

BROADCAST[®] engineering

An INTERTEC[®] K-III Publication

April 1997 \$10.00

AUTOMATION & NETWORKS

Finally, automation
with a brain

**STUDIO
LIGHTING
SYSTEMS**

Less power and
cooler operation

**DIGITAL
TELCOM
LINKS**

Digital remotes
are now easy

Some Countries Have It ALL!



WSIX - Nashville, Tennessee "Country Music Station of the Year"

A-500 Studio Furniture delivered March 1993
A-500 Console S/N 20789 delivered April 1993
A-500 Console S/N 20792 delivered April 1993
A-6000 Studio Furniture delivered March 1995
A-6000 Console S/N 22536 delivered March 1995
R-15 Console S/N 22557 delivered March 1995
SP-5 Console S/N 22593 delivered April 1995

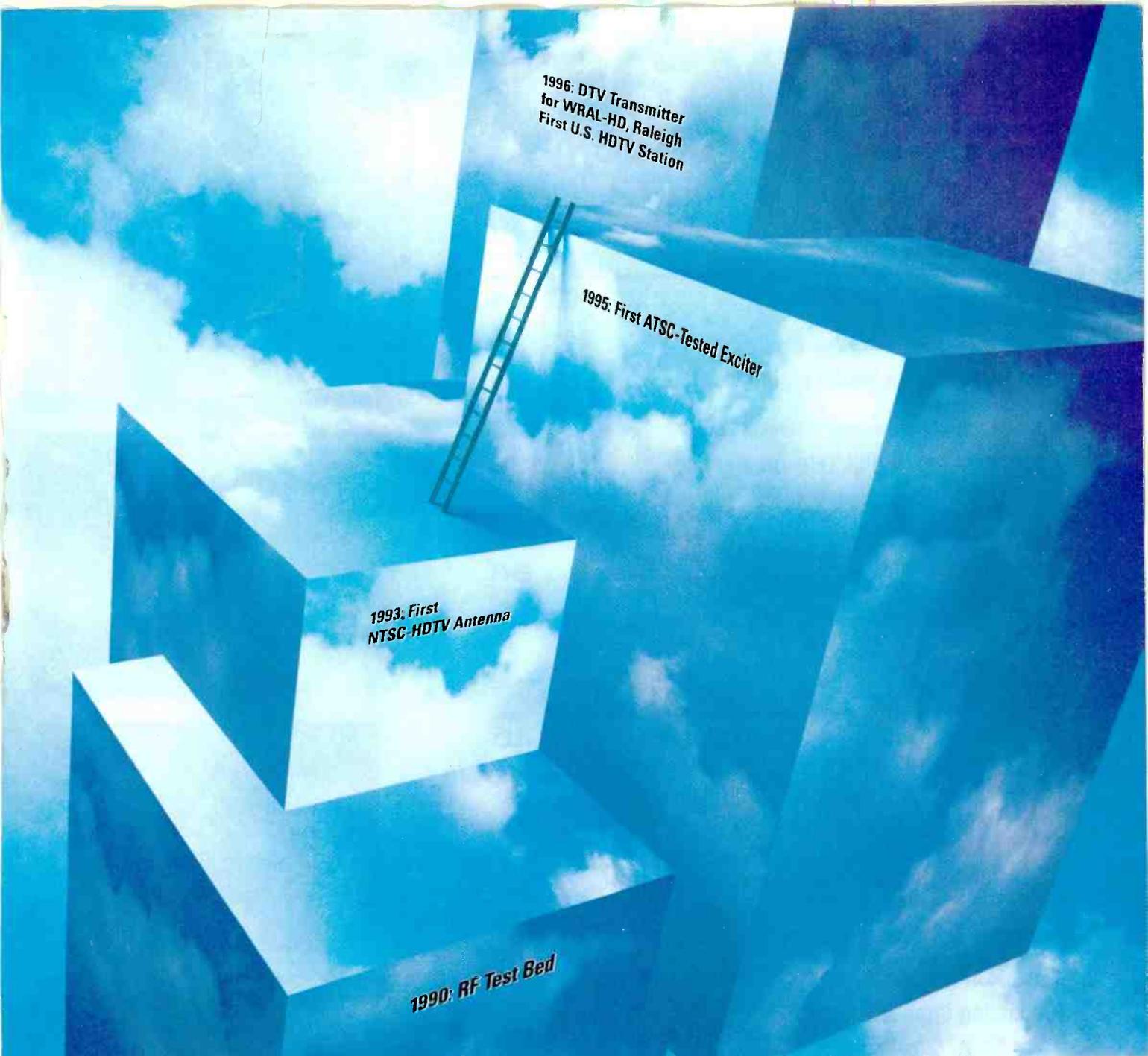
1995 Academy of Country Music Award
1995 Marconi Country Music Award
1995 Billboard Country Music Award
1995 Country Music Association Award
1995 Country Music Association SRO Award
1995 Gavin Country Music Award
1996 Gavin Country Music Award
1996 Academy of Country Music Award

Wheatstone Model A-6000 Audio Console shown

 **Wheatstone Corporation**
tel 315-452-5000 / Syracuse, NY.

Circle (1) on Free Info Card

www.americanradiohistory.com



1996: DTV Transmitter
for WRAL-HD, Raleigh
First U.S. HDTV Station

1995: First ATSC-Tested Exciter

1993: First
NTSC-HDTV Antenna

1990: RF Test Bed

We took a few remarkable steps to give you the smoothest path to DTV.

As you begin planning your move to digital television (DTV), you'll want a partner who can give you the quickest, easiest and safest path possible. Harris would like to be your partner.

From the start of the revolution leading to DTV, we have had only one goal—to give you the smoothest path. So we've been willing to take the hardest steps ourselves, from developing the RF test bed used by the ATTC to evaluate every HDTV system proposed for the U.S., to delivering

the proven DTV transmitters operating on the air today.

The list of Harris' "firsts" is long. But they all add up to one simple benefit for you. No matter where DTV technology takes us, you can count on Harris for proven solutions. To learn what numerous major groups who have DTV Transmitter Equipment Agreements with Harris have discovered, please call. Find out how you can count on Harris to help you make the leap to tomorrow. Today.

Harris Corporation Broadcast Division

US and Canada
Phone: 1 217 222-8200
FAX: 1 217 224-1439
Elsewhere
Phone: 1 217 222-8290
FAX: 1 217 224-2764



HARRIS

A new world of broadcast solutions

©1997 Harris Corp.

Circle (4) on Free Info Card

www.americanradiohistory.com

features

Automation and Networks 44

By Cal Ostrom

Finally, automation with a brain.

New Directions in Studio Lighting 62

By Peter Bryenton

Is it time to replace your studio lighting system?

Understanding Digital Telecom Services 78

By Ken Freed

Digital technology is affecting significant change in the wired telecommunications world.

Remote Truck Audio 86

By Peter A. Douglas

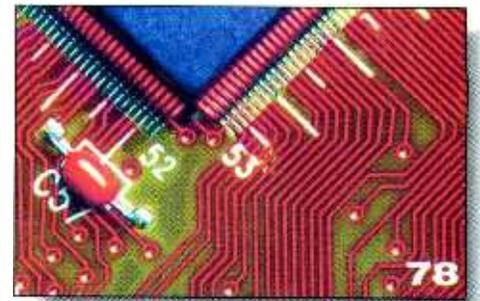
Don't forget the audio when building a remote vehicle.



44



62



78



86

columns

FCC Update 12

DTV public-interest obligations

Management 14

Training needs in the information age

Transition to Digital ... 18

MPEG-2: A closer look

Computers & Networks .. 22

Software development for the broadcaster

Production Clips 30

Digital audio dynamics

Interactive 34

Bigger data pipes: Costs and risks

ATV Update 40

Get on the queue now

Cabletec 42

MPEG-2: Making the right choices

Transmission.....96

Maintaining transmission lines

Field Report.....100

JVC Digital-S

Applied Technology....104

News Digital Systems

Applied Technology....108

ADC Broadband Communication's DV6000

Digital Basics 134

Initials for everything

departments

Editorial 06 New Products 113

News 08 Classifieds..... 128

Industry Briefs 112 Advertisers' Index ... 133

BROADCAST ENGINEERING (ISSN 0007-1994) is published monthly (except semi-monthly in June and December) and mailed free to qualified persons by Intertec Publishing, 9800 Metcalf, Overland Park, KS 66212-2215. Periodicals postage paid at Shawnee Mission, KS, and additional mailing offices. Canada Post International Publications Mail (Canadian Distribution) Sales Agreement No. 0956295. POSTMASTER: Send address changes to *Broadcast Engineering*, P.O. Box 12902, Overland Park, KS 66282-2902. CORRESPONDENCE: Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2215. Phone: 913-341-1300; Edit. fax: 913-967-1905. Advert. fax: 913-967-1904. © 1997 by Intertec Publishing. All rights reserved.

ON THE COVER: The transmission control room at Speer Communications in Nashville, TN, is the nerve center for the facility's ability to originate 20 separate digital or analog network feeds. The D-1 facility uses the Alamar Media Manager, the DEC Alphastudio terminal and control terminals for two Philips Media Pool video servers. The TDC intelligent multicolor undermonitor displays provide information on the routing and status of network feeds, as well as providing instant visual error messages about equipment or systems failures.

Look To Sencore/AAVS For All Your Video Testing Needs.

**RF
Video**

**Digital
Video**

**Baseband
Video**

MPEG-2 Testing

**Digital
Broadcasting**

Sencore/AAVS has the instrument to make your video troubleshooting journey easier and faster than ever before. Whether you're working with analog, CCIR601 composite or serial digital, or MPEG-2 compressed digital video – we offer unique and specialized instruments with exclusive tests and analyzing capabilities that will simplify your life – and ultimately make your customers happier.

Circle (5) on Free Info Card

We are your complete video analyzing connection.

For more information on Sencore or AAVS's complete product line, simply call 1-800-SENCORE (736-2673), or 1-800-769-AAVS (2287) today.
www.americanradiohistory.com

SENCORE AAVS
3200 Sencore Drive, Sioux Falls, SD 57107

Blue bananas



In celebration of the FCC's recent momentous action on DTV, I'd like to offer a moment of reflection on some of the more flavorful comments made by key industry officials as we wound our way to this point in broadcast history. These comments were taken from the book, "Defining Vision: The Battle for the Future of Television," by Joel Brinkley, published by Harcourt Brace.

The observations presented here obviously do not have their full background. They do, however, exemplify the changing public face that was placed on this trek to our digital future. It is only now, with a work such as this from Brinkley, that you can better appreciate the technical and political challenges faced by industry leaders, and especially those lead by Richard Wiley and his Advisory Committee on Advanced Television Service. For me, their challenges and triumphs were made real in Brinkley's book and I highly recommend it. Following are some excerpts:

If American broadcasters "are precluded from offering HDTV as a free, over-the-air service to the nation," that will bring the death of local broadcasting as we know it. NAB president, Eddie Fritts, 1986.

"It (Advanced Compatible Television) will immediately obsolete every TV in America." James Carnes, Sarnoff (RCA) Labs. 1987.

"ACTV's just a ploy to sell more picture tubes." Wayne Luplow, Zenith, 1989.

"We'll have digital television the same day we have an antigravity machine." Joe Flaherty, CBS.

"HDTV is a lot of hot air." Nicholas Negroponte.

"Hot Damn! Now we're getting somewhere. This is HDTV!" Peter Fannon, ATTC, 1991.

"We're staring down the barrel of a gun." TV station owner, 1992.

"HDTV is liable to become the eight-track of the '90s." An ABC vice president, 1992.

"Now is not the time to get weak-kneed." Al Sikes, 1992.

"I'm in the television business. You're telling me I gotta get out of my business and go into the business you think I should go into... (digital broadcasting is) going to drive local TV stations all across the country out of business, and the American people are going to lose their local television service!" Philip Lombardo, group TV station owner, 1993.

"WARNING: The Electrical General has determined that interlace may be hazardous to your health." Poster outside meeting room at Technical Subgroup meeting, July 1993.

"The commission asked them to build us a better bicycle, and they came back with a Ferrari...now we have to decide what to do with this Ferrari." Reed Hundt, FCC, December 1994.

"I suspect you (broadcasters) know better than the government what you should send (transmit)." Reed Hundt, 1995 NAB Convention.

"HDTV is a very marginal and possibly superfluous venture, because standard-definition is going to be just as exciting visually as (HDTV)...So why not have three channels simultaneously at 480 lines as opposed to one channel with 1,080 lines? They'll look the same. The notion of (HDTV) as a single or so-called second channel for broadcasters is defunct." Reed Hundt, 1995.

Finally, from breadboards and computer simulations to reality. HDTV finally happens.

July 23, 1996, WRAL-HD broadcasts first Grand Alliance signal.

July 30, 1996, WHD-TV broadcasts first live HDTV images. The first shots were of the GA equipment racks. But there, hanging from one rack was the engineers' tribute to TV's historic adventure, a hand-painted bunch of blue bananas.

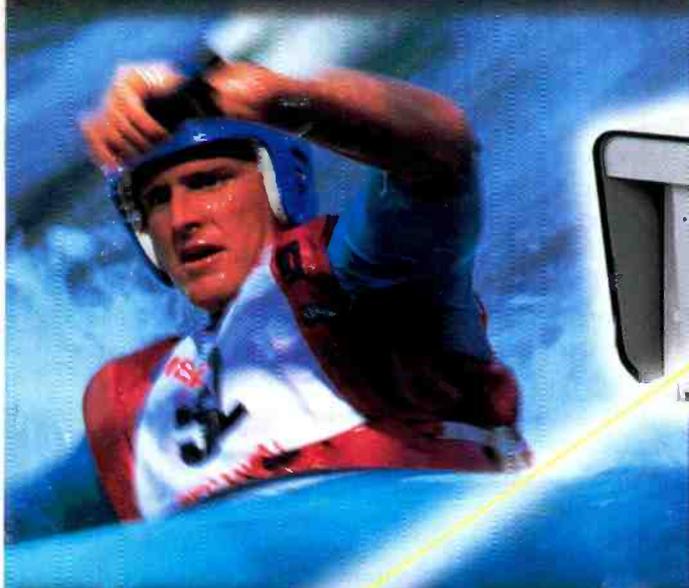
Brad Dick, editor



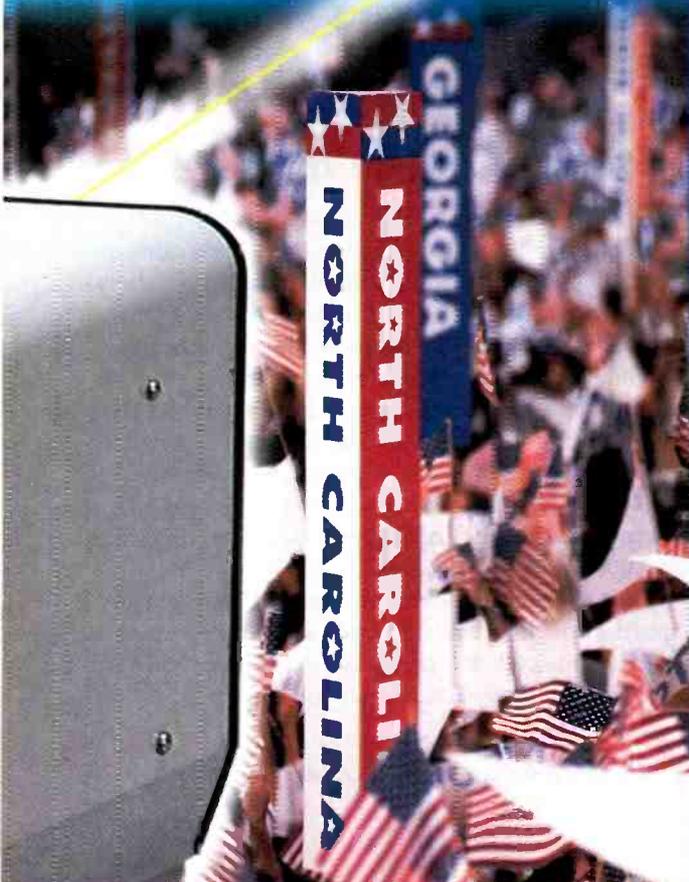
PART OF THE ACTION.

CANOBELM II

Wireless Optical Beam Transmission System



**EVALUATIONS
EXCEED EXPECTATIONS
EVERYWHERE YOU LOOK.**



Since its introduction, Canobeam, our optical wireless transmission system has been used at The Indianapolis 500, The Centennial Olympics and The 1996 Presidential Conventions to rave reviews. Users note video quality far exceeding microwave, and CD-level quality audio. It's not surprising.

Canobeam is a bi-directional system that sets up in minutes, has four video channels, requires no license and is ideal to free-up valuable microwave channels, while providing on-the-spot operation.

Broadcasters have discovered Canobeam's impressive 2.5 mile range and features which include path security, freedom from interference, remote set-up and operation, and auto-tracking to insure uninterrupted operation (even from the tops of buildings prone to sway).

Get in on the action. For more information on Canobeam, please call 1-800-321-4388.

Canon

Web site @ <http://www.usa.canon.com>

Circle (11) on Free Info Card

DTV gets the go-ahead

DTV now has a green light, but it may really be up to the consumers as to how long this conversion process will take.

In a decision by the FCC on April 3, digital television will be available to the public over the next two years. The current analog broadcast system will still be operable for the next nine years, but after that, viewers will either have to buy a new digital television or a set-top converter. Consumers will have to

fork over about \$2,000 for a brand new set or buy a set-top converter that will range from \$150 to \$300, in order to receive the digital signals.

Twenty-five stations in the top 10 markets have promised to offer digital broadcasts within 18 months. Networked owned-and-affiliated stations in the next 20 largest

markets will have 30 months, and the remaining stations will have five years to convert. And now that the plan has been approved, the FCC will be issuing new digital broadcast licenses to every TV station in the country.

According to the FCC, stations will be able to broadcast as little or as much HDTV programming as they want. With the digital technology, TV stations will be able to put more services into their airwaves — however, the FCC mandates that stations still provide free TV service.

During the conversion to digital, broadcasters will be transmitting programs over two channels — the existing analog channel and a second digital channel that they will get from the government for free. The FCC has put stations on notice, however, that they may have to broadcast more public-interest obligations, such as public affairs, kids shows and political ads.

The abandoned analog channels will be auctioned by the government for non-broadcast uses, such as paging, mobile phone and wireless Internet access. The digital channels will come from channels now reserved for UHF stations (channels 14 and higher).



Hundt got his wish—a short timetable for pushing DTV onto the market.

So even though the FCC's plan shortens the conversion time frame from 15 years to nine years (by 2006), TV sets will not be immediately obsolete.

Until the majority of cable systems go digital, many of the more than 68 million cable TV subscribers who purchase new TV sets, however, will still have to use their TV's rabbit ears or a rooftop antenna in order to receive the digital signals.

ATSC creates DTV certification program

To avoid consumer confusion as the new digital televisions come to the marketplace, the Advanced Television Systems Committee (ATSC) is creating a program to certify TV sets, computers and other consumer video devices that can receive all ATSC video formats for the new digital era.

According to ATSC chairman Robert Graves, consumers need to know that what they buy will work now, no matter which ATSC format is used by programmers.

This certification program will be simple and will indicate that a consumer video receiver will work with all of the video formats in the ATSC DTV standard.

Although the program will provide information to indicate whether a television will receive all of the ATSC video formats, it will leave the choice of the display type, such as progressive or interlace scan, high-definition or standard-definition to the consumer.

Stall on cable modem rollouts

Cable operators are beginning large-scale cable modem deployment throughout the United States, although the rollout is slower than expected. Delays in cable system upgrades have contributed to the limited deployment of modems in many markets.

According to the study, "Cable Modems & High-Speed Data Services: Technology, Content and Business Strategies," by Michael Harris, president of Kinetic Strategies, while cable modem service is available to two million homes, cable operators only had captured 19,000 paying subscribers.

Even though some cable operators have only a small portion of their cable systems available for modem service, the systems will grow as cash flow and experience with data services increase.

Read on for Hot News at NAB on page 10.

NETWORKABLE

EXPANDABLE

BULLETPROOF



*MediaStream Server
broadcast series*



Looking for a broadcast server to get you on air today — and keep you there? You should give the HP MediaStream broadcast server a shot.

Our bulletproof architecture is engineered to maximize dependability today. And minimize problems adapting to a changing industry. A single server provides 6 channels and nearly 50 hours of storage. And HP servers can be easily networked — allowing you to add even more channels and storage as you go. Plus, our open-systems approach ensures compatibility with a wide variety of third-party hardware and software vendors.

Combine all that with HP's 24-hour service and support, and you're looking at the most reliable server money can buy.

But don't just take our word for it. Ask the

engineers at KCRA in Sacramento. Or MTV Europe in the U.K. Because from Arizona to South Africa, broadcasters around the world count on HP's broadcast server every day. And it hasn't let them down.

It's engineered to meet your broadcast needs well into the future. But at \$100,000, it's priced to fit your budget today.

For free product literature with more information, call 1-800-FOR-HPTV, Ext. 1632 today. You'll find out what HP's broadcast server can bring to your station, both now and in the future.

If you're looking to invest in a server you can count on, take a look at the HP MediaStream broadcast server. Then give it your best shot.

There is a better way.

Starting at
\$100 K



Hot news from NAB

Java unveiled

In a move that turns open vs. closed platforms on its head, software developers writing the Java language will be able to write applications for the entire family of Quantel products.

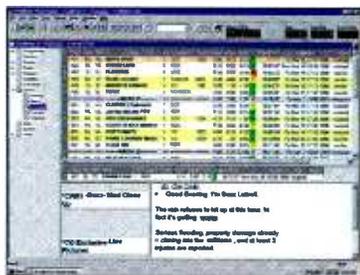
Java is now the first platform-independent programming language. Users will have the freedom to integrate limitless Java applications with the functionality and ergonomics of their Quantel systems. No changes in hardware or software will be required.

Sony opts for open architecture, seeks partners for SX

Sony has committed to open systems and to providing customers with a working digital solution to encompass hardware and software from other vendors when appropriate. In addition, Sony will make available SX compression ICs and SDDI networking chips to third parties so they can develop their own products. Sony's Charlie Steinberg said that the company wanted to be a true partner, not just a vendor, in the industry's transition to DTV.

Sony announces DVCAM tape format

Sony has announced a new recording format for HDTV. Dubbed HDCAM, the format is based on the SX recording platform. The announced products include a one-piece HD camcorder, editing VTR, digital switcher, DVE and control room HD monitor. The system, which adheres to the SMPTE 292M standard, is designed for baseband distribution and networking. Key operational features include dual HD and SDTV outputs. The SDTV output can operate in 16:9 or 4:3 aspect ratios.



AVID launches AvidNews

Avid previewed its new digital news-gathering technology, showing a complete disk-based production system. Based on client/server architecture, the Avid DNG stores digital video,

audio and graphics in a single central video server. Data can be simultaneously accessed by Avid's client workstations for recording, editing and playback.

The company based the new system on the strength of its purchased BASYS and SofTECH companies. AvidNews uses a Windows 95 interface, provides video on the desktop, advanced machine control and allows users to post material directly to the web.

The Clipbox on steroids

That might describe Quantel's new version of its famous Clipbox. Now much more than a clipstore, the Clipbox is capable of storing up to eight hours of



uncompressed video. User-selected compression ratios of 5:1, 10:1 and a mirrored storage of 20:1 are available, providing a total of 160 hours of video. The new Clipbox comes complete with automation interfaces and a user-control system for those yet without automation.

uncompressed video. User-selected compression ratios of 5:1, 10:1 and a mirrored storage of 20:1 are available, providing a total of 160 hours of video. The new Clipbox comes complete with automation interfaces and a user-control system for those yet without automation.

Roswell who?

Odetics introduced a facility management system titled Roswell. Controlling a variety of storage and switching systems, Roswell signifies Odetics' entrance into the stand-alone broadcast management system market. The software system automates material, media tracking, provides multichannel automation and real-time machine control. The system is scalable for operation from small stations just getting into multichannel operation up to large broadcast installations.

Panasonic, Philips-BTS and Sony agree on common digital standard

An upcoming SMPTE vote could put the stamp of approval on a common transport layer for digital video interconnection. While Sony and Panasonic have been publicly locked in a battle for their own versions of SDI (SMPTE 259M), consumer realities seem to have forced the giants to put aside their differences. Sony had originally proposed its SDDI system as a proprietary version of SDI, whereas Panasonic and BTS supported what came to be called CSDI. Agreement on a common transport layer means that devices can exchange video files. Although an SX file will not be the same as a DVCPRO file, those files can still be transported around a facility on the same networking topology. According to SMPTE, the final stamp of approval by all parties on the specifications should be in place by June. ■

**Two years ago, on-line,
non-linear editing
became a reality.**

We called it Editbox.

**Over 300 customers
are already reaping
the rewards.**



**Can you afford to
wait any longer?**



The world's on-line, non-linear editing system

**EDIT
BOX**

Call our 24 hour Editbox Hotline now: 1 800 218 0051 Ext. 494

Quantel Inc., 28 Thorndal Circle, Darien, CT 06820 Tel: (203) 656 3100 Fax: (203) 656 3459 <http://www.quantel.com>

Circle (13) on Free Info Card

www.americanradiohistory.com

DTV public-interest obligations

The White House is asking the FCC to move expeditiously on issuing digital TV licenses. In a news conference in February, Vice President Gore said President Clinton and his administration are convening a special advisory group to study and make recommendations within one year on what the public-interest responsibilities of broadcasters should be regarding digital television.

Gore further noted that it is the administration's position that the FCC should keep the question of public-interest obligations open while proceeding with digital license allocations. FCC chairman Reed Hundt and public-interest groups welcomed the proposal with open arms. Hundt said he totally supports the idea that no DTV licenses should be issued unless and until it is clearly understood that licensees must serve the public interest in a variety of ways. He later added that the commission might establish a general public-interest mandate — such as a requirement that 5% of the digital channels be devoted to public-interest use — that regulators would later develop into specific rules.

Hundt further noted that a perfect example would be Barry Diller's big, brilliant proposal to use digital television to help solve the campaign finance problem. Diller proposed that broadcasters give free time to political candidates in return for less regulation. Hundt said he sees the administration continuing to oppose DTV auctions and repudiating the FCC policy of the 1980s which, according to Hundt, said the public interest is served merely by the commercialization of the spectrum. Hundt interprets the administration policy to mean the FCC should get licenses out quickly, but they should be written to serve the public interest. Hundt further called it a great idea to have public debate on what the public-interest obligations of digital broadcasters should be.

Vice President Gore's chief domestic policy advisor, Greg Simon, said the administration continues to

A notice of Proposed Rulemaking has been released for the 1997 regulatory fees. See the table below.

TV-VHF COMMERCIAL		TV-UHF COMMERCIAL	
MARKETS 1-10	\$44,700	MARKETS 1-10	\$18,875
MARKETS 11-25	30,500	MARKETS 11-25	15,625
MARKETS 26-50	16,350	MARKETS 26-50	8,250
MARKETS 51-100	4,925	MARKETS 51-100	2,875
REMAINING MARKETS	835	REMAINING MARKETS	815
CONSTRUCTION PERMITS	7,750	CONSTRUCTION PERMITS	5,950
SATELLITE TV STATIONS	\$975	LPTV, TV/FM TRANSLATOR & BOOSTERS	\$225
CONSTRUCTION PERMIT (Satellite TV)	\$350	BROADCAST AUXILIARY	\$25



Harry Martin

support the early awarding of broadcast spectrum, with auctions of analog spectrum in 2002 and broadcasters returning spectrum in 2005. Broadcasters are hardly enthusiastic about additional public-interest responsibilities, but the real news for them was the White House's call to move forward with the issuing of digital licenses. ■

Harry C. Martin is an attorney with Fletcher, Heald & Hildreth, P.L.C., Rosslyn, VA.

DATELINE

All stations must file their 1997 annual employment reports (FCC Form 395-B) on or before May 31. Tower owners in the following states must file their tower registrations on the dates indicated: Louisiana, Maine and Rhode Island by May 1-31; Colorado and Minnesota on June 1-30.

TV stations in Michigan and Ohio and LPTV/translator stations in Utah must file their renewal applications on or before June 2, 1997. Commercial TV stations in the following states must file their annual ownership reports or ownership report certifications on or before June 2: Arizona, Washington DC, Idaho, Maryland, Michigan, Nevada, New Mexico, Ohio, Utah, Virginia, West Virginia and Wyoming.



Beat it.

You deliver the story at the top of the hour. Period. The story is everything—and the tools you use to deliver it must be proven. Flexible. And fast.

Avid can help you beat the clock. Letting you air consistently high-quality broadcasts while the competition's still running around with tapes.

Our disk-based editing system, NewsCutter®, is, quite simply, a better way to edit news. Just like word processing for video. Cut and paste. Pinpoint shots frame by frame. Make copies without degradation. And no predigitizing. No other technology allows the control and flexibility that digital-on-disk does.

Avid's newsroom computer systems, Avid NetStation™ and NewsView™, let your entire team share wires, scripts, rundowns and assignments. The latest graphical interface makes it fast and easy. Imagine the impact on productivity and efficiency.

And our unique Digital News Gathering (DNG) system integrates our news editing and playback products into a complete server-based production

system. No more waiting. No more missing the deadline.

Avid's field-tested systems are scalable, modular and open. They can be integrated into your existing analog or digital facility and will grow with you.

Sci-fi? Look again. Avid's systems are in use in more than 900 broadcast facilities worldwide. Today. That's a lot of broadcasters who can react to late-breaking news faster—and better—than you can, if you're relying just on tape.

For more information on Avid disk-based news editing, newsroom computer systems or Digital News Gathering, call 800 949 AVID. You can't control time. But you can make better use of it.

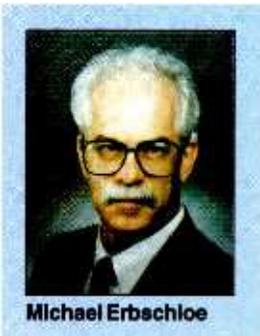


NEWS SOLUTIONS

Circle (14) on Free Info Card

Training needs in the information age

In the search for greater productivity, healthier profits and a jump on the competition, stations are relying heavily on desktop computers. Although these systems can do everything from word processing to project management and accounting, it's their power for creative and editing tasks that make them most desirable for TV stations. It's also in this area that your staff can benefit from proper training.



Michael Erbschloe

Many times, stations will include training in the purchase of new systems. And, if you press hard enough, the vendor may throw in some training just to close the deal.

Sometimes, a station may forgo the training if it's too expensive. Bean counters may balk at paying for training saying, "Why can't we train ourselves?" Or, "We'll learn as we go along." This is short-sighted and can be an expensive mistake.

You can't avoid training costs

Good training can be expensive and time-consuming. Without a structured and results-oriented training program, your staff is forced to adopt one of several approaches to survive. First, even though you bought the hardware to provide your staff with greater productivity and creativity, they may avoid using it. Or second, they just may put off tasks or continue for as long as possible to do things the old way. Or third, they may try to get others to do those tasks that require heavy use of the new system. Many times, projects just don't get done.

People who fear technology will avoid the new equipment. This is less the case in broadcasting because technology is so much a part of our business. However, just because you install a new automated master control system, don't *assume* your operators will quickly or willingly embrace it. In some cases, there may be a fear that if the darn thing works, they'll be replaced.

Help me

Another problem with no official training is that some of your staff will rely on their co-workers for help. This may sound harmless, but it can diminish the productivity of your best and brightest staff members.

It often works like this: Those that are having prob-

lems won't look in the manual, assuming there is even one available; they'll just start bugging somebody to help them. The slower learners are, therefore, forced to ask questions and interrupt the concentration of others. This disrupts the work flow of the department and can go on for weeks or even months until the slow learner gains enough skills to survive, or really screws something up.

An equally undesirable, but common, result is that one person quickly masters the technology and becomes the default help desk and trainer. Everyone runs to her for answers. Meanwhile, the work she was supposed to do begins to suffer.

Most of these problems can usually be avoided if a proper training program is put into place when the equipment is first installed! ■

Michael Erbschloe is a management consultant, author and technical editor and teaches management courses at Oklahoma State University.

Where to look and who to send

Training on many editing and creative systems is available at or after the time of purchase. However, it can be expensive. Training may run hundreds of dollars per day or even thousands of dollars per week. Even so, the vendor is usually the first, and best, place to look for help.

Third parties also provide training on the high-end production systems. This includes products from vendors such as Avid, Quantel, Discrete Logic, Abekas and others. Sometimes, these third parties are officially approved by the vendors, even to the point of handling the training for new clients if the vendor's classes are full or too far away for the client.

Because of the expense, there may be a temptation to send only one or two staff members to the training. That may be a mistake. If you are running several hours of newscasts a day, sending one or two people to school hoping they'll train all the others, probably won't work.

Instead, send the supervisor for each shift of your production staff. Or send the lead creative person and one assistant. That way, you'll have at least one properly trained person on each shift. But don't stop there. Try to schedule training for others on the staff within several months after you've had the systems up and running. That way, your operators will understand the basics and can gain even more from the factory training.

Also, training is usually seen as a benefit and recognition. Treat the training as a reward. You may be surprised how hard your staff will work just for the privilege of going back to school.

Now if you could get your kids to think that way about their homework. ■

IKEGAMI/AVID'S DIGITAL DISK CAMERAS...

BE READY FOR ANYTHING.



**NOW
AVAILABLE
FOR DELIVERY.**

Dead footage can be your worst nightmare. You anticipate, record and then discover the shot was missed... too late.

RetroLoop™ solves this dilemma. RetroLoop captures the moments before and the moments after the action begins. Simply set the record mode in continuous loops of 10 to 60 seconds. When the action begins, hit the record trigger and you've got the whole story including the "footage" contained in the loops recorded just prior to pushing the record trigger.

Ikegami's Digital Disk Cameras combine camera know-how with Avid's disk-based recording and non-linear editing software.

No dead footage, you'll get the shot and be ready to air the finished story ahead of the competition. Pictures are recorded digitally on a removable FieldPak™. This revolutionary non-linear recording technique allows instant editing back at your facility, or even in the field with the built-in editing capabilities.

These remarkable tapeless cameras are available in two models. The DNS-11 with FIT CCDs, and the DNS-101 with IT CCDs.

Ikegami's Digital Disk Cameras: Be Ready For Anything. For further information contact an Ikegami Regional Sales Office.



DIGITAL DISK CAMERAS: NEW FRONTIERS AWAIT

Ikegami Electronics (U.S.A.), Inc. 37 Brook Avenue, Maywood, NJ 07607 East Coast: (201) 368-9171
West Coast: (310) 534-0050 Southeast: (954) 735-2203 Southwest: (972) 869-2363 Midwest: (630) 834-9774
RetroLoop and FieldPak are trademarks of Avid Technology, Inc.

Ikegami[®]

Circle (6) on Free Info Card

www.americanradiohistory.com

The next gen

Dual speakers,
built in

LED displays
for time code,
audio levels
and VTR status

12V DC powered



Panasonic

AJ-PT75 BACK PANEL



- Mic and line level inputs
- Video in/out and monitor out
- RS-422 control ports
- Line audio and monitor outputs

100 Event
memory

Carry handle

Headphone jack



DVCPRO

For more information call: 1-800-528-8601 (Upon request enter product code 08)
The DV-1 logo is a registered trademark of Time Warner Entertainment Company, L.P. © 1996

Evolution of video.

Elimination of the lead between two I-lead, making frame-accurate editing at the source.

High quality TFT LCD monitors



DVCPRO 63-min. cassette, DVCPRO 2-hr. cassette Mini DV Cassette in adapter

Tilt down monitor bridge

2 Independent DVCPRO recorders

Auto or manual punch in/out editing

Audio out level controls

"TBC" controls with system timing



AJ-L175 DVCPRO laptop editor

25 lbs, battery powered, frame accurate, DV compatible, Digital editing. Here. Now.

Panasonic
Broadcast & Television Systems Company

MPEG-2: A closer look

The primary application of interest for the MPEG-2 standard is true TV broadcast resolution, as specified by CCIR-601. This is roughly four times as much picture information as the MPEG-1 standard provides. MPEG-2 is a superset of MPEG-1. As such, MPEG-2 decoders should also decode MPEG-1 datastreams. MPEG-2 adds to the MPEG-1 toolbox with provisions

for dealing with interlace, graceful degradation and hierarchical coding.

Although MPEG-1 and MPEG-2 were each specified with a range of applications and resolutions, the committee's specifications form a set of techniques that support multiple coding options. Variations exist with regard to picture size and bit rates. Although MPEG-1 can run at high bit rates and at full CCIR-601 resolution, it processes

frames, not fields, limiting the attainable quality, even at data rates approaching 5Mb/s.

Keep in mind that the MPEG specifications apply only to decoding. The ramifications of this approach are:

- Owners of existing decoding software can benefit from future breakthroughs in encoding processing. Furthermore, suppliers of encoding equipment can differentiate their products by encoding quality, cost and features.
- Different schemes can be used in different situations.

MPEG-2 layer structure

To allow for a simple yet upgradable system, MPEG-2 defines only the functional elements — syntax and semantics — of coded streams. Using the same system of I-, P- and B-frames developed for MPEG-1, MPEG-2 employs a six-layer hierarchical structure that breaks the data into simplified units of information. (See Table 1.)

The sequence layer defines the decoder constraints by specifying the context of the video sequence. Its data header contains information on picture format and application-specific details. The second level allows for random access to the decoding process by having a periodic series of pictures; it's this group of pictures (GOP) layer that provides the bidirectional frame prediction. Intracoded (I) frames are the entry point frames, requiring no data from other frames for reconstruction. Between the I-frames lie the predictive (P) frames, which are derived from analyzing previous frames and performing motion estimation. These P frames require about one-third as many bits per frame

as an I-frame. Finally, B-frames, which lie between frames or P-frames, are bidirectionally encoded using of past and future frames. The B-frames require about one-ninth of the data per frame as the I-

Different compression ratios for the frames at different data rates, such that buffers are required at encoder output and the decoder input to ensure that a sustained data rate is constant. Unlike MPEG-1, MPEG-2 allows for a variety of data buffer sizes to accommodate different picture dimensions and to prevent buffer under- and overflows.

The data required to decode a single picture is embedded in the picture layer, which is comprised of horizontal slice layers, each containing several macroblocks. Each macroblock layer is made up of individual blocks. The picture undergoes DCT processing, with the slice layer providing synchronization, holding the precise position of the slice within the image frame.

MPEG-2 places the motion vectors into the coded macroblocks for P- and B-frames; these are used to improve the reconstruction of predicted pictures. MPEG-2 supports field and frame-based prediction, thus accommodating interlaced signals.

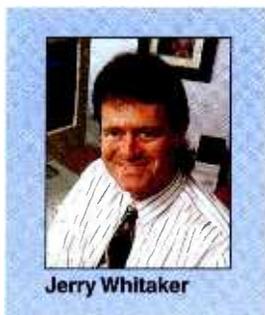
The last layer of MPEG-2's video structure is the block layer, which provides the DCT coefficients of either the transformed image information for I-frames or the residual prediction error of B- and P-frames.

Spatial and SNR scalability

Because MPEG-2 was designed for handling different picture sizes and resolutions, including standard definition television (SDTV), as well as HDTV, provisions were made for a hierarchical split of the picture information into a base layer and two enhancement layers. In this way, SDTV decoders would not be burdened with the cost of decoding an HDTV signal.

An encoder for this scenario could work as follows. The HDTV signal is used as the starting point. It is spatially filtered and subsampled to create a standard resolution image, which is then MPEG encoded. The higher-definition information could be included in an enhancement layer.

Another use of a hierarchical split would be to provide different picture quality without changing the spatial resolution. An encoder quantizer block could realize coarse and fine filtering levels. Better error correction could be provided for the more coarse data, so that as signal strength weakened, a step-by-step



Jerry Whitaker

reduction in the picture signal-to-noise ratio would occur in a way similar to that experienced in broadcast analog signals today. Therefore, with poorer reception, the viewer would experience a more graceful degradation in picture quality instead of a sudden dropout.

SYNTAX LAYER	FUNCTIONALITY
Sequence	Context unit
Group of pictures	Random access unit: video coding
Picture	Primary coding unit
Slice	Resynchronization unit
Macroblock	Motion compensation unit
Block	DCT unit

Table 1. Layers of the MPEG-2 video bitstream syntax.

Profiles and levels

Six profiles and four levels describe the organization of the MPEG-2 standard. A profile is a subset of the MPEG-2 bitstream syntax with restrictions on the parts of the algorithm used. Profiles are analogous to features, describing the available characteristics. A level constrains general parameters, such as image size, data rate and decoder buffer size. Levels describe the upper bounds for a given feature and are analogous to performance specifications.

The most popular element of the MPEG-2 standard is the Main Profile in conjunction with the Main Level, which gives an image size of 720x576, a data rate of 15Mb/s and a frame rate of 30fp/s. All higher profiles are capable of decoding Main Profile@Main Level streams.

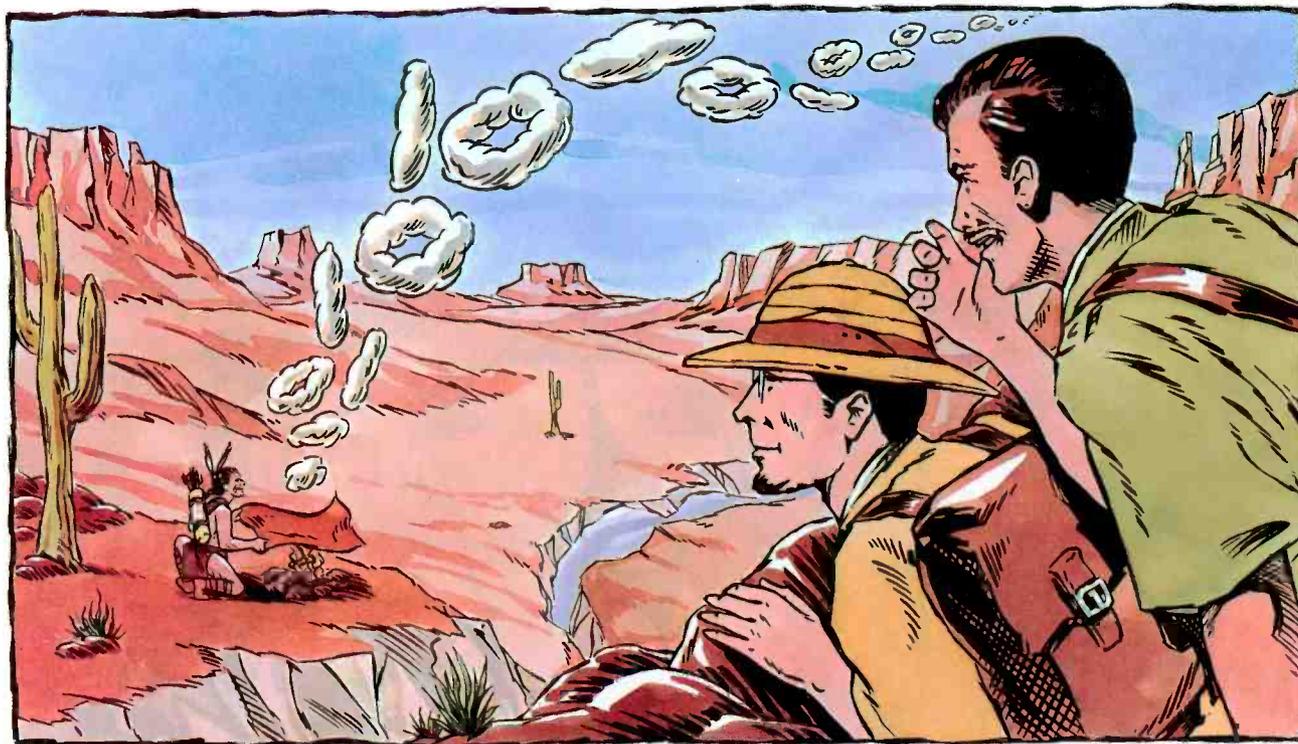
Table 2 lists the overall MPEG-2 classifications. With regard to the table, these generalizations can be made:

- The three key flavors of MPEG-2 are Main Profile/Low Level (SIF), Main Profile/Main Level (Main) and Studio Profile/Main Level (Studio).

- The SIF Main Profile/Low Level offers the best picture quality for bit rates below about 5Mb/s. This provides acceptable quality for interactive and multimedia applications. The SIF profile is replacing MPEG-1 in some applications.
- The Main Profile/Main Level grade offers the best picture quality at rates from about 5Mb/s to 15Mb/s.
- The Studio Profile offers high quality for multiple-generation applications.
- The High Profile targets HDTV applications.

The Studio Profile

MPEG-2 is capable of coding interlaced source video at full bandwidth while reducing storage and bandwidth costs. However, the MPEG-2 Main Profile/Main Level remains a less-than-ideal choice for production because individual frames are hard to access due to the larger group of pictures structure. For this reason, the



“LOOK WILCOX, THE DIGITAL COMMUNICATIONS TREND IS CATCHING ON EVERYWHERE,” WHISPERED SNELL.

transition to digital

4:2:2 Studio Profile was developed. The Studio Profile expands upon the 4:2:0 sampling scheme of MPEG-1 and MPEG-2. In essence, "standard MPEG" samples the full luminance signal, but ignores half of the chrominance information, specifically the color coordinate on one axis of the color grid. Studio Profile MPEG increases the chrominance sampling to 4:2:2, thereby accounting for both axes on the color grid by sampling every other element. This provides better replication of the original signal.

The Studio Profile is intended for editing applications, where multiple iterations of a video signal are required or where the signal will be compressed, decompressed, and recompressed several times before it is finally transmitted. ■

Jerry Whitaker is a consulting editor for Broadcast Engineering magazine.

PROFILE	GENERAL SPECIFICATIONS	PARAMETER	LEVEL			
			LOW	MAIN (CCIR 601)	HIGH 1440 (HDTV, 4:3)	HIGH (HDTV, 16:9)
SIMPLE	PICTURES: I, P CHROMA: 4:2:0	IMAGE SIZE ¹ IMAGE FREQUENCY ² BIT-RATE ³		720x576 30 15		
MAIN	PICTURES: I, P, B CHROMA: 4:2:0	IMAGE SIZE IMAGE FREQUENCY BIT-RATE	325x288 30 4	720x576 30 15	1440x1152 60 100	1920x1152 60 80
SNR-SCALABLE	PICTURES: I, P, B CHROMA: 4:2:0	IMAGE SIZE IMAGE FREQUENCY BIT-RATE	325x288 30 3, 4 ⁴	720x576 30 15		
SPATIALLY-SCALABLE	PICTURES: I, P, B CHROMA: 4:2:0 ENHANCEMENT LAYER ⁵	IMAGE SIZE IMAGE FREQUENCY BIT-RATE IMAGE SIZE IMAGE FREQUENCY BIT-RATE			720x576 30 15 1440x1152 60 40, 60 ⁶	
HIGH ⁷	PICTURES: I, P, B CHROMA: 4:2:2	IMAGE SIZE IMAGE FREQUENCY BIT-RATE		720x576 30 20	1440x1152 60 80	1920x1152 60 100
STUDIO	PICTURES: I, P, B CHROMA: 4:2:2	IMAGE SIZE IMAGE FREQUENCY BIT-RATE		720x608 30 50		

NOTES:

1 IMAGE SIZE SPECIFIED AS SAMPLES/LINE x LINES/FRAME

2 IMAGE FREQUENCY IN FRAMES/s

3 BIT RATE IN Mb/s

4 FOR ENHANCEMENT LAYER 1

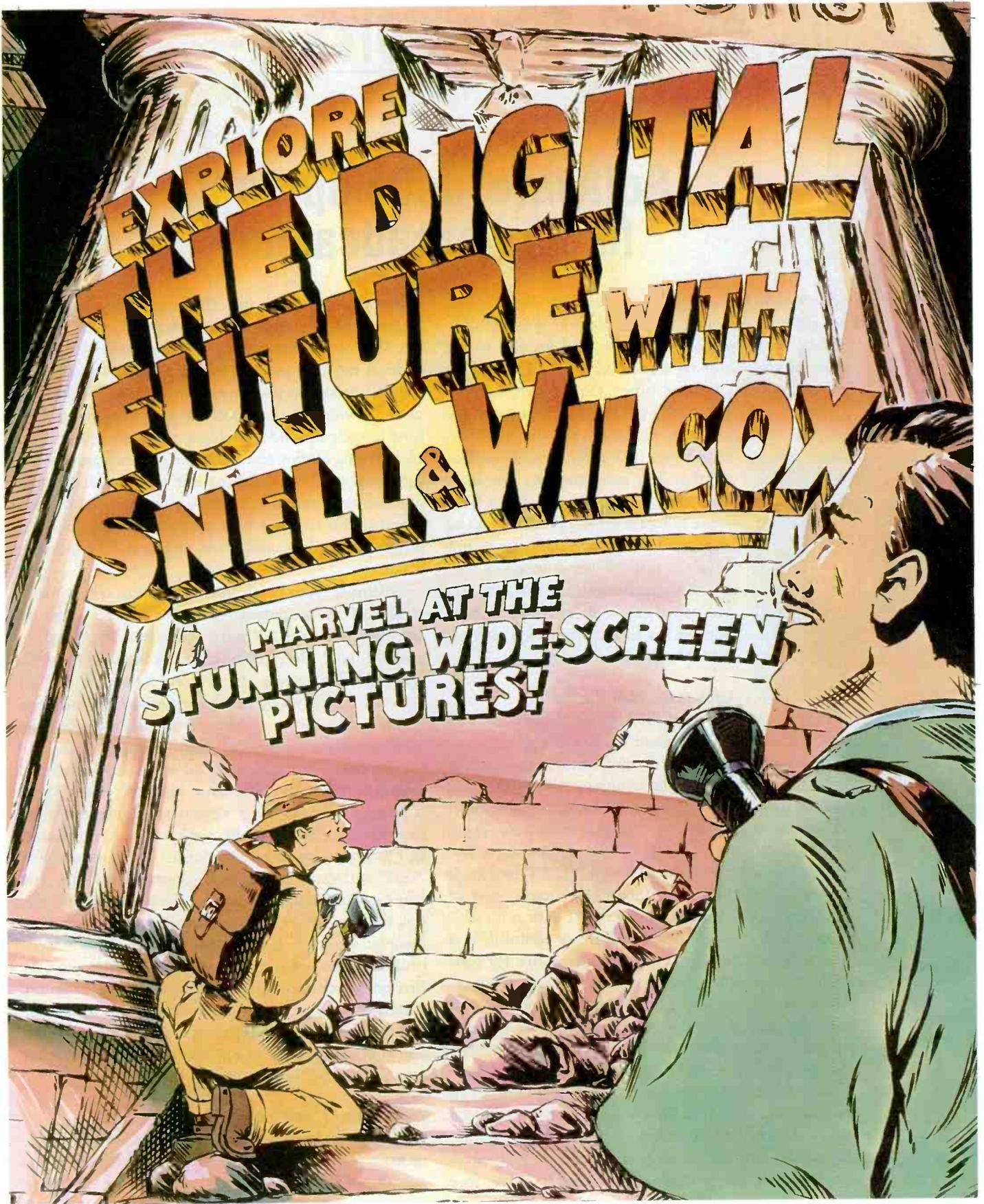
5 FOR ENHANCEMENT LAYER 1, EXCEPT AS NOTED BY ⁶ FOR ENHANCEMENT LAYER 2

7 FOR SIMPLICITY, ENHANCEMENT LAYERS NOT SPECIFIED INDIVIDUALLY

Table 2. The MPEG profiles and levels in simplified form.



“CLEARLY THE RESULT OF AN EARLY EXPERIMENT IN COMPRESSION...” MUSED WILCOX.



EXPLORE THE DIGITAL FUTURE WITH SNELL & WILCOX

MARVEL AT THE
STUNNING WIDE-SCREEN
PICTURES!

☪ SNELL & WILCOX ☉

Engineering with Vision

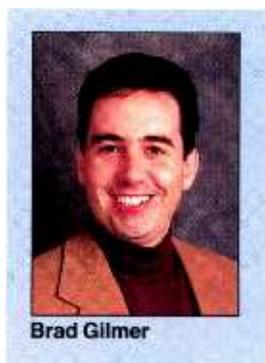
Circle (7) on Free Info Card

www.americanradiohistory.com

Software development for the broadcaster

Software projects start off many different ways. Perhaps you have taken a class at a community college, come back to the station, and decided to put some of your skills to work. Or, maybe you have a group of folks in your office that knows how to program — the boss walks in with a task, and you are on your way. You also might have an information

technology (IT) group in your company that has programming resources available to you. Or, you might have some software project that needs to be done, and you realize that you do not have the skills in-house to do it. You hire a company to write the software for you. Let's look at each of these approaches to identify which alternative may be best for you.



Brad Gilmer

Look ma, I built it myself

Many software projects are handled this way. You or someone in your department is a computer hobbyist. They see an opportunity to put something together, make things better for the company and they get to exercise their programming skills all at the same time.

There is nothing wrong with this approach. These days, a little Visual Basic or C++ programming is like a screwdriver or some other tool in the TV facility. It allows you to build or maintain some useful part of your equipment. Advantages of the "I built it myself" approach to software development are plentiful. It is almost always the least-expensive alternative for software development. It makes for fast "idea-to-product" time if you do not bite off more than you can chew. It gives the person who writes the program a sense of accomplishment and ownership. In addition, it allows you to develop small projects economically. These projects might never be tackled if they had to go to an outside vendor. Generally, it gives a close fit between the need and what the product will do. This is because the person who develops the product is intimately familiar with the problem he is trying to solve. (See Figure 1.)

Of course, the "I built it myself" approach does have some disadvantages, too. Imagine having to tell your manager, "There is only one person on the planet that knows about this software, and he quit three years ago." This frequently happens when you develop soft-

ware in-house. But it can also happen if you have a system developed by an outside vendor. Typically, there is a lack of documentation with internally developed code. It requires an iron will and excellent self-discipline to document your own code properly. In the heat of battle, when you have just had a brilliant insight into how to code around a problem, it's really tough to sit there typing all this text in quotes so someone else can figure out what you did. Frequently, the problem is that you can be a little too clever for your own good. In six months, you will not have a clue what this brilliant scrap of code does, and it will take you days to figure it out.

Sometimes, people fall into the trap of trying to fix structural or procedural problems with a piece of software. We have all heard the saying, "garbage in, garbage out." No piece of code, no matter how well-written, will take care of a problem if the real solution is to change the way you are currently doing business. It can be difficult to see this if you are developing the code to solve a problem in your own back yard.

A common problem with an internally developed code is biting off more than you can chew. Many "I did it myself" projects die a slow whimpering death because the code writer got in over his head. Unfortunately, I am speaking from experience. If this is your first "real" software project, pick something you are sure you can do. Getting through the first project will give you the confidence and experience you need for more complex projects. If all you have ever done is write programs that you use yourself, you will be amazed the first time someone else sits down to use your program.

Even though there are some challenges to writing your own code, I encourage you to give it a shot. It gives you confidence, plus the experience needed to manage others who may write code for you in the future.

We're from IT, and we're here to help you

Using programming resources within an IT department in your own company can be challenging. If you are fortunate enough to be in a company that has an internal computer software development department, and if you have a customer/client relationship with them, this can be a real advantage.

