two. You can set this on first entering the program, on the Setup screen. There you can make this selection, as well as a number of others such as pre-roll and post-roll times, edit mode and frame-code mode (drop-frame or non-drop-frame).

The whole configuration is saved to a file on the disk, and can be loaded the next time the program is started.

## Auto edit

One of the nicest options AmiLink gives you is that of automating your entire edit. AmiLink can read your edit decision list from the disk as long as the list is in one of several standard text formats—EDLP, CMX 3600, TEXT CMX 3600 or AmiLink's own LST format.

It will probably be a while before you take advantage of this feature, but even when you are working from your own EDL and doing all the edits by hand, AmiLink records an "after the fact" decision list that shows every edit you made during the session. This is good for later reference; or, if something happens to your edited master, AmiLink can reconstruct it automatically using this list.

There are other features like this in AmiLink that will keep the user busy. The General Purpose Interface, or GPI, can control external devices for additional special effects. There is also a frame-by-frame mode you can use to record frames of animation created on the

NewTek Video Toaster.

There is even an interface for the programming language ARexx; you can use it to program functions that will extend AmiLink's capabilities or coordinate activities with other programs. (In fact, it is an ARexx program that allows AmiLink to work with the Toaster.)

## Easy to use

Overall, AmiLink is very easy to use. As software, its design is clean and intuitive, and as an edit-controller replacement, it will spoil you.

There is a lot of flexibility to accommodate different styles of use. For instance,

most of the on-screen controls have keyboard equivalents that many people will find more efficient to use once they gain some familiarity with the program.

The documentation is extensive and mostly complete, but still a little rough in places, particularly the screen illustrations. It is evident that RGB has been upgrading the program faster than it has the manual.

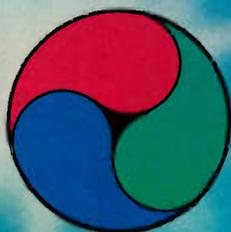
Now, as if to up the ante, RGB has come out with a "consumer/industrial" version of AmiLink. Unlike its big brother, it will not read time code, and will only control Panasonic 1960 VHS tape decks. But with such a dramatic

price drop, it will surely bring desktop video a step closer to us.

*Editor's note: Paul Smolen is a television producer and Terry Dyke is a systems analyst for Media Methods in Austin, Texas. The two have worked together for more than 20 years on everything from producing programs for cable to setting up television production facilities. Media Methods is a communications design and production company.*

*The opinions expressed above are the author's alone. For more information, contact Mike Rowe at RGB Computer & Video: +1-407-844-3348, FAX +1-407-844-3699, or circle Reader Service 50.*

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# Toaster Can Slice The Cost of Video

Focus on PC Graphics takes a look at emerging graphics software and hardware based on the Amiga, IBM and Apple Macintosh personal computer platforms.

John Spofford is an audio/visual specialist and videographer based in Newfields, New Hampshire.

The Video Toaster, developed and manufactured by NewTek, Inc. in Topeka, Kansas, is a plug-in card

and software package for the Commodore Amiga 2000/2500 series computers that transforms the Amiga into an easy to use, multipurpose video "appliance."

It was introduced in 1990, and recently, Newtek released a major software upgrade. The software greatly enhances the capabilities of the Toaster while still using the original hardware. The Video Toaster is presently only available as an

NTSC device, although plans are underway for a PAL version.

The Video Toaster has done much to solidify the Amiga's claim as an effective low cost video platform. More importantly, the Video Toaster creates a user-friendly video system that explores the middle ground between those who understand computers and those who understand video.

NewTek's Video Toaster was originally

designed for the "prosumer" market ("prosumer" is a U.S. term used to describe the video equipment user who

## FOCUS ON

## PC GRAPHICS

by John Spofford

crosses the low-end professional and high-end consumer video markets). Continuously improved during its long development process, the Toaster has become a product with several professional/consumer contradictions.

### Sophisticated effects, but...

For example, it produces sophisticated digital video effects (DVEs) but it provides composite NTSC through BNC connectors.

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**The Video Toaster has done much to solidify the Amiga's claim as an effective low cost video platform.**

With a list price of US\$2495 (including software), the Toaster has a prosumer video price, yet requires time-base-corrected input.

It is a high quality device. The composite NTSC output is excellent, whether measured on a waveform monitor or with the naked eye.

Physically the Video Toaster consists of a large PC board that plugs into the Amiga's internal video slot, giving it direct access to the computer's display signals. Four VLSI (Very Large Scale Integration) computer chips form the heart of the Toaster, making it a powerful graphics computer designed to work in concert with the Amiga's own custom display and animation chipset.

When installed, the Video Toaster is completely invisible except for a vertical row of six BNC connectors protruding out of the back of the computer. Four of these connectors are the video Inputs 1 through 4.

While the Video Toaster generates its own RS-170A sync internally, it is programmed to synchronize itself to Input 1. The two bottom BNC connectors are outputs: a "Preview Out" for a composite monitor and a "Program Out" that is connected to the recording VCR.

### Impressive software

The Video Toaster hardware is impressive, but it is NewTek's software (included on 14 diskettes) that makes it work.

Depending on which software program is running, the Video Toaster becomes either a video switcher (with nearly 200 built-in DVEs), a comprehensive character generator, a frame grabber with disk storage of video stills, a luminance keyer, a chroma effects generator, a 16 million

(continued on page 22)



Extensive professional controls include MGC, AGC, AFC, level sets, normal/invert video, clamp/unclamp video, skew, subcarrier frequency selection, video and IF test points are conveniently located on the front panel. Meter reads C/N ration, signal strength or center-tune.

Direct reading format and channel display also indicates upper/center/lower transponder position, C or Ku-band operation, and antenna polarity.



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# MARKETPLACE



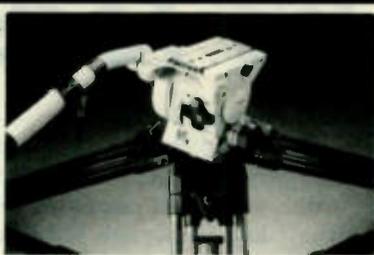
### Digital effects system

CEL's Meridian-fx system is a 3-D digital effects system intended for the broadcast and production facilities markets.

A modular system, it features an all digital 4:2:2 core, and is able to accept a variety of interfaces to the user's environment.

The basic model is a single channel unit capable of 3-D effects, page turns and shatter effects. More channels can be added and brought together with an integral component digital mixer.

For more information, contact CEL at +44-799-523817, FAX +44-799-528081, or circle Reader Service 15.



### Pan and tilt head

Vinten's new Vision SD12 pan and tilt head was designed to accommodate one-piece ENG camcorders and dockables, but is able to carry additional payloads of larger viewfinders, heavy batteries and larger lenses.

The SD12 incorporates the new Serial Drag system, as well as the Vision line's "true balancing" system.

For more information, contact Mike Martin at +44-284-752121, FAX +44-284-750560, or circle Reader Service 32.

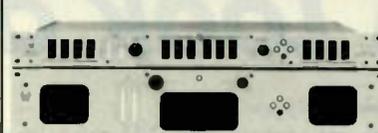
### Vision mixer

Snell & Wilcox's DVS 1000 is a compact 4:2:2 vision mixer designed for use in telecine bays, graphics suites and special project applications where simple mixes and wipes are needed between component digital sources.

The DVS 1000 enables facilities to maintain the integrity of the signal path without using expensive specialized equipment. It provides internal black and background generators, fades and a selection of wipe patterns with variable edge softness between all sources.

For editing, it may be controlled by an externally standardized bus utilizing RS-422 protocol.

For more information, contact Joe Zaller at +44-0-705-268-827, FAX +44-0-705-241-252, or circle Reader Service 53.



### Audio monitoring

Wohler Technologies introduced the AMP-2, its latest addition to its series of rack-mount stereo audio monitoring systems. It contains three power amp and driver combinations: two handle the midrange and high frequencies in stereo, while summed low frequency information is fed to a third center channel.

Frequency response of the AMP-2 is 100 Hz to 16 kHz  $\pm$ 5 dB. The two stereo amps are rated at 20 W peak and the center channel amp at 32 W peak.

For more information, call +1-415-285-5462, FAX +1-415-821-6414, or circle Reader Service 58.



### Digital video mixer

FOR.A Corp's DVM-400P component digital video mixer is a D-1 tape format component digital mixer for small production and graphics suites.

It features a six-bus multilevel mix effects system, 10-bit signal processing, four primary component D-1 inputs, three key levels, 18 simple and complex wipe patterns, and more.

For more information, contact FOR.A at +81-3-3446-3936, FAX +81-3-3446-4452, or circle Reader Service 86.

### Portable satellite system

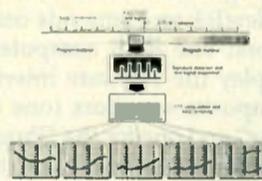
Harris Allied's S-1 "Flyaway" portable satellite uplink system is contained within 13 cases, each weighing less than 100 pounds and conforming to international baggage requirements.

The system may be checked as excess baggage on domestic and international flights.

The S-1 was designed for setup in less than 30 minutes, and features a 1.8 meter Vertex antenna with a transmit gain of 46.6 dbi.

The unit also includes a TWTA-type HPA system, an Intelsat-approved Ku exciter, a Ku receiver and LNB, a spectrum monitor and an audio and video baseband package.

For more information, contact Davina Frost at +44-223-245115, ext. 212, FAX +44-223-210441, or circle Reader Service 94.



### Audio test system

Audio Precision recently introduced a new audio testing technique, FASTTRIG, for stereo or monaural channels with less than one second's interruption of programming.

The 1/4 second FASTTRIG burst provides 160 measurements on a stereo channel, response at 22 frequencies on both, phase at 22 frequencies, distortion summed into 22 frequency bands on both and more.

For more information, contact Bob Metzler at +1-503-627-0832, FAX +1-503-641-8906, or circle Reader Service 76.



### Still store system

Thomson Broadcast's Pixtore is a modular still store system capable of broadcast-quality image processing and archiving requirements.

It is comprised of a 386 microcomputer connected to one or more digital or analog broadcast video input/output channels, with an internal 4:4:4:4 structure.

Data compression enables the Pixtore to store several hundred pictures. One picture can be loaded in less than 1.5 seconds.

For more information, contact Thomson at +33-1-34-20-70-00, or circle Reader Service 45.

### Digital interface

Leitch's MIX-7000 Digital Interface series is a low cost modular system designed to solve serial digital interfacing problems.

The current modules include multistandard serial DAs, serial to PAL (or NTSC) monitoring DAs, 4x1 routers, test signal generators, composite and component digital serializers/deserializers, and the Leitch PROM-SLIDE (a 4:2:2 still on a card).

For more information, contact David Strachan at +1-416-445-9640, FAX +1-416-445-0595, or circle Reader Service 98.



### Production switcher

Grass Valley Group introduced the 4000-2A 10-bit serial digital component production switcher at IBC, part of its 4000 Series, a range of medium and high end switchers.

The 4000-2A features 24 inputs and, with the addition of wipes in the program preset mix, is focussed on the requirements of live applications.

For more information, contact Jay Kuca at +1-916-478-3141, FAX +1-916-478-3411, or circle Reader Service 57.

### Transmitter control

Logica's Transmitter Master Control (TMC) is a system for the remote control and monitoring of a transmitter network. Originally developed as part of a project for National Transcommunications Ltd., the system enabled operators at regional control centers to monitor the status and performance of any single transmitter. It also permitted changes to be made in operating parameters.

In addition to alerting operators to technical problems and potential transmission failures, the system assists in planning routine maintenance.

For more information, contact Maggie Owen at +44-71-637-9111, FAX +44-372-363072, or circle Reader Service 62.

