An INTERTEC®/PRIMEDIA publication

SEPTEMBER 1999

Broadcast ENGINEERING®

THE JOURNAL OF DIGITAL TELEVISION®

Digital audio solutions:

Audio processing for TV
Digital jitter
Understanding Dolby E

Also:
Newsroom automation
Graphics technology

The Industry Leader
40 years
Since 1958

DIGITAL INTEGRATOR

DON'T LET THE TRADITIONAL LOOK FOOL YOU! This new audio console from Wheatstone has the most advanced DIGITAL FEATURES available on the market today! How about **serial control** of all switch, fader and eight-character source display settings—for **TRUE INTEGRATION** with routers and automation systems—or four stereo mix busses with simultaneous digital and analog outputs? Multiple mainframe sizes? Dedicated phone modules with DSP generated mix-minus for easy control of two to four callers?

BUT DON'T STOP HERE: optional DSP equipped modules allow programmable ducking with gain reduction and master/slave selection, digital input attenuation, pan/balance, 4-band sweep EQ (plus sweep high pass), and compressor/limiter with threshold, ratio, attack, release and makeup gain—all on *each* input!

A meterbridge **router controller panel** can run our new Wheatstone rackmount switcher for hundreds of additional inputs. The totally modular hot-swap design accepts both analog *and* digital inputs. Dual metering is simultaneous VU and full scale digital peak. Add a PC based **setup program** for quick configuration of all displays, mutes, tallies, machine starts and mix-minus assigns (once set the PC is removed for console stand-alone operation) and you begin to see the *power* that lies behind this intuitively simple control surface.

SOUND LIKE SOMETHING YOU'RE LOOKING FOR? Give us a call here at **Wheatstone** and ask about the brand new **D-600 DIGITAL AUDIO CONSOLE**—our sales engineers would love to tell you more!

Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

Circle (101) on Free Info Card

ncoders have the one feature
e been waiting for. A future.

ity. Introducing Harris' expanded
2-rack unit UniCoder SD and
S5--all joining the original,
utions are available in 24
efinition or high definition
ding. And their flexible,
nsions*. We're also intro-
e, with video-enhancing
losed Caption and PSIP
y.

ations

UniCoder

VSS

*Self-contained UniCoders are factory upgradeable. ©1999 Harris Corporation.

next level solutions

WIRELESS

BROADCAST

COMMUNICATIONS
PRODUCTS

HARRIS
Communications

Circle (104) on Free Info Card

I M P L E M E N T I N

[AJ-D9
2/3" DVC

SHOOT DVCPRO TODAY

[AJ-D810A
2/3" DVCPRO]

[AJ-D215
1/3" DVCPRO]

[AJ-PD900WA
2/3" PROGRESSIVE]

[AJ-D900W
2/3" DVCPR(

[AJ-D700A
1/2" DVCPRO]

DVCPRO DVCPRO 50 DVCPRO P

Y O U R V I S I O N

[DVCPRO 25Mbps]

[DVCPRO 50 50Mbps
DVCPRO PROGRESSIVE]

PLAY HD TOMORROW

Could you imagine using a system that lets you shoot with the economy of standard definition today, yet plays back programs in HDTV tomorrow? We bet you can!

Panasonic offers an entire range of DVCPRO camcorders... from the AJ-PD900WA for shooting 480 Progressive for documentaries to the AJ-D910WA DVCPRO 50 for field production... from the AJ-D810A 2/3" DVCPRO for news to the AJ-D215 for weddings and events.

Whichever Panasonic DVCPRO camcorder you shoot with, you're building a digital program archive on a compact 1/4" cassette for later HDTV transmission. Panasonic's new DVCPRO HD studio VTR is capable of playing back any 525 line resolution DVCPRO cassette with either 1035i, 1080i or 720p HDTV resolution video output.

Now, with a clear way to protect your financial investment in digital.

WHAT ARE YOU WAITING FOR?

WWW.PANASONIC.COM/BROADCAST

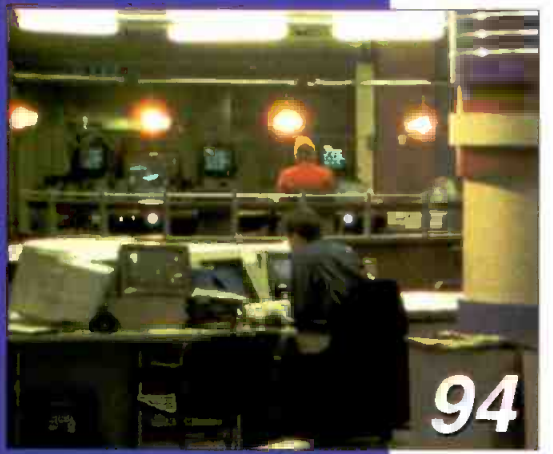
For more information on DVCPRO, DVCPRO 50 or DVCPRO P products, phone 1-800-528-8601
(enter product code 2)

Panasonic

September 1999
Volume 41
Number 10

Broadcast ENGINEERING
THE JOURNAL OF DIGITAL TELEVISION
www.broadcastengineering.com

IN THIS ISSUE



Features

82 Audio processing for TV
By Robert Orban
Working with 5.1 audio in local and network settings.

86 Jitter in digital audio systems
By Peter Schut
How to identify and prevent digital audio artifacts.

90 Understanding Dolby E
By Steve Lyman
An introduction to working with Dolby's new audio encoding system.

94 Newsroom automation
By Dean Kolkey
New systems offer efficient solutions to newsroom staffs.

100 Graphics in post
By Steve Wiedemann
Graphics hardware and software have an important role in DTV.

106 Gamut: An old problem with several new faces
By Mark Everett
DTV poses a whole new set of color correction problems.

116 Managing your transformation to DTV
By Jim Boston
Developing a clear plan for your new plant is critical.

Beyond the Headlines

NEWS

14 Residents pose threat to Denver broadcast towers
16 CEMA proposes new digital broadcast service
18 FCC relaxes local ownership rules
22 Grass Valley Group purchases Tektronix's video division
24 IBEW threatens strike over AT&T's treatment of cable workers

FCC UPDATE

28 FCC revises local television ownership rules

EXPERT'S CORNER/VENDOR VIEWS

30 Are new receiver tests needed?

Digital Handbook

TRANSITION TO DIGITAL

36 MPEG audio compression

COMPUTERS AND NETWORKS

42 Maintaining software

ASK DR. DIGITAL

50 Comments on compatibility

(continued on page 8)

We're the recipe
for broadcast success.

The most complete broadcast enterprise-wide solution is Louth.

The ingredients to a successful broadcast enterprise have gotten quite complex. DTV, multi-channel, global networks... not to mention a mandate for seamless and scalable automation. It's why we're constantly adding to an already comprehensive menu of broadcast solutions. Like GMT,™ our Global Media Transfer solution that captures the capabilities of video and networking technologies to get media exactly where you need it. Or, our DTV Manager,™ an innovative tool to effectively manage your DTV needs through the entire transmission chain. Visit our website at www.louth.com to see why leading broadcast organizations count on Louth to be a key ingredient to their broadcast strategies. Louth. It's the one way to satisfy your appetite for success.

Come taste for yourself. Visit www.louth.com

Louth

Circle (114) on Free Info Card

ON THE COVER: *Further demonstrating the popularity of moving into all digital broadcast, WLS-TV, ABC's owned-and-operated station in Chicago, has installed a Solid State Logic Aysis Air all digital broadcast console. Photo by Dave King.*

Systems Design & Integration

SYSTEMS DESIGN SHOWCASE

60 TXCN goes digital
68 Digitizing WLWV-TV

TRANSMISSION & DISTRIBUTION

74 Winterizing the antenna site

PRODUCTION CLIPS

78 Recording in stereo with a single microphone

New Products & Reviews

APPLIED TECHNOLOGY

124 Philips' Venus routing switcher HD module expansion
128 Pinnacle's Thunder storms the server market
134 Tektronix's ContentShare: global asset management
138 TeraNex'sPixelComp DTV format converter

TECHNOLOGY IN TRANSITION

140 Broadcast graphics systems: Where the PC workstation drives the show

NEW PRODUCTS

146 The Grass Valley Group Kalypso, plus other new products

BUSINESS WIRE

164 Business highlights from broadcast and production

Departments

10 Editorial
12 Reader Feedback
144 Management
182 Classifieds
189 Advertisers' index
190 EOM

WEB SITE DIRECTORY

www.broadcastengineering.com

Feature Articles

Departments

New Products & Reviews

Classifieds/Jobs

Marketing/ Advertising

Reader Resources
- Editorial calendar
- Article archives

Contact the Editors

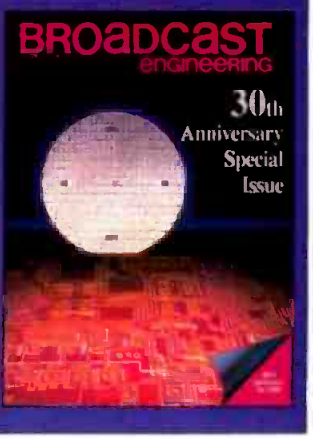
Questions? Contact:
Jim Saladin
jim_saladin@intertec.com
913/967-1905 fax

FREEZE FRAME

A look at the technology that shaped this industry.

Do you remember?

Predictions are always dangerous. In what year and month did former BE Editor Jerry Whitaker make this forecast? "By 1999 ATV will be transmitted by a majority of TV stations in the U.S. ATV will carry over-the-air television through the year 2000, when fiber-optic delivery of 'real' HDTV will begin." Correct entries will receive a Broadcast Engineering T-shirt. Send entries to: brad_dick@intertec.com.



Editorial

I want my TV – and PC!

As little as a year ago, the computer industry was predicting that viewers would soon be switching off their TVs and using their PCs to watch television. Guess what? That's not happening. Instead, viewers are increasingly watching TV and surfing at the same time. A recent report by Showtime Networks and Paul Kagan Associates confirms a trend reported early this year in *Broadcast Engineering*. Television viewers are increasingly *multitasking*, using both the computer and TV at the same time. Fully one-quarter of all households, almost 23 million homes, now have PCs and TVs in the same room. What's amazing is that in 80 percent of these homes, viewers watch TV and surf at the same time. (See Paul Kagan Associates report "Connected Household" at www.pkbaseline.com.)

The research suggests today's viewers are pressed for time and want to be able to multitask as much as possible. It therefore becomes natural to both watch TV and surf at the same time.

Many expected TV viewing to drop as the PC invaded the TV viewing room. However, that's not what's happening. In the convergent household, TV viewing (eyeball time) actually increases. Broadcasters should love that.

In addition, these convergent households have some of the most desireable (at least to a marketer) demographics. Their household incomes are significantly higher ($64,000 vs. $38,000), and these consumers tend to have more have college degrees (44 percent vs. 20 percent) than other households.

These households are electronic gadget havens. When it comes to entertainment and digital products, these consumers are adopters: 97 percent have a VCR, 88 percent have a CD player, 50 percent have a camcorder, 17 percent have a satellite system and, at twice the national average, 13 percent have DVD players. These factors combine to create a highly desirable audience for advertisers.

A study by DFC Intelligence (www.dbpwebcasttrack.com) shows that 38 percent of affiliate TV stations have some form of streaming video or network link-back capability. These stations are repurposing their local programming to capture viewers — even when those viewers aren't watching the TV set! Of the affiliate stations surveyed, 318 host some form of video programming. Some merely provide links back to their networks, but others provide full-time or on-demand video programming. Where's the advantage? Glad you asked.

Today, a severe thunderstorm passed through my city. I'm at work and don't have a TV or radio, but I do have a Net-connected PC. As the storm arrived, I simply logged onto a local TV station's live radar site. Bingo, I'm getting the latest (real-time) weather feed. It was up-to-the-minute accurate and tailored for my neighborhood. No 15-minute, multicounty, delayed-feed-from-Atlanta radar sweep for me!

With an increasing number of viewers having access to the PC in the same room as their TVs, (not to mention Net-connected PCs at work) it makes sense for stations to use their greatest strength, which is in the creation of local programming, to capture this audience. Cable can't do it. Satellite can't do it. Only over-the-air broadcasters can do it.

So what's your excuse?

Brad Dick

Brad Dick, editor

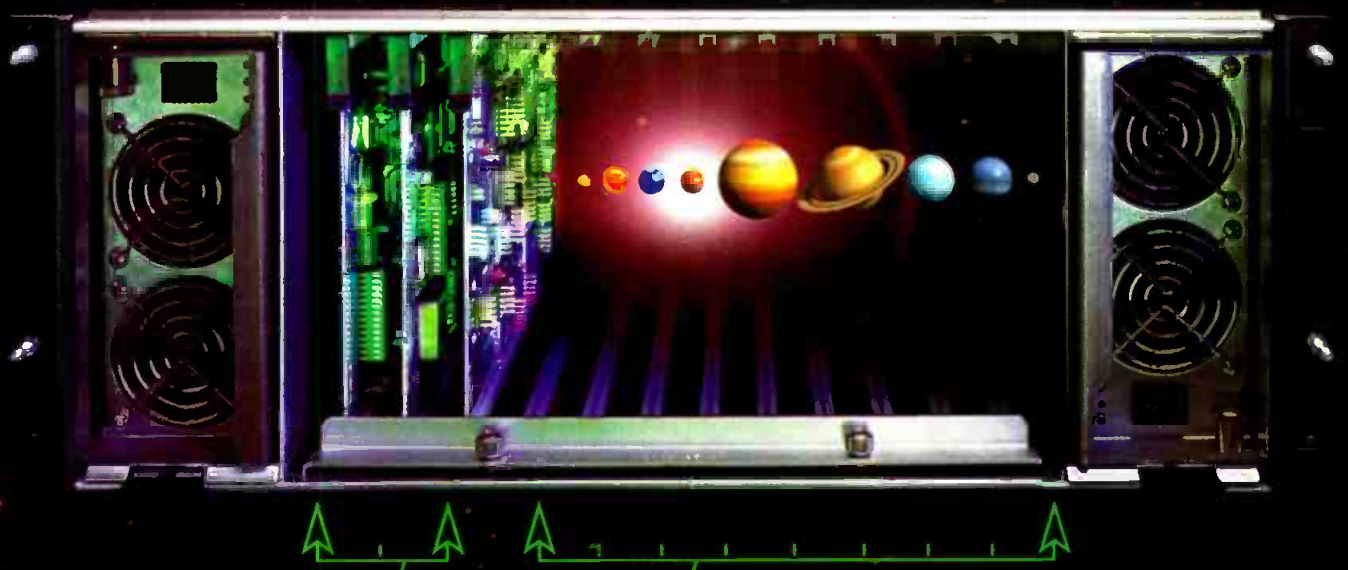
Send comments to:
direct: brad_dick@compuserve.com
website: www.broadcastengineering.com

Introducing

Next Generation Upconversion

AQUILA

When Our Space Meets Your Space...



AQUILA

More than you'd expect from a DTV/HDTV Upconverter. For a lot less than you'd expect !

AQUILA

Next-generation 3D-adaptive interpolation technology - Conceived in the Stellar Series frame - For a universe of possibilities...

THE STELLAR SERIES FRAME

A highly modular, 4RU housing frame built to accommodate multiple Aquilas (up to 4 Aquilas in 1 frame)

AQUILA

- Up to 4 Aquila Upconverters in one Stellar Series frame
- Standards: 480p/720p 1035i/1080i/1080p
- 4 :2 :2 (601) and/or NTSC inputs
- HD serial digital and/or component analog output
- Advanced adaptive 3D interpolation
- Full cropping, zoom and aspect ratio control
- Full power supply redundancy
- Modular architecture provides maximum flexibility and expandability

www.miranda.com

1-800-224-7882

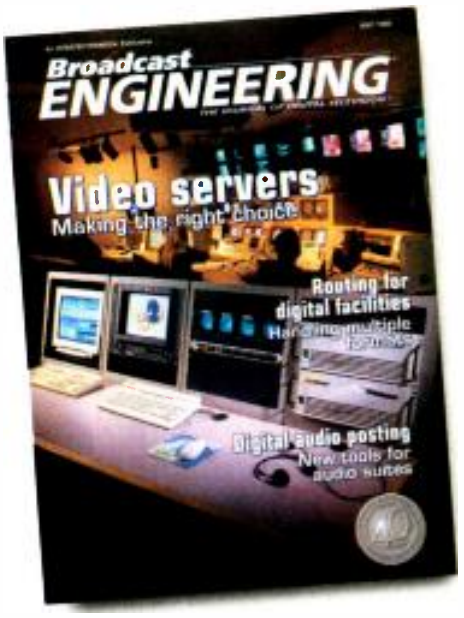
Tel. 514.333.1772
Fax. 514.333.9828
Saint-Laurent,(Qc)
Canada

Miranda

Miranda Technologies inc.

Circle (116) on Free Info Card

Reader Feedback



Another consumer digital format

In the May news column, Larry Bloomfield indicated that both Sony and JVC are working on 15Gb disc systems. I assume these will be competitive with TiVo and Replay.

This trend to home "mass storage" devices is of particular interest to me, since I have been pioneering for 18 years a method of indexed-video electronic publishing. It is based on downloading or "timeshift delivery" of indexed material to any read/write video platform. The content can then be read out like electronic microfilm. *Quickscan* is patented and has been licensed by Dow Jones and Rupert Murdoch, but it has not yet been put into commercial use.

The bottom line is that while TiVo and the like are designed to capture and manage the garden-variety TV jungle, it is possible to easily create dedicated indexed-video services, which can bring Internet-type content (reformatted) to the millions of VCRs in place worldwide with a limited degree of interactivity and high interactivity to disc recorders. For more information, go to www.quickscan.org.

GEORGE VAN VALKENBURG
TIMESHIFT VIDEO SERVICES LTD.

I'm tired of low pay

Dear Editor:

I'm chief engineer of a (location withheld) TV station. For what will become obvious reasons, I request you do not publish my name.

One of the things that bothers me the most about being a broadcast engineer is the pay (actually, the lack of it). Trying to get a raise out of some managers is like pulling teeth. It is almost impossible. I can't understand why a company who would offer so many incentives to "come on board" won't (later) give raises. I don't want to be like some I know who look around one day to discover they're making just about the same thing they were hired at 10 or 20 years ago. I keep up with wages. I've changed jobs a lot, but I shouldn't have to.

I've noticed a new breed of mostly young, upwardly mobile techs that change jobs very often. But watch out if you want to settle into a community, buy a home and build a life. We live in times where corporate broadcasting will take full advantage of your comfort.

There's an old joke about the guy who wanted a raise, so he quit. He walked out the back door, got in his car and drove around the block to the station's front door. Going back into the station, he asked to be hired in the vacant engineer's position, whereupon he was rehired at a much higher rate. I know of others in station departments who swap jobs every three to four years, for this very reason.

It reminds me of the farmer and his mule. When asked if he was working a mule too hard, the farmer replied, "He's just a mule, besides $2 buys me another one any day of the week!"