However, there are definitely some things you can do to make things go more smoothly. First, be sure you are clear about what you want to accomplish. This will

Finally The
Routing System
That Takes You
To Tomorrow



The **UTAH-300 Routing Switcher** with the new **SC-3 Routing Control System** will make your facility soar, now and well into the 21st century. The UTAH-300/SC-3 system easily meets the challenges of post production, broadcasting and even telecom applications, with the most powerful feature set on record.

The **SC-3 Advanced Control System** maintains compatibility with all previous Utah routers, and can even control new and older routers from other manufacturers. It features Ethernet and open control protocols, and works with PAL and NTSC. Choose from a variety of panels as well as easy-to-use Windows programming screens. You also get remote control capability through RS-232 and RS-422 ports.

The **UTAH-300 Routing Switcher** is small enough for mobile truck applications, yet powerful enough for even the largest satellite uplink facilities. A 128x128 video system (analog and/or digital) uses just 12 rackunits of space. It's also designed to expand: start as small as 32x32 and build to 512x512. Don't forget, you can change from analog to digital by simply swapping boards. The UTAH-300 is the one system that easily handles all your format needs in the analog and digital worlds, video and audio. There are even power supply options for all applications, including a -48 V DC supply option.

All Utah Scientific routers come with reliability you can depend on. They're backed with an extended warranty and round-the-clock support.

Call Utah Scientific now for your free Technical Planning Guide.
1-800-453-8782



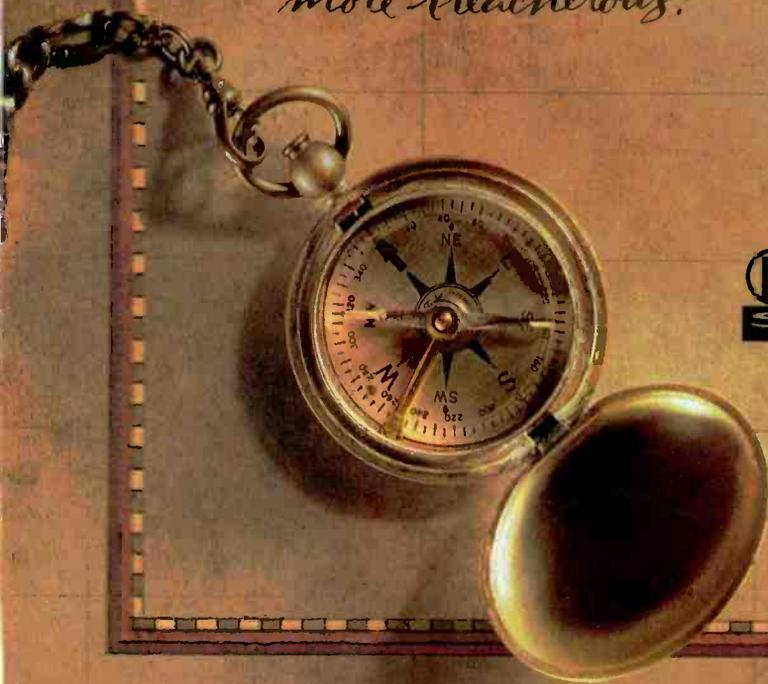
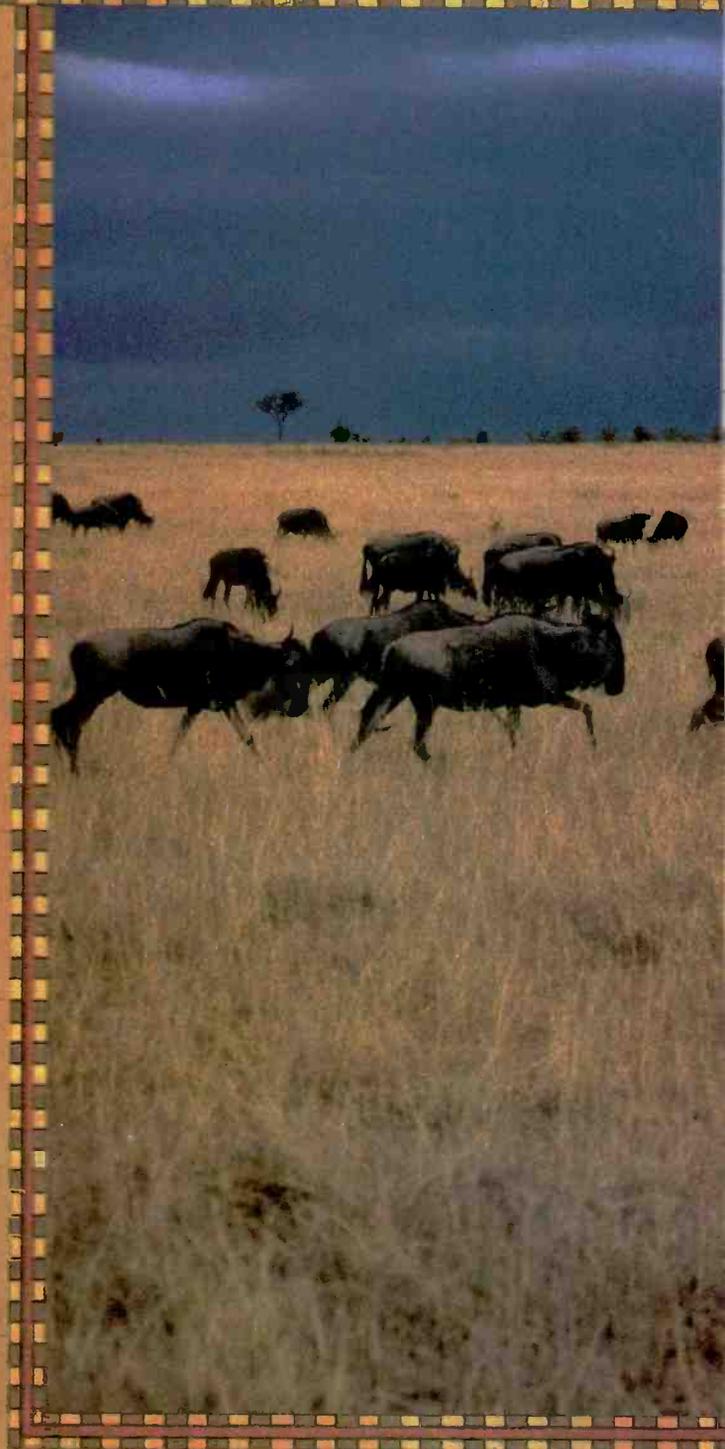
UTAH SCIENTIFIC

Americas 1-801-575-8801 • Europe / Africa / Middle East 44 1635-521939
Asia / Pacific 852-2863-1993 • info@utsci.com • http://www.utsci.com
© 1997 Utah Scientific, Inc.

Circle (15) on Free Info Card

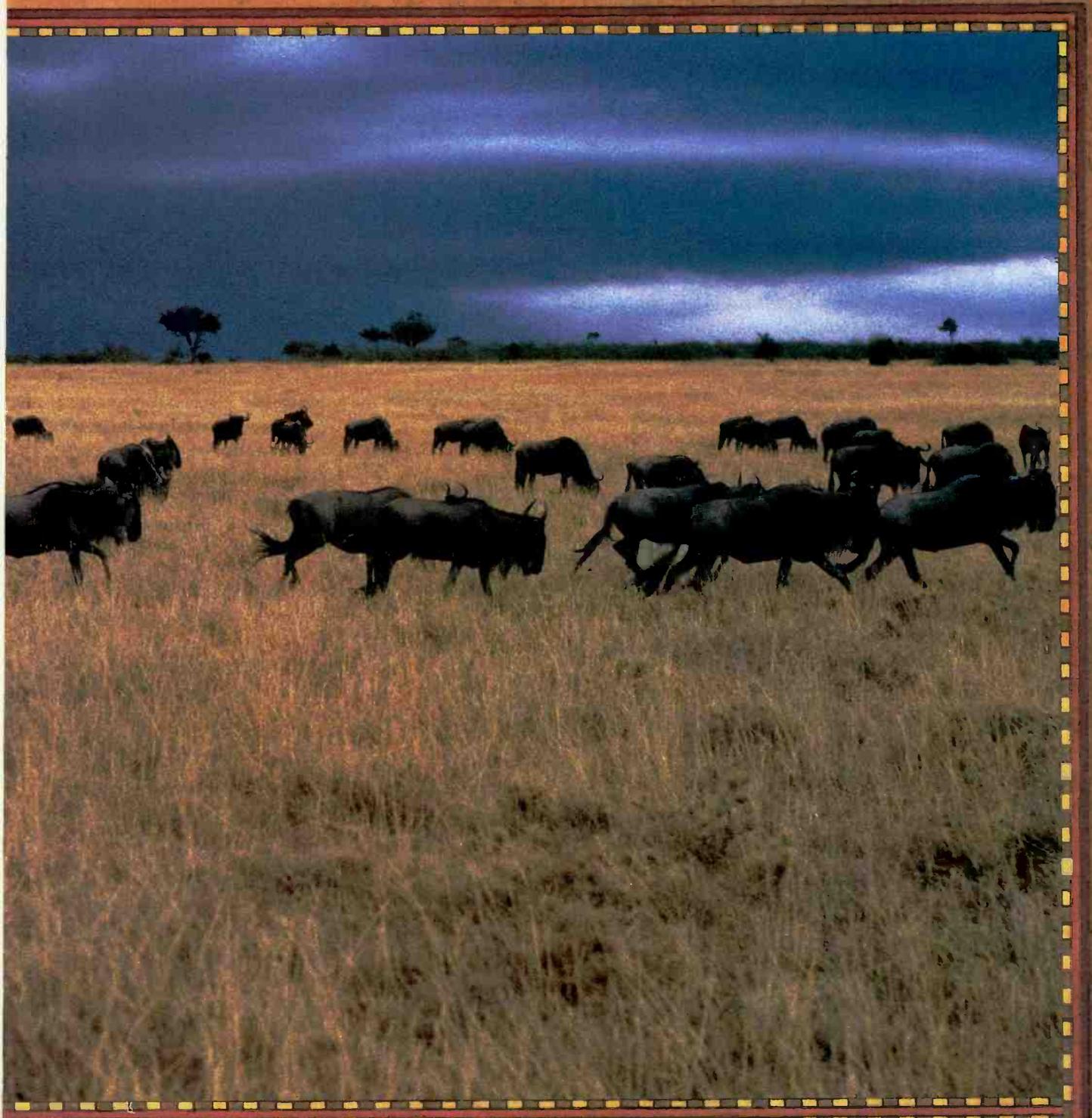
*Braving extreme
conditions and
ravenous packs of
wild hyenas, the
African Wildebeest
endures the second
most difficult migration
known to man.*

*The broadcaster's
journey to digital
being slightly
more treacherous.*



**FLEX
SYS**

The trek toward disk-based broadcast transmission is on. And Sony is beside you every step of the way with the new FlexSys™ transmission control system. By integrating tape and disk storage, the FlexSys system provides the flexible and cost-effective migration path you've



been looking for. The FlexSys system combines high quality MPEG-2 4:2:2 P @ ML compression and RAID disk storage with Sony's leading VTR and Flexicart® technology. And the familiar user interface ensures your transition will be as painless as possible. To find out what FlexSys system configuration is best for your transmission needs, just call 1-800-635-SONY, ext. FLEXSYS. We'll put you on the one path to digital transmission that leads to success.



SONY

help you relate the information to your IT group, thus avoiding misunderstandings down the road. Second, talk to others in your company who have used your IT department for development and see if they have any recommendations on making the relationship work. Third, take the time to educate your IT folks about what you and your department do on a daily basis. The suitability of your final product to

task is to some degree determined by how well the programmer understands what you are doing on a daily basis. Finally, you should be clear up front about shared decision making on the project; compare agendas. The IT group may be trying to maintain particular hardware platforms across departments. They may be trying to best fit

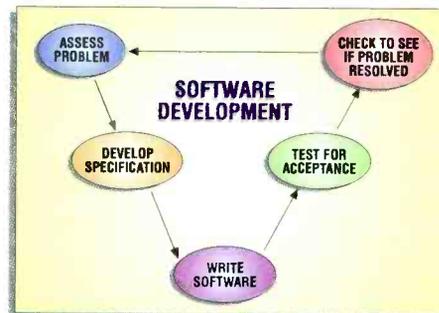


Figure 1. Steps broadcasters should take when developing software.

their knowledge base to your problem (Visual Basic programmers to a solution that it best resolved with a C++ programmer), and so on. On the other hand, these differences in agendas can lead to problems for your application and your company. Be aware of these differences in agendas.

Other alternatives

You might want to consider taking small- to medium-sized projects to a small software house or individual developer. This can be a good alternative when you do not have the resources internally to develop what you need.

Here are some general suggestions that apply to all software development. First, use a prototype, especially if someone other than yourself will be using the program. Second, try to do as much work on the specs up front as you can. The better your specification process is, the clearer you will be on what you are asking for. This has another benefit — you will know that your program (or one written by someone else) meets your needs. In even smaller systems, tight specifications up front help you achieve your results. Finally, for real-time broadcast applications, I prefer to write in COBOL using the IBM 360 operating platform. The flexibility of COBOL, combined with the easy modification of punch cards, makes the 360 ideal for this application (you did notice that this is the April issue, didn't you?). See you next month. ■

Brad Gilmer is director of advanced network operations & technology for Turner Entertainment Networks.



Digital Traffic Jam?

Miranda Will Get You Moving

Avoid "traffic jams" on the road to the Digital Frontier with Miranda's comprehensive line of integrated product solutions... like the *imaging* family — modular, high-quality Audio and 4:2:2 Video converters, encoders and decoders with optional remote control software — all designed for seamlessness and a peak performance to keep you in the fast lane!

At an intersection between the video and workstation worlds? Consider Miranda's family of cross-platform Digital Video Gateways supporting the entire range of digital imaging formats.

Whatever business you're driving, count on Miranda to get the wheels in motion.

Some of our digital solutions include:

- 4:2:2/NTSC/PAL Composite Encoders/Decoders
- Serializers/Deserializers
- FrameSyncs, Ancillary Data Processors
- Line Quadruplers
- 4:2:2/CAV D/As and A/Ds
- 4:2:2/4fsc Converters
- Digital Disk Recorders
- Computer Gateways

Miranda Technologies Inc.

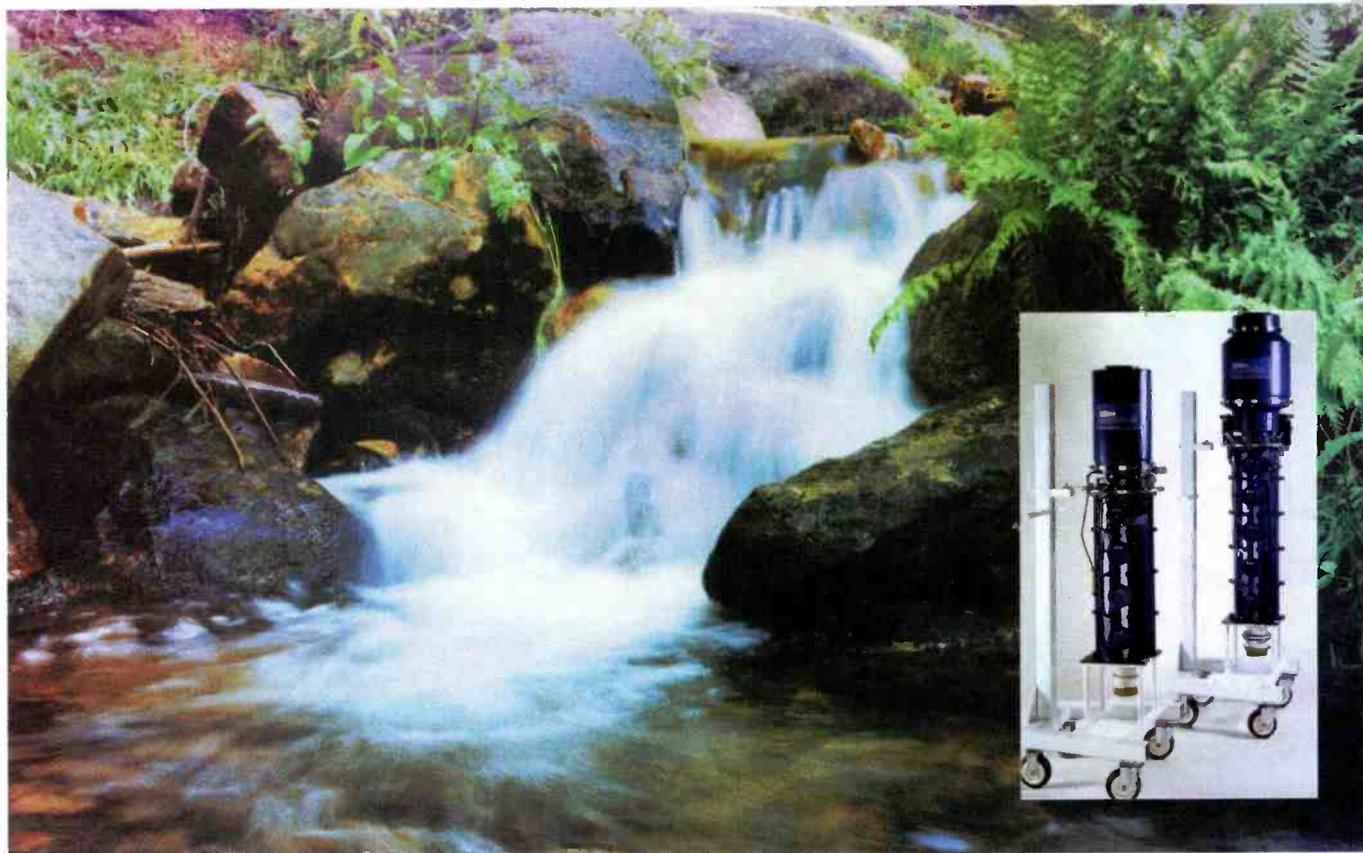
2323 Halpern
St-Laurent, Quebec
Canada H4S 1S3

Phone: 514.333.1772
Fax: 514.333.9828



Solutions For The Digital Frontier And Beyond

Circle (16) on Free Info Card



MAKING A SPLASH IN UHF BROADCAST

Introducing UHF-TV Klystrons From Litton

Litton Electron Devices, Williamsport, PA, a leader in the manufacture and repair of vacuum tubes, is now rebuilding and repairing tubes for the UHF-TV Broadcast Industry.

Litton has been designing and producing high performance, cost effective microwave power devices for over 40 years. Magnetrons, cross-field amplifiers, klystrons, traveling wave tubes and thyratrons are all designed to meet strict military and commercial specifications. This background provides Litton with the expertise and technical capabilities to rebuild and repair UHF-TV klystrons.

LITTON ELECTRON DEVICES
1035 Westminster Drive / Williamsport, PA 17701

Litton

Electron Devices

Consider the following list of capabilities:

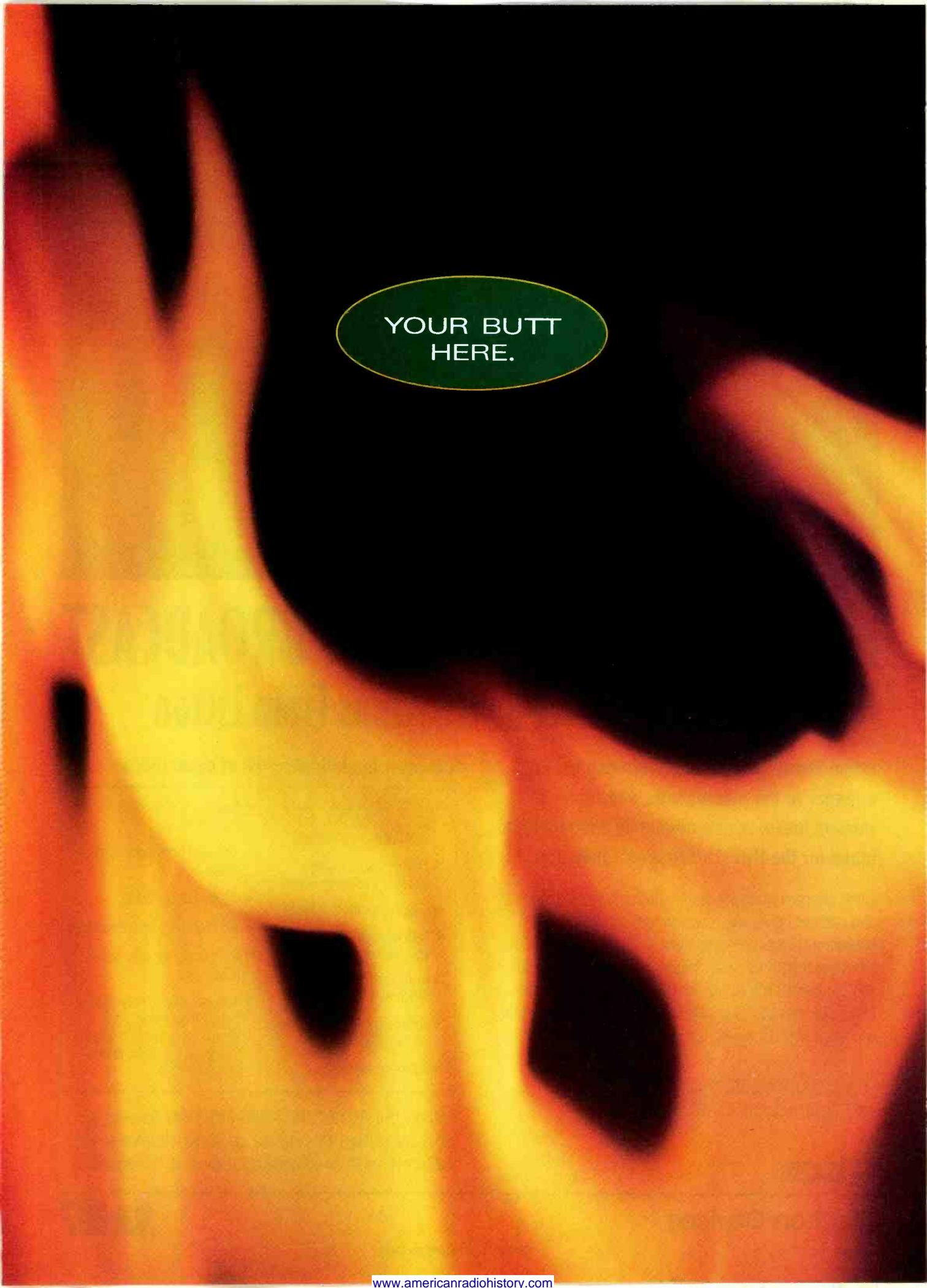
- Complete rebuild or repair of Series 89X, 95X, and 755X UHF-TV Klystrons
- Prompt inspection and return of Evaluation Report
- Quick turnaround of repairs
- Rebuild/repair to specification standards
- ACE gun provided on all rebuilds
- Tubes fully tested to assure performance
- New tube warranty
- Tuned to specific channel frequency
- Shipment from stock in many cases
- Cash/credit for DUDS
- Technical back-up and service
- 800 number for easy access to service
- Also prepared to provide the L-4945A deuterium filled, double gap ceramic crowbar thyratron (equivalent to the EEV CX-2708)

Call our UHF-TV HOTLINE at **800-861-1UHF** for pricing, stock availability, DUD purchase, questions, technical service, data sheets and tube information. Or fax us at 717-326-5816.

Circle (17) on Free Info Card

www.americanradiohistory.com

NAB 897

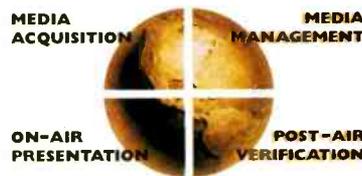


YOUR BUTT
HERE.

GOOD NEWS TO THOSE WARMING UP TO THE INEVITABILITY OF BROADCAST AUTOMATION

Systems, strategies and sweating bullets. Let's face it, keeping your cool in the fiery transition to video servers and broadcast automation takes more than just a seat-of-your-pants approach. It takes the people, products, vision and experience of Louth Automation.

From satellite control through traffic integration, our proven track record makes Louth the worldwide leader in broadcast automation systems.



Our growing client list is a who's who of leading-edge broadcasters. Since 1988, Louth has set the benchmark for scalable station automation. So, whether you're moving from tape to disk, or facing a mega multi-channel expansion, it's no wonder why hundreds of successful broadcasters partner with Louth to get them on the air. And keep them on the air.

Feeling the heat? We'd be happy to help you take the next step. No matter where you're at in the process of transitioning your station to a new era of automation, we can help. With people. With experience. With solutions. Call us today at **415/843-3665** for more information or a demonstration of our flagship ADC-100 and the new entry-level ADC-50 System. Broadcast automation from Louth. It's the best answer to keeping your cool.



Circle (18) on Free Info Card

Digital audio dynamics

In the days of analog audio, recording media always dictated the limiting factors of dynamic range. Even with noise reduction, an analog tape recorder's dynamic range was much narrower than a good analog console's.

This is no longer the case in digital audio recording. Today's DAT, CD-R, digital audio on videotape or computer-based systems almost always meet or exceed the dynamic range of the audio electronics associated with them. This affects the way in which interfacing between such audio devices should be handled.

Defining dynamic range

Although misunderstood, there is standard terminology for defining an audio system's dynamic range. (See Figure 1.) The limiting factors of any audio system's dynamics are *distortion* as a maximum and *noise* as a minimum. The difference, in dB, between these two points is the dynamic range of the system.

To navigate between these extremes, a middle-ground target is established, called the *reference level* or *design center*. This defines a signal amplitude point that is far enough below the system's maximum level to have minimal risk of distortion, while being above the system's noise "floor" to sound quiet. Operators are then trained to steer the variable levels of program audio they work with toward this central zone around the reference level.

Those two areas above and below the reference level also have standard names: From the reference up to the distortion point is called *headroom*, and from the reference down to the noise floor is the *signal-to-noise ratio* (S/N). Each is quoted in dB, and summed together their values equal the dynamic range of the system.

Storage vs. signal path

Analog storage devices have a much smaller dynamic range than signal paths. For example, a good analog tape

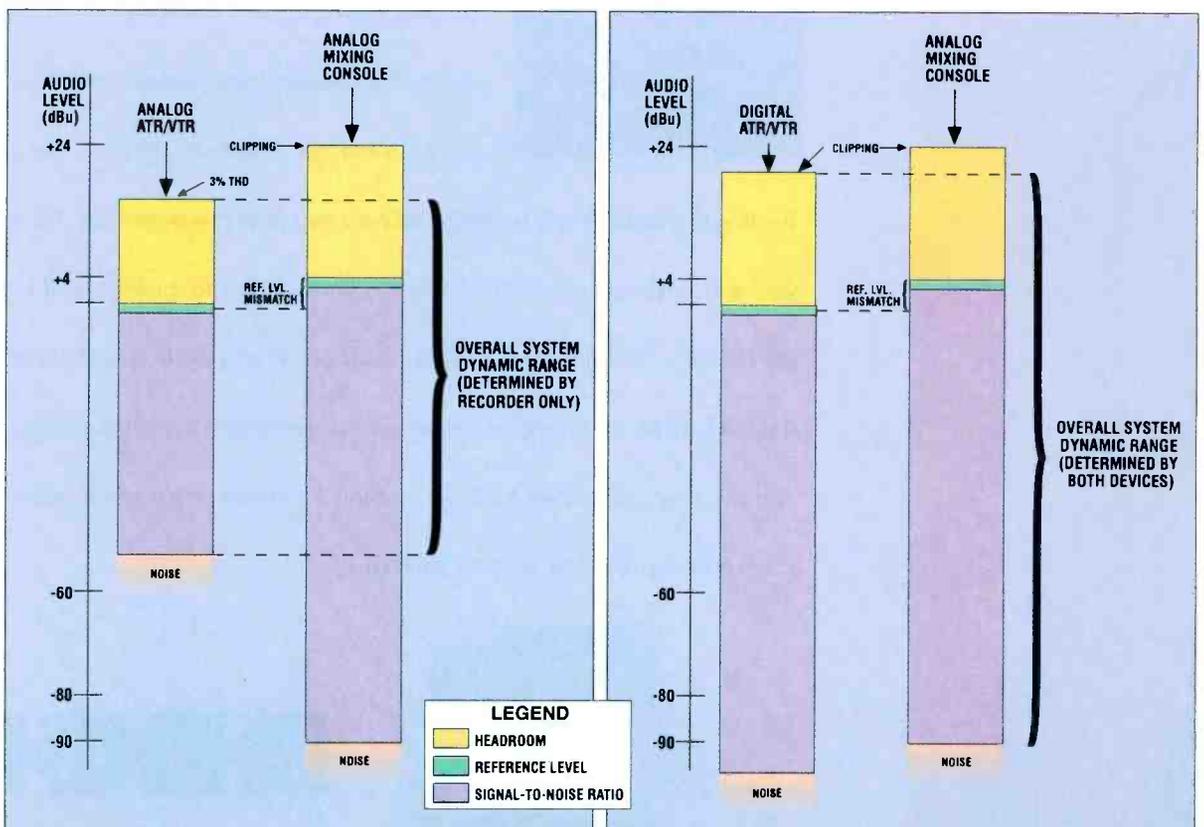


Figure 1. Comparison of dynamic range in analog and digital/analog hybrid systems. Note that a mismatch in reference level alignment between recorder and mixer is of little consequence in the pure analog world (at left), but the same mismatch has the effect of reducing system dynamic range in the hybrid environment (at right).

GET OFF IT.

INTRODUCING THE LOUTH ADC-50. A GREAT REASON TO ENTER A WORLD OF BROADCAST AUTOMATION IN ONE AFFORDABLE LEAP.

From cache-based spot insertion to totally tapeless solutions, the new Louth ADC-50 is the perfect solution for budget-conscious broadcasters who are looking for the dramatic efficiency and performance of a broadcast automation system. Based on our flagship ADC-100 – the world's leading Automation Software – the ADC-50 is your low-cost, high-performance, built-to-grow solution. The ADC-50 can be used with a wide range of cart machines for caching to video disk systems, or use it with stand-alone servers for a totally tapeless solution. With the ADC-50 you get the performance you need today with the power and flexibility to support your long-term strategy.



LOUTH ADC-50 THE AFFORDABLE AUTOMATION SOLUTION

- *Reliable, proven design keeps you on air 24 hours a day.*
- *Widest range of video disk VTR, and cart devices gives you maximum system flexibility.*
- *Supports up to 4 on-air channels to allow future expansion to multi-channel broadcasting.*
- *Windows playback interface is easy for new and experienced users alike.*
- *Extensible to full ADC-100 master control automation with full investment protection.*

Powerful media preparation software and a Windows-based master control system make the ADC-50 powerful, intuitive, and easy to use. Think of it. Frame accurate control, proven reliability, multi-channel broadcast potential, and an on-air look that's absolutely impeccable. Just what you'd expect from Louth.

After all, we're the leader in broadcast automation with hundreds of satisfied broadcasters worldwide. Through our products, our people, and our experience, you'll have the best engineered solution for your station. For a demo, a quote, or more information on the ADC-50, call 415/843-3665 today. Powerful Louth automation at an affordable price. It's an opportunity worth jumping on.

CALL 1-415-843-3665 FOR MORE INFORMATION

© Copyright Louth Automation 1997. All rights reserved.

Circle (8) on Free Info Card

L O U T H
A U T O M A T I O N

recorder might provide some 55dB or 60dB dynamic range, while a decent mixer or routing system can offer 90dB or more. This means that the storage device will always define the limits of the analog system's overall dynamic range.

As long as the tape recorder's limits fell within those of the much wider signal path's, the dynamic range of a system was considered "in alignment" (as in Figure 1).

Small to moderate mismatches of reference levels between recorders and mixers had no real effect on overall system dynamic range.

With digital audio storage systems, all this has changed. Now, digital storage and analog signal-path dynamic ranges are roughly equivalent. This means that if the dynamic ranges of digital recorders are not precisely aligned to the analog signal paths they interface with, overall

system dynamic range will suffer.

Maximizing system dynamic range

How a system's dynamic range is divided into its two components — headroom and S/N — is up to the system designer. There is always some flexibility for where the reference level is placed. Headroom can always be traded for S/N or vice versa.

When designing such an interface, the analog reference level can no longer be cited simply in relative terms (e.g., "20dB below clipping"), but in *absolute* terms (e.g., "+4dBu," equivalent to 1.23v). Proper system design evaluates each device's clipping point and aligns them to get the maximum dynamic range from the system. This may require some attenuation or amplification between one device's output and the following device's input, to ensure that design centers of all variable-gain stages are also well aligned. Ideally, when all devices in a system are properly interfaced and operating at unity gain, they will all clip simultaneously when signal level exceeds a given value.

Incidentally, clipping is used as the level-alignment reference in these interfaces rather than noise, because noise levels are often less critically defined, and system noise is an additive function, dependent on the current number of active inputs. Clipping, on the other hand, is a singular and well-defined level that remains constant regardless of a system's operational status.

These dynamic range problems are largely eliminated in *fully* digital systems, where standard AES/EBU interfacing between devices inherently guarantees proper level alignments throughout. A host of *other* interface issues do arise in such systems (primarily in the timing domain), but we'll leave those for another day.

Meanwhile, without an understanding and alignment of dynamic range in hybrid digital/analog audio systems, the best equipment items will underperform as an ensemble. Maximize the value of your audio investments by examining this level interface carefully. ■

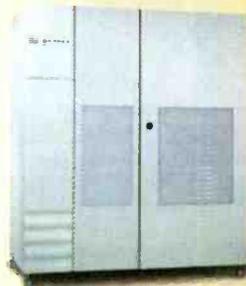
MGE: providing power protection to television and earth stations worldwide.

You get the picture.

Where there's power, chances are there's MGE. We make the products that keep you online, on the air, or just plain "on" all the time. With power protection against surges and outages for everything from television stations to super computers to your desktop PC.

Shown here, from MGE, the EPS6000 provides uninterruptible power and maximizes both UPS efficiency and output power quality to the highest possible levels under all load conditions. With a kVA rating of 150-4500.

MGE also provides 24 hour, seven days a week teleservice and UPS monitoring. So for all your power protection needs, you can count on MGE. After all, power runs in our family.



MGE
UPS SYSTEMS

Nothing will stop you now™

Tel 800-344-0570
(714) 557-1636
Fax (714) 557-9788
www.mgeups.com
info@mgeups.com

©1997 MGE UPS SYSTEMS

Video 18 Plus. Video 20 Plus.

A meeting of the
cleverest heads ...



... to cover every angle.

Whatever your point of view, showing people it can be done without friction or tension is in your daily work. And it is the strength of the famous Sachtler fluid heads

Video 18 Plus and Video 20 Plus:

As they are the best heads around you can, of course, control how much you want to drag things out. With Video 18 Plus and Video 20 Plus you do that in **seven easy steps** giving you the best and sharpest shots from any angle. And that means coping with the

unexpected – like turning the world upside down, taking on **heavyweight cameras!** In fact it takes clever heads of the Video 18 Plus and Video 20 Plus to give you the **right smooth setting.**

You want to go one better?

Go sensitive! Our sensor versions **Video 18 Sensor** and the even stronger **Video 20 Sensor** measure the settings electronically – so you get true sensitivity.

Sachtler. Heads the way.
Smooth drag for tough shots.

Sachtler AG, Germany,
Gutenbergstr. 5, 85716 Unterschleissheim,
Tel.: (0 89) 32 15 82 00. Fax: (0 89) 32 15 82 27

U.S.A.: sachtler® corporation of America,
New York office:
55, North Main Street, Freeport N.Y. 11520,
Phone: (5 16) 8 67-49 30, Fax: (5 15) 6 23-68 44

アマミック サハトラー株式会社
Japan Amic Sachtler Corp.
東京都世田谷区三軒茶屋
1-2-21 〒154
電話 (03) 3413-1212
Fax: (03) 3413-0868



sachtler
Support & Lighting

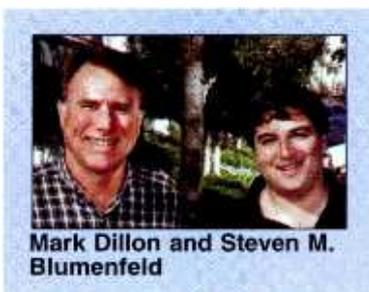
Circle (10) on Free Info Card

www.americanradiohistory.com

Bigger data pipes: Cost and risks

Video-on-demand has not become the killer interactive TV application, nor has fiber optics become the essential transport layer. The killer app is the Internet itself and existing phone and data networks are the transport layer. Though success has begun to clog these skinny copper pipes because the applications that run over them use more and more large audio and

video files, there is increasingly less reason to believe that fiber optics and coax are the solution to this congestion. To the contrary, there is more and more reason to believe that the existing twisted pair copper plant has lots of head room to accept high-speed data rates.



Last month, we looked at some of the ways to get high-speed Internet access — cable modems, ISDN and ADSL. This month, we'll look at some of the practical and operational issues affecting their deployment.

Telco solutions

- **Cable modems.** Most existing cable systems are immense hierarchical tree structures feeding thousands of subscribers. Before these systems can support cable modems, the plant must be upgraded or, as a few are doing, built from scratch.

Upgrading older systems presents two problems. First, they are usually not two-way. The line amplifiers are one-way only and must be replaced. The second problem is ingress, the insertion of noise that occurs in a shared media system. In a shared medium environment, every on-line user inserts noise into the larger system.

The customer side cable plant is also extremely noisy. Though repairable on a household-by-household basis, home cable wiring is often a mess. The coax spread around the house behaves as a large antenna, collecting noise from household devices and inserting it into the outside network. Turning such gerry-rigged nightmares into a clean two-way system will be a real challenge.

- **ISDN.** Using ISDN requires a box that currently sells for about \$400. Like most consumer products, in sufficient volume, the price drops considerably. On the telco side, ISDN-compliant digital switches must be

provided. Approximately 80% of American phone lines are so provisioned. An additional cost (also shared by ADSL) is "line conditioning." Line conditioning is the removal of load coils that were originally installed to clean up the analog signal, but which effectively act as notch filters, blocking ISDN and ADSL signals.

Today, the biggest risk to ISDN seems to be the installation process. Many telcos lack sufficient numbers of trained field personnel to install ISDN efficiently. In response, some ISDN equipment manufacturers have actually begun providing assistance to customers in facilitating phone company installations. Despite this, ISDN is the only high-speed data pipe that most of us can order tomorrow. It is here now and it works as advertised; no waiting — not much anyway, just a few weeks. Just get ready to pay an additional \$30 to \$60 per month, plus an installation fee of \$67 to \$457. (See May 1996, "Editorial," for example of installation costs.)

- **ADSL.** Though ADSL has been tested in real-world conditions by many telcos, notably Bell Atlantic and GTE, it is the least mature of the technologies. There are several conditions that affect an ADSL circuit. First is length of run. The current practical limit for an ADSL loop is 12,000 to 14,000 feet. Second is crosstalk created by other high-speed lines. The presence of a T-1 line within the same bundle can interfere unacceptably with the ADSL circuit. Figure 1 illustrates the bandwidth required by a two-way ADSL system.

ADSL is delivered via a single subscriber line. Consequently, the user is not affected by competition for local

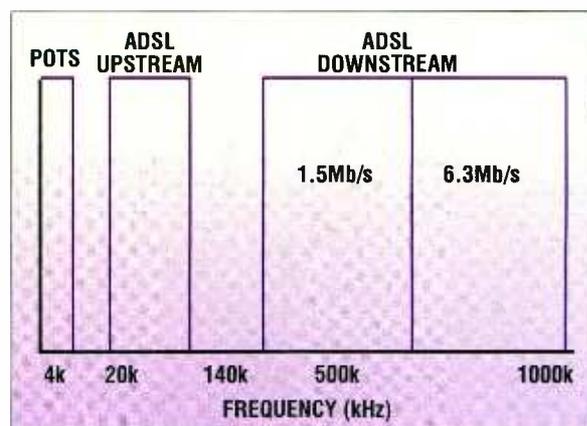
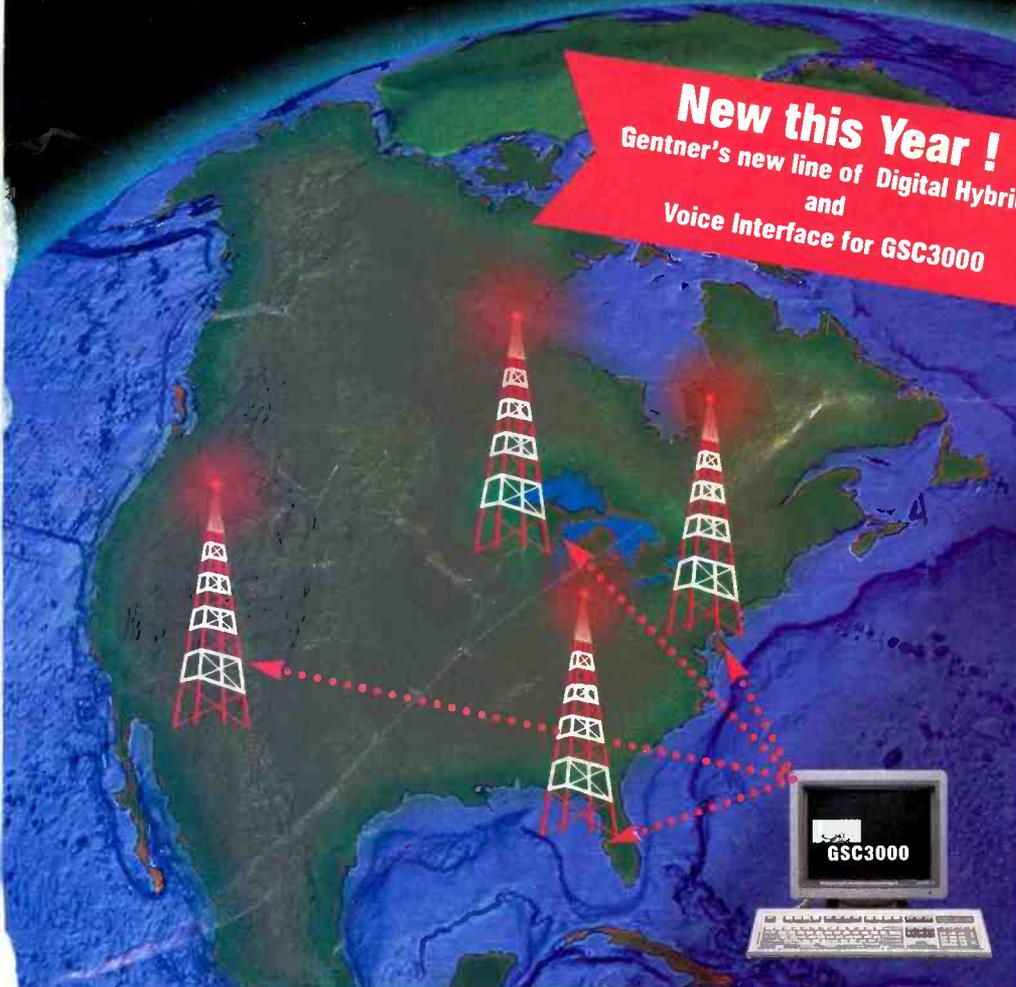


Figure 1. ADSL frequency spectrum.

YOU HAVE A WHOLE NEW
WORLD OF TRANSMITTER SITES.
 WE HAVE AN
INTELLIGENT SOLUTION.

New this Year!
 Gentner's new line of Digital Hybrids
 and
 Voice Interface for GSC3000



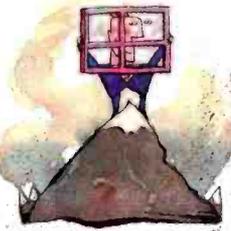
You have three transmitters in New York, four in Chicago, two in Orlando and one in Albuquerque. With GSC3000 site controllers from Gentner, you can keep tabs on all of them from a single screen on your Windows® PC. You can execute commands or just let the GSC3000 at each transmitter site handle the decisions and report back at your convenience. The GSC3000 has enough on board intelligence to function without a connection to a PC. Download a free copy of GSC3000 software at <http://www.gentner.com>.

COMPLEX AUTOMATION THROUGH MACROS

The GSC3000 lets you create macros allowing the system to do complex control tasks, like automatically switching from the main to the standby transmitter. Virtually any event can trigger a macro allowing automation of your system.

WINDOWS® BASED APPLICATION SOFTWARE

Operating in Windows® 95, Windows® NT or Windows® 3.1 the GSC3000 software provides point-and-click convenience while you monitor, program, and operate your site or sites. Plus, you can access the system anywhere you have a PC.



THE BUILDING BLOCK APPROACH TO SITE CONTROL
 The GSC3000 is flexible enough to meet your needs whether you are a single station site or a multi-station network. You get from 8 to 256 channels of metering, status, and command per site at as many as 256 sites.

MANUAL, AUTOMATIC OR TIME-OF-DAY FUNCTIONS

Program the GSC3000 to make automatic corrections when problems arise. Program it with time-of-day commands to do specific things at specific times on specific days. Then walk away. Of course, wherever you might find yourself, you can access the system via PC or laptop.



FREE SITE CONTROLLER GUIDE

Featuring the GSC3000, VRC2000, and all the accessories, this guide will walk you through the decision-making information you need to design or upgrade your site control system. Just call and ask for Gentner's free Site Control Guide.

1.800.945.7730



<http://www.gentner.com> • FAX on demand 1.800.695.8110
 1.800.975.7200

Windows is a registered trademark of Microsoft Corporation

Circle (19) on Free Info Card

Uncompromised Picture Quality.
Easy System Integration.
Affordability.

It's like you

DIGITAL-S FROM JVC.

For years, it existed only in your head. But now, whether you're in broadcast, post production or corporate video, Digital-S brings to life your concept of the ideal digital video recording and editing system.

Since you're a discerning professional, your dream system requires **THE ULTIMATE IN PICTURE QUALITY**. That's why we equipped Digital-S with 4:2:2 8 bit component processing and a very mild



3.3:1 compressor that yields a 50 Mbps data rate. Plus, it utilizes a 1/2-inch metal particle tape. These technological achievements enable Digital-S to reproduce an image far superior to any analog system, and rivaling that of the highest priced digital systems.

For the first time ever, **INTEGRATION IS BOTH EASY AND PRACTICAL** because of video pre-read. A key feature of our BR-D85 Editing Recorder, pre-read enables multi-format digital editing through your S-VHS, Betacam or U-Matic system with the addition of just one VTR. More impor-



designed it yourself.

tantly, it retains the quality of your original footage, generation after generation, ensuring phenomenal results.

As if that weren't enough, pre-read also allows you to perform complex layering effects and A/B roll editing with only two VTR's instead of three. And, by incorporating both analog and digital inputs and outputs, Digital-S delivers the optimum performance level in either the digital or the analog environment with virtually no degradation.

Finally, **YOUR DREAM SYSTEM WOULD BE AFFORDABLE.** By pricing Digital-S comparable to the lowest priced component analog systems,

JVC makes going digital a truly affordable reality.

Digital-S from JVC. Your dream system brought to life. The Digital-S system includes: the BR-D85 Editing Recorder with pre-read and digital I/O, the BR-D80 Editing Recorder, and the BR-D50 Player.



For more information, visit our web site at www.jvc.ca or call us at 1-800-JVC-5825 and simply mention **Product Code 187 O.**

JVC

PROFESSIONAL

Circle (20) on Free Info Card

www.americanradiohistory.com

No Matter How You Play It, You'll Have a Winning Hand.



Play the LMA/duopoly card. Intraplex digital audio multiplexers let you deliver programming to multiple stations from a single consolidated studio.

Or play the STL card. Radio stations and radio networks are saving money while enjoying higher audio quality by using Intraplex equipment for STL, LMA or networking applications.

Many radio stations have already chosen Intraplex for their LMA, duopoly, or STL transmission solution. When you choose Intraplex, you'll get the benefits of dealing with the industry's digital transmission leader and the flexibility to handle all your communications needs.

Why gamble? Call for our free booklet on radio stations already using Intraplex. In it, radio professionals give their own reasons for choosing Intraplex for a quality transmission solution. Intraplex, Inc. (508) 692-9000. In Europe, +44 1442 870133.



Intraplex

Intraplex, Incorporated
3 Liberty Way
Westford, MA 01886-3636 U.S.A.
TEL: (508) 692-5000 FAX: 2200
England TEL: +44 1442 870133 FAX: 870148 Web Address: <http://www.intraplex.com>

Circle (21) on Free Info Card

interactive

access. However, if there are many users, the impact upstream may be tremendous. There can be contention for resources at the head-end, where users are combined to share a single Internet connection, and of course, upon servers and, ultimately, the entire Internet backbone.

Although the per line cost of ADSL modems is currently high, that will drop to be comparable with cable and ISDN modems as mass production is reached. Recent announcements by a number of phone companies suggest that by the end of 1997 or 1998, ADSL will become

Turning gerry-rigged nightmares into a clean two-way system will be a real challenge.

as available as ISDN or cable modems in some markets.

With the dramatic increases in bandwidth that ADSL provides, it probably offers the greatest long-term potential for an increase in performance. However, that promise will be restricted until the bandwidth of today's Internet infrastructure is increased.

ISDN's additional demand for bandwidth is minor compared to cable modems and ADSL. Neither of these big pipes will flow freely if the upstream distribution and storage systems are not there to support them. That being the case, the thoughtful observer of this situation might ask: "Just who will be in the best position to see that their competing technology gets the required back-end infrastructure improvements?" Without those supporting elements, it won't matter how big the pipe is into the home. ■

Mark Dillon is vice president, on-line services, and Steven Blumenfeld is vice president, technology and studio operations, with GTE, Carlsbad, CA.

Rack Mountable and Rugged
Use it in the studio, in the field or in your rack.

Balanced Inputs and Outputs
Running lots of cable? Using pro equipment? You'll need these. (Unbalanced, too!)

Double Reinforced Ground
Part of TASCAM's low noise circuitry that promises transparency and hum free operation.

12 Total Inputs
4 stereo, and 4 mono.
The world's best utility mixer.

Channel Inserts (CH 1-4)
A TASCAM exclusive in this price range. Just like larger consoles, these handy inputs are great for compressor/limiters or using even more effects.

60mm Master Fader
What's a mixer without a master fader? Greater visual reference of your mix.

Precision 12-Segment Display
Bright LEDs so you know what's going on.

Stereo Buss/AUX SUB Inputs
Signal routing designed for flexibility and expansion.

Dedicated Stereo Tape Input
No need to waste a precious stereo channel for your master recorder. Assignable to L/R buss or monitor.

EQ on Every Input
Hi (1.2kHz) and Low (60Hz) $\pm 16\text{dB}$ on each.

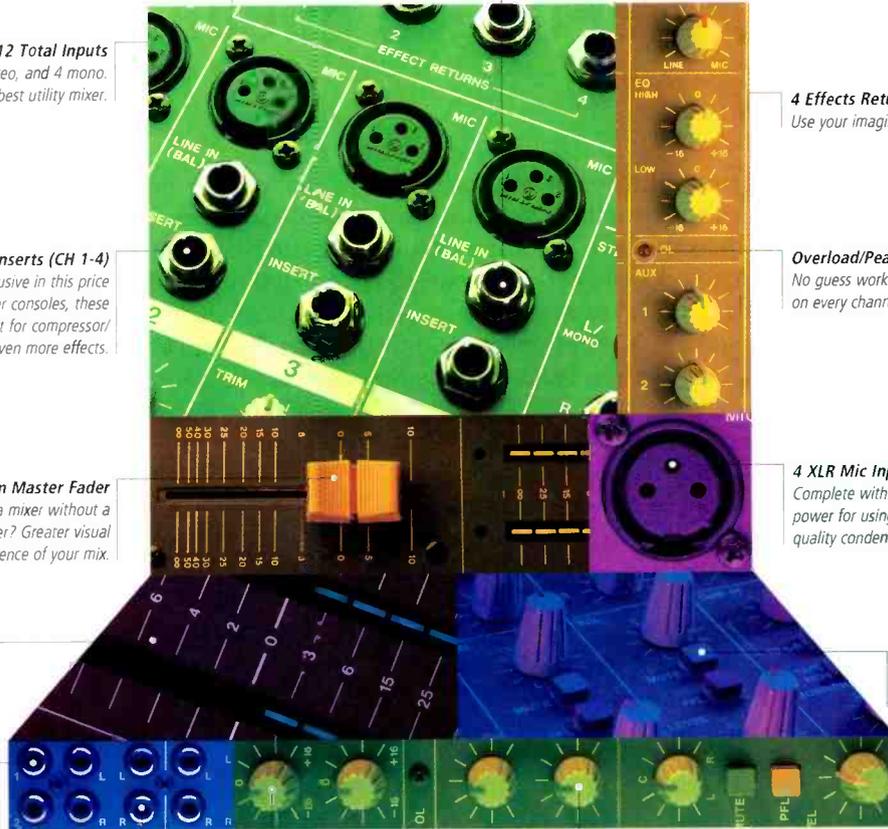
2 AUX Sends
Take your signals Pre or Post

4 Effects Returns
Use your imagination.

Overload/Peak Indicators
No guess work here. You get them on every channel and for PFL.

4 XLR Mic Inputs
Complete with 48V phantom power for using the highest quality condenser microphones.

Mute & PFL
Switches on every channel. PFL overload indicator too!



THE LAPTOP YOU CAN GET FOR UNDER \$350*

No more excuses for not having a compact, full-featured utility mixer. A mixer you can plug in anywhere. Need more inputs? How about a submixer? What about audio for video or multimedia? Get a TASCAM M08. It's the perfect mixer for these applications and more. Part of the new breed of next-generation mixers from the leader in recording, TASCAM's new M08 will surprise you. You'll scratch your head trying to figure out how we can give you so much

mixer for so little cash. No tricks. Just value.

Look at all those features! It's the mixer that goes anywhere to do almost anything. Use it every day — or when you're in a crunch. So whatever you do, don't scramble for more inputs, or schlep that big mixer, pull out your M08 instead. It's the world's best and hardest working compact utility mixer. And it comes with TASCAM quality and durability at no extra cost. Everybody needs one. Best part is, at \$349 anyone can have one. They're at your dealer. Get yours today.

TASCAM®
Take advantage of our experience.

Circle (52) on Free Info Card



©1996 TEAC America, Inc. 7733 Telegraph Road, Montebello, CA 90640 (213) 726-0303
TEAC Canada LTD., 340 Brunel Road, Mississauga, Ontario L4Z 2C2 Canada (905) 890-8008
*Actual MSRP is \$349.00. Actual prices may vary by dealer.



INFORMATION+ SPECS VIA FAX
800 • 827 • 2268
DOCUMENT #6280

**UTILITY
M08
MIXER**

Get on the queue now

By now, we are aware of the extremely aggressive DTV build-out schedule that the FCC pressed hard for broadcasters to follow. There are many difficult issues associated with a quick build-out. A glance at any of the associated editorials in the major newspapers during the last two weeks of March demonstrated the high-level press regarding the fast-build schedule for DTV, and not all was good.



Broadcasters took major public-relations hits because the schedules proposed to the commission included the necessary lengths of time for financial, regulatory and equipment availability delays. The new schedules are much more aggressive. The reality of the schedules is that for individual cases, all of the schedules are based on the assumption that certain waivers will be secured.

Political pressure

Broadcasters responded to the FCC pressure by offering a shorter construction plan for DTV that has faster implementation dates than those originally proposed by the broadcasters. The broadcasters now plan to provide a minimum of one digital signal to at least 43% of all TV households in just over 18 months. The major O&Os have made significant 18-month build-out commitments.