### News control system

Louth Automation's NEWSTRAK system provides control for the fast pace of news and sports. It works within your existing newsroom system to control switchers, multiple cart machines, effects devices, still stores, character generators and VTRs.

The playlist can be used in any mode, and you can move, add or delete events within seconds of going on-air, or even while on-air.

Device control is frame accurate for instant response.

For more information, contact George Fullerton at +1-415-329-9498, or circle Reader Service 30.

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# A Look at NewTek's Toaster

(continued from page 20)

color paint system or a 3-D modeling, rendering and animation system!

Because of the Toaster's well designed computer interface, each of these options is surprisingly easy to access and in many cases the options can work together. In addition, the Video Toaster's video encoder hardware can be used with other Amiga graphics applications.

## Frame buffers

Integral to the operation of the Video Toaster are its dual 24-bit frame buffers. In general terms, a frame buffer is a piece of hardware (mostly memory chips) that

stores all the data necessary to display a picture. In the Toaster, each frame buffer stores a 768x480 pixel picture.

By storing 24 binary digits (bits) in memory for each pixel displayed, the computer can calculate a palette of 16,777,216 possible colors. Amiga hardware can only display a maximum of 4096 colors; therefore the Video Toaster converts its 16.7 million color display to composite NTSC, which is displayed on a monitor or sent directly to tape.

Although 24-bit display boards have been available for the Amiga for quite some time, the Video Toaster is unique in the way it uses two frame buffers to manipulate live video during DVEs by digitizing video and animating two 16 million color displays in real time (60 frames per second). The output of other graphic sources, such as the paint program or character generator, can also easily be combined with live video through the built-in video switcher.

NewTek recommends using three monitors: one RGB computer monitor to display the software interface and two composite monitors (one for the "Preview" and one for the "Program" output). Loading the software consists of booting the Amiga and "clicking" on the Video Toaster icon, at which point the main control screen will appear on the computer monitor.

## A click of the mouse

Buttons are "pushed" by clicking on them with the Amiga's mouse. A bank of 32 effects buttons fills the top half of the screen. Five more banks of effects can be selected. Included are cuts, wipes, keying and fades; effects such as push/pull, squeeze, zoom, split, swap, tumble, compression, blinds, mosaics and tiles; and switcher DVEs such as digital trails and snow fade. The digital video effects can be timed by the computer with one of three preset speeds or performed manually by moving the "T handle" with the Amiga's mouse.

On the lower lefthand side of the control screen are three input busses. Each bus consists of seven video source selection buttons: the four video inputs, DV1 and DV2 (the frame stores) and a background matte. Directly above the busses are a row of access buttons to "Chroma Effects," "Toaster Paint," the character generator, LightWave 3D and a configuration menu.

The configuration menu allows the user to set up global defaults such as background and border colors, termination settings for the four video inputs and setup for a GPI trigger. The GPI allows signals from an outside device, such as an editing controller, to trigger a Video Toaster effect.

The remaining controls on the main screen are for the freeze frame. The Video Toaster captures a video frame over a span of four consecutive fields for maximum color fidelity. Video still frames are normally stored on the Amiga's hard drive.

The character generator features a full 16 million color palette and its anti-aliased fonts are equivalent to 35 nanoseconds resolution. With 25 supplied fonts and a variety of shadow styles, this character generator is one of the best available for the Amiga but can only be used in conjunction with the Video

Toaster hardware.

The character generator is organized into pages, books and projects. The basic unit, a page, can be either a blank, key, framestore, scroll or crawl. The first three are based on a single displayed screen: a blank is simply a blank page, a key (usually text) is a page intended to be keyed over live video and a frame store is usually a video still or a 24-bit graphic.

The scroll and crawl pages are somewhat different; they are "virtual pages" much taller or wider than the screen and only limited in size by the available memory. Both scroll and crawl move at a very smooth 60 frames per second rate. One hundred pages are stored in a book, which can contain up to 20 different fonts. Only one book can be resident in the Video Toaster at a time. Books are stored as "Projects" along with their setup information such as the Toaster preferences.

Toaster Paint is a 24-bit paint program. The program interface, which has a family resemblance to NewTek's DigiPaint III, is displayed by the Amiga hardware on the RGB computer monitor. The final output is a 24-bit picture displayed on the Preview monitor, but the picture

## LightWave 3D can produce 24-bit output at a maximum resolution of 3072x1920 pixels . . .

you actually work on is an Amiga HAM mode (4096 color) equivalent. This HAM interface measures 384x240 pixels, showing only about one quarter of the finished picture.

## "Autoscrolling"

The work screen "autoscrolls," allowing the picture to remain centered under the cursor without resorting to the cursor keys. Working with a full complement of paint tools, the picture is reworked on the Amiga monitor. The changes are then updated to the frame buffer and displayed on the Preview monitor.

For most types of work, such as creating background and cutting and pasting elements together, this arrangement works fine, but because the work display is only an approximation of the final product, pixel by pixel retouching is nearly impossible.

Chroma Effects controls on-screen color. Included are global effects such as monochrome, negative, posterization or solarization, as well as many of the color correction tools of a processing amplifier. In addition, it is possible to create custom effects such as color vignettes or graduated filter effects.

LightWave 3D is NewTek's modeling and rendering software. While using a two-dimensional paint program such as Toaster Paint can be compared to painting on canvas, creating a picture with a 3-D modeler is analogous to building and photographing a miniature set. But in this case the model, the lights and the camera are imagined by the computer.

Animations are built up by changing the scene and recalculating frame after

frame. Much of the animation seen on television is created this way—although generally on computer systems much more expensive than the Amiga.

LightWave 3D can produce 24-bit output at a maximum resolution of 3072x1920 pixels, which compares favorably with dedicated systems. The trade-off is rendering speed. While the software can output a low resolution test image in about 90 seconds, at full resolution the same frame might take many hours to render. At 30 frames per second, even a relatively short animation will tie up the Video Toaster (and your Amiga) for days at a time. However, this limitation holds true for 3-D animation on any microcomputer.

While rendering a scene, the final output is sent to the preview monitor a few scan lines at a time. This gives you the option of interrupting the rendering process if the results are not what you hoped for.

## Key framing

The LightWave 3D software also animates scenes by the key frame method. With this method, "key" frames within the action of an animation are specified and the computer will calculate the "in between" frames. As many key frames as are necessary to complete an action can be employed.

Because of the high quality 24-bit output, animation playback in real time is not possible. Recording an animation requires a transport controller and a video deck capable of single frame recording. This last requirement greatly exceeds the cost of the Video Toaster. Of course, LightWave can still be employed to make background stills for use with the character generator, Toaster Paint and other programs.

The Video Toaster is designed to work in an Amiga 2000 or 2500 with a large hard drive and at least 5 megabytes of memory, although 9 or more megabytes are highly recommended. Presently, the Video Toaster cannot be installed in the Amiga 3000 series.

Video equipment requirements are a bit more complicated, but one point is clear: The Video Toaster requires extremely stable video input. It will lock onto live camera feed, including most consumer cameras, but any type of prerecorded video requires time-based correction. This is an absolute requirement. Fortunately, the Video Toaster has created an entire market of low cost TBCs, many of which plug into the AT expansion slots inside the Amiga.

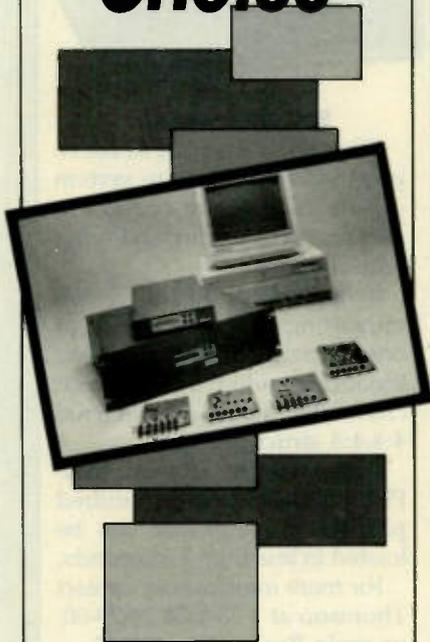
An important distinction needs to be drawn between traditional hardware-based video production and this newer trend in computer-based video equipment. In the past, adding new digital effects to a hardware switcher usually meant redesigning the product, retooling and manufacturing a new, improved switcher. Adding these new effects to your studio required throwing away your old switcher.

NewTek added 60+ digital effects with a software upgrade; the Video Toaster hardware remained unchanged! My experience with computer software suggests that the Video Toaster hardware is currently showing us less than half of its true potential. Better yet, it will be many years before the Video Toaster is obsolete.

John Spofford is an audio video specialist/videographer at Harvard Industries in Newfields, New Hampshire. He may be reached at +1-603-772-3771.

For more information on the Video Toaster, contact NewTek at +1-913-354-1146, or circle Reader Service 89.

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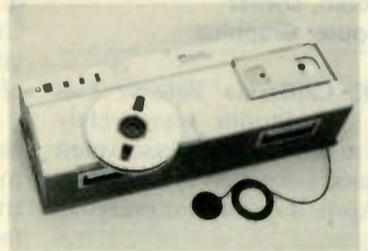
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# Autodesk Refines its 3-D Studio

by Bruce Goren, Owner  
Cheap Computer Graphics

VAL VERDE, California Release 2 of Autodesk's 3-D Studio was widely reported on at the National Association of Broadcasters convention in Las Vegas, Nevada in April. It is not your everyday

## USER REPORT

bug-fix, handful-of-features enhancement. 3-D Studio release 2 has so many speed-ups, refinements and new modules that AutoDesk might just as well have renamed the product instead of incrementing its version number.

### Grand opening

3-D Studios' new open architecture, which allows for third party add-ons, plus the video post production interface scheduler, will win it many placements in the professional and broadcast animation suite where larger beasts used to roam unchallenged.

3-D Studio versions 1 and 2, operating on IBM or compatible 386/486-based computers, already have begun making an impact on network television. James Hyde from Media Of Exchange in Dallas, Texas created a spectacular basketball-themed network ID piece for MTV. Richard Sher, an independent animator in Los Angeles, California, worked with Seth Levinson of DiC to animate several minutes of video for NBC's "Chip and Pepper Show."

3-D Studio also has non-broadcast applications, including scientifically accurate simulations and recreations for civil litigation and the criminal courtroom.

### The shape of things

Creating an animation in 3-D Studio means stepping through a logical se-

quence of linked program modules. Usually, the 2-D shaper is the first place you work. This is where just the outline of a shape or logo is drawn.

Next, the contents of the 2-D Shaper can be imported into the 3-D loft module where 2-D outlines can be extruded, spiraled and revolved to a surface, much as a child's loop and wand turns a 2-D shape into odd-shaped soap bubbles.

The resulting 3-D mesh objects, once built, are imported into the 3-D editor module where they are arranged and lit, assigned surface attributes and framed for the camera that you place anywhere in x, y, z space. Surface attributes are defined and stored in a library using the materials editor module.

The materials editor facilitates the design of the objects' coloration, texture, opacity and bump mapping, as well as simulating physical properties of shininess, reflections and special case procedural shading techniques that can approximate dents and erosion.

### All together now

Finally, in the keyframer module, objects, cameras and lights are choreographed and set in motion.

Real time previews in wireframe or shaded faces can be viewed to assist in adjusting the action prior to invoking the renderer and committing to tape or disk. For TV people, the keyframer module has a safe frame and safe zone overlay, but it is unclear exactly how these relate to broadcast standard safe title and safe action areas.