I've heard there are a few good jobs out there. Unfortunately, they are less seen and more talked about than Bigfoot, or the Loch Ness monster.

I don't know what the answer is, but I know this industry has too many lawyers, bean counters and stupid managers. Perhaps contract engineers will be the wave of the future. I know that's going to be my next gig.

Thanks BE, I feel better already. ...

NAME WITHHELD ON REQUEST

This month's T-shirt winners:

Tom Alderson
G. Yanulis
Mike Gianutsos, Texolve Inc.
John Tonti, Express TeleVideo
Carlton Davis, Johnson-Davis Broadcasting

Have you won your *Broadcast Engineering* T-shirt? See page 8 for this month's Freezeframe question. Correct entries receive a "digital" *Broadcast Engineering* T-shirt.

I M P L E M E N T I N G

[AJ-D910WA 2/3" DVCPRO 50]

SHOOT DVCPRO TODAY

[AJ-D810A 2/3" DVCPRO]

[AJ-D215 1/3" DVCPRO]

[AJ-D400 1/2" DVCPRO]

[AJ-PD900WA 2/3" PROGRESSIVE]

[AJ-D900WA 2/3" DVCPRO 50]

[AJ-D700A 1/2" DVCPRO]

DVCPRO DVCPRO50 DVCPROP DVCPROHD

Our encoders have the one feature you've been waiting for. A future.

*Self-contained UniCoders are factory upgradeable. ©1999 Harris Corporation.

And now, your DTV future holds even more flexibility. Introducing Harris' expanded family of ATSC MPEG-2 encoding systems--the 2-rack unit UniCoder SD and UniCoder HD, and the 5-rack unit FlexiCoder VS5--all joining the original, top-capacity FlexiCoder VS21. These encoding solutions are available in 24 configurations--from basic, single-channel standard definition or high definition encoding to fully redundant, multi-channel HD encoding. And their flexible, modular designs allow for easy plug-in upgrades and expansions*. We're also introducing next-generation software for our entire encoder line, with video-enhancing HD Compression Management, SD Statistical Management, Closed Caption and PSIP solutions. The Harris encoding family. A future of flexibility.

next level solutions

WIRELESS

BROADCAST

COMMUNICATIONS
PRODUCTS

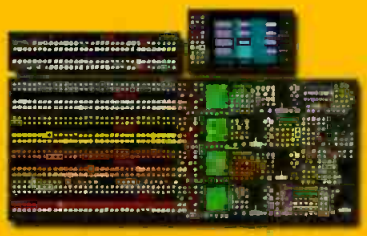
HARRIS
Communications

1-800-4-HARRIS ext. 3083 ▪ www.harris.com/communications

Circle (104) on Free Info Card

INTRODUCING *Kalypso*™ VIDEO PRODUCTION CENTER.

SHATTERING THE LIMITS OF LIVE PRODUCTION WITH THE PUSH OF A BUTTON.



Kalypso Video Production Center

Breaking out of the confines of a traditional switcher, Grass Valley's Kalypso Video Production Center will put more power and capabilities at your fingertips. With Kalypso, the world's most advanced multi-client live production system, you can create two independent parallel program streams for two different clients. You can maximize your production potential with the power of 8 M/Es in a 4 M/E system. For more information about how Kalypso can free you from boundaries so you can stretch your own, visit our website at www.tektronix.com or call 1-800-835-8433, x9946.

Grass Valley

Premiering at IBC Stand #8.132

Circle (117) on Free Info Card

News

Residents pose challenge to Denver broadcasters' towers

BY LARRY BLOOMFIELD

In addition to the technical and financial challenges of meeting the DTV deadline, many broadcasters face the additional obstacle of overcoming public opposition to the most visible link of the transmission chain: towers. In one market, a group of broadcasters is finding that public opposition may be the biggest hurdle in meeting its DTV deadline.

The group, known as the Lake Cedar Group (LCG), consists of Denver's KCNC-TV (CBS), KRMA-TV (PBS), KMGH (ABC), KUSA-TV (NBC) and KTVD-TV. All four of the stations placed their broadcast towers on Lookout Mountain during the early 1950s, when the underlying land was not zoned. Two other stations, KWGN and KDVR are also located on Lookout but are zoned differently and decided not to join the LCG. The site was chosen and developed as the location for the metro antenna farm because it offered a nearby, unobstructed location from which to cover the Denver metro area.

Denver, the 18th largest U.S. television market, is in the midst of the second wave of migration to digital television. In its attempts to comply with the FCC schedule and placate the desires of Jefferson County residents, the coalition hopes to ultimately consolidate the antennas to one tower and minimize the visual impact on Lookout Mountain.

Seven Denver television stations have their broadcast towers and antennas located at nearby Lookout Mountain. A coalition of five stations faces opposition to its plan to build a single DTV tower and remove existing NTSC towers. Photo provided by Virtual Topics Inc.

Despite efforts to consolidate new digital antennas onto a single tower structure and eliminate the older NTSC towers, Denver broadcasters continue to face staunch opposition for nearby residents and a recalcitrant county government that is unwilling to approve LCG's plans.

The conflict between broadcasters and area residents has been building for years. The mountain was zoned residential in the early to mid 1960s, long after the television stations had been in place. The broadcast owners did not attempt to have their land zoned specifically for the purpose it was being used for: broadcast transmission. Since there

FRAME GRAB

A look at the issues driving today's technology

TV stations repurpose on web

Simulcasting gets TV stations on the net.

Total TV affiliate stations	840
TV affiliates with web sites	318
Percent affiliates hosting some form of on-demand video	37.9%
Percent (of those sites) providing simulcast or on-demand video	67%
Percent (of those sites) providing only links back to network	33%
Overall percent of TV affiliates with simulcasts	25.5%
Overall percent of TV affiliates providing links to networks	12.5%

SOURCE: Digital Broadcasts & Programming/Web Cast Track www.dbpwebasttrack.com

Cover all the bases with Portable One Dual Domain

Interface

Digital Analog

Today's audio testing requires a comprehensive audio analyzer. A hand-held jitter meter or audio monitor just won't do. Whether you're facing a new high performance a/d converter, multimedia audio, a transition to digital broadcasting, or just another routine week of maintaining a mixture of digital and analog equipment, you'll need to make three types of measurements: digital audio, digital interface, and analog audio. The Portable One Dual Domain does all three.

Digital Audio–
Generate signals and measure:

- Level & Ratio
- THD + N
- Frequency
- Phase
- Noise & Amplitude
- Crosstalk
- IMD

Digital Interface–
Measure key interface parameters, including:

- Jitter–in UI or nanoseconds
- Sample rate
- AES signal voltage
- Frame delay
- Delay relative to house sync

Flexible digital interface testing is vital for troubleshooting and verifying performance of digital audio at the systems level. Portable One Dual Domain impairment signals allow simulation of real world transmission and interface problems.

Analog Audio–
Generate signals and measure:

- Level & ratio
- THD + N
- Frequency
- Phase
- Noise & Amplitude
- Wow & Flutter
- Crosstalk
- IMD

Plus:

- Save 30 test setups internally in non-volatile memory.
- True Dual Domain instrument with independent analog & digital generators and analyzers.
- Monitor - Listen to all measurements in the digital and analog domains over the internal loudspeaker or a pair of headphones.
- Pass Mode - Sends input to output while modifying status bytes, validity bit, etc. A lifesaver for diagnosing equipment incompatibilities.
- Rugged purpose-built case protects the instrument.

Lease Plan Available

Audio precision

PO Box 2209
Beaverton, Oregon 97075-2209
Tel: (503) 627-0832, Fax: (503) 641-8906
US Toll Free: 1-800-231-7350
Web Site: www.audioprecision.com

Circle (105) on Free Info Card

Cover your bases by requesting an immediate demo of the Portable One Dual Domain from one of our worldwide force of Audio Precision representatives.

INTERNATIONAL DISTRIBUTORS: **Australia:** VICOM Australia Pty. Ltd., Tel: 3 9563 7844; **Austria:** ELSINCO GmbH, Tel: (1) 815 04 00; **Belgium:** Heynen NV, Tel: 11 60 09 09; **Brazil:** INTERWAVE LTDA., Tel: (21) 494-2155; **Bulgaria:** ELSINCO Rep. Office Sofia, Tel: (2) 958 12 45; **Canada:** GERRAUDIO Distribution, Tel: (613) 342-6999; **China, Hong Kong:** A C E (Int'l) Co. Ltd., Tel: 2424-0387; S & V Instruments Co. Ltd. Tel: 2833 9987; **Croatia:** ELSINCO Rep. Office Zagreb, Tel: 1 615 34 50; **Czech Republic:** ELSINCO Praha spol. s r.o., Tel: (2) 49 66 89; **Denmark:** npn Elektronik aps, Tel: 86 5? 15 11; **Finland:** Genelec OY, Tel: 17 813 311; **France:** ETS Mesureur, Tel: (1) 45 83 66 41; **Germany:** RTW GmbH & Co. KG., Tel: 221 70913-0; **Greece:** KEM Electronics Ltd., Tel: 1 6748514/5; **Hungary:** ELSINCO Budapest KFT, Tel: (1) 339 0000; **India:** Comcon Industries, Tel: 11-6311606; **Israel:** Dan-El Technologies, Ltd., Tel: 3-647 8770; **Italy:** Audio Link s r.l., Tel: 521 648723; **Japan:** TOYO Corporation, Tel: 3 (5688) 6800; **Korea:** B&P International Co., Ltd., Tel: 2 546-1457; **Malaysia:** Test Measurement & Engineering Sdn. (Selangor), Tel: 3 734 1017; Test Measurement & Engineering Sdn. (Penang), Tel: 4 6422088; **Netherlands:** Heynen B.V., Tel: 485 55 09 09; **New Zealand:** Audio & Video Wholesalers, Tel: 9 279 7206; **Norway:** Lydconsult, Tel: 47-69-178050; **Poland:** ELSINCO Polska sp. z o.o., Tel: (22) 39 69 79; **Portugal:** Acutron Electroacustica Lda., Tel: 1 940 1785; **Singapore:** TME Systems Pte Ltd., Tel: 747-7234; **Slovakia:** ELSINCO Slovensko s.r.o., Tel: (7) 784 165; **Slovenia:** ELSINCO d.o.o., (61) 133 62 79; **South Africa:** SOUNDFUSION MFG., Tel: 11 477-1315; **Spain:** Alava Ingenieros., Tel: 91 567 97 00; **Sweden:** TTS Tal & Ton Studioteknik AB, Tel: 31 52 51 50; **Switzerland:** Dr. W.A. Gunther Audio Systems AG, Tel: 1 910 45 45; **Taiwan, R.O.C.:** Double Advance Tech., Tel: 2 2596 0696; **Thailand:** Massworld Company Ltd., Tel: 2-294-4930; **United Kingdom:** Thurlby Thandar Instruments, Ltd., Tel: (1480) 412451

(09-04-98)cs

didn't appear to be any real issues at that time, broadcasters, were allowed to continue their broadcast operations.

As time passed, other transmission facilities, including later TV allocations, FM broadcast, two-way radio base stations and repeaters, microwave relays and telephone services, also began to take advantage of the site as demand for frequency use and broadcast services to the metro Denver area increased.

Concurrently, the Lookout Mountain area became popular as a place to live. From the late 1970s on, homes began to spring up. As the broadcast population on Lookout Mountain began to grow, it became necessary for the new broadcast facilities to apply for conditional use permits.

By the late 1980s, citizens began to lobby the Jefferson County government to remove the communications towers, in particular the tall TV transmission towers. Jefferson County even proposed a zoning ordinance that would require the removal of the towers when they had been depreciated for Federal tax purposes.

That proposal was defeated by a coalition of the broadcasters, but in the early 1990s Jefferson County did pass a nonconforming use ordinance specifically directed at the taller broadcast towers, as opposed to other shorter (under 200 feet) towers used for two-way cellular, etc. The ordinance permits the continued use of a facility as it was being used at the time of enactment but precludes any expansion. It states that no antennas can be added, but antennas can be replaced on a one-for-one basis if the replacement antenna carries the same service. In addition to this, the ordinance does not permit any tower strengthening.

DTV forced broadcasters to formulate plans to create a facility that would address their future needs while incorporating the county's desire to consolidate. A general outline was submitted to the Jefferson County Commission in early February 1997. The plan was for Denver broadcasters to form a joint venture to create a consolidated DTV tower/facility. The original plan included the removal of several older existing towers after 2006 or when analog broadcasts were terminated. The final plan, as presented, would have removed two of the four NTSC facilities immediately by relocating the analog transmission of KCNC and KRMA to the proposed facility and included space for all of the FM stations presently located on Lookout.

The plan included the use of the combined land holdings of the broadcasters (approximately 80 acres) and the acquisition of other parcels, where possible, for the facility and to create a greenbelt buffer around it. In an earlier vote, the Jefferson County Planning Commission voted 6-1 in favor of the project.

The current controversy revolves around opposition to an application filed by LCG to the Jefferson County planning commission to rezone the area for communications and to approve its antenna and tower consolidation plan.

In an all-or-nothing effort, a neighborhood opposition group called CARE (Canyon Area Residents for the Environment) launched a public campaign to remove the broadcast towers. With a NIMBY (not in my backyard) approach, CARE contended the standards for RFR are incomplete and too liberal. The group argued that since the FM stations on Lookout were above the accepted levels that the TV stations should pay the penalty.

CARE's opposition to the LCG proposal has been based on the supposed threat of an increase in RF, although it would continue to be well below the safety standards included in both the FCC requirements, and Jefferson County ordinance. CARE challenged the RF standards and wanted them reduced by factors of hundreds to levels that would have precluded any broadcast.

To educate any of the misinformed residents and address unfounded issues, LCG further proposed to include directional antennas in order to prevent transmission in the direction of local homes and a school on Lookout Mountain.

In a reprise vote by Jefferson County in late July, the matter was turned around in a 3-1 vote to deny the tower. The county said that LCG had not performed due diligence in finding other sites and that its plans were not complete. ■

CEMA proposes new digital broadcast service

The Consumer Electronic Manufacturers Association unveiled its proposal for a new mobile broadcast service to be placed on UHF channels 60-62 and 65-67.

CEMA states its Mobile Multimedia Broadcast Service would provide 5.1 channel audio, weather and navigation data, Internet and data services over 70 channels at up to 384kb/s per channel.

Added to this is what CEMA calls "important high-capacity data services, with seamless, robust and interference-proof reception in the mobile environment also transmitted in spectrum efficient multiplexed 'ensemble' service."

CEMA President Gary Shapiro touts the proposed service as a boon for broadcasters and equipment manufacturers.

"This is an exciting and historic opportunity for the commission, for mass media entities, for receiver and transmitter equipment manufacturers and for the American public," Shapiro said.

In its filing to the FCC, CEMA states MMBS "will present 'scalable' reception opportunities to consumers whereby their costs/value assessments determine whether they purchase equipment capable of receiving the full complement of 5.1 channel audio, at CD+ quality, and a host of data features and services, or (at another extreme) simply monophonic reduced-quality audio reception or simple data services."

CEMA describes the implementation of its MMBS in this 36MHz by designating it exclusively for MMBS by creating and empowering an advisory committee to evaluate, assess, integrate and to structure the system.

CEMA has strongly supported the 8VSB-modulation scheme for DTV. However, the organization touts COFDM as the superior choice for its mobile services.

"CEMA recognizes that the mobile reception environment is one of the most demanding technical challenges to overcome. Past studies have demonstrated the advantages of coded orthogonal frequency division multiplex (COFDM) modulation to overcome difficult mobile multipath reception

Introducing An Innovative HDTV Studio Lens At A Breakthrough Price.

Our New XJ25 Is Big On Specs And Performance, Not On Price.

Canon's XJ25X6.8BIE-D is a remarkable lens that combines Canon's industry-standard HDTV quality with our breakthrough IFxs technology, to produce a lens that features enhanced specs, smaller size and a lower price than any HDTV lens on the market today.

Its affordable price allows you to purchase HDTV optics today even if you are still using conventional NTSC cameras and continue to use these optics in the future when you upgrade to HDTV.

Featuring the shortest MOD in its class (0.6m) and a wide range of focal length (6.8~170mm), the XJ25 incorporates Canon's exclusive Digital Zoom and Focus Servo system with 13 bit repeatability, as well as Digital Servo Controls to provide the precise focus control required by HD systems (since the depth of field is almost half that of NTSC).

Canon's XJ25 features a Crossover option which maximizes operation on switchable cameras.

For more info: Call 1-800-321-4388

(In Canada: 905-795-2012)

http://www.usa.canon.com

Maximize Your Camera's Performance.

Canon

Circle (106) on Free Info Card

environments successfully," CEMA states in its filing.

"Further, if the data rate available in MMBS can be flexibly distributed over different program/data channels (with the use of the COFDM ensemble structure), the data capacity can be dynamically changed depending on the service offerings and requirements."

It's no surprise how Sinclair Broadcasting views CEMA's selection of COFDM. Mark Aitken of the Sinclair's New Technology Group said, "Perhaps CEMA has decided that HDTV and 8VSB will not produce the quick revenue that they had hoped for years ago. So, to save face they now propose a new service that will leave today's broadcasters swinging in the wind but will create a new consumer product line for their members."

If CEMA is successful with its MMBS project it could hobble today's broadcasters by sapping advertising revenue away to a new service. Such data services might be equally well transmitted by DTV that could be provided by today's broadcaster.

The organization hopes to measure support for the proposed service and set service and technical parameters in a meeting in Washington D.C.

For more information, visit CEMA's website at www.cemacity.org.

"Perhaps CEMA has decided that HDTV and 8VSB will not produce the quick revenue that they had hoped for years ago." — Mark Aitken, Sinclair Broadcasting

FCC revises local ownership rules

The FCC relaxed its local TV ownership rules to allow broadcasters to own more than one station in a market if it meets the requirements designed to protect the number of individual media outlets.

Until the action (Report and Order — FCC 99-209) was signed into law by the Commission, broadcasters have been barred from owning more than one TV station in the same area.

Under the new regulations, TV stations in larger markets are free to merge if the markets meet "minimum voice floors," or the minimum number of independent commercial and non-commercial radio and television stations, cable providers and newspapers.

It remains to be seen how these new rules will play in situations such as that which exists with Gannett Broadcasting's Channel 11 in San Jose and its recently acquired TV station Channel 20 only 60 miles away in San Francisco. The new rules will allow two stations in

Liquid Assets

Do you know you may be sitting on a gold mine?

Bowser material viewing screen

Those thousands of hours of video material now in storage could be worth a lot of money. Odetics Broadcast has a solution to help you uncover the value of your video library - *the Bowser™ Visual Asset Manager.* The premier tool for tracking and mining your video assets, the Bowser Visual Asset Manager provides cataloging and content retrieval from the convenience of your desktop workstation. To learn how to convert your video assets into cash, contact Odetics Broadcast today.