Back in the FCC's court

The FCC has now completed the process of assigning a new channel for DTV to each of the 1,700 NTSC TV stations. All the new DTV channels are being paired with the current NTSC channel. The vast majority of the new DTV assignments are in the UHF band. In past columns, we have reviewed the basis for the DTV assignments. An important question for station management remains: Will my current viewing audience be able to receive the new DTV signal? Or an even better question is how much of my current NTSC audience will receive my new DTV channel and will I lose some of my NTSC audience?

Broadcasters have worked hard to ensure that existing audiences will be able to receive DTV as well as they receive NTSC. The principle of replication was proposed by the broadcasters and was subsequently adopted by the commission. The allotment/assignment pro-

gram was designed so that, in most cases, a good outdoor antenna will allow virtually everyone who is able to receive NTSC on Channel 4 to also receive DTV on UHF Channel 54. The laboratory and field tests confirmed that DTV outperforms NTSC transmission. Generally, with sufficient power, a DTV transmitter can deliver HDTV-quality pictures into the fringe areas of where we now receive NTSC.

Spectrum and power issues

VHF stations are able to serve a large geographic area, including the service beyond the horizon, without employing massive amounts of power. On the other hand, NTSC stations operating in the UHF band have nominally smaller service areas because of the massive amounts of power necessary to transmit a signal. Accordingly, VHF analog NTSC stations that have been matched with a UHF DTV channel require more power to replicate the coverage area of the existing analog VHF station.

Alternately, UHF NTSC analog stations that have been matched with a UHF DTV channel will need significantly less power to replicate their actual geographic coverage areas. This is the reality of the implementation of the replication principle. In some cases, a power disparity arises out of this situation. Sometimes the power disparity can be large. However, according to the FCC and the Broadcasters Caucus, the allocation/assignment plan provides for replication. It is hoped that the final FCC table replicates without a power cap imposition. With a power cap, there is no replication.

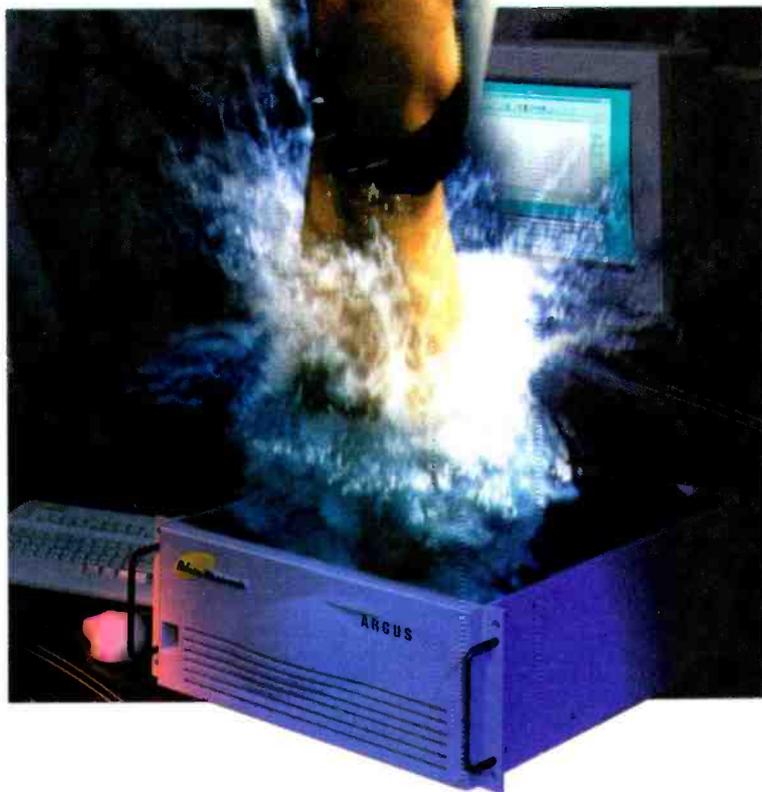
The generally lower DTV ERPs proposed for existing UHF TV stations have raised concerns about the difference between indoor and outdoor signal strength. However, because of the replication, the same exact indoor/outdoor attenuation factors apply for NTSC and DTV service. For satisfactory NTSC reception, a signal-to-noise (S/N) ratio of approximately 40dB is required. A digital TV signal requires a S/N of only 16dB, a difference of 24dB. Therefore, if the average receiver DTV power level is less than 24dB below the received NTSC peak power level, DTV reception should be satisfactory.

The basis for the broadcaster table of assignments

In early 1995, the Broadcasters Caucus submitted its recommendation for a nationwide DTV channel assign-

Continued on page 128

The Cost Of MPEG-2 AFF Encoding Is Taking A



So before you go off the deep end and pay for something you may not be getting, consider this: Argus... Vela's MPEG-2 encoding workstation ...answers the need for affordable clip encoding and storage for the broadcast professional. And at a cost that won't have you gasping for air. Look at the enhancements Argus supports:

Real-time encode, monitoring, multiplex and transfer to video file servers in one pass.

Simple and easy-to-use Graphical User Interface (GUI) built on Windows® NT 4.0.

Optional support for the MPEG-2 4:2:2 Studio Profile.

On screen VGA real-time confidence monitoring.

Rack mount or desktop solutions.

Louth automation interface support.

Expandable clip storage.

Random access to stored material for playback.

Support for multiple output channels.

GPI support.

Support for NTSC and PAL.

Dive.



8 1 3 • 5 7 2 • 1 2 3 0
<http://www.vela.com>
2501 118th Avenue North
St. Petersburg, Florida • 33716

Circle (31) on Free Info Card

MPEG-2: Making the right choices

MPEG-2 video compression has emerged as a major technical force in the broadcast, entertainment, computer and cable industries, yet will MPEG-2 eventually solve the problem of multiple formats and transport protocols? Let's look at the issues surrounding the use of MPEG compression in TV facilities. What critical issues need to be evaluated before buying your first piece of equipment?

How TV operations can use MPEG-2

- **News and acquisition.** Today's acquisition equipment relies on non-linear editing systems and still-stores based on Motion-JPEG. We've figured out ways to transcode JPEG files to MPEG, but the challenge has been concatenation as material is decoded and encoded multiple times while moving from one piece of equipment to another. This problem is being solved by MPEG-2 4:2:2@ML, which provides high picture quality for improved multigeneration capabilities with a maximum data rate of 50Mb/s. Studio MPEG-2 also allows frame-accurate editing.

- **Pre-processing and multiplexing.** MPEG can be used for pre-processing and multiplexing satellite feeds, videotapes and even Internet web pages. Many incoming signals can benefit from pre-compression filtering, which may improve the look of the product.

- **Spot playback.** Compression is used in cable head-ends and in TV stations that have replaced their aging cart machines with file servers. These storage systems mostly are based on Motion-JPEG, and all are proprietary implementations. Early adopters quickly found that software is critical to enabling interstitial materials to be inserted on transmission. Control, applications and networking increasingly will be MPEG-driven. The trend will be large, linked systems, with sister operations accessing multiple servers.

- **Archiving.** Storage technology is often based on desired quality levels and needed capacity. Useful here is MPEG-2 with its high data rate and IB GOP (group of pictures) structure. Another area of confusion (and opportunity) is library management where browsing applications need to access low bit-rate thumbnails using lower compression ratios on the file server. Hierarchical systems for storing content require scaleable compression methods.

- **Distribution.** All distribution file servers use MPEG in some way, whether the vendor's own or another vendor's

MPEG module as a front-end. With target transmission data rates of 15Mb/s (MPEG-2 4:2:2@ML) to feed an NTSC/PAL transmitter and downward to 1.5Mb/s in DBS multichannel applications, MPEG-2 is being implemented within TV stations. Cable and DBS or direct-to-home distribution operations may rely on the 4:2:0 format of MPEG-2 MP@ML.

Choosing what works for you

MPEG-2 has emerged as an international standard to help TV stations deal with the transition to digital. MPEG-2 aims to fill the need for flawless interoperability of those systems. MPEG-2 is also a highly sophisticated technology that, when correctly applied and properly supported, will produce higher quality video. ■

Evaluating MPEG-2 solutions

1. **Study the vendors.** Identify the key players and industry leaders in MPEG-2 compression technology. Check out their web pages for technical papers. Compare how various equipment adheres to standards and compliance. (See *BE's* home page for an index of articles on MPEG at be@intertec.com.)

2. **Talk to vendors.** Ask your vendors how they plan to route MPEG-2. How do the various file sizes fit through various routers and switchers? Cascading of compression systems has been a hot topic at the last few SMPTE conferences, so look for papers on the subject.

3. **Talk to vendors' customers.** Ask vendors for the names of their Beta testers and other early adopters. Have the infant mortality issues been solved?

4. **Ask about testing and measurement.** Various compression quality measurement methodologies are being developed. Ask them how to measure your own operational performance. Ask them how you can monitor signal errors/correction as video data moves from one place to another within your facility.

5. **Talk about interoperability.** Vendors often expect customers to choose the various modules and figure out how they interconnect. That's why the Internet, SMPTE, STE, SBE, ITS and other industry group meetings can be great sources for sharing data about interoperability problems and solutions. Will your chosen technology work with existing equipment? How about another vendor's equipment?

6. **Emphasize system integration.** Consider consulting a reliable systems integrator or engineering firm to assist with evaluating your design, implementing and testing. Many issues will be addressed and questions answered by actual MPEG-2 deployment and experience. (See the *BE Buyers Guide* for a complete list of system integrators on p. 22.)

Brian Quandt is president and founder of HEURIS/Pulitzer in St. Louis, MO, a full-service provider of MPEG video compression solutions for professional video and multimedia developers. A partner of Pulitzer Broadcasting Company, HEURIS/Pulitzer can be reached on the Internet at www.heuris.com.

COMMSCOPE 4000 SERIES

Broadcast Quality Audio Cables



So Installer-Friendly, They Almost Install Themselves

High quality audio performance is just the beginning. With foil shields, tight stranding, alphanumeric and color-coded pair jackets, plus ease of stripping — CommScope's MultiPair Audio Cables are *installer preferred for their ease of installation*. Overall jacketing is matte-finish TPE for flexibility over a wide range of temperatures. Rugged interpair jackets with 100% coverage foil shield on each pair reduces cross-talk. Foil shields are bonded to jackets to improve flex-life of shield and stripability. Plus tight-lay stranding makes for an extremely flexible cable that resists

fraying. Paired conductors and drain wires of the same size for consistent termination add to the ease of installation of these audio performers. For even more advantages of these installer-friendly cables, contact CommScope today or our exclusive Broadcast Distributor, GEPCO International at 800.966.0069. And hook up with *MultiPair Broadcast Analog Audio Cables that almost install themselves!*

CommScope

For information call 1-800-982-1708 or 704-459-5000.

Circle (32) on Free Info Card

www.americanradiohistory.com





Automation and networks

Finally, automation with a brain

By Carl Ostrom

THE BOTTOM LINE:

With an increase in multichannel facilities, managers must find ways to do more with little or no increase in equipment and/or personnel. In many instances, today's automation systems can be used to streamline operations that take place throughout a facility rather than just in master control. \$

F

rom commercial insertion for local CATV systems to large-scale multichannel network facilities, broadcast automation needs have become increasingly diverse over the last few years.

For multistation broadcast groups, one notable trend is in operational streamlining. Many have chosen to reduce costs by feeding two or more TV stations — for different markets or for the same market through creative “cooperative” ownership agreements. This trend is creating a growing demand for complex multichannel facility management.

For years, “satellite stations” commonly carried programming and merely inserted local commercials and IDs over the originator's commercials and IDs. Although this situation might work for a station with network programming today, it is unlikely that, in this highly competitive market for syndicated programming, two different stations in two different markets will have identical programming contracts. It is also improbable that the two different market demographics would even support the same programming. The point? In today's broadcast world, these two stations will probably have to run separate programming, as well as separate commercials, thus acting like two completely different

Photo: WDRB-TV in Louisville, KY, currently uses the Odetics TCS2000 for station automation.

Automation and networks

stations within the same facility. So, where are the savings?

Storage and playback is a hardware issue

This scenario begins to look more attractive once you add in a program and commercial storage device large enough to store and playback all the material for two or more stations. Still, the task of managing the logistics of acquisition, inventory, scheduling and presentation of a multichannel system is monumental. Mix in the needs for local news, live sports, program segment timing and special programs, and it borders on inconceivable.

The solution to the storage and playback challenge is primarily a hardware issue. A number of manufacturers have been touting such products for the last two years. And, with storage costs decreasing and storage system size increasing, it appears that large-scale data storage and servers will continue to dominate the future of broadcast presentation for a long time to come.

With increased storage capacity and the emergence of MPEG-2 as a new distribution standard, it is feasible to envision a large-scale data storage network that contains enough programming for more than one day. This can be done with just more than 500GB. Even if the onset of DTV requires twice as much storage capacity, the trend in storage advancement should meet and surpass that requirement far before capacity becomes an issue.

Automation is a software issue

While the hardware accomplishes the storage of data, the critical task of managing that data is primarily a software issue. Yet, few suppliers have developed software solutions to fulfill the presentation needs for such systems. Why? The problem here is twofold.

First, the solution must currently come from multiple manufacturers. Although each may claim to have compatible products, this scenario can frequently result in extensive finger-pointing sessions as the different manufacturers attempt to sort out interface issues.

This should read as, "Beta testing done while you operate."

The second issue is that no system presently covers the entire station operation. Typically, there is one software solution for acquisition, another for news, and yet another for traffic and presentation. This creates the largest problem caused by using multiple computer management and automation systems within one facility: the presence of multiple databases. Multiple databases require that information from the acquisition database be entered into the daily log and then into the master

this task is performed in an environment of stress, time constraints and numerous distractions. This is not a recipe for success. Furthermore, if this facility also has a news automation and commercial video library, each with its own database, the problem becomes significantly larger.

But wait. We thought all this automation was supposed to improve accuracy and reduce labor, right? Now, it's like we're driving a team of horses without a harness — lots of power, without enough control.

Automation, in and of itself, can solve



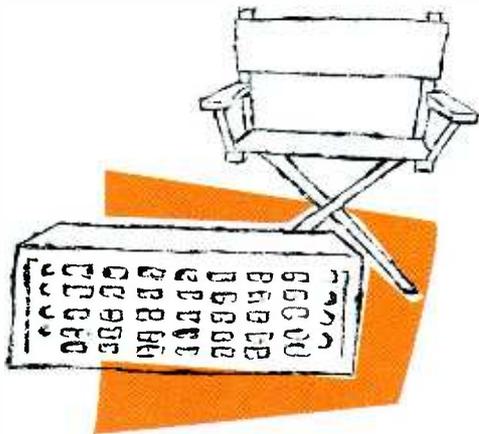
As station automation increases, operators are required to oversee an increasingly diverse equipment set.

control automation system — a process that can also involve a manual media transfer as a videotape is stored and reloaded for playback.

This transfer process opens a wide door to the single largest source of system error: human intervention. Data transfer is time-consuming and cumbersome. Keeping all records straight and the databases matched, demands absolute accuracy. But unfortunately,

some problems, but it can also initiate others. The success of any computer-based management or automation system is based on the system's ability to perform tasks and manage data reliably with minimal human intervention.

Does this mean that "HAL" should take over the facility? No. It does mean that once a human has entered data, based on a predictable, functional process, the system should know all the



Trans*gig*uration

Case Study 1: Silicon Graphics Entertainment Center

GigWorks™ Fibre Channel network products from Ancor can be a transformational experience. Silicon Graphics Entertainment Center uses GigWorks switches, adapters and routers as part of their network solution to maximize the creative power of their machines - and achieve networking nirvana. ▶

GigWorks products are available for popular Silicon Graphics models including the new O2™ series. They

also interoperate with all popular platforms and protocols, and handle video, voice and data on a common network. And, they're backed by an ANSI standard that's already been specified to a mind-bending 4 gigs.

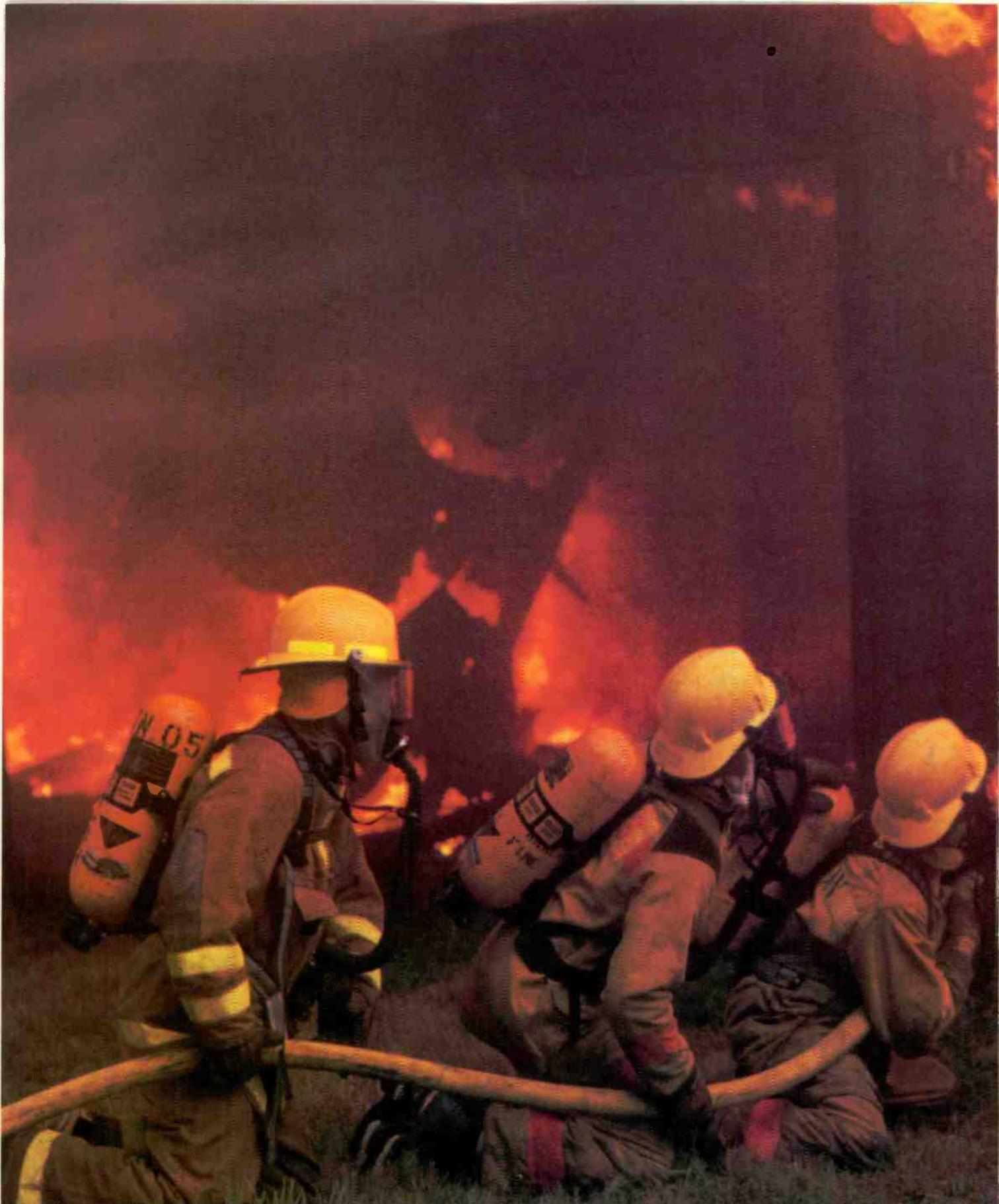
To move your network to a higher plane call the GigWorks gurus at 1-800-342-7379, or download the works at www.ancor.com. Then make the world's fastest networks a truly easy gig.



GigWorks™, ANCOR™ and the Ancor logo are the marks and property of Ancor Communications, Inc. Silicon Graphics and O2 are trademarks of Silicon Graphics, Inc. To learn more about the Silicon Graphics Entertainment Center contact Ancor or your local Silicon Graphics dealer.

Circle (22) on Free Info Card

www.americanradiohistory.com

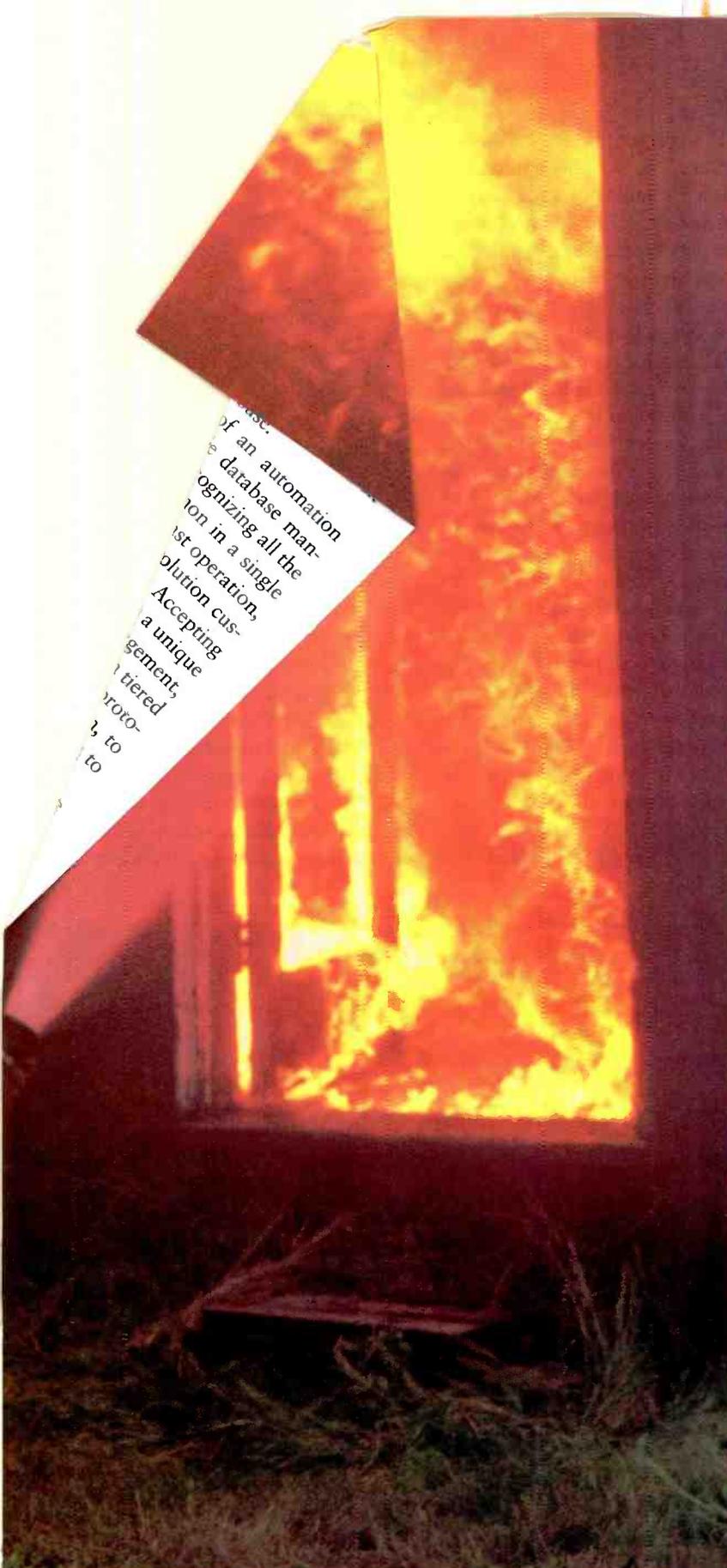


Media and Resource Management

PROFILE[®]
DISK STORAGE

NEWSTAR[™]
AUTOMATION

EDIT STAR[™]
NLE EDITING

A photograph of a fire burning through a window, with a document in the foreground. The document is tilted and contains text about automation and database management. The fire is bright orange and yellow, with black smoke rising from it. The background is dark, suggesting a night scene.

Can your news operation take the heat?

You spend half your time putting out fires, and the other half looking for more efficient ways to prevent them. Day after day, you're on the line, facing the hot issues. Faster acquisition. Better media management. Internet publishing. High speed networks. Archiving. Script-based editing. Resource management. You need the support of a knowledgeable partner who can supply you with open, scalable platforms and solutions, and help you integrate and manage them. Someone who understands where you're coming from...and where you're going. Someone who won't let you get burned. To get the right combination of experience and innovation, come to Tektronix. We'll supply everything you need. The hottest technology. The most creative solutions. Proven, tested and ready to install — today. Got burning questions? Just call ...

1-888-TEK-VIDEO dept. 604
www.tek.com/VND

Circle (23) on Free Info Card

Let's talk news.

Come see News Solutions in action at our booth 9914 at NAB.

NEWSWORKS
VIDEO EDITING

GRASS VALEY
SWITCHERS

Tektronix

Automation and networks

steps necessary to perform that function from inception to completion. The system should also have the ability to control the devices necessary to perform each function.

The integrated system concept

The only way to accomplish this goal is to have one integrated system that involves every facet of the programming process. Take, for example, a syndicated talk show. Ideally, the acquisition time and location for the talk show would be entered into the database along with the air time. With this data, the system should be able to assign a satellite receiver to the task, move the dish to the location of the required satellite, select the proper channel on the receiver, locate and assign a storage device with enough space to record the feed, establish the path from the receiver to the storage device and

initiate the record process at the assigned time. The system would then designate a file name or number to this program and enter that file on the appropriate play list (or lists if multichannel) for the air time designated.

In a perfect world, a subprogram would be able to locate the break times and durations during the record process. These would be entered into the database as links to the program file. The traffic data entered into the database appointing commercials and promos to this program would then be automatically assigned to the proper break locations. Finally, the segment times, break locations and content would be calculated from the available data and entered as a complete play list.

This program would sit in the storage device until the proper time. Then, the system would initiate a play command to run that specific file. When the program has run its course, the file would be marked as expendable to allow space on the disk for a new program. If necessary, the file would be spooled to a

DLT or archive s

Predictal
fect for an
most of the
every day —
automation sy
this and allow a
events to be kept
schedule in the dat

The key element
system is a large-scal
agement approach. Rec
functions that are comm
and multichannel broadc
this approach provides a s
tom-suited to these issues.
that each user is going to have
application for facility mana
the ideal system would provide
product approach and an open
col, based on a standard platform
allow users and peripherals vendor
integrate custom applications.

This necessitates that the system be designed in a hierarchical modular format to allow extreme flexibility. Be-

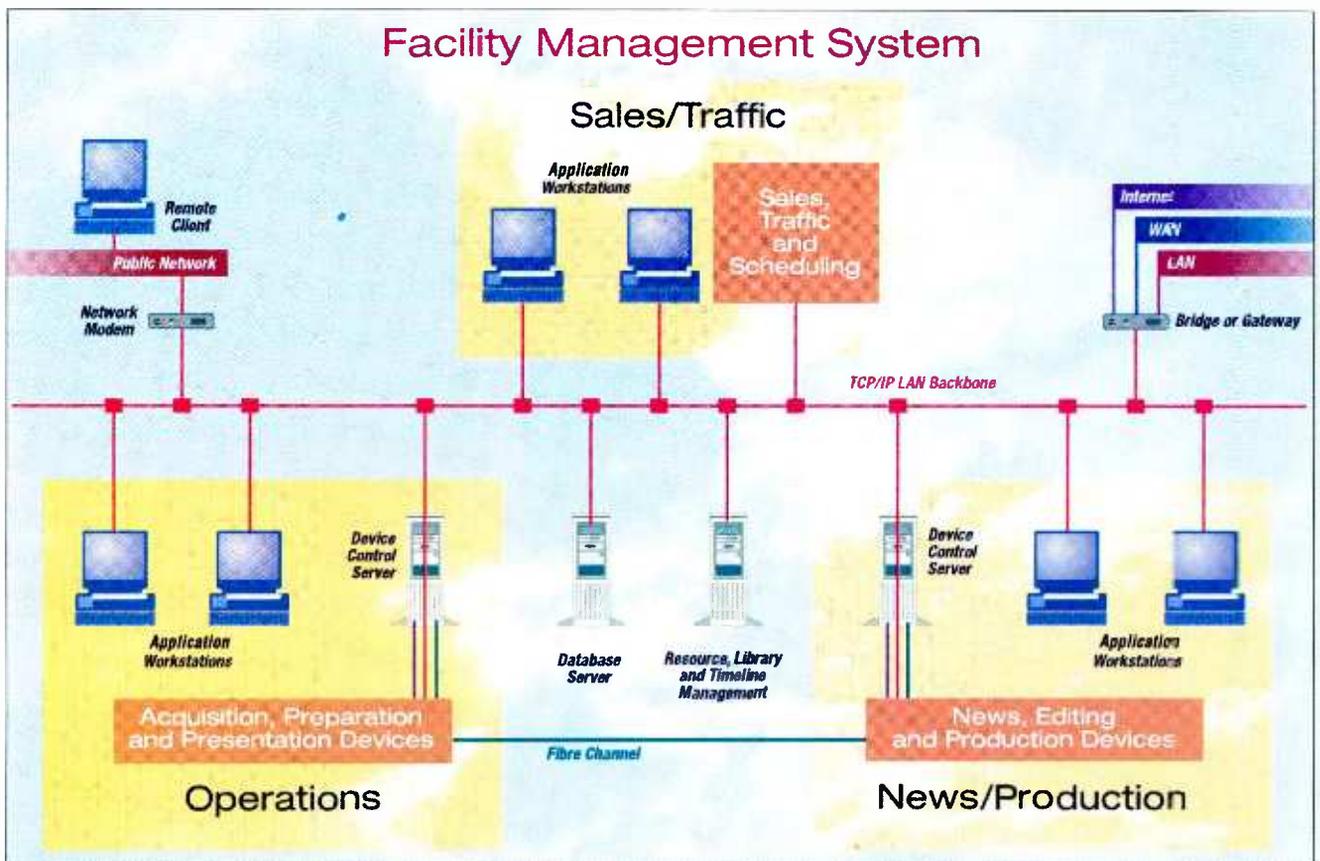


Figure 1. A total facility management system would have access and content capabilities across a variety of station resources and equipment. (Diagram courtesy of Odetics.)



*We've been
improving our
delivery speed.
It's now about
1000% faster.*

Not content with merely offering the finest video distribution technology in the world – one that makes interoperability between analog and digital formats easy – we looked to see where else we could improve. So we decided to get it to you faster.

Now when you need Grass Valley equipment, instead of three months, you can have it delivered within two weeks.* It's part of our new delivery system.

Why not call and test it? We'll send you our distribution products catalog and a free Tektronix stopwatch. But act soon because our supplies are limited.

**1-888-TEK-VIDEO,
dept. 904
www.tek.com/VND**

Circle (24) on Free Info Card

Have you talked to Tektronix?

Tektronix

*Pending credit approval. Call for details of products included in this program.

Automation and networks

cause the needs of every organization are unique, it is important that any large-scale total facility controller be adaptable to the needs of the user. It clearly cannot force fit the user to the assumptions of the vendor.

This is not rocket science. Editor products have used this philosophy

for a number of years. They take a standard platform computer, write an application-specific software machine-control and media-management software program, and use this program to communicate with a number of media control devices through an existing RS-422 machine control protocol. Most broadcast products provide an RS-422 interface. This gives the system the ability to select and control

devices chosen by the user.

The basic concept is simple. Build a software-based station automation system using a standard protocol, and partner with hardware manufacturers to provide a single-station product with different hardware options. In order to prevent another intervendedor gunfight, the automation system manufacturer must also accept responsibility for the entire product. One vendor – one product, tested and delivered as such.

So, if one vendor must assume responsibility for the entire product, why not have one vendor also create the entire product, including all the media control hardware?

There are two issues here. First, most facilities will desire to use as much of their existing equipment as they can to make the implementation affordable. The second issue involves the need for flexibility in product choice when either available funds or technology call for upgrading certain portions of the facility.

Each storage vendor has its own unique place in the market and subsequent appeal to different users. Having the ability to choose the quality, signal format, size, protection and cost relationship of each product to suit each users' needs and emotional bent is extremely important.

When hardware products change, as they certainly can do rapidly, these changes can be implemented quite easily. This is much like the editor analogy mentioned earlier. If the new device emulates an existing protocol, no new driver is needed. All the system needs is the device parameters entered into the database to allow the management software to know what it has to work with.

Any system architecture must be designed to control multiple channels with separate programming. The single database concept is extremely important in multichannel operations. This gives stations the ability to keep track of all the media necessary, with respect to physical location on a drive and where it is needed in each current play list, as well as future use requirements.

For example, if a particular media segment runs one day a week on three different channels at separate times, the



Introducing the Top Performing IOT in Broadcasting

The Eimac Klystrode® IOT – One Tough Act to Follow

Eimac's family of Klystrode IOTs offer the power and performance you need for Advanced TV broadcast requirements, from today's analog to tomorrow's Digital TV.

- **Dependability:** Behind the scenes, the Klystrode IOT operates effortlessly to your specifications with exceptional reliability
- **Longevity:** Many Eimac IOTs in use now have more than 40,000 hours of tube life
- **Tuning and Maintenance:** Klystrode IOTs are compact, user-friendly, easy to install and simple to maintain. You'll forget you own it!
- **Versatility:** Easily tuned across the entire UHF-TV band – 470 to 860 MHz
- **Cost-effectiveness:** Broadcasting's highest efficiency power amplifier
- **Linearity:** Meets and exceeds the extended dynamic range required for digital broadcasting



For stellar performance, specify only genuine Klystrode IOTs from Eimac.



Communications & Power Industries

Eimac Division
301 Industrial Way • San Carlos, CA 94070
Phone 415 592-1221 Fax 415 592-9988 • www.eimac.com



Made in USA
ISO-9001 certified

Circle (26) on Free Info Card

THE PROFILE DIGITAL NETWORK

*Build from
a strong
foundation.*

That means a broadcast operation that's flexible, networkable, compatible with any number of manufacturers, and easy to upgrade. In short a system based on Profile[®], digital storage solutions.

The new, four-channel, modular, and scalable PDR200 Video File Server can store up to 96 hours of RAID protected video. It has the ability to serve high quality video and audio over a Fibre Channel network at faster than real time speeds, in all industry standard formats.

But this just scratches the surface. To learn more about the entire Profile line of video digital storage solutions and the Fibre Channel network, call and order our free white paper, "Building the Fibre Channel Network."

1-888-835-8433 dept 705
www.tek.com/VND

Let's talk digital storage.

Tektronix

Circle 25 on Free Info Card

Automation and networks

video segment is loaded from off-line storage to a server on the air day. After the segment runs on the first channel, it stays in the server for the subsequent air times on the other two channels. After the last channel has aired the segment, the video clip is deleted from the server because it already exists in off-line storage for use next week. The data management system can ascertain each channel's criteria from all the data available on one database.

Is facility management here?

So now that you're ready to start your system with a push of a button, where can you find an automation system like this?

NBC recently faced this issue. Its solution was to build a custom proprietary system called GENesis. But, the capital budget for most stations doesn't include funding for development of a

custom-based system. So are the rest of us doomed to endless data entry and solving intervencor interface problems? Maybe not.

What is really needed is one organization that will step up and provide the complete package as a product. In fact, hope is on the horizon. Odetics Broadcast introduced a new product at NAB this year, called the Roswell Facility Management System, which is based on many of these concepts. It can only be a short time before others will follow suit.

Using a typical system as shown in Figure 1, we can see how the concept of a single, global system might function. Notice that all devices are connected to the LAN backbone. This is the single point of control and database management. So, as video clips are moved from the production editing disk recorder to the presentation video servers over the fiber channel link, the data management system is keeping track of where the file is going and where it eventually resides on the server.

Having a standard LAN system for management allows access from remote locations over traditional network equipment. This would allow a remote sales person the ability to query the database to see if the commercial he or she just sold for the "Annual Arbor Day Chainsaw Sale" is still in the archive file from last year. The sales person could then look to see if there is still an avail in the last break of "Rush."

This facility management system also permits all news story material to be recorded from remote sources and archived onto raw dedicated disk drives or VTRs. All news material can subsequently be edited from these devices and recorded to a common drive or server for air playback. During the newscast, each story is then played back from this disk drive without any physical media movement.

If a story is about to air and the producer does not have the video clip file name on the drive directory, he or she would then know that the story is not ready. A decision can be made to



THE NEW *Scan Do* ULTRA WHAT PUTS IT OUT IN FRONT? THE FEATURES BEHIND IT.

Introducing a giant step forward in broadcast-quality images. Scan Do® Ultra has everything you asked for in a PC, Mac® and workstation to video scan converter: powerful features you want, higher resolution you need, the superior quality of the Scan Do family, and a price that's incredibly affordable. In fact, at just **\$6,495**, Scan Do Ultra offers the industry's best balance of performance and value.

So now you can create true, broadcast-quality video with studio genlock from computers of all kinds—without creating problems for your budget.

But don't take our word for it. Call for a free demo, and we'll put a Scan Do Ultra in front of you. Then you can discover for yourself all the features behind our most powerful scan converter ever!

 **Communications
Specialties, Inc.**
...For high-performance computer video interfaces.

Phone: 516-273-0404 / Fax: 516-273-1638
E-mail: info@commspecial.com
Internet: <http://www.commspecial.com>

FaxNOW

Call 1-888-4-FAX NOW or
1-516-273-1710 to retrieve information

Scan Do is a registered trademark and FaxNOW is a trademark of Communications Specialties, Inc.
All other trademarks are property of their owners. ©1997 Communications Specialties, Inc.

Circle (28) on Free Info Card

See us at Infocomm Booth #2537

*Not every
Emmy winner
gets a big,
spacious
trailer.*

No, some get the rack. But then that's where they do their best work, making sure programming appears exactly the way it's supposed to. Tektronix analog and digital test equipment has supported television for as long as television has been around. Today, our serial digital test equipment offers the highest quality, accuracy and repeatability available. No surprise, then, that when it comes to broadcast, production, post production and uplink systems needs, most people choose Tektronix. Test equipment that regularly wins Emmys. Though you wouldn't know it by the way it's treated.

Call 1-800-426-2200, press 3 and request code 3006 today, or visit us at www.tek.com

Video at its best.

Tektronix

UNCOMPRESS UNCOMPRESS UNTOUCH

ADC DV6000. THE MOST WIDELY USED UNCOMPRESS



PROMISING. COMPRESSED. UNMATCHABLE.

THE MOST VERSATILE DIGITAL VIDEO TRANSPORT SYSTEM IN THE WORLD.

Live broadcast events. CATV supertrunking. Post production. Distance learning. High quality backbone transport. Cable headend consolidation. Just some of the ways the DV6000 video transport system delivers multiple channels of high resolution, 2.4 Gb/s video over fiber. Using an uncompressed digital format, the DV6000 moves more channels, with higher quality, over longer distances than any other transport system.



The DV6000 is a highly versatile fiber optic transport system offering:

- Transport of QAM, MMDS, HITS™ and other digital video services
- Compatibility with all video standards (NTSC, PAL, SECAM, MPEG, JPEG, CCIR-601, etc.)
- Centralized scrambling, VBI insertion and subscriber control
- Dense WDM, embedded switching and single channel options
- Combined multiple analog video, digital telephone and data transport

So why compromise the quality of your digital broadband transport by using anything other than the best. To find out more, call us at **800 366-3891** for a free paper on SONET vs. DV technology.



W W W . A D C . C O M

Circle (33) on Free Info Card

DV6000 is a trademark of ADC. HITS is a trademark of TCI.

Automation and networks

move to a new story and run a different video clip. The producer simply modifies the news story play list from a workstation in the control room and the original story is moved to a later segment in the program.

That's the easy part. How to manage the talent and the teleprompter copy is another problem. This is where an open architecture system has an advantage. Many news departments have some form of software management in place. The ability to interface with an existing product through open architecture allows the rest of the station to tool up for full automation without forcing the news department to abandon its current investment and operating process.

One huge issue related to automation

systems is the fact that the eggs are all in one basket. Thus, it had better be a good basket.

Loading videotapes in the event of an automation system failure is no longer an alternative function in most facilities. Failure of any system must be soft. Redundant controllers, redundant data files and instant access to redundant media storage all help to solve the problem. However, when any part of the system fails, a manual or semi-automatic backup function should be available to allow the operational elements of the system to continue to function in their original capacity.

Anyone in the video business has a number of stories to tell about non-video companies and their lack of understanding about broadcast issues and priorities. Manufacturers must know broadcast operations. They need to

know the need for multiple play lists in a live sports event filled with pitching changes, 20-second time-outs and the like. They need to know that some news stories are created during the news show and not canned 30 minutes before air. They need to know that a recorded message on the manufacturer's customer service line is an unacceptable response to a live operation.

So, are we there yet? Not quite. But, I think we can see it from here. A deep and comprehensive data management system is a concept that extends far beyond the explanation in this article. Yet, it is quite another issue to make the data easily accessible and intuitive to operate and use. But, that is precisely the task of any provider wishing to offer a complete station automation system. ■

Carl Ostrom is a video system consultant with System Resources in Nevada City, CA.

Monitoring the monitors

By Skip Ferderber

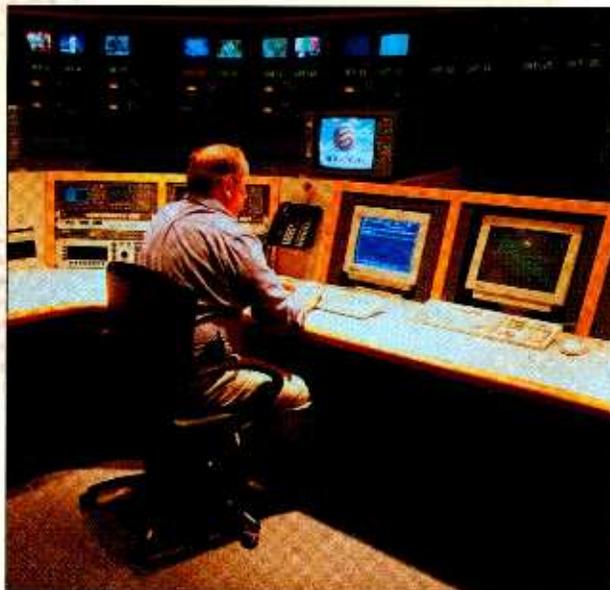
The new Speer Communications facility in Nashville, TN, is capable of simultaneously originating up to 20 channels of video — quite a record for a traditional broadcaster. In spite of the high level of automation involved, operators still need to track the large number of separate elements required in any broadcast channel; programs, commercials, bumpers, promos, etc. A typical installation would simply assign a separate monitor to each video source. However, in the case of the Speer installation, the dynamic nature of the broadcast day and the need to provide 20 times as many output channels as most TV stations, that wasn't possible.

The monitor solution

The solution was to develop a large bank of monitors and then switch the feeds to each monitor as needed. However, as sources changed, some way needed to be developed to label those sources by monitor. The solution was provided by TDC, formerly Tally Display Corporation. The company provides intelligent dynamic multicolor undermonitor displays that can provide source identification, as well as instant visual error messages.

Each monitor has a TDC display mounted below it to identify the source of the video. The key was to use displays that can be controlled by the automation system, so as the video sources change, so does the label below the monitor. The dynamic nature of the display and external automation control allows the TDC displays to also provide other information to the operators — equipment status, clip IDs and error messages. Another advantage of dynamic labeling is that monitors can be assigned *intelligent names* that mean something to the individual client or production. The days of the black marker and white tape labeling are gone.

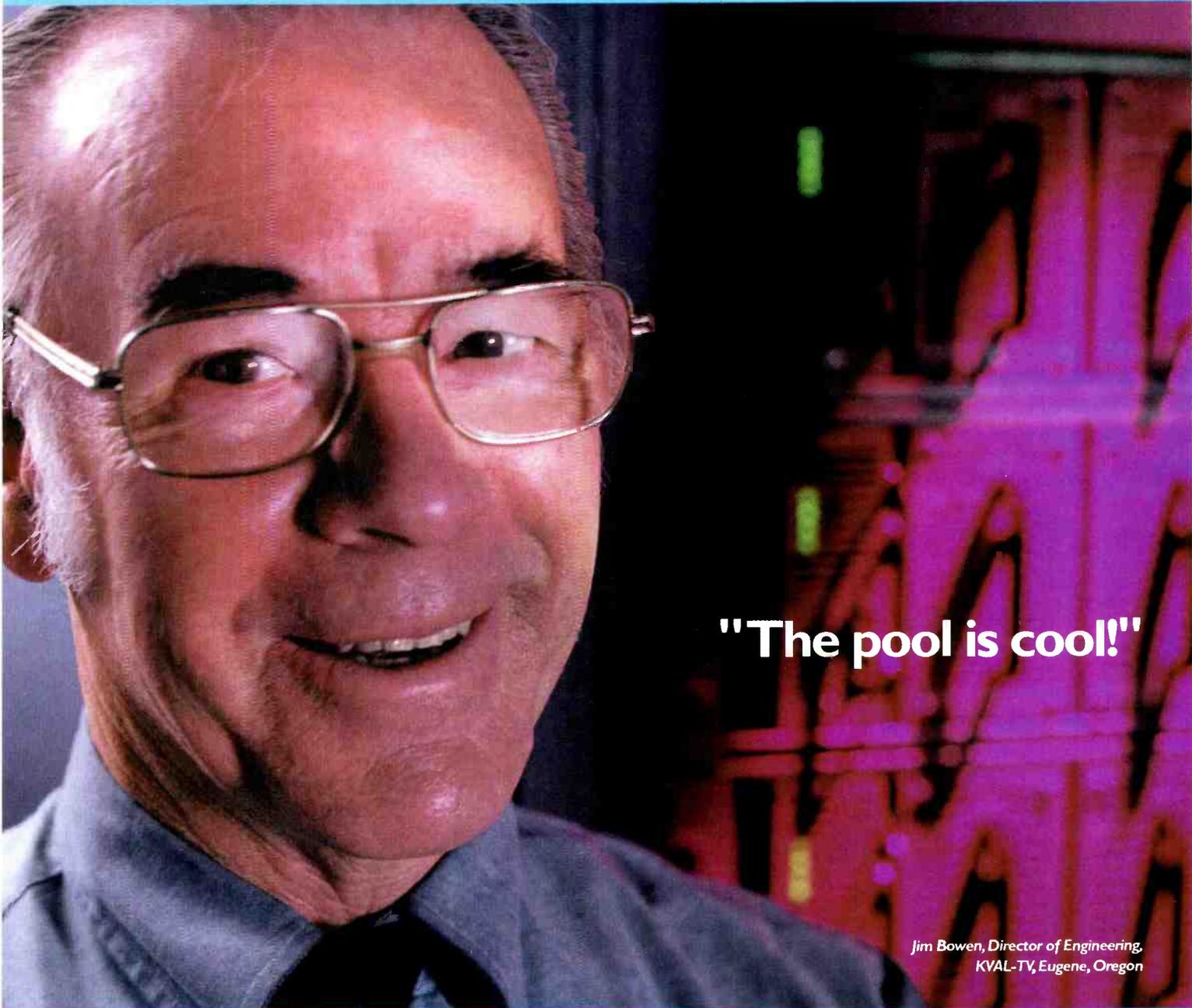
Each display panel is controlled by a serial BCD datastream providing the information to be displayed on the panel. Messages can be coded to display in different colors, helping



The transmission control room at Speer Communications, Nashville, features the Alamar Media Manager, the DEC Alphastudio terminal, control terminals for two Philips Media Pool video servers and TDC undermonitor displays.

operators understand what's happening more quickly. Even long messages or several short ones can be scrolled across the panel.

As facilities move to multichannel operation, operators need to be able to monitor more status points and sources. An intelligent display system fully integrated with an on-air automation system can go a long way toward reducing operator mistakes and keeping all of those channels running error-free. ■



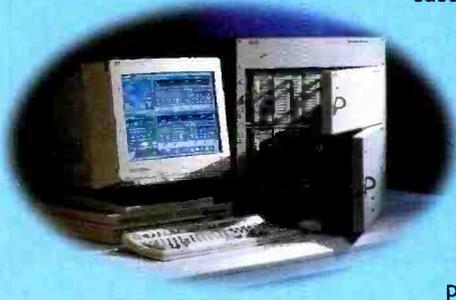
"The pool is cool!"

*Jim Bowen, Director of Engineering,
KVAL-TV, Eugene, Oregon*

"The Philips BTS Media Pool video server is our gateway into the future requirements of DTV, providing a single source for centralized programming to KVAL-TV and our affiliate stations, KPIC-TV and KCBY-TV.

In researching the video servers currently available, cost effectiveness, versatility of configuration and the preservation of CCIR601 standards were at the top of our list of critical requirements. The Media Pool's ability to meet those requirements, together with the Philips BTS reputation for unparalleled customer support, made the Media Pool our best possible choice.

Today we program our stations with confidence, utilizing Philips DISKCART™ and STREAM™ software and trusting in the quality and reliability of the Media Pool to provide the programming directly.



The Media Pool is definitely a cool tool."

For more information visit us at www.phillipsbts.com or call 1-800-962-4287.

Circle (34) on Free Info Card

Let's make things better.



PHILIPS

Automaton is vital for facility networking

By Ken Freed

Any comprehensive solution for facility networking must include plans for automation. What factors need to be considered in automation system design and integration?

First, any kind of automation system needs to be modular and scalable. A modular system lets station engineers choose only those components that actually fit their requirements. System scalability is crucial for supporting facility expansion down the road.

Second, systems today must use open architecture design. With the wide range of digital equipment in use today (and an even wider variety soon to be developed) closed systems don't make economic sense. Manufacturers recognize that and are providing interfacing solutions to meet this need.

"In the overall operating environment today," says Frank

reel, cassette and server stored, must be effectively tracked. The importance of this capability can't be understated. If your station played only 100 breaks a day, with multichannel operation (DTV) that number could easily jump to 500 or more. Manual tracking simply won't work.

Fourth, an automation system must accommodate flexible resource allocation. This means that any tape machine or hardware, including server channels, can be switched to anything. This includes both input and output channels. The system must be able to foresee hardware needs far enough out to effectively allocate resources in advance so that at no time do conflicts develop.

To illustrate the possibilities, at the high end is the DirecTV 200-channel automated DBS operation in Colorado that has interfaces at 22 computers distributed over the entire facility. So much media comes into the facility from so many different sources every day that the staff uses bar code guns to feed information into the media manager.

At the other end of the spectrum is a single-channel operation providing tourist information in hotels in Branson, MO. The station has one computer and a couple of tape machines hooked into its media manager. That basic configuration can be upscaled, when needed, to automated multichannel service.

Where the trend is taking us

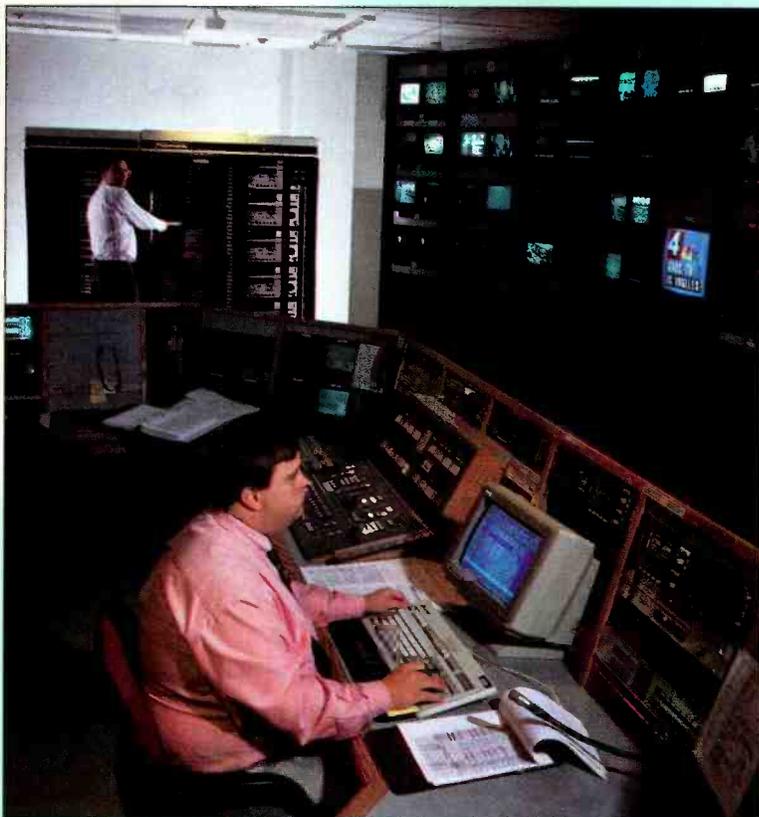
The trend is toward multichannel information in all TV environments, including broadcast facilities. Why? Because broadcasters are looking for new revenue streams anywhere they can find them, for they increasingly need to have multiple-channel capability, if even only two channels — one for analog and one for digital.

Today, and in the future, automation can solve two operational problems. First, automation can reduce your total personnel overhead. Of course, on-site staff can't be eliminated altogether. You can't just turn on the system and walk away from it. You still need someone to make everything work properly.

Second, automation permits you to do some things you couldn't do manually. A busy multichannel environment can become so demanding that your station probably cannot afford the needed staff to accomplish all the

diverse tasks involved.

Today, it's possible for almost all of the drudgery work to be handled by automation. Tracking, recording satellite feeds, logging material into the system's database, time-shifting, router switcher control, as well as standard program, spot and promo playback can all be handled by automation. Your operators should monitor your automation, not be stuffing tapes into it. ■



The Alamar MC-2095 automation computer in the foreground at KNBC-TV, Los Angeles.

Alioto, chief operating officer of Alamar, a wholly owned subsidiary of Philips, "you need a very open architecture if you're going to automate. For instance, you need a good traffic interface software package that can take the log generated by any traffic system and then convert it to a play list. You also should have a media management capability that lets you catalog and trace all media within the facility."

Third, the heart of an effective automation system is a comprehensive media management component. Today's stations must handle perhaps hundreds of tapes a day and several thousand over a couple of weeks or a month. To prevent errors and lost spots and programs, all of this media,

Ken Freed is a technical writer specializing in cable and interactive television, and is based in Denver.



" MOSES PARTS THE RED SEA. TONIGHT AT 10. "

DIGICART/II. THE VOICE OF MASTER CONTROL. No wonder it's used by virtually every major television network in the world. Fact is, DigiCart®/II is the industry standard for playback of bumpers, voice-overs, stingers, and effects. Nothing else organizes, archives, and instantly retrieves more than 10,000 sounds with digital quality and precision. It's networkable, uses both hard disks and removable media, and supports both fully linear digital audio and Dolby® compression. With programmable playlists, full GPI, and serial control, DigiCart/II is your best insurance against dead air, missed cues, and make-goods. So test drive a DigiCart/II in your facility at our expense. Call today and we'll send you one tomorrow.



DigiCart/II



360 Systems
PROFESSIONAL DIGITAL AUDIO



If you're a call-letter station, you can try DigiCart/II for 10 days with no obligation. If you decide to buy it, we'll arrange your purchase through one of our authorized dealers. Call (818) 991-0360 or fax (818) 991-1360 today.

e-mail: info@360systems.com • web: www.360systems.com

Test offer good in the continental US and Canada only. Test offer expires March 31, 1997. 360 Systems and DigiCart/II are registered trademarks of 360 Systems. ©1996 360 Systems

Circle (35) on Free Info Card

www.americanradiohistory.com



New directions in studio lighting

Is it time to replace your studio lighting system?