The learning curve admittedly can be kind of stiff with a feature-packed program like 3-D Studio release 2, but I congratulate Jack Powell at the Yost Group (which developed 3-D Studio for the Multimedia division of Autodesk) for the finest set of reference documentation and step-by-step tutorials I have ever

seen in either a consumer or professional product.

### New and Improved

There are more than 100 new and improved items I could talk about in this release, none of them trivial. Shining brightly in this treasure trove of new and improved features are items like automatic environment mapping and generation of cubics.

I still have a minor beef about the environment mapping. The background is mapped under the reflections of the objects in the environment. The background is in back of the reflective object; what should be reflected is what is in back of the imaginary camera.

3-D Studio needs a way to select an alternate bitmap other than the background in its automatic mode. There is a work-around: You can surround the environment with a giant sphere or cube and map any picture onto it.

### Hurrah for Booleans!

There is a starfield generator, field rendering option, freehand two-dimensional spline drawing, automatic texture coordinate generation, "banked" paths for moving objects, exploding objects and even the much coveted Boolean operations of Union, Subtraction and Intersection.

But wait, there is more! There is now the automatic use of Postscript Type 1 fonts by the Shaper. That means you will no longer have to spend hundreds of dollars for a handful of new fonts.

### IPAS jewels

In my estimation, the most important of the new features is a cluster of jewels called IPAS. The acronym grows from the four basic types of add-on external processes that 3-D Studios' newly opened architecture allows the Yost Group and third party developers to offer for sale in the immediate future. Those four program group components are Image Processing, Procedural Modeling, Animated Stand-in and Solid Pattern.

Image Processing routines, which are called from the new Video Post module within the Keyframer, can currently be used to composite multiple image files. It resembles a very slow frame-by-frame

Quantel Harry or a poor man's Getris Venice.

In the future, I anticipate development of libraries of wipe patterns and suites of special purpose filters to enhance animations with charcoal, watercolor and oil paint stylistic looks such as those employed by Fractal Paint Designer and Aldus Gallery Effects.

Procedural Modeling allows you to create or deform mesh objects. It is exciting to have this kind of power tool available on a PC so soon. Using radial wave distortion, an animator can easily simulate complex phenomena such as water ripples, waving flags, blowing curtains and other things that would be a

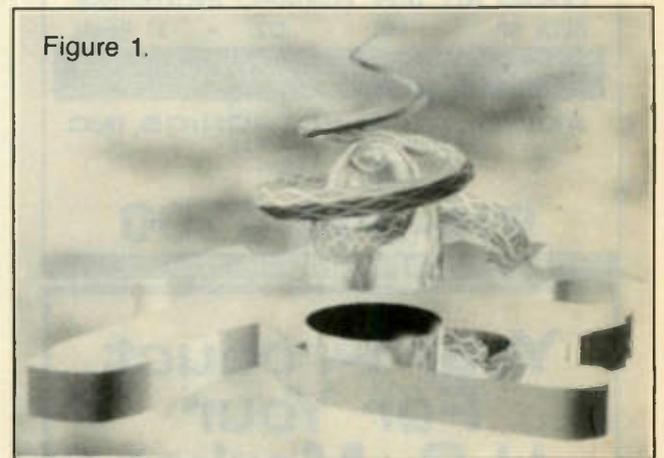


Figure 1.

nightmare or simply impossible to morph and keyframe.

### Third party software

You can already purchase another fascinating Procedural Modeler style application program. Schreiber Instruments, Inc. has the distinction of being the first with a line of IPAS-based third party software for 3-D Studio.

Schreiber's most intriguing software is a geometry generator called Nursery. Nursery apparently uses a database of 58 tree biology morphologies and fractal growth code to create smooth, texture-mapped mesh objects that are "render ready."

The price is US\$149, as are the company's other two offerings, Imagine, which is a DOS command line front end for 3-D Studio, and 3D Surf, a terrain generator.

Animated Stand-in procedures replace a simple mesh objects geometry (a cube, for instance) with a complicated set of geometries whose behavior is partly ruled-based and partly random. A particle systems generator example procedure is included with 3-D Studio release 2, along with instructions for making a Tornadic cone.

I will bet that third party developers will jump on this opportunity to provide users with procedures that invoke flocking and schooling behaviors, as well as gravity procedures to allow particle systems to simulate evolving galaxies, waterfalls and even wind-blown leaves, rain, snow, etc.

### "Fudge ripple" feature

Solid pattern procedures are very similar to what most people think of as Renderman-style Shaders. Included with 3-D Studio are solid pattern procedures for things like wood grain. Unlike texture maps, which are strictly surface

(continued on page 26)

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Andrew HJ7-50A 549' 1 5/8" air Helix w/conns on wooden spool, \$2000/BO. S West, KRIS, 409 S Staples St, Corpus Christi TX 78401. 512-886-6153.

Sony CCD V99; CCD V101; Ricoh 800H, all Hi 8 single chip, \$600 ea. B Tucker, A-L Videography, 1796 Devendorf Rd, Schenectady NY 12303. 800-772-5412.

## VIDEO CAMERAS

### Want to Sell

Pana WV-V3 3-tube, 10:1 zoom lens, (3) batt packs, cables, case, chgr, manual, mint cond, \$1000. R Axmacher, Morningstar Prods, 159 Sawyer Ave, Babylon NY 11702. 516-422-9445.

JVC KY15 BR-S410U S-VHS camcorder, 16X lens, MV-P602 stereo mic, AA-P250 pwr & chgr, (3) NB-G1U batts, cam plate, time code input, manuals, low hrs, mint cond, \$5475. Hilary, 412-327-1333.

Sony BVP-150 color w/3 Saticon tubes, \$1850; Sony DXC M7 (3), \$6900, in full studio config, \$8300, w/CCU & Sony switcher, \$7900, w/Sony SEG 2000A switcher, \$10700, w/complete A/V mon & dist, \$7900. J Gora, 404-355-3398.

Pana AG-460 S-VHS camcorder, new w/access+4 BP212 batts, \$2650; Sony V5000 Hi8 camcorder, mint cond, \$1750. D Lezette, GRC, 2 Eagle St, Rochester NY 14608. 716-325-1020.

Hitachi FZP31, \$1000. George, 615-256-7678.

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JVC KY-25 S/BR-S411U S-VHS back, Fujinon 16X, Porta-Brace soft case, KA-20 cam adprr w/Anton brckt, 26-14 cable, AC pwr, excel cond, very low hrs, \$7000/BO. L Kallenbach, Business TV, 5 Horizon Rd #708, Ft Lee NJ 07024. 201-224-6063.

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JVC KMD 600U dual TBC, SEG, dig effects, full compressions, (4) YC & comp inputs, 9 mos old, \$3995. G Barich, 707-586-0383.

GVG 100 w/serial interface, \$7000, w/regen board, \$7800, w/chroma kybd, \$7500. J Gora, 404-355-3398.

Pana WJ-MX10 AV, like new w/manual & CG, \$1000. R Buscher, Prec Video Prod, 1319 S 163rd St, Omaha NE 68130. 402-334-4887.

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Townsend TA-558 55 kW single tube on chnl 16 w/ITS-20 exciter, EEV 3276 klystron, Westinghouse outside heat exchanger, 7 amp beam sply, \$12500. R McInturff, WXMT, 300 Peabody St, Nashville TN 37210. 615-256-3030.

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JVC RMG 810U edit controller, \$1000. B Tucker, A-L Videography, 1796 Devendorf Rd, Schenectady NY 12303. 800-772-5412.

Prime Image HR-600+ (2) TBCs w/hoiseo red, sepia, mosaic & poster, supports Betacam, S-VHS, ¼ dub & composite inputs/outputs, like new, \$4000 ea; Convergence/ECS 195LM edit controller w/TC gen & read, parallel & serial cards, cables for Sony type 5 & 9 machines, excel cond, \$6000. D Lawson, Lawper Video, 1465 41st St E, Moline IL 61265. 309-762-0732.

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The largest dealer in the USA. We buy, sell, consign, locate & trade used equipment. Pro Video & Film Equipment Group, Dallas. 214-869-0011. FAX: 214-869-0145.

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Fortel CCD-1H TBC w/image enhancer, \$500. B Specter, Specter Video, 4148 Windsor St, Pittsburgh PA 15217. 412-521-1444.

Sony FCG-700 frame code gen, BKU-701 computer interface board, both units brand new, never used, \$2500/BO. Call BTS, 303-744-3500.

VO-5850, RM-440/VO-5800 edit system, \$5000. J Gora, 404-355-3398.

Sony BK2006 (4) TBC remote controls, \$225 ea. George, 615-256-7678.

3M D-1000 char gener, works great, bdcy quality, \$900. B Montbleau, Advanced Video, 22 Main St, Salem NH 03079. 603-898-1240.

Betacam standard editing equip/PWW Betacam SP, gd cond. Chris, 209-544-0642.

Chyron III char gener w/extra kybd, nds repair, \$200; Chyron II char gener, extra kybd, \$500; disk drives, memory boards, kybds & other for Chyron II; Telemation char generators: TCG-1432A, \$50/BO, 1425 & 1425B, \$100 ea/BO, extra kybds. T Steinke, Univ of WI, POB 413, Milwaukee WI 53201. 414-229-5470.

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Pana WU-555 3-tube, 10:1, 32p to 10p cable, AC pwr sply, batt packs & chgr, tripod plate, manual, shotgun mic, wind screen & dual range switcher, JVC ZR-4400L4 ¼" port VCR w/Kangaroo case, extra pockets, shoulder strap, extra belts, fuses, batt & chgr, Pana NV-9100A ¼" table top VTR, canon 3mm color+20mins, ¼" video tapes w/cases, used twice & erased, \$3500/BO. E Malone, TVS Prods, 4256 E 119th St #1, Cleveland OH 44105. 216-641-4360.

Sony DXC-325 w/Canon 10x1 lens, CA-325 adapter case, 14-pin cable, tripod adapter, \$4195; Sony EVV-9000 Hi8 dockable VTR, PCM audio low hrs, \$2395, both \$6395. B Montbleau, Advanced Video, 22 Main St, Salem NH 03079. 603-898-1240.

CEI 260A (4) systems w/CCUs, lens, cable & extra parts, \$2000/BO. T Steinke, Univ of WI, POB 413, Milwaukee WI 53201. 414-229-5470.

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Gentner VRC2000 w/many options, new cond, \$1990. J Hegeman, KWQC, 805 Brady St, Davenport IA 52808. 319-383-7000.

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| E. CATV company                                  | P. Educational TV facility |
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▶ VIDEO PRODUCTION...

Leader LBO-5860A WFM, \$525; Pana WV5361 scope frame, \$50; Pana WV5380A 9" B&W, \$75; (2) Pana WV-5370 9" B&W video, \$75 ea; (3) Pana WV-5380 9" B&W video, \$75 ea; Pana WV-5410 12" B&W, \$75 ea. George, 615-256-7678.

VTRS/VCRS

Want to Sell

BUV 110 w/time code board, \$900. J Gora, 404-355-3398.

JVC CR-8200 editor, 100hr heads, manual, Anvil case avail, \$950. S Braker, Worthwhile Films, 104 King St, Madison WI 53703. 608-251-8855.

Pana AG-7400 port S-VHS rec, 14-pin camera conn, 4-chnl audio w/hi-fi trks, framing servo, flying erase head, audio level meters, like new, \$1400. T Keegan, Video Keepsakes, 7 Thoreau Rd, Trenton NJ 08690. 609-890-3255.

Pana AG-6100 (2) 1/2" industrial VHS players, great cond, edit source desks w/shuttle search control, \$500 ea. S Nething, Prairie Prods, 902 10th St NE, Jamestown ND 58401. 701-252-0727.