Odetics Broadcast

Content Management Solutions

The Americas (714) 774-2200
Europe +44 (0) 118 927-4600
Asia Pacific +65 324-0636

Email: broadcast-sales@odetics.com
Web: www.odetics.com/broadcast/

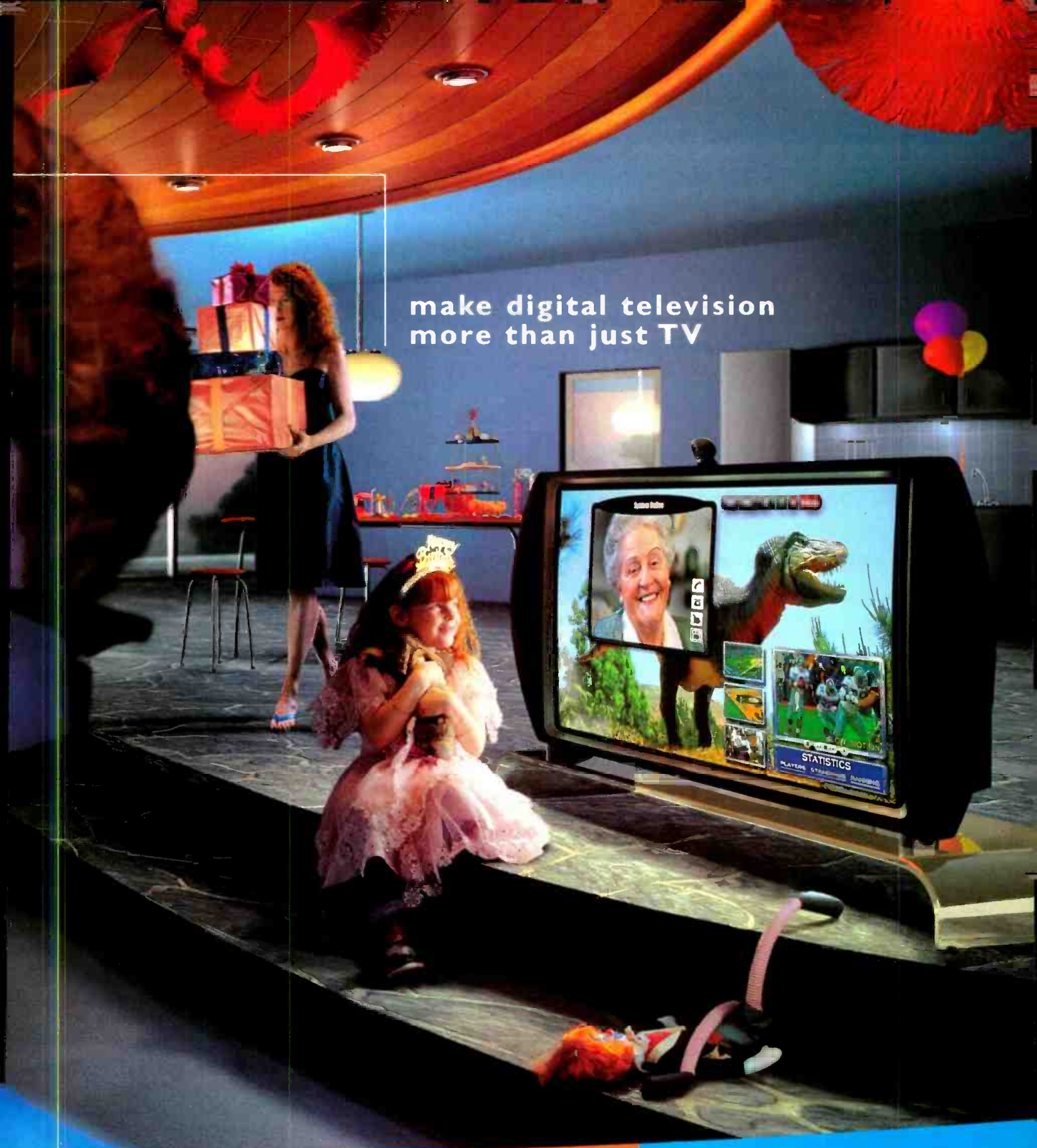
Let's...

Look into ATSC DTV and you see a world of possibilities, from high definition video and surround sound to new information and interactive services. So do we.

At Philips Semiconductors we're ready with the TriMedia™ processor, a new generation of VLIW chips that brings it all to the living room. Use the TriMedia reference design and software to build an ATSC television, set top box or PC DTV card that handles all 18 ATSC video formats plus multi-channel audio.

C/C++ Programmability means that a TriMedia-based product can be upgraded with new software to support new and evolving services. A TriMedia processor can also support

* Presented at NAB, 1998



a TV Web browser, reverse communications channel, video email, JAVA and VRML applications - even software to improve NTSC video. So visit Philips Semiconductors at www.trimedia.philips.com for your copy of "A Programmable architecture for Digital television"*.

USA tel. +1-800-914-9239 ext. 1480. E-mail: trimedia@harte-hanks.com

Circle (109) on Free Info Card

PHILIPS

Let's make things better.

separate designated areas to merge, no matter how close the markets are together .

The new ownership rules also establish waivers for failing stations, failed stations and unbuilt stations. Under the waivers, stations can purchase stations that have been off the air for more than four months or financially struggling stations that have low audience share.

The FCC wants to get unbuilt stations on the air and the new rules will permit waivers allowing mergers that result in bringing these unbuilt stations to air. The FCC will even grant waivers if one of the merging stations had gone dark or is in danger of going dark.

There are approximately 70 TV local marketing agreements that were entered into before Nov. 5, 1996, the day the FCC had originally proposed to crack down on LMA's. The FCC will grant them a five-year grace period. Those 10 or so operators that entered into an LMA after that date will have a two-year grace during which they will have to either divest or otherwise come into compliance with the new laws.

The FCC has also revised its broadcast and cable/MDS ownership attribution rules. The attribution rules define what constitutes a "cognizable interest" for purposes of applying the ownership rules. A Report and Order (FCC 99-207) recently adopted improves the precision of the attribution rules and makes them more clear to financial markets. ■

Grass Valley Group purchases Tektronix's video division

A private investment group announced that it will purchase Tektronix's Video and Networking Division and run the new company under the Grass Valley Group name.

The new owners have formed what they are calling "a new, privately held digital broadcast and video equipment company, Grass Valley Group Inc." The acquisition is subject to normal governmental regulatory agency scrutiny.

Although the announcement was made in early August of this year, negotiations began nearly two months earlier. As part of the deal, Tektronix will retain a 10 percent equity interest in GVG. The transition is expected to close this month.

The major force behind the move to independence of the new Grass Valley Group is Terence Gooding, GVG's new chief executive officer. Gooding is an entrepreneurial industrialist who is no stranger to the electronics, test equipment and their related industries. Gooding, along with Tim Thorsteinson, president of the Tektronix Video and Networking Division (VND) and the new president and chief operating officer of the new GVG Inc., lead an investor group in the acquisition.

Terence Gooding, Grass Valley Group CEO

Gooding is currently co-chairman of the board of Wavetek Wandel Goltermann Inc., the second largest international communications test company. During the past 35 years, Gooding has successfully led five technology companies through product development and complementary acquisitions into growth markets. He has built two small companies to more than $1 billion in revenues.

GVG will maintain its compliment of approximately 700 employees worldwide with headquarters in Nevada City, CA. Other GVG centers of note are Beaverton, OR, and the new company's ongoing digital broadcast and video product software-development efforts that will to be supported by the Tektronix development center in Bangalore, India. In addition to this, GVG will maintain a presence in Europe, headquartering in London with sales and technical support in Paris and Cologne, Germany. The Asia/Pacific market will be supported from facilities in Tokyo and Hong Kong.

Thorsteinson said the new Grass Valley Group has the resources to serve a variety of emerging markets. As the transition to digital production and transmission takes hold, "We will remain vigilant to serve the needs of the industry as many operations transform themselves into media companies capable of delivering content to multiple digital pipelines ranging from the Internet to E-Cinema.

"The new GVG will hold fast to new technology such as Kalypso while we look forward to the recent alliances we have with such organizations as Avid, Accom and Ampex Data Systems," Thorsteinson said.

For more GVG information, see www.grassvalleygroup.com. ■

Harris acquires Pacific Research & Engineering

Harris Corp. and Pacific Research & Engineering announced that Harris will purchase the audio console manufacturer in a cash tender offer that values PR&E at $9.5 million.

The boards of directors of each company have unanimously approved the transaction. The transaction is contingent upon customary conditions, including the tender of at least 90 percent of PR&E's outstanding stock and normal governmental regulatory agency scrutiny. The deal is expected to close this month.

Jack Williams is Pacific Research & Engineering's founder, chief executive officer and chairman. Williams has been responsible for the design of many of the company's most well known products.

PR&E began in a spare bedroom in Williams' Southern California home back in 1969 when he was distributing Ampex tape recording equipment. Since then names like Newsmixer, BMX and Tomcat have become common names at many broadcast facilities. PR&E will continue to manufacture its broadcast studio products and provide turnkey studio design/integration services to the worldwide broadcasting industry with the added resources of Harris Corporation.

"We're excited about the acquisition which brings two quality organizations together. Starting this business and growing with it has been a tremendous experience personally," Williams said, "and

mikroport®

3000 Series PROFESSIONAL RF WIRELESS AUDIO SYSTEMS

Designed for the working professional, Sennheiser's 3000 Series UHF RF wireless systems offer rugged reliability for the most demanding applications. National touring acts, broadcasters and rental houses have all come to recognize Sennheiser wireless systems as the most dependable in the world. True-diversity operation means unsurpassed audio quality and interference-free operation, and with its wide variety of configurations, including a superior in-ear wireless monitoring system, the 3000 Series is the best way there is to get professional wireless quality.

Will YOUR Wireless Mics Still Work When DTV Hits?

When DTV begins broadcast (late '98), the RF spectrum will become much more congested. Consequently, many wireless systems will be rendered obsolete. NOT SENNHEISER! We offer the widest selection of frequency ranges, so we can easily retune your Sennheiser system over a large portion of the spectrum. Only Sennheiser provides this flexibility in its RF circuit architecture. For questions, or your FREE DTV Compatibility chart, just give us a call. TOLL FREE at:

1-877-SENNHEISER

Get the full story at our web site: http://www.sennheiserusa.com

Sennheiser Electronic Corporation, 1 Enterprise Dr ve, PO Box 987, Old Lyme, CT 06371
Telephone: 860-434-9190 • Fax: 860-434-1759 • TTY: 860-434-0509
Sennheiser Mexico: Av. Xola 613, PH6, Col. Del Valle 03100, Mexico, DF. Telephone: (525) 639-0956. Fax: (525) 639-9482
Sennheiser Canada: 221 Labrosse Ave, Pte-Claire, PQ H9R 1A3. Telephone: 514-426-3013. Fax: 514-426-3953
Manufacturing Plant: Am Labor 1, 30900 Wedemark, Germany

SENNHEISER® defining sound

Circle (118) on Free Info Card

through out our history we have maintained a certain set of values and responsibilities to our clients, and we're very please to be going with Harris Corp., which shares these values."

"The bringing together of these two organizations will build on our complementary strength in serving our industry," PR&E President Don Naab said.

Williams and Nabb will continue with PR&E in yet-to-be-determined roles. ■

IBEW threatens strike over AT&T's treatment of cable workers

The International Brotherhood of Electrical Workers picketed AT&T facilities and the union has threatened to strike over its claims that AT&T has unfairly treated some of its cable system workers.

The AT&T purchase of TCI included Jones Intercable Systems, an earlier TCI acquisition that was completed before the AT&T deal. IBEW represents some 330 cable technicians that came along with the former Jones/TCI operation at several locations in Illinois through Locals 21 and 134.

When TCI acquired Jones, they recognized the collective bargaining agreements that were in place with IBEW, but the union contracts expired on June 15, 1999. To facilitate negotiations, the contracts were extended for a month and then on into early August.

The crux of the union case is that AT&T is trying to establish a three-tier work force, with cable employees being paid less and receiving reduced benefits compared with phone technicians who work for AT&T and are represented by the IBEW.

"At a time when the telecommunications industry enjoys unlimited opportunities, there is no reason for a large and successful company like AT&T to stonewall its own workers," IBEW International President John J. Barry said.

The union foresees cable technicians eventually doing much of the same work other AT&T technicians are doing as AT&T beefs up TCI's cable infrastructure to provide local phone service, along with high-speed Internet access, over cable lines.

AT&T spokesperson Mike Pruyn said AT&T is not trying to establish a different class of workers.

"We're hopeful that ABIS (AT&T Broadband and Internet Service) will be able to negotiate a fair and equitable new contract with the IBEW as soon as possible," Pruyn said.

ABIS promises to continue service to all its customers irrespective of the outcome of these rounds of negotiations. ■

Wink provides datacasting services to FOX, DirecTV

FOX broadcasting and DirecTV will begin providing interactive programming and other datacasting services with software and equipment from Wink Communications.

Wink's technology will permit FOX to enter the realm of interactive programming and advertising starting as early as this fall. The Wink software works locally or through a network

COME TO THE SOURCE OF MULTICHANNEL AUDIO.

Multichannel audio production and delivery is no mirage. Innovations like Dolby Surround and Dolby Digital deliver high-quality surround sound to consumers everywhere. Dolby E allows broadcast and post facilities to produce and deliver multichannel audio using today's infrastructure. Whether through film, video, DVD, DVD-ROM, broadcast TV, or the Internet, Dolby technologies and products provide the tools to create exciting surround sound...and that is no illusion. For more information on our products, visit our web site or call us for the dealer nearest you.

www.dolby.com/pro

Dolby

BREAKING SOUND BARRIERS

VISIT US AT AES / BOOTH 224 / SEPTEMBER 24-27, 1999 / NEW YORK

Dolby Laboratories Inc • 100 Potrero Avenue, San Francisco, CA 94103-4813 • Telephone 415-558-0200 • Fax 415-863-1373
Wootton Bassett, Wiltshire, SN4 8QJ, England • Telephone (44) 1793-842100 • Fax (44) 1793-842101 • www.dolby.com

Circle (120) on Free Info Card

with a variety of delivery methods and a special set-top box as well as with select TV sets currently being distributed through out the U.S.

"Wink affords FOX a unique opportunity to offer interactive enhancements for our most popular programming, and we look forward to improving the entertainment experience for our viewers," said Larry Jacobson, executive vice president of the FOX Television Network. "We are also tremendously interested in the e-commerce capabilities Wink provides both the network and its advertisers, as we expect to pursue those opportunities aggressively."

Wink's software allows its Internet content to be broadcast with existing programs and commercial material, in either analog or digital. The system requires no network infrastructure upgrades and is a free service to the viewer. The software can be integrated into local broadcast operations as well to enhance and supplement the network's various campaigns.

FOX will begin by applying Wink's TV-based e-commerce capabilities to 30-second interactive advertisements through use of interactive overlays that will provide additional information in the form of small text and graphics.

Wink's technology will permit FOX to enter the realm of interactive programming and advertising.

Maggie Wilderotter, president and chief executive officer of Wink Communications said, "We are thrilled that FOX will be creating and airing Wink-enhanced programming and advertising. FOX's exciting programming and creative leadership hold great promise for compelling interactive enhancements, and present great opportunities for advertisers interested in leveraging a large and committed audience toward electronic commerce on television."

Wink enhanced broadcasting has been available in Japan since October 1996 and in the United States since June 1998 where it is currently available to viewers in five states.

In January, DirecTV announced that it would offer Wink Enhanced Broadcasting to its customers and expects to have Wink's interactive technology installed in at least four million of its system's receivers by the end of 2001.

Thomson Consumer Electronics and Hughes Network Systems (HNS) have signed license agreements with Wink Communications to manufacture Wink-enabled DirecTV systems. DirecTV expects to provide Wink-enabled services on RCA DirecTV System receivers developed by Thomson and HNS beginning in the first half of 2000. The companies will be collaborating with licensed manufacturers of DirecTV receivers to accelerate the transition to Wink-enabled models. ■

Send questions and comments to:
larry_bloomfield@intertec.com

VHF-HB

UHF

VHF-LB

FM

L-Band

14,000 *transmitters*

Microwave

Solid State

110 *countries*

IOT

8VSB

1 *company*

DAB

MMDS

Tetrode

DVB

DTV

all to schedule a visit to our factory in Denver

call us at (303) 464-8000 or visit our web site at www.itelco-usa.com/be

itelco®

Circle (121) on Free Info Card

improved upon with closer coordination with the broadcasters include better communications with the viewer (signal level, configuration, setup), and standards for channel and sub-channel indicators, input and output signals and connectors and ability to drive a NTSC receiver or monitor. Yes, there are standards for the coding but not for the user's convenience.

It should be no more difficult to tune between over-the-air broadcast stations than it is for cable or satellite channels. Close coordination between sender and receiver make that possible and simpler for the viewer.

Compliance with allocations planning factors, the other need for DTV receiver testing, can only be determined in the laboratory.

The new DTV service requires that 1600 new allocations be implemented in already crowded TV bands. In order for the FCC DTV allocation plan to work it is essential that DTV receivers meet the planning factors for sensitivity (noise figure), and for co-channel, adjacent channel and taboo channels (DTV and NTSC).

Viewers with receivers that have less than satisfactory performance may experience problems with reception. This will delay the transition to DTV that offers viewers spectacular high definition pictures and sensational quality sound. ■

VENDOR

Linc Reed-Nickerson is president of Broadcast Technology LTD, Inc.

Less than two years ago I was helping a major TV set manufacturer test its first ATSC receiver. The signal source was the local PBS station, and we had far more questions than answers. After two days of determining why things wouldn't work, we were making pictures. Now, I used the term receiver, but what the invited guests didn't see was all the breadboard equipment hidden under the table. A few months later, with a couple of exceptions, those that had DTV receivers at the Consumer Electronics Show in January 1998 had their hardware hidden under the table as well. That is, if they had a DTV receiver at all.

It reminds me of the space program; we started with Alan Shepherd's suborbital flight, and a few years later had a man on the moon.

It reminds me of the space program; we started with Alan Shepherd's suborbital flight, and a few years later had

Born to Broadcast ...

and On Air Around the World.

Aysis air

"WRC is in the final stages of its digital rebuild project. When it came time to choose between an analog or digital audio console, the decision was made to go with Aysis Air. It was important to have a multi-input board which takes advantage of layering to present a more efficient, compact, operating desk to the audio engineers. Because the console is used for multiple productions, the file recall setup attribute became an important feature to help to ensure consistency in our product."

Jerry Agresti, Director of Engineering
NBC 4, WRC TV, Washington, DC

Solid State Logic

International Headquarters
Begbroke Oxford OX5 1RU England
Tel: +44 (0)1865 842300
Fax: +44 (0)1865 842118
Email: sales@solid-state-logic.com
http://www.solid-state-logic.com

New York	Los Angeles	Tokyo	Paris	Milan	Toronto	Singapore
+1 (1)212 315 1111	+1 (1)323 463 4444	+81 (0)3 5474 1144	+33 (0)1 3460 4666	Tel +39 02 2622 4956	+1 (1)416 431 9131	+65 (0)438 2272

Circle (112) on Free Info Card

a man on the moon. While there were many glitches along the way, we achieved our goals while creating new technology.