By Peter Bryenton

THE BOTTOM LINE:

The advantages of tungsten light are numerous, but efficiency and cost-effectiveness are not high among them. New lighting systems based on more efficient fluorescent technologies are making inroads, as the quality of their light moves closer to traditional tungsten bulbs, and users become more familiar with their applications. \$

T

elelevision is one of several color reproduction systems invented by people for people, so it isn't surprising that it needs much the same kind of illumination as the human eye. Therefore, because visible light energy includes wavelengths from roughly 400nm to 700nm, this is just the right stuff for broadcast-quality cameras, as well. Their light-sensitive chips have an inherent infrared response, but built-in optical filtering blocks this. (Consumer camcorders are unfiltered, however, as you will see if you use one to look at the emitting end of a hand-held infrared remote-control unit when it is transmitting.)

Figure 1 shows the output of a typical three-chip broadcast studio camera. It analyzes colors using overlapping bands of red, green and blue light. Ideal light would have a spectral content matching

Photo: This four-person news desk at KOIN-TV, Portland, OR, is lighted with SRGB products from Videssence.

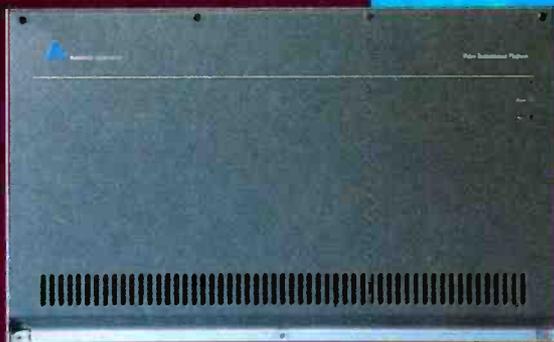
EFFICIENCY ISN'T MAKING A LONG STORY SHORT.

It's the ability
to compress the story into
digital video data compatible
with whatever format
you need.

Our TRANsend™ MPEG-2 program encoder is extremely well thought out. It compresses one video channel, plus multiple audio channels, and outputs an MPEG-2 data stream that's fully compliant at main profile at main level. These advanced encoders will ensure the highest quality video is maintained at output — no matter how variable the source material.

So, whether your input is in NTSC, PAL or D1 digital video, with either analog or digital AES/EBU audio, this versatile encoder will work for you. Plus, 10 of these encoders fit neatly into one plug-and-play platform. And, best of all, like every product in Harmonic's new digital lineup, the TRANsend MPEG-2 encoder incorporates our built-in NETWatch™ local and remote element management system!

As television, telecommunications and high-speed telecomputing continue to converge, Harmonic will be there in every uplink, headend and transmission center, with network products that keep you online. Simpler, faster and better.



VTP
Platform
MPEG-2
Program
Encoders



Harmonic Lightwaves
Transcending the ordinary.

www.harmonic-lightwaves.com
549 Baltic Way, Sunnyvale, California 94089, U.S.A.
tel: 800 730-4099 408 542-2500 fax: 408 542-2511

Circle (27) on Free Info Card



The Good News: The US HDTV

The Not So Good News: Your

The Options:

Option 1

Convert your existing equipment
into non-existing equipment



The HD6000, with serial digital I/O and a data rate of 1.5Gbps, is one of a range of ten HDTV processors from Snell & Wilcox designed to provide a seamless transition between all conventional and high definition standards.

Standard has been agreed
existing equipment is incompatible

Option 2

Convert from 1125/60
with 1035 active lines and
1920 pixels to 1125/59.94
with 1080 active lines
and 1920 pixels (and vice
versa) using the HD6000
High Definition Processor.



For more information please contact us at:

USA Tel: +1 408 260 1000 Fax: +1 408 260 2800 **UK** Tel: +44 (0)181 607 9455 Fax: +44 (0) 181 607 9466

France Tel: +33 1 45 28 1000 Fax: +33 1 45 28 6452 **Germany** Tel: +49 611 99 08 40 Fax: +49 611 30 57 36

India Tel: +91 11 641 2609 / 622 8014 Fax: +91 11 621 8777 **Japan** Tel: +81 3 3446 3996 Fax: +81 3 5449 7392

Russia Tel: +7 095 248 3443 Fax: +7 095 248 1104 **Singapore** Tel: +65 332 5455 Fax: +65 332 5466



HDTV by 

Circle (29) on Free Info Card

www.americanradiohistory.com

New directions in studio lighting

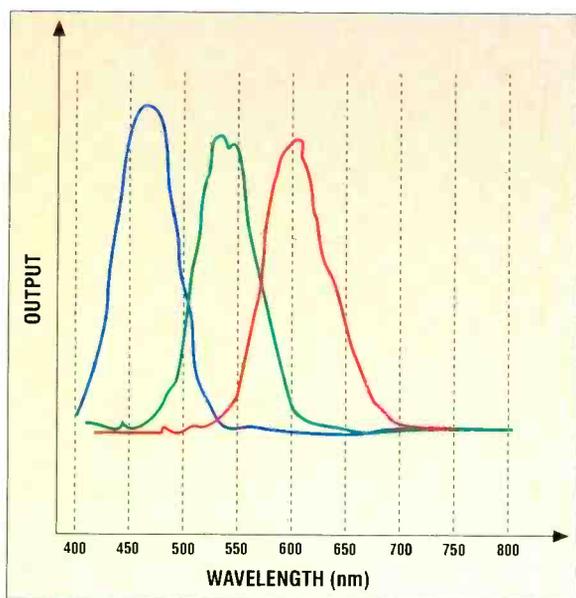


Figure 1. A typical camera's spectral response. (Source: BBC.)

these curves.

Color

One way to measure the performance

of lighting for any color-imaging system is to define the fidelity with which colors in the original scene are reproduced. A system has been devised: the color *rendering index*, with units (Ra) ranging from 0 to 100. Tungsten lamps mimic the sun's radiant energy and so have the maximum rating of 100Ra. Broadcasters generally accept anything over 70Ra as adequate.

Tungsten lamps remain the most common studio light source. The graph in Figure 2 shows they are weakest in their blue output, increasing through green to red.

They aren't terribly efficient either: little light out for power in. Most of the electricity making the bulb filament glow actually produces heat, which is radiated as infrared

energy. With cameras deliberately blinded to that energy, the situation is wasteful, and made further so because the unwanted heat must be removed by air-conditioning systems, which in turn consume even more power. An additional expense to broadcast facility construction is added by the difficulty in getting these big air conditioners to work quietly for sound-recording purposes.

Containing errant light

Fresnel spots offer easy beam control with their lenses and barn doors. Naked, they are a cruel thing to shine onto a face, however. Used carelessly, they can appear to age the talent. Softer light is needed for flattering portraiture. Unfortunately, the untamed soft stuff escaping from man-made lighting units tends to go everywhere. Unchecked, it can flatten a scene, lifting shadows to the point where modeling is weak, contrast is lowered and colors become desaturated.

Lamp head design can help. Adding louvers or deep baffles to a soft light

The Look of Kino Flo

Flatter the talent and make your set sparkle with the cool, lustrous light of Kino Flos. Only Kino Flos provide a true match to quartz or daylight. Controllable, portable and durable, Kino Flos pack a powerful punch, yet run on an energy-lean diet.

For studio or location. Serious light you can stand by.



K I N O F L O

10848 Cantara Street Sun Valley, CA 91352
818-767-6528, Voice 818-767-7517, Fax
Circle (30) on Free Info Card



LOOKING
FOR A
SYSTEM THAT
DOES IT
All?

Telect's VersaFrame™ 2000 is your all-in-one modular frame for professional audio and video signal management. The uniquely flexible VersaFrame supports analog and digital audio and video equipment, all with "hot swapping" capabilities to



Telect VersaFrame™ 2000 And Modules

MODULARITY YOU CAN MIX AND MATCH.

- Routing
- Control
- Audio
- Analog
- Distribution
- Conversion
- Video
- Digital

allow reconfiguring without shutting down the system. Individual Pro A/V modules dock in the VersaFrame for easy custom system configuration.



Only one audio/video frame does it all—Telect's VersaFrame. For

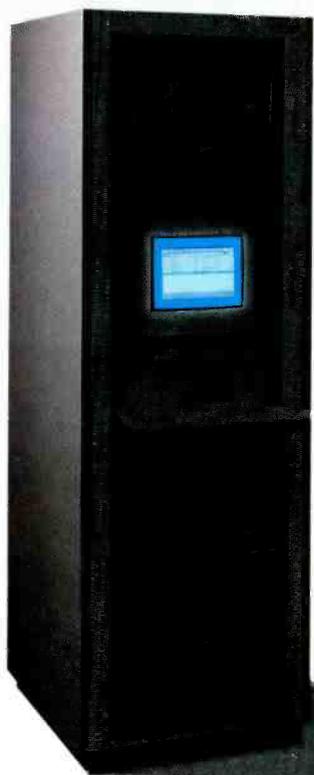
more information, call today: 509.926.6000 or 800.551.4567. Or visit our web site:

www.telect.com.

Circle (36) on Free Info Card

Telect
CONNECTING THE FUTURE

Hello, I'm "Roswell".



Let me introduce myself.

My award-winning creators at Odetics Broadcast set out to build a practical solution to a monumental problem. This problem has the potential to overwhelm those who are not prepared for it.

Today's world of on-air presentation won't resemble what you will face tomorrow — a future filled with digital compression, data networking and digital storage requiring much more complex management systems. Odetics is the first to fully recognize the size of this issue, and to confront it head on.

These visionaries have answered this need with a holistic solution that totally integrates the management of material, media, resources and data. They've decided to call me Roswell, and I'd like to introduce myself.

I'm the first forward-thinking Facility Management System that does it all.

This is no time to be humble, so let me be perfectly clear.

I'm a thinking machine that's scalable and extensible to cover your needs, no matter how small or large. There isn't a current or future facility management issue I can't handle. I'm even going to take care of issues and technologies that haven't been conceived yet.

And I'll adapt to any size operation in a cost effective manner, from a single channel television operation to the most sophisticated installation on the planet.

Ethericals, terrestrials and data storage systems; I command them all.



I'll not only control the devices currently in use at your facility, but I'm prepared to manage a new generation of equipment, and in much smarter ways. I'm just as happy to control your automated video tape library as I am your master control switcher, routing switcher and graphics devices.

You'll find that I make this easy with my graphical user interfaces. And, I track all the material on all the different storage media across the facility without breaking a sweat.

I'm object oriented and Microsoft Windows NT 4.0 savvy. My applications will automate the way you acquire, manage and present your spots and programs. I'm built on a client-server architecture so I'm very flexible in meeting your needs, with plenty of room to grow. In fact, I'll control up to 160 broadcast devices in real-time, on up to 50 on-air channels.

I'll be your best friend, forever.

I'm not just some shooting techno star, I'm your unconditional friend for the long haul because of my dedicated family at Odetics Broadcast. As your needs grow, so will I. I've been designed to be open, to provide unprecedented interconnectivity.

My Oracle relational database management system will provide better integration with your traffic and news departments than ever before.

Every so often there's a significant advancement in the application of technology. I'm that breakthrough for you, and I want to make your television operation future ready.

Please call one of my associates at Odetics Broadcast to learn more about me. Or check with me on the Web at: <http://www.odetics.com/>



CONSOLE COMPATIBILITY



Two-bay Winsted Rack Console

One Brand of Consoles Compatible With All Video Electronics Brands

There are a lot of electronic brand names out there, but no matter what brand of electronics you own or what video editing system you use, there is one console brand that will fit your needs like a glove. **Winsted**. Of course, most racks sold meet EIA standards, but Winsted goes further by offering over 100 standard consoles from which to choose with many designed to house specific editing systems. And, with our exclusive System/85 modular components, there is an infinite number of configuration options available.

Check out our newest catalog or talk to a Winsted design engineer and we guarantee that you'll find it the perfect console brand for your video needs - no matter what brand of electronics you want to put in it.

FOR A FREE CATALOG CALL OR WRITE

1-800-559-6691

Winsted®

10901 Hampshire Ave. So., Minneapolis, MN 55438-2385
Fax: 612-944-1546 • Web site: www.winsted.com • email: racks@winsted.com

Preferred by Professionals Worldwide™

Circle (38) on Free Info Card

New directions in studio lighting

restricts the beam width and shape, thus limiting the amount of unwanted light released in the studio.

Lighting isn't everything

Successful video images take more than just good lighting. The set designer can also make a positive contribution. Separating vertical planes by putting plenty of distance between surfaces allows space for light to fall off naturally. This opens the possibility of differential exposure between foreground and background planes.

Introducing color as an integral part of the overall design helps to maintain saturation. Textures, absorbent and reflective surfaces all add interest. The lighting director completes the picture, enhancing the illusion of three

Tungsten is still essential for large-area coverage where clean shadows thrown from afar are needed.

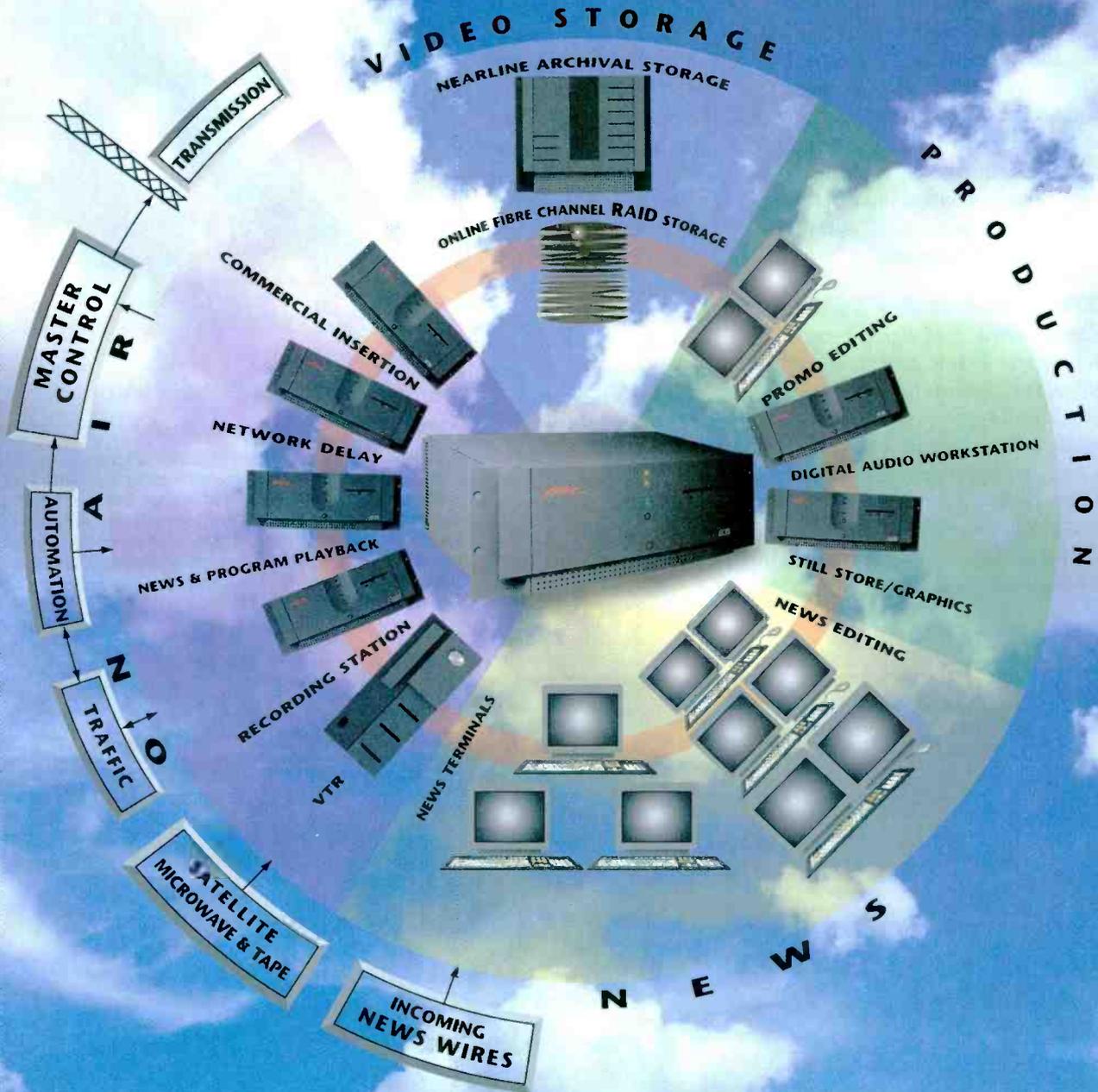
dimensions with light and shade in appropriate quantity, quality and direction. The most interesting set will look flat and boring if lit only with frontal soft light. Whatever the light source, if it's in the wrong place, everything becomes two-dimensional.

The cost of tungsten

In today's energy-conscious culture, tungsten is greedy, not green. Accountants are looking to reduce running costs in simple, contemporary studio setups located in modest buildings. In addition to the inefficiency and high infrared heating problems noted earlier, bulb life is also a concern. A good tungsten bulb only lasts about 250 hours.

Furthermore, consider that a large chunk of the capital investment required for a new studio is to support

NO OTHER BROADCAST VIDEO SERVER DELIVERS MORE.



ASC's VR300™ Broadcast Video Server is more flexible, more scalable, and more reliable. With 1,066 Mb/sec available bandwidth, it provides up to 24 simultaneous channels and 96 hours of online digital storage.

VR300's building-block approach makes it easy to expand channel capacity without purchasing unneeded storage. ASC's open systems design ensures compatibility with leading automation and newsroom systems.

VR300 features hardware redundancy, software RAID technology, and FibreDrive™, ASC's exclusive Fibre Channel architecture.

FibreDrive incorporates high-bandwidth Fibre Channel RAID storage to eliminate bandwidth restrictions, SCSI bottlenecks, and single points of failure. Direct access to digital storage means last minute changes can always be made easily and instantly.

With no tapes to transport and no data files to transfer, VR300 takes integrated digital operations to new heights.

For more information, call 818-843-7004 for a free white paper, "The FibreDrive Difference."

ASC
The FibreDrive Difference™



New directions in studio lighting

the overhead lighting suspension system. Structural walls and floors are built on foundations of cash.

The tungsten studio lamp has long been the standard for TV productions. While advances in TV technology have happened at an astonishing rate recently, the basic design of the Fresnel spot lamp has changed little in 60 years. Small wonder then that some have started looking at alternatives for the new millennium.

Fluorescent studio lighting

Often called *cold lights* because of their relatively low operating temperatures, fluorescents have been around since the 1940s. Commonly, a low-pressure mercury vapor tube produces mostly ultraviolet light. A coating of phosphors on the inside walls of the glass envelope reacts to this ultraviolet energy by emitting visible light: *fluorescence*.

In the cold-light tube, some of the energy transfer incurs a slight delay, introducing an after-glow: *phosphorescence*. Modern tubes have an efficacy of at least three times that of tungsten, generating upward of 75 lumens per watt. The right mix of three phosphors makes visible light in the broad bands of red, green and blue.

The light output of fluorescents is neither continuous in time nor constant in level. Fluorescents flicker at main frequencies, which may be noticeable in our more motion-sensitive peripheral vision. A camera scanning at a different frequency may strobe. If the lamps run at high frequencies relative to

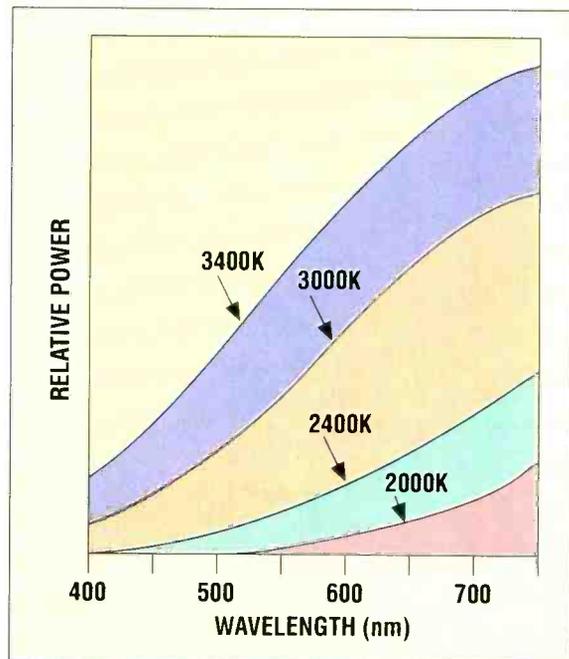
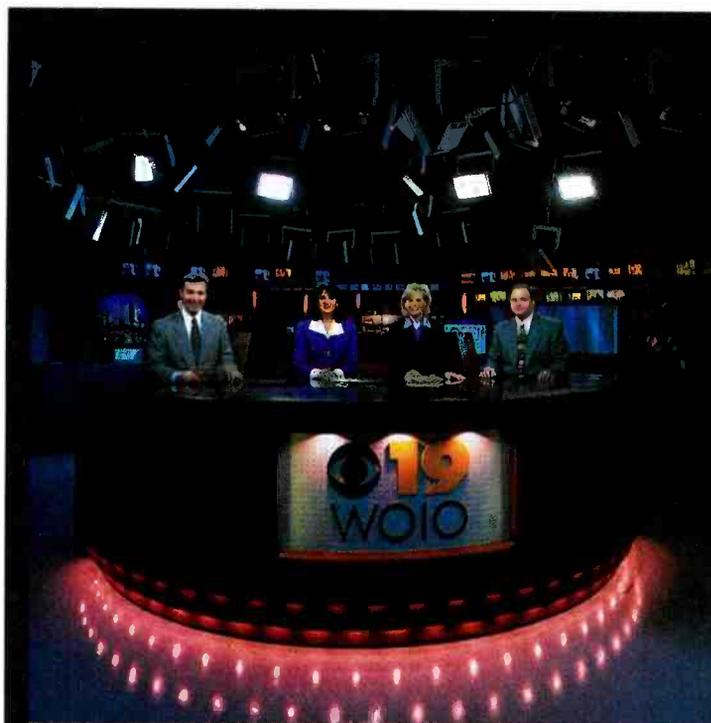


Figure 2. The spectral power distribution curves of tungsten lamps at four different color temperatures. The efficacy of the lamp increases at higher color temperatures because more visible light and less infrared light is emitted for a given wattage. Typical efficacies for tungsten filament lamps would be about 25 lumens/watt at 3,200K with a color rendering index of 100Ra. (Source: "The Reproduction of Color," by R.W.G. Hunt.)



VIDESSENCE

Media Lighting



- Dramatic Lighting
- Perfect Chromakey Illumination
- Stage Craft/Specialty Lighting
- Power Distribution
- Dimming Systems
- Design/Installation Services

1-800-579-7577
FAX 1-415-579-7579
visit the COOLIGHT CAF...
www.videssence.com



"We are extremely pleased with the quality look provided by our Videssence System. The dimmable feature provides a flexibility that is not possible with other lighting systems. Our unique turn-table (180°) news desk created challenges in properly lighting each of the many anchor positions. The Videssence fixtures, dimming strips and control console give us quality lighting on our talent. We achieved excellent lighting. We attained our goal of reduced energy costs and heat loads in our working news room space."

- Harry E. Wilkins, Director of Engineering, WOIO, Cleveland, Ohio

Circle (47) on Free Info Card

*Our Routing Switchers Never
Call in Sick ...*



**Routing Switchers have to deliver everyday, all the time.
It's that simple.**

Datatek has been supplying teleproduction facilities with the most reliable family of Routing Switcher Systems since 1970. All Datatek Routing Switcher Systems feature:

- Total upgradeability
- Support for all signal formats
- Same frame mixing of analog and digital formats
- Full compatibility in mixed digital/analog facilities
- Fully modular architecture
- Advanced, comprehensive control system
- Same protocol, large & small routers

Every Datatek Routing Switcher is delivered with twenty-seven years of experience and a tradition of service.

For additional information contact
Datatek at 1121 Bristol Road,
Mountainside, NJ 07092
Tel: 908-654-8100
800-882-9100
Fax: 908-232-6381

D
DATATEK
CORP

Circle (48) on Free Info Card

www.americanradiohistory.com

New directions in studio lighting

the camera scanning rate, they will appear flicker-free, however.

The combination of an appropriate phosphor color balance and high flicker frequency has led to the development of successful broadcast lighting systems using fluorescent technology. This approach is generally referred to as *sustained RGB* (SRGB), and is most notably associated with the lighting manufacturer Videssence, which has pioneered much of the development in this area.

Videssence's light fixtures use what the manufacturer calls *tri-phosphor* tubes. There are two color-balanced versions offered: daylight and tungsten, so mixing these units with other forms of lighting is not a problem. Using the color-rendering index, Videssence bulbs have been measured at 87Ra. SRGB lighting can also be fitted with the light control fixtures mentioned earlier, to keep errant light

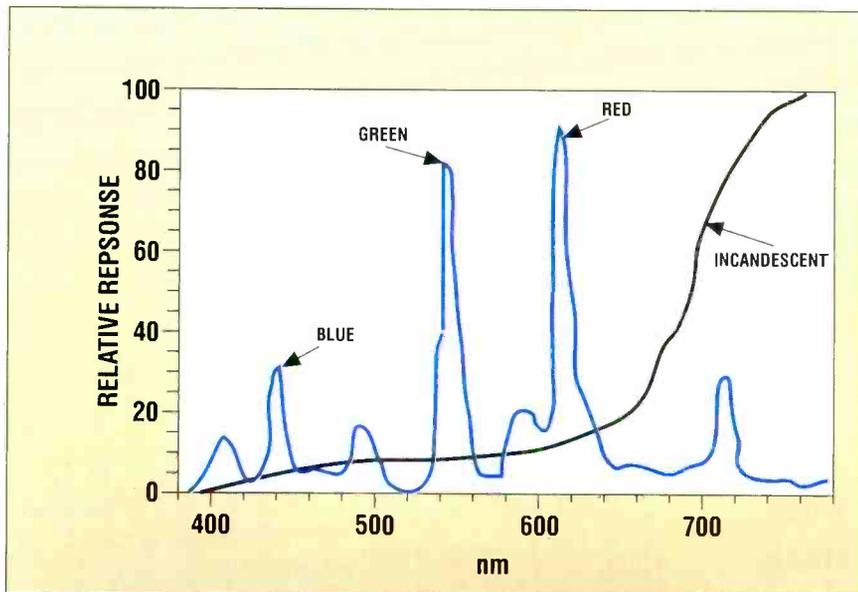


Figure 3. Exemplifying the emission of today's fluorescent studio lighting is this spectral plot from a Videssence SRGB 3000K lamp.

under management.

SRGB lighting is also attractive because its tubes have long life spans. The ones used by Videssence are rated at 10,000 hours, about 40x that of the typical tungsten bulb.

Controlling fluorescents

The basis of dimming fluorescent lights electronically has been known for a long time, but it's only recently been possible to make the controllers small, low-cost and reliable enough to

October 24-26, 1997 • Sands Expo Center, Las Vegas

FOR GROUND-BREAKING INNOVATION IN ENTERTAINMENT DESIGN AND TECHNOLOGY... Hit the jackpot at LDI!



- LIVE PERFORMANCE ♠ THEMED ENVIRONMENTS
- CLUBS ♦ CONCERTS ♥ THEME PARKS ♣
- CRUISE SHIPS ♠ SPORTS FACILITIES ♦ PERFORMING
- ARTS VENUES ♥ RETAIL ♣ RESTAURANTS
- CORPORATE & SPECIAL EVENTS
- ARCHITECTURAL LIGHTING ♠ FILM ♦ TELEVISION

The fastest-growing themed entertainment capital of the world—Las Vegas!

CELEBRATE THE 10TH ANNIVERSARY OF NORTH AMERICA'S LARGEST ENTERTAINMENT DESIGN AND TECHNOLOGY SHOW.

LDI 97
10th Anniversary

Be a winner at LDI97, with more than 300 international manufacturers and distributors in over 200,000 sq. ft. of exhibits. Hot new products right off the drawing board. The latest in lighting, audio, pyrotechnics, lasers, hardware, software, staging and rigging. Workshops and hands-on tutorials. Backstage Las Vegas tours. And a special 10th anniversary celebration. All at Lighting Dimensions International—LDI97.

PRESENTED BY LIGHTING DIMENSIONS™

TCI

S&VC
sound & video contractor

VIDEO
Systems

AND ESTA

TOGETHER WITH millimeter

BROADCAST engineering

WORLD BROADCAST™
News

IMAGE

SHOPPING CENTER

Entertainment Services & Technology Association

For more information call Interfec Presentations • 1-800-288-8606 • Fax: 1-303-770-0253

Circle (62) on Free Info Card

TRANSPARENCY

I s E v e r y t h i n g



NVISION's family of high performance Precision Interfaces for AES audio A to D, D to A, and Sample Rate Conversion, will add total and transparent connectivity to your digital system. Tested to meet our new **dbi** standard, these interfaces are affordable and reliable, and clearly illustrate NVISION's "Customer Driven" design philosophy - a philosophy that goes into every product we make. No messy glue. No awkward adapters. Just **100% pure genius**. For more information on these and other precision products, call us at 1-800-719-1900. Please call for a current catalog, a copy of THE BOOK, or The Video Engineer's Guide To Digital Audio.

NVISION[®]

Circle (50) on Free Info Card

www.americanradiohistory.com

New directions in studio lighting

be practical. This allows dimming at constant color temperature over a wide range of brightnesses.

When a tungsten lamp is dimmed conventionally, it changes its color significantly. Faded between 25% and 100% of its output, changes of +/- 150K are experienced. This is noticeable on pictures, but can be recovered by altering the color balance of the camera channel using the red, green and blue "paint pots." Such remedial requirements can be reduced significantly with constant color-temperature dimming systems. Dynamic (real-time) color correction is still desirable in order to accommodate changes in optical flare as cameras move or change lens angle, however, regardless of the type of source illumination.

Using SRGB products

Makers of SRGB lighting provide a wide variety of lamp heads. The larger ones are designed for studio rigs and

the smaller designs for location use, though a flexible working philosophy that views any lamp as a light source shouldn't restrict the way they are used.

For more unusual situations, there are a range of modular units that can be assembled as required, making conferencing, tabletop product shots and animation work less cumbersome. (Plasticine models won't be as warm and pliable as they used to be, but at least the dinosaurs won't droop from the heat in the desert scenes.)

Some users have complained that SRGB makes a set look flat and two-dimensional. However, the technology has become quite popular with talent who appreciate the cool working conditions it provides. Studio owners and their accountants are also convinced of its value in reducing the costs of facility construction and operation.

Application-based solutions

So is tungsten dead? No! A big, powerful tungsten lamp is still essential for large-area coverage where a

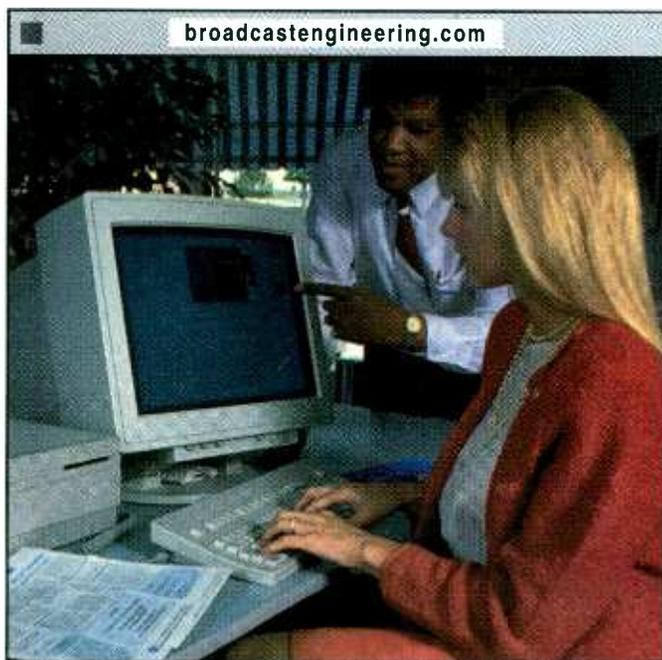
single set of clean shadows thrown from afar is needed. Studio dramas involving sunshine or moonlight are done that way. Entertainment shows with live audiences (where the action may need to be lit from behind a large seating area) sometimes need long throws and high output levels. So, tungsten isn't dead — it's just not dead center stage these days. It has taken a more mature and balanced place in the field of contenders for creative lighting. Relatively new technology like SRGB lamps have earned their rightful place, too. Lighting designers must use what is appropriate in order to produce elegant solutions to modern video lighting challenges. ■

Peter Bryenton is a lecturer at the BBC's Centre for Broadcast Skills.

**FOR MORE
information**

Circle (150) on Free Info Card. See also "Lighting - Portable" and "Lighting - Studio," pp. 30-32 of the *BE Buyers Guide*.

There's no reason to miss the NAB Convention this year.



In fact, invite your whole crew to attend the 1997 NAB Convention on *Broadcast Engineering's* groundbreaking Internet Show Daily site. Be there all four days beginning April 6, hearing the buzz, getting news as it occurs, and learning about new products as they're announced. All this with a click of your mouse.

Now all of your staff will have the latest show information at their desks while they're keeping your signal on the air and productions on time.

The industry's first Internet Daily features *Broadcast Engineering's* editorial staff and includes topical updates from the editorial teams of *BE Radio*, *Lighting Dimensions*, *Millimeter*, *Satellite Communications*, *TCL*, *Video Systems*, and *World Broadcast News*. Cover all the NAB '97 hot buttons with the industry's leading group of communications magazines.

Be a part of the NAB Convention with the best at <http://www.broadcastengineering.com> April 6 through September 12, 1997.

For Internet Daily advertising opportunities, contact The Eidolon Group Inc., 800-901-8202 or e-mail robt@eidolongroup.com.

EIDOLON™

The stuff that dreams are made of...

**BROADCAST
engineering**

Circle (63) on Free Info Card



Space age CCD-cameras don't fit on iron age pedestals

The new Sachtler Vario Pedestals offer unique features for studio and OB operation:

- 1** Continuous column stroke, for shooting from sitting to standing person's height – Vario Ped 2 - 75.
- 2** Rock steady and 50 kg/110 lb lightweight, to carry equipment up to 90 kg/200 lb – Vario Ped 1 - 90.
- 3** Carriage and column can be disassembled in seconds – compact modules for ease of transportation.

4 Quickfix, allows instant change of fluid heads for flexibility – included.

5 Track width, narrow and wide, symmetric and asymmetric – set

in no time
and you
well can



expect precise, easy steering and crabbing, smooth and jerkfree column movement thanks to the patented Sachtler pneumatic system. Test for yourself the optimum camera support for all compact Studio/OB cameras, now!

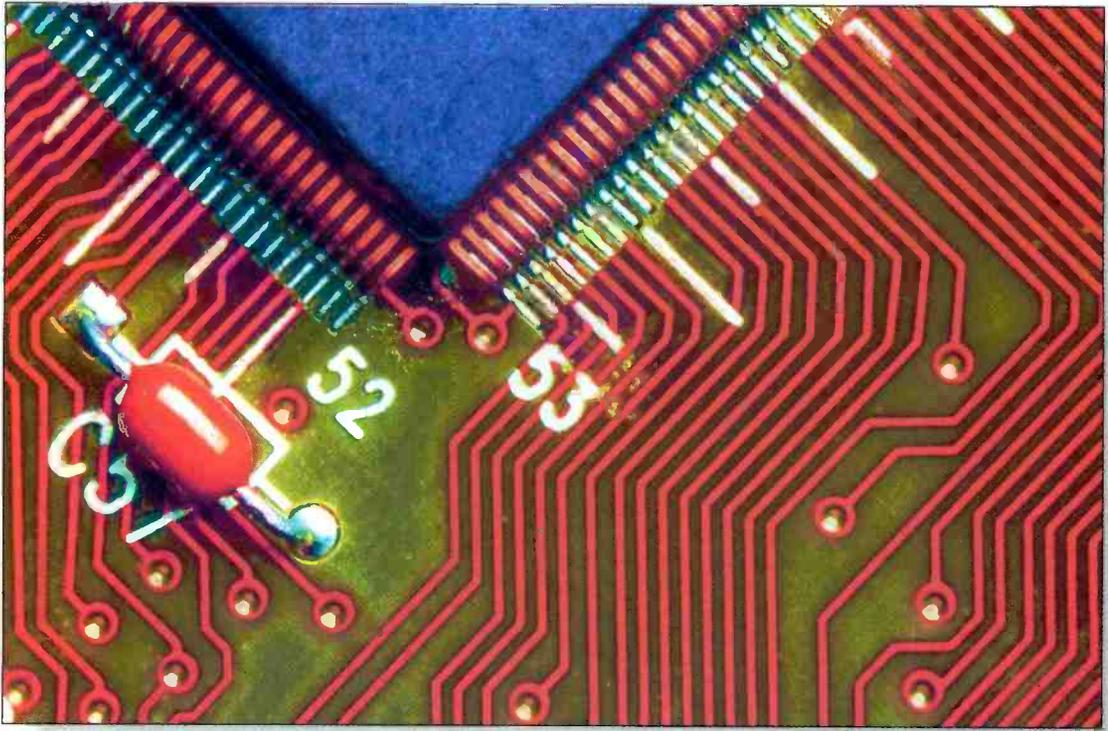
55 North Main Street
Freeport, N.Y. 11520
Phone (516) 867-4900
Telex 140 107 sac frpt
Fax (516) 623-6844

California office:
3316 West Victory Blvd.
Burbank, CA 91505
Phone (818) 845-4446



sachtler
corporation of america

Circle 31 on Free Info Card



Understanding digital telecom services

Digital technology is affecting significant change in the wired telecommunications world.

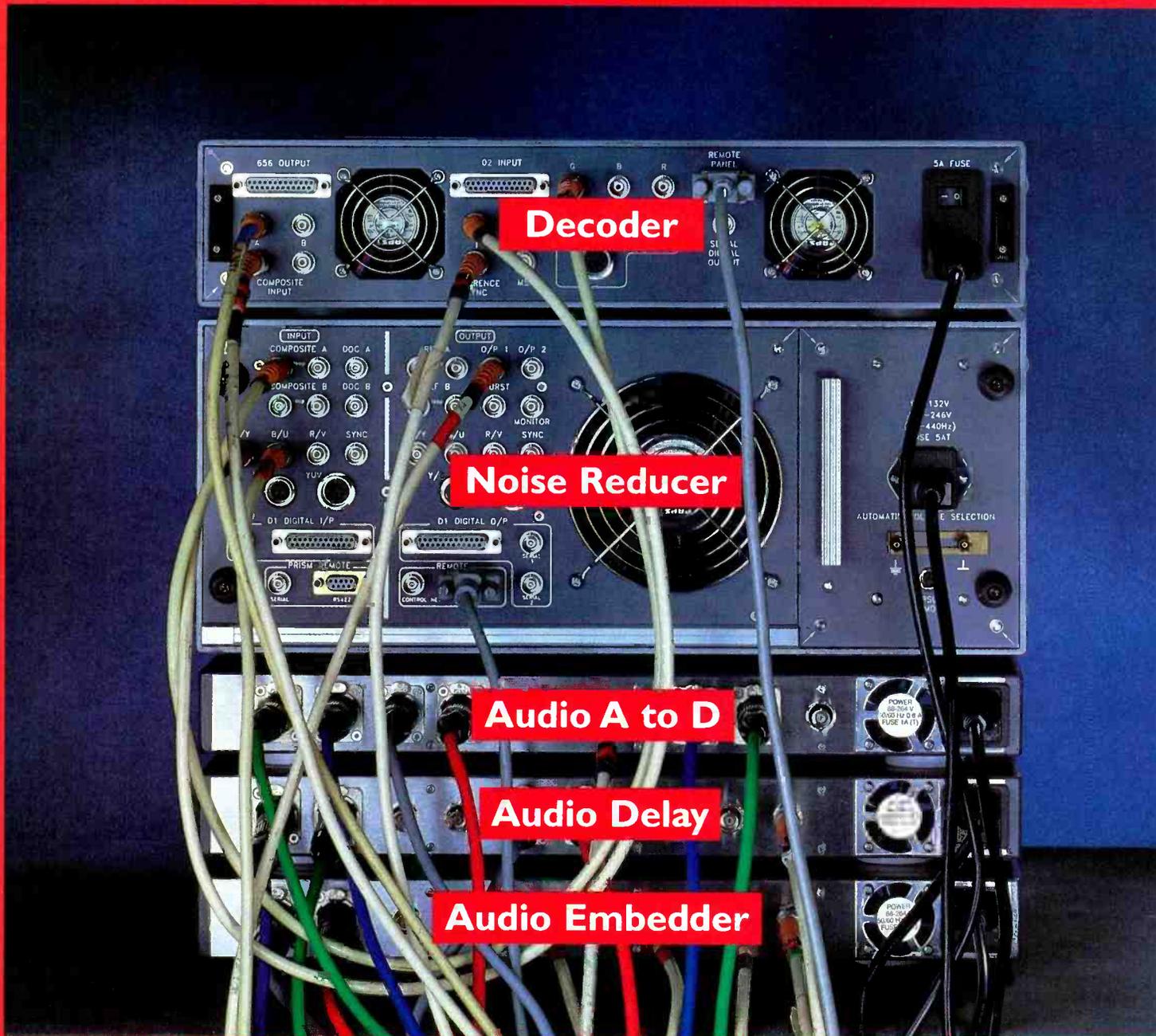
By Ken Freed

THE BOTTOM LINE:

For acquisition, production or distribution, television has long used telecommunication lines. New technologies have vastly changed this landscape, however, and broadcasters need to have at least a basic understanding of what kinds of services are available today or emerging for the near future. \$

Broadcast content often contains video and audio that at some point was carried by telephone networks. This technological partnership between broadcasting and “telco” has existed since the earliest days of wireless, but changes always seem to take place faster in the telecom world than in broadcasting. This challenges broadcasters to keep up with what telcos are up to, and lately, there’s been plenty of movement afoot.

Consider the telco infrastructure. For a phone call, an analog signal goes from the customer’s telephone



Decoder

Noise Reducer

Audio A to D

Audio Delay

Audio Embedder

When first compressions count, you can count on Snell & Wilcox.

It was the word "compression" that gave us the idea

It takes a whole stack of black boxes to convert analog signals for compressed satellite transmission.

Or rather, it used to.

Now we have integrated all these functions into a single 2U box, cutting down on cost, real estate and the potential for connector glitches.

The unique PROFIX draws on our award-winning compression pre-processing technology. It employs sophisticated Snell & Wilcox decoding and noise reduction. And, for ultimate signal handling convenience, it also incorporates embedded audio.



PROFIX MDD3000 Decoder Pre-processor



For more information please contact us at:

USA Tel: +1 408 260 1000 Fax: +1 408 260 2800 **UK** Tel: +44 (0)181 607 9455 Fax: +44 (0) 181 607 9466

France Tel: +33 1 45 28 1000 Fax: +33 1 45 28 6452 **Germany** Tel: +49 611 99 08 40 Fax: +49 611 30 57 36

India Tel: +91 11 641 2609 / 622 8014 Fax: +91 11 621 8777 **Japan** Tel: +81 3 3446 3996 Fax: +81 3 5449 7392

Russia Tel: +7 095 248 3443 Fax: +7 095 248 1104 **Singapore** Tel: +65 332 5455 Fax: +65 332 5466



Circle (40) on Free Info Card

www.americanradiohistory.com

Understanding digital telecom services

handset over "plain old telephone service" (POTS) lines to the *central office* (CO) of the local exchange carrier. From there, calls directed beyond that CO are digitally encoded, switched and multiplexed with other calls for trans-

strictest telco definition, this terminology only applies to the copper implementation of service networks at these data rates.) The line classes vary by bandwidth capacity. (See Table 1.) As benchmarks, keep in mind that uncompressed serial component digital video needs about 240Mb/s, yet an MPEG-2 datastream requires a pipeline of 3Mb/s to 30Mb/s, depending on the amount of compression applied.

T1 lines can handle low-end MPEG-2.

The distribution of a single wideband data signal over multiple data circuits is the opposite of what telco does with voice-grade circuits on such digital links. Instead of bundling separate signals into one datastream, a single high-speed datastream is spread across several digital circuits. Such a process is called *inverse multiplexing* (IMUX).

A DS3 line can handle 44.736Mb/s, sufficient bandwidth for real-time and non-real-time acquisition, production and broadcast of compressed NTSC for full-motion video at 30fps. DS3 can also handle one or two MPEG-2 channels with room for additional data overhead.

IMUXed DS3s can handle transport of digital video recordings in formats like D-1, as used by the film industry, TV network production, satellite broadcast centers, cable and wireless head-ends and testing of telcos' *Open Video Systems*.

At the other extreme, there are still numerous installations of *Switched-56* service. Switched-56 can stream low-end video like QuickTime and AVI for computer applications.

CLASSES OF DIGITAL TELECOMSERVICES	BITRATE	MONTHLY RATES	APPLICATIONS
BASIC ISDN (2B+D)	128kb/s	\$25 - \$100	DESKTOP VIDEO TELECONFERENCING (15 fps) QUICKTIME AND AVI ISDN MODEMS MOTION-JPEG
PRIMARY ISDN (23B+D)	1.288 - 1.472Mb/s	\$600 - \$1,200	HIGH-END VIDEO TELECONFERENCING (30 fps) ISDN MODEMS MOTION-JPEG MPEG-1
DS1 (T1)	1.536Mb/s	\$400 - \$1,000	"APPROVAL QUALITY" VIDEO LOW-SPEED CABLE MODEMS MOTION-JPEG MPEG-1 MPEG-2 ON MULTIPLE T1
DS3 (T3)	44.736Mb/s	\$2,000 - \$10,000	"BROADCAST QUALITY" & COMPRESSED NTSC HIGH-SPEED CABLE MODEMS MOTION-JPEG MPEG-1 MPEG-2 D1 ON BUNDLED DS3

Table 1. The four digital telecom services most widely used by today's broadcasters.

mission on copper or fiber backbones to destinations where other COs decode the signal and switch it to another analog telephone.

That may work fine for voice calls, but broadcasters undertaking digital operations are increasingly reliant on upgraded telecom facilities that provide sorely needed wide bandwidth. Digital telecom services support higher data rates than analog can deliver, which equates to higher-quality signals.

Transmission-line principles still apply, and in the digital world this means that the shorter the telco line, the faster the *bit rate* it can handle. Engineers can benefit from understanding the kinds of digital telecom services available, the methods of gaining access to them and how to apply them to broadcast operations.

DS1 and DS3

A place to start is with understanding the four major classes of digital telco lines: DS1, DS3 and two forms of Integrated Services Digital Network (ISDN), each involving paid carriage over multiple twisted pairs. (DS1 and DS3 are also known as T1 and T3, but in the

In telco parlance, a line able to handle one digital signal is labeled a Digital Service zero (DS0). The voice-grade audio carried on a DS0 is sampled at 8kHz, with eight-bit PCM resolution. Each DS0 produces a 64kb/s data rate. When 24 DS0s are multiplexed into one signal, the result is a DS1, with its effective data rate of 1.536Mb/s. (An additional 8kb/s of sync data brings the actual DS1 throughput to 1.544Mb/s.)

Further multiplexing allows higher bandwidths to be carried on fewer cables. These include DS2, which combines four T1 channels for a throughput of 6.3Mb/s; DS3, which provides 28 DS1s for a data rate of 45Mb/s; and DS4, which offers 168 DS1 channels for a total data rate of 274Mb/s. The most common services used by the TV industry are DS1 and DS3 lines, which are available in and between larger cities.

DS1 can deliver at least "approval quality" video. The service supports cable modems, low-end Motion-JPEG and MPEG-1. DS1 offers variable, non-real-time video acquisition, production and post applications, including digital effects systems when bundled. Multiple

ISDN

Besides DS1 and DS3 lines, the most ubiquitous digital telecom service is ISDN. Deployed as an eventual replacement for POTS, ISDN has two classes: 1. ISDN's *Basic Rate Interface* (BRI), for domestic consumer use, includes two 64kb/s "B" (*bearer*) channels for content, plus one 16kb/s "D" (*Delta* or *Data*) channel for address signaling and other call-direction data. Designated "2B+D," ISDN BRI operating in IMUXed fashion at 128kb/s is suitable for desktop video applications. The BRI also supports non-real-time Motion-JPEG for TV production and post-production.

2. Intended for business customers, *Primary Rate Interface* (PRI) ISDN provides 23 "B" channels of 64kb/s each, plus one 64kb/s "D" channel. ISDN PRI can handle IMUXed bit rates up to 1.47Mb/s, and can provide high-end "viewphone" services at 30fps or real-time M-JPEG for production and post, as well as MPEG-1 for multimedia production.

Responding to demands by PC users for faster Internet access, most local telcos offer ISDN lines. ISDN is a switched service, meaning that it can be

MOBILE DIGITAL TV PRODUCTION ACCELERATING AHEAD-OF-THE-ART



Floor it! That's the attitude our engineers had when conceiving, designing and building our mobile digital video production vehicle. We found a place for every piece of high-tech gear that could possibly be placed on board. And then we found room for more. Consider: 18 camera-capability, 96 audio channels, 10 Digital Beta record/players, 2 Beta SP record/players, 4 VHS machines, 2 video servers and 4 quad splits. You can find lots of smaller, older, slower production vehicles. But you can only get the best from one place. The National Digital Television Center (NDTC). Berthed in Los Angeles and operational anywhere in the continental United States, our mobile vehicle provides the utmost in advanced digital audio/video production services. When it comes to technology, we're the ones who put the pedal to the metal.



photo: Bud Shannon Photo, Inc



photo: James Harvey

Get rolling into the 21st century, call: 303-486-3800



NDTC National Digital
Television Center

4100 East Dry Creek Road, Littleton, Colorado 80122

© 1997, NDTc, INC

Circle (41) on Free Info Card

Understanding digital telecom services

“dialed-up” and connected to any other location on the worldwide ISDN network if compatible equipment exists at both ends whenever a circuit is required. Point-to-multipoint bridging can be established with ISDN, as well. DS circuits, on the other hand, are fixed, permanent lines between two dedicated locations, similar to telco’s traditional analog program loops.

Digital telecom services appear affordable. ISDN BRI service runs from \$25 to \$100 per month. Primary-rate ISDN may range from \$600 to \$1,200 per month or more. DS1 (T1) lines go for \$400 to \$1,000 per month. Monthly DS3 service starts at \$2,000 and goes up to \$10,000.

Before you pencil a budget, add to your calculations the per-minute charges for some ISDN services on top of the monthly rate. If any long-distance ISDN trans-

port is used, the LD carrier’s charges are incurred atop any local carriage costs. The biggest hit can come from installation charges, depending on location.

Digital subscriber lines

Like ISDN, *digital subscriber lines* use the existing POTS wiring network. Various forms of digital subscriber lines (xDSL) include *asymmetric* (ADSL), *single* (SDLS), *high data-rate* (HDSL) and *very high data-rate* (VDSL). DSL’s biggest hurdle is the high cost of terminal hardware, which becomes a problem when telcos consider the deployment of thousands of set-top boxes.

Of available digital subscriber lines, ADSL seems the best-suited for video applications because most of the bandwidth is devoted to the “downstream” traffic. ADSL offers just enough upstream bandwidth for sending instructions on what to send downstream. ADSL downstream capacity yields at least VHS-quality video at 30fps, which may be deemed approval quality for some production and post applications.

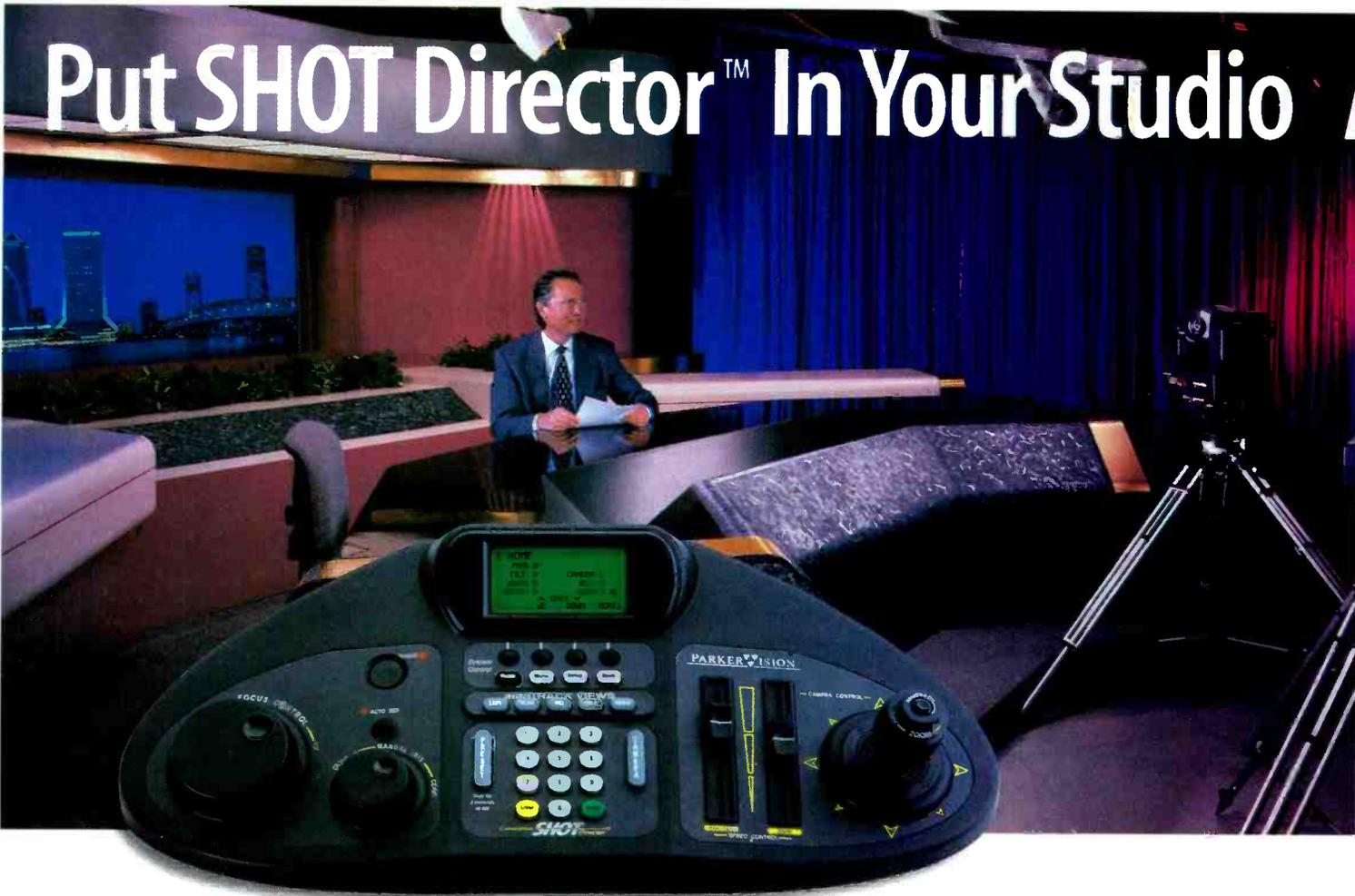
VDSL, while still a young technology, may rapidly grow up to handle MPEG-2 for HDTV.

An ADSL circuit on a twisted pair uses frequency division multiplexing and echo cancellation to create three asymmetric channels for downstream, upstream and POTS traffic. The downstream channel handles 1.5Mb/s for circuits up to 18,000 feet. On shorter distances, ADSL can carry up to 6.1Mb/s on paths of 9,00 to 12,000 feet. Most recently, ADSL service has upgraded to 9Mb/s downstream. The upstream duplex channel handles 16kb/s to 640kb/s over the same distances, with shorter circuits yielding faster carriage. ADSL circuits also include one 64kb/s POTS channel.