Sony BVU200 editing VTR, \$400, JVC CP5000 3/4" plyr, \$250; Polaroid freeze frame video printer, new, \$900; Polaroid slide maker, Palette II IBM, new, \$500; Proxima A200 LCD Palette, \$250; Sony Beta VCR SLP300, \$200. Tony, IMP, 1141A Old County Rd, Belmont CA 94002. 415-595-1217.

Pana 9600 & 9240 3/4" editing syst w/SMPTE timecode controller, excel cond w/all svc books, \$3200. B Specter, Specter Video, 4148 Windsor St, Pittsburgh PA 15217. 412-521-1444.

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Chyron RGU-2 CG, \$5400. George, 615-256-7678.

Videonics DIRECT ED PLUS editor, perf cond w/manual, \$285. G Collins, Memory Ln Prod, 3700 Newport Blvd, Newport Bch CA 92263. 714-723-4366.

Sony BVU-150 U-Matic SP w/time code, Porta-Brace & (3) ProPac90 batts, \$2900. W Neumeyer, Concordia HS, 1601 St Joe River Dr, Ft Wayne IN 46805. 219-483-1102.

RCA TR-22 w/head, gd for parts, \$500/BO. T Steinke, Univ of WI, POB 413, Milwaukee WI 53201. 414-229-5470.

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Sony DXF-40 (2) 4" studio viewfinder, \$300 ea; CCO-AM (3) 50M studio cable, \$300 ea. P Herrmann, Daybreak TV Prods, 795 Main St, Buffalo NY 14203. 716-847-8733.

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# Understanding the Role of Multitrack

(continued from page 12)  
a variety of tape widths.

While most professional equipment manufacturers strive to adhere to accepted track designations and specifications, there are a few "custom" formats. Most were originally designed for the semi-pro or home studio market. But they have, for various reasons, found their way into the professional audio world.

For instance, eight tracks of audio are

ing and playback electronics have made cleaner and quieter recordings possible. High performance tape formulations and improved transport design have enhanced audio quality and high speed channel and machine control functions complement the package.

The topic of multitrack audio plays such an important role in audio for video that I will continue this discussion in subsequent issues.

Ken Hahn is co-founder of New York's Sync Sound and has received three Emmy awards and numerous other awards for his work. He may be reached c/o TV Technology.

**The audio quality usually diminishes as the number of tracks increases on a given width of tape.**

available on professional 1-inch tape and the semi-pro 1/2-inch and even 1/4-inch tape widths. One cannot tell with the naked eye whether a 1/2-inch wide tape was recorded on a four-track or eight-track tape machine. Thus the tape format and width are important specifications to indicate when you label or otherwise refer to your tapes.

The audio quality usually diminishes as the number of tracks increases on a given width of tape. The larger the area designated to individual audio tracks, the higher the quality in audio performance.

So be advised that interchange of tapes between facilities can be problematical. The video industry is not alone when it comes to having its share of incompatible formats. The 2-inch, 24-track format is closest to what could be called a "standard" for multitrack audio. Most U.S. professional audio studios have at least one of these machines.

An extraordinary list of features have enhanced the multitrack format. Record-

## BUYERS BRIEF

BTS' E-Clips desktop video production system works within the Microsoft Windows graphics environment for PC computers.

E-Clips can be used as a standalone system—comprised of a videotape edit controller, video switcher/dissolver, CG-keyer, audio mixer and scene management system. And it can access hundreds of Windows programs, including word processors, and paint and graphics systems.

Users need to learn only one set of controls in order to operate any of the system's components.

The basic E-Clips unit is a videotape edit-controller. The editor uses proprietary control design to communicate with RS-422 VTRs, RS-232 videodisc recorders and RS-422 video and audio switchers.

E-Clips is installed on a 386 PC, and includes a dedicated control panel with a VTR shuttle knob and an editing-specific keyboard.

For more information, call +1-801-977-1551, or circle Reader Service 104.

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COPY & MAIL

## 3-D Studio is Refined

(continued from page 24)

coverings, solid pattern procedures go all the way through, kind of like a container of fudge ripple ice cream with the user controlling the shader parameters to affect the thickness and patterns of the fudge whorls in the vanilla ice cream.

Solid textures also can be used as bump maps.

### Out of this world

There is also a "World Creating Toolkit" included with 3-D Studio release 2. The World Creating Toolkit is a CD-ROM packed with 600 megabytes of stock images, texture maps (more than 60 types of marble) and mesh objects, ready-made, that you can use in your own animations royalty-free to get up and running fast.

There are also lots of .FLI format animation sequences you can view (contributed by successful 3-D Studio users)

which you can use for inspiration as you ponder your blank screen at the beginning of an animated working day.

If you are contemplating your very first purchase of a PC-based 3-D animation program, the price performance leader has clearly emerged as Autodesk's 3-D Studio release 2.

Editor's note: In addition to being owner/ animator of Cheap Computer Graphics in Val Verde, California, Bruce Goren is the technical support man for Getris Images, Inc. in Hollywood and works as a television engineer at KLCS-TV in Los Angeles.

The opinions expressed above are the author's alone. For more information on Autodesk's 3-D Studio Release 2, call +1-415-491-8300 and ask for extension 8801, FAX +1-415-331-8093, or circle Reader Service 13. For more information on Schreiber Instruments software, circle Reader Service 25.

# BUYERS GUIDE

## Transmission Equipment

Equipment reports from users in the field and information on the latest technology

# Acrodyne Transmitter Goes on Air

by Moe Strout  
Director of Engineering  
Lone Star Broadcasting Inc.

**NACOGDOCHES, Texas** It was about this time last year that more than two years of planning had become reality. We were ready to build our second station, KLSB-TV in Nacogdoches.

After talking with several transmitter manufacturers and visiting with all of them at the (U.S.) National Association of Broadcasters show, we chose the Acrodyne 10 kW with a 500 watt solid state driver and the Thomson CSF TH-582 tetrode final.

## USER REPORT

The factors we considered in going with Acrodyne included parts availability and service, performance and overall reliability. After a great deal of research, we determined that Acrodyne satisfied all our concerns and more. We feel we got the most transmitter for our dollar.

### Self-Installed

We opted to do our own installation, so we were provided with all the drawings and manuals prior to delivery.

## BUYERS BRIEF

**Browning Labs, Inc.** of Miami, Florida, carries a line of modest-priced RF products, including VHF and UHF TV and FM transmitters and translators in power levels from 2 watts to 25 kW, and microwave links.

Rounding out its product line is a 25 kW VHF transmitter, the TVT-25000V. This transmitter is all solid state except for the final tube. The tube used in the output stage is a high efficiency tetrode. The transmitters are constructed by paralleling ultra-linear amplifier modules to obtain the power level required. Parallel operation provides redundancy and eliminates lost air time.

The company also can custom-build transmitters for special frequencies and applications. It can provide PAL, SECAM and NTSC modes of operation. Options such as over-the-air scrambling and switching from one standard to another are easily accommodated. The company can supply a complete turnkey system.

For more information, call +305-885-3356, FAX +305-885-0426, or circle Reader Service 65.

Documentation on the transmitter was excellent.

With suggested layouts, we were able to do the installation very easily. Acrodyne provided all the parts necessary for a typical installation.

Once the transmitter was installed, an Acrodyne field engineer came in to turn it on and do the proof of performance.

The start-up went very well. We operated into the dummy load for a couple of days, making nothing more than minor adjustments.

The transmitter has been on the air since 1 September 1991. It ran about 20 hours a day until 3 November, when we went 24 hours a day.

Since going on the air, we have experienced only minor failures, such as an air flow sensing switch in the PA, a fan in the PA and a metering module.

Basic operation of the transmitter is very straightforward, as are the logic displays and metering, which are also available for remote monitoring and control through any standard remote control system.

### Vertical heat exchanger

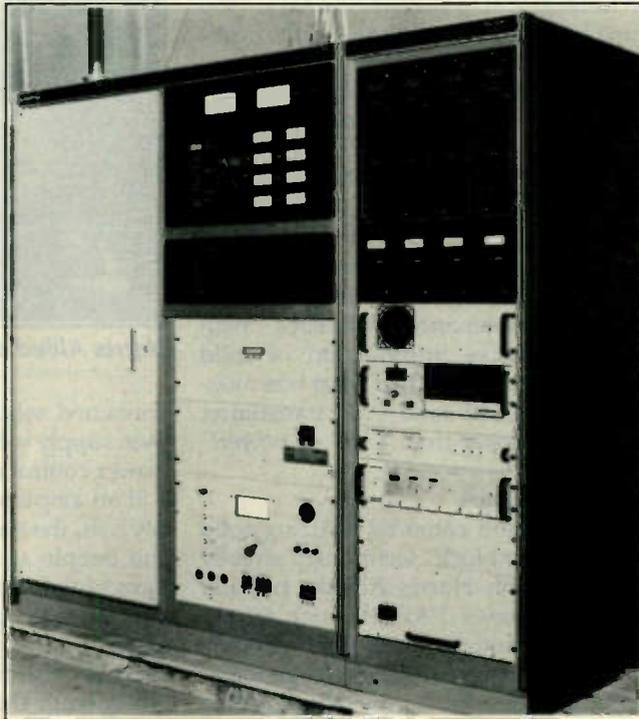
The heat exchanger, which we built vertically to occupy less floor space, is simple, efficient and very loud (but not as noisy as air-cooled transmitters on the market). All of the flow and temperature indications can be removed.

The Acrodyne transmitter has made it very easy to maintain on-air quality. However, it tends to be a little sensitive to video levels and changes in DC levels, so good input processing is a must.

With just over 5,000 hours on the final, it is a little early to predict tube life, but we expect to get 20,000-plus hours.

At approximately 20-21 kW including the heat exchanger, power consumption is about what the manufacturer's specifications state, maybe a little better. We based our projected operating costs on these figures and have been consistently within budget.

We got a well-built transmitter for our money. And we have had very few problems, at least when I compare them with some other installations I have been involved with.



The TLU/30KV the 30kW version of Acrodyne's TR Series of single tetrode UHF TV transmitters.

And I believe that because Acrodyne's package consisted of the antenna, line and transmitter, things seemed to go much more smoothly.

### Patience is a virtue

As for the company and its staff, Acrodyne stuck with us for almost two years while we kept promising we

would actually build this station. I think that says a lot about the company's commitment to the customer.

Acrodyne delivered the transmitter when promised and did everything it said it would. The company's field engineer was great; we had problems getting power to the transmitter building, which caused delays in the start-up, but all the while he remained extremely patient.

We had an air date that had been set a year prior, and Acrodyne saw that we made it.

We also had the usual weather that you get when you plan tower work (rotten), but the crew got it done in spite of some rain. We literally flew the cable up the tower on Saturday morning and went on-air Sunday at 6 a.m.

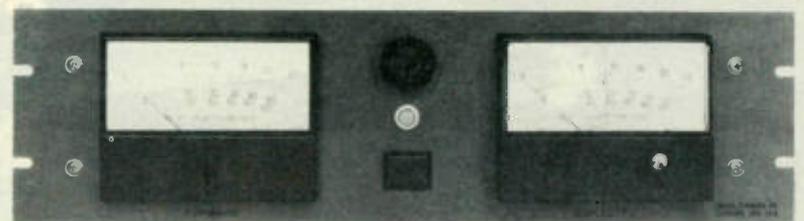
I guess if I had the station build to do over again I would do some things differently. But choosing an Acrodyne transmitter is not one of the things I would change.