Perhaps you might not consider an ATSC receiver rocket science, but the determination to overcome the problems with early receivers is just as intense. Today we have groups of "scientists" working to make the best ATSC receiver possible. Early in the process, a number of engineers published papers that suggested ways receiver performance could be improved with no change to the transmission standard. Clearly the adoption of the ATSC standard is an evolutionary process, much like the space program.

We need to remember that the FCC set receiver development back by months when suddenly we had to deal with the low-band VHF channels. If it were not for the superior performance of 8VSB in the presence of impulse noise and co-channel interference, use of these channels would not be possible.

The first indication I had that the TV set manufactures were on the right track was a call I received from one station engineer. He couldn't understand why his professional receiver and his 8VSB measurement set could neither decode nor quantify signal performance at his transmitter when an off-the-shelf receiver at a shopping mall 25 miles away was happily displaying pictures. We traced the problem to mistuned transmitter that was hovering at the theoretical signal-to-noise threshold for 8VSB.

There are still variations from manufacturer to manufacturer in TV set performance, and the second round of professional receivers are just now becoming available. The improvement in performance is nothing short of dramatic.

We need to go back to the locations where careful alignment of an outside antenna was required and indoor antennas wouldn't work at all, and retest with the receivers available today. We need to understand that continued improvements will occur and set prices will drop as volume sales start. Today we are all guilty of sending mixed and negative messages to the public by referring to testing that is clearly ancient history.

It is time for another round of receiver tests. We need fresh data to present to the public, to silence the naysayers, and to tell the world ATSC is a good and valid choice for digital television transmission. ■

Today we are all guilty of sending mixed and negative messages to the public by referring to testing that is clearly ancient history.

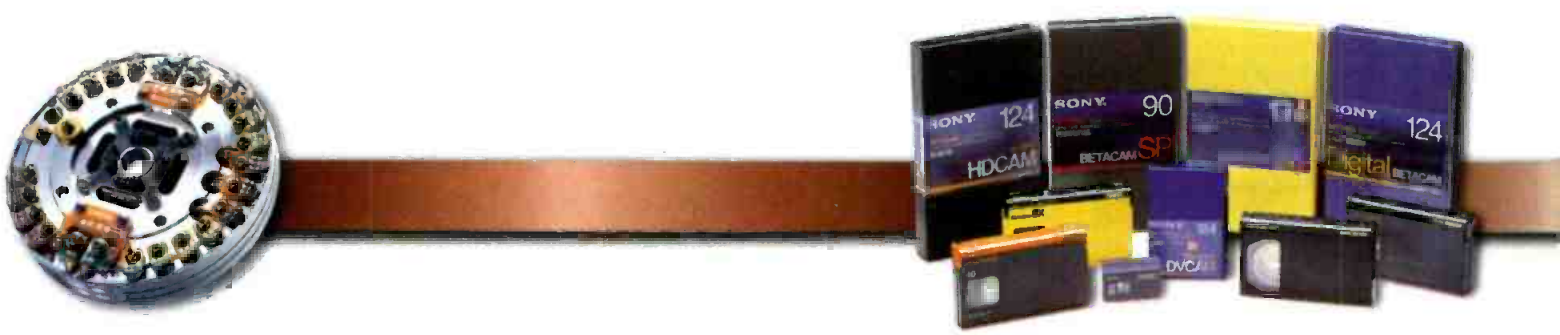
Photo provided by the NBA

You use your eyes to capture history. We use our heads to make better tape.

At Sony, we design our recording media and hardware together. The same engineers who develop the media also design the heads, integrating them into a total video solution. The result is performance you can count on.

Quite simply, Sony tape is more reliable, more consistent. You can trust Sony media to deliver greater durability, lower drop-outs, lower headwear, improved still frame accuracy and greater archival stability.

Sony's history in video technology is a history of industry leadership in format development from Betacam SP® to D2, Digital Betacam®, Betacam SX®, DVCAM and HDCAM® formats. Each of these was made possible by Sony's continual innovation in the development of metal particle and metal evaporated technology. And each is proof of the effectiveness of their shared development platform: co-engineered media and hardware.



Sony. Our media is your memory.™

SONY

Transition to Digital

MPEG audio compression

BY MICHAEL ROBIN

Consider an AES/EBU audio datastream with 20-bit resolution and a sampling frequency of 48kHz. The essential bit rate is equal to:

20 bits per sample x 48kHz = 960kb/s.

A stereo pair requires a bit rate of 1.92Mb/s.

Compared to a CCIR 601 datastream with a total bit rate of 270Mb/s and an essential bit rate of approximately 215Mb/s, the digital audio bit rate represents less the 1 percent of the video bit rate. Given the sensitivity of the ear to audio distortion this means that in many studio applications, audio need not be compressed at all. Even if the video signal were compressed by a factor of 2.3 (e.g. Digital Betacam) the uncompressed digital audio bit rate would still only represent approximately two percent of the compressed video bit rate. Audio compression is simply not necessary. If the video bit rate is compressed by a higher ratio such as 50, the audio and video bit rates become comparable and audio compression makes sense.

Audio compression concepts

The MPEG audio compression methods remove redundant digital audio data based on human psychoacoustic characteristics and their limitations. This system of audio coding is best described as a perceptual coder rather than a waveform coder. In a perceptual compression process, the codec (coder/decoder pair) does not attempt to recreate the input signal waveform. Its goal is to ensure that the re-created signal sounds natural to a human listener. The human auditory system (HAS) has certain characteristics that are exploited by audio compression systems. These are:

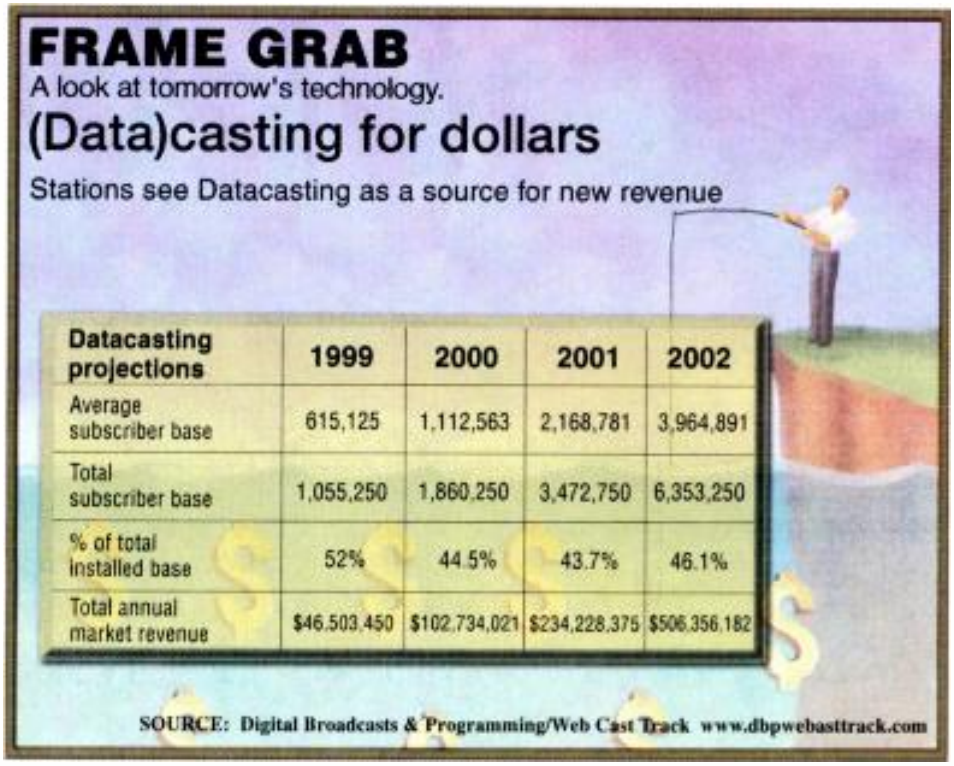
The human auditory system (HAS) has certain characteristics that are exploited by audio compression systems.

Spectral response: The HAS behaves like a spectrum analyzer. It separates the audible sound spectrum into 25 frequency bands called critical bands. The bandwidth of the critical bands is proportional to the center frequency and varies from 100Hz (below 500Hz) to 3500Hz (at 13500Hz).

Masking effects: The HAS suppresses some sounds in the presence of others, a process called auditory masking.

Frequency response: The sensitivity of the ear decreases at low and high frequencies and is dependent on the sound pressure level (SPL) being relatively flat (±10dB) at 120dB SPL.

As shown in Figure 1, temporal masking results in a delay in the perception of a sound (premasking) and a slow decay in its perception (post masking). While the sound is maintained, other sounds of lower amplitude are masked. As shown in Figure 2, the threshold of hearing is frequency dependent. The solid curve represents the HAS threshold of hearing. Sounds at various frequencies with SPL levels below this curve are inaudible. The dotted curve shows how a 5kHz sound raises the threshold of hearing and effectively masks lower amplitude sounds of neighboring frequencies. Simultaneous frequency domain masking results in the raising of the perception threshold of sounds with frequencies in the vicinity of a higher amplitude sound. In the presence of a complex audio spectrum, such as music, the threshold is raised at all frequencies. The beneficial effect is the masking of background noise during the reproduction of music. The



Datacasting projections	1999	2000	2001	2002
Average subscriber base	615,125	1,112,563	2,168,781	3,964,891
Total subscriber base	1,055,250	1,860,250	3,472,750	6,353,250
% of total installed base	52%	44.5%	43.7%	46.1%
Total annual market revenue	$46,503,450	$102,734,021	$234,228,375	$506,356,182

INTRODUCING THE

Omneon VIDEO AREA NETWORK™

ONCE AGAIN, YOU'LL GO PLACES YOU NEVER THOUGHT POSSIBLE.

Amazingly, a single notion created possibilities that were previously unimaginable. The Omneon VIDEO AREA NETWORK is destined to do the same for the evolving television industry. Reaching far beyond the content production and distribution capabilities of existing systems, the Omneon VIDEO AREA NETWORK supports a wide range of digital services from television to the Internet. In fact, the Omneon VIDEO AREA NETWORK is the only system offering it all -- integrated networking and storage, scalable architecture, data-type independence. Get ready to explore new possibilities.

www.Omneon.com

OMNEON VIDEONETWORKS

You're on.

Circle (123) on Free Info Card

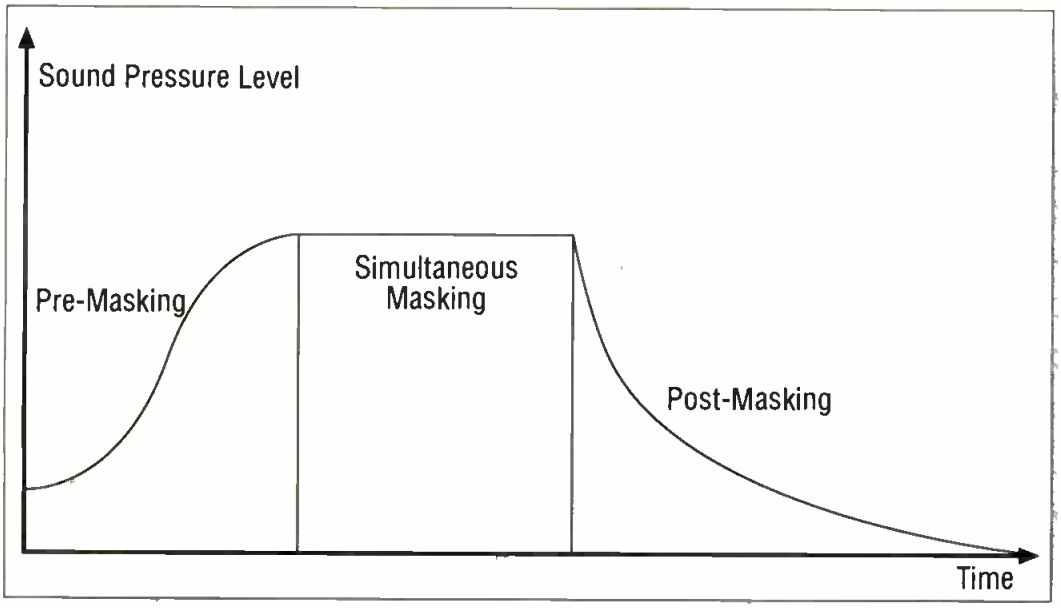


Figure 1. Temporal masking results in a delay in the perception of a sound (premasking) as well as a slow decay in the sound's perception (post masking). Simultaneous masking occurs between these two effects. Sounds of lower amplitudes are effectively masked throughout this time.

parts of the signal that are masked are referred to as irrelevant. The parts of the signal that are removed by a source encoder are referred to as redundant. To remove the irrelevancies in the audio signal the encoder contains a psychoacoustic model. It analyzes the input signal in consecutive time blocks and determines for each block, the spectral components of the input signal by applying a frequency transform.

MPEG audio compression

MPEG works in phases such as MPEG-1 and MPEG-2. In both, there are three distinct layers of sophistication of the audio compression, sometimes incorrectly referred to as levels. These layers represent a family of coding algorithms and are identified as Layer I, Layer II and Layer III. The complexity of the encoder and decoder, the encoder/decoder delay and the coding efficiency increase when going from Layer I to Layer II and to Layer III.

Layer I has the lowest complexity and is suitable for applications where the encoder complexity plays an important role. It requires a simple coder and therefore must use a higher bit rate or lower quality will result. In MPEG-1 the compressed data rates are between 32kb/s and 448kb/s.

Layer II requires a more complex encoder and a slightly more complex decoder. It is directed towards one-to-many applications (i.e. one encoder serves many types of decoders). It is designed to be the most appropriate layer for everyday purposes. Compared to Layer I, Layer II is able to remove more of the signal redundancy and apply the psychoacoustic threshold more efficiently. In MPEG-1, the compressed data rates are between 32kb/s and 384kb/s.

Layer III is more complex and is directed to the lower bit rate applications, as it has a better redundancy and irrelevancy extraction from the enhanced resolution of its filterbank. In MPEG-1, the compressed data rates are between 32kb/s and 320kb/s.

MPEG-1 supports three sampling frequencies: 32kHz, 44.1kHz and 48kHz and four modes of operation:

- Monophonic mode (single channel).
- Dual monophonic mode (e.g. dual language sound track).
- Stereo mode.
- Joint stereo mode (Only the lower input audio spectrum is transmitted separately; the upper half of the spectrum is transmitted as a joint signal).

Figure 3 shows a simplified block diagram of an MPEG encoder. In this encoder, a filter bank splits the input signal into 32 subbands in an essentially lossless and reversible manner similar to the HAS process. Bands in which there is little energy result in small signal amplitudes that can be transmitted with short word lengths. Thus each band results in variable length samples but the sum of all the sample word lengths is less than that of the input and so a coding gain can be obtained.

An FFT (fast Fourier transform) of the audio is used as the input to a masking threshold algorithm to determine what scale factor and quantizing level to use. A scaler boosts low amplitude signals

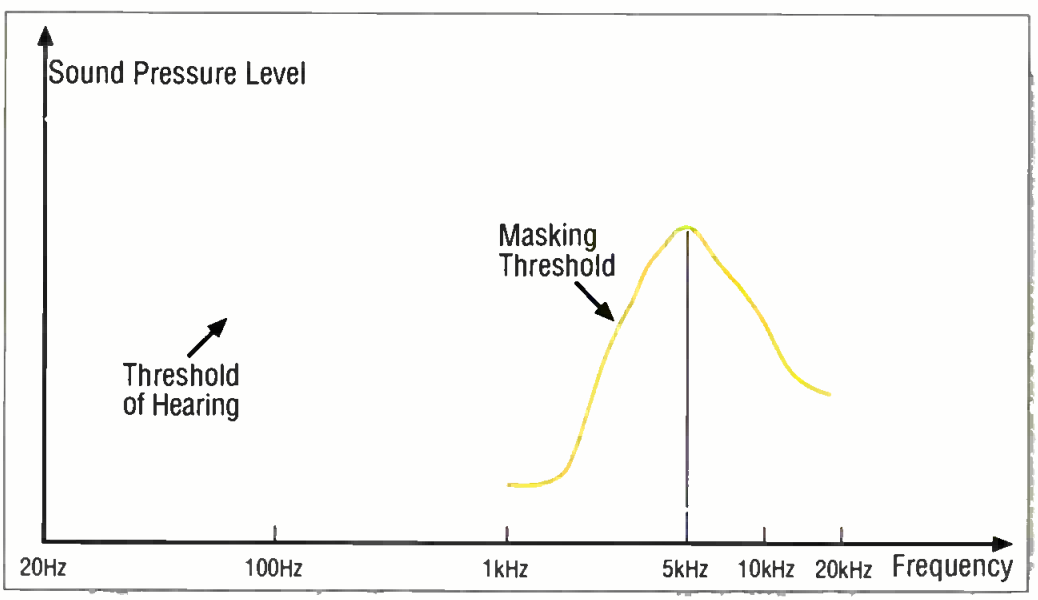
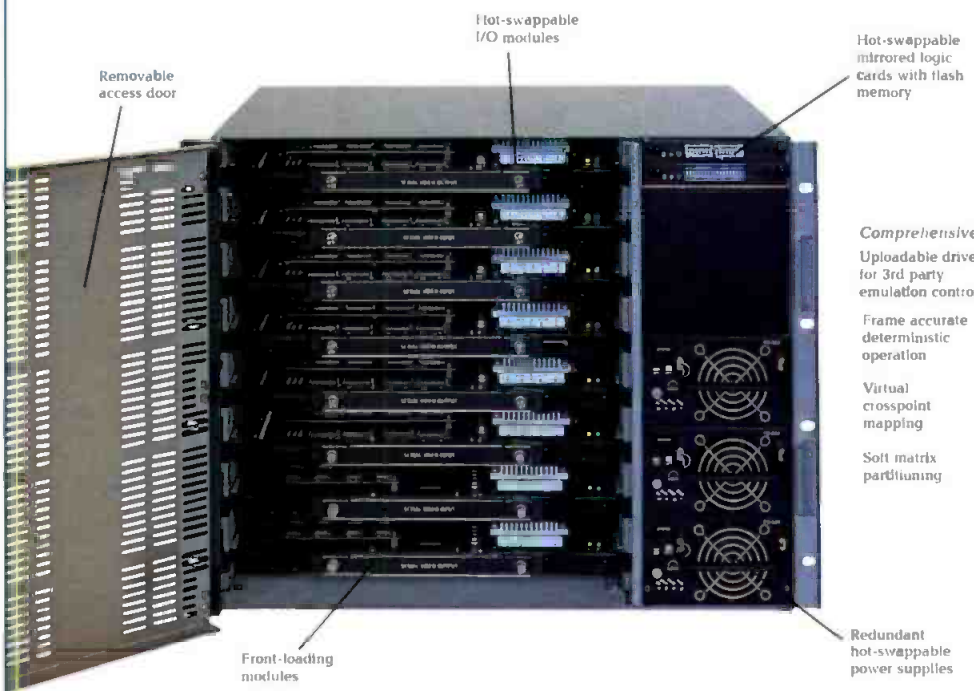
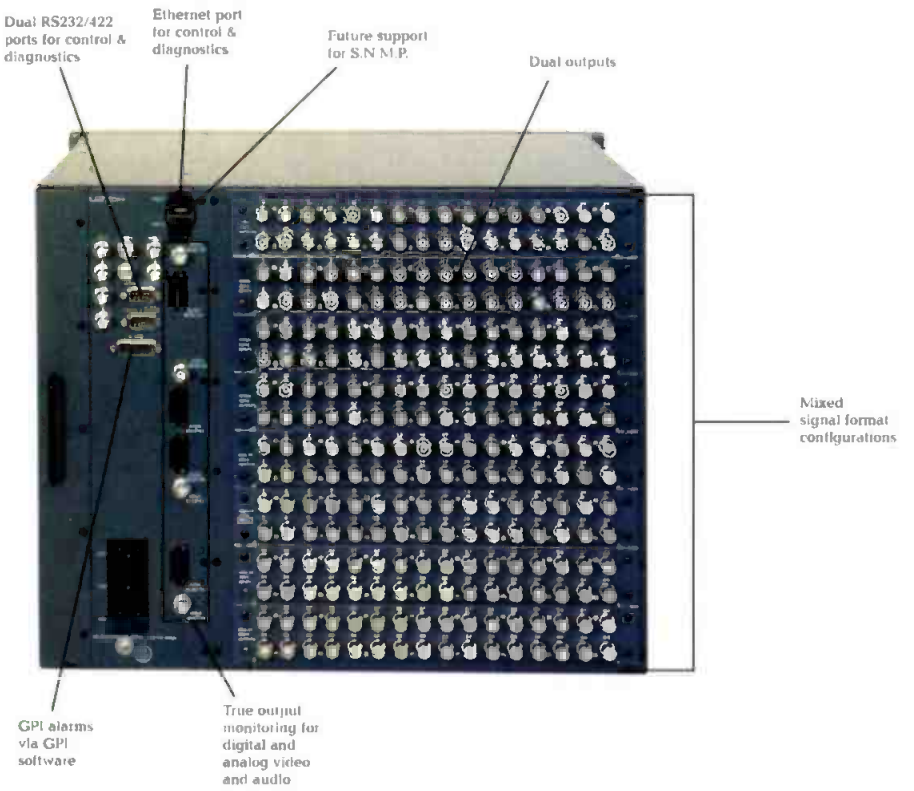