As telco infrastructure matures, ADSL modems will accommodate ATM transport for MPEG-2. Applications then may expand beyond Internet access to include interactive multimedia, video-on demand, interactive games, electronic commerce, and other services.

As DSL matures, expect broadcast

Put SHOT Director™ In Your Studio



applications to increase. For instance, VDSL7 at 13Mb/s to 52Mb/s can transport NTSC and HDTV. For local stations wanting to offer wide-screen digital television, the use of existing copper networks to homes might help lower implementation costs. VDSL circuits then could be modified for asymmetric upstream traffic, which would support interactive HDTV.

Fiber services

Where operating budgets allow, the best video transport choice is an optical fiber line. High-bandwidth fiber-optic paths provide unsurpassed signal integrity and video resolution.

A widely adopted, open standard for fiber network operation is called *Synchronous Optical Network* (SONET). SONET permits compliant devices from competing manufacturers to communicate. Users of one encoder, for instance, need not worry about optical "mid-span meet" mishaps when the signal reaches another vendor's light-wave decoder at the other end of the

line. Standardizing the optical signal's characteristics allows SONET to support "multivendor interworking."

One SONET synchronous transport signal (STS-1, or its optical equivalent, OC-1) has a rate of 51.48Mb/s. SONET, therefore, begins at about 5Mb/s faster than DS3, and at roughly the same speed as today's best VDSL performance. A compressed HDTV signal needs about 50Mb/s, so each OC-1 channel has the capacity for one "ATV channel." Higher multiples of OC service increase the available bit rate. Imagine multichannel service to the consumer on OC-3 at 155Mb/s.

Here's where synchronicity enters the scene. Telecommunications companies often lay fiber in anticipation of demand. Sometimes, unused fiber exists between where you are and where you need your signal to be. Any unlit optical link is called a "dark fiber," and dark fiber produces no revenues. Telcos and other telecom service providers with dark fiber may be willing to make deals to light up their lines.

Completing the circuit

For applications where lower speeds suffice, Basic- and Primary-rate ISDN can work wonders for multimedia and even low-end TV production. DS1 and DS3 can do the job when digital signal acquisition, production and distribution demands higher bandwidths between fixed locations. For future HDTV TV applications, VDSL may serve where bundled DS3 and DS4 have not yet been supplanted by fiber.

Meanwhile, strands of optical fiber increasingly are available to meet the TV industry's existing and anticipated demands for digital telecom services. As fiber interlinks our facilities, more broadcasters will begin to see the light. ■

Ken Freed is a technical writer specializing in cable and interactive television, and is based in Denver.

Acknowledgment: Thanks to EDnet, Inc. and the ADSL Forum for help with data used in the table included in this article.

d Get A Grip On Camera Control.

CameraMan® SHOT Director, from ParkerVision, puts control of the studio environment right in your hands. One fully integrated unit gives you everything you need to operate and adjust up to 16 CameraMan



One SHOT Director™ allows you to control up to 16 1-chip or 3-chip CameraMan® cameras.

cameras. Joystick, LCD display, CCU control, and more – it's all there. Now with less equipment and manpower, you can run a fully functional, multi-camera studio. SHOT Director is the beginning of ParkerVision's CameraManSTUDIO™ product line and is fully upgradeable to meet

your future needs. Get a handle on all that SHOT Director can do. Call 1-800-532-8034 or 1-904-737-1367 to schedule a test drive today.

CameraMan® **SHOT Director**™

Features:

- Menu-driven LCD display with real-time status indicators
- Speed-adjustable joystick pan, tilt, and zoom
- On-the-fly CCU control for up to 16 cameras
- Patented *autoTRACK*™ technology*
- Up to 15 *autoTRACK* Views™ *
- Auto iris
- Focus control
- Store and recall location presets
- Serial RS-485 system communications
- Inter-camera distances of up to 2500 feet

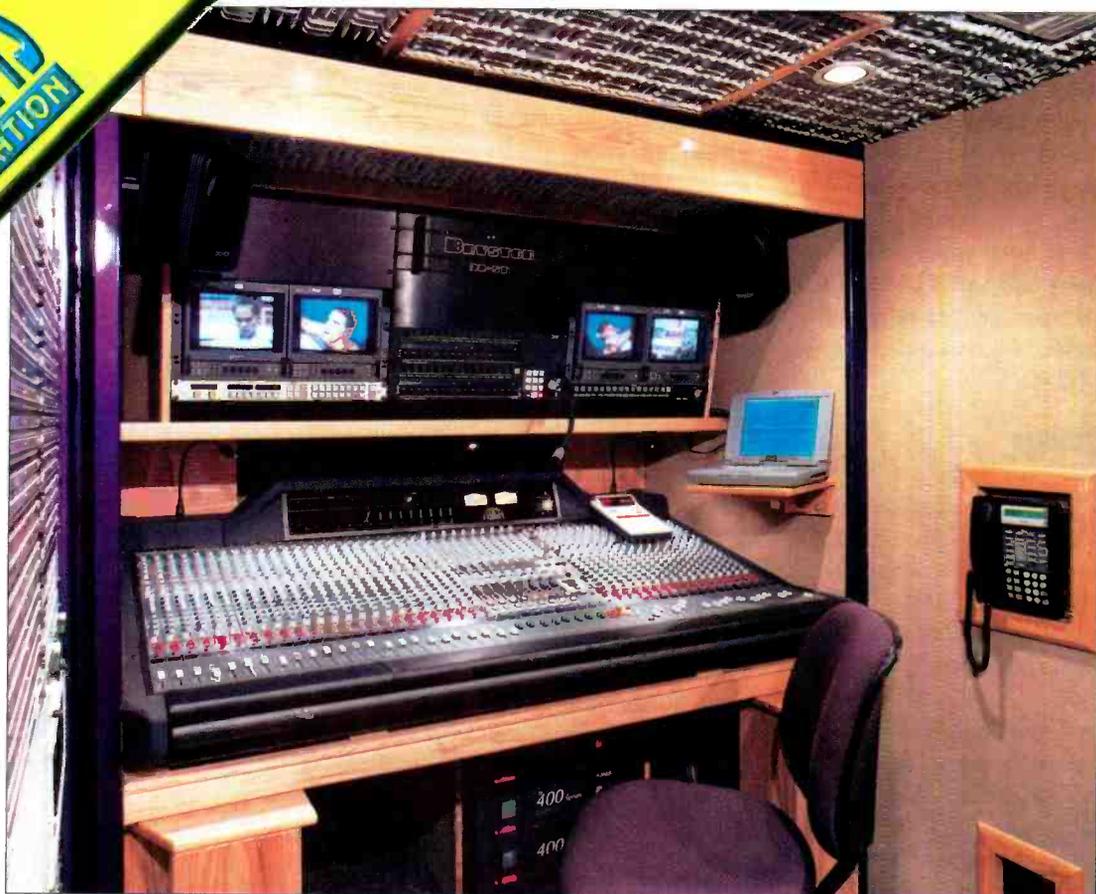
*On *autoTRACK* models.

® Registered Marks of ParkerVision, Inc. ™ Trademarks of ParkerVision, Inc.

PARKERVISION®
Visibly Better.™

Visit our website at <http://www.parkervision.com>

Circle (42) on Free Info Card
www.americanradiohistory.com



Remote truck audio

Don't forget the audio when building a remote vehicle.

By Peter A. Douglas

THE BOTTOM LINE:

A recently completed production truck intended primarily for entertainment events includes some unique aspects in its audio design. This case study reveals the thinking behind the design and how it was implemented. \$



It was a cold day in December 1985 when I temporarily inherited responsibility for my station's two remote trucks — “just until we can hire someone full-time” (which had a ring of “the check is in the mail” to it). Although one unit was fairly modern and did not require much special understanding, the other was an older unit with about 10 different generations of wiring and equipment.

In an attempt to understand the audio flow of this unit, I made the mistake of disassembling some of the racks to see what was inside. I received quite an education from that process. After recovering from the shock of discovering cotton-insulated wire, I encountered the truck's unique DA system. The program audio distribution system DA consisted of an old 10W audio amp with quite literally a ball of resistors on the output, feeding various points in the remote truck unit that required program audio. (I later came to understand that this was not so unusual for the period.) I still remember that experience and other

Photo: The smaller of the NDC truck's two audio mixers, generally used for music submixing.

Inter BEE '97

33rd International Broadcast Equipment Exhibition

Period: November 12-14, 1997 Place: Nippon Convention Center (Makuhari Messe)



BEE Part of the Action

If you've never taken part in the International Broadcast Equipment Exhibition (Inter BEE) in Japan, perhaps it's time you did. That's because the annual Inter BEE is one of the most important events for the professional broadcast, video, and audio technologies.

And this year's Inter BEE promises to be the very best yet, featuring the latest in digitized editing and other state-of-the-art technologies and systems.

Inter BEE '97 should draw more than 460 manufacturers and more than 27,000 broadcast

professionals from around the globe. And there will be symposiums, forums, and seminars hosted by some of the world's leading broadcasting, audio, and video software producers, and systems hardware developers, who will provide valuable insights into the future of the broadcast equipment industry.

Inter BEE '97, it's a unique opportunity to market, network, get new ideas, and be truly part of the exciting and fast-changing action in broadcasting, video, and audio technologies.

Exhibition Category

- Audio Equipment • Cameras
- VCRs • Disc Recorders
- Video Equipment • Output Systems
- Relay Systems • Transmission Systems
- Lighting Equipment
- Measuring Equipment
- Transmission Cables • Power Units
- Satellite Broadcasting Systems
- HDTV-EDTV Systems
- Multiplex Broadcasting Systems
- Multimedia Systems
- Other Related Items

For more information on Inter BEE '97, contact:

Japan Electronics Show Association

Sumitomo Shibadaimon Bldg. 2 Gokan, 1-12-16, Shibadaimon, Minato-ku, Tokyo 105, Japan Fax: 81-3-5402-7605

Circle (70) on Free Info Card

www.americanradiohistory.com



Remote truck audio

similar ones, and vowed that if I ever built a remote unit I would do it "right."

Fast forward

Eleven years later, I found myself in a planning meeting with my production manager at the National Digital Television Center (NDTC), working on designs for a remote unit. I still had visions of cotton-insulated wire, no DAs, intercoms that produced more feedback than communication, and lots and lots of hum. Here was my chance to do that remote vehicle "right," working with an experienced integration team from Shook Electronics USA.

It was to be a large remote unit, designed to specialize in entertainment events. The audio would be its crowning glory, with a system unlike any other remote unit on the road. This would help create some unique opportunities for the vehicle while solving some traditional audio problems in remote units.

Some of our requirements included enough inputs to handle live music in a TV environment, room for at least four operators, a place for modular digital multitrack (MDM) decks, quick setup of complex ISO situations, ability to split microphones into different mixers and interconnect to stage sound systems without audio degradation, enough processing to accommodate large musical events, a comprehensive patchbay and a large matrix-type intercom with 12 wire-less channels.

The design called for a truck 51 feet long with a 40-foot-long expansion to the side and a smaller expansion to the rear. It would contain 14 dual aspect ratio cameras, 18 digital tape machines, two digital production switchers, three routing switchers, a full edit package, four channels of still-store, and enough audio to support musical awards shows, talk shows, concerts and the like.

The basic building blocks for the au-

dio in this unit consisted of two Amek Recall mixers, two Mackie Designs sound reinforcement mixers, a Datatek 256x128 analog audio router, a Tele-cast fiber-optic transport and splitter system, and a large assortment of processing and storage devices.

With the rear expansion unit on the truck, we were able to produce an audio compartment nine feet wide and 15 feet deep. The physical configuration places one 56-input Amek mixer facing the front of the truck and looking through a window into the main production control room, plus a second 40-input Amek mixer facing the back of



The main audio mix position of the NDTC remote truck places processing gear, recorders and communications all within easy reach.

the truck. Processing and source machines are above each mixer and contained in a special cabinet to the left of the main mixer console. There are two racks of ancillary equipment and patching to the left of the second mixer. Between the two mixers there is eight feet of floor space.

Operationally, one mixer can be used for the primary broadcast mix while the other is used for live music submix. The design also accommodates direct-out feeds to ADAT recording equipment without affecting the live broadcast mix. Another requirement was the ability to quickly set up complex ISO situations with up to 18 tape machines.

Audio operations

Each Amek mixer has the ability to take a "snapshot" of the configuration and settings on the mixer. This enables

us to return quickly to preset conditions. The line-by-line automation is also handy when multiple rehearsals are required prior to performance. All of the direct outputs of the console appear as sources on the 256x128 router. This allows any tape machine to grab any direct input, as well as any mix bus output. Stereo line inputs on the main console are also connected to the router, both as direct-out sources and input destinations. Because the router has salvo capability, the entire setup of mixer and routing can be recalled with simple commands.

Effects sends and returns are all patch-

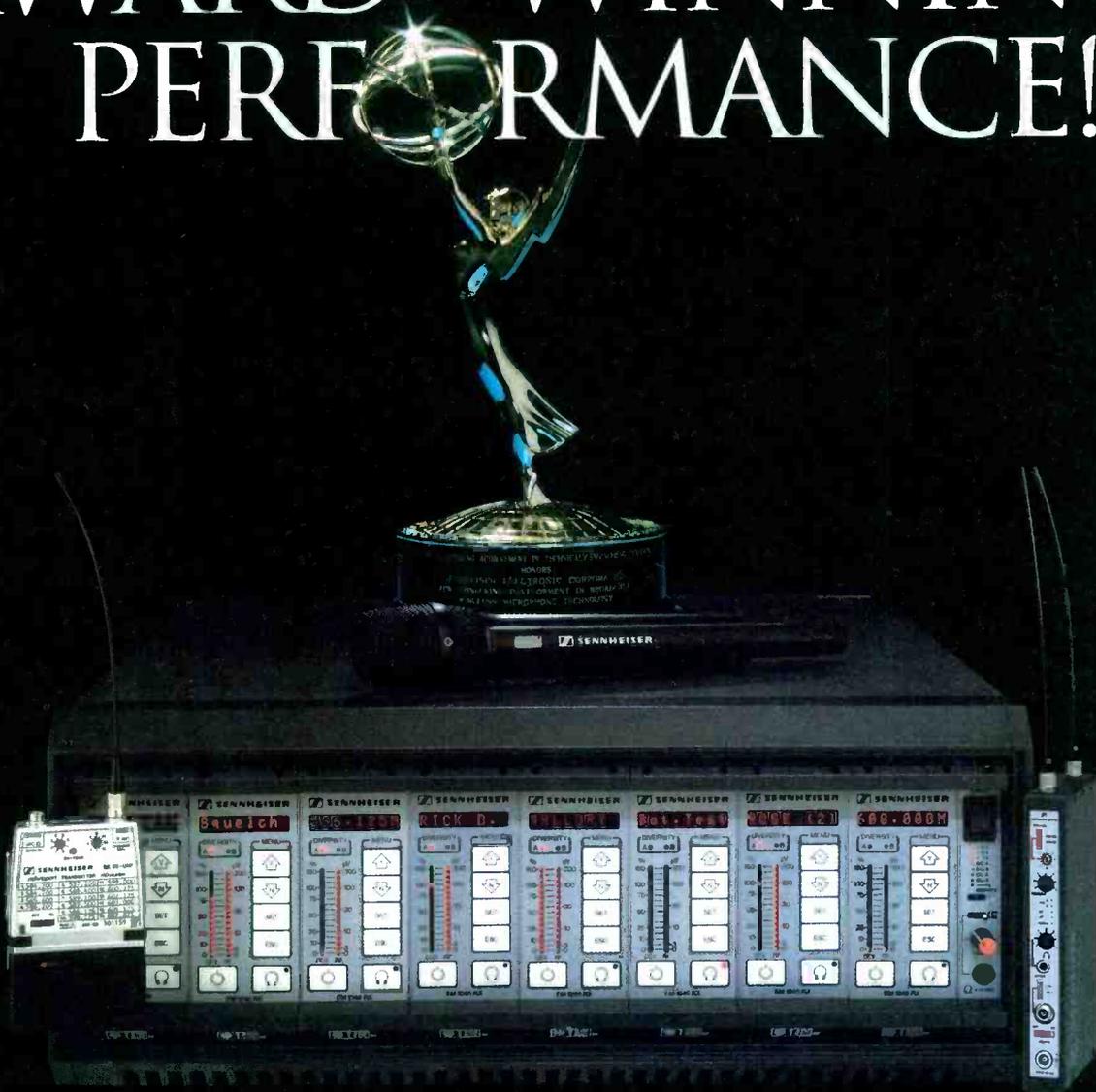
able. A 60-position Aphex rack frame contains the majority of the processing equipment, including 12 parametric EQs, 12 Expanders, 12 expander/gates, 12 aural exciters, four Compellers and four Dominator IIs. Other outboard processing includes two Lexicon 480L digital effects systems, four Drawmer M500 dynamic processors, two Dolby Cat 43 ambient room noise suppressers and two Roland SN550 digital noise suppressers. Patching and additional rack space can accommodate more processing equipment (there's never enough).

Recording and playback

To accommodate the varying needs of different events, we equipped the truck with a variety of storage devices. These include two Sony PCM7010 DAT recorders with full SMPTE time-code capability, one 360 Systems Digicart II (for storage of locally produced material and input of customer-supplied material), a 360 Systems Instant Replay (networked to the Digicart II), a Studer D731 CD player and Tascam 122 MKII audio cassette machine.

For cost-effectiveness and convenience, most of the truck's audio paths are analog, including feeds to and from recorders that offered AES3 (like the truck's Digital Betacam VTRs). With AES3, the two channels of each stereo pair are tied together and, although

AWARD WINNING PERFORMANCE!



1996 Emmy Award For Outstanding Achievement in the Sciences of Television Technology
presented to Sennheiser for RF Wireless Microphone Systems

German craftsmanship, advanced engineering, and precision manufacturing combine to produce Sennheiser RF Wireless Microphone Systems. Hailed worldwide as "the ultimate", Sennheiser is the absolute best investment you can make in wireless technology.

Sennheiser Wireless Systems deliver the most natural and transparent sound ever transmitted. Our HiDyn *plus*TM noise reduction system yields tremendous signal-to-noise ratios. Phase-locked loop (PLL) frequency synthesis provides frequency agility and stability, so you can

easily adjust your equipment to local RF conditions. Plus, advanced transmitter battery management systems even allow remote status indication. Only Sennheiser offers real-time computer monitoring and remote control of all receiver functions. Only Sennheiser provides service facilities worldwide. Only Sennheiser brings all of this together in a single state-of-the-art package.

For award-winning performance every time, there's only one name you can count on... Sennheiser.

THE EVOLUTION OF AUDIO
SENNHEISER[®]

SENNHEISER ELECTRONIC CORPORATION

6 VISTA DRIVE, P.O. BOX 987, DEPT. 4015, OLD LYME, CT 06371 • TEL: 860-434-9190 EXT: 4015 FAX: 860-434-1759 • CALIFORNIA: TEL: 818-845-7366 FAX: 818-845-7140
MEXICO: TEL: (525) 639 09 56 FAX: (525) 639 94 82 • CANADA: TEL: 514-426-3013 FAX: 514-426-3953

World Wide Web: <http://www.sennheiserusa.com>

Manufacturing Plant: Am Labor 1, 30900 Wedemark, Germany

Circle (53) on Free Info Card

www.americanradiohistory.com



Kudos IQ Modular

To help you go digital we've racked our brains.

The advent of digital television calls for new interface solutions. If you're going digital, this is the modular system you need to make the transition as painless as possible.

Kudos IQ provides a flexible, controllable, 10-bit digital system, ideally suited to automated environments.

It offers all the performance of dedicated units, but in ultra-compact rack-mountable form.

For more information about Kudos IQ and our ever-expanding range of modular functions, please contact us at: **USA** Tel: +1 408 734 1688

UK Tel: +44 (0)181 607 9455 Fax: +44 (0)181 607 9466 E-Mail: Info@Snell.co.UK

France Tel: +33 J 45 28 10 00 **Germany** Tel: +49 611 99 0840

India Tel: +91 6481740 **Italy** Tel: +39 6 66 38 594 **Japan** Tel: +81 3 3446 3996

Russia Tel: +7 095 1926992



Circle (54) on Free Info Card

www.americanradiohistory.com

Remote truck audio

possible, routing in this format can get a little tricky. The only exception to this is the use of AES3 outputs to feed a Graham-Patten DSAM 820 editing mixer. This gives us digital audio in post where it is more likely to suffer from multiple generation loss.

Microphones

The truck stocks a common assortment of Sennheiser MKH416, ME67 and ME66 shotgun mics along with the usual Shure SM58s, Electro-Voice 635As and Sony ECM77Bs. For most events that use this truck, someone from the production crew will specify mics. We rent anything else that the client needs.

For interconnection of mic signals between the stage and truck, we decided on a fiber-optic system made by Telecast, after evaluating its reliability and durability. The system has 1:1 backup on all power supplies, and we pur-

chased enough fiber to run separate jackets for main and backup (even though the basic fiber contains two fibers in the same jacket). The fiber proved to be resistant to physical abuse and is field repairable.

The fiber system consists of six 48-input/output stage boxes and the fiber to interconnect them. Each box contains XLR connectors and redundant optronics and power supplies. Chan-

fiber system is the reduced weight of the fiber vs. traditional copper snakes.

Entertainment events often require mic splitting. Typically in a large musical event, or even a talk show that includes a band, you will need to split mics between broadcast music mix, stage monitor mix and house (PA) mix. We designed this system with the help of Telecast to include a five-way passive optical splitter. This splitter allows us to run separate fibers to up to four locations at the event (in addition to the truck, which is the fifth port), with all mixers getting the same audio quality and level.

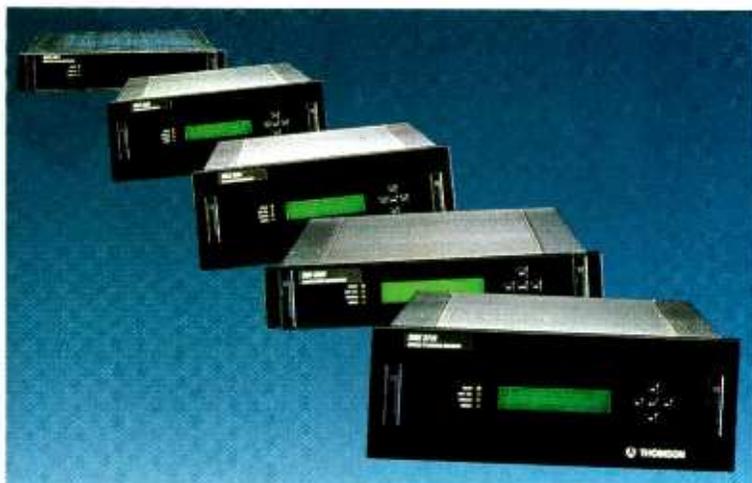
If a third-party house or monitor mix system is employed (as might be encountered with high-profile acts that have their own touring sound company), we can connect to their splitter via the fiber without any danger of electrical interaction — in other words, no ground-loop buzz. The large number of inputs on our system also allows multiple stages to be interconnected simultaneously in this fashion, for large multi-act shows.

The truck has already received numerous compliments, and its audio is the most often-mentioned feature.

nels can be used for mic or line level, and can be operated in either direction. The main connection panel on the truck has multiple fiber jacks that connect to the truck's distribution system, where all circuits are routed through patch panels and normalled into mixer inputs. The truck carries 8,000 feet of fiber on board. One added bonus of the



ONLY THOMSON LETS YOU CONTROL THE COMPLETE TRANSMISSION...



With Thomson Broadcast's MPEG2 Compression System, control is at your fingertips from start to finish...

The most powerful, high-performance transmission solutions...Thomson has the end-to-end systems expertise that brings them together seamlessly.

Spanning the breadth of the digital transmission chain, Thomson MPEG2/DVB equipment line includes:

- encoders
- multiplexers
- modulators
- management system
- integrated receiver/decoders (IRDs)

Call us to find out how Thomson can keep you in control

THOMSON BROADCAST

49 Smith Street, Englewood, NJ 07631 - Tel: 1-800 882 1824
email: sales@thomsonbroad.com <http://www.thomsonbroad.com>

Circle (55) on Free Info Card

In under half a second, grab a still from 10,000 in the built-in VideoCarte still store.

Instant access to 20 minutes of lossless clips in the built-in clip store.

Run 1000's of Windows NT software packages including Chyron WinFinal!, Adobe Photoshop and Inscrber CG Supreme

TROPICAL HONEYMOON

Page curls, flying cubes, ripples and spheres from a built-in Pinnacle Genie DVE.

DOES YOUR Switcher DO THIS?

Run 10 bit CCIR-601 component digital, with seven input/output formats: digital: component, composite, FireWire analog: component, composite, Y/C, RGB

Plug in a network card to integrate with your DVE's, servers, edit stations, mobile units, and even the web.

Three program/preset control panels with up to 34 inputs, 15 outputs, 2.5 MVE's, 5 keys and dual chromakeys.

Automatically sets up the 6:00 news, with standard lead-ins, clips, effects, sequences and stills loaded into hot-keys, and tiled on your monitor.

The new ECHOLab 5000 family of digital video switchers combine the power of Microsoft's Windows NT, with 25 years of video expertise from America's second largest production switcher company.

Every ECHOLab 5000 switcher has a built-in server that accepts a huge variety of open architecture options. You can look forward to a growing reservoir of options as leading video companies embrace Windows NT.

ECHOLab 5000

Switchers with Windows NT®

Put yourself in the mainstream of the digital video revolution for just \$29,900, including control panel, frame monitor and software. Load it up with a clip store, still store, CG, networking, Pinnacle Series 3D DVE and a Matrox DigiMix card with frame buffer, advanced wipes and five 2D DVE's—and it's still under \$49,900.

In over fifty countries, ECHOLab switchers have earned a reputation for quality and rock solid reliability. The ECHOLab 5000 features

a bulletproof design, with a dedicated real time co-processor to handle all critical switcher functions. And redundant power.

For smaller studios consider the new ECHOLab 2000 family of compact digital switchers. ECHOLab also has a complete line of digital-upgradeable analog switchers. For more information, and a representative near you call 617-273-1512, fax 617-273-3275, or visit us at:

ECHOLab

175 Bedford Street, Burlington, MA 01803

www.echolab.com

All products mentioned are trademarks of their respective companies.

Circle #56 on Free Info Card

www.americanradiohistory.com

Remote truck audio

Communications

The item most blessed, cursed and misrepresented in virtually all remote trucks is the key to the operation: the intercom. As with any remote truck project, the designers vowed that this time the intercom would be adequate for every project the unit will encounter. Unfortunately, intercoms are like closets — the more you have, the more you fill up.

Our best shot at intercom competency starts with a 96x96 RTS ADAM system. The beauty of modern digital matrix intercoms is that while the wiring is greatly simplified, the operation is incredibly flexible. All programming including sources, destinations and even labeling for the displays can be done off-line on a PC. If you are repeating events you can store the files and recall the configuration at will. Another added advantage is that any station or circuit can operate as either point-to-point or PL. We added four Clearcom-to-RTS interfaces to accommodate tie-in to stage PL systems.

Every position in the production area has at least one 16-button master intercom panel. Several locations, such as the director and AD positions, have *paired* 16-button panels to accommodate IFB control. The six tape operator positions have eight-button panels and the tape coordinator position has a 16-button panel. Both audio-mix positions have paired 16-button panels. The system also includes a 12-channel wireless PL system made by Vega.

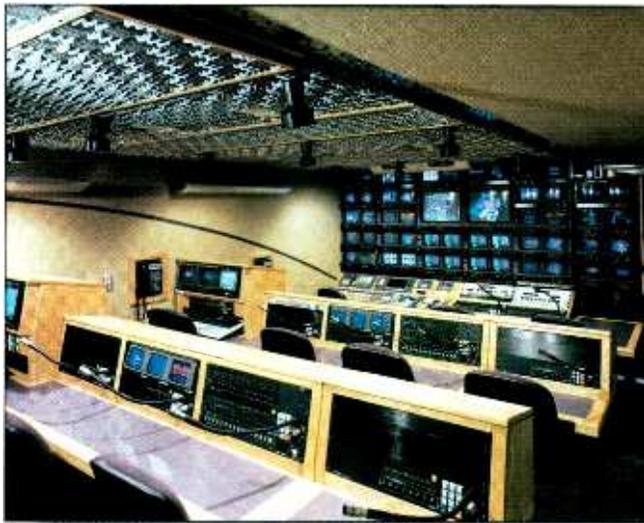
The IFB is a 16-channel system fed by a router for greatest flexibility. IFB control is built into the normal intercom panels so that any intercom control position can have either full or limited IFB control. With the matrix system, camera ISO is not a problem.

Rounding out the communications package is not one but two 900MHz base stations and eight portable radios. Telephones in the truck consist of an

AT&T 10-line system. There are four auto-answer Gentner telephone interfaces and eight Telos telephone interfaces installed in the audio room. The RTS is interfaced to the telephone system with a four-channel digital auto-nulling adapter.

Monitoring

Audio monitoring within the truck is expansive. The production area has the normal high-quality monitoring system featuring 200W Bryston amps feeding Tannoy monitor speakers. The production monitors are fed by a separate monitor strip on the main mix console.



The main production control room of the NDTC truck.

A second monitor strip on the main mix console feeds the monitors in the audio room. We use near-field Tannoy monitor speakers for both console positions. These monitors are fed by 100W Bryston amps.

Scattered throughout the truck, especially in production, audio and tape, are RTS switchable monitors. These monitors allow for custom setup and monitoring of virtually any audio in the truck. Each VTR has its own audio monitor panel from Wohler Technologies, which includes phase and level indicators.

Shore connections

The last step in the process is getting the audio out of the truck. This is done with a set of 10 Leitch ARG-880 remote gain line amps feeding the side panels of the truck. AES3 audio from the DSAM mixer is also available as a line feed. There are B&B Systems phase scopes located in both audio mix posi-

tions and the side panel connector area of the truck.

Noise-generating light dimmers and the transformers and stabilines are fully shielded and grounded. All construction uses punch blocks, bantam self-normalizing patch panels and a “star” grounding method.

The truck now has several gigs under its belt. We recently completed a three-day shoot for the Los Angeles Philharmonic where the audio system was used to its fullest extent, including a multi-track ADAT recording for an upcoming CD. The truck’s other recent events include the Yanni world tour and Golden Eagle award show.

One last little feature is our use of remote-controlled CCD cameras as “audio spotters.” After some success with this idea in studio projects, NDTC engineers reasoned that it would be even more helpful for remotes. The cameras allow the audio operator to set up a personalized view of what is happening on the set or stage, and thereby better predict microphone usage and ambient conditions during the show. This is useful on talk shows with live audiences

and unscripted interviews.

The truck has already received numerous compliments, and its audio is the most often-mentioned feature. Certainly, it is one of the elements that sets this truck apart from most others. Of course, running a truck like this is always a challenge, but most of the challenges fall to the director. These include issues like “How do I use all four DVE channels?” or “How can I create a log jam of graphics even with a four-channel still-store?” and the “What? Only 14 cameras and 96 mic inputs!” crisis. But my favorite is the operator who asked, “Do you have any white tape to cover up all those annoying undermonitor LED tally displays, so I can write on them with my Sharpie?” ■

Peter Douglas is vice president at the National Digital Television Center, a division of TCI, in Denver.

Photos by Bud Shannon Photo, Inc.

NOT
A LOT
HAS
CHANGED
IN
LIGHTING
TECHNOLOGY
IN
THE
LAST
40
YEARS...



...UNTIL NOW!
THE NEW
IPS DIMMER SYSTEM.



UNCONVENTIONAL,
QUIET,
COOL,
LIGHTWEIGHT,
COMPACT.



Circle (43) on Free Info Card

For More Information Call: 1-800-223-9477

Maintaining transmission lines

Many times, a transmission line is treated like a log chain on a farm. It is left hanging somewhere, sometimes with a load on it, ignored and yet expected to work well in any situation. If the chain develops a problem, it is assumed that it was a lousy chain in the first place, not that it wasn't taken care of.

In the case of transmission lines, the maintenance required varies with type and use. For example, a buried coaxial cable is really left on its own. No one is going to dig up a cable to check its appearance. If it hasn't been properly installed, there isn't much you can do about it. For these types of cable, the installation can be important and can add significantly to the cable life.

For small cables, direct burial can be accomplished by simply plowing them in, especially in those cases where the cable is not critical. For larger cables, certainly those with air dielectric, they should be placed in a ditch in a protective bed. A healthy layer of sand below and above the cable will protect it from abrasion as the ground freezes or shifts from vehicles driving over the ground.

Keeping up the pressure

The transmission lines that require the most maintenance are those that are tower mounted with air dielectrics. The obvious problem is that of pressurization. For some reason, there is still a group out there who doesn't believe that a line must be pressurized if it doesn't leak. That's right up there with "they won't sting you if you stand still." No matter how airtight you may believe a line to be, it must be pressurized. As the line is heated and cooled by the combination of signal power and natural forces, water molecules will be drawn into the line in the absence of pressure. That's right, the primary purpose of pressure is simply to be sure that dry air goes out of any leak, no matter how small, instead of wet air coming in.

Pressurization with exotic gases can also be used to increase the power-handling capability of cable. That is a separate issue from simple pressurization to keep the cable dry. Lines will normally be pressurized with either air or dry nitrogen. Now here is an important point to remember: pressurization is to keep moisture out of the line, not to attempt to send the line into low earth orbit. Using the theory of "if a little is good, a lot is better," some technicians have been known to pres-

surize lines to unreal levels. I am aware of one TV station where 6¹/₈-inch line was pressurized to 65psi with dry nitrogen. The CE decided that the line was arcing (it wasn't, at least not in the way he thought) and tried to cure it with pressure. All that is needed is 3psi to 5psi to ensure that dry air (or gas) is lost rather than wet air being gained.

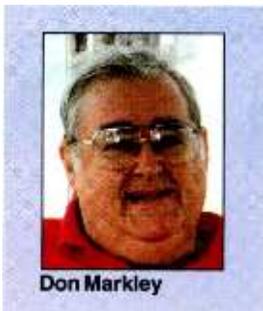
Dry air requires a dehydrator of some type. This must be properly maintained or it will eventually start putting moisture into the line. The manufacturer's instruction manual will guide you in the proper maintenance for your particular unit. If in doubt, install a desiccant cylinder in the line between the dehydrator and the transmission line. When the color changes, replace or dry the desiccant.

An alternative is to use dry nitrogen gas or a nitrogen generator. Dry nitrogen is available from commercial sources at a reasonable price. Low-pressure regulators are inexpensive and readily available from transmission line manufacturers. One source of nitrogen generators is Litton Industries through its commercial products division in Davenport, IA. These are excellent if you need a larger amount of gas, as in the case of several or large transmission lines.

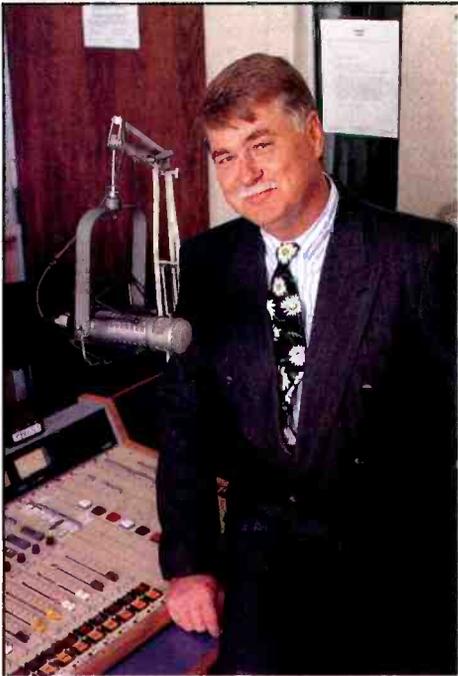
Keep an eye on the connections

Next, the biggest need for transmission line maintenance is the connector between sections of rigid transmission line. If sliding connections are used, they will eventually be worn down, with the residue building up around the center conductors. This problem has been eliminated in some newer lines by having the expansion and contraction of the center conductors absorbed by expansion sections in the center conductor or by having a semiflexible center conductor with the joints being bolted together. Others use lubricated connectors or "watch-band springs." These get their names from watch bands that were popular in the '40s and that had a unique ability to rip all hair from the wearer's wrist. As jewelers got rid of the watch bands, someone got the idea that they would make great sliding connectors because copper does not normally have hair nor does it complain.

These spiral bands work well for some time until they start to lose their tension and deform from heat. The solution is to replace them regularly with new bands. This requires opening the line at each joint. In turn, the "O-ring" seal between line sections should be replaced at the same time. When a seal has been in place, under pressure for several years, it will not reseal properly

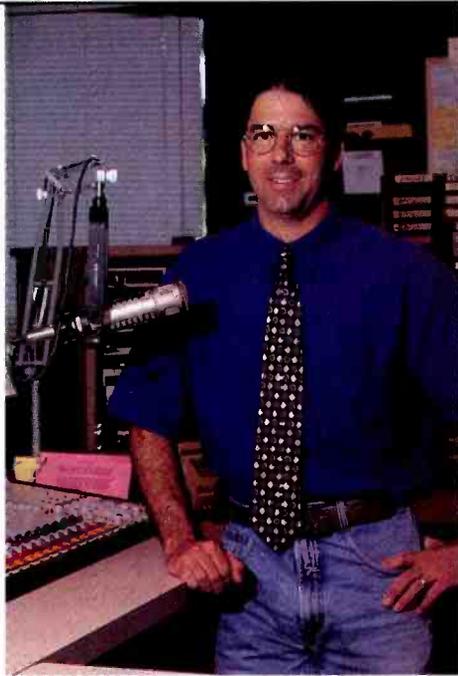


Don Markley



Lindy Williams
V.P. Engineering
Lotus Communications
Los Angeles, California

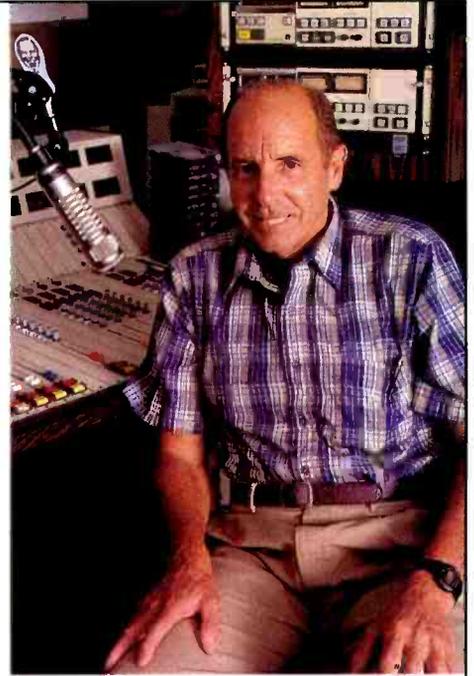
"We've replaced some 'very expensive' condenser microphones with the RE27N/D ...now the GM wants the guest mic replaced, as well as the production studio and the newsroom microphones. You're blowing my engineering budget!"



Steve Lariviere
Chief Engineer
WSNE

East Providence, Rhode Island

"We replaced six expensive German condenser microphones in favor of the RE27N/D. What a great sound!"



Marv Collins
Chief Engineer
KFI-KOST-KACE

Los Angeles, California

"The RE27N/D has the fullness of a ribbon with the punch of a shotgun condenser microphone. The pattern is very good, giving good backside rejection of noise. Congratulations on building such a fine microphone."

RE27N/D

Studio Dynamic Microphone

The new broadcast standard.



ElectroVoice®

Electro-Voice, Inc. a Mark IV company
 600 Cecil Street · Buchanan, MI 49107
 616/695-6831 · 800/234-6831
 616/695-1304 Fax

See your local EV dealer, for a test drive.

Circle (61) on Free Info Card

www.americanradiohistory.com

transmission technology

when removed and replaced. The ring material ages and simply loses its ability to deform properly to recreate the seal. As to timing, around seven years is a good time to replace the watch bands.

Riggers: Proper care and feeding

A point to remember is that your rigger is your hands and eyes on the tower. Find a tower contractor who is knowledgeable about RF, not just steel. A good rigger will keep your lines properly suspended and braced and can perform the necessary repairs to the line in a manner that will maintain its electrical characteristics. It is your rigger who ultimately is responsible for keeping your lines in good condition.

With respect to semiflexible lines, the biggest requirement is to see that the line is properly installed. It cannot be lifted by the end connector. All manufacturers make hoisting grips, which are the only way to safely install a cable. After the line is lifted into place, the hoisting grip(s) should be left on the cable to hold the cable weight. Cable clamps should then be installed to keep the cable in place. Remember, these clamps simply keep the cable from moving around and are not to support the cable weight.

Rigid lines and waveguides are suspended with spring and rigid hangers. The problem is that the steel tower

does not expand at the same rate as the copper coaxial cable or the aluminum waveguide. Normally, these systems use a rigid hanger at the top and at the building entrance. The line or waveguide is then allowed to expand or contract as necessary between those two fixed points. This calls for hangers to use springs to absorb the length change without breaking anything. The tension on the springs is normally set so that a light upward force results on the top. The springs on each section are simply to hold that individual section up, not to launch the whole system like a javelin through the tower top. Again, your tower contractor will check the hangers and replace them as needed.

Transmission line maintenance is simple and comes down to simple issues. For air-dielectric lines or waveguides, maintain pressure at the proper levels all of the time. For rigid lines, replace sliding connectors when needed along with seals, as necessary. For all systems, keep the support systems in good mechanical condition by using a good tower contractor often enough for him to keep you out of trouble. Finally, reward the contractor's crews with good beef and appropriate beverages. ■

Don Markley is president of D.L. Markley and Associates, Peoria, IL.



MPEG-2

Test and Measurement

Whatever your requirements for *real time* MPEG-2 and DVB test and measurement, Digital Transport Systems has the hardware and software solution:

- *Transport Stream Analyzer (TSA™)*
- *Transport Stream Generator (TSG™)*
- *Transport Stream Workstation (TSW™)*

For powerful, cost-effective solutions, Digital Transport Systems is your single source. Call us today.

Circle (45) on Free Info Card



Digital Transport Systems

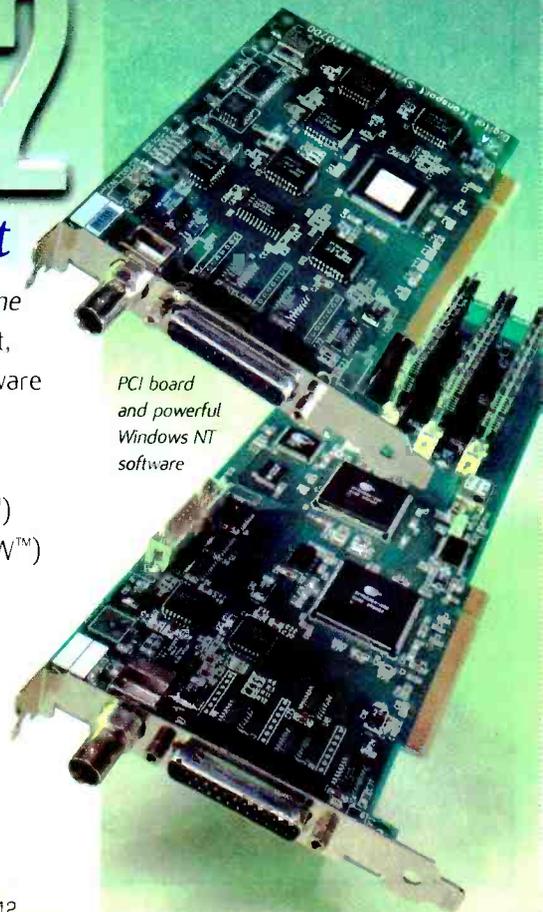
11545 West Bernardo Court, Suite 200

San Diego, CA 92127

phone: (619) 675-1410 fax: (619) 675-1412

email: calac@dtvs.com URL: www.americanradiohistory.com/~dts

www.americanradiohistory.com



PCI board
and powerful
Windows NT
software

GREAT MINDS THINK ALIKE. AND NOW, THEY CAN EVEN WORK TOGETHER.

Introducing, CentraVision™, a Fibre Channel Network Solution by MountainGate. It's the first networked storage system that lets you and your coworkers share the same digital video source material – even at the same time.

Now, your entire facility can have immediate access to video source files at speeds up to 100MB a second (200MB/sec full duplex). No more duplicating, transferring files or running hard disks from office to office.

Storage capacity can be expanded from 36 GB to more

than 1 Terabyte, so you'll have room for the most demanding broadcast and post-production applications. And because CentraVision keeps all your files in one place, it cuts down on the number of hard drives you need and even makes backing up easier.

All workstations, whether Mac, SGI or other PCI compatible stations, can run on the same network, share the same files and work together. We've also built an easy-to-use graphical interface into the system to administer the network.

FIBRE

CHANNEL

BRINGING
CREATIVE
MINDS
TOGETHER

NETWORK

SOLUTIONS

www.mountaingate.com

CALL US AT 702.851.9393 OR 800.556.0222. AND START WORKING TOGETHER.

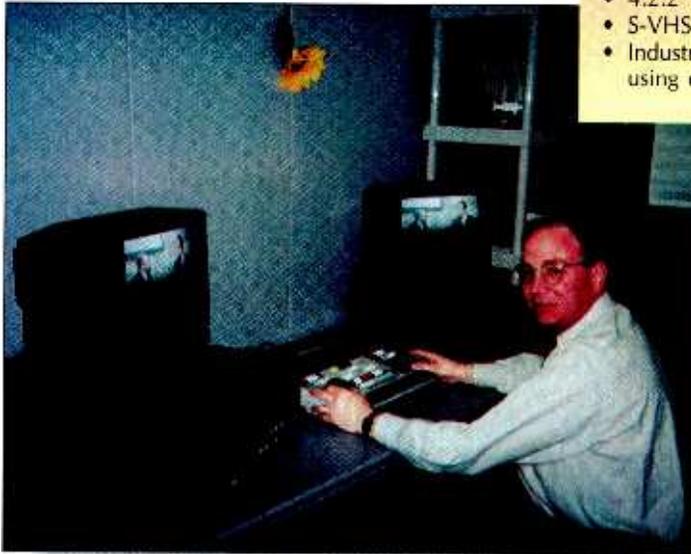
Circle (57) on Free Info Card

www.americanradiohistory.com

 **MountainGate**
A Lockheed Martin Company

JVC Digital-S

Ethnic American Broadcasting Company (EABC) is a spin-off of the Russian American Broadcasting Company. Three years ago, it broadcast only five hours of television a night, but it has grown to 24 hours of broadcasting on Satellite SBS 5, picked up mostly by multiple dwelling units where Russians tend to congregate. EABC also reaches single-family and condo subscribers via a



The author with EABC's Digital-S recorder.

dish and there are plans of going to a digital platform shortly.

About 80% of the network's schedule is recordings of programs from Russia. Some are recorded here via satellite, and others are recorded in Russia and then sent to EABC. For the rest, EABC does the nightly news with stories from the United States and Russia, and it has several call-in talk shows.

EABC is making a move to JVC Digital-S from Betacam SP. Why? The main reason is that 90-minute SP tapes cost \$45 each, and the company was spending \$14,000 in tapes every month. We have worked with Beta SP for a long time, and have been happy with it, but the price of complete conversion to Digital Betacam was out of reach.

JVC's Digital-S was appealing because of the size of the tape. DVCPRO was also considered, but its big selling point is how small it is and that small size suggested problems with misplacing tapes. You're not

as likely to stuff a Digital-S tape in your back pocket.

We considered both formats and liked the serviceability of Digital-S. Costs were another important consideration; a Beta head would cost us a minimum of \$1,200, but we could change the whole Digital-S head assembly for about \$800. That was appealing.

Performance at a glance

- Mild compression
- 4:2:2 recording
- S-VHS compatibility
- Industry standard compression using dual DV chip set.

The frequency of replacement is one of the unknowns, but we have more than 1,000 hours on most of our machines and have not encountered significant problems. Also, the 104-minute length of the Digital-S tape allows us some leeway in recording non-standard-length Russian shows and movies.

EABC is in the process of condensing its library of 90-minute Betacam tapes to Digital-S, averaging two Betacam to one Digital-S, and recycling the Betacam tapes back into the "off satellite" record process. This has lowered the tape bill by about \$10,000 a month, while we convert the whole facility to Digital-S, effectively offsetting the cost of becoming "digital." EABC has already recouped half the cost of the first part of our conversion in tape costs alone. When you see an improved picture to go with that, you understand that it's not just about tape savings.

We've sent one Digital-S machine to Russia with a standards converter so that they could start sending us quality tapes. The difference in the digital audio is noticeable, and the Digital-S format easily supports cutting out the Russian commercials and inserting our own. The network is still about 60% Beta on the air, but in the next few months, the use of Digital-S is

going up to about 60%. By the end of this year, EABC should have just two Betacam machines left out of the 27 that we have now. We're a little cramped in the current facility and are in the process of setting specs for a new facility with its own uplink. Digital-S fits like a glove everywhere in the designs. Because the Digital-S tapes take up less space than the SP tapes, the tape library can be smaller.

**EABC is making a move to JVC
Digital-S from Betacam SP.**

going up to about 60%. By the end of this year, EABC should have just two Betacam machines left out of the 27 that we have now. We're a little cramped in the current facility and are in the process of setting specs for a new facility with its own uplink. Digital-S fits like a glove everywhere in the designs. Because the Digital-S tapes take up less space than the SP tapes, the tape library can be smaller.

Down by the Bitstream

Mention Oregon and most people visualize rugged Pacific coastline, whitewater streams, mountains and big trees. Yes, we do have timber (and spotted owls), but Oregon also has a "forest of silicon", where companies design everything from A to P... that's audio to Pentiums™.

Since 1984 Audio Precision has designed and manufactured advanced audio test equipment in Beaverton, Oregon. Our first product, the System One is now known as the recognized standard for audio testing, with many thousands in use worldwide.

System Two furthers this audio testing tradition with new features designed for testing the digital audio pulse stream, as well as higher audio performance specifications overall:

System Two

- ❑ Complete AES digital interface pulse stream measurements to AES3 spec
- ❑ Read and test AES interface control & status information
- ❑ Measurements of embedded audio
- ❑ Analog THD+N $\leq 0.0004\%$ (-108 dB)
- ❑ Analog Analyzer residual noise $\leq 1.0 \mu\text{V}$ (-118 dBu)
- ❑ Digital analyzer noise ≤ 140 dBFS wideband ≤ 150 dBFS narrowband
- ❑ Digital analyzer residual THD+N ≤ 130 dBFS
- ❑ FFT analyzer residual -140 dB

System Two... the New standard for Audio Testing. For further information and a demonstration contact any of our worldwide representatives.

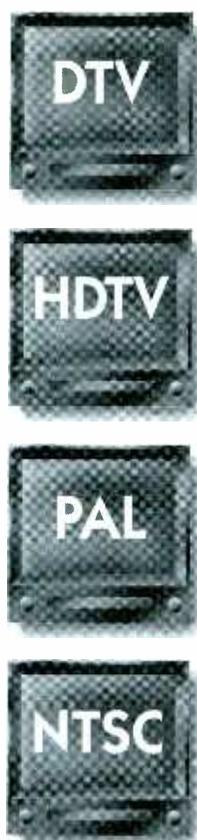


**Audio
precision**

Audio Precision
PO Box 2208
Beaverton, Oregon 97075-3070
Tel: (503) 627-0851 FAX: (503) 641-8906
US Toll Free: 1-800-231-7350

Circle (58) on Free Info Card

INTERNATIONAL DISTRIBUTORS: Australia: IRI Electronics Pty. Ltd., Tel: 2-55-3744; Austria: ELSINCO GmbH, Tel: (1) 814 04 00; Belgium: European Music NV, Tel: 06 5010 81 81; INTERWAVE LTDA, Tel: (21) 325-5351; Bulgaria: ELSINCO Rep. Office Sofia, Tel: (2) 958-12-45; Canada: GERHA, DPO Distribution, Tel: (416) 293-2779; China: Hong Kong: ELSINCO Ltd., Tel: 2422 0000; W Ina Electronics Co. Ltd., 833 9987; Croatia: ELSINCO Rep. Office Zagreb, Tel: 1-68-09-14; Czech Republic: ELSINCO Rep. Office Prague, Tel: (2) 48 90 8 00; Denmark: APM Electronics Aps, Tel: 55 37 15 11; Finland: Genelec OY, Tel: 17 813 31; France: ETS Mesureur, Tel: (1) 46 83 66; Germany: BTW Elektronik, Tel: (0221) 4913-0; Greece: REM Electronics, Tel: (01) 67 48514; Hungary: ELSINCO Budapest, Tel: (1) 269 18 50; Israel: Dar-El Technologies, Ltd., Tel: 3-641 877; Italy: Audio Precision, Tel: 041 21 74 21; Japan: TACO Corporation, Tel: 3-7769-0880; Korea: B&P Electronics Co., Ltd., Tel: 2-546-1467; B&P (Kumi Office), Tel: 546-53-7347/8; Malaysia: Test Measurement & Engineering Sdn. Bhd., Tel: 64220171; Mexico: ELSINCO Mexico s.p.a. de c.v., Tel: 52-55-5221071; New Zealand: Audio3 Video Wholesalers, Tel: 9 226 7220; Norway: Lys, Tel: 02 22 21 07; Poland: ELSINCO Polska sp. z o.o. sp. z o.o., Tel: 79 620 00 00; Portugal: ELSINCO Rep. Office Lisboa, Tel: 340 1785; Singapore: TME Systems Pte Ltd., Tel: 747-7234; Slovakia: ELSINCO Slovakia, s.r.o., Tel: (0) 2 52 71 85; Spain: ALIAS SOUNDEUSION S.A., Tel: 1 177 11 11; Sweden: TTS Tai & Tan Studioteknik AB, Tel: 31 52 51 51; Switzerland: B. W. A. Gunther AG, Tel: 41 51 41 1; Taiwan: A.C.C. Double Advance Tech., Tel: 586 0690; Thailand: Massworld Company Ltd., Tel: 2-294-4930; United Kingdom: Thudby Instruments, Ltd., Tel: 1452 2451



Our new video patch will have you all jacked-up for the future.

With all the new video formats, it only makes sense that the jacks you buy today accommodate your needs both now and into the future. ADC's new line of standard and mid-size video jacks features 2+ GHz bandwidth and a revolutionary sealed switch design that *eliminates* dust, dirt and more importantly, RFI.

So, meet the jack of *all* formats, present and future. Call us for more information today at **800 726-4266**.

ADC Telecommunications

W W W . a d c . c o m

Circle (59) on Free Info Card

On the maintenance side, my assistant and I recently attended a Digital-S class. The course was laid out intelligently and I was pleased with the documentation. In addition, there are self-diagnostics embedded in the equipment itself. We also have the ability to go on-line with JVC for troubleshooting. Eventually, we'll install a modem at our service desk for both maintenance and on-line parts ordering with a simple point-and-click interface.

I also want to note that JVC's support staff is great. They are always willing to come over and see if there is anything they can do to help us. I think they would have helped us install the equipment if we had asked, but we are usually pretty good at that on our own.

I am pleased with the prospect of using the JVC Digital-S equipment over the long term, and I believe the Digital-S format is here to stay. There are many smaller stations around the country that are just moving out of a high-band three-quarter format, and they cannot afford to go with something like Digital Betacam. In such cases, Digital-S is a more cost-effective solution.