*Editor's note: Moe Strout has worked in television for 20 years and has been chief engineer at various Texas stations for 16 years.*

*The opinions expressed above are the author's alone. For more information on Acrodyne transmitter products, contact Steve Blasetti at Acrodyne: +1-215-542-7000, FAX +1-215-540-5837, or circle Reader Service 73.*

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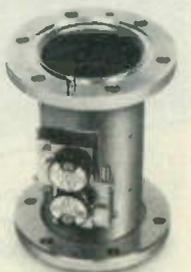


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Service and Dependability... A Part of Every Product



# Harris Allied Stresses World Vision

By Charles Taylor

QUINCY, Illinois Quincy, Illinois, has one terminal at its airport. Much of the terrain in this Midwestern U.S. town is defined by farms and fields.

## SPECIAL REPORT

But drive up North 30th Street and take a right onto Hilmer Swanson Drive, and you will face the 250,000-square-foot headquarters of Harris Allied Broadcast Division, a world class competitor in television and radio transmission equipment.

Since its founding 70 years ago, this division has generated technology that literally changed the way the world transmits audio and video. In recent years, much of the credit goes to Senior Staff Scientist Hilmer Swanson (thus, the street name), whose contributions to RF science lend a significant hand in shaping the company's success.

Beyond manufacturing transmission equipment, Harris Allied is a leading distributor of more than 5,000 broadcast products from more than 240 manufacturers worldwide, and integrates fixed and mobile broadcast, video and satellite communications systems.

But company leaders also stress teamwork along with global vision. Inside the plant, 400 employees implement the steps for success, from design to manufacture to service and training. In all, the Broadcast Division employs about 800 throughout its plants in Quincy; Richmond, Indiana; Highland Heights, Kentucky; and Cambridge, England.

### State of the art

On the floor of the Cambridge plant, (formerly TVT, now a Harris Allied property), workers are scurrying about in state-of-the-art assembly line fashion, working on the new pride of the television transmitter line, the Sceptre.

Developed two years ago, the all solid-state UHF transmitter is available in power levels from 3 kW to 30 kW. Models are designed to meet every world standard, using negative visual modulation, with BTSC, IRT or NICAM multichannel stereo sound.

Such world vision is a key to Harris Allied's long-term business plan, according to Roy Ridge, vice president and resale product line director. "We all have to think global to survive," he says. "You can't build a transmitter that only works in the U.S. anymore."

Development of the Sceptre came as a result of the industry's movement toward solid state operation, according to John Wills, managing director for Harris Allied in Cambridge and television product line director for the division.

"The trend in technology was improved reliability and efficiency and reduced maintenance," Wills says. "With the progressive introduction of solid state, we had established what was missing was a UHF solid state transmitter capable of more than 1 kW of power."

### Already in place

The solution came by utilizing solid state "power block" technology already in place with Harris Allied's popular Platinum Series 1 kW through 60 kW VHF transmitters and other product lines. The Sceptre features a broadband solid state design, completely replacing tubes with fullband (470 to 860 MHz) modules and combiners. Since visual and aural modules are identical, any Sceptre module can be used for either video or audio in any Sceptre transmitter on any channel.

Various power levels are attained by assembling a series of identical modules and power supplies in a parallel configuration. Simply, as power requirements increase, these power blocks are added to produce the desired output. Each Sceptre power block module is essentially a self-



Harris Allied engineers conduct proof of performance testing of the Sceptre.

contained solid state generator, with its own supply voltages, RF drive, audio and power control and fault protection.

If an amplifier module or power supply fails, the transmitter reacts with what the people at Harris Allied like to call "graceful degradation." The transmitter continues to operate at slightly reduced power until repairs are made. Amplifier modules can be removed and replaced safely while the transmitter operates, assuring 100 percent on-air time.

The air-cooled Sceptre is designed for unattended operation, incorporating a processor-based central monitoring system with a VDU display. Analog measurement and status from the exciter, transmitter, cooling system, etc., are digitized and fed to the processor, which monitors data continuously and stores it in memory. Each parameter has software-determined "windows," which detect if it is within satisfactory limits, high, low or failed.

The processor provides outputs that enable the transmitter to be connected to a maintenance base. Software supports a modem, which permits the equipment to initiate a telephone call to report a failure. Users also may access data remotely.

### Sceptre sales record

To date, eight of the new Sceptre transmitters have been shipped—to Hannington, Stockland and Waltham, all in the U.K., and to Cyprus. Shipments to Canada are expected soon.

Marketing efforts for the product essentially span the globe, Wills says.

For one, the privatization of radio/TV in many regions has created an urgent need for new and modern equipment on channels that did not exist a year ago. As well, there are nations where network operations are mature.

Among Harris Allied's other key manufactured television products are its Platinum Series 1 kW through 60 kW solid state VHF TV transmitters (introduced in 1988); high efficiency multistage depressed collector (MSDC) klystron 60 kW through 280 kW UHF transmitters, and a complete range of VHF and UHF antennas.

Also prominent is the company's wide array of video and satellite communications systems and vehicles, manufactured and marketed from Harris Allied's Highland Heights plant.

For all Harris Allied products, 24-hour telephone technical service and parts assistance is available.

With its constantly burgeoning product line and list of services and support, it is apparent that Harris Allied intends not only to keep up with a rapidly changing industry, but to help set the pace.

"Broadcasting is changing dramatically, so our mindset has to be radical," Ridge says. "Basic technology will stay the same, but you have to be willing to be flexible in your thinking and radical with your mindset to be world class."

For information on the Harris Allied Sceptre, contact John Wills in England at telephone: +44-223-345115; FAX: +44-223-214632. In the U.S., telephone in Illinois: +1-217-222-8200; FAX: +1-217-224-1439; or circle Reader Service 47.

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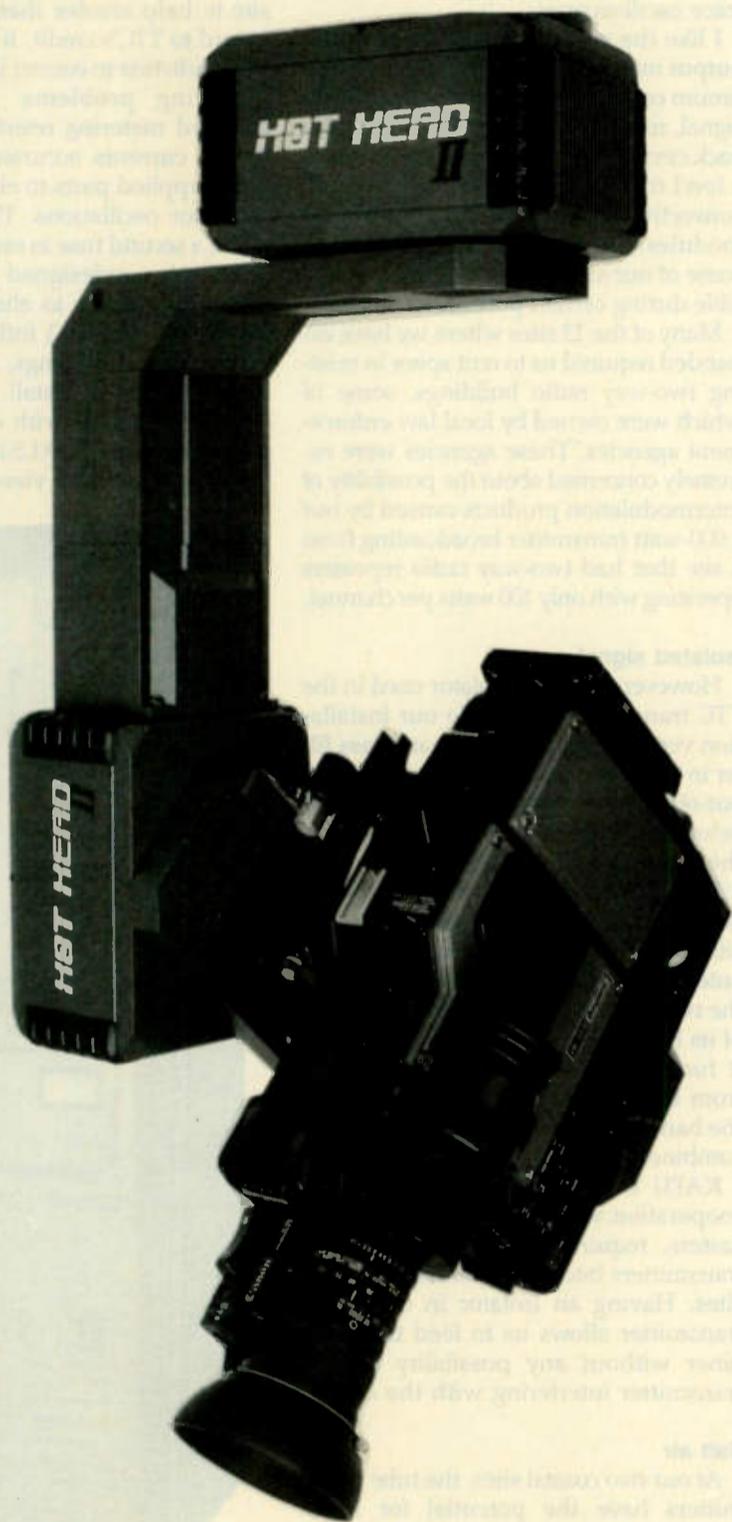
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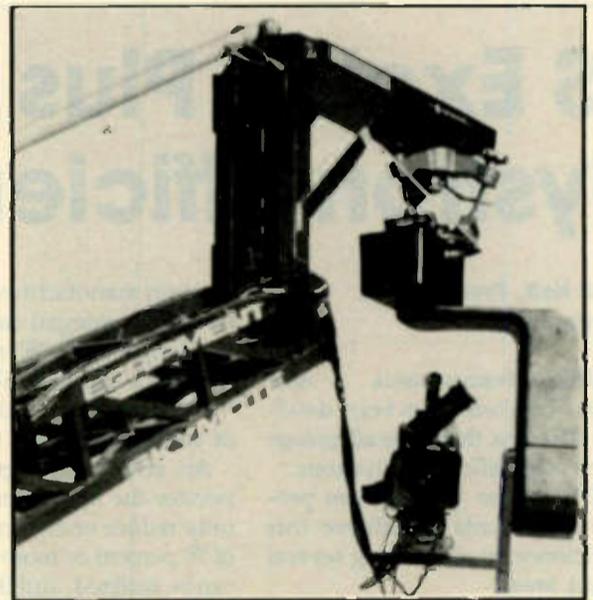
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# TTC Provides Clean Signals

by Everett Helm  
Chief Engineer  
KATU-TV

PORTLAND, Oregon Television broadcasters today are faced with improving their signals or losing their audience.

At KATU-TV in Portland, Oregon, we must maintain our audience coverage by providing not just an on-air signal presence, but a quality signal.

Translators using over-the-air signals are subject to ghosting and co-channel and power line interference. A direct microwave feed eliminates most of the problems in outlying service areas, but, since many translator associations rebroadcast our signals, we wanted the cleanest pictures possible for them to use.

## Translator feeds

We decided to install a statewide 7 GHz microwave radio system radiating from Portland, Oregon, and including parts of southern Washington state. This allows us to feed translators and cable systems directly, in most cases providing pictures rivaling the quality of those delivered by satellite.

When shopping for new translators to operate with our microwave radio system, we had to have high reliability and low maintenance. We chose a solid state

transmitter since a couple of tube changes would easily make up the difference between the purchase price for a tube and a solid-state model.

After reviewing the choices, we selected Television Technology Corp. (TTC) XLS1000 Series translators because of their simplicity of design, multi-output device redundancy, brute force ferro-resonant power supply and the use of an output isolator.

The XLS1000 solid state transmitter is more efficient than a tube model. Not only does it save money on electricity, but it lowers the heat load in the building.

## USER REPORT

TTC's dual input system gave us a cost-effective alternative to a redundant microwave system. The dual-input feature uses the video signal from the microwave radio system for the primary video and audio source. Should the microwave system fail or the video be lost, the TTC transmitter automatically switches to the translator mode and picks up the nearest on-air signal to maintain programming.