Figure 2. The threshold of hearing (solid line) is frequency dependent. Simultaneous masking occurs around the frequencies contained in a sound, raising the perception of hearing and effectively masking nearby frequencies. The dotted curve shows how a 5kHz sound raises the threshold of hearing and effectively masks lower amplitude sounds of neighboring frequencies.

OUR BIG ROUTER SELLS FOR LOTS OF LITTLE REASONS





You get great value...

...when you combine Leitch's service with the Integrator's™ capabilities:

Flexible, Expandable Architecture

- Combines multiple analog and digital formats in 4, 6 or 8 RUs
- Expands to 128x64 in a single unit and 128x128 in multiple frames
- Prepares your broadcast, post or telco facility to switch today's and tomorrow's formats, including HDTV and ASI

Phenomenal Feature Set

- Protects your operation with redundant hot-swappable logic cards and power supplies
- Simplifies maintenance through hot-swappable, front-loading I/O modules
- Eliminates need for monitoring DAs and routers, with "true" output monitoring and separate analog and digital video outputs
- Accommodates both RS232/422 and Ethernet connections

Comprehensive Control

- Frees you from hardware constraints with virtual crosspoint mapping and soft matrix partitioning
- Enhances control with 3rd party up-loadable drivers and software reconfigurable control panels
- Permits on-air control from automation systems or PC-based control using Leitch's RouterWorks™ software

BIG router. BIG benefits. BIG value. Make the move now! Call Leitch or visit www.leitch.com.

HDTV • SDI • ANALOG AUDIO • PAL • NTSC • SECAM • ASI • AES • E3 • DS3

LEITCH® ENGINEERING THE BIG PICTURE™

International/Canada +1 (416) 445-9640, (800) 387-0233 • U.S.A. East +1 (800) 231-9673, U.S.A. West +1 (888) 843-7004 • Latin America +1 (305) 591-0611
Europe +44 (0) 1483-591000 • Australia +61 (2) 9939-3355 • Japan +81 (3) 5423-3631 • Hong Kong +(852) 2776-0628 • Brazil +55 (11) 867-0218

Circle (128) on Free Info Card

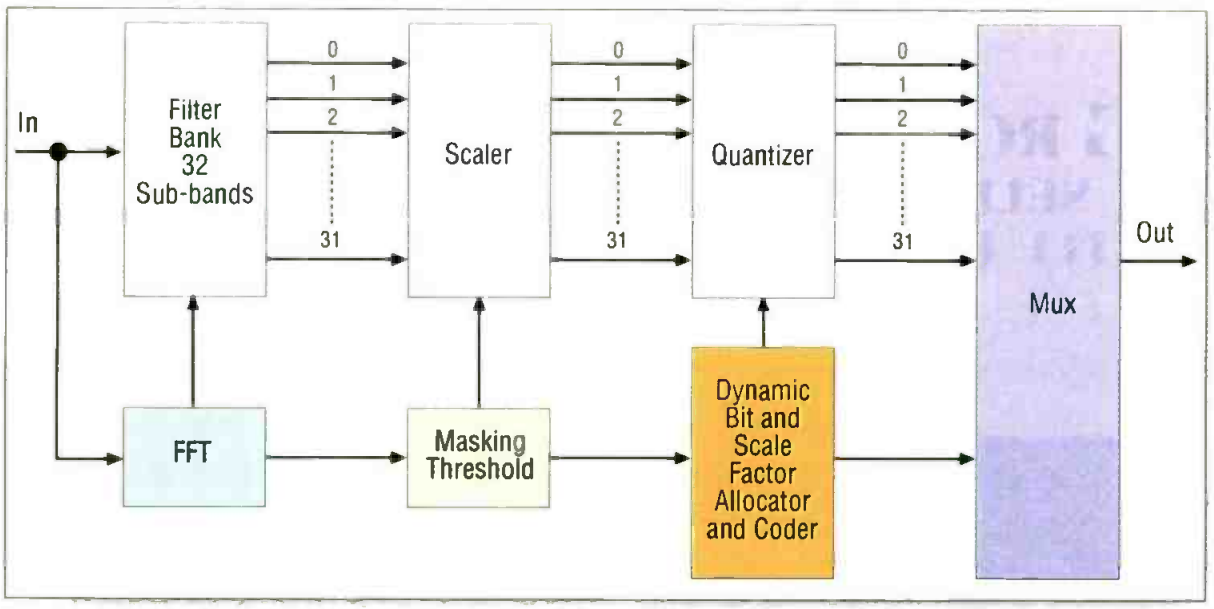


Figure 3. Simplified block diagram of an MPEG audio encoder. A filter bank splits the input signal into 32 sub-bands in an essentially lossless and reversible manner, while an FFT is used as the input to a masking threshold algorithm. The results are multiplexed and output.

as far above the noise level as is possible. The quantizer then allocates the available number of bits in a way that meets both the bit rate and the masking requirements. The information on how the bits are distributed over the spectrum is contained in the bitstream as side information.

The decoder is less complex because it does not require a psychoacoustic model and bit allocation procedure. The sub-band filter of Layer I is also used by Layer II and Layer III. Layer II adds a more efficient coding of side information. Layer III adds a frequency transform in all the sub-bands. The three layers have been defined to be compatible in a hierarchical way, i.e. a full layer n decoder is able to decode the bitstreams encoded in layer n and all layers below n. Consequently, a full Layer III decoder accepts Layer I, II and III bitstreams and a full Layer II decoder accepts Layer I and II bitstreams. Layer I decoders only accept Layer I bitstreams.

The first phase, MPEG-1, deals with mono and two-channel stereo sound coding, at sampling frequencies commonly used for high quality audio (48kHz, 44.1kHz and 32kHz). The second phase, MPEG-2, meets the needs of new applications including a wide range of audio quality levels with data rates ranging from 32kb/s to 1066kb/s. This wide range is realized by splitting the MPEG-2 data rate into two parts: an MPEG-1 compatible primary bit stream (384kb/s for Layer II) and an extension bitstream. With Layer III at 64kb/s per channel, five independent full-bandwidth audio channels can be encoded within 320kb/s (5 x 64kb/s = 320 kb/s). Alternately six

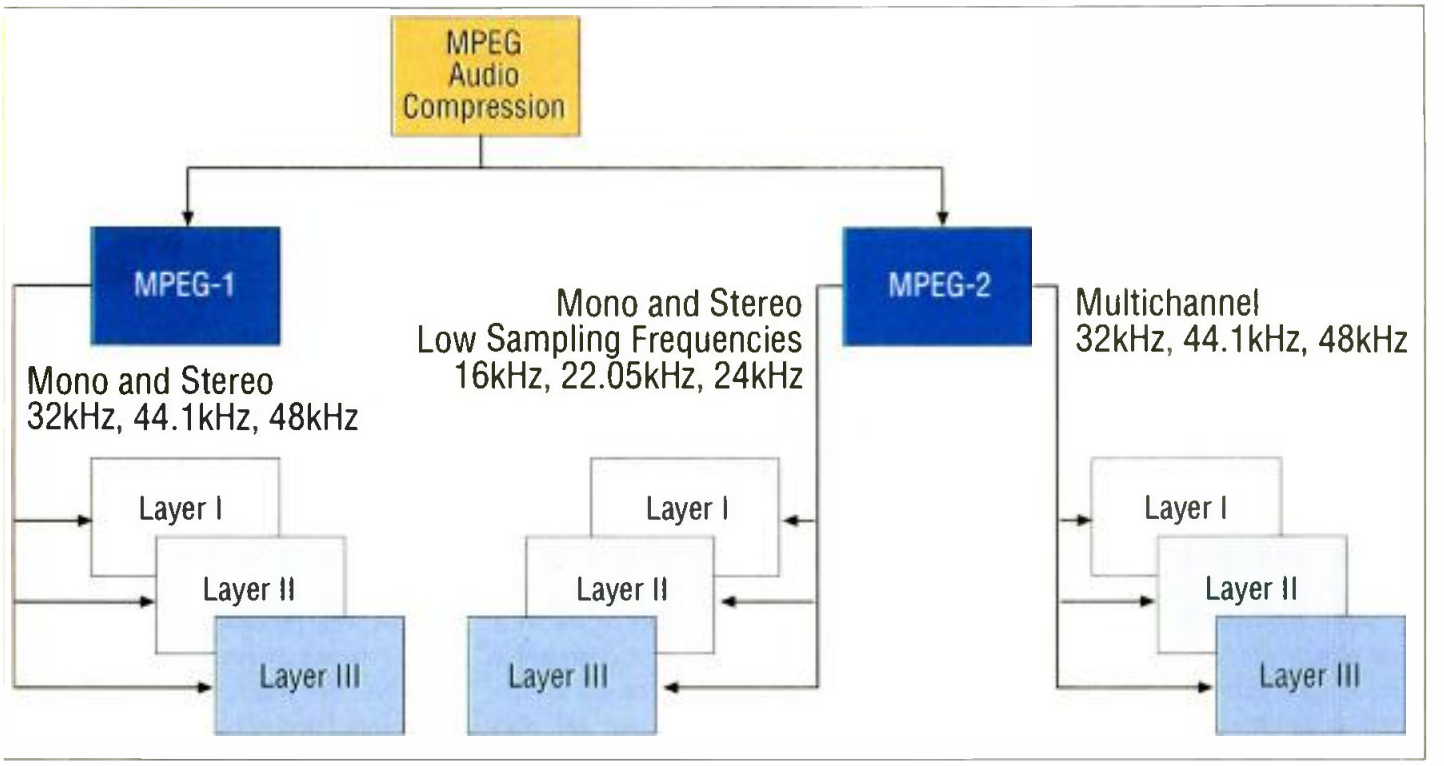


Figure 4. The MPEG audio compression family includes MPEG-1 and MPEG-2 specifications for Layer I, II and III coding.

audio channels, including a low-frequency enhancement channel (LFE), can also be carried to support multichannel surround sound requirements (5.1 audio). Additionally, extensions to lower sampling frequencies (16kHz, 22.05kHz and 24kHz) provide better sound quality at very low bit rates (below 64kb/s for a mono channel). Figure 4 summarizes the layers of MPEG audio coding. ■

Michael Robin, former engineer with the Canadian Broadcasting Corporation engineering headquarters, is an independent broadcast consultant located in Montreal, Canada. He is co-author of Digital Television Fundamentals, published by McGraw-Hill.

Send questions and comments to:
michael_robin@intertec.com

Michael Robin's book may be ordered directly from the publisher by calling 800-262-4729. It is also available from several booksellers.

Maintaining software

BY BRAD GILMER

No doubt, maintaining your facility is one of the things you do best. As you go through maintenance checklists — cleaning transmitter air filters, replacing pinch rollers and calibrating scopes — consider adding a frequently overlooked category of equipment to your maintenance schedule: computers and the software that runs on them. Like most equipment, maintaining computer systems properly can help you avoid costly downtime and save you money.

Why maintain software?

The most compelling reason to maintain software is the same as that for maintaining hardware-based systems: without proper maintenance, the systems will fail. Another reason to maintain computer systems is to take advantage of new features that may be available free of charge. Finally, maintaining computer systems will keep you fresh and familiar with the systems themselves. If a system does fail, you do not want to lose valuable time looking for manuals, passwords and other essential information.

So, what needs to be maintained on a computer? Fans quit, floppy disk drives need occasional service and power supply cooling vents need to be cleaned. Because many computers used in broadcast applications sit in racks unattended, these items can be easily overlooked.

Several years ago, I was called in to repair a critical automation computer system with a failed hard disk. The computer had been backed up religiously, so reloading software was not a problem. And, there were spare disk drives on the shelf. Unfortunately, things went downhill as soon as I tried to insert a boot disk into the floppy drive and found that the door wouldn't close. Inside was a fur ball big enough to make an Angora cat proud. Attempts to clean it out enough to make it serviceable were unsuccessful. (Later, we determined that the floppy disk had not been used in over two years.) The moral is: While it is true computers have very few moving parts, and those parts need only occasional maintenance, neglect can lead to major headaches.

By now, the need for computer hardware maintenance may be obvious, but what about the need for software maintenance? Some time ago, I was responsible for a critical piece of on-air equipment produced by a well-known manufacturer. Every once in a while, the equipment would throw up its hands, give a somewhat cryptic error message, and fall flat on the floor. Doing this every month or two was inconvenient, but it did not pose a major risk to the facility. The system would be rebooted and there would be a search for something wrong, but nothing was ever found. Inquiries to the manufacturer yielded no results. No, they had never heard of this problem. Yes, we were the only people in the entire solar system experiencing difficulties like this. No, this was not covered under the warranty. I was not too concerned about the problem until a second system started experiencing similar symptoms. Now this had my full attention. Was it a virus? Were there defective connectors inside the machine that were starting to go intermittent with age? Bad RAM chips?

It was highly unlikely that the problem was a virus. This was a UNIX-based system and few viruses have been written for these computers. Also, these computers were dedicated machines with no connection to the Internet. Bad connectors generally do not get better on their own without some sort of physical movement. A simple reboot fixed the machine. As for bad RAM chips, there was never an error message even though countless RAM diagnostic tests were run. It turned out to be something fairly obscure called faulty pointer math.

These systems were on for months at a time. After performing millions of calculations, the machines would fail to properly clear out the stack space (a temporary storage location used in microprocessors for arithmetic calculations) for re-use. While the retained stack space was very small, cumulative errors in clearing the stack space caused the unclaimed area to grow. Eventually, the machine ran out of stack space, halting the system. Rebooting fixed the problem because the stack space was reset in the process — eliminating any long-term cumulative effects. People used to tell me that a system reboot was part of their regularly scheduled computer system maintenance. Although they did not know exactly why, this periodic reset

Now:

Build and maintain a software inventory that includes:

- Operating software
- Application software
- Diagnostic software
- Drivers

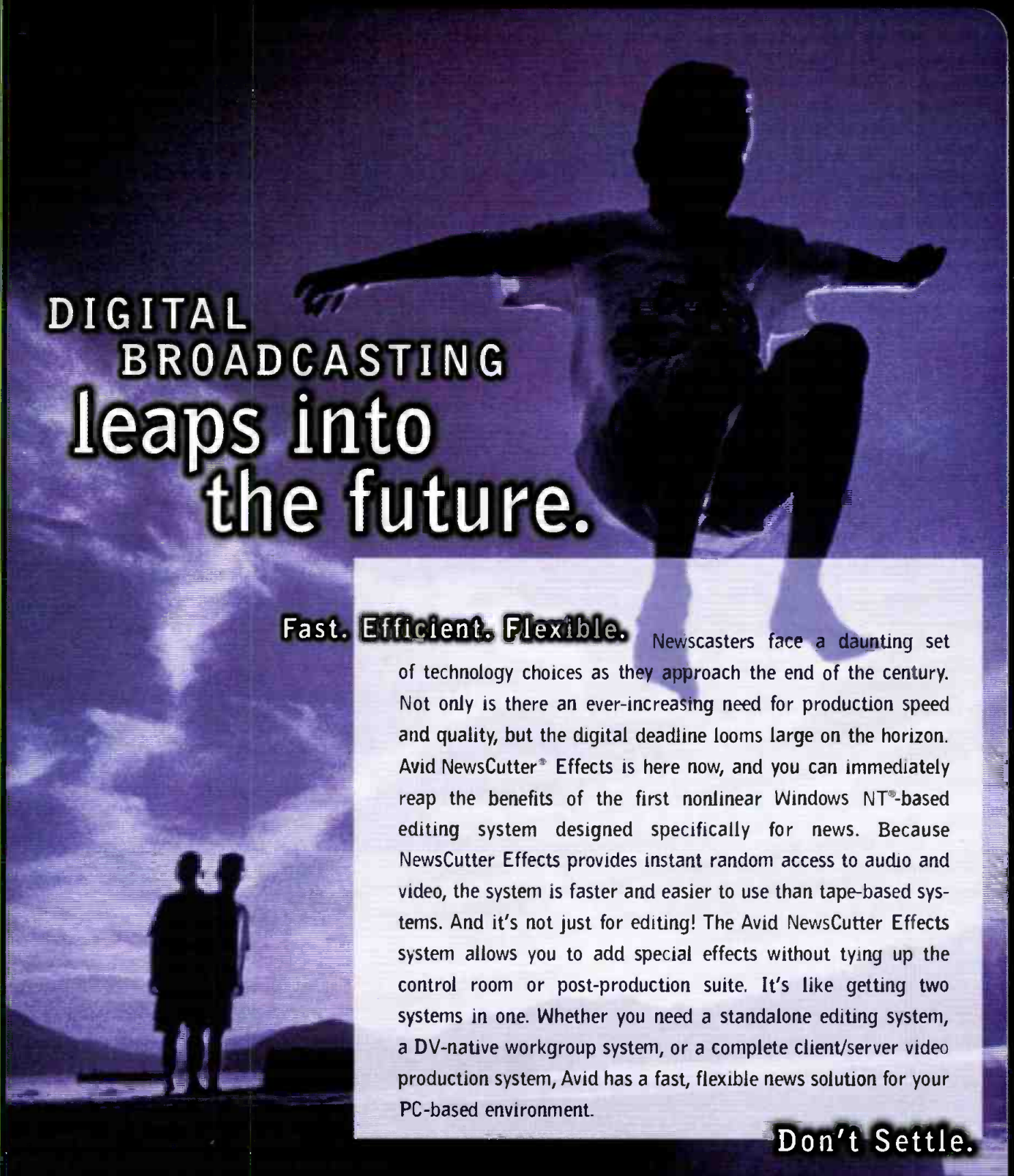
In each case, track versions, serial numbers and machines that the software is installed on. Include firmware version where applicable.