You might argue that there is a quality difference between Digital-S and Digital Betacam. But if you compare picture quality on side-by-side monitors, it's hard to tell them apart. And when that lower price (one-third that of Digital Betacam) is added to the comparison, I think that Digital-S is a winner. ■

Denis Roche is director of engineering and broadcast support for the Ethnic American Broadcasting Company, Ft. Lee, NJ.

Editor's note: Field Reports are an exclusive Broadcast Engineering feature for broadcasters. Each report is prepared by well-qualified staff at a broadcast, production or consulting company.

The reports are performed by the industry, for the industry. Manufacturers' support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of Broadcast Engineering to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by Broadcast Engineering magazine.



CARDKEY
LINEAR VIDEO KEYS

**THE PERFECT SOLUTION FOR
EAS MESSAGE INSERTS AND TRANSPARENT ID'S**

- models to plug directly into LEITCH or GVG DA frames
- key controls on card edge
- flexible remote GPI contact configuration
- remote pushbutton with tally on single coax



broadcast video systems

40 West Wilmot Street, Richmond Hill, Ontario L4B 1H8
Tel: (905) 764-1584 Fax: (905) 764-7438 E-mail: bvstor@neocom.ca

Circle (60) on Free Info Card

Artifact-free Compression

Hours of Digital Storage

4-channel 24-bit Audio

Real Time D-1 Recording

Scalable Video Quality

Single/Dual Serial Digital I/O

RS-422 Protocols

Built-in 20GB Tape Drive

Multi-format Support

Total Connectivity

We deny all allegations that ALIEN technologies were used in creating QuBit

Introducing QuBit

The most phenomenal digital recorder-server on the planet.

And just maybe, the universe. This ultrahigh quality digital recorder-server combines powerful digital signal processing, artifact-free QuVIS compression and open networking standards in a single, scalable device. QuBit delivers the high-quality digital video you want and the versatility you need.

QuBit is networkable for instant access and expandable for virtually unlimited digital storage. With both disk and tape storage you can record and play back simultaneously - perfect for tape delay situations. QuBit is also a cost-effective replacement for any VTR you own. It can record better than D-1 quality in real time and features a dozen industry-standard connections.

QuBit - there's no digital recorder-server this advanced, this versatile and this affordable anywhere. Even if you're not from this planet.

To learn more about QuBit call 800-554-8116, 913-272-3656 or fax 913-272-3657.

Circle (65) on Free Info Card

QuBit

Not Made by Aliens



www.quvis.com

News Digital Systems

With ever-increasing demands for fast, cheap information and limited satellite capacity, new digital compression equipment allows broadcasters to exploit the trade-off in acceptable picture quality for commercial and operational benefits, translating it into a win-win situation.

As broadcasters migrate from analog to end-to-end digital broadcasting systems, they are recognizing that MPEG-2 and DVB digital compression standards provide a host of performance and cost advantages.

Digital Satellite News Gathering (DSNG) is an area where the application of digital compression technologies is making a large impact. The mandate to quickly and efficiently transmit news from around the globe over satellite is driving the adoption of the new ap-

proach. DSNG equipment, which combines MPEG-2 video, audio and data encoding with multiplexing and modulating functions, enables broadcasters to reduce their cost of ownership with smaller bandwidth and power requirements — leading to lower operational costs.

MPEG-2 powerful flexibility

Historically, ETSI-based codec systems have been used to compress news feeds. But times are changing. Increasingly, the more efficient and flexible compression technology offered by the MPEG-2 DVB standard has led to MPEG-2 becoming the compression method of choice for DSNG.

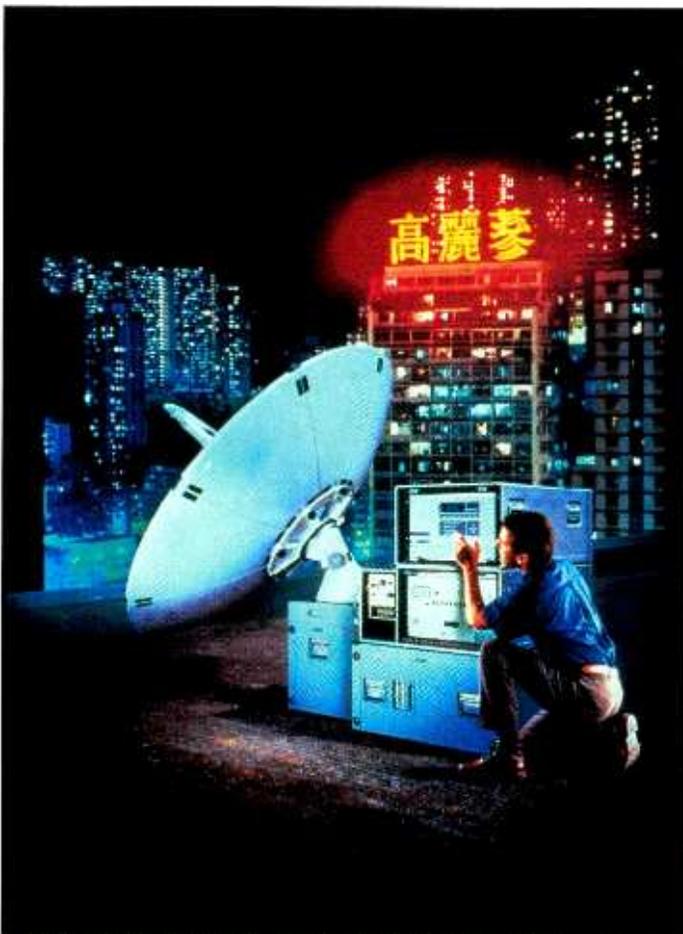
With any digital compression system, there are bandwidth savings. MPEG-2 is far more flexible in its use of bit rate and, therefore, bandwidth than ETSI, which is fixed to telecommunication line speeds at either 8Mb/s, 34Mb/s or 45Mb/s. Conversely, MPEG-2 Main Profile at Main Level (MP@ML) encoding will do 1Mb/s to 15Mb/s for video.

The resulting flexibility in the occupied bandwidth not only allows broadcasters to take advantage of reduced satellite space segment tariffs when space segment requirements can be planned, but also allows them to whatever space segment is available in times of crisis. This is particularly important in cases where large numbers of broadcasters are rushing to cover a breaking event somewhere in the world. With reduced bandwidth requirements, broadcasters are more certain to get crucial space on a satellite, ensuring that their news gets on air.

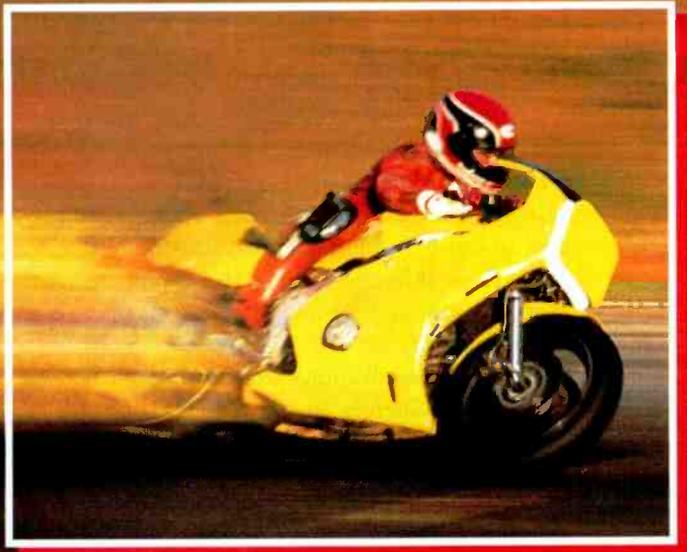
While the nature of the material being encoded (e.g. fast-moving action or talking heads) influences the picture quality for a given bit rate, picture quality equates to the bit rate used in a non-linear fashion. The flexibility in source and channel coding offered by MPEG-2 allows the DSNG operator to make commercial savings by exploiting this relationship to obtain an acceptable picture quality within minimum bandwidth. As broadcasters can appreciate, picture quality is a subjective and emotive subject. For those willing to answer the question “What is an agreeable picture quality for my service?” the benefits await.

Smaller, lighter systems

A key advantage of DSNG is that the system requires



LIGHTNING FAST IMAGES



Pinnacle Systems Introduces



Image Storage for News and Sports

LIGHTNING FAST

The Lightning Video Image Storage System recalls and plays images in less than 1/2 second. And you can add our ShotBox for your most demanding on-air applications.

BUILT-IN 3D DVE

Our unique built-in DVE lets you instantly size and rotate an image, add borders, a drop shadow, and 3D perspective.

OPEN NETWORKING

Lightning lets you browse and move images on *all* your network drives. You can even convert images to and from TGA, TIFF, BMP and JPEG formats in order to import and export images to and from graphic design and paint programs.

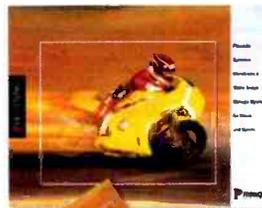
INCREDIBLY EASY IMAGE MANAGEMENT

Use our picture-based database to view over 100 thumbnail images at a time, or search by number, date, title, user, subject, and other fields. And you can drag-and-drop any image directly from the picture database into preview or on air.

SEE FOR YOURSELF

Call Pinnacle Systems today for a Lightning brochure. Better yet, if you have a PC with Windows® 95 or a Power

Macintosh®, with a CD drive, ask for the Lightning CD-ROM. It will show you everything that's in the brochure, and more.



Call 1-800-4PINNACLE ext. 42 for a Brochure or CD-ROM.

Pinnacle Systems, Inc. • 280 N. Bernardo Avenue • Mountain View, CA 94043
Phone: 415-526-1600 • Fax: 415-526-1601 • Fax Back: 415-237-1973 • BBS: 408-933-8630 • Web Site: <http://www.pinnaclesys.com>
Europe: 44-1895-442003 • Latin America & Caribbean: 954-349-6745 • Asia Pacific: 65-3243207 • N. E. Asia: 81-3-3221-9710

© 1997 Pinnacle Systems

™Lightning is a trademark of Pinnacle Systems, Inc. ®Windows is a registered trademark of Microsoft Corporation, and Macintosh is a registered trademark of Apple Computer, Inc.



PINNACLE
SYSTEMS

Circle (66) on Free Info Card

www.americanradiohistory.com

less transmission energy, so broadcasters can use smaller high-power amplifiers (HPAs) and smaller transmission dishes. The trend for smaller, lighter DSNG systems, such as DMV's DSNG Codec, enables individual reporters and operators to personally transport the system, while greatly reducing transportation costs.

There are other advantages to MPEG-2 DVB DSNG systems. They provide enhanced transmission robustness to noise by employing interleaving and concatenated Reed-Solomon coding. This is especially important to ensure that the final broadcast is of the highest possible quality.

There are also advantages to reducing timely processing delays. Whereas in any compression encoding, MPEG or ETSI based, there is a phenomenon known as processing delay. This primarily affects live two-way news gathering scenarios. With sophisticated DSNG equipment, broadcasters can address this annoying problem by using lower-delay encoding configurations where slight reductions in picture quality can be traded for reduced processing delay.

Interoperability for DSNG

Recently, participating encoder and decoder manufacturers have been attempting to demonstrate secure interoperability of MPEG-2 DVB systems at the ISOG/

Intelsat interoperability trials. The aim is to have open systems so that transmissions sent from different up-link equipment is receivable by as many manufacturers as possible. Interoperability trials are ongoing and manufacturers are truly working together to achieve this open systems objective.

For the operator, interoperability allows greater flexibility to purchase from a wide choice of different manufacturers equipment. However, interoperability also increases the chance of eavesdropping, and even pirating, so the inclusion of scrambling capabilities in your selection of DSNG transmission equipment should not be overlooked.

Choosing the right equipment

The adoption of digital technology need not be an operational nightmare. There are a number of features that a DSNG system should include so that you don't run into basic logistical or location problems. Of course, it needs to be compact, lightweight and rugged. For international news-gathering equipment, it should also have a broad operating temperature range.

DSNG equipment needs to be rapidly deployed and used. The flexibility of the MPEG-2 and DVB standards can be somewhat daunting to the unfamiliar operator, or time consuming to set-up. However, features such as user configurable preset configurations or automatic encoder configuration can be used to get the system operational quickly and minimize operator training.

Integral receivers should not only be capable of monitoring at points within the transmission system, but also capable of being tuned to allow monitoring off satellite for the ultimate confidence test. Self-test and diagnostic features help get you out of trouble, and audio tone and video test pattern generation help with diagnosis or transmission testing.

The introduction of MPEG-2 compression into the news gathering market is driving the acceptance of digital technology in this sector. Digital satellite technology is also changing the face of all outside broadcasting and broadening the application base. For instance, the bandwidth efficiency allows multicamera sports events to be transmitted to the main permanent studio for production in the same satellite space segment as one analog channel, negating the need for an on-location studio. ■

Join the world leader on the trail of intelligent system design

- Avoid Design Pitfall
- Keep off Poor Planning Precipice
- Soar over Organizational Obstacles
- Ride around Budget Rock
- Bypass Specification Swamp

Get there fast with

VidCAD

POWER Levels 1 - 6

...Or eat dust!!

VidCAD Documentation Programs

749 Carver Road • Las Cruces • NM 88005 USA

(800) VidCAD-6 • (505) 524-8959

Fax: (505) 524-9669 • sales@vidcad.com

Circle (67) on Free Info Card

Carl Fergusson is DMV DSNG Codec product marketing manager for News Digital Systems, Middlesex, England.

FREE 44pg Catalog & 80 Audio/Video Applc.
PWR SUPP. EQ. TEST PRODUCTS
PHONO, MIC.
TRANS. ACH.
TAPE, VIDEO, / PRESS
LINE, OSC BOXES
1-in/9-out Video/Audio
1-in/18-out Video/Audio
12-in/24-out Audio Only
12-in/24-out Video/Audio
Video & Audio Dist. Amplif.
RGB-Sync Dist. Amplif.
Routing Switchers
OPAMP LABS INC (213) 934-3566
1033 N Sycamore Av LOS ANGELES CA, 90038
<http://www.opamplabs.com>

Circle (68) on Free Info Card

Just digital isn't enough.

Think Small

All the features. One small package.



Get the smallest encoder/modulator available! Features interoperable video, scrambled video and network control.

Save space. Pack digital video encoding, three stereo digital audio channels *and* your QPSK modulator into 5 1/4 inches of rack space. Wrap it in a package so rugged it thrives in SNG trucks. Only Wegener delivers this much in this little space!

Get control. Boost programming flexibility with the industry's most advanced network control system. Go beyond addressability!

Control each receive site, groups of sites or all sites simultaneously. Deliver localized programming. Switch external devices. Transmit messaging and e-mail. Send data.

Change video data rates on the fly—2.5 to 15 Mbps—

to adapt to broadcast material, weather conditions and available bandwidth. Select FEC coding rate (DVB compliant, of course), output power and frequency.

Locally, use front-panel controls or a remote serial port. Over the network, a new drag-and-drop graphical interface makes Wegener's advanced Addressable Network Control System even more powerful.

Get more than just digital video. Get the Wegener difference in MPEG-2 digital video. Cut your costs and build your profits. Call our Fax-On-Demand toll-free at (800) 711-1142 for a fact sheet that will help you compare digital video products—or e-mail zmpeg2@wegener.com.

Do it today. We'll respond immediately.

WEGENER®
COMMUNICATIONS
(770) 623-0096 FAX: (770) 623-0698

Circle (69) on Free Info Card

www.americanradiohistory.com

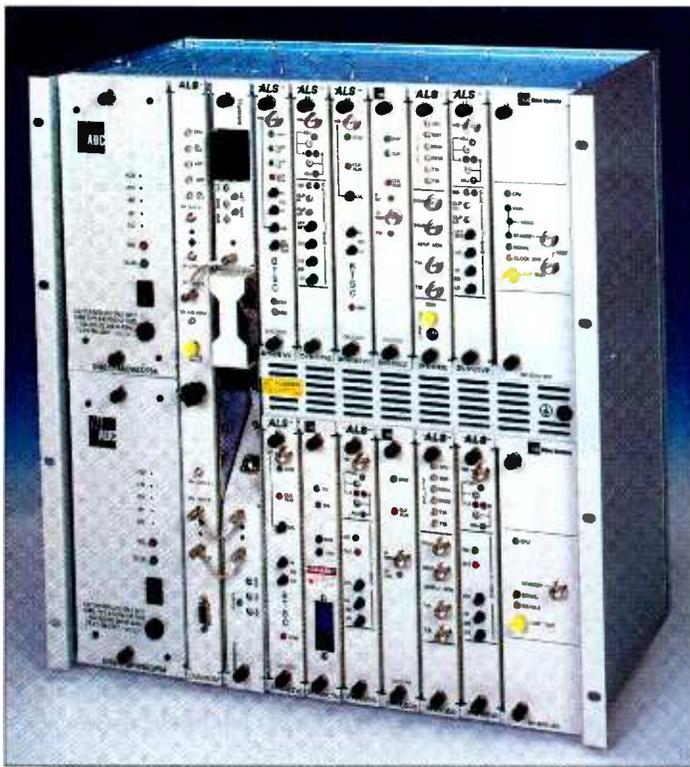
ADC Broadband Communications' DV6000

Competition from direct satellite television, increasing business costs and the threat that telcos may enter their market are forcing cable TV operators to seek new ways of improving service and advertising revenue.

One stumbling block to increased revenues has been the inability of cable systems to cost-effectively deliver real-time advertising messages. As a result, national and regional advertisers have focused on national TV spot advertising, avoiding the complexities involved with spot advertising on cable systems. For some time, cable operators in large metropolitan

Continental Cablevision, Jones Intercable, Inc., Time Warner Cable, Multimedia Cablevision, Post-Newsweek Cable, Prime Cable of Chicago, Prime Time Cable Ads, Telecommunications, Inc. and US Cable have formed the Chicago Cable Interconnect (CCI).

The CCI is the first-in-the-world hard-wired digital system for distributing ads to member cable companies. It serves as a one-stop cable-TV buying outlet for advertisers, providing real-time, single-point ad insertion so that ads can be run simultaneously across the entire dominant market area (DMA) or in specific market zones.



ADC Video Systems' DV6000.

areas have sought a way to overcome this limitation. Now, there is a way that will allow cable operators to offer the immediacy of spot advertising, in addition to the demographic and geographic specificity of local cable systems.

In Chicago, cable operators have joined together to form a multiple cable system cooperative that has changed the environment for spot cable advertising.

CCI uses the latest technology to store, insert and transport spot advertising into the local cable systems. A system from ADC Video Systems was selected for the real-time transmission of advertising spots to cable company head-ends for delivery to subscribers. The use of uncompressed digital video technology maximizes signal quality and eliminates costly and error-prone analog insertion processes.

For the first time, national and regional advertising can be stored and accurately distributed to multiple cable systems in large metropolitan areas. Additionally, the real-time nature of the insertion process, a 24-hour turnaround time, allows member system operators to take advantage of time-sensitive regional and local advertising opportunities.

Single head-end storage

The CCI is a centralized system for the warehousing and on-demand broadcasting on spot advertisement from national and regional advertisers. Using Interconnect facilities, ads can be run across the entire DMA or targeted to specific demo-

graphic zones with the DMA. CCI has engaged National Cable Communications (NCC), 50% owned by the Katz Media Group, to represent and operate the Interconnect for the cable partners.

NCC has established and operates the head-end facility that will receive ads from regional and national advertisers and broadcasts them as required for the eight-member cable operators. The backbone of the

ABILITY

Is Everything



Jump into the mix with the new NV3064SA – true synchronous switching at a very affordable price. Designed for smaller facilities and budgets, the NV3064SA features the same pre-reframing technology as our industry leading NV3512SA, so data is never corrupted or compromised. Designed to work within all current control systems, the NV3064SA requires less space and power than traditional audio routers, and can grow as you do from 32² to 64². Redundant power supply and control interface options are also available. To get in sync with the most affordable digital audio router on the planet, call 1-800-719-1900.

NVISION[®]

Circle (49) on Free Info Card

www.americanradiohistory.com

CONVERT COMPUTER GRAPHICS



TO VIDEO



RGB/Videolink® VIDEO SCAN CONVERTERS

Up to 1600 x 1280 pixel input

Analog output / NTSC, PAL,
S-Video, CAV

Digital output / CCIR 601

Flicker filter

Autosync

Video overlay

Pan & zoom

Simple external connections



SPECTRUM®

A visual communications company™

950 Marina Village Parkway
Alameda, CA 94501

Tel: (510) 814-7000

Fax: (510) 814-7026

E-mail: sales@rgb.com

http://www.rgb.com

Circle (71) on Free Info Card

applied technology

head-end site is a fiber-optic transmission system that provides 16 channels of MPEG-2 digital insertion to 54 head-ends via 24 switch points. Additionally, 16 channels of digital insertion will be provided to a configuration of head-ends that will create five additional demographic zones.

Once the ads are received by NCC, they will be stored in a video server. When a queuing signal is received from the cable system, the server feeds the ads to the digital transport system that transmits the ads through a video switch to a fiber-optic delivery system. The signal is received at each head-end and switched into the cable operators audio/video stream prior to the channel modulator.

ADC Video Systems' DV6000 system was chosen as the transport system by CCI because of its flexibility and ability to deliver a clean video signal.

ADC Video Systems' DV6000 system was chosen as the transport system by CCI because of its flexibility and ability to deliver a clean video signal. The system is a 16-channel, high-resolution, 2.4Gb/s fiber-optic transmission system that encodes signals in an uncompressed digital format to achieve higher quality imagery. The flexible architecture supports diverse network configurations and multiple formats allow the transport platform to meet individual cable system requirements of all eight cable operators.

New paradigms

This system has changed the environment for spot cable advertis-

ing in the Chicago DMA, providing the backbone for a digital insertion system that has created a new paradigm for cable advertising insertion and distribution systems throughout the United States. Dan Lawlor, CCI general manager, says, "The CCI provides the impact and reach of television, plus much more. We target like print, but with the accuracy of direct mail. We also offer the frequency and creative versatility of radio. We are capable of 24-hour turnaround, and best of all, this is now accomplished with one order, one contract and one set of invoices."

With the use of the NCC service, individual cable systems avoid the labor costs associated with the storage and scheduling of each ad while benefiting from reduced equipment requirements and the convenience of centralized billing. Cable advertising has become a viable medium for national and regional advertisers. Now when an advertiser buys cable spots in the Chicago metropolitan area, instead of receiving up to 54 affidavits, there will be only one affidavit and one contract.

Equally significant, however, is that cable systems gain a new capability for demographic programming and can offer advertisers the same geographic configuration as newspapers. For the first time, national advertisers will be able to select those geographic zones of metropolitan Chicago in which they want their ads to appear.

Kevin Dowels, chairman of the CCI governing board said, "The CCI system will guarantee that spots will be aired instantaneously, securing the correct market area distribution, and increasing the attractiveness of cable television to national advertisers. I expect that national bookings in the Chicago area will increase significantly with this new, digital interconnect." ■

Wes Simpson is DV6000 product manager for ADC Broadband Communications, Meriden, CT.

SCEC 97

The 19th Annual
Satellite Communications
Expo & Conference

September 17-19, 1997
Washington Convention Center
Washington D.C., U.S.A.

DISCOVER



SCEC'97:

Discover the power of the technologies, products, services, and developments that are shaping the future of your business.

- ▶ 20++ educational workshops and roundtables
- ▶ 100++ exciting exhibits featuring the latest satellite technologies and services
- ▶ 1000++ new ideas and solutions for the technical & engineering management professional

This power-packed conference program provides practical solutions to the challenges presented by today's changing satcom industries.

ATTENTION VENDORS:

Prime exhibit space is going fast. For details on exhibiting, call Kim Greenway, Intertec Presentations, 770-618-0423.

For complete information on the conference, exhibitors, hotels, special events and more, return this coupon today or call **FAX-ON-DEMAND at 1-800-601-3858***, or Intertec Presentations at 1-800-288-8606 or 303-220-0600.

* Available after 3/15/97

If you're involved in planning, using or buying satellite communications services, systems and products, the solutions to your challenges can be found at SCEC 97.

- YES!** Please send me attendance information.
 Please contact me about exhibiting.

First Name _____

Last Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone* _____

Fax* _____

*International guests, please include country and city codes.

SOURCE CODE: AD

Presented by

SATELLITE

COMMUNICATIONS

With support from these other Intertec Publications:
 Telephony • Global Telephony • World Broadcast News • Broadcast Engineering • Cellular Business
 • WireWorld • RF Design • Mobile Radio Technology • Cellular & Mobile International

Managed and produced by Intertec Presentations,
 a division of Intertec Publishing

Circle (64) on Free Info Card

www.americanradiohistory.com

MAIL OR FAX TO:

Intertec Presentations • SCEC 97
 6300 South Syracuse Way, Suite 650
 Englewood, CO 80111

Phone: 1-800-288-8606 or 303-220-0600

FAX: 303-770-0253

industry briefs

Business

Thomson Broadcast announced the opening of two offices. Atlanta: 3101 Roswell Road, Marietta, GA 30062. Chicago: 6126 Lincoln Ave., Morton Grove, IL 60053.

Matsushita Electric Industrial, Osaka, Japan, has been selected as the official broadcast equipment supplier and systems integrator/prime contractor by the Nagano Olympic Committee for the XVIII Olympic Games in Nagano, Japan in 1998.

Anton/Bauer, Shelton, CT, has been acquired by the UK-based Vitec Group, plc. Anton/Bauer will continue its operations in Connecticut and will retain all key management under the same name.

Pinnacle Systems, Mountain View, CA, has acquired the Deko titling systems product line and technology from Digital Graphix, Inc., Bloomfield, CT. Pinnacle expects to pay Digital Graphix \$5 million in cash and assume liabilities of approximately \$1 million.

Harris Corporation, Quincy, IL, has been awarded contracts valued at nearly \$30 million to provide digital broadcast equipment for Georgia Public Broadcasting, Atlanta, and Discovery Communications' Latin America Television Center, Miami.

Acrodyne Industries, Blue Bell, PA, has been awarded a \$1.6 million contract for the manufacture, delivery and installation of two 60kW UHF TV transmitters for use in the statewide Wisconsin Educational Communications public TV system.

Panasonic, Secaucus, NJ, and NBC, have teamed up to present the NBC Astrovision by Panasonic overlooking Times Square in New York City. The display will operate from 7 a.m. to 1 a.m. daily and will feature varied programming from NBC.

Quantel, Newbury, UK, announced the sale of its Editbox 4020 editing system to Burbank, CA-based post house Suite 16. Quantel also announced the sale of its Hal Express on-air graphics system to local station KARE, in Minneapolis.

Avid Technology, Tewksbury, MA, announced a strategic alliance with Intel Corporation, Santa Clara, CA, in support of Avid's plans to offer video and audio

editing products on the Intel architecture. Under terms of the agreement, Avid will develop digital content creation products for Intel's architecture, and Intel will purchase 1.5 million newly issued shares of Avid common stock.

Telex, Minneapolis, has entered into a recapitalization agreement and plan of merger with Greenwich II LLC and GST Acquisition Corporation, affiliates of Greenwich Street Capital Partners, Inc., a New York-based private equity fund.

Lodestar Towers, Inc., Los Angeles, will install two DTV towers atop Mt. Harvard in Los Angeles County. The towers will feature fiber-optic cabling and are slated for completion late this summer.

Dielectric Communications, Raymond, ME, has developed an adjacent-channel, slot-type antenna for WETA in Washington, DC. The antenna will be used for DTV field tests at the station.

People

Navroze Mehta has been appointed president and CEO of Comark Corporation, Southwick, MA.

Kent Porter and **Jim Lein** have been named product managers for Videotek, Inc., Pottstown, PA.

James C. Collins has been named director of sales and marketing for MountainGate, Reno, NV.

Rob Van Oostenbrugge has been appointed business unit manager for Philips BTS, Simi Valley, CA.

Rick Sawyer has been hired as North American sales manager for Orban, San Leandro, CA.



Charles R. Hoeg is director of engineering for Fiber Options, Bohemia, NY.

Tekniche, Northvale, NJ, announced the additions of **Thomas E. Neumann** as operations manager and **Jorge Paredas** as service engineer.

Tony Pierson has been appointed group product manager of transmission products for Philips Broadband Networks, Manlius, NY.

Don Peebles has joined Solid State Logic, New York, as vice president of broadcast and post-production. ■



new products

By Deanna Rood



Demodulators Videotek

• **Agile demodulator series:** Videotek has cut the price of the DM-154 agile video demodulator 22%; this high-performance TV tuner/demodulator can be used for FCC compliance testing, as well as in testing applications and in locations where computer control is required; the DM-192 is a cable-ready agile demodulator that lends itself to broadcast and cable TV video services and testing due to selectable synchronous or envelope detection mode, zero carrier chopper mode, Quadrature output, IF loop capability and composite audio out for stereo testing or remodulation; the family of demodulators also includes the DM-141A and the DM-145.

Videotek, 243 Shoemaker Rd., Pottstown, PA 19464-6433; 610-327-2292; fax 610-327-9295

Circle (257) on Free Info Card

Digital production switcher

Sony Electronics

• **DVS-7200:** this mid-range digital switcher is a post-production version of Sony's DVS-7000 that provides a wide



variety of visual effects and operational flexibility; like the DVS-7000, it can be used at component or composite stations; the DVS-7200 features two mix/effects banks, each with two full-function keys.

Sony Electronics, Sony Dr., Park Ridge, NJ 07656; 800-635-SONY; fax 201-358-4058; www.sony.com

Circle (250) on Free Info Card

Rack-mount receiver

Harmonic Lightwaves

• **HRM 3810:** a rack-mount receiver for broadband networks that offers an RF power detector and alarm that enables detection of system problems before signals reach the optical link; in addition, the HRM 3810 supports a broad range of optical input levels from -6 to +3dBm; state-of-the-art GaAs amplifiers allow excellent receiver performance, flatness and low distortion.

Harmonic Lightwaves, 549 Baltic Way, Sunnyvale, CA 94089; 408-542-2500; fax 408-542-2511

Circle (259) on Free Info Card

ENG zoom lens

Fujinon

• **A15X8 EVM/ERD:** this hand-held ENG zoom lens combines lightweight, unmatched optical performance, Fujinon's proprietary Aspheric Technology and a new inner focusing system to produce unprecedented image quality; in addition to offering outstanding telephoto features to go along with its 15X zoom ratio, it also has excellent ramping characteristics, a variable zoom grip and selectable zoom speed, which creates the smoothest possible zoom from 8mm to 120mm.

Fujinon, 10 High Point Dr., Wayne, NJ 07470; 201-633-5600; fax 201-533-5216

Circle (261) on Free Info Card



Serial digital matrix routing switchers

Videotek

• **SDR-800 & SDR-800A:** matrix routers for serial digital video and AES/EBU audio; the units are 8x8 in a 1RU frame and can be expanded to 16x16 by adding the SDR-EX expansion frame for video or the SDR-EXA for audio; each unit includes a front-mounted control panel with an optical rotary encoder for accurate data entry, RS-232, RS-422 and RS-485 serial interfaces, GPI port and an LCD display for matrix status, crosspoint selection and salvos.

Videotek, 243 Shoemaker Rd., Pottstown, PA 19464-6433; 610-327-2292; fax 610-327-9295

Circle (276) on Free Info Card

Fluid heads for digital cameras

Sachtler AG

• **System DV 2 & System DV 4:** tripod kits that consist of a digital video fluid head, aluminum tripod and ground spreader; both systems feature the leakproof, two-step (0+1) Sachtler fluid system that works reliably and independently of temperature, whether you are shooting in a hot or cold environment; the fluid heads come with a single pan arm and the Sachtler Touch & Go quick camera locking system.

Sachtler AG, GutenbergstraBe 5, D-85716 Unterschleißheim, (0 89) 3 21 58-2 00; fax (0 89) 3 21 58-2 27

Circle (265) on Free Info Card





Battery charger/discharger

Aspen Electronics

- **ROQ-4 series:** a battery maintenance system that features a serial 232 output and a four-channel analyzer option in the form of a Microsoft Windows-based software program; the series is NP and BP compatible for Ni-Cd batteries, and includes fast charge and discharge multitasking, selective discharge with sequence memorization; it is compatible with all international AC power input voltages.

Aspen Electronics, 15131 Triton Lane, Suite 107, Huntington Beach, CA 92649; 714-379-2515; fax 714-379-2517

Circle (275) on Free Info Card

Mobile camera link video enhancer

Studio Systems Electronics

- **RANGER:** a mobile camera microwave link video enhancer that processes the received video signal from the microwave link and maximizes picture quality; the video is enhanced by stabilizing the chrominance, locking-on to the video signal, and enabling all the video action to be captured, even from difficult remote mobile cameras, where multipath reception can be a problem.

SSE, Unite 10 Falcon Business Park, Ivanhoe Rd., Finchampstead, Wokingham, Berkshire, England, RG40 4QQ; +44 (0)1189 731737; fax +44(0) 1189734 734679;

106600.475@COMPUSERVE.COM

Circle (273) on Free Info Card



CD player

Denon Electronics

- **DN-C680:** a CD player designed for everything from broadcast studio to post-production to DJ use; it features a large jog dial and shuttle wheel for fast searching and precise cueing; the jog dial moves through a CD frame-by-frame or it can be adjusted to move in 10-frame increments; the CD's index can also be scrolled through in a single or 10-index increments; up to 25 tracks can be sequentially programmed for track-by-track or continuous play.

Denon, 222 New Rd., Parsippany, NJ 07054; 201-575-7810; fax 201-808-1608

Circle (271) on Free Info Card



Hand-held digital multimeters

Tektronix

- **DMM800 series:** a family of hand-held true rms digital multimeters that provide up to twice the accuracy and up to 10 times the resolution of competing hand-held DMMs; the series offers a full range of features including voltage, current, resistance, capacitance, frequency and temperature; the series includes the entry-level DMM830, the mid-range DMM850 and the high-end DMM870.

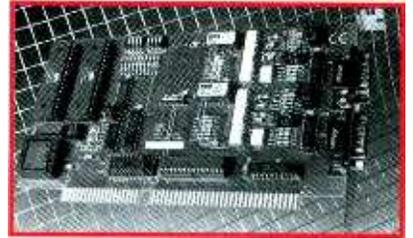
Tektronix Measurement Business, Literature Distribution Center, P.O. Box 1520, Pittsfield, MA 01202; 800-479-4490 (action code 715)

Circle (255) on Free Info Card

Automatic RS-485/422 card

Sealevel

- **ULTRA-SIO:** a two-channel serial I/O adapter for the PC and compatibles; it provides two RS-485/422 DOS, Windows 3.X/95/NT, and



OS/2 compatible serial ports allowing connection of up to 32 RS-485 devices to each port; each port provides true optical isolation eliminating the effects of ground loop current and other transient spikes; the ULTRA-SIO allows the RS-485 line to be managed transparently without user or software intervention and eliminates RS-485 network contention.

Sealevel, P.O. Box 830, Liberty, SC 29657; 864-843-4343; fax 864-843-3067

Circle (270) on Free Info Card

Portable MPEG-2/DVB encoder and satellite uplink

Philips Digital Videocommunications Systems

- **QuickSat:** a complete encoder and satellite uplink system in one compact enclosure; QuickSat comprises the key elements of a digital MPEG-2/DVB-compliant SCPC uplink; it supports a range of data rates and satellite bandwidths for a variety of video, sound and data applications while optimizing the use of available transponder bandwidth; QuickSat is ideal for digital satellite news gathering and broadcasting to closed user groups; its compact size, low weight and robust construction allow for ease of transportation and installation where space is critical.

Philips DVS, +31-40-273-3615; fax +31-40-273-2715

Circle (274) on Free Info Card

Multichannel MPEG-2 transmission solution

ADC Telecommunications

- **CDV3000 system:** developed as a joint effort between ADC Telecommunications and NUKO Information Systems, this universal MPEG-2 transmission system has the ability to transport multiple real-time MPEG-2 channels over a variety of standards-based networks through an open, scalable and modular architecture; the CDV3000 platform provides flexible encoding, multiplexing and transport of up to eight video channels on a single DS3 circuit; the DS3 output from the CDV3000 can be routed into and transported over a DV6000 backbone network or over any standard DS3 network for trunking and distribution.

ADC Telecommunications, 999 Research Parkway, Meriden, CT 06450; 203-630-5700; fax 203-630-5701

Circle (251) on Free Info Card



Production switchers for Windows NT

ECHOLab

- **ECHOLab 5000 switchers:** a family of digital video production switchers that run Windows NT; the three new 5000 models have full-function control panels for live or post-production environments and the open architecture design, with an integrated, built-in mini-server, can run a variety of video devices from the leading companies embracing Microsoft's Windows NT; the 5000 family runs 10-bit CCIR-601 component digital and handles up to 38 inputs and 16 outputs.

ECHOLab, 175 Bedford St., Burlington, MA 01803; 617-273-1512; fax 617-273-3275; www.echolab.com

Circle (252) on Free Info Card



Integrated applications for Profile PDRs

Tektronix

- **Profile Tool Box 1.0:** a set of integrated applications that allows users of Profile professional disk recorders to easily manage digitized media, perform basic cuts-only editing, build and execute lists of events and configure hardware and system resources; all digital audio and video can be managed and viewed from a single console whether the material is on one Profile PDR or a network of Profile PDRs; the Profile Tool Box consists of the Tool Box framework, a media manager and three applets (Tool Box Editor, List Manager and Configuration Manager).

Tektronix, P.O. Box 500, Beaverton, OR 97077-0001; 800-547-8949; fax 503-627-7275; tekxpress@vnd.tek.com;

www.tek.com/vnd

Circle (258) on Free Info Card



Multichannel decoder

Vela Research

- **MPEG-2 four-channel decoder:** a low-cost-per-channel solution for digital ad insertion applications; the decoder is designed with a gen-lock input to allow the video output to an external video source; a 2x1 video/audio switch for passing the gen-lock video and stereo inputs to the output provides a low-cost switch for environments that require passing a network feed; the decoder accepts MPEG-2 data and device control commands from a SCSI-2 fast/wide interface; each playback channel is addressable via a SCSI Target ID and logical unit number and images can be decoded from SIF to ITU-R-601 (CCIR-601) with NTSC or PAL outputs.

Vela Research, 2501 118th Ave. North, St. Petersburg, FL 33716; 813-572-1230; fax 813-573-2508

Circle (253) on Free Info Card



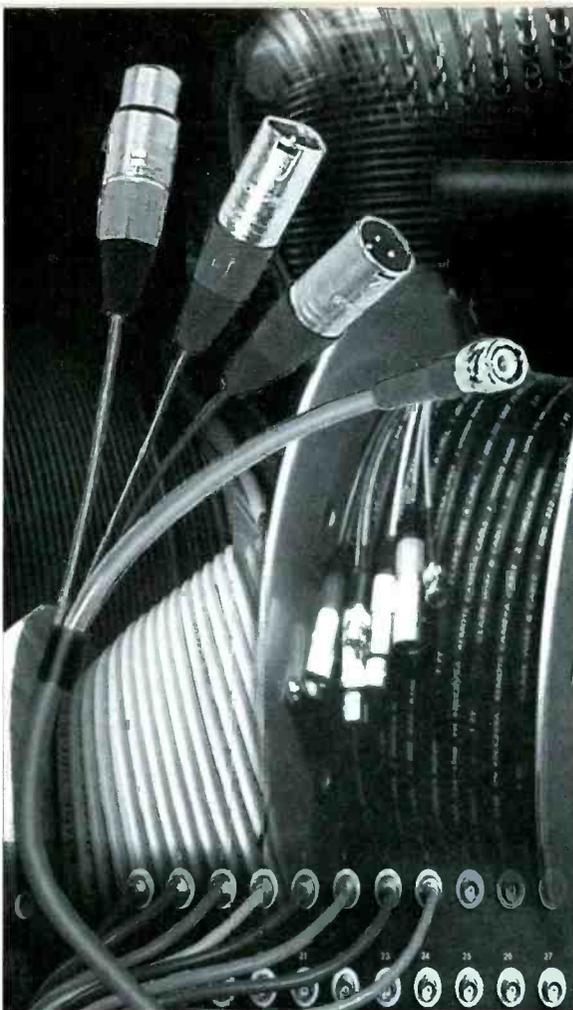
Video/audio/data multiplexer

Opticomm

- **FMX-48000:** a frequency modulated, LED or laser-based NTSC, PAL and SECAM compatible video multiplexer, with optional combinations of simplex audio and data; it combines 4-8-16 channels of video, audio and data in one multiplexer system operation over one fiber-optic cable; the FMX-48000 allows local area network communication between buildings in the 5 to 35km range; units are available as a stand-alone or in the card version.

Opticomm, 6046 Cornerstone Court West, Suite 209, San Diego, CA 92121; 619-450-0143; fax 619-450-0155

Circle (272) on Free Info Card



After you buy this year's hottest new equipment, you're going to need to connect it.

And after you've made the investment to be the best of the best, you're going to insist on quality cabling.

At Clark, quality is our number one concern, along with stocking the products you need. All standard cables and accessories are on hand, including a wide range of Composite Cables to eliminate multiple cable runs. And we specialize in digital products - like audio and video digital cabling, complete digital assemblies and digital patchbay systems.

And when you need more than the standard product, the Clark Custom Cable Shop is ready to provide custom cable assemblies that meet your exacting standards and your exact needs.

When it comes to cable, we get you connected. Call us at 1-800-CABLE-IT. See Us At NAB'97 Booth #7871.



Quality products for quality customers

(800) 222-5348 · Fax: (847) 949-9595

email: sales@clarkwc.com

www.clarkwc.com

Circle (85) on Free Info Card

new products

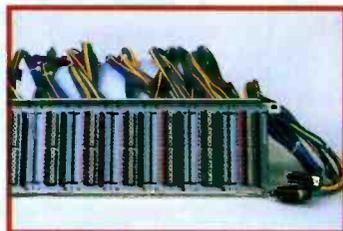
Punch-block interfaces

Leitch

• **ADC punch-block interfaces:** interfaces for audio routers and audio distribution amplifiers for quick inter-connection for a variety of system configurations; the interfaces come prewired with umbilical cord and D25 connectors for plug-in to equipment frames; the audio router interfaces each provide 16 input or output connections, and up to eight interface modules will fit in a three-rack unit supplying as much as a 32x32 routing system; the audio DA interfaces each provide inputs and outputs for one DA and up to 10 interface modules will fit in a two-rack frame; the modules are compatible with Leitch's series 883 and 884 mounting frames.

Leitch, 920 Corporate Lane, Chesapeake, VA 23320; 800-231-9673; fax 757-548-4088
www.leitch.com

Circle (277) on Free Info Card



AES/EBU digital interface Intraplex

• **Line of high fidelity audio modules with AES/EBU digital transport capability:** these modules can feed AES/EBU digital audio over Intraplex's TDM-160 T1 multiplexer systems and TDM-260 2Mb/s multiplexer systems and stay all digital end to end; the AES/EBU provides transmission of audio sampled at 32, 44.1 or 48kHz providing interface support to all common digital studio and transmitter equipment; a sophisticated sample rate converter, combined with digital signal processing technology, provides a smooth interface between the timing characteristics of the AES/EBU interface and the digital transmission circuit.

Intraplex, 3 Lyberty Way, Westford, MA 01886-3656; 508-692-9000; fax 508-692-2200

Circle (254) on Free Info Card

Lenses

Canon

• **Optical Image Stabilizer lenses:** these lenses incorporate Canon's Vari-Angle Prism (VAP) technology and eliminate image shaking commonly associated with shooting from a moving vehicle or in high wind conditions; a full line of VAP lenses are available including the J14aX17B KRS-V telephoto range zoom, the J13aX9B KRS-V, which features a wider angle and the IS-20B adapter, which is designed for front mounting on Canon's J20aX8B/H20aX6B ENG/EFP lenses.

Canon U.S.A., One Canon Plaza, Lake Success, NY 11042; 800-321-4388

Circle (260) on Free Info Card



UHF wireless microphone

AKG Acoustics

• **WMS 300:** a UHF-based wireless microphone system that offers 10 different microphone combinations and up to 16 different frequency options within 20MHz bandwidth; with the WMS 300 system, up to eight different WMS 300 units can be operated at the same time — safely and without cross interference — if interference should occur, you can switch the receiver and transmitter to another frequency channel.

AKG Acoustics, 1449 Donelson Pike Suite 12, Nashville, TN 37217; 615-399-2199; fax 615-367-9046

Circle (256) on Free Info Card

Video furniture catalog

Winsted

• 1997 Winsted Catalog: a free colorful, 148-page catalog featuring hundreds of broadcast and video workstations in both desk and console configurations supported by a full complement of accessories; a complete line of modular consoles, AV and distance learning carts, vertical equipment racks, rack slide kits and Winsted's extensive variety of tape storage systems round out the offering.

Winsted, 10901 Hampshire Ave. So., Minneapolis, MN 55438; 800-559-6691

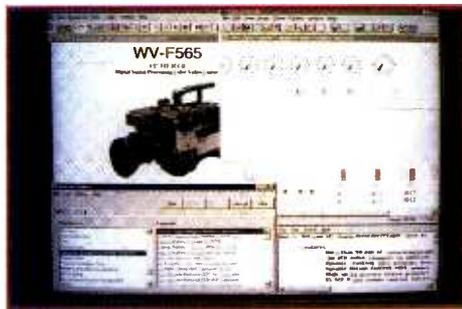
Circle (263) on Free Info Card



Audio, video and multimedia catalog on CD ROM

VidCad Documentation Programs

• VidCAD Specs: a CD ROM catalog that contains the specification information on thousands of products from hundreds of manufacturers; the CDs are updated quarterly and



updates are posted weekly on the web; information provided includes product descriptions, technical specifications, options lists, high-resolution photographs and detailed front-panel line drawings.

VDP, 749 Carver Rd., Suite 2, Las Cruces, NM 88005; 800-949-SPEC; 505-524-8959;

fax 505-524-9669; www.vidcad.com

Circle (267) on Free Info Card

ENG broadcast lens

Fujinon

• A10X4.8EVM/ERD: a wide-angle lens that provides 85° horizontal range of view; featuring Fujinon's Aspheric Technology, Electron Beam Coating and a new internal focusing system, it can be used in extremely tight settings; the internal focusing system eliminates pumping effects, providing the camera operator with a constant picture size during focusing; the lens is also equipped with an extra-large focusing ring and an ergonomically designed, adjustable hand grip to suit individual preferences.

Fujinon, 10 High Point Dr., Wayne, NJ 07470; 201-633-5600; fax 201-533-5216

Circle (262) on Free Info Card



Switcher series for RGBHV video/audio signal routing

Extron

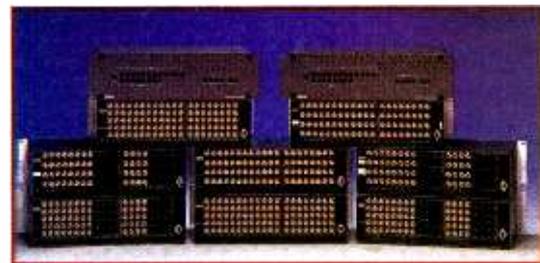
• HV CrossPoint Series: HV versions of the CrossPoint matrix switcher series for RGBHV video and audio

signal routing; the HV switchers can switch separate horizontal and vertical sync to ensure proper sync polarity and a more stable image; the HV series switch the separate horizontal and vertical sync as required by LCD, DLP and some CRT technology displays for proper sync "lock-up" and a jitter-free output; the series includes four models — 84HV, 84HVA, 128HV and 128HVA.

Extron, 1230 S. Lewis St., Anaheim, CA 92805; 800-633-9876; 714-491-1500;

fax 714-491-1517

Circle (268) on Free Info Card



Platform-independent programming language

Quantel

• Java: Quantel is opening its application-specific hardware to external programmers, and software developers writing the Java language will be able to write applications for the entire family of Quantel products; Java is a platform-independent programming language, and users will have the freedom to integrate limitless Java applications with the functionality and ergonomics of their Quantel systems offering unprecedented access to external creative sources.

Quantel, 28 Thorndal Circle, Darien, CT

06820; 203-656-3100; fax 203-656-3459

Circle (264) on Free Info Card



Multipair audio cable

Gepco

• 4200 series: working with CommScope Inc., Gepco has improved its 618 series to produce a new multipair audio cable; the 4200 series features 22-gauge stranded, tinned copper conductors; using tight lay stranding on the conductors and drain wire provides flexibility, while reducing strand fraying; each pair is individually shielded and jacketed to virtually eliminate crosstalk and ground loops by isolating the ground contacts with adjacent shields.

Gepco, 2225 W. Hubbard, Chicago, IL

60612; 312-733-9555; fax 312-733-6416

Circle (269) on Free Info Card

DTV solid-state UHF transmitters

ITS Corporation

• ITS-8800 series: solid-state digital UHF transmitters that combine DTV performance and operational features; while offering solid-state power levels up to 5kW average power, the series provides DTV coverage solutions for digital or analog applications; a user-friendly control panel and operator interface include push-button access, front-panel LEDs and software metering.

ITS, 375 Valley Brook Rd., McMurray, PA

15317; 412-941-1500 ext 150; fax 412-941-

4603; www.itscorp.com

Circle (266) on Free Info Card



THE PROFESSIONAL'S SOURCE FOR PHOTO,

FOR ORDERS CALL: **800-947-9928** OR FAX (24 HOURS): **800-947-9003**
212-444-5028 **212-444-5001**

ALL ORDERS SHIPPED WITHIN 24 HOURS
OVERNIGHT SERVICE AVAILABLE

On the Web: <http://www.bhphotovideo.com>

QUICK DIAL 72 MILLER Fluid Heads and Tripods

The silky, smooth action of each Miller Fluid Head is the product of the finest quality cast and machined parts functioning together in a fluid environment. They are engineering masterpieces, built to operate under extreme conditions. They're engineered to exceptionally fine tolerances and their mechanisms are protected effectively against ambient moisture and dust.

Miller 20-Series II Fluid Head

- Dynamic fluid drag control
- Sliding quick release camera platform
- Weights 4 lbs - handles up to 22 lbs.
- Counterbalance system compensates for nose heavy or tail heavy camera configurations and permits fingertip control of the camera throughout the tilt range
- Includes independent pan and tilt locks, bubble level, dual pan handle carriers and integrated 75mm ball levelling



Miller 25-Series II Fluid Head

- 100mm ball level fluid head
- Robust, lightweight, low profile design
- Quick release camera platform • Weighs 7 lbs - handles up to 25 lbs.
- Multi-step fluid drag system and integrated counterbalance system provide ultra-smooth repeatable pan-and-tilt fluid control and finger-tip camera balance for ENG camcorders, industrial CCD cameras or small studio cameras

#601-Lightweight Tripod

- Weights 4.5 lbs., supports up to 30 lbs.
- Minimum height down to 24", maximum height to 57".
- Extremely portable, folds down to 33"
- Engineered from thermoplastic moldings, diecast alloy and hard anodized tubular alloy.
- Fast one turn, captive leg locks
- Includes 75mm (3") ball levelling bowl

#649-2-Stage Tripod

- Two extension sections on each leg. Operates at low levels as well as normal heights without the use of mini legs.
- High torsional rigidity, no pan backlash
- Weights 6.6 lbs., supports 50 lbs. • Very portable, folds to 27"
- Includes 75mm (3") ball levelling bowl

System 20 #338—Miller 20 Head, 601 Lightweight Tripod, On Ground Spreader

System 20 ENG #339—Miller 20 Head, 649 2-Stage Aluminum, On Ground Spreader

System 25 #500—Miller 25 Head, 611 Lightweight Tripod, On Ground Spreader

System 25 ENG #502—Miller 25 Head, 641 2-Stage Aluminum, On Ground Spreader

Vinten Vision SD 12

- Pan and Tilt Head with Serial Drag**
 The Vision SD 12 head features "Serial Drag" pan and tilt system. System consists of a unique, permanently sealed fluid drag and an advanced lubricated friction drag. You achieve the smoothest pans and tilts regardless of speed, drag setting and ambient temperature.
- Patented spring-assisted counter-balance system permits perfect "hands-off" camera balance over full 180° of tilt.
 - Instant drag system breakaway and recovery overcome inertia and friction for excellent "whip pans"
 - Consistent drag levels in both pan and tilt axis.
 - Click on, flick off pan and tilt caliper disc brakes.
 - Greater control, precision, flexibility and "touch"
 - Touch activated, time delayed illuminated level bubble.
 - Working conditions from as low as -40° up to +60°C.
 - SD 12 weighs 5.6 lbs and supports up to 35 lbs.

Vision Two Stage ENG and LT Carbon Fibre ENG Tripods

- The ultimate in lightweight and innovative tripods, they are available with durable tubular alloy (Model #3513) or the stronger and lighter, axially & spirally wound carbon fiber construction (Model #3523). They incorporate torque safe clamps to provide fast, safe & self adjusting leg clamps
- "Torque Safe" requires no adjustment. Its unique design adjusts itself when required, eliminating manual adjustment and maintenance and making for a much more reliable clamping system.
 - New hip joint eliminates play and adds rigidity
 - They both feature 100mm levelling bowl, fold down to a compact 28", and support 45 lbs.
 - #3513 weighs 6.5 lbs - #3523 CF (Carbon Fibre) weighs 5.2 lbs.

Vision 12 Systems

Vision 12 systems include #3364-3 SD 12 dual fluid & lubricated friction drag pan/tilt head, single telescoping pan bar & clamp with 100mm ball base

SD-12A System

- SD-12 pan and tilt head
- 3513-3 Single stage ENG tripod with 100mm bowl
- 3363-3 Lightweight calibrated floor spreader

SD-12D System

- SD-12 pan and tilt head
- 3513-3 Two-stage ENG tripod with 100mm bowl
- 3314-3 Heavy-duty calibrated floor spreader

VIN-5ST and VIN-10ST

- Compact & lightweight, they maintain Vision performance and quality
- Provide total stability and durability with payloads up to 33 lbs.
- VIN-5ST includes Vision 5LF head, single stage toggle clamp tripod, spreader and soft case.
- VIN-10ST includes Vision 10LF head, single stage toggle clamp tripod, spreader and soft case.
- Ideal for the latest generation of dockable and one-piece camcorders
- Compatible with all Vision accessories.

QUICK DIAL 72 JVC DIGITAL S BR-D80/BR-D85

Digital Editing Recorder / Digital Editing Recorder with Pre-Read

Affordable, broadcast quality digital video is here. Digital-S reproduces images that not only are superior to any analog or digital 4:1:1 format but rival even the highest priced digital systems. It combines the robustness and reliability of a 1/2-inch format with 4:2:2 component processing and very mild compression to achieve and sustain excellent quality through multi-generation dubbing



Broadcast Quality Digital Video

- 4:2:2 digital component processing adds richness and warmth unobtainable with lesser systems. Plus, only 4:2:2 stands up to the rigors of sophisticated chroma-keying, multi-generational editing, special effects, blue-screen compositing, matting, ATV up/down conversion, and multiple transversion between compression systems.
- Mild 3:3:1 compression reproduces the finest colored details while minimizing artifacts. Digital S pumps out horizontal resolution of 540 TV lines, S/N ratio is 55dB.
- Audio is recorded by 2-channel, 16-bit PCM signals with a sampling frequency of 48KHz. PCM audio channels can be edited independently.
- Standard analog inputs/outputs provide outstanding performance for most applications. When virtually perfect dubs are required, the BR-D85 offers a serial digital interface. The one true digital video standard today, SMPTE 259M permits long cable runs and is used for direct connection to digital switchers, disk-based recorders and digital tape recorders. (Optional with the BR-D80).