The simplicity of the TTC design allowed us to go into sites where other models with external diplexers mounted

on top of the cabinets would not fit because of the ceiling height. The ferro-resonant power supply gives us automatic power line regulation and provides easy troubleshooting. Additionally, the power regulators are simple to repair because they do not require pulse generators, external power supplies and dual trace oscilloscopes.

I like the vertical arrangement of the output modules, which provides for optimum cooling and maintains our output signal, regardless of fan failure. The fold-back circuit reduces the output power to a level that can be sustained by natural convective air flow through the output modules. This is important to us since some of our sites are not instantly accessible during certain portions of the year.

Many of the 13 sites where we have expanded required us to rent space in existing two-way radio buildings, some of which were owned by local law enforcement agencies. These agencies were extremely concerned about the possibility of intermodulation products caused by our 1,000-watt transmitter broadcasting from a site that had two-way radio repeaters operating with only 100 watts per channel.

## Isolated signal

However, the 2 kW isolator used in the TTC transmitter has made our installation very site-friendly. The bandpass filter in the transmitter output assures that out-of-channel signals will be attenuated below the point of causing de-sensing to the two-way radio receivers.

For our central Oregon site, we purchased a two-way radio combiner for the site owner to allow tower space for our antenna installation. This also improved the two-way radio coverage area because of its higher location on the tower. And it further isolated the UHF-TV signal from the two-way system by nature of the bandpass characteristics used in the combiner.

KATU is improving its coverage in cooperation with other Portland broadcasters, requiring us to combine two transmitters into one antenna at various sites. Having an isolator in each TTC transmitter allows us to feed the combiner without any possibility of one transmitter interfering with the other.

## Salt air

At our two coastal sites, the tube transmitters have the potential for high-voltage arcing caused by corrosion and lowered air dielectric voltage. However, the low voltages used in the TTC solid state design eliminate this problem, as well as the potential for tarnishing in the tube cavity.

The XLS1000 uses 16 output devices to generate 1 kW output power. At one site, an output device was drawing too much current, so the transmitter automatically turned the device off.

Since there is plenty of headroom in the transmitter design, we are maintaining the kilowatt output power with only 15 devices operating. Because of travel time, we have decided to leave this transmitter operating as is until we make our next routine trip to the site.

With the Burke ARC16SA Remote Control and the TTC transmitter remote monitoring capability, we can check each output device for its voltage and current if we get a master alarm indicating a

transmitter problem. We also built our own battery backup system so we can call up the site to monitor microwave battery voltages as well as transmitter status if there is a power failure.

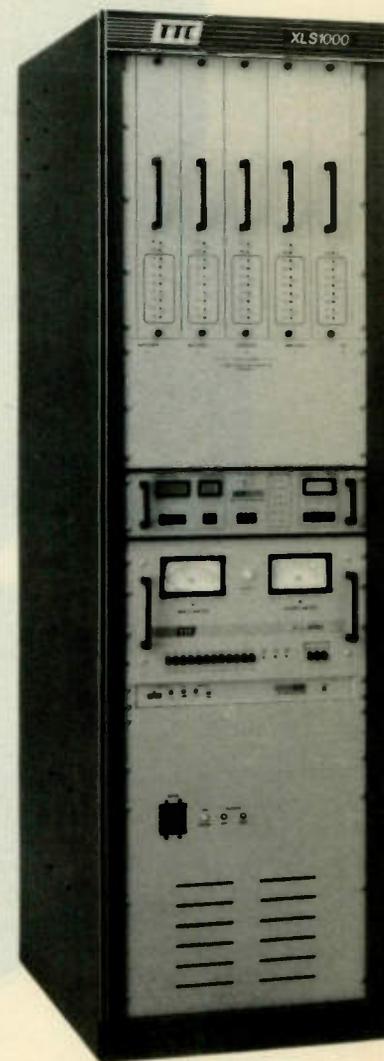
Having TTC XLS1000 serial numbers 1, 2 and 3, we expected to have a few problems with a new transmitter design. The redundancy in the XLS1000 has allowed us to stay on the air with a minimum of 300 watts when problems occur.

When problems do occur, TTC sends service and engineering personnel to our site to help resolve them.

And to TTC's credit, it has issued two field bulletins to correct initial minor engineering problems. One bulletin changed metering resistors to monitor device currents accurately and added TTC-supplied parts to eliminate voltage regulator oscillations. The other eliminated a second fuse in one power circuit.

TTC also redesigned the RF power metering module to eliminate Average Picture Level (APL) influence on peak visual output readings, and it shipped new modules to install.

We are pleased with our decision to purchase four TTC XLS1000 UHF transmitters. When one viewer complained



The TTC  
XLS1000 transmitter

that her picture was snowy, we learned she had no UHF antenna on her TV and was picking up our signal with the set's internal wiring. She was elated when a coat hanger bent into a loop brought her crystal-clear pictures.

And many other viewers have called the station to compliment KATU on its improved on-air signals.

*Editor's note: Everett Helm has 25 years of broadcast experience and has worked for Motorola Semiconductors as a lab technician.*

*The opinions expressed above are the author's alone. For more information on the XLS1000, contact Alex DeLay at TTC: +1-303-665-8000 ext. 230, FAX +1-303-673-9900, or circle Reader Service 12.*

# ITS Exciter Plus Lifts Klystron Efficiency

by David Neff, Product Mgr.  
ITS Corporation

McMURRAY, Pennsylvania A new package of hardware has been developed by ITS Corp. that takes advantage of today's high-efficiency klystrons.

The ITS Exciter Plus system provides the elements to achieve this high efficiency by addressing several important areas.

A key development in modern klystrons is the ability to pulse beam current with a much lower voltage signal than the 4-7 kV pulse required by older klystrons with mod anode pulsing.

New electrode designs require pulse signals of about 7,000 volts, while offering even more substantial control of beam current than the mod anode. ITS' low-voltage pulser is a compact, solid state unit.

Because beam current pulsing lowers klystron gain during picture and blanking time, higher-powered driver amplifiers are needed.

Approximately 25 watts at the tube input is a typical requirement. Linear Class A solid state amplifiers are provided with the ITS package to meet this need.

A modern exciter is required to provide sync processing for efficient pulser operation and for advanced signal correction to cancel distortion introduced by deep pulsing.

In addition, more efficient tuning modes have been developed by the

klystron manufacturers, most recently for Varian integral cavity tubes. This is referred to as "S" mode (for super efficiency operation) replacing the "H" mode (high efficiency operation) of earlier versions.

An efficiency upgrade that incorporates the above items can dramatically reduce energy costs. Efficiencies of 70 percent or more (figure of merit) can be realized, and thousands of dollars per year can be saved as a result.

While the efficiencies obtained are less than what is possible with a new MSDC or IOT transmitter, the initial investment is only a fraction of that for a new transmitter.

Many stations are already equipped with the klystrons needed to realize super efficient operation, and need only add the external hardware.

Recent installations have confirmed the energy saving benefits of ITS Corp.'s Exciter Plus package. At WSYM in Lansing, Michigan, average beam current was reduced from 5.0 to 3.5 amps on an RCA 55 kW UHF transmitter with the conversion. At 24 kV beam voltage, 18 hours per day operation, and seven cents per kW-hour energy costs, savings of over \$16,000 per year should be realized at the station.

*The opinions expressed above are the author's alone. For more information on the ITS Exciter Plus package, contact the author at: 412-941-1500, or circle Reader Service 110.*

# Station Opts for LDL's Solid State

by Roy Mitchell  
Chief Engineer  
KMSB-TV

**TUCSON, Arizona** When the Providence Journal Company decided to upgrade the transmission facility at its KMSB-TV (Tucson, Arizona) mountain-top station, we opted to work with LDL Communications Inc.

## USER REPORT

We required a 100 percent solid state transmitter with 44 kW output power for reliability and ongoing cost savings, a new directional panel antenna and a complete new tower installation. LDL was selected because we felt a single turnkey supplier should provide the entire transmitter site upgrade package.

The centerpiece of the package was the Larcan 44 kW all-solid-state transmitter.

After careful evaluation, Larcan was

selected because of its straightforward, strip-line circuitry and its ease of maintenance. It was clear that it was the only solid state transmitter designed with the engineer in mind.

### Strip-line circuitry

The strip-line circuitry used in the Larcan transmitter is an adaption of technology that has been around for many years at higher frequencies. Strip-line is used in the transmitter power amplifier for RF combining.

A strip-line is a transmission line constructed using printed circuit techniques. Its propagation mode is similar to the transverse electromagnetic mode of coaxial transmission line.

We engineers work with many types of transmission lines. Coaxial is the most common and waveguide is used for the transmission of microwave signals and some high-power UHF applications. Strip-line is less common, but is becoming more widespread in RF

transmission equipment.

Because uniform transmission paths may be easily constructed, strip-line construction is increasingly used for multiple parallel transmission of digital data and RF energy. Strip-line is widely used

### The centerpiece of the package was the Larcan 44 kW all-solid-state transmitter.

in RF amplifiers and splitters because of its inherent simplicity, reliability, stability and less required maintenance.

Because of the transmitter's mountain-top location, access to the site is difficult and time consuming. That is why we look favorably upon the ease of maintenance and built-in redundancy of the

Larcan transmitter. We now have the ability to maintain the transmitter while it is on the air, and we can also carry out on-site replacement of the solid-state devices.

As far as the antenna and tower part of our project was concerned, this all went without any problems. We are receiving coverage in our market from the antenna, and revenues have increased as a consequence.

The transmitter has lived up to all of our expectations for performance, reliability and maintenance.

### On-air maintenance

Maintenance, which consists largely of changing air filters or an occasional FET, is conducted during the day while we are on the air. This has resulted in a significant savings over our previous transmitter.

As for reliability, our off-air record speaks for itself. In the last two-and-one-half years, our down-time attributable to transmitter faults has been zero.

On the few occasions when we have needed factory support from Larcan, we received it promptly and effectively. It is very comforting to know that such backup is always available.

In summary, we are still pleased with our Larcan transmitter after three years of operation and would have no hesitation in recommending the purchase of another one for one of our other facilities.

*Editor's note: Roy Mitchell has been a broadcaster for 20 years, the last five of which have been spent as chief engineer of KMSB-TV.*

*The opinions expressed above are the author's alone. For further information on Larcan transmitters, contact Jim Wilson at LDL Communications: +1-301-498-2200, FAX +1-301-498-7952, or circle Reader Service 99.*

# Astre Delivers MSDC System

by Joseph Addalia, Jr.  
Director of Engineering  
WKCF-TV

**ORLANDO, Florida** In October 1991, WKCF-TV in Orlando, Florida, switched television broadcast channels with WBCC-TV, an educational station located in Cocoa, Florida. Both stations utilized new tower sites, thereby facilitating the need to completely rebuild the transmission plants.

WBCC-TV, the recipient of channel 68, utilized at its new plant the former WKCF-TV68 equipment. The new TV18 facility was constructed new from the ground up.

The first of many equipment purchasing decisions facing WKCF was the transmitter. With technology changing every day, and some UHF transmitter manufacturers halting sales in the U.S., this was not an easy decision to make. WKCF also had some additional parameters of its own, which in some ways helped the situation and in other ways hindered it.

### No time

One of these parameters was the fact that the channel 68 to 18 swap was originally started in the mid 1980's, and, in turn, budgeted for at that time.

What WKCF needed was a UHF transmitter manufacturer that was capable of utilizing our choice of the new technology (MSDC klystrons); a transmitter that was modern in design but basic enough to maintain without calling the factory for every problem; a design that could be adapted to utilize the parts already owned by WKCF; and to work within a limited budget.