Weekly to monthly:

Verify you have the latest software versions.

Check mechanical items such as floppy drives, cooling fans, air inlets and mouse/trackballs.

Reboot and clean up unused files.



Fast. Efficient. Flexible.

Newscasters face a daunting set of technology choices as they approach the end of the century. Not only is there an ever-increasing need for production speed and quality, but the digital deadline looms large on the horizon. Avid NewsCutter® Effects is here now, and you can immediately reap the benefits of the first nonlinear Windows NT®-based editing system designed specifically for news. Because NewsCutter Effects provides instant random access to audio and video, the system is faster and easier to use than tape-based systems. And it's not just for editing! The Avid NewsCutter Effects system allows you to add special effects without tying up the control room or post-production suite. It's like getting two systems in one. Whether you need a standalone editing system, a DV-native workgroup system, or a complete client/server video production system, Avid has a fast, flexible news solution for your PC-based environment.

Don't Settle.

The **NewsCutter Effects** model is now shipping to broadcasters everywhere!
Call 800 949 AVID
www.avid.com/newscutterfx

Avid
tools for storytellers™

Priority Code: NCBE199

Circle (130) on Free Info Card

seemed to make their systems run better. After this experience, I believed them. A regular reboot should be a part of any computer PM routine.

Periodically rebooting your critical computer systems is a good idea for another reason. The system can be programmed to automatically cleanup unnecessary files during the boot process. This is necessary because, as the computer performs its tasks, it frequently opens up temporary files. These temp files may or may not be deleted when a task finishes or when the system shuts down. This is especially true if the system experiences an abnormal shutdown during a power failure or forced reboot. Just as with the pointer math problem above, failing to clean up these temp files can cause your hard disk to become cluttered with useless files. Eventually, your system could fill up, causing slowed response as cache sizes reduce. Finally, this will cause the system to stop entirely. If the computer system is sitting in a rack, someone may not notice the disk full warning messages until it is too late. A solution for Windows machines is to insert a simple command in the AUTOEXEC.BAT file to clean up these unnecessary temp files. The command will be executed every time the computer reboots.

Although computers have very few moving parts, and those parts need only occasional maintenance, neglect can lead to major headaches.

To do this, first, look at your existing AUTOEXEC.BAT file. Look for a line containing an entry similar to the following:

set temp=c:\temp or set wintemp=c:\wintemp

This command tells the system where to store temporary files. Note that you may have either, both or none of the lines above in your AUTOEXEC.BAT file. If neither of these commands is present, consider adding them. This allows well-behaved programs to store their temporary files in a common location rather than scattering them all over your hard disk.

Next, enter the following command into your AUTOEXEC.BAT file: if exist c:\temp*.* erase c:\temp*.*

This command looks for any files in the temporary directory. If it finds them, it deletes them. Another line can be added to the AUTOEXEC.BAT file for the wintemp directory if it is present.

If you are responsible for maintaining a UNIX system, there are many other things that you may need to do to keep your system in top operating condition. Print queues, e-mail queues, various log files and other items can all grow out of control unless they are maintained properly. Fortunately, in the broadcasting environment,

We know you're running fast to keep up with technology, but sometimes in this fast-paced world of file servers and LANs it's easy to overlook something as basic as the furniture that houses this exciting new equipment.

Don't worry, while you keep pace in the technology race, Winsted is doing its part by designing its products to meet the new standards. In 1997 we were the first to introduce a file server workstation especially designed for the broadcast/video market, and we've been expanding the line ever since.

Winsted has long been the industry's first choice in racks, consoles and editing desks. Rest assured, when the next technology advance comes along we'll be in the race right along with you.

For More Information Visit Our Web Site at:

www.winsted.com

To order a free catalog today, call

800-559-6691

or

612-944-9050

Winsted®

Preferred by Professionals Worldwide®

Circle (132) on Free Info Card

vendors resolve many of these issues. To learn more about maintaining these systems, there are a number of excellent books on UNIX system administration. The best book I have found on UNIX system administration is *UNIX System Administration* by D. Fiedler and B. Hunter, published by Hayden Books (ISBN 0-8104-6289-3)

Application software maintenance

Things can also be done to keep applications running in top form. Operating system software is not the only software capable of shooting itself in the foot through pointer math errors. Application software can be guilty as well. For that reason, regularly scheduled reboots are a must. Rebooting resets all the registers and allows programs to clear out any

Operating system software is not the only software capable of shooting itself in the foot through pointer math errors. Application software can be guilty as well.

faults or problems that may have accumulated over weeks of operation. In addition to an occasional reboot, it is wise to periodically check with the manufacturer to verify you are running the latest version of application software available. Many times, vendors will make upgrades available at no cost. These upgrades may also contain bug fixes that resolve system issues. The question of whether to upgrade a system and how to do it is not as straightforward as it might seem, especially with something as critical as an on-air automation system.

While vendors work very hard to be sure that their software is fully tested before it leaves the factory, it is possible that a product is delivered with a bug. For that reason, it is wise to install any new software revisions on a test system before putting the system on-line. In the case of automation systems, a bug may not be fully revealed without all peripherals attached. For most broadcasters, it just is not possible to have a complete master control suite and associated support equipment available for an upgrade test. In any case, it is best to perform as much off-air testing as possible before putting an upgrade on the air.

Many broadcast computer systems now are available with maintenance contracts. These contracts may be an excellent buy for stations that do not have the time, funds or personnel to maintain their systems. Let's face it — maintaining computer systems, especially those based upon UNIX or other non-WINTEL architectures require specialized knowledge. It may not be worth having someone on staff full time when these skills are only needed occasionally. For those with larger systems, however, it may be less expensive to have someone on staff than to contract for maintenance.

Brad Gilmer is president of Gilmer and Associates, a management and technology consulting firm.

Send questions and comments to:
brad_gilmer@intertec.com

THE NEXT GENERATION OF DIGITAL AUDIO RECORDERS STARTED WITH SOME VERY GOOD IDEAS: YOURS.

DAT

INTRODUCING THE TCR™ FAMILY OF SYNCHRONOUS DIGITAL RECORDERS.

We started with solid engineering and some innovative ideas from real hands-on engineers and editors like you. Then molded that thinking into the TCR8™ and TCR4™. Two professional production recorders, ideally suited for the edit bay, the studio or the field. Not just a designer's dream, but yours.

- 8-track and 4-track models
- Perfect for broadcast and video production
- 24-bit audio quality
- High density removable disks
- Massive hard disk storage
- Complete timecode implementation
- True VTR emulation

Just one of many Digital Audio Solutions from 360 Systems.

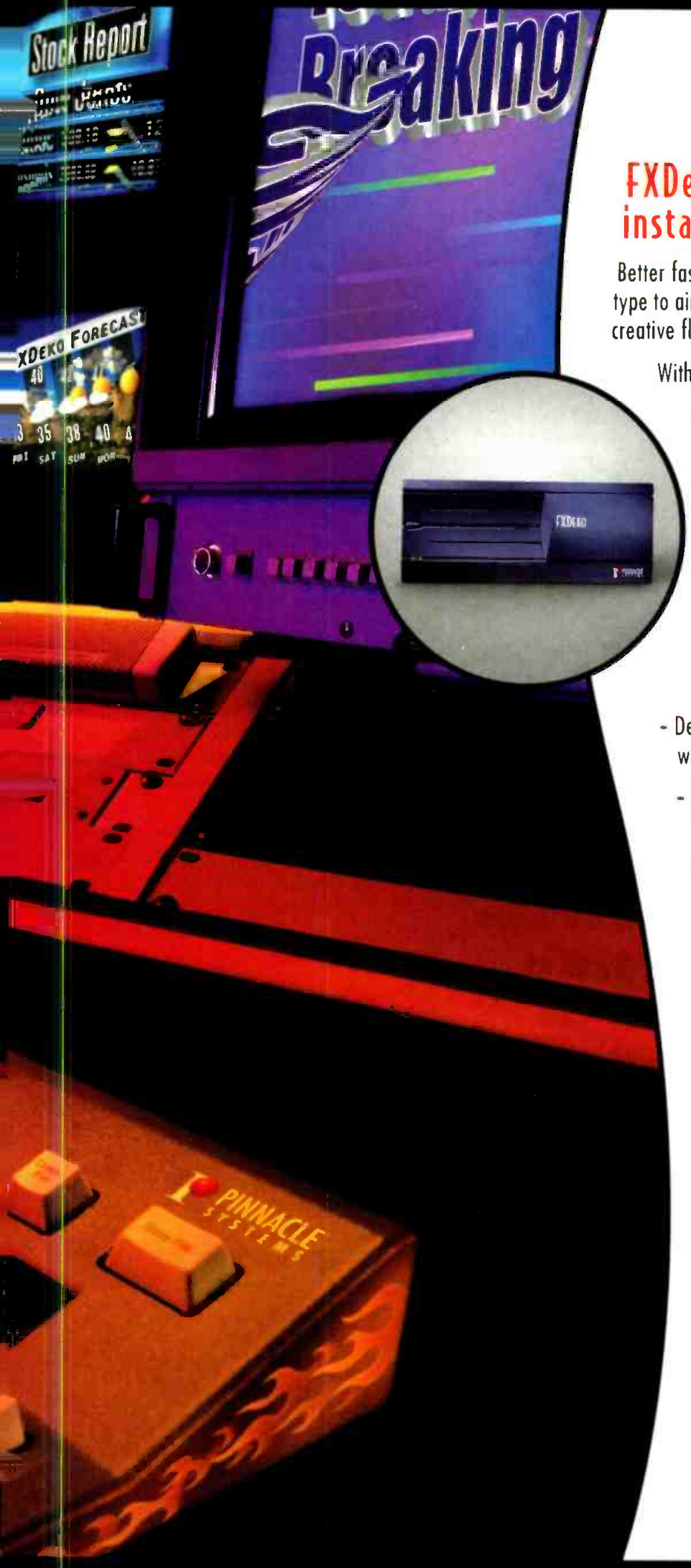
360 Systems®

PROFESSIONAL DIGITAL AUDIO

See us at IBC Booth #9.322 and AES Booth #1006

For more information call (818) 991-0360 / Fax: (818) 991-1360 / e-mail: info@360systems.com / website: www.360systems.com

Circle (124) on Free Info Card



FXDeko. The hottest CG with instant effects and 3D transitions.

Better fasten your seat belts. Because with FXDeko you can type to air instantly, with dazzling 3D effects and maximum creative flexibility.

With FXDeko you get:

- Intuitive interface to get your graphics to air fast
- Automation, Templates, Macros and database power — information to air directly — even from the Internet
- Deko's FastAction Keyboard to turbo-charge graphics creation
- Deko SportsWare™ to "POP" text during live events
- Deko Chyron™ File Conversion to easily integrate with *older* CG's
- Integration with Pinnacle Systems' Lightning™ still store
- International language support for a global CG
- Second Channel Preview
- 3D transitions, such as page turns, shards, water ripples and more!

And introducing FXDeko HD for HDTV!!

So if you want your graphics to be the hottest on-air, get your fingers flying and call 1-800-4Pinnacle or visit www.pinnaclesys.com.

www.pinnaclesys.com

PINNACLE SYSTEMS

See What You Think.

Circle (125) on Free Info Card

Ask Dr. Digital

Comments on compatibility

BY STEVE EPSTEIN, TECHNICAL EDITOR

In July, I ran a letter from Leland Brun regarding problems he was having with machines based on the DV format. Since that article ran, my e-mail box has been quite full. The letters have touched on a variety of related topics including reader experiences, tips and lessons learned. Tape format wars within this industry go back almost to the beginning of tape recording. Maybe because of this history we tend to view minor squabbles as all-out war. The debate regarding the real compatibility of these various DV-based formats has yet to be resolved completely, but the following two letters shed a new and different light on the matter at hand:

As Panasonic's Tech Support Manager, I have received comments on various versions of this ongoing issue. Two years ago many of Mr. Brun's comments may have had some validity but these issues have all been resolved. Today, we are not experiencing any particular problems, and we speak with hundreds of customers who are using both Panasonic and Sony products, interchanging tapes without incident.

Approximately two years ago users of the DV format may remember a shortage of Sony DV tape in the U.S. Dealers stated the shortage was due to a supply-and-demand situation. About this same time Panasonic received a few calls from customers who were experiencing problems that appeared to be related to the combined use of Panasonic and Sony tapes in the same camcorder. The problem manifested itself as a brown smear of oxide that appeared on surfaces the tape came in contact with. It was determined that the problem was related to an incompatibility in the tape lubricants used by each manufacturer. If used individually there wasn't any problem. Once combined, the two could interact and cause head clogging. It is said that Sony's lubricant formulation was developed to increase the time between head cleaning. It was apparently somewhat successful, but the byproducts caused other problems. It is interesting that in Japan the dealers were acknowledging the tape compatibility issue. Here in the U.S. the shortage of Sony tape was attributed to supply and demand.

Jointly, Matsushita and Sony resolved the issue and within a few months Sony released an improved formulation. Looking back, we have not received any calls on this issue for at least 18 months. I should also mention that the number of related incidents we did receive calls on were very few and could have been counted on one hand. As for Mr. Brun's comments on DVCPRO decks playing DV and DVCAM, I strongly disagree. It is a known fact that DV tape will shed a bit more oxide than DVCPRO and DVCAM tape. Accordingly, the heads and transport mechanism will require maintenance slightly sooner in any deck that would be using DV tape as compared to decks playing DVCPRO and DVCAM tape. This has nothing to do with the inherent design or quality of each manufacturer's decks, but is related to the type of tape the DV format uses.

Tech Support has realized a trend in which as long as a deck is working, users tend to leave it alone. Maintenance is something you do when you develop a problem, and preventative maintenance is seldom practiced. Those users of today's digital formats who are concurrently using DVCPRO, DV, and DVCAM tapes in Panasonic machines, and who are delighted with the results, are the same customers who perform the recommended maintenance on their equipment. I sincerely hope this information would bring this matter to closure. Panasonic's Tech Support staff would also encourage any readers with related questions to contact us at pbtssupport@panasonic.com.

Bob Kozlarek
Tech Support Manager
Panasonic Broadcast & Television Systems Co.
Secaucus, NJ

Today, we are not experiencing any particular problems, and we speak with hundreds of customers who are using both Panasonic and Sony products, interchanging tapes without incident. — Bob Kozlarek, Panasonic

Regarding your July article, some questions and some comments came to mind.

The statement from Panasonic's field engineer, "Sony tape is so abrasive that you could only expect about 500 hours before the heads are shot," is an incredible statement. It is a rare occasion that I go to bat for a competitor, but if the ME tape manufacturing process were better understood by that field engineer he would surely ascertain that there is a major discrepancy in his statement.

Metal evaporated tape typically has such an incredibly smooth surface that a lubricant is required. This lubricant is applied during manufacturing following the passivation process. Without the lubricant, the performance of metal evaporated tape would be severely ham-

Continued on page 114

Sony Broadcast and Professional Group

SONY

Prepared by the editors of Broadcast Engineering

The NewsBase Server System:

Technology to Increase Newsroom Productivity

WPIX New York's newsroom, one of 15 Tribune Broadcasting stations that has selected Sony's NewsBase server system. WPIX's new system will include newsroom desktop editing.

The Sooner You Get the Pictures,

News is the driving force behind the successful television station of today. The real-time, no-fault, nature of news imposes unique demands on personnel, systems, and planning. In television, the need exists to bring a wide variety of divergent elements together at the right place, at the right time. It was within this framework that Sony's NewsBase™ Newsroom System was designed.

A Sony news specialist prepares a NewsBase system for Times Square Studios Limited, the future home of ABC's "Good Morning America."

What is NewsBase?

NewsBase is a nonlinear server-based news production system. It supports feed recording, editing, on-air playback, and newsroom desktop video browsing and editing.

Beyond the story of NewsBase lies a much larger issue: namely, what is the next step forward for newsroom automation?

In a busy television newsroom, ultimate efficiency and productivity is achieved only when three key elements or functionality are combined:

- Text search and editing
- Video search and editing
- Centralized server technology

With these key issues in mind, the NewsBase system was designed to provide these benefits:

- **Video on the desktop.** For too long, news production processes have made it difficult to match text and video.
- **No waiting.** Technology needs to make the process faster. Never force a user to wait for video to transfer from one place to another—not even if the transfer occurs faster than real time.
- **Incoming feed access.** As soon as feed recording begins, all users can view or edit the material within seconds.
- **Simultaneous access.** Many people can utilize the same material at the same time. Users simply access the material they want, directly from the server.

These features are important because they define how a modern newsroom should operate.

It is no secret that stations across the country—and indeed around the world—are being challenged to produce more material, of higher quality, with the same human resources. This task can only be accomplished with better tools. Such tools can erase technological barriers between the reporter or producer's idea of what a story should be, and the steps necessary to implement that vision.

The Benefits

The unique approach crystallized in the NewsBase system makes two very important improvements on today's all-tape operation: it makes a news operation faster and it makes it better. Faster, because material can be accessed as it is received and then used simultaneously by different writers and editors. Better, because desktop editing makes it easier to match words and pictures.

It is an unfortunate fact of life that much of a journalist's valuable time is spent performing routine—even mundane—tasks, such as waiting for feeds, searching for tapes, and standing in line at an edit suite. This is the primary reason that the systems-wide approach to news automation is so important.

In the case of NewsBase, Sony's ClipEdit™ software enables producers, writers, and reporters to view video at their desktop, and if they like, to actually edit the material—from simple teases to reporter packages. Or "final polishing" can be left to an editor in an edit suite. Either way, reporters, editors and producers have the tools necessary to easily review the universe of material that is available so that truly the best shots (not just the easiest shots) can be selected. Furthermore, once selected, the system provides a platform that makes it easy to write to the video.