Robust 1/2-inch Format

- They achieve super-high image quality using a robust, 1/2-inch metal particle cassette tape. The cassette housing has a dust-proof structure to increase tape life as well as your images.
- 1/2-inch format also offers an extra wide track-width of 20 microns for improved stability and reliability.
- Has powerful error correction circuitry that not only replaces data in the unlikely event of a tape dropout but continues to play back a picture even with a clogged head.

Digital Editing

- Equipped with variable slow motion which can be accessed by standard editing commands. Smooth and noiseless, the image quality of slow motion is equal to regular playback and is available within a range of ±10X.
- Longitudinal tracks include two auxiliary audio (cue) tracks and a control track for tracking purposes. Cue tracks provide easy location of edit points which can be heard at any tape speed.
- Because of its linear control track, Digital-S has a short lock-up time which eliminates long pre-rolls. This feature achieves a stable picture faster, saving precious editing time.
- Auxiliary video (sub-code) area stores two selectable uncompressed lines of video. Suitable for recording closed caption or other information located in the vertical blanking interval.

PRE-READ EDITING (BR-D85 Only) Previously an exclusive feature of very high-end digital systems, video pre-read enables the recorder to first play back the digital signal on the tape, before recording a new signal in its place. Operable with either digital or analog signals, pre-read lets you perform layering and A/B roll editing with only two VCRs, instead of three.

QUICK DIAL 72 GY-X2B 3-CCD S-VHS Camcorder



- Newly designed three 1/2" CCD image sensors deliver 750 lines of horizontal resolution and superb signal-to-noise ratio of 62dB
- Micro-lens technology provides exceptional sensitivity of F8.0 at 2000 lux and L&LUX mode lets you shoot with almost no light! Shoot super footage with excellent color balance at a mere 1.5 lux
- Variable Scan allows flicker-free shooting of a computer screen
- Full Time Auto White circuit lets you move from incandescent to fluorescent to outdoor lighting without changing white balance or the filter wheel.
- Quick Record Mode - when turned on the camera is set to the auto iris even if lens is set at manual. Also activates Automatic Level Control and Extended Electronic Iris which provides both variable gain and variable shutter.
- Dual output system allows camera output to be connected directly to an external recorder

is set at manual. Also activates Automatic Level Control and Extended Electronic Iris which provides both variable gain and variable shutter. Shoot continuously from dark room to bright outdoors without having to adjust gain, iris or ND filter.

Dual output system allows camera output to be connected directly to an external recorder

KY-27C 3-CCD Color Video Camera

- New 2/3-inch broadcast-quality 380,000 pixel CCDs with advanced electronics deliver resolution of 800 horizontal lines and reduced smear.
- High sensitivity of F9.0 at 2000 lux allows a truly usable minimum illumination of 1 lux with JVC's exclusive LoLux dual pixel readout sampling technique
- LoLux mode allows shooting scenes that were previously impossible due to insufficient lighting. CCDs are maximized for low light sensitivity equivalent to an electronic gain of 24dB, then the dual pixel readout system is added which provides an additional 6dB. Together they provide +30dB without the noise and picture degradation normally associated with this much gain.
- Signal-to-Noise ratio of 63dB assures virtually "noise free" images
- Auto knee circuitry extends a scene's light to dark dynamic range reproduction by up to five times without overexposure.
- Has large 1.5-inch viewfinder with 600 lines of resolution and SMPTE color bars. Status system provides audio levels, accumulated or remaining recording time, VTR operation, battery voltage and camera setup. Zebra pattern indication and safety zones with a center marker are also provided.
- Variable scan function enables a precise shutter speed from 1/60.2 to 1/196.7 of a second in 256 increments to be set, matching a computer scan rate. Almost any computer display can be clearly recorded.
- Camera head allows direct input of genlock signal and timing adjustment. A wide range optional remote controls, RS-232 interface, multicore and triax CCD's are available.
- Docks directly to the JVC BR-S422U, BR-S411UB and BR-S420CU professional S-VHS recorders. Optional adapters for docking to Hi-8 and Betacam SP are also available.



Panasonic AG-DP800H Broadcast & Television Systems UPERCAM

S-VHS 3-CCD Digital Signal Processing Camcorder



- Three high-density 380,000 pixel CCDs with half-pitch pixel offset achieves over 750 lines of horizontal resolution, a S/N ratio of 60dB and remarkable sensitivity of 18 at 2000 lux. Additionally the Frame Interline Transfer (FIT) CCDs minimize vertical smear, so you maintain impressive picture quality even in very bright illumination.
- Digital Signal Processing circuitry provides four valuable benefits
 - 1) Consistently reliable up-to-spec performance.
 - 2) Fine adjustment of a wide range of parameters.
 - 3) Memory storage and instant recall of specific settings.
 - 4) More flexible and higher quality image processing, as well as easier maintenance.
- Six Scene File modes. There are two user modes for custom digital parameter settings including Horizontal Detail, Vertical Detail, Chroma and Dark Detail, and Color Correction. The four preset modes are normal, fluorescent, special and sparkling.
- In addition to regular AGC (Automatic Gain Control), Supercam has a Super High Gain mode. At F1.4 this enables shooting under illumination as low as 2 lux while retaining detail and color balance.
- Synchro Scan function allows flicker-free shooting of computer monitors. Electronic shutter increments can be set variably from 1/61 seconds to 1/253 of a second.
- Built-in internal time code generator lets you record with SMPTE LTC/VITC (Longitudinal/Vertical Interval) time code
- Two hi-fi stereo audio channels with a dynamic range of 80 dB, as well as two linear audio channels with Dolby NR. Normal/Hi-Fi recording is selectable. Uses XLR connectors to further ensure high-quality sound.
- Has a 26-pin connector on the back that outputs a composite or component video signal. This enables convenient backup recordings using an additional VCR equipped with a 26 or 14-pin connector
- Phantom power can be supplied to an optional microphone. Power can be switched off to prevent battery drain when not in use.

DP-800H "LS" Package:

- DP-800H Supercam 3-CCD camera head with 1.5" electronic viewfinder and Anton Bauer Gold Mount battery
- Fujinon S14x7.5 BRM 14:1 servo zoom lens
- CC-5800 soft carrying case
- WV-07100 tripod mounting plate

DP-800H "XL" Package:

- DP-800H Supercam 3-CCD camera head with 1.5" elec tronic viewfinder and Anton Bauer Gold Mount battery
- Fujinon S14x7.5 BRM 14:1 servo zoom lens
- CC-H800 Thermodyne hard shell carrying case
- WV-07100 tripod mounting plate
- Two Anton Bauer Digital Tripack 14 batteries
- Anton Bauer 2-position quick charger

QUICK DIAL 72 sachtler VIDEO 14/100 FLUID HEAD

- Sachtler Touch and Go System
- Integrated sliding battery plate
- Strengthened dynamic counterbalance in 2 steps
- Fictionless leak proof fluid damping with three levels of drag
- Vibrationless vertical and horizontal brakes
- Built in bubble for horizontal leveling



HOT POD TRIPOD SERIES

Especially developed for use in ENG, the Hot Pod tripod is the "fastest in the world. The central locking system is activated on all three legs at the same time, while the pneumatic center column easily makes it possible to raise the lens at a height of over 7 feet. The elevation force of the center column is factory set and doesn't require any setup. When moving to another location it can be carried by its handle located at the center of gravity.



ENG TWO-STAGE TRIPOD SERIES

Sachtler two-stage tripods have an enlarged height range (lower bottom and higher top position) so they are more universal. Legs can be locked in seconds with Sachtler's quick clamping. There are also heavy duty versions for extra stability. The heavy duty aluminum has a 20mm diameter tube vs. 16mm and the heavy duty carbon fiber has a 24mm diameter tube vs. 22mm. All heavy duty two-stage tripods have a folding tripod handle.

NEW! Sachtler CADDY systems

New Sachtler quality is available to low budget users. The price of a CADDY system includes the new 7-step damped CADDY fluid head, ultra-light but rugged carbon fiber tripod, lightweight spreader and either a soft bag or cover. The CADDY fluid head features an adjustable pan bar, 7 step adjustment for quick counter balance and the self-locking Sachtler Touch and Go System.

- CADDY Fluid Head • ENG Single-Stage Carbon Fiber Tripod
- SP 100 Lightweight Spreader • Transport Cover 100
- CA 2A 2-Stage ENG Carbon Fiber System
- CADDY Fluid Head • ENG 2-Stage Carbon Fiber Tripod
- SP 100 Lightweight Spreader • Soft padded ENG Bag

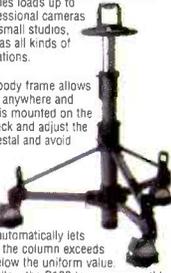


P100 Portable Pneumatic Pedestal

The P100 is a small size pedestal that offers great flexibility without taking up too much space. Featuring an advanced air pressure system, the P100 smoothly handles loads up to 66lbs., easily accommodating professional cameras used in a studio. Ideal for CATV, small studios, event and wedding video as well as all kinds of industrial and medical applications.

Air Pressure System:

- Air pump attached to the main body frame allows air to be pumped into a column anywhere and anytime - even while a camera is mounted on the pedestal. This allows you to check and adjust the air pressure while using the pedestal and avoid over-tilting of air.
- Air pressure can be gradually adjusted by discharging air through a bleed valve when too much air has been pumped into the column.
- There is also a relief valve that automatically lets air out when air pressure inside the column exceeds the uniform value, bringing it below the uniform value.
- Large double wheel "C" casters allow the P100 to move smoothly and quickly. Wheels and caster axles are easily fixed by the double stopper system.
- A track lock mechanism locks the wheels of the pedestal so that it only moves in a desired position.
- Cable guards prevent the casters from rolling over and becoming tangled in camera cables when the tripod is moved around in a studio.
- Large steering wheel allows greater ease in handling when shifting columns up and down or when moving the pedestal.
- Maximum and minimum height is 31" to 61". By attaching the optional LA-100 Low Angle Adapter to the dolly for shooting at low angles. (Height from the ground to mount is only 10").
- The column and dolly can be quickly disassembled for convenient transport. The column weighs 18 lbs. and the dolly 16 lbs.



H80 Professional Fluid Head

The H80's patented counter-balance mechanism supports various operating configurations including stand-alone cameras, camcorders and studio cameras with large viewfinders. Perfect balance can be obtained with settings from 0 to 3, depending on camera weight (from 15 to 33 lbs.) and tilt angle.

- Sliding balance plate features a locking mechanism and allow a total of 4" (100mm) of travel for camera balance. Has a 100mm claw ball to simplify camera leveling.



H70 Professional Fluid Head

The H70's patented counter-balance mechanism supports various operating configurations including stand-alone cameras, camcorders and studio cameras with large viewfinders. Perfect balance can be obtained with settings from 0 to 3, depending on camera weight (from 15 to 33 lbs.) and tilt angle.

- Sliding balance plate features a locking mechanism and allow a total of 4" (100mm) of travel for camera balance. Has a 100mm claw ball.



SEVEN-DAY CUSTOMER SATISFACTION GUARANTEE

VIDEO and PRO AUDIO



TO INQUIRE ABOUT YOUR ORDER:
 800 221-5743 • 212 807-7479
 OR FAX 24 HOURS:
 800 947-2215 • 212 366-3738

119 WEST 17TH STREET, NEW YORK, N.Y. 10011
 Store & Mail Order Hours:
 Sun 10-4:45 • Mon & Tues 9-6 • Wed & Thurs 9-7:15 • Fri 9-2 • Sat Closed
BUSINESS LEASING AVAILABLE



NRG POWER VEST SYSTEM

The Power Vest combines the comfort and convenience of a photo-journalist style vest with the power of NRG's highest capacity power belt. Available in two styles: the **Field model** is designed for use in a field production environment, while the **Event model** is for shooting events where style is everything. The Field model is ruggedly constructed from black high density weathered ballistic nylon and has an open-cul style that makes it comfortably wear in a variety of climates. Also has a highly adjustable design to fit almost any physical proportion.

- Internal and external pockets for blank tapes and accessories, a clear insert window for a press pass or business card, D-rings for cables and microphones, and an integral padded camera rest on the right shoulder.
- Cables concealed inside the vest is your choice of 12-volt 86 watt hour or 13.2-volt 95 watt hour nicad pack outputs.
- A control box on the front features dual power outputs (dual cigarette, dual XLR or mixed).
- 7-stage "fuel-gauge", charge status indication and auto-reat (short/overload) protection.

The **Event model** is very similar to the **Field** except in place of rugged fabric and pockets it features shoulder to sternum black satin lux fabric. Worn under a suit coat, the **Event model** is indistinguishable from a formal dress vest and it still retains interior and low exterior pockets. Both vests include 300-series charger (12 hrs.) and can be used with the optional IntelliQuick Fast Charger (2 hrs.).

POWER CAN SERIES

For powering single or multiple pieces of 12v DC equipment for extended periods of time, nothing beats the power and convenience of NRG's Power-Can Series. It integrates an ultra-high capacity, high-discharge-capable UPS type lead acid power cell, a world-wide fast charger, and computer-controlled monitoring system with display—in a single, rugged package. Connect up to four pieces of equipment simultaneously. From a midnight emergency scene to a wedding reception in the park, the Power-Can delivers ample power for extended running time.

- Recharge in 8-10 hours by simply plugging the Power-Can into any source of AC power (90-230V AC).
- LCD display shows discharge/charge status, voltage etc.
- An optional "Power Dolly" allows the Power-Can to be rolled for easy transport.
- Available in 18, 28 and 40 amp versions, each Power-Can has either four cigarette lighter connectors, four 4-pin XLR connectors.

HORITA BSG-50 Blackburst/Sync/Tone Generator

The BSG-50 provides an economical means for generating the most common RS-170A video timing signals used to operate various video switchers, effects generators, TBCs, VCRs, cameras and video edit controllers.

- 6 BNC video/pulse outputs
- Now available: 6 blackburst, 4 sync, 2 subcarrier
- Each sync output individually settable for composite sync, composite blanking, H-drive, or V-drive
- Separate buffer for each output—maximum signal isolation
- 1KHz, 0dB sinewave audio tone output, locked to video
- Outputs can easily be configured to meet specific user and equipment needs.

***269**

CSG-50 Color Bar/Sync/Tone Generator

Generates full-SMPTE color bars, blackburst and composite sync signals.

- Built-in timer can automatically switch video output from color bars to black after 30 or 60 seconds. Easy and convenient for producing tape leaders and stripping tapes with color bars and black.
- Front panel selection of full-field or SMPTE color bar patterns or black (blackburst) video output.
- Includes crystal-controlled, 1KHz, 0dB audio tone output.
- Outputs: video, sync, ref frame, 1KHz, 0dB
- Audio tone switches to silence and color bars change to black when using 30/60 second timer
- Fully RS-170A/5C/H phased and always correct.

No adjustment required ***349**

WE STOCK THE FULL LINE OF HORITA PRODUCTS INCLUDING:

- WG-50 - Window Dub Insertor
- TG-50 - Generator/Insertor
- TRG-50 - Generator/Insertor/Search Speed Reader
- TRG-50PC - Has all of the above plus RS-232 control.
- VG-50 - VTC Generator, LTC-VTC Translator
- VLT-50 - VTC-To-LTC Translator
- VLT-50PC - VTC-To-LTC Translator / RS-232 Control
- RLT-50 - Hi8 (EVO-9800/9850) LTC To LTC Translator
- TSG-50 - NTSC Test Signal Generator
- SCT-50 - Serial Control Titrer "Industrial" CG, Time-Date Stamp, Time Code Captioning
- SAG-50 - Sale Area, Convergence Pattern and Oscilloscope Line Trigger and Generator

Canon

IF+ Series 1/2-inch and 2/3-inch Zoom Lenses

Canon's IF+ family of lenses are engineered to meet the needs of the next generation of broadcasting while meeting the standards of today. Besides having the widest wide angle lens available, the IF+ lenses have wider angles at shorter M O D (Minimum Object Distance), provide higher MTF performance and incorporate Hi-UD glass for reduced chromatic aberration. In addition to superb optics they're all designed with Canon's "Ergonomic Grip" for fatigue-free shooting over an extended time. IF+ lenses are your assurance of unsurpassed quality and performance for today and tomorrow.

J15ax8B
 A next generation internal focusing lens with the shortest MDD and widest angle of any standard lens. The J15ax8B IRS/IAS is a standard ENG lens that lets you shoot in tight or restricted areas at the closest minimum object distance ever possible and capture more of the subject. It incorporates all the great features of IF-lenses including a built-in 2X extender, high MTF performance, Hi-UD glass, square lens hood and Canon's "Ergonomic Grip".

J20ax8B IRS/IAS
 Excellent for ENG, sports and production, the J20ax8B IRS/IAS lets you squeeze in shots from 8mm and still take you all the way out to 320mm with its built-in extender. Incorporates all IF+ features—plus is the only lens (besides the J9ax2.8B IRS/IAS) with a Vari-Polar lens hood, enabling rotation of attached filters.

Anton Bauer

Logic Series DIGITAL Gold Mount Batteries

The Logic Series DIGITAL batteries are acknowledged to be the most advanced in the rechargeable battery industry. In addition to the comprehensive sensors integral to all Logic Series batteries, each DIGITAL battery has a built-in microprocessor that communicates directly with Anton/Bauer InterActive chargers, creating significant new benchmarks for reliability, performance, and life. They also complete the communications network between battery, charger and camera. With the network in place, DIGITAL batteries deliver the feature most requested by cameramen: a reliable and accurate indication of remaining battery power.

DIGITAL PRO PACS
 The Digital Pro Pac is the ultimate professional video battery and is recommended for all applications. The premium heavy duty Digital Pro Pac is designed to deliver long life and high performance even under high current loads and adverse conditions. The size and weight of the Digital Pro Pac creates perfect shoulder balance with all cameras/camcorders.

- DIGITAL PRO PAC 14 LOGIC SERIES NICAD BATTERY
 14.4v 60 Watt Hours: 5 1/8 lbs. Run time: 2 hours @ 27 watts, 3 hrs. @ 18 watts
- DIGITAL PRO PAC 13 LOGIC SERIES NICAD BATTERY
 13.2v 55 Watt Hours: 4 3/4 lbs. Run time: 2 hours @ 25 watts, 3 hours @ 17 watts

GOLD MOUNT BATTERIES
 Logic Series Gold Mount batteries are identical to the respective DIGITAL versions with respect to size, weight, capacity, IMPAC case construction, and application. They are similarly equipped with micro-code logic circuits and comprehensive ACS sensors. They do not include DIGITAL microprocessor features such as the integral diagnostic program "Fuel Computer", LCD/LED display and InterActive viewfinder fuel gauge circuit.

- PRO PAC 14 NICAD BATTERY (14.4v 60 Watt Hours)
- PRO PAC 13 NICAD BATTERY (13.2 v 55 Watt Hours)
- TRIMPAC 14 NICAD BATTERY (14.4v 40 Watt Hours)
- TRIMPAC 13 NICAD BATTERY (13.2 v 36 Watt Hours)
- CDMPC 14 NICAD BATTERY (14.4v 40 Watt Hours)
- CDMPC 13 NICAD BATTERY (13.2v 36 Watt Hours)

InterActive 2000 Power/Chargers

A new generation of portable power systems, the InterActive 2000 Power/Charger series was designed from the ground up to offer unprecedented flexibility and economic expansion capabilities. Fully compatible with all current and future Gold Mount batteries, the InterActive 2000 Power/Chargers deliver all the advancements and proven reliability of interactive charging plus the ability to power a camera from AC mains. They also offer a unique, totally modular design that allows economical expansion to meet future needs. Starting with a base model, upgrades can be easily added at any time. With an unparalleled combination of value and features, the InterActive 2000 Power/Charger system redefines the standard of power for video applications.

Standard Features on all InterActive 2000 Power/Chargers

- Two or four position models each with the full complement of InterActive technologies (see previous pages) including Automatic balance and rejuvenation, Lifesaver Maintenance, Cold battery safety and Power Loss Memory modes.
- They have a slim, lightweight design for easy portability. The 2702 and 2401 Quad Power/Chargers fit easily in a notebook computer carrying case and the 2701 and 2401 Dual Power/Chargers weigh just 2.3 pounds. Plus, they include power supplies, so you can leave your AC supply behind!
- Built in regulated DC power supply outputs powers cameras from AC mains worldwide. Wide range (90-260v AC, 50/60 Hz) input automatically adapts to any worldwide source.
- Standard serial output for printer and PC interface.
- Two power choices for optimized performance and economy.
- LCD automatically displays critical battery and charger data.
- Expanded communications with Digital Batteries and new charging protocols improve charge times and performance.
- Modular design allows addition or upgrades after purchase:
 - A charge position expansion port allows the addition of expansion charge modules to increase charge capability to four, six or eight batteries, including NP and BP-90 types.
 - Optional Diagnostic/Discharge module featuring automatic calibration of digital batteries is available for each model. (standard on Quad 2702)
 - Power supply upgrade allows 40 Watt (2400 series) to be upgraded to 70 Watt (2700 series) capability.

QUAD 2702/2401 Four-Position Power/Chargers

The 2401 and 2702 are the lightest (and slimmest) full featured four position chargers ever available. Designed for the rigors of professional use, they can fast charge four Gold Mount batteries and can be expanded to charge up to eight. They also power any camera/camcorders from any AC main; all in a package the size of a notebook computer and weighing a mere 4 lbs (1.8 kg)! The 40 watt (upgradeable to 70 watts) 2401 will charge ProPac batteries in two hours and Trimpac batteries in one hour. Add the Diagnostic/Discharge module and the QUAD 2401 becomes an all purpose power and test system with its standard LCD providing instant access to battery status. The 70 watt QUAD 2702 bundles the complete package of all the Power/Charger features in the ultimate professional power system:

Dual 2702/2401 Two-Position Power/Chargers

The DUAL 2701 (70 watt) and 2401 (40 watt) are sleek, rugged and economical two position Power/Chargers that have all the features of Anton/Bauer InterActive 2000 technology including DC camera output and an LCD display that shows the status of each battery as well as the internal battery data communicated from Digital Batteries. The high performance DUAL 2701 will charge any Gold Mount battery in one hour. The DUAL 2401 charges ProPac batteries in two hours and Trimpacs in one hour. Their compact, lightweight package design makes them the ultimate travel Power/Chargers. They can also be upgraded with the Diagnostic/Discharge Module and/or with the Expansion Charge Modules to charge up to six batteries of any type.

PROFESSIONAL VIDEO TAPE

Professional Grade VHS

PG-30	2.29	PG-60	2.49	PG-120	2.69
SG-30	3.39	SG-60	3.99	SG-120	4.49
ST-30	6.99	ST-60	7.49	ST-120	7.99

Superior Grade Double Coated VHS

H471S S-VHS Double Coated

M221 Hi 8 Double Coated	
630HMP	4.99
660HMP	6.49
6120HMP	8.49

M321SP Metal Betacam (Box)

05S	17.95	10S	18.49
20S	19.95	30S	22.95
60L	31.95	90L	49.95

DVCPRO

12M (Medium)	7.59	23M	9.19
33M	11.99	63M	20.49
64L (Large)	21.59	94L	32.49
123L			42.19

maxell

P/1 PLUS Expatial VHS

T-30 Plus	1.69	T-60 Plus	1.99	T-90 Plus	2.09
T-120 Plus		T-180 Plus	2.19	T-160 Plus	2.69

HGX-PLUS Expatial VHS (Box)

HGXT-60 Plus	2.69	HGXT-120 Plus	2.99
HGXT-180 Plus			3.99

BQ Broadcast Quality Expatial VHS (Box)

T-30 BQ	5.49	T-60 BQ	6.19	T-120 BQ	7.39
---------	------	---------	------	----------	------

BQ Certified Professional S-VHS (In Box)

ST-31 BQ	7.19	ST-62 BQ	8.09
ST-126 BQ	8.39	ST-182 BQ	14.99

Betacam SP

B5MSP	15.75	B10MSP	17.75	B20MSP	19.75
B30MSP	20.50	B60MLSP	29.75	B90MLSP	46.49

Panasonic

Mini DV Tape

AY DVM-30	9.95	AY DVM-60	11.99
-----------	------	-----------	-------

DVCPRO

AJ-P12M (Medium)	10.99	AJ-P23M	12.99
AJ-P33M	15.99	AJ-P63M	29.99
AJ-P64L (Large)	29.99	AJ-P94L	49.95
AJ-P123L			64.95

SONY

Hi-8 Professional Metal Video Cassettes

P6-30 HMPX	4.59	P6-30 HMEX	7.99
P6-60 HMPX	6.59	P6-60 HMEX	11.49
P6-120HMPX	8.89	P6-120HMEX	15.49

Hi-8 Metal Evaporated Editor (HMEAD)

E6-30 HMEAD	10.49	E6-60 HMEAD	14.89
E6-120 HMEAD			20.19

PR Series Professional Grade VHS

T-30PR	2.39	T-60PR	2.59	T-120PR	2.79
--------	------	--------	------	---------	------

PM Series Premier Grade Professional VHS

T-30PM	3.49	T-60PM	3.99	T-120PM	4.79
--------	------	--------	------	---------	------

BA Series Premier Hi-Grade Broadcast VHS (In Box)

T-30BA	3.59	T-60BA	3.99	T-120BA	4.79
--------	------	--------	------	---------	------

MQ Master Quality S-VHS (In Box)

MQST-60	7.49	MQST-120	8.39
---------	------	----------	------

BRS 3/4" U-matic Broadcast Standard (In Box)

KCS-10 BRS (mini)	8.29	KCS-20 BRS (mini)	8.99
KCA-10 BRS	8.19	KCA-20 BRS	8.69
KCA-30 BRS	9.69	KCA-60 BRS	13.39

XBR 3/4" U-matic Broadcast Master (In Box)

KCS-10 XBR (mini)	8.79	KCS-20 XBR (mini)	10.19
KCA-10 XBR	9.29	KCA-20 XBR	10.69
KCA-30 XBR	11.99	KCA-60 XBR	15.69

KSP 3/4" U-matic SP Broadcast (In Box)

KSP-S10 (mini)	9.59	KSP-S20 (mini)	11.09
KSP-S10	10.09	KSP-S20	11.59
KSP-S30	12.99	KSP-S60	16.99

BCT Metal Betacam SP Broadcast Master (Box)

BCT-5M (small)	14.99	BCT-10M (small)	15.99
BCT-20M (small)	17.99	BCT-30M (small)	18.99
BCT-30ML	21.49	BCT-60ML	27.99
BCT-90ML			41.99

BCT Metal Professional Series

UVW-30MLA	18.95	UVW-60MLA	25.50
UVW-90MLA			39.95

Mini DV Tape

DVM-30ME	15.99	DVM-60ME	19.95
----------	-------	----------	-------

PVD Series Professional DVCAM Tape

PVDM-12ME (Mini)	24.50	PVDM-22ME (Mini)	26.95
PVDM-32ME (Mini)	29.50	PVDM-40ME (Mini)	31.95
PVD-64ME (Standard)	39.95	PVD-94ME (Standard)	44.95
PVD-124ME (Standard)	49.95	PVD-184ME (Standard)	59.95

ALL ORDERS SHIPPED WITHIN 24 HOURS

www.americanradiohistory.com



THE PROFESSIONAL'S SOURCE FOR PHOTO,

FOR ORDERS CALL:

800-947-9928
212-444-5028

OR FAX (24 HOURS):

800-947-9003
212-444-5001

ALL ORDERS SHIPPED
WITHIN 24 HOURS
OVERNIGHT SERVICE AVAILABLE

On the Web: <http://www.bhphotovideo.com>

DIGITAL PROCESSING SYSTEMS INC.

PVR-2500 'Perception' Digital Video Recorder

The Heart of an Advanced Digital Audio/Video Workstation

The PVR-2500 offers powerful features for awesome animation, morphing and rotoscoping capabilities. With features like 720 x 480 resolution, 10-bit 2x oversampled video encoding, better than D1 scaling, component and S-Video outputs, multi-processor support and integrated FAST SCSI-2 controller, it empowers your computer to rival the finest professional production studios.

- The PVR-2500 is a full-length PCI card with a FAST SCSI-2 controller which connects to one up to seven dedicated hard drives. Because the SCSI controller is integrated with the PVR-2500, video data never has to go over the PCI bus during playback. This avoids the bottlenecks found in systems which use the computer's hard drive for video storage.
- Perception gets animations out of your computer fast and easy. Its exclusive real-time virtual file system ensures complete integration with your Windows NT applications. Any acquired video or computer generated Perception video clips appear simultaneously in many different file formats including TARGA, SGI, BMP and IFF. Perception is compatible with Lightwave 3D, Autodesk 3D Studio Max, Crystal Graphics TOPAS 5.1 PRO, Microsoft SoftImage, Elastic Reality and others.
- Runs under Windows NT 3.5 on computers with Pentium, DEC Alpha or MIPS processors. Perception's software utilizes NT's native support for multitasking and multiple processors, allowing use with the most powerful computers.

- Perception performs real-time interpolation of 30 fps video to 24 fps film rates or vice versa. This means that it is also at home on the Hollywood movie set as well.
- Video output section utilizes 10-bit 2x oversampled encoding and provides broadcast quality CCIR-601 (720 x 480) resolution. Dynamic range is in excess of D1 scaling so images are brighter, have more color and greater spatial resolution than ever before. Component, composite and S-Video outputs are provided via the included breakout cables.



- Also control BVU protocol VCRs for video acquisition. VCR-like controls on the Perception's GUI simplifies the task of batch digitizing and recording. In this mode, the PVR-2500 can read SMPTE time code from the source deck.
- Can be used with any Windows NT compatible sound card while synchronization of audio and video is maintained by the PVR software. Captured audio is stored on the computer's system hard drive, not on the dedicated drives. This approach provides maximum flexibility for manipulating audio and video during editing.
- Can be used with third party editing software such as Adobe Premier or iSync Speed Razor MACH III. In fact, a system equipped with the PVR-2500, AD-2500 capture card, a sound card, editing software & one or more SCSI drives becomes a non-linear editor of unparalleled performance - at an unbeatable price.

AD-2500 Component Video Capture Card

Coupled with the AD-2500 live video capture daughter card, the PVR-2500 becomes a broadcast-quality digital disc recorder. It delivers unsurpassed picture quality and storage capacity is limited only by the size/number of attached SCSI hard drives.

- Has component, composite and S-Video inputs for real-time recording. Captured video can also be exported as sequential RGB files for rotoscoping and other compositing applications.
- Incorporates a sophisticated automatic entropy prediction circuit that analyzes the content of incoming video and dynamically calculates the optimum amount of compression on a field-by-field basis—even during real-time recording. You also have complete manual control over compression level/quality settings.

The FX-2500 Perception Effects Accelerator

- A stand-alone PVR-2500 provides real-time cuts between video clips, but other transitions, such as dissolves and wipes, substantial delay can occur. A 20 frame delay can take minutes to render, even with the fastest PC, because the host CPU processes source frames on a pixel-by-pixel basis. The Perception FX reduces the waiting time to under 10 seconds.

DAR-2500 Digital A4V Recorder

Featuring comprehensive audio post-production capabilities, the A4V (Audio for Video) board records perfect video/audio synchronization when used with the PVR-2500. A full-length PCI card, the A4V's input and output connections are made via the supplied breakout cables while digital audio is stored on the system hard drive. And to ensure compatibility with third-party audio editing software, it plays and records standard uncompressed WAV files. It can also be controlled directly by video editing software like iSync's Speed Razor Mach III.

- Non-linear, non-destructive audio editing. No waiting for edits to complete.
- True audio scrub.
- Simultaneous record/playback. Play up to three stereo tracks while recording one stereo track.
- Mix four stereo source tracks down to two output channels in real-time.
- Four-band Parametric EQ for each channel (assignable by stereo pair).
- Real-time reverb and compressor/limiter. Additional effects can be easily added via software upgrades.
- Built-in LTC/VITC time code generator/reader/inserter lets you create video dubs with time code information superimposed over composite or S-Video signals.
- Unlimited audio editing capabilities with third party software.

FAST The Art of Digital Video

Video Machine

Video Machine is an edit controller for A/B roll, AX roll and audio/video split editing. It controls any VCR with Control-LR or Panasonic S-pin edit protocol. With optional interface it provides RS-232C/RS-422 machine control as well. Controls 3 VCRs with no other hardware. It also features EDL export, alpha wipes, test pattern generator, Editing Panel, and more than 400 digital effects.

- Bundled VM-Studio software uses a graphical timeline interface for editing. You can work with all available material at the same time, and all projects in the timeline can be edited and moved to any position, any time.
- During previews and recording uses time code (VITC, RC, Control Track) to accurately cue the VCRs to the in/out points of individual clips. Graphics, titles, and effects are automatically inserted at the point specified.
- Over 400 digital video effects (dissolves, wipes, lumbies, flips, picture-in-picture, fly-ins, fly-outs, zoom etc.). With the DVE Editor, create an unlimited number of 2D effects. All effects are performed in real time.
- Supports composite and S-Video signals in PAL and NTSC. Up to six video inputs (two of which are controllable) can be connected, and any two can be assigned to the two video channels. Video standards can be mixed in real time.
- Two integrated frame synchronizers eliminate the need for TBCs (Time Base Correctors). Also provides two 32-bit framesters and a built-in background color generator.



- VM-Titler lets you create titles, logos and graphics in Windows application such as Corel DRAW or Photoshop. Use any font, size and color. Graphics produced in standard word processing or graphics applications are imported via the VM-Titler software module. Scanned pictures or images can even be imported from Photo CDs. Titles and graphics can be manipulated with any of the effects available. Functions such as scroll and crawl titling are off and running within a matter of seconds. Has complex filters for anti-flickering, scaling etc. Produces text without "stair-stepped" effects.

VIDEO MACHINE + DPR = HYBRID EDITING

Linear and Non-Linear Editing in a Single System for Maximum Flexibility

Video Machine with DPR (Digital Player/Recorder) is the only system which offers real-time mixing of analog and digital sources. Video Machine with DPR integrates two complete editing systems under one interface, thus ensuring the optimum balance of cost, performance, training, and maintenance. It executes both tape- and hard disk-based edits effortlessly, and it's simply a matter of preference whether you work in analog or digital, or both—all on the same system. Only the FAST hybrid system gives you the best of both worlds. Instead of being stuck with an inflexible system, you can select your method to suit your circumstances. For example, viewing and logging your tape footage can be tedious enough without having to face the next step. But imagine instructing the system to copy selected scenes onto the hard disk, while you take a coffee break. When you come back, you're ready to enjoy the creative freedom of non-linear. And once the creative decisions are made, you can either have the system perform the on-line edit for you, from tape or hard disk, or you can choose to go with an EDL export. No other system gives you this much flexibility.

DPR (Digital Player/Recorder):

- With DPR Video Machine becomes a state-of-the-art digital editing system. In addition DPR executes effects and transitions in real time. True M-JPEG compression enables every frame or field to be accessed individually.
- Compresses and decompresses video (software-selectable) from 200:1 to 2:1. At 2:1 DPR delivers broadcast, on-line quality allowing for mastering directly from the hard disk.
- Video Machine system treats the DPR just like any other "normal" video source. The DPR is enabled by a single mouse-click in the VM-Studio software. The edit suite instantly converts to nonlinear and allows you for example, to execute an offline edit in real time. A second click changes the editing suite back to analog. You can now edit the project using tape source material from your VCRs. Whether working on- or off-line, linear or non-linear—all four editing modes are available on one complete system.
- Integrated digital eight-channel mixer allows audio to be edited in real time in standard WAVE format. The audio is synced to video and recorded in full 16-bit, 48 kHz sampling. It is easy to split the digital audio and video signals, and the waveform display helps to precisely position edits. All eight online tracks can be monitored simultaneously.
- DPR is an ideal solution for animation. It offers broadcast quality while reducing recording time to a fraction of what is required with single-frame capable VCRs. Scene logging and batch digitizing are also automatically integrated via the connection of the edit control functions of Video Machine.
- Video Machine is based on an open architecture design and is almost infinitely expandable as far as storage. Up to 29 hard disks can be daisy-chained directly to the DPR. Using 9 GB drives, up to 260 GB is available on the system - enough for 15 hours of 5:1 or 300 hours of 100:1 video.

OPTIONAL ACCESSORIES:

Video Machine is designed to interface perfectly with traditional broadcast equipment. These rack-mountable accessories integrate Video Machine into a professional video studio environment.

Studio Control (SC):

Connects video, audio, sync, machine control and TC cables from VCRs to Video Machine. With built-in LTC reader/generator, additional preview outputs, balanced XLR audio and reference in/out, the SC box offers a simple way to interface with studio equipment.

YUV Interface:

19-inch terminal box connects to the internal YUV board. Enhanced analog bandwidth, 2X oversampling and a balanced signal filter guarantee excellent quality. Included calibration software lets you adjust volume and timing. Digital signal passes directly without generation loss.

GPI Box:

The GPI box provides control of external DAT recorders, CD players, video mixers and effect generators. As a master, Video Machine can sync control of up to four devices with pulse signals and has tally support for live cameras in slave mode. Video Machine serves as the player for titles, graphics and digital video effects.

Jog/Shuttle Wheel:

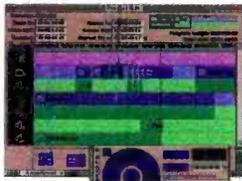
An alternative to the mouse and keyboard, the physical Jog/Shuttle wheel offers a better "feel" for the edit and during preview.

Scitex

Professional Video Editing Software for Macintosh

Working in conjunction with the Apple PowerMac 9500 and Truevision's TARGA 2000 RTX board, SphereOUS provides two simultaneous channels of CCIR 601 high resolution video, key-frameable effects control and four channels of stereo audio. An editors dream, dual streams of video eliminate waiting for transitions to render and enable a still alpha channel to be superimposed without rendering. Who says the pros get to have all the fun? Now, sophisticated, real-time video editing capabilities are yours thanks to the industry-rocking punch of SphereOUS.

- Variable video compression ratios as low as 3:1 (user-selectable up to 18:1) translates to excellent picture quality. Plus SphereOUS offers extremely clean input and output (CCIR 601, 720 x 486 pixel NTSC, 720 x 576 pixel PAL) electronic video paths, with results that are virtually indistinguishable from the original source.
- Two simultaneous streams of broadcast-quality video allow special effects to take immediate shape on your monitor. InstantFX. Realtime. All the Time. InstantFX means your fingers fly across the keyboard, and as soon as you enter an idea POW! there it is on the screen. Want to modify something? Another POW! The minute you think of it, there it is moving from concept to reality in the blink of an eye. SphereOUS fully leverages the dual real-time video stream capability of the TARGA 2000 RTX.



DveousFX and AdvancedFX Options

For maximum impact, the AdvancedFX mezzanine board takes you a step further with the addition of a palette of unique warps including page turns, rolls, ripples and spheres. The board also adds chroma keying, lighting and color correction controls that make you the master of features like luma and chroma gain, hue rotate, black level, and posterization. Dual color light source can be positioned in 3D space with a choice of bar, flood or spotlight effect to produce extremely realistic highlights and shadows. These can interact with page turns and ripples to pack your production with a realistic punch. With SurfaceFX you can even add surface textures for a completely new dimension.

- Warp shapes include: Cylinders, rolls, wave, barrel, circle, bowtie, helix, twist, wrap, ripple, zigzag, paper fold, lace, interface, split, shred, pipe organ, burst, flare, quad page turn, quad page roll, lens, swirl, rings, melt, quad page split and multi-picture.
- AIFF/CD audio file import and export
- Tools for organizing and managing source material
- PICT file import/export
- CMX compatible EDL output/import
- Control panel operator: Audio Sliders (record and playback) Mode switches (Loop, Preview), VJ Meters, VTR Controls

SphereOUS Control Panel

The optional SphereOUS Control Panel is ergonomically designed with jog knob, four faders for control of stereo audio level, master volume, mute, marks, and forward and rewind.

ANTEX ELECTRONICS

StudioCard

4-Channel Digital Audio Card for Windows

The next generation in digital audio for the desktop. StudioCard is a premium-quality digital audio adapter with advanced features, studio-quality specs and professional connections. Unmatched in quality, flexibility and expandability, it features 4 tracks of audio sound and real-time digital mixing capability, making it the ideal board for musicians who want digital multitracking and mixing on their PC, or producers looking for a versatile board for post-production digital audio editing and uncompressed audio quality. StudioCard is Windows 95+ plug and play compatible plus includes drivers for Windows NT as well.

- Key to StudioCard's amazing sound is the marriage of a low noise analog I/O section and high quality A/D and D/A converters. A PCI-based 32-bit memory mapped board, it delivers less than 0.003% total harmonic distortion and 92dB dynamic range. Plus, a PLL-based sample clock generator that can be locked to an external clock source.
- Incorporates a programmable 32-bit 40 MHz DSP and pro connections like 4 independent balanced analog I/Os (+4dBu or -10 dBV) and AES/EBU or S/PDIF digital I/O. It also offers a MIDI port with deep buffers and time stamping. No matter which type of equipment you have StudioCard will integrate into standard studio environments.

- Compatible with film, video or MIDI. StudioCard offers synchronization via SMPTE, MTC, word and pixel clocks, and composite video. Plus, the StudioCard not only reads SMPTE timecode, but generates it as well.
- Unique to the Antex design is StudioCard's multiple adapter capability. This means you can install multiple StudioCards in a single computer for up to 16-track recording. Start with one StudioCard today - add more StudioCards tomorrow. Also included is an on-board SPX expansion connector for plugging in optional daughtercards for compression or enhanced DSP operations.

VIDEO and PRO AUDIO



TO INQUIRE ABOUT YOUR ORDER:
800 221-5743 • 212 807-7479

OR FAX 24 HOURS:
800 947-2215 • 212 366-3738

119 WEST 17TH STREET, NEW YORK, N.Y. 10011

Store & Mail Order Hours:

Sun 10-4:45 • Mon & Tues 9-6 • Wed & Thurs 9-7:15 • Fri 9-2 • Sat Closed

BUSINESS LEASING AVAILABLE



StudioFrame Modular Video Processing System

The Nova StudioFrame Series is a modular, flexible, digital/analog signal processing system. It is designed to efficiently and effectively combine a wide variety of individual function (or processor) boards such as A-D and D-A converters, video signal encoders and decoders, audio and video distribution amplifiers and frame synchronizers into more complex function groups, all in one equipment mainframe. The scalable nature of the StudioFrame design allows it to be easily reconfigured and/or upgraded as today's video standards and requirements continue to evolve. The system is based on two rack-mount frame models (the SF-3 and SF-1) allowing up to thirteen front loading processor boards and thirteen rear mounted passive interface cards to be accommodated in a single chassis. Both the StudioFrame SF-1 and SF-3 chassis are designed to meet the most stringent broadcast requirements. The SF-3 is a thirteen slot, 3RU chassis while the SF-1 is a 4 slot, 1RU chassis. All studio cards as well as the two chassis are backed by a two year warranty on parts and labor with guaranteed 24-hour turnaround service. The units are ruggedly constructed to endure studio rackmount, production van and DB (Outside Broadcast) mobile applications. A universal power supply operates at either 110 or 240 VAC, 50/60 cycle. DC operation is optionally available as is a redundant supply with automatic switchover. Dual exhaust fans maintain proper airflow and cooling. "Hot swappable" front card loading allows power-on removal/insertion of individual processing modules without disturbing others in the system. All cabling can remain in place while you service any module. An intelligent "centerplane" provides power, sync, timing and data distribution, facilitating expansion to more complex, more cost-effective signal processing functions.



NovaASD/NovaSDA

Analog to Serial Digital & Serial Digital to Analog Converters

Components of the Nova StudioFrame series, the NovaASD and the NovaSDA incorporate the latest digital video processing techniques for high speed A-D and D-A signal conversion. They are designed to meet the most stringent broadcast requirements and their "hot swappable" front card loading facilitates servicing without disturbing other cards in the system. The NovaASD is ideal for interfacing analog signals with digital video formats and the NovaSDA for interfacing serial digital signals with existing analog video systems as well as for signal monitoring applications.

SDA-1 Serial Digital Component to Analog Component Converter

- SMPTE 259M 4:2:2 Serial Digital Component (D1) input,
- Equalized and reclocked serial digital component output
- Analog component video (Y, R-Y, B-Y/YUV), RGB or RGB/S outputs
- 10-bit D/A converters
- Output level control
- NTSC and PAL compatible

SDA-2 Serial Digital Component to Composite and S-Video Converter

- SMPTE 259M 4:2:2 Serial Digital Component (D1) input,
- Equalized and reclocked serial digital component output
- Dual composite & dual S-Video outputs
- Color bar output selectable
- 10-bit D/A converters
- Output level control
- NTSC and PAL compatible

SDA-3 Serial Digital Component to Analog Video Converter

- SMPTE 259M Serial Digital Composite (D2/D3) input,
- Equalized and reclocked serial digital composite output
- Four analog composite video outputs
- Color bar output selectable • 10-bit D/A converters

ASD-1 Analog Component to Serial Digital Component Converter

- Analog component video (Y, R-Y, B-Y/YUV), RGB or RGB/S input
- Dual SMPTE 259M 4:2:2 Serial Digital Component (D1) outputs
- 10-bit D/A converters
- Picture positioning control
- NTSC and PAL compatible

ASD-2 Analog Composite and S-Video to Serial Digital Component Converter

- Analog composite and S-Video input
- Dual SMPTE 259M 4:2:2 Serial Digital Component (D1) outputs
- 10-bit D/A converters
- NTSC and PAL compatible

ASD-3 Analog Composite to Serial Digital Component Converter

- Analog composite video input
- Dual SMPTE 259M 4:2:2 Serial Digital Composite (D2/D3) outputs
- 10-bit D/A converters
- Input gain adjustment

NOVAMNR Median Noise Reducer

The NovaMNR is a StudioFrame card that eliminates impulse and transmission noise, cleans up satellite, microwave and fiber feeds and fills in CODEC and time-based corrected videotape drop-outs. It features full bandwidth, uncompressed 10-bit digital processing for ultimate video transparency as well as analog composite inputs and outputs.

- Eliminates "sparkles", those black and white dots that sometimes appear on remote video feeds. The NovaMNR incorporates a proprietary adaptive three-dimensional median filter that analyzes pixels from several fields of video and replaces the impulse noise with uncontaminated, clean video.
- Universal drop-out compensation replaces missing video information, whether it is from a time-base-corrected VCR source or the decoded output of a CODEC feed. The NovaMNR effectively fills in drop-outs with replacement video from the surrounding pixels and previous video field.

- Control's are accessible locally or remotely. A three position threshold switch (off/low/high) adjusts system noise sensitivity while a bypass/operate switch is also included. Both switches are remotely via RJ-11 jack.
- Also available in PAL and PAL-M versions.

NC-8 RGB/Component to Composite/S-Video Encoder

The NC-8 processor module is a 10-bit digital encoder that converts analog RGB or component video input sources into Y/C and composite video. Designed to facilitate multi-format interface requirements, the module incorporates the latest digital video processing techniques along with luminance and chrominance pre-comb filtering to assure the highest quality encoding. A frame of memory is utilized to provide an effective zero insertion delay.

- 10-bit processing, 8-bit D/A conversion
- Zero insertion delay, frame of memory
- Two composite and one S-video output.
- Analog RGB (Sync on Green or all three), RGB/Sync and YUV (Betacam) inputs. Also available with looping inputs
- Variable luminance notch filter
- Y and C pre-comb filtering for maximum encoding performance

- Remote serial control
- Output level control
- Color bar output selectable
- Designed to meet the most stringent broadcast requirements.
- "Hot swappable" front card loading facilitates servicing without disturbing other cards.
- Available in PAL and PAL-M versions

NOVAROUTER Intelligent Matrix Routers

NovaRouter is a series of serially controlled audio and video matrix routing switchers. These intelligent routers are available in 8x8, 16x16 and 32x32 matrices. They are capable of up to five switching levels to support unlimited combinations of Stereo Audio, Composite Video, Y/C Video, Component Video (Beta or MII), RGB/S and VGA Graphics. Audio follow video or breakaway routing is controlled by very intuitive computer software or optional XY control panels.



The computer software and VGA display provides quick visualization of all crosspoints and facilitates routing operations. An unlimited number of switching configurations may be stored and recalled at the click of a mouse. User defined labels for all sources and destinations provide positive identification of the matrix status. One computer can control several NovaRouter Systems for multiple studio or large presentation system applications. The optional, easy to use, XY control panels provide routing functions for basic systems without the use of a computer interface. All video, audio and audio follow video switching functions are controlled by source select and destination select switches. Changing and verifying the matrix configuration is simple and clear. The XY controls may be front panel mounted or are available as a remote control unit. Broadcast quality audio and video processing and microprocessor control ensure superior quality and performance. Yet, the simplicity and modular configurations of NovaRouters™ make them economical for broadcast production, cable TV, graphics, presentation, teleconference and educational applications.

- 8x8, 16x16 and 32x32 switching matrices
- Stereo audio, composite video, Y/C, component video, RGB/S and VGA
- Up to five (5) levels of switching
- Audio follow video and audio break-away
- Serial control via intuitive computer software or optional XY control units
- Computer VGA monitor display provides quick visualization of all crosspoints
- Easy single "click" mouse switching control
- User labeling of sources and destinations
- Store system configurations in memories
- Multiple locations can be controlled from one computer
- Push-button XY control options, front panel mount or remote control units
- Audio and video modules provide easy system upgrade

VIDEONICS POWERScript™

The most advanced character generator ever designed for video production, multimedia and industrial applications, PowerScript delivers the huge range of titles and graphics supported by PostScript type technology, plus animation, effects, transparency and color keying. It features two GPI inputs, anti-aliased, 17.5 ns (nanosecond) pixel resolution and 4:2:2 broadcast-quality video. It also offers high-speed RISC processing to provide real-time Level 2 PostScript imaging and fast rendering—even with the most complex images. The PowerScript works stand-alone or with a computer, has a built-in TBC, offers a powerful and intuitive interface, and is suitable for the desktop or can be rackmounted.



Powerful Character Generator

- Choose from 35 built-in fonts or download PostScript fonts from your PC. PowerScript's high-speed RISC processor provides real-time PostScript imaging.
- Characters can be rotated at any angle, scaled to any size, stretched horizontally or vertically.
- Styles include variable bold and italic, underline and shadow (drop shadow, variable displacement and opacity). Each character can be adjusted separately.
- Text can be positioned anywhere on the screen or automatically centered, vertically or horizontally. Left, right, top, bottom and center justification is also provided.
- Characters are automatically kerned, using the font's standard kerning information. Spacing is highly flexible with variable word and letter spacing and line spacing (leading).
- Built-in real-time shape drawing tool and text editor—no computer or software required. Design can be done ahead of time and displayed later, or can be done on the fly.
- Supplied keyboard and mouse are used with easy on-screen menus to place and modify graphics and text.
- Change fonts, colors, and other characters instantly.

Transparency and Colors

- Characters can be made transparent (0-100%) over video, other characters and graphics with 64 levels of transparency.
- Opaque characters can use over 4,000,000 colors. Transparent characters can use over 8,000.
- Different colors can be used for fill and outline (variable width) as well as each letter and each graphic.

Roll, Scroll, Animation, Effects

- Variable speed roll, crawl and push (side) in all directions.
- Every text object, graphic and logo can be animated. Complex animations include having elements follow paths, bounce, etc.
- Elements can change outline and/or fill color, transparency, position as they move and results are displayed in real time.
- Move individual characters in different directions, make colors change, flash words, make letters and words bounce, spin a letter across the screen. Use fades and wipes to transition between titles and video or between two pages of titles.

Backgrounds and Graphics

- Titles can be placed on solid color, patterned or graduated backgrounds, or they can be genlocked to incoming video.
- Lines, squares, rectangles, ovals and circles can be created and placed anywhere on the screen. Each graphic object can use a different color, transparency, rotation, size, fill and outline.

Imported Logos and Graphics

- Accepts most PostScript or PCX format graphics without modification. Imported images can be any size and can be scaled, skewed, and rotated when placed on screen. Transparency and anti-aliasing can be defined when graphic is generated.

Expansion Capabilities

Although PowerScript operates on its own, you can still add peripherals and connect to a computer or network. Two PC-card slots allow the addition of non-volatile flash-EEPROM and Ethernet cards. RS-232 port allows connection to desktop computers for added storage and downloading of fonts or graphics from a PC.



LEADER

Manufacturing test and measurement equipment for over 40 years, Leader Instruments is the standard which others are measured against for reliability, performance, and most important—cost effectiveness. Before a product is brought to market, an exceptional degree of energy and effort go into its design. Prototypes are built and tested to withstand environmental and other factors far exceeding actual operating conditions. These include high humidity, extremes of heat, cold, shock and vibration. Manufacturing quality is built in every step of the way and only the finest parts are used. At each production run, subassemblies are separately tested before they are integrated into the finished product, then each product is tested again. This is why less than half of 1% of all Leader products are ever returned for warranty repair or adjustment.



5860C WAVEFORM MONITOR

A two-input waveform monitor, the 5860C features 1H, 1V, 2H, 2V, 1 s/div and 2V mag time bases as well as vertical amplifier response choices of flat, IRE (low pass), chroma and DIF-STEP. The latter facilitates easy checks of luminance linearity using the staircase signal. A PIX MON output jack feeds observed (A or B) signals to a picture monitor, and the unit accepts an external sync reference. Built-in calibrator and on-off control of the DC restorer is also provided.

5850C VECTORSCOPE

The ideal companion for the 5860C Waveform Monitor, the 5850C adds simultaneous side-by-side waveform and vector monitoring. Featured is an electronically-generated vector scale that precludes the need for fussy centering adjustments and eases phase adjustments from relatively long viewing distances. Provision is made for selecting the phase reference from either A or B inputs or a separate external timing reference.

5100 4-Channel Component / Composite WAVEFORM

The 5100 handles three channels of component signals, plus a fourth channel for composite signals, in mixed component / composite facilities. Features are overlaid and parade waveform displays, component vector displays, and automatic bow-tie or "shark fin" displays for timing checks. Menu-driven options select format (525/60, 625/50, and 1125/60 HDTV), full line-select, vector calibration, preset front-panel setups and more. On-screen readout of scan rates, line-select, preset numbers, trigger source, cursor time and volts.

5870 Waveform/Vectorscope w/SCH and Line Select

A two-channel Waveform/Vector monitor, the microprocessor-run 5870 permits overlaid waveform and vector displays, as well as overlaid A and B inputs for precision amplitude and timing/phase matching. Use of decoded R-Y allows relatively high-resolution DG and DP measurements. The 5870 adds a precision SCH measurement with on-screen numerical readout of error with an analog display of SCH error over field and line times. Full-raster line select is also featured with on-screen readout of selected lines, a strobe on the PIX MON output signal to highlight the selected line, and presets for up to nine lines for routine checks.

5872A Combination Waveform/Vectorscope

Models 5872A offers all the operating advantages of the 5870, except for the following: SCH is deleted from the 5872A (line select retained), making it ideal for satellite work.

5864A Waveform Monitor

A two-input waveform monitor that offers full monitoring facilities for cameras, VCRs and video transmission links. The 5864A offers front panel selection of A or B inputs, the choice of 2H or 2V display with sweep magnification, and flat frequency response or the insertion of an IRE filter. In addition, a switchable gain boost of 24 magnifies setup to 30 IRE units, and a dashed graticule line at 30 units on screen facilitates easy setting of master pedestal. Intensity and focus are fixed and automatic for optimum display. Supplied with an instruction manual and DC power cable.