Oh, and I almost forgot, the transmitter had to be operational in less than 90 days.

### The search

We researched all of the UHF television manufacturers. Most of the group had the design that we were looking for and were able to accommodate the MSDC technology.

Some of the manufacturers were open to the idea of using the parts already on hand or purchasing them. Two or three were priced very close to our budget. But when we mentioned the time frame of 90 days, our choices narrowed considerably.

## USER REPORT

What WKCF was asking for was a manufacturer to give us its undivided attention for three to four months. Only one could comply.

Astre Systems Inc. of Modesto, California, the smallest of the UHF transmitter manufacturers, could offer us the most.

Astre was able to provide us with a

complete 120 kW MSDC klystron transmitter. The transmitter is composed of three separate 60 kW cabinets, all capable of full power. The two visual cabinets are equipped with the Philips PDC klystrons powered by Peter Dahl/Astre beam supplies, and the aural runs a Philips standard YK1265 klystron powered by an NWL 8 amp beam supply, which was part of the WKCF parts inventory.

Other highlights include an ultra-pure water system nominally running at better than five megohms of purity. The pure water circulates through a plate heat exchanger, with the primary water system taking almost an 80 percent transfer of heat.

(continued on page 33)

**Shure. Transmission - Power Tubes: Amperex, Burle, EIMAC, National and Siemens. Camera Tubes. CRTs: For Barco, Conrac, Ikegami, Sony and other major manufacturers' monitors. RF Transistors: SGS-Thomson and RF Products. UHF Power Blocks: MMD/Spectrian. Stage/Studio Lamps: General Electric. Microphones: MMD/Spectrian.**

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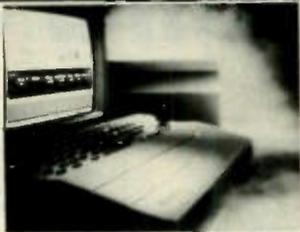
Richardson now stocks GE stage and studio lamps and Shure microphones.

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# MARKETPLACE



### Video workstation

Pinnacle Systems has introduced enhancements to its Prizm video workstation. Among these are a compact control panel and computer processor unit for broadcast vans and small studios. There also has been a software upgrade and optional CCIR digital I/O option.

The compact control panel provides all the functions of the full-size panel.

For more information, contact Walter Werdmuller at +1-408-395-1161, FAX +1-408-395-0544, or circle Reader Service 23.

### Animation controller

Lyon Lamb has completed an interface that allows its -VAS series of animation controllers and the MacVACS software animation package for the Apple Macintosh to operate with the new Sony EVO-9650P Hi8 animation tape recorder.

The company's -VAS controllers operate with all major computer platforms to record single-frame animation onto videotape. Recordable video formats include Betacam and Betacam SP, U-Matic and U-Matic SP, D-1, D-2, 1" Type C, HDTV, recordable laser disc, and now Hi8.

For more information, contact Sheldon Pines at +1-818-843-4831, FAX +1-818-843-6544, or circle Reader Service 38.



### Battery/charger system

Anton Bauer's Interactive battery system features a communication channel creating a network of charger, battery and camera. The Logic Series digital battery indicates actual remaining battery capacity. Through a special circuit developed with the cooperation of camera manufacturers, remaining battery capacity is communicated to a "fuel gauge" in the viewfinders of many cameras.

For more information, contact Anton Bauer at +1-203-929-1100, FAX +1-203-929-9935, or circle Reader Service 56.



### S-VHS recorder/player

JVC's BR-S525 Variable Tracking S-VHS feeder/player offers RS-422A control compatibility, time base correction, and time code precise programmable A/B roll editing control with variable tracking.

The variable tracking system is the first to vary continuously from -2 to +3 times. Programmable playback shifts speeds automatically in 1/10 percent steps, permitting exact program timing.

For more information, contact JVC (Victor Company of Japan) at +81-3-3246-1139, FAX +81-3-3245-1614, or circle Reader Service 64.



### Waveform/vector monitors

Tektronix recently introduced a family of half-rack analog video waveform/vector monitors. The 1740A series offers the lightest weight and largest feature set. The 1750A series offers the same features as the 1740A, plus SCH and color frame verification capabilities. The 1760 series is designed for mixed format applications.

All feature eight loop-through video inputs, vector and waveform cursors and more.

For more information, contact Donna Loveland at +1-503-627-3124, FAX +1-503-627-4486, or circle Reader Service 71.



### Robotic camera operation

Radamec EPO Ltd.'s new SEE & SELECT function for its camera robotics systems replaces the need to give preset shot numbers or names for referencing purposes.

The system freezes a frame of video coming from the camera under control and stores it with all relevant data concerning camera and lens positioning.

For more information, contact Alan Head at +44-932-561181, FAX +44-932-568775, or circle Reader Service 80.

### Computer video board

Truevision's VideoVGA II is a single slot 16-bit board capable of integrating video input and output with VGA capabilities. Thus, for example, computer-aided design (CAD) users who want to take their files into applications such as Autodesk 3-D Studio and Animator Pro, and then output to video, need only this board to do so.

VideoVGA II has simultaneous output of non-interlaced VGA display and interlaced composite and S-Video video output in either NTSC or PAL. The interlaced video output can be recorded onto videotape or displayed on a monitor.

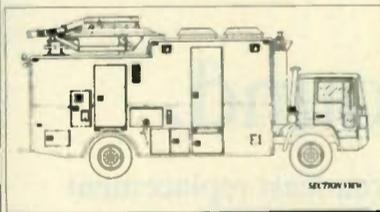
For more information, contact Techex in your area, or call Techexport Inc. at +1-617-229-6900, or circle Reader Service 33.



### Character generator

Aston Electronics' Motif character generator features online resizing, smooth movement in roll and crawl, and full color outputs. Other notable features include full color preview, logo compose with the Aston Wallet Syquest drive interface, networking of up to eight Motifs, shapes plane, Vector and Super Vector display effects, a serial port protocol, video frame grab option, and a gateway interface to Apple Macintosh graphics.

For more information, contact Alison Redman at +44-252-836221, FAX +44-252-837923, or circle Reader Service 54.



### Broadcast vehicle

BAF Communications Corporation has a full line of broadcast vehicles, including the 7000-B pictured. Custom-built features include an all-aluminum, aircraft-grade, welded structure, acoustic and thermal foam insulation, and six custom racks with console.

Four frame-mounted, hydraulic-operated leveling jacks provide a stable frame in a deployed position.

For more information, contact BAF at +1-508-535-1969, FAX +1-508-535-1441, or circle Reader Service 72.



### Wireless microphone receiver

Telex Communications' portable wireless microphone receiver, the ENG-1, can be used with most video cameras or camcorders. The single channel receiver is available in one of four computer-selected frequencies for minimal interference.

The ENG-1 includes both balanced and unbalanced outputs that interface to any audio system.

For more information, contact Telex at +1-612-884-4051, FAX +1-612-884-0043, or circle Reader Service 36.

### Scan converter

I.Den Corporation's line of computer graphic VGA and Macintosh video scan converters (IP-X10, IP-X50 and IP-X200) are hardware-based and require no supporting background software. Thus they are compatible with all PC and Macintosh software packages on the market.

With the Pixel Resizing feature, the IP-X50 and IP-X200 take VGA vertical resolutions of 200, 350, 400, 450 or 480 lines and convert them to either 625 or 525 lines of video, keeping the original picture aspect ratio.

For more information, contact I.Den in Tokyo at 81-3-3447-5220, FAX 81-3-3447-3440, or circle Reader Service 8, or in the U.S. +1-203-827-8900, FAX +1-203-827-8999, or circle Reader Service 79.

### Camera crane

Egripment's SKY-KING is a camera crane capable of safely supporting both a cameraperson and an assistant (as well as their equipment) at a maximum platform height of 21 feet, 8 inches. This renders an approximate lens height of 23 feet, 4 inches without the use of camera risers.

The standard package can be adapted to suit individual needs.

For more information, contact Keith Bailey at +1-818-787-4295, FAX +1-818-787-6195, or circle Reader Service 61.

Send new product press releases along with black and white photographs to: Marketplace Editor, P.O. Box 1214, Falls Church, VA 22041.

# EXITOSO "PLATINO" DE HARRIS

por Luis Soares de Paula  
Ingeniero Jefe de Transmisión

SAO PAULO, Brasil Desde su sede en la ciudad de Sao Paulo, la Fundación Padre Anchieta opera bajo la autoridad del estado del mismo nombre. Esta estación educativa de televisión tiene una audiencia de aproximadamente quince millones de personas y retransmite su programación desde 28 lugares en el estado.

## INFORME DE LOS USUARIOS

A partir de su inauguración, en Junio de 1969, el mandato que ha seguido la estación ha sido proporcionar una programación cultural a su audiencia. La Fundación Padre Anchieta ofrece una variedad de programas: deportes, noticias, películas antiguas, música, entrevistas, cursos en inglés, francés y alemán, cursos preparatorios para admisión a las universidades y entreti-

miento en general sin cuñas o interrupciones comerciales.

El mercado paulista es muy competitivo y la Fundación compete con seis otras estaciones VHF y cinco estaciones UHF que prestan servicios en la misma zona.

Además de la estación televisora, la Fundación Padre Anchieta también opera estaciones AM y FM. Tenemos un personal de ingenieros y técnicos que mantienen el equipo de transmisión y de los estudios de las tres estaciones.

La Fundación operaba un antiguo transmisor RCA TT25DL de 25 kW. Teníamos planeado mudarnos a un nuevo sitio y decidimos invertir en la compra de equipo moderno de transmisión. Favorecíamos la compra de equipo de estado sólido por muchas razones:

Primera, un transmisor de estado sólido requiere mucho menos mantenimiento. Segunda, un transmisor de estado sólido requiere menos espacio y

utiliza menos energía. Tercera, un transmisor de estado sólido brinda mayor confiabilidad en el aire.

Al escoger nuestro transmisor tuvimos que considerar la calidad del producto como punto más importante que el precio, la facilidad de adquisición de partes de repuesto y el apoyo prestado por el fabricante en caso necesario. La fundación escogió el transmisor de estado sólido HTD 60LS de la Serie Platino de Harris con dos unidades de 30 kW.

El transmisor de la Serie Platino satisface nuestras necesidades con:

Un diseño que requiere únicamente el 10 por ciento del mantenimiento de rutina requerido por un transmisor de tipo tubo.

Un excitador de combinación visual/auditivo que brinda funcionamiento excepcional con ajustes minuciosos, síntesis de frecuencia y controles digitales para reducir y elevar la potencia.

Y, por último, una construcción modular paralela que ofrece gran confiabilidad en el aire. Los módulos amplificadores de 1 IW de banda ancha FET de estado sólido pueden ser reparados en el campo, pueden ser enchufados o reemplazados mientras el transmisor está funcionando y están protegidos contra averías. Los sistemas de control y de enfriamiento aumentan aún más las confiabilidad del equipo.

Además de estas características y de su calidad, los transmisores de Harris están protegidos por servicio de 24 horas que ofrece acceso a partes de repuesto y a asistencia técnica. La empresa Electro Equip, representante de Harris, nos brinda asistencia adicional.

El HRD 60 LS de Harris llegó a Brasil durante el mes de febrero de 1961. El transmisor fue instalado por los ingenieros de la fundación siguiendo el plan diseñado por Harris.

La instalación hizo necesario el reemplazo de cierto equipo, la construcción

de un nuevo sistema de escape y de un nuevo sistema de conmutación de energía y la instalación de un interruptor coaxial para la antena. Durante la instalación surgieron problemas con el combinador, con algunos módulos de amplificación de potencia y con la colocación del híbrido.