Editorial oversight is another critical item in any news opera-

the Better You Can Tell the Story

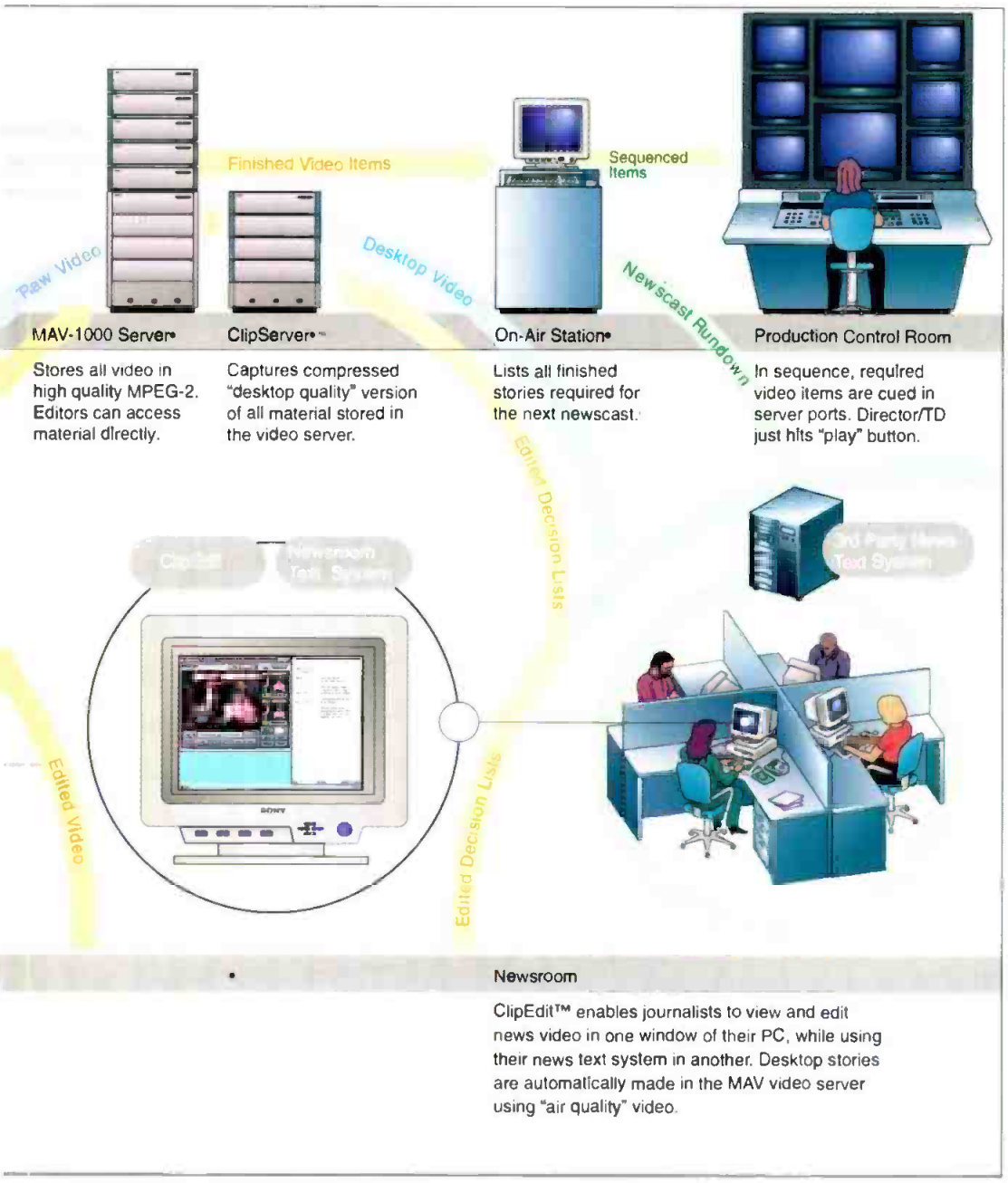


Figure 1 The core elements of the Sony NewsBase newsroom system.

tion. In today's newsroom, material is rarely screened by news managers or producers prior to air; it's just too difficult to do routinely. Fortunately, centralized technology offers a better alternative. The ClipEdit system makes it easy for executive producers to review material prior to air from any desktop.

Many news organizations have Internet services, and Sony's web publishing extension enables any desktop ClipEdit software user to send finished items to the newsroom's web server. Here again, the integration of many different—formerly separate—functions yields enormous returns in efficiency and creativity.

ClipEdit software is designed to integrate with any Windows NT® 4.0 newsroom computer text system. That means it is simple to write scripts in one window and view or edit video in another. Both systems automatically exchange rundowns and status information. If the text system supports the emerging industry standard Media Object Server (MOS) protocol, it is possible to search for text and video items together in one integrated search from the text system. MOS is intended to be an open industry standard, allowing more complete integration between newsroom computer systems and media server devices such as still stores, graphics systems, audio servers, and video servers.

Desktop video editing will be as important to television news as desktop publishing has been to the design and production of printed material. In that industry, early adopters enjoyed a clear competitive advantage. Expect no less from television news, which has a history of redefining itself—thanks to new technologies.

How Does it Work?

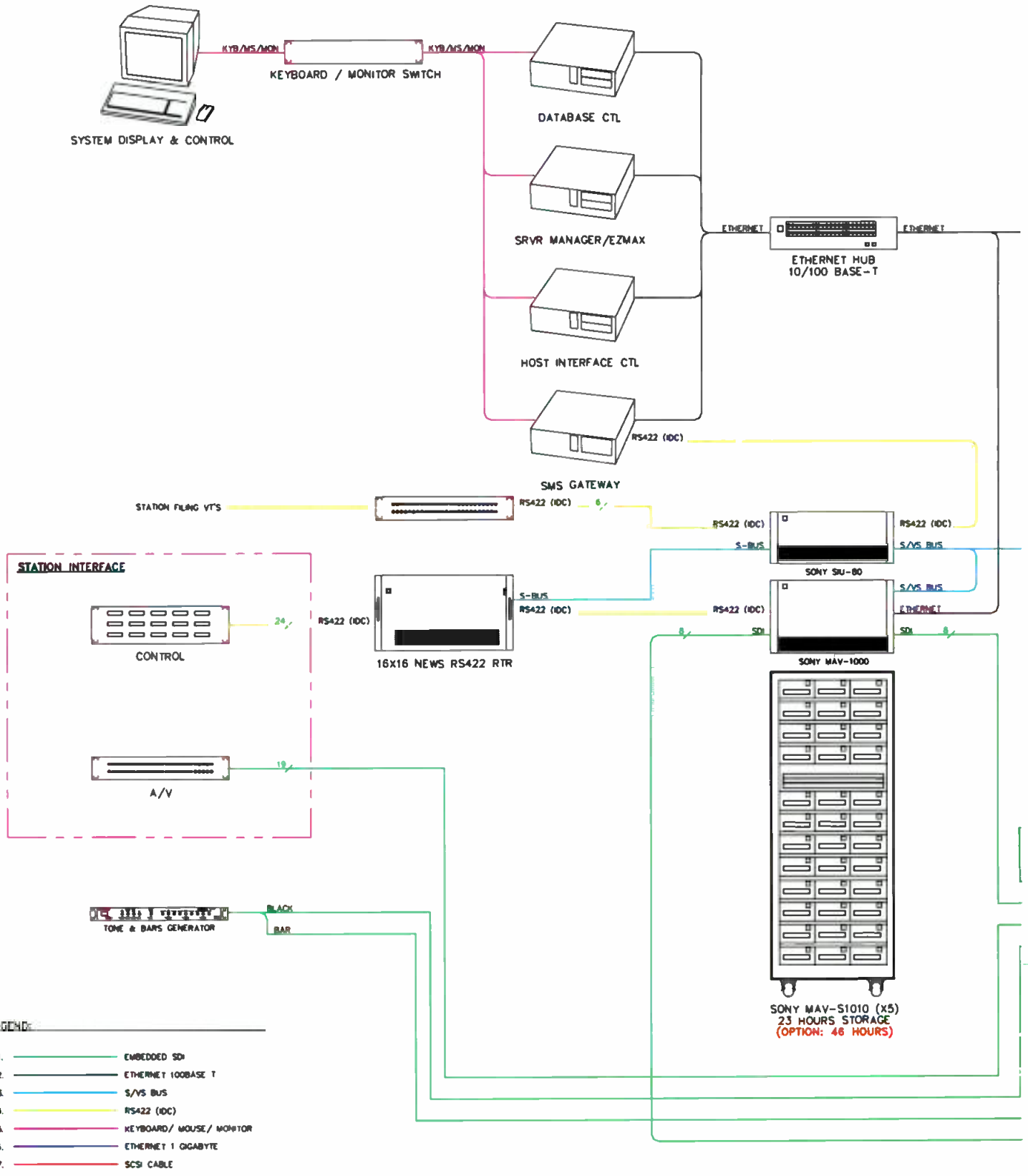
All of the elements that make up a modern newsroom automation system are illustrated in the diagram shown in Figure 1 at left. To begin the process, a Filing Station triggers the recording of incoming feeds and tapes. As material is received, it is accessible within seconds to all users. Scheduled incoming feeds—and ad hoc tape and line feeds—can be automatically recorded using the Filing Station. One Filing Station can manage many operations simultaneously.

Users can access this new material from all edit suites and the newsroom. Editors can use traditional linear edit controllers or nonlinear editors. No transfer time is required. Newsroom users can see and edit the video with ClipEdit.

The ClipEdit software application runs on the same Windows NT operating system that now supports most news text systems, which means that journalists can edit video and pictures on the same computer screen. Incoming feeds can be monitored (and edited) as they are received.

With the capabilities brought to the desktops of journalists by ClipEdit, there are no more excuses for not writing to video!

Whether on the desktop or in the edit suite, when users indicate their stories are complete, they can be aired in a matter of seconds. The On-Air Station automatically sequences the stories that are "next up." These pieces, automatically arranged based on the newscast rundown, are cued in server playback ports. The director can roll and take the ports just like a VTR.



System Architecture

By design, the NewsBase server architecture is flexible. This is important because of the evolutionary process now underway in television stations, where migration from an old system to a new one is the preferred method of implementation. Start with a single server and add server units as the needs demand; add ClipEdit software and expand to desktop editing. Multiple servers can be combined under one management system so that reporters and producers can find any material from any user terminal.

As shown in the typical implementation depicted in Figure 2 above, NewsBase is fundamentally an SDI/SDTI router system with a video server and application software designed specifically for television newsroom use. Server ports are dynamically configured to function as inputs or outputs, depending upon current newsroom requirements. The number of ClipServer I/O ports and ClipEdit stations also can easily be varied.

NewsBase servers utilize 4:2:2 Profile @ Main Level MPEG-2 video coding, with up to four channels of uncompressed audio. This provides high picture quality, robust multigeneration performance,

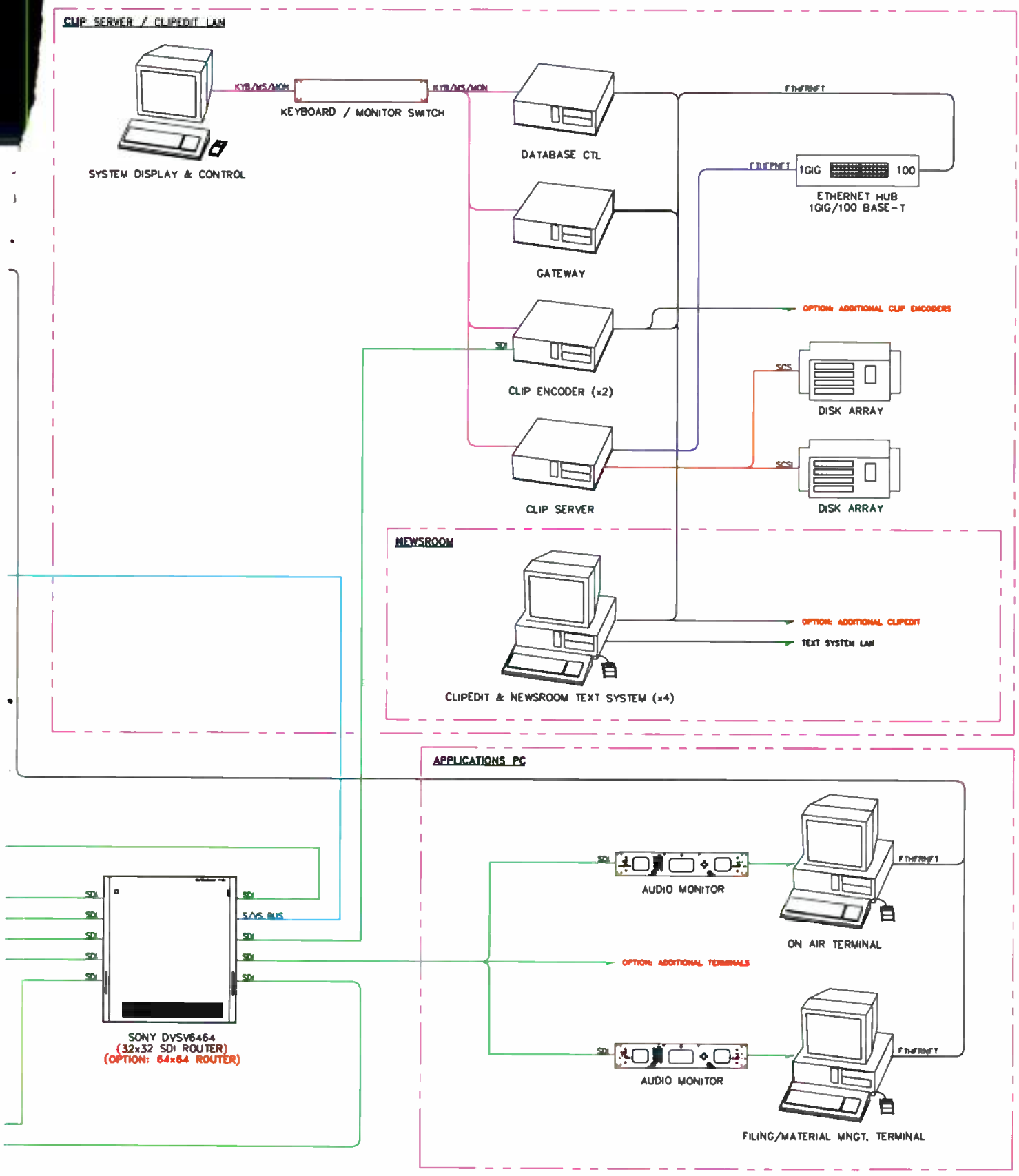


Figure 2 Sony NewsBase newsroom automation system overall conceptual diagram.

and efficient storage. Superb reliability is provided through the use of fault-tolerant, redundant, or hot-swappable components. Mirrored file management techniques also can be utilized.

Sony's server architecture consists of two basic units:

- The MAV-1000 controller
- MAV-S1010 RAID-3 storage units

Each MAV-1000 controller can be configured with up to eight SDI input/output ports, or up to six SDI input/outputs, and one SDTI port. Transfer speeds up to four times faster than real-time are available using SDTI. MAV-S1010 storage units provide 23 hours capacity.

Frame-accurate, real-time control of the MAV units is managed by Sony's Server Management System (SMS/GW) and Intelligent Device Controllers (IDC). Signals are switched via SDI/SDTI digital routers. This assures delivery and enables faster-than-real-time transfer of material.

ClipEdit/ClipServer software is included in all NewsBase systems. The basic package enables two simultaneous Clip system inputs and four user seats.

Edit Suite Options

Sony's NewsBase server system brings two key benefits to edit suites:

- Users in different suites can access the same source material simultaneously.
- Users can start editing from source material as it is being received at the station—no more waiting for the feed to end.

These benefits can be realized with or without changing from today's linear editing interfaces to nonlinear systems.

Nonlinear Editing

A nonlinear editing system brings enormous flexibility to any newsroom operation. The full capabilities, however, typically have not been realized in a stand-alone situation. Integration with a server is the key to productivity.

The Sony DNE-1000 enables editors to immediately access material in the NewsBase server system. While a fast (4x) download mode is available, such transfers are not required.

For late arriving tapes, the DNE-1000 supports Sony's "linear-like" mode to edit directly from tape to disk without download. The DNE-1000 can be configured to include A/B roll effects and downstream title keying. All effects in the DNE-1000 are processed in real-time, so there is no need to wait for results before continuing to work.

The DNE-700 offers cost-effective nonlinear editing by simultaneously utilizing the tape and disk drive inside Sony's DNW-series hybrid recorders. Its linear-like mode enables placing shots from tape directly on the timeline, without first downloading. Alternately, users can opt for material acquired on Betacam SX tapes to be transferred to disk storage in a faster-than-real-time mode.

Using either editor, finished stories can then be transferred back to the server and begin playing to air seconds after the transfer starts.

Powerful editing capabilities are realized when the Sony DNE-1000 is incorporated into the NewsBase system. Shown here is TXCN, Belo's 24-hour Texas statewide news channel.

For greatest versatility, conventional linear editing controllers can be used with the NewsBase news server system, as illustrated here with the Sony RM-450A.

Linear Editing

Installing a video server does not mean that an immediate change in edit suite equipment is required. The integration of the NewsBase server with a linear editing system offers significant advantages in workflow, expense management, and training. The linear editing element is significant for a number of reasons, including the following:

- It gives stations important implementation options.
- It lowers the entry price of a NewsBase system.
- It enables a customer to control when—and if—new tools and new control surfaces should be brought into the edit suite.

It has long been recognized that the user interface is one of the most important features of any product. In the case of a newsroom operation, a familiar interface is critical because of the tight time limits typically imposed on editors and journalists. Therefore, the ability to use familiar tools with the new technology of video servers is an important feature. The RM450A, for example, is one of four traditional devices that work with the Sony NewsBase system (other devices are the FXE-120, and front panel VTR editing with a BVW-75 or DNW-A75). This linear editor-to-server link enables many—perhaps most—of the benefits of owning a NewsBase system to be realized without changing the work style in the edit room.