5854 Vectorscope

A dual channel compact vectorscope, the 5854 offers precision checkout of camera encoders and camera balance, as well as the means for precise genlock adjustments for two or more video sources. Front panel controls choose between A and B inputs for display and between A and B for decoder reference. Gain is fixed or variable, with front panel controls for gain and phase adjustments. A gain boost of 5X facilitates precise camera balance adjustments in the field. Supplied with a DC power cable.

Designed for EFP and ENG (electronic field production and electronic news gathering) operations, they feature compact size, light weight and 12 VDC power operation. Thus full monitoring facilities can be carried into the field and powered from NP-1 batteries, battery belts and vehicle power. Careful thought has been given to the reduction of operating controls to facilitate the maximum in monitoring options with the operating simplicity demanded in field work.

ALL ORDERS SHIPPED WITHIN 24 HOURS

Circle (73) on Free Info Card
www.americanradiohistory.com

MPEG-2

Compression
Decompression
Noise Reduction

Broadcast contribution
quality video



- Supports main level/main profile and main level/professional profile
- Real-time encoding/decoding of CCIR601 resolution in 4:2:2 chroma format
- Selectable parameters of bit rate (2 to 45 Mb/s), profile and GOP structure

LEITCH®

<http://www.leitch.com>

U.S.A. (800) 231-9673 • Canada (800) 387-0233

Circle (77) on Action Card

CLIP AND SAVE!



BAF SATELLITE SPACE

BAF Satellite Space (800) 966-3822
Best price & service, domestic & international • KU & C-Band, SNG & long-term rates
LOCAL (804) 221-0544 FAX (804) 221-0818 E-MAIL 2059198.mci@mail.com

SNV, ENG, EFP, Radio ENG/SNV Vehicles (800) 633-8223
ADDRESS 314-316 Northstar Ct., Sanford FL 32771 LOCAL (407) 324-8250
FAX (407) 324-7860 E-MAIL baf@gate.net WEB <http://www.bafcom.com>

European Sales +44 1789 765 850
ADDRESS Unit 2, Tything Park; Arden Forest Industrial Estate; Alcester,
Warwickshire, B49 6ES UK FAX +44 1789 765 855



Circle (75) on Action Card

The GALLERY

LEIGHTRONIX, INC.

CONTROL PRODUCTS

Contact LEIGHTRONIX for
your control solution!



- AUTOMATED VIDEOTAPE PLAYBACK
- UNATTENDED RECORDING
- TIMED EVENT VIDEO AND AUDIO SWITCHING
- REMOTE VCR AND SWITCHER CONTROL

LEIGHTRONIX, INC.™

2330 Jarco Drive ■ Holt, MI 48842
■ Ph (517) 694-8000 ■ Fax (517) 694-1600
www.leightronix.com

Circle (81) on Action Card



Choosing equipment means trekking thru
mountains of spec sheets. But no more!

Now you can find it fast with

VidCAD SPECS

A comprehensive catalog of video, audio and multi-media
equipment specifications on CD ROM

- Descriptions
- Specifications
- CAD images
- Quarterly disks
- Options lists
- Hi-res photos
- Thousands of products
- Weekly Web updates

VidCAD Documentation Programs • 749 Carver Road • Las Cruces • NM 88005 USA
(800) 949-SPECS • specs@vidcad.com • (505) 524-8959 • Fax: (505) 524-9669

Circle (78) on Action Card

SPENCER STILL STORE-2000



"Superstation" look ...
without the super budget!

- Designed for LIVE NEWS Production
- Fast, high resolution User Interface
- NETWORK with C-G's and Paint systems
- DUAL Preview channels plus Program
- Key dazzling graphics with 0-100% transparency with our Linear keyer
- > 10,000 still storage capability
- DVE for Live "Picture in Picture"
- Create Logos with transparency
- Very powerful database

SHOWING AT
NAB # 6532
NEXT TO SONY

SPENCER TECHNOLOGIES, INC.

NEWSTORE™

The Video-Clip Store System

- Similar to our STILL STORE-2000, but stores video & audio clips
- Assemble entire newscast: News & Sports stories, Promos, Show opens/closes, Bumpers, etc
- Replace VTRs in Live News
- Complete random access
- Last-second changes are fast
- Recues are INSTANT
- Non-linear Editing
- Powerful database
- Fast intuitive User Interface with Touchscreen for simplicity

Burbank, CA Tel: 818.840.0907 FAX: 818.840.8375
E-mail: 104067.321@compuserve.com

The GALLERY

GET ACQUAINTED Super Sale

CapTech CT90 Battery
(Replacement for Sony BP90)

Features:

12V 5AH
Auto-Reset Circuit Breaker
Only \$129.95

30 Day Money-Back Guarantee
1 Year Limited Warranty

CALL TOLL FREE:

1-888-CAP-1-TOL
(1-888-227-1865)

CAPITOL TECHNOLOGIES, INC.
WASHINGTON, DC

Circle (79) on Action Card

PUT THE POWER OF NUCOMM IN YOUR HAND

with our HTG4
Hand Held Test
Generator

- SMPTE/EBU Color Bars, Multi-Burst, NTSC, Ramp & Black Burst
- 16 Character ID Display
- Small size—4.5" x 2.75" x 1.0"
- Stereo 1 kHz Test Tone
- 12 Hours of Battery Operation



ONLY
\$625

JUST CALL 1-800-9-NUCOMM X3030

Credit Cards Accepted



NUCOMM INC.
MICROWAVE COMMUNICATION PRODUCTS
101 Bilby Rd., Hackettstown, NJ 07840
Tel: 908-852-3700 Fax: 908-813-0399
http://www.nucomm.com

Circle (84) on Action Card



Serial Digital Video

INTERFACE PRODUCTS

- Serial Digital A-to-D and D-to-A
- NTSC/PAL Decoders/Encoders
- Digital DA's
- Monitoring D/A's
- Audio embedders/extractors

Television Equipment Associates, NY

914.763.8893 Fax: 914.763.9158

Matthey Electronics, UK

+44 1782 524918 Fax: +44 1782 524977

E Mail: sales@matthey.demon.co.uk

Circle (82) on Action Card

Call For Rigid Line MYAT & Components

New installation? Facility upgrade?
"Right Now" emergency?

MYAT is the solution for dependable
quality, maximum performance, long life
and on-time delivery.

Call MYAT at 201-767-5380 or
FAX 201-767-4147 for our complete
catalog and reference guide.



380 Chestnut St
P.O. Box 425
Norwood, NJ
0 7 6 4 8



Circle (83) on Action Card

Slow Motion Controllers for Demanding Sports Production



ST300-S/SM Slow Motion Controller

NEW!

- All the features and functions you would expect to find on an \$8,000 to \$10,000 slow motion controller for less than \$3500!
- Simple and easy to use with a small space-saving footprint.
- Powerful set-up menu—configure the slow motion controller for the way you work.
- Quickly and easily store and recall up to 100 cue points.
- Cue points are retained when power is turned off.
- Slow motion from -100% to +200% of play speed.
- Can be customized for your specific application.
- T-Bar or detented wheel provide fast & easy slow motion control

PHONE:
(818)
252-0198

FAX:
(818)
252-0199

Another Control
Solution From . . .

DNF
INDUSTRIES

Circle (80) on Action Card

MATCH IT!

HENRY ENGINEERING

503 Key Vista Drive
Sierra Madre, CA 91024 USA
TEL (818) 355-3656 FAX (818) 355-0077
FAX-on-Demand Doc #120 (818) 355-4210
http://www.henryeng.com



Get Matchbox II to convert "consumer" (RCA and mini-jack) audio inputs and outputs to "600 ohm" balanced lines at +4dbm professional levels. Eliminate the hum, buzz, and distortion caused by mismatched levels and impedances! Gold plated connectors and direct-coupled, active circuitry yield superb audio performance. Over 20,000 units in use worldwide!

HE HENRY
ENGINEERING

We Build Solutions.

Circle (76) on Action Card

Continued from page 40
ment table to the FCC. The table pairs a channel for DTV simulcast with every NTSC station. The filing was signed by many broadcast groups and stations. The assignment table optimizes DTV service for all broadcasters with minimal impact to existing NTSC service areas as the

top priority.

The goal of the assignment process is to assign the DTV channels in such a way that any DTV interference into NTSC falls mostly in areas *already* lost to NTSC interference, translating to no loss at all. Any reduction of NTSC service area is termed new interference. A DTV transmit anten-

na is assumed to be at the same location and height and to have the same directional pattern as the antenna of the paired NTSC station.

The noise-limited contour of a DTV station is where the predicted signal strength, in the absence of interference, is just sufficient for errors in the received signal to not exceed the threshold of visibility. The FCC Advisory Committee has determined this threshold as a digital signal bit error rate of 3×10^{-6} . This bit error rate is achieved at a signal-to-noise ratio of 14.9dB. The DTV service area is the area within the noise-limited contour reduced by the areas where interference from DTV or NTSC stations is above the threshold of visibility. This was the plan according to the broadcasters and the FCC. And finally, we have the channels.

Here come the channels

Now is the time to begin your station's implementation plans. First, you need to analyze your coverage to ensure that you receive fair DTV coverage. Second, make sure that your NTSC service will be unharmed. For the third and final step, after you have established that your station can transmit and the DTV signal can be received as well as your NTSC signal, it is time to begin planning for your first DTV broadcasts. Not all the broadcast and studio equipment necessary for DTV operation is available. Even so, planning must begin *now*. ■

Louis Libin is a broadcast/FCC consultant based in New York.



Sony's Business and Professional Group is seeking the following broadcast professionals:

Senior Video Systems Design Engineers

We are looking for seasoned engineers to design large-scale digital audio/video facilities, including floor plans, equipment rack layouts and detailed signal flow diagrams. Candidates must have 5+ years' experience with state-of-the-art analog and digital A/V, production and broadcast facilities, and be especially strong in system-level engineering design and technical problem-solving. Fluency in MS Excel for Windows is required; AutoCAD, Word and Access knowledge is a plus. Team-building, communication skills and the ability to work with minimal supervision are also key. We have both regular and contract positions available, but all require full-time presence at our San Jose facility. Some travel during installation/testing will be required. (Job # CY-BE.1)

Project Managers

Responsible for the management of resources to execute fully integrated broadcast systems. Must be able to complete projects on time and within budget. The ideal candidate will bring 5+ years of project management in broadcast or production systems. (Job # CY-BE.2)

Senior Marketing Manager

Develop and direct marketing strategy for the broadcast industry. This includes video file server-based automation systems, master control routing switches and related products. Position requires 10+ years of extensive marketing experience in broadcast or other closely related industry. (Job # CY-BE.3)

Engineering Instructor/Trainer

Develop and present courses on repairing and maintaining state-of-the-art video equipment and systems. Courses will be constructed around focused objectives and concentrate on hands-on skills development. You must have strong computer skills, BSCS/BSEE with 5 years' experience in the broadcast/professional video industry. (Job# CY-BE.4)

Product Support Engineer

Manage all technical support for products such as Sony's Integrated Duplication Operation, Video Store and Edit Station. You will review all technical documentation, actively problem-solve and act as a liaison between factory design and support, and marketing, field service and product sales. Position requires a BS in EE or CS with 7+ years of experience developing and supporting software-based products and 2+ years with servicing or designing Sony products. (Job # CY-BE.5)

Please send your resume, INDICATING CODE OF INTEREST, to: Sony Electronics Inc., Attn: Professional Staffing, MS SJ-2C2, 3300 Zanker Road, San Jose, CA 95134-1901. Fax: (408) 955-5166. E-mail (in ASCII text): sj_jobs@mail.sel.sony.com. For more information, visit our Web site at: <http://www.sel.sony.com/HR/EOE>.



SONY®

Waivers

The schedules for the DTV build-out are based on the assumption that certain waivers will be secured for individual cases. Waivers could be required for:

- Broadcast equipment availability
- FAA tower issues
- Local zoning approvals
- Compliance with FCC radiation requests
- Conclusion of retransmission consent negotiations
- Availability of electrical power
- Availability of DTV construction financing
- Channel and site adjustments
- Consulting engineer availability
- Border frequency coordinate issues

professional services

 **Stainless, Inc.**
50 Years of Broadcast Tower
Design - Fabrication - Construction

210 S. Third St. Voice 215-699-4871
North Wales, PA 19454 Fax 215-699-9597

NETCOM
STATE OF THE ART ENGINEERING
FOR AUDIO AND VIDEO
ENGINEERING DESIGN • CAD DRAFTING SERVICES
CABLE FABRICATION • PRE-WIRED PATCH PANEL RACKS
SYSTEM INSTALLATIONS • EQUIPMENT SALES

(201) 837-8424
FAX (201) 837-8384
1465 PALISADE AVE. TEANECK NJ 07666

video, audio, & automation electronics
serving manufacturers & systems integrators

**electronics R & D
& custom product design**

BARANTI GROUP INC

 Professional Engineers phone (905) 479-0148
Ontario fax (905) 479-0149

WRAYTRANSR.F. SYSTEMS CONSULTING

Specializing in
• Transmitter/RF System •
Training, Repair, Alignment

• RF/CATV •
Distribution, Design/Installation

P.M. Program Development
306-545-6385

 **HAMMETT & EDISON, INC.**
CONSULTING ENGINEERS
RADIO AND TELEVISION

DANE E. ERICKSEN, P.E.
Box 280068
San Francisco, CA 94128
707/996-5200 707/996-5280 Fax

JOHN H. BATTISON P.E.
CONSULTING BROADCAST ENGINEER,
FCC APPLICATIONS AM, FM, TV, LPTV
Antenna Design, Proofs, Fieldwork
2684 State Route 60 RD #1
Loudonville, OH 44842
419-994-3849 FAX 419-994-5419

**D.L. MARKLEY
& Associates, Inc.**
CONSULTING ENGINEERS

2104 West Moss Ave.
Peoria, Illinois 61604
(309) 673-7511
FAX (309) 673-8128
Member AFCCE

East Coast Video Systems
consultants • engineers • systems integrators

3 Mars Court
Boonton, NJ 07005
201.402.0104
Fax: 201.402.0208
www.ecvs.com

on line **in time**

CHAN ASSOCIATES
Strategic Marketing • Public Relations • Advertising

1307 Shadow Lane, Suite C
P.O. Box 5509
Fullerton, CA 92838-0509
Phone: (714) 447-4993
Fax: (714) 578-0284
Pager: (714) 506-1357
Email: cjhan@chan.netcom.com
CompuServe: 74601.2707

Curtis Chan
President

classified

SERVICES

**FULL-TIME TRANSPONDER SPACE
AVAILABLE ON CABLE SATELLITE**

located in the premiere cable neighborhood on SATCOM C-3
at 131 W, using General Instruments DigiCipher II (MPEG-
2) video compression system. Your network could be seen
using the new digital set-top technology, improving your
network's chance of cable carriage. In addition to
transponder space, uplinking, playback, editing, and
duplication services are also available from our new digital
uplink facility located in Englewood, CO.

Call Doug Greene @ 303-784-8809 or
E-Mail at dougreene@aol.com

**FULL-TIME TRANSPONDER
SPACE AVAILABLE ON INTELSAT
709 C-BAND, 50° WEST**

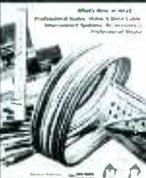
Excellent satellite coverage to distribute
your network to head ends and private
networks in Canada, US, and Latin
America, using Divicom MPEG2-DVB
compression (MCPC). Fiber, turn-around,
playback, editing, and duplication
services are also available from our
facilities in New York City.

**CALL ALICIA VASQUEZ
@ 212-966-5660
or e-mail at alicia@hitn.org**

FOR SALE

STOCK ANSWERS.
For video duplication, demos, audition reels, work
tapes, our recycled tapes are technically up to
any task and downright bargains. All formats,
fully guaranteed. To order call:

(800)238-4300 CARPEL
VIDEO

 **NEW CATALOG**
Audio / Video / Data
Cable, Accessories, Tape

1-800-999-HAVE

HAVE, INC., Dept. BE
Hudson, New York 12534

 **For the jobs you do -**

- Tool Kits & Specialty Tools for Installation, Maintenance & Repair of Broadcasting and Other Telecommunication Equipment
- Test Instruments & Diagnostics
- Soldering/Desoldering Stations
- Static Control Devices . . . and much more!

Plus, Jensen gives you fast delivery, quality customer service, free technical support, and a Lifetime Guarantee on Jensen brand hand tools.

Call Dept. 053 JENSEN TOOLS
800-426-1194

7815 S. 46th St., Phoenix, AZ 85044
Tel: 800-426-1194 or 602-968-6231
Fax: 800-366-9662 or 602-438-1690
<http://www.jensentools.com>

FREE CATALOG!

Circle (101) on Free Info Card

CONSULTING - ENGINEERING

INSTALLATION - FURNITURE

BROADCAST PRODUCTS

BECK ASSOCIATES

2403 HOWARD LANE
AUSTIN - TX - 78728
1-800-728-3725
FAX: (512) 388-1833

NEW!!

SDV 4-4 - Serial Digital and Analog Video Monitoring DA - 4-2-2/270 mbps.
Four relocked SDV outputs, plus four CVBS or RGB outputs. 10 bit DACs. Fits GVG 8500/8800 DA frames. **\$895**

TBC-RMT - TBC Remote Control Unit
Remote control of up to 3 TBC's. For use with internal TBC's on BVW, DVW, PVW, UVW, and BVH Beta machines or any machine using Sony BVR-50 controller. Purchased with 1, 2, or 3 modules. With 3 modules. Now available for JVC machines - Series 22, 80, 85. **\$960**

SCR-4X8 - Serial Machine Control Router - Input/Output Twelve rear mounted DB9-F connectors (four controllers, eight devices). EIA RS-422 send and receive. Controls: Twelve lighted pushbuttons for channel assignment. **\$980**

SCP-10 - Serial 422 Patch Panel
10x10 passive non-normalizing serial data patch panel. Two rack units high. Legend strips and 10 patch cards included. **\$350**

VU2-P - VU/Peak Meter with Phase Indicator - Simultaneous peak and VU display. Solid state phase indication. Highly readable LED arrays. Adjustable headphone output. Hi-impedance looping inputs. **\$890**

SPK-2 - Two Channel Audio Monitor
Two channel audio confidence monitoring. Accepts both balanced and unbalanced inputs. Five switchable listening modes. Headphone output with speaker mute. **\$650.**

classified

FOR SALE

* **Studio Exchange** *

Burbank

(818) 840-1351 Fax (818) 840-1354

New and Used Video Equipment

Audio/Video Dealer

Starring

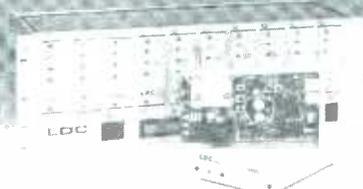
Panasonic & Sony

CALL NOW FOR CURRENT SPECIALS

BUY, SELL, TRADE & CONSIGN

*816 N. Victory Blvd.
Burbank, CA 91502*

Fiber Optic Video + Stereo Audio Modem



- ✓ Celebrating our 10th anniversary.
- ✓ Digital Audio Signal Processing.
- ✓ Meets RS250C Specifications.
- ✓ Superior Video/Audio Performance.
- ✓ Multimode Link starts at **\$850/pair**.

In US and Canada Call:
1-800-DATA-LEE
or Fax at 1.888.328.2533

Lee Data Communications
2501 Technology Dr., Hayward, CA94545
Tel:(510)785-2900, Fax (510)785-3232.
In Canda Call: Telonix at 1.888.835.6649

Cardboard vs. HOODMAN



Hoodman guarantees glare-free monitor images in any environment. Hoods sized to fit 2-inch through 21-inch monitors. Viewfinders and teleprompters can be shipped to you today! For more information, call

(310) 379-6391

P.O. Box 614, Hemet, CA 96254

HOODMAN

Circle (100) on Free Info Card

Circle (102) on Free Info Card

ANTENNA STRUCTURE REGISTRATION SIGNS

F.C.C. ANTENNA STRUCTURE REGISTRATION

1234567

Mail us your F.C.C. Registration number

12"X18" Sign \$75.00

610-458-8418

Call for information Voice or Fax

ID-ER Antenna Products
Thomas Moyer 22 Bryan Wynd Glenmoore, PA 19343

TARGA 2000E video editor with 40mb memory with Adobe Premier and Video for Windows. 8X Cdrom \$4,950.00 - new. 804-525-0900.

HELP WANTED

TELEVISION STUDIO MAINTENANCE ENGINEER KSTP TV is looking for someone to perform first line and final diagnosis and repair of Studio Television Equipment problems. Minimum of four years experience in the repair and maintenance of Television Studio Broadcast Equipment. Experience in the assembly, setup, and troubleshooting of MS-DOS and/or Macintosh personal computers. Completion of a college or technical institute course of studies in Television Technologies or another related technical area or equivalent experience. Submit resumes to: Human Resources, KSTP TV Job #30-97, 3415 University Ave., St. Paul, MN 55114. Please include Job #. No Telephone Calls Please. AN EQUAL OPPORTUNITY EMPLOYER.

MAINTENANCE ENGINEER KNXV-TV, Phoenix, Arizona seeks an individual with repair and installation skills of television broadcast and computer equipment. Should have three years experience in maintaining audio, video, computer and RF broadcast equipment and systems. This position requires a two year electronic technical degree or equivalent, and experience with Beta and CCD ENG camera equipment. Fax resume to Engineering Manager at (602) 304-3000 or send to KNXV-TV, 4625 S. 33rd Place, Phoenix, Arizona 85040. EOE.

TV MAINTENANCE TECH: Installation and maintenance of Television and radio broadcast equipment. Associate degree in Electronics Technology, four years of broadcast television maintenance and installation experience required. Equivalent combinations will be considered. SBE certification preferred. Cover letter and resume to: Dispatch Broadcast Group, Business Office #153, 770 Twin Rivers Dr., Columbus, OH 43215. Qualified minorities and women are encouraged to apply. EEO Smoke and Drug free workplace.

BROADCAST MAINTENANCE TECHNICIAN South Louisiana Television station with its eye on the future needs a Television Engineering Maintenance Technician immediately with 5-7 years experience in broadcast maintenance. Must have knowledge of monitors, VPR-6, 3/4", Ampex, ADO, still store and switcher...primarily repair, maintenance and installation. Computer maintenance and operation a plus. College degree preferred. Send letter and salary requirements to Veronica Bilbo, EEO Officer, KPLC-TV, P.O. Box 1490, Lake Charles, LA 70602. EOE.

Initials for everything

Is it just me or do all technologies these days have to be expressed in initials or abbreviations? In my early video days at the BBC, it was the people who had the initials, not the equipment. Every position's title was an abbreviation from HE (head of engineering) down through EiC (engineer-in-charge) to SE (shift engineer); there were hundreds of titles you were expected to remember. Those, plus your staff number, were essential to any kind of communications save the video and audio we were producing for transmission.



Paul McGoldrick

Today, the worst area is in networking where three-letter acronyms are prolific. Using a vowel to complete the word is popular: think of LAN (local area network) and WAN (wide area network). What's wrong with local network and wide network? But then, how small is local and how big is wide?

To the rest of the world, ATM is where you convert plastic to paper money, but in engineering we have no choice but to think of it as a communications networking protocol. A short while ago, this column was disparaging of ATM's abilities to "make it" with video people. The same thing seems to be happening in the telecommunications industry where carriers and local PTTs have lots of ATM networks, but all of them seem to be experimental. So, the only real users today seem to be the highly accepted, high-performance corporate networks. And, despite the fact that this is making money for some people, there are still others who think that the standard is an unacceptable compromise, and that the much-vaunted ATM Forum — an industry de facto group, a standards body — works faster than the school principal in deciding guilt or innocence. That sounds good, but for those of us who have been on standards committees, we know that although the processes are slow, sometimes excruciatingly slow, they are often necessary to preserve even the smallest features.

Making amends on ATM

At a recent conference, I did get castigated about ATM. That's not unusual, the being castigated bit, but having three people set on me in as many days on one subject is extremely unusual. The general tone of the conversation was that I had ignored an important aspect of ATM.

They are correct and I should make amends: ATM is a packet structure, but it differs from other packet-switching systems. The protocol of Ethernet is one of a connectionless network. When an Ethernet transmission is originated, there is no need for the sending terminal to advise the receiving point; the sending terminal commits packets to the system with the packet header containing the network address to route the packet. With each packet being committed as an individual entity, the routings could be entirely different for each. Some could go astray, some could be out of sequence, but the available bandwidth is likely to be efficiently used.

ATM is a connection network protocol. Before the message packets are transmitted, the preliminary task is a call setup phase; the route from transmit to receive point across the network is defined in this phase with routing of the ATM session only taking place once. The connection path, the virtual circuit, is marked by a connection identifier included in each ATM header in the session. Every ATM switch in the virtual path is configured to switch the incoming cells based on the connection identifier. Compared with a connectionless protocol, there is no need for the constant unbundling and rebundling of the packet to find the output node port required for the destination address. The connection network protocol has major advantages as systems get bigger. The general view is that at about 1,000 users, the connectionless protocol switching becomes almost unmanageable, and even with competent staff, there will be some strange routings: you hear of stories of poor response times between adjacent buildings in San Jose only to find out that servers were having data routed via London!

The use of bandwidth in the ATM connection protocol is inherently low. Once a virtual circuit has been allocated bandwidth, then the amount of the allocation cannot be increased or reduced; the maximum loading on an ATM bearer circuit cannot, under normal use, be allowed to exceed 65%. This is extremely low by telecommunications standards and would be considered a major objection to ATM.

Despite the billing systems we are used to seeing, however, bandwidth is, to all intents and purposes, free in the huge bandwidth systems we now have. ■

Paul McGoldrick is a free-lance writer and consultant based on the West Coast.

ad index

	Page Number	Reader Service Number	Advertiser Hotline		Page Number	Reader Service Number	Advertiser Hotline
AAVS/Div of Sencore	5	5	800-769-AAVS	Miranda Technologies Inc.	26	16	514-333-1772
ADC Telecommunications Sys.	56-57	33	800-366-3891	Mountaingate Data Systems	99	57	800-556-0222
ADC Telecommunications Sys.	102	59	800-726-4266	Myat	127	83	201-767-5380
Ancor Communications Inc.	47	22	800-342-7379	National Digital TV	83	41	303-486-3953
ASC Audio Video Corporation	71	46	818-843-7004	Nucomm Inc.	127	84	908-852-3700
Audio Precision	101	58	800-231-7350	NVision Inc.	75, 109	50, 49	916-265-1000
Avid Technology	13	14	800-949-2843	Odetics, Inc.	68-69	37	800-243-2001
BAF Communications Corp.	126	75	407-324-8250	Opamp Labs, Inc.	106	68	213-934-3566
Beck Associates	130	100	512-388-9777	Panasonic Broadcast & TV	16-17		800-524-0864
B&H Photo - Video	122-125	72, 73	800-947-9928	ParkerVision	84-85	42	800-532-8034
Broadcast Video Systems Ltd.	102	60	905-764-1584	Philips Broadcast Television	59	34	800-962-4287
Canon USA Broadcast Lens	7	11	201-816-2900	Pinnacle Systems Inc.	105	66	415-526-1600
Capitol Technologies	127	79	202-723-2278	Quantegy	79	39	770-486-2800
Clark Wire & Cable	120	85	800-CABLE-IT	Quantel	11	13	203-656-3100
CommScope Inc.	43	32	800-982-1708	QuVis	103	65	913-272-3656
Communications Specialties	54	28	516-273-0404	RGB Spectrum	110	71	510-814-7000
CPI/Eimac Division	52	26	415-594-4000	Rosco Laboratories Inc.	95	43	203-708-8900
Datek, Inc.	73	48	800-882-9100	Sachtler Corp. of America	77	51	516-215-4900
Digital Transport Systems	98	45	619-675-1410	Sachtler GMBH	33	10	893-215-8200
DNF Industries	127	80	818-252-0198	SCEC '97	111	64	800-288-8606
Echolab Inc.	93	56	617-273-1512	Sennheiser Electronics Corp.	89	53	203-434-9190
Electro-Voice	97	61	616-695-6831	Snell & Wilcox Ltd.	19-21	7	408-260-1000
Gentner Communications	35	19	800-945-7730	Snell & Wilcox Ltd.	64-65	29	408-260-1000
Harmonic Lightwaves	63	27	800-730-4099	Snell & Wilcox Ltd.	80-81	40	408-260-1000
Harris Corp/Broadcast Div.	3	4	606-282-4800	Snell & Wilcox Ltd.	90-91	54	408-260-1000
Henry Engineering	127	76	818-355-3656	Sony Electronics Inc.	24-25		408-955-5493
Hewlett Packard	9	12	800-452-4844	Spencer Technologies Inc.	126	74	818-840-0907
Hoodman Corporation	130	102	310-379-6391	Tascam/Teac America, Inc.	39	52	213-726-0303
Ikegami Electronics Inc.	15	6	201-368-9171	Tektronix Inc.	48-49	23	503-627-2830
Interbee/Jesa	87	70		Tektronix Inc./GVG	51	24	503-627-2695
Internet NAB Show Daily	76	63	800-288-8606	Tektronix Inc./Profile	53	25	503-627-2695
Intraplex, Inc.	38	21	508-692-9000	Tektronix Inc./Measurement	55		503-627-2695
Jensen Tools, Inc.	129	102	602-968-6231	Telect Inc.	67	36	509-926-6000
JVC Professional Products Co.	36-37	20	800-JVC-5825	Thomson Broadcast	92	55	800-882-1824
Kino Flo Inc.	66	30	818-767-6528	Utah Scientific	23	15	800-453-8782
LDI '97	74	62	800-288-8606	VDP Inc.	106	67	800-VIDCAD-6
Leightronix Inc.	126	81	517-694-5589	VDP Inc.	126	78	800-VIDCAD-6
Leitch Incorporated	126	77	800-231-9673	Vela Research Inc.	41	31	813-572-1230
Leitch Incorporated	136	3	800-231-9673	Videotek, Inc.	135	2	800-800-5719
Litton Electron Devices	27	17	800-861-1UHF	Videssence	72	47	415-579-7577
Louth Automation	31	8	415-843-3665	Wegener Communications	107	69	770-623-0096
Louth Automation	28-29	18	415-843-3665	Wheatstone Corporation	2	1	315-452-5000
Matthey Electronics Ltd.	127	82	914-763-8893	Winsted Corporation	70	38	800-447-2257
MGE UPS Systems	32	9	714-557-1636	360 Systems	61	35	818-991-0360

sales offices

WEST
Duane Hefner
 5236 Colodny Ave., Suite 108
 Agoura Hills, CA 91301
 (818) 707-6476
 Fax: (818) 707-2313
 E-Mail address:
 dnhefner@worldnet.att.net

Susan Simon
 3046-3 Lakemont Drive
 San Ramon, CA 94583
 (510) 735-7616
 Fax: (510) 735-7626
 E-Mail address:
 ssimon@pacbell.net

Sue Horwitz
 809 South Orange Drive
 Los Angeles, CA 90036
 (213) 933-9485
 Fax: (213) 965-1059
 E-Mail address:
 76345,2624@compuserve.com

EAST
Josh Gordon
 210 President Street, Suite #4
 Brooklyn, NY 11231
 (718) 802-0488
 Fax: (718) 522-4751

EAST/MIDWEST
Joanne Melton
 1775 Broadway, Suite 730
 New York, NY 10019
 (212) 641-5270
 Fax: (212) 459-0395

INTERNATIONAL
Richard Woolley
Tony Chapman
 P.O. Box 250
 Banbury, Oxon OX16 8YJ U.K.
 +44 (0) 1295 278407
 Fax: +44 (0) 1295 278408

JAPAN
Orient Echo, Inc.
Masby Yoshikawa
 1101 Grand Maison
 Shimomiyabi-Cho 2-18
 Shinjuku-ku, Tokyo 162, Japan
 (3) +81 3235-5961
 Fax: (3) +81 3235-5852

CLASSIFIED ADVERTISING
OVERLAND PARK, KS
Jeff Utter
 P.O. Box 12901
 Overland Park, KS 66282
 (800) 896-9939 (913) 967-1732
 Fax: (913) 967-1735

LIST RENTAL SERVICES
Lori Christie
 9800 Metcalf
 Overland Park, KS 66212-2215
 (913) 967-1875
 Fax: (913) 967-1897

BROADCAST[®] engineering

EDITORIAL

Brad Dick, *Editor*
 Skip Pizzi, *Technical Editor*
 Steve Epstein, *Technical Editor*
 Dawn Higginer, *Senior Associate Editor*
 Derrina Rood, *Associate Editor*
 Jim Saladina, *Editorial Assistant*
 Tom Cook, *Senior Managing Editor*
 Carl Beitz, *Directories Manager*

ART

Stephanie L. Mastersom, *Art Director*

BUSINESS

Raymond C. Maloney, *President*
 Cameleon Bishop, *Senior Vice President*
 Dennis Triola, *Publisher*
 Judson Alford, *Associate Publisher*
 Eric Proffler, *Marketing Coordinator*
 Kathy Volkland, *Advertising Coordinator*
 Annette Hulsey, *Classified Advertising Coordinator*
 Doug Coonrod, *Corporate Art Director*
 Barbara Kummer, *Circulation Director*
 Leann Sandifar, *Circulation Manager*
 Customer Service: 913-967-1711 or 800-441-0294

TECHNICAL CONSULTANTS

Jerry Whitaker, *Contributing Editor*
 Eric Neil Angevine, *Broadcast Acoustics*
 John H. Garrison, P.E., *Antennas/Radiation*
 Dale E. Erickson, P.E., *Systems Design*
 Donald L. Markley, *Transmission Facilities*
 Harry C. Martin, *Legal*
 Curtis Chan, *Audio/Video Technology*

MEMBER ORGANIZATIONS

- Sustaining Members of:
- Acoustical Society of America
 - Society of Broadcast Engineers
 - Society of Motion Picture and TV Engineers
 - Society of Cable & Telecommunications Engineers

Member, American Business Press



Member, BPA International



Affiliate Member,
 International Teleproduction Society



BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other management personnel at commercial and public TV stations, post-production and recording studios, broadcast networks, cable, telephone and satellite production centers and networks. Qualified persons include consulting engineers and dealer/distributors of broadcast equipment.

SUBSCRIPTIONS: Non-qualified persons may subscribe at the following rates: United States and Canada; one year, \$55.00. Qualified and non-qualified persons in all other countries; one year, \$70.00 (surface mail); \$130.00 (air mail). Subscriber information: P.O. Box 12937, Overland Park, KS 66282-2937.

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Intertec Publishing, provided that the base fee of U.S. \$2.25 per copy, plus U.S. \$0.00 per page is paid directly to Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. The fee code for users of the Transactional Reporting Service is ISSN 0361-0942/1997 \$2.25+\$0.00. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. Prior to photocopying items for classroom use, contact CCC at (508) 750-8400. Organizations or individuals with large quantity photocopy or reprint requirements should contact Chris Loresso, (312) 840-8407. Microfilm copies of *Broadcast Engineering* magazine are available by calling or writing UMI, 300 North Zeeb Rd., P.O. Box 1346, Ann Arbor, MI 48106-1346. Phone: (313) 761-4700 or (800) 521-0600.

©1997 by Intertec Publishing
 All rights reserved.



HELP WANTED



**ENTERTAINMENT
TELEVISION®**

E! Entertainment Television, an international cable network, has the following opportunities available at our Los Angeles headquarters:

Director, Engineering

Individual will oversee the day-to-day operations of the Engineering Department including managing systems design, installation, trouble-shooting and training. Minimum 5 years broadcast/cable related management experience required. Familiarity with overall system layout of a network including Master Control, Studio, and Post Production. Experience with Video Disk Servers, CCIR 601 digital format and digital equipment required. Bachelor degree in Engineering or equivalent desired, SBE certification preferred.

Engineer

Individual will facilitate program production; assist with system design, installation, trouble-shooting and operator training; maintain and repair all on-line and operational equipment; and perform emergency trouble-shooting and repairs. Minimum 3-5 years of broadcast/cable related experience required. Must have experience with construction, wiring and component level trouble-shooting. Experience with Video Disk Servers, CCIR 601 digital format and digital equipment desired. Bachelor degree in Engineering or equivalent preferred.

Excellent health benefits package, flexible spending and 401(k) Savings Plan. Please send resume with salary history to:

E! Entertainment Television

Attn: Engineering, 5670 Wilshire Blvd., Los Angeles, CA 90036

E-Mail: hr@entertainment.com

(please send all documents in MS Word for Mac 5.0).

Equal Opportunity Employer

PROFESSIONAL COMMUNICATIONS SYSTEMS

A Tampa based systems integration company is expanding to handle our increasing business. We have openings for the following experienced and talented people.

SENIOR PROJECT MANAGER - 5-10 years engineering, design, and broadcast project management experience - digital and computer experience essential, VIDCAD experience a plus.

INSTALLATION SUPERVISOR - 5+ years experience in installation of broadcast, board room and industrial facilities. Coordinate schedules and train installation personnel.

INSTALLATION TECHNICIANS - 3-5 years installation experience on broadcast, board room, and industrial related facilities.

SERVICE TECHNICIAN - 3-5 years bench experience on Sony and Panasonic broadcast and professional equipment.

Join a rapidly growing company in sunny Florida. Excellent salary and benefits - some travel required. Mail/FAX resume and cover letter to: Personnel Director, PCS, 5426 Beaumont Center Blvd., Suite 350, Tampa, FL 33634 (813) 886-9477 EOE/Drug Test Required.



PROFESSIONAL COMMUNICATIONS SYSTEMS
Technology evolves. We take you there.

A Division of Media General, Inc.

HDTV DIGITAL ENGINEER - Person to be responsible for HDTV development, including testing, installation, integration of systems, liaison with manufacturers development team and other Engineering resources. College degree or equivalent experience, five years digital experience required. Must have valid driver's license and good driving record. MPEG, MPEG2 and digital video experience, compression technology knowledge, excellent communication and presentation skills. Specify job #97030. Visit our website at www.cbc-raleigh.com and apply under employment opportunities. Forward resume to Capitol Broadcasting Company, Inc., P.O. Box 12800, Raleigh, NC 27605. An E.O.E., M/F.

SNG OPERATOR MAINTENANCE TECH: Drive and operate SNG Mobile uplink truck. Extensive travel required. Install and maintain television broadcast equipment. Associate degree in Electronics Technology with 2 years of broadcast television operator experience required. Equivalent combinations will be considered. CDL license, SBE certification preferred. Cover letter and resume to: Dispatch Broadcast Group, Business Office #154, 770 Twin Rivers Dr., Columbus, OH 43215. Qualified minorities and women are encouraged to apply, EEO Smoke and Drug free workplace.

CABLE TV CHIEF FIELD TECHNICIAN A municipal utility located in the capitol city of Kentucky, has an opening, in its Community Cable Television Division. An Experienced Chief Technician is needed to assist with the maintenance of its CATV system (17,000 subs) by implementing preventive maintenance standards, providing emergency repair service, conducting proof tests; trouble-shooting system from head-end to taps; performing leakage-detection and repair service; and providing emergency repair service at all hours. Must have high school or equivalent plus five years directly related work experience. Vocational courses in related field and/or SCTE Certification is preferred. Must possess a valid KY drivers license with a good driving history. Must be able to successfully complete drug screening and background investigation. We offer between \$13.66 - \$16.39 Hourly and an Attractive Benefits Package (KY Retirement System, Life, Health, Dental, Uniforms, Holidays, Vacations and Sick Leave, etc.). Qualified applicants may request an application form by phone: (502) 223-3401 Ext. 133 or by mail: FEWPB Personnel Officer, P.O. Box 308, Frankfort, KY 40602. Applications accepted through April 30, 1997. Equal Opportunity Employer.

Uplink Engineer

TCI's Broadcast Satellite Uplink Center is growing from 275 uplinked services to 400. We need technicians to construct and operate this state of the art facility. Several positions available with responsibilities and compensation dependent on qualifications. Experience with digital video, computer based control systems, RF and broadcast operations desired. SBE, SCTE certification preferred.

Uplink Draftsperson

TCI's National Digital TV Center is seeking CAD draftsperson to set up and administer documentation and planning documentation. Experience with video and broadcast operations desired. SBE, SCTE certification preferred.

Drug and background check will be required for employment. Successful applicants needing an accommodation for the interview should inform manager at time of contact. Send resume with salary requirements to: **TCI National Digital Television Center**, Attn: Office 105, 4100 E. Dry Creek Rd., Littleton, CO 80122, fax 303-486-3891. EOE.

WE PLACE ENGINEERS USA & WORLDWIDE



KEYSTONE INT'L., INC.
16 Laflin Road, Suite 900
Pittston, PA 18640, USA

Fax (717) 654-5765 • Phone (717) 655-7143
E-mail: keyjobs@keystone.microserve.com

LAKE TAHOE

TECH SUPPORT/ PRODUCT SPECIALIST POSITIONS

Sierra Design Labs, the leader in long format video disk recorders, is seeking two technical support specialists for our New York and Lake Tahoe offices. Responsibilities include telephone and On-site support of software and hardware Products. Requirements include a strong technical understanding of the professional video post production and broadcast environments, computer literacy in SGI, MAC and PC platforms, as well as excellent written and oral communications skills. Minimum 3 years technical experience in the computer/video industry. Some travel required. Competitive compensation and excellent benefits. Mail or fax resume and salary requirements to: HR, Sierra Design Labs, 999 Tahoe Blvd., Box B, Incline Village, NV 89451; Fax: (702) 831-5710



**SIERRA
DESIGN LABS**

classified

HELP WANTED



TELEVISION ENGINEERS

Turner Broadcasting System, the leading News, Sports, and Entertainment system in satellite communications, has career opportunities for engineers with **broadcast maintenance** experience. These positions demand an extensive background in television engineering and at least two years of training in electronics technology. Turner Broadcasting System offers an excellent benefit and compensation program.

Send resumes to:

Mr. Jim Brown, Corp. Engineering
Turner Broadcasting System, Inc.
One CNN Center
P.O. Box 105366
Atlanta, GA 30348-5366
(404) 827-1638 office
(404) 827-1835 fax

TBS is an equal opportunity employer

Turn your SURPLUS Broadcast Equipment into a great TAX ADVANTAGE!

High Adventure Ministries
is a non-profit
501(C)(3) Corporation.

**We can take your good surplus
equipment for our International
Broadcast Network and issue you a
valuable tax deductible receipt.**

Contact Paul W. Hunter
Director of Engineering
High Adventure Voice of Hope
P.O. Box 100
Simi Valley, CA 93062 USA
Phone: (805) 520-9460
(800) 517-HOPE
Fax: (805) 520-7823

Take control of your advertising dollar!

Advertise in Broadcast Engineering Classifieds!

**Call Jeff Utter
at 800-896-9939**

INTERN SOUGHT

for North America's largest entertainment technology trade show, *Lighting Dimensions International*. 40 hrs/wk in LDI's New York office, 6/1-10/31/97. Stipend \$125/wk plus all-expense-paid trip to *LDI97* in Las Vegas! Call Lester Grant at (212) 229-2965, ext 828, or email LGRANT@ETEC.ORG for details.

TELEVISION TRANSMITTER SUPERVISOR

WASV-TV in Asheville, NC has an opening for a transmitter supervisor/chief operator to oversee construction and operation of our new 5,000 watt state-of-the-art transmitter site in beautiful Western North Carolina. This is an excellent opportunity for a self starter with a strong technical background in the maintenance of UHF transmitters and microwave systems to be involved "from the ground up". Formal electronics education, FCC General Radiotelephone License and/or senior SBE certification are preferred. Excellent compensation and benefits. Send resume, cover letter (with references) and salary history to: Bone & Associates, Attn: WASV Project, 6 Blackstone Valley Place, Suite 109, Lincoln, RI 02865 or fax to 401-334-0261. Pappas Telecasting Companies is an EEO and encourages female and minority applications.

SENIOR BROADCAST ENGINEER Search extended. The Wright State University Television Center has an immediate opening for a Senior Broadcast Engineer. The individual will install, operate and maintain all video and audio equipment associated with the engineering service areas of the department. Additional duties include analyzing systems failures, diagnosing problems and isolating them to the component level, training staff and students in engineering operations. Requires an Associates Degree in Electronics or at least two years experience as an electronics technician, and 4 years of experience in broadcast engineer, maintenance and operations. Must have good human relations skills and a willingness to work occasional odd hours. Desired qualifications include SBE certification and an FCC license. Send letter of interest, resume, and the names, addresses and phone numbers of 3 professional references by May 15, 1997, to: Director, 104 TV Center, Wright State University, Dayton, OH 45435 EO/AA Employer.

NATIONAL MOBILE TELEVISION INC. has 2 immediate openings for field engineers and 1 supervisor/maintenance engineer, to be based out of Los Angeles. Send resumes and references to 1933 Del Amo Blvd., Torrance, CA 90501.

IMMEDIATE OPENING FOR MAINTENANCE engineer in central Florida. Must have very strong VTR skills. FCC license preferred. Minimum 2 year technical education and 5 years experience in post production industry. Send resume and salary requirements to: John McMahan, Century III, 2000 Universal Studios Plaza, Orlando, Florida 32819.

HANDS-ON EXPERIENCED TELEVISION studio engineer. Repair of video tape & studio equipment to component level. Resume to: Jerrell Kautz, WCBI-TV, Box 271, Columbus, MS 39701, FAX: 601-329-1004, Email: jkautz@wcbi.com.

PRODUCER Seeking experienced producer to launch daily, hour-long talk and demonstration program on local NBC affiliate. The program is focused on home and family in Atlanta and the south. Format will be energetic and fun. Candidates must have experience producing a live, daily non-news program. Send resume and sample show tape to: Executive Producer Programming, 1611 West Peachtree St. NE, Atlanta, GA 30309. EOE M/F

BROADCAST TECHNICIAN Multi-channel cable TV facilities in Littleton, CO. Duties include installation and repair of all types of broadcast audio and video equipment. Minimum qualifications include: 3+ years broadcast video, audio equipment repair and operations experience. The preferred candidate will also possess an Associates Degree in Electronics and experience in maintenance and repair of multiple format broadcast video tape machines. Other duties, weekend and shift work as required. Drug test and criminal records check required of final applicants. Non-smoking environment. Send resume with salary history to: Broadcast Technical Mgr., National Digital TV Center, 4100 E. Dry Creek Rd., Littleton, CO 80122. EOE.

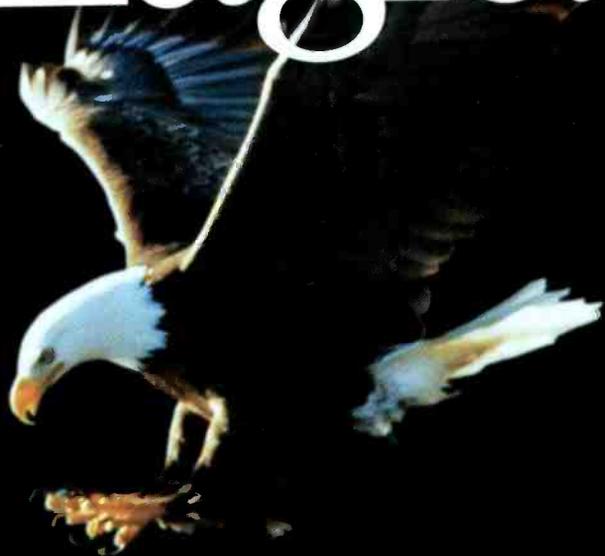
FAST GROWING, SE, FOX NEWS AFFILIATE is seeking experienced, self motivated broadcast employee's: Account Executive, Maintenance Engineer, News Producer/Director. Excellent benefits including medical and a 401K. Women and minorities are encouraged to apply. Equal Opportunity Employer. Fax resumes to: Lynne Carter at 912-435-0485.

THE UNIVERSITY OF OREGON School of Journalism and Communication seeks an Electronic Media Technology Coordinator to supervise and service the operation of the new Carolyn S. Chambers Electronic Media Center. Duties include instruction in a variety of electronic media equipment, including camcorders, lighting, sound and editing equipment; maintenance and repair of that equipment; supervision of part-time student staff; and advising of faculty and administration on equipment and budgetary needs. Five years of appropriate technical experience preferred. BS or BA degree required. Applications and supporting materials, including the names and phone numbers of three professional references, should be sent to: Search Committee, Electronic Media Technology Coordinator, School of Journalism & Communication, 1275 University of Oregon, Eugene, OR 97403-1275. Review of files will begin on April 15 and continue until position is filled. The University of Oregon is an affirmative action/equal employment opportunity employer committed to cultural diversity and compliance with ADA.

ASSISTANT CHIEF ENGINEER with production experience; hands-on-equipment-repairs experience. South Texas, great for family. Mail resume to 48 KNVO-TV, 1800 South Main Street, Suite 850, McAllen, TX 78503-5444, or fax to 210-687-7784.

KCAL-TV, LOS ANGELES, needs a TOC Operator for satellite and microwave. Must know satellite and ENG controllers, routing, frame stores and beta recording. For applications, call the job hotline at (213) 960-3770.

Legal Eagle.



Serial Digital Proc Amp

The DPA-100 with *Auto Legal* keeps a keen eye on your broadcast signals.

There's no easier way to ensure a Broadcast Legal signal than with the DPA-100 Digital Processing Amplifier. With its one-button *Auto Legal* feature, the DPA-100 automatically forces a video signal to "Broadcast Legal" by using a phase coherent chroma clip for true dynamic correction. And, while the default is set to broadcast standard, you can easily change the settings to meet any transmission requirement such as microwave, satellite up-link, cable, or for production in the studio and on the road.

The DPA-100 is ideal for any 601 serial digital system including Non-Linear Video Editing, DVC Pro, D-1, D-5, Digital Betacam and Digital S. Real Time control over video parameters allows total adjustment of video, luminance and chroma gains, plus black level, hue shift and Y/C delay. At the touch of a button, you can initiate the active bypass to view the original signal.

Full EDH support is provided, including input verification, flag passing and output recalculation.

Our unique design allows 2 units to be rack mounted side by side in 1RU. The DPA-100 can also be used stand-alone in desktop or portable applications.

Simple, intuitive controls on both the DPA-100 and its optional remote makes both units a breeze to operate.

Make it legal with Videotek's new cutting edge design. Call today to find out more about this and other innovative 601 digital solutions that will let your standards soar to new heights.

Premium Quality, Intelligent Design, Smart Prices... That's Videotek.

VIDEOTEK™
A Zero Defects Company

Five Year Warranty.

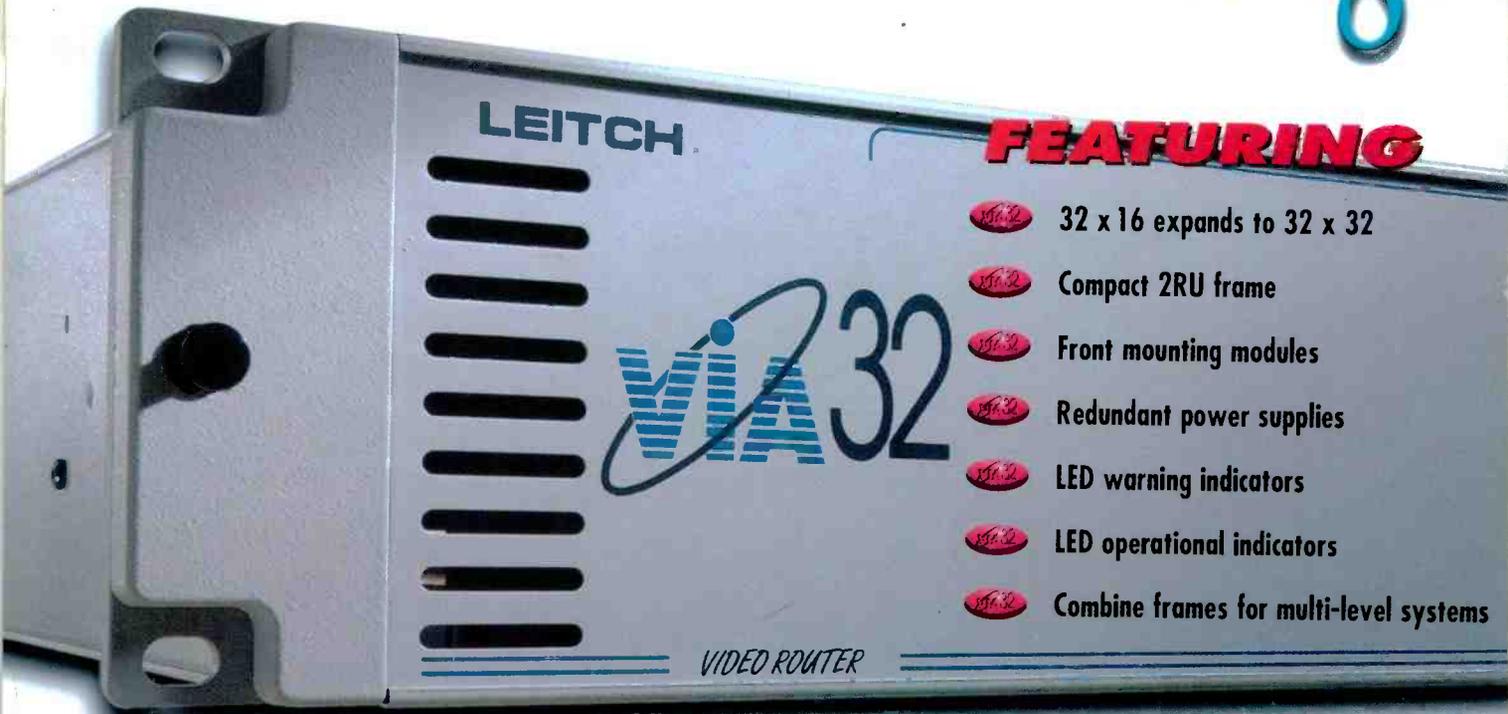


A Digital System
Integration Product

243 Shoemaker Road, Pottstown, PA 19464 1 800-800-5719 (610) 327-2292 Fax: (610) 327-9295

Circle (2) on Free Info Card

Best Value in Routing?



FEATURING

-  32 x 16 expands to 32 x 32
-  Compact 2RU frame
-  Front mounting modules
-  Redundant power supplies
-  LED warning indicators
-  LED operational indicators
-  Combine frames for multi-level systems

Just Compare

CONTROL

- Interface using X-Y, RS-232 and RS-422
- Button programmable control panels
- RouterWORKS® PC software control
- Schedule switching with EventWORKS™
- Controllable by modem



AUDIO

- AES/EBU professional digital audio data rates (75 ohm coax or 110 balanced)
- Analog 200 KHz bandwidth

VIDEO

- Serial digital up to 360 Mb/s (mix & match fiber and coax)
- Analog bandwidth of 120 MHz

LEITCH®

U.S.A.

(800) 231-9673 Fax: (757) 548-4088

<http://www.leitch.com>

Canada

(800) 387-0233 Fax: (416) 445-0595

San Francisco, CA
(800) 900-6413

Los Angeles, CA
(800) 380-1676

Indianapolis, IN
(800) 861-9440

Dallas, TX
(800) 401-3770

New York, NY
(800) 653-4824

Norfolk, VA
(800) 665-5062

Atlanta, GA
(800) 641-1277

Quebec
(800) 909-3301

Europe
+44 (0) 1256 880088

Brazil
+55 (11) 867-0218
Circle (3) on Free Info Card

Japan
+81 (3) 5423-3631

Australia
+61 (2) 9999-2355