Desde su instalación el HTD 60 LS ha satisfecho todas las expectativas de tecnología, funcionamiento y confiabilidad. La estación ha notado disminución en el mantenimiento y en el consumo de electricidad y mejor funcionamiento. Para un funcionamiento óptimo es imperativo tener un buen sistema de aislamiento a tierra y equipo para eliminar la sobretensión o sacudidas eléctricas momentáneas.

Los controles en el panel frontal facilitan la operación y la presentación digital de los medidores es fácil de leer. El HTD 60 LS no requiere tiempo para calentarlo, prenderlo o apagarlo ni la vigilancia continua que requería nuestro transmisor viejo.

La facilidad en el mantenimiento y en el diagnóstico de problemas, la operación sencilla, la redundancia de los módulos de amplificación de potencia de estado sólido, los indicadores con diodos emisores de luz y la posibilidad de hacer reparaciones mientras el transmisor está "en el aire" son características apreciadas por la Fundación Padre Anchieta.

Nos complace informar que el Harris HTD 60 LS ha excedido nuestras expectativas.

Luis Soares de Paula tiene 24 años con la Fundación Padre Anchieta, durante los últimos tres ha sido el Ingeniero Jefe de Transmisión.

Para obtener más información referente al HTD 60LS de Harris, comuníquese con Jack O'Dear, Director de Ventas Internacionales, Quincy, Illinois, Teléfono +217-222-8290 o marque el Reader Service 68.

## Astre Delivers MSDC Technology to WKCF

(continued from page 31)

The exciter system is a complete ITS drive chain that has since been expanded to include a completely redundant system with an automatic change-over switch.

### Redundancy built-in

Not only does the transmitter deliver power efficiency of transmitters half its size, the transmitter is completely redundant.

It is possible for one visual to fail and the transmitter to continue to operate on-air at 50 percent power. If the second visual should also fail, the aural is capable of full multiplexing at approximately 30 kW peak visual.

This, in our opinion, is the greatest advantage of the transmitter.

The Astre ST-120DC, interfaced to the Dielectric Magic Tee system, assures that WKCF will always have the ability to stay on the air.

Additional fine features of the transmitter are the space present inside the amplifier cabinets and the adjacent power supply cabinets.

This transmitter is made for the emergency situation. If something was to fail inside one of the cabinets, repair would not be hindered due to lack of room to work or the need to remove something first.

### Alot of plusses

The remainder of the transmission plant consists of a Dielectric TFU38JDAS TRI-LOBE tri-lobe antenna, and Dielectric 9 3/16" coaxial transmission line.

The entire plant is backed up by a 400 kW Caterpillar diesel generator. This also demonstrates an added advantage of the Philips depressed collector klystrons. If a plant the size of the WKCF plant was to use the same generator with standard klystrons, operation would be borderline, and it might even be necessary to reduce output power when on stand-by power.

To sum up our transmission plant,

WKCF has modern energy saving technology and a top-notch drive and RF system, all backed by a transmitter that can deliver reliability, flexibility, and "fixability," all for a cost that was unbeatable.

Joseph Addalia, Jr. is director of engineering at WKCF-TV in Orlando, Florida, and can be reached at telephone 407-645-1818, FAX 407-647-4163.

For more information on Astre Systems products, contact George Ledoux at telephone 209-575-1000, FAX 209-575-0322, or circle Reader Service 43.

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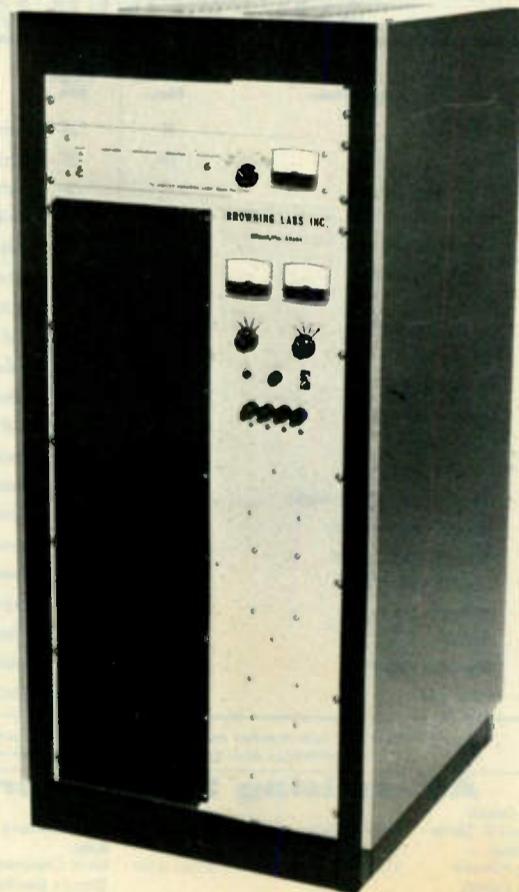
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# Comark Sees an IOT Future

by Arthur Cole

**COLMAR, Pennsylvania** Comark Communications Inc. is positioning itself to be the leader in HDTV transmission equipment, devoting significant resources to the development of IOT-technology-based transmitters.

With about 50 EEV IOTs either on the air or under construction, and about the same number of Varian klystrons in the field, Comark President and CEO Nat Ostroff is very optimistic about the digital HDTV future.

"Comark is making plans for a significant increase in business," Ostroff said. "We are extremely optimistic about the second half of the 1990s."

## Long road

The company has come a long way since it was founded in 1972, principally as a supplier of transmission line components, filters and waveguide equipment. Its first full transmitter was not built until 1978, but Ostroff said even that product was based on the design of other transmitters that were already available.

By the early '80s, Ostroff said the company had decided to stop following and start leading.

"EEV and Valvo (a Philips company) had developed a high-efficiency, four-cavity klystron that provided a quantum increase in efficiency (about 50 percent) and a reduction in price," he said.

In 1982, Comark introduced the first U.S. use of the EEV wideband, high-efficiency klystron in its S Series transmitter. By 1987, the wideband klystron transmitter had become an industry standard.

By that time, Ostroff said, the company was already looking to the next generation of RF technology.

"Innovation tends to drive more innovation," he said. "We had to again look

at our product line because the competition was imitating what we did."

## Enter the klystrode

The result was the first transmitter equipped with Varian's klystrode, which was installed in the Georgia Public TV network in 1988.

"The klystrode transmitter offers an increase in efficiency by a factor of two to three times over the best that klystrons could produce," Ostroff said.

While Comark was working with Varian on the klystrode, however, EEV was

## The company's primary foreign markets are in the Middle East, South America and the Far East.

busy developing its Inductive Output Tube (IOT), which Ostroff says is "based on the same technology as the klystrode," but is "more user-friendly" than the earlier klystrode products.

The first IOT went on the air in June 1991 at WGBY-TV in Springfield, Massachusetts.

Ostroff said Comark's commitment to IOT technology, along with several other innovations, has put Comark at the starting gate in the race to get HDTV on the air.

Unlike the klystron, which draws a continuous DC current to provide peak power, klystrons and IOTs draw power in direct proportion to the output. Thus, they are ideal for HDTV, he said.

"HDTV will not be low-power; that is a false impression," Ostroff said. "HD power is measured at the average because there is no peak sync power reference. The peak power of these digital signals are running 10 dB or greater

above the average power. When you are talking about a 5 kW average, you could have a 50 to 100 kW peak.

"The klystron would have to be drawing DC power as if it was delivering the peak power all the time. This would be tremendously inefficient," he added.

Ostroff said Comark is anticipating the dual NTSC/HDTV broadcast environment through its development of common amplification. The method combines vision and sound at low levels and transmits them through the system together. In other words, each tube can handle both vision and sound together. In a parallel tube system, common amplification can provide an automatic backup, should one tube fail.

"In the future, the system could be split apart, and HDTV could be transmitted through one half while NTSC could be transmitted through the other," Ostroff said. "Each half could feed separate antennas.

"Stations using the common amplification/IOT technology will merely have to plug in the HDTV exciter and they will be on the air without modifications to the transmitter," Ostroff said.

Comark was recently notified that a Comark dual-use IOT common amplification transmitter was selected to be the test standard for the D-HDTV field tests next spring in North Carolina. The selection of the Comark transmitter appears

## COMPANY PROFILE

Comark  
Communications Inc.

P.O. Box 506, Rt. 309 &  
Advance Lane  
Colmar, PA 18915

Phone: 215-822-0777  
FAX: 215-822-9129

to be confirmation that the IOT transmitters from Comark represent the state of the art in D-HDTV and NTSC transmission.

Owned by Thomson CSF in France, Comark currently employs about 100 people at two facilities: its corporate headquarters and advanced development center in Colmar, Pennsylvania, and a manufacturing facility in Southwick, Massachusetts.

Ostroff said about 40 percent of Comark's business is overseas, where the company concentrates on the market for transmitters 25 kW and higher.

The company's primary foreign markets are in the Middle East, South America and the Far East.

"We are also working very hard at developing business in the former Soviet Union," Ostroff said.

Comark recently received an order for three IOT transmitters from Finland.

"We expect IOT common amplification technology to play an ever-increasing role in international markets," Ostroff said.

## BUYERS BRIEFS

**Altronic Research's OMEGALINE** 5800 Series self-contained heat exchangers dissipate power in a water-cooled load, maintaining stable RF characteristics while water is circulated through the internal cooling system.

Features provide quiet operation, interlock, compact size and casters for mobility, with options of remote load operation and calorimetry.

The 5800 Series is available in continuous power ratings of 10 kW, 25 kW, 50 kW and 80 kW power ratings.

For further information, contact Doug Starkey in the U.S. at +1-501-449-6000, FAX +1-501-449-6000, or circle **Reader Service 37**.

**Richardson Electronics, Ltd.** has a new offering for the UHF-TV market—a new 1 kW transmitting tube and cavity amplifier combination.

On the solid state side, Richardson has teamed with manufacturer MMD/Spectrian to offer five new broadband UHF power blocks for 470-860 MHz TV transmitters.

The 1.1 kW Class A linear amplifier operates at a frequency between 465 and 870 MHz.

Also offered is the NL347 power tube, which provides 1 kW of output power when common amplification of vision and sound is required. Higher power levels are possible if video and audio are transmitted separately.

The UHF power blocks are manufactured using surface mount

technology. The company currently offers the UHF4-A (4 watts), UHF10-A (10 watts), UHF15-A (15 watts), UHF60-AB (60 watts) and UHF200-AB (200 watts) off-the-shelf. The blocks may be configured for 1 W to 30 W transposers, low power TV and high power externally diplexed applications.

For more information, call in England: +44-522-542631, or circle **Reader Service 4**; in France: +33-1-34-26-4000, or circle **Reader Service 18**; in Italy: +39-1678-62138, or circle **Reader Service 52**; in Spain: +34-1-528-37-00, or circle **Reader Service 75**; in Germany: +49-89-80-02-13-1, or circle **Reader Service 91**; or corporate headquarters in the U.S.: +1-708-208-2200, or circle **Reader Service 55**.

**Plante**, based in Rio de Janeiro, Brazil, features a line of RF equipment, including STLs, exciters, CATV modulators and demodulators, and TV distribution systems.

Among the line is the 443 CATV modulator, a plug-in unit designed for NTSC and PAL for CATV and VHF television. It features a change-up converter module, VSB SAW filter, front panel adjustments for IF, aural and visual levels, and an economical price, according to the company.

For more information, contact Nils Manzieri in Miami at +1-305-594-6664, FAX +1-305-477-1913, or circle **Reader Service 40**. Or contact the main office in Brazil, at +55-21-581-3047, FAX +55-21-581-4286, or circle **Reader Service 118**.

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