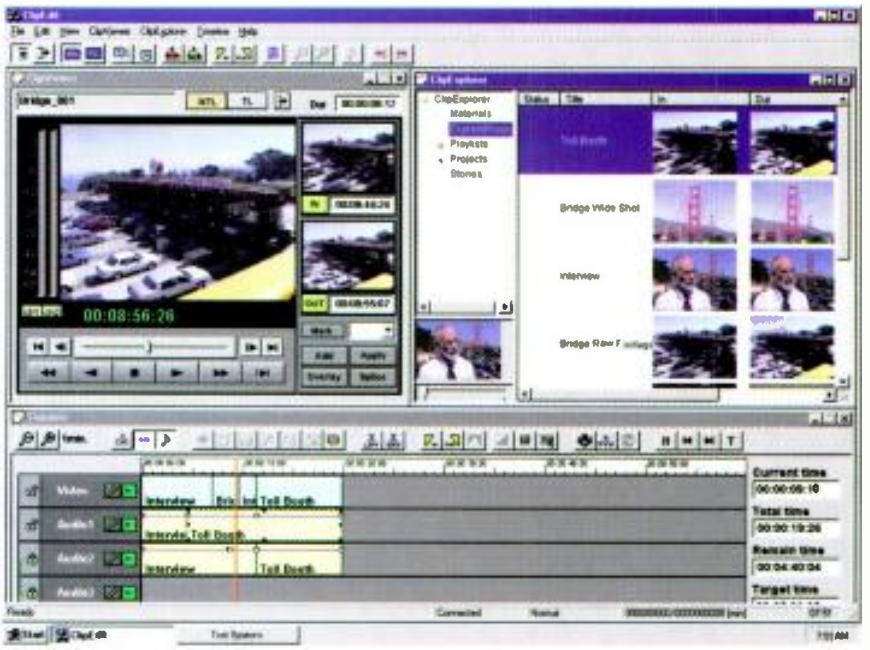
In this application, users select the source file they want from a PC in the edit suite. When selected, RS-422 control, video, and audio are automatically routed from the server to the edit system. The server appears just like a VTR on the Play side of the edit controller. Users edit from server to tape. When complete, the tape can be transferred back to the server and begin playing to air in sec-

onds, regardless of the item's length.

Apart from the benefits of familiarity, this approach is valuable because the source material from the server is instantly available. For example, for a feed that is coming in live from the scene of an event, there is no need to swap tapes or wait until the feed is concluded before beginning to edit the story. This capability eliminates a significant bottleneck for coverage of breaking stories. Furthermore, the file is available to multiple users at the same time. Everyone who needs the material can get it simultaneously, and they can do it without changing the control surface or learning how to work a nonlinear editor.

The linear editing approach, therefore, offers a number of valuable capabilities for stations that do not want to move to a nonlinear editing system in one step. By using such a staged approach, stations can phase-in the purchase of editing equipment and—equally important—phase-in all the training required for staff members.

The training issue is important for any business, but in the news business, it is critical. The time-sensitive nature of television news makes it imperative that any newsroom automation and editing system integrate seamlessly into the operating routine of the station. A phased approach to introducing nonlinear editing allows for a smooth transition, and ensures that the newsroom staff will concentrate on getting their news programs on the air—not on learning how to operate new devices and systems.



ClipEdit software is a video viewing and editing tool made for news writers and producers. Select any file and it pops into the viewer window where it can be viewed with VCR-like controls on the same PC as the newsroom text system.

Newsroom Desktop Video

The ClipEdit software package brings powerful editing capabilities to the journalist's desktop. The user interface is intuitive and it runs on a standard PC. When integrated with a newsroom text system, considerable gains in efficiency and final production quality can be realized.

The ClipEdit system's user interface is designed for news writers and producers, not editors. While the interface is sophisticated enough to cut a reporter package, it is intuitive enough to enable any newsroom hand to cut a voice over or tease without formal training. Even if used only as a means of viewing material, ClipEdit makes it easier to match video and text.

All material edited using the low-resolution ClipEdit software is automatically ready to air in the main server system. Regardless of where material is cut, news managers can screen all material prior to air, from any ClipEdit terminal.

NewsBase Select™ Systems

Configuring a NewsBase system is not a science project. Sony can simplify the process with its Select Systems service.

The concept of the Sony Select System is simple: take the complexity out of purchasing and installing the highly sophisticated NewsBase production system. Sony minimizes the costs of up-front engineering and system integration, and takes responsibility for installing, testing and commissioning the new system.

Everything about the system is pre-planned. Customers select the basic system size and consider several optional features. Racks are pre-designed. Software is pre-loaded. The system is pre-assembled and pre-checked by Sony engineers in the company's own state-of-the-art systems integration facility. Then, it is installed on the customer's premises and checked again. Sony provides convenient I/O panels to easily connect the NewsBase system with the existing station router, news editors, and newsroom LAN.

Sony does everything necessary to ensure that the system is up and running quickly, easily and on schedule. This commitment includes on-site operator training, plus a full year subscription to Sony's SupportNet™ 24-hour customer support.

Typical configuration options are listed in the accompanying table above.

5 in/out ports	6 ports	8 ports	16 ports
23 hours on-line storage	23 hours on-line storage	23 hours on-line storage	46 hours on-line storage
Filing, on-air, and material management user applications All NewsBase hardware and software All ClipServer/ClipEdit software Newsroom text system interface On-site commissioning and training One year 24 x 7 SupportNet service coverage			

NewsBase options and capabilities. Larger systems can be configured to meet specific needs as custom system integration projects.

Here's an example of cutting a VO for the five and a package for the six o'clock news.

NewsBase: On the Air Around the World

NewsBase systems have been selected by many U.S. and worldwide customers. Systems marked with † are being installed or are soon to be installed.

WSB Atlanta
Texas News Channel
Texas Cable News
KHON Honolulu
Times Square Studios Ltd. New York
WXMI Grand Rapids
KDAF Dallas
KSWB San Diego
Turner Sports, Atlanta†
WPIX New York†
KTLA Los Angeles†
WGN Chicago†
CLTV Chicago†
KWGN Denver†
TV Globo, Brazil
Televisa, Mexico
Reuters, UK
RAI, Italy
TeleMadrid, Spain
SF-DRS, Switzerland
VRT, Belgium†
Canal+, France†
Fuji TV, Japan
NHK-1, Japan
Iwate Asahi, Japan
TV Asahi, Japan
SME, Japan

For more information, contact your Sony Account Manager:

NORTHEAST REGION
123 West Tryon Avenue
Teaneck, New Jersey 07666
(201) 833-5200

MID-ATLANTIC BRANCH
9901 Business Parkway
Lanham, Maryland 20706
(301) 577-4850

SOUTHEAST REGION
3175A Northwoods Parkway
Norcross, Georgia 30071
(770) 263-9888

MIDWEST REGION
1200 N. Arlington Heights Road
Itasca, Illinois 60143
(630) 773-6000

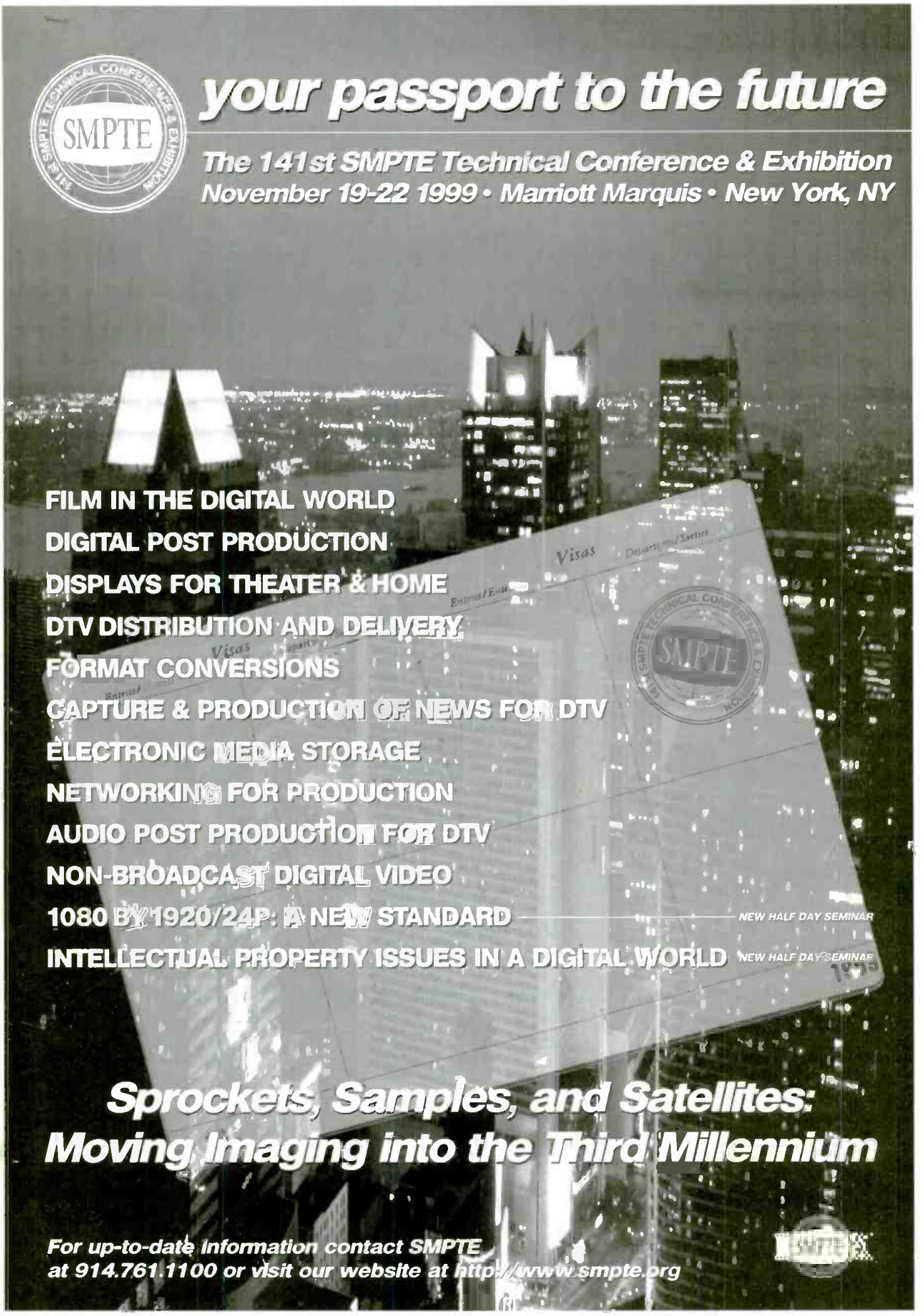
SOUTHWEST REGION
8400 Esters Boulevard, Suite 500
Irving, Texas 75063-2214
(972) 915-3100

WEST REGION
10833 Valley View Street
Cypress, California 90630
(714) 220-9100

SONY SYSTEMS INTEGRATION CENTER
3300 Zanker Road
San Jose, California 95134
(408) 432-1600
www.sony.com/newsroom

SONY

Visit us at RTNDA Booth #563



SYSTEM DESIGN SHOWCASE

TXCN goes digital

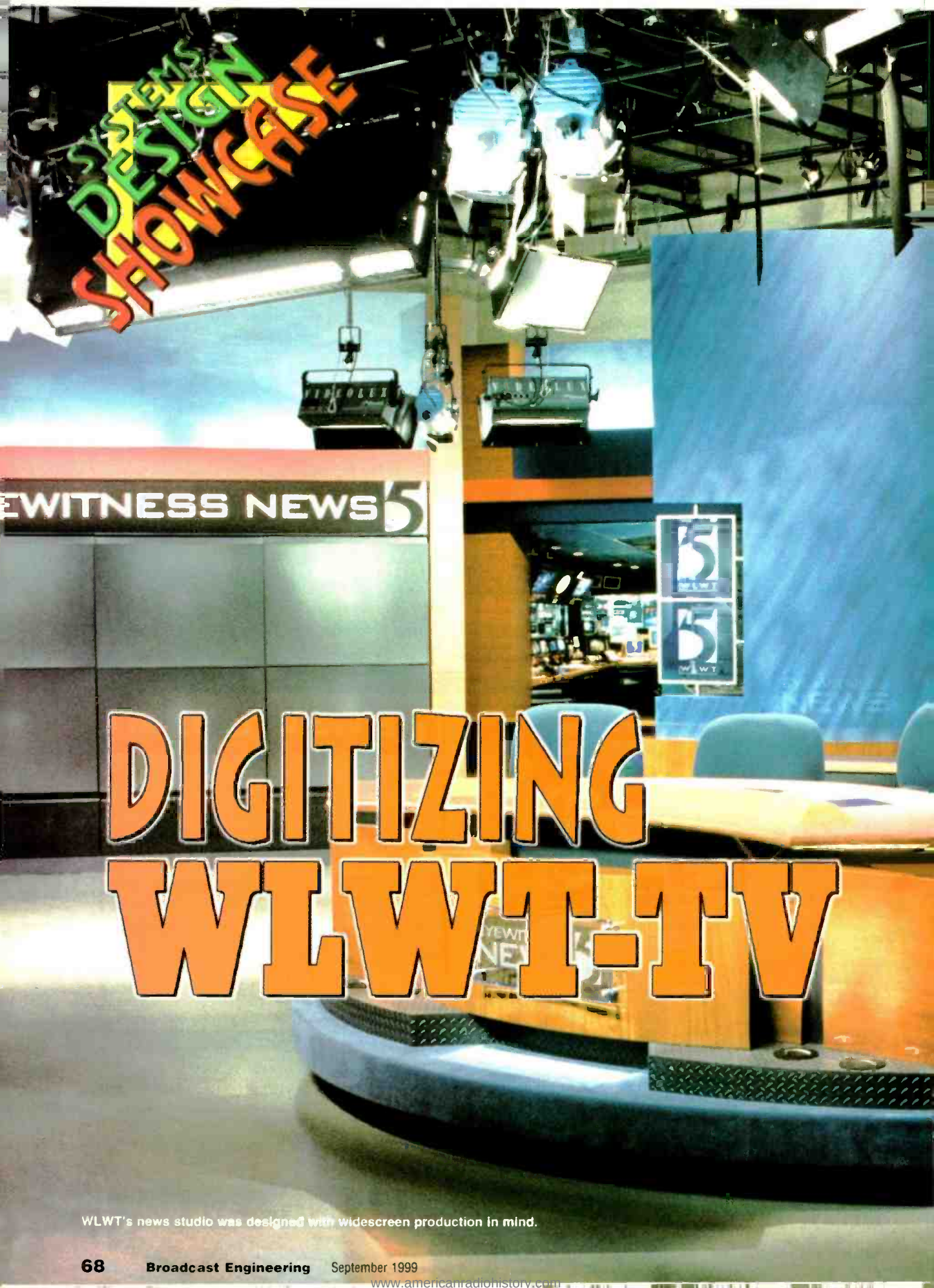
Texas Cable News' digital newsroom provides 24-hour statewide news-on-demand with the help of Sony's MAV-1000 servers, DNE-700 nonlinear editors, Avid News and Sony DVS-V6464B digital routing switchers. Photo by Concept Benson & Rice.

By Tom Matasso

TXCN (Texas Cable News) in Dallas is one of the first news operations in the country to adopt server-based digital technology through out the entire production and broadcast process.

Drawing upon resources of the four Texas stations owned by the Belo Corporation, as well as satellite feeds from major networks and TXCN's in-house production facilities, the station provides state-wide news, weather and business reports of interest to local and state viewers around-the-clock, seven days a week.

At the hub of TXCN's operation is Sony's NewsBase news production system. Thanks to the flexibility of its central MAV-1000 server and software, the station doesn't record complete half-hour news shows. Instead, segments are recorded that make up shows, which allow updating as necessary. That way the content of an individual story



DIGITIZING WLWT-TV

WLWT's news studio was designed with widescreen production in mind.

By John Duggin Sr.

WLWT, Channel 5 in Cincinnati, is one of the most historic TV stations in the U.S., emanating from the golden days of radio. WLWT's first owner, The Crosley Broadcasting Company, was a prolific producer of live local programming through the 1950s, 1960s and 1970s.

DIGITIZING WLWT-TV

ing and stays digital until it arrives at the analog transmitter. The terminal equipment chosen to execute these conversions includes Leitch's 6800 series and Digital's DPS-470. With this equipment, the station's outside analog sources (NBC, news feeds, satellite feeds of syndicated product, etc.) are brought into the plant and concurrently synchronized to the WLWT plant, converted to digital and put as a source on the Philips 360Mb/s router.

WLWT selected Panasonic DVCPRO as its digital videotape format, using DVCPRO-25 for newsgathering and editing and DVCPRO -50 for program store-and-forward, production and promotions production. The decision on newsgathering equipment was made after several months of comparing DVCPRO equipment to the station's existing Beta SP equipment. Key criteria included picture quality and signal durability during the news transmission and editing process, equipment durability, small tape size and the desire of the news shooters for a physically smaller format.

The Philips Diamond Digital switcher, Pinnacle Devious DVE and still store expedite newscast production, long WLWT's market forte.

Decisions on lighting, look, and investment in new newsroom camera equipment involved several factors. DST assisted with the technical aspects of achieving a cost effective, yet high-end look, by providing an energy-saving Strand-Century lighting system. The system combines quartz key and cold cathode flat fixtures, providing the best available look for station news talent while minimizing the heat generated in the studio; consequently, the air conditioning energy bills are lower. The long life of the cold-cathode bulbs is also a plus.

While the station did not invest in expensive, high-definition cameras to prepare for HD format, WLWT did consider widescreen format in its newsroom studio design. WLWT can easily make the transition to future formats without having to remodel its facility extensively.

Included in WLWT's rack room are Panasonic DVCPRO decks for recording and playback tasks.

Staging

After configuring and planning the entire technical basis and equipment components of station operations, DST took the paper design, assembling and evaluating them at its own facility. By recreating WLWT's rack room, DST evaluated the wiring layout and tested the system. Changes and testing occurred before installation at the new facility. DST built each island on palettes and shipped them to the station.

Prebuilding the station's custom islands simplified the moving schedule and eased the transition to the new facility. It not only helped in the installation by preestablishing the exact floor plan, but freed up workspace at the new facility as workers scrambled around during final stages of completion.

The completed WLWT facility is the final step in making a full transition to digital. WLWT purchased and installed an Itelco T603WN 7.5kW solid-state UHF DTV transmitter in early 1998. WLWT-DT began transmissions last February on channel 35. An SD digital signal has also been transmitted since early February 1998, using the Philips TokenMux encoder to drive the transmitter. This transmission provides an ERP of approximately 65kW (average, maximum main-lobe) effective radiated power from the existing WLWT tower.

In its conversion and upgrade to DTV, WLWT worked carefully with DST to design and implement a configuration that would embrace any of the possible format combinations at minimal cost. Issues of intermixing picture format at the time of transmission are yet to be resolved by any network, broadcaster, equipment integrator or equipment manufacturer. However, WLWT prepared itself for online by integrating the most appropriate tools and is in place to be in the forefront of U.S. DTV stations. ■

John Duggin Sr. is president of Digital System Technology.

Design team, WLWT

John Duggin Sr., DST president
Dwight Crumb, DST design engineer
Janet Crumb, DST project coordinator
Richard Lohmueller, WLWT design engineer
Cindy Hutter, WLWT design engineer
Martin Faubell, Hearst-Argyle representative
Jerry Dixon, Hearst-Argyle representative

Equipment list

Ikegami monitors
Telex/RTS intercom
Louth automation
Wheatstone TVS 1000 audio console
Philips DD30 production switcher, Saturn master control, Venus routing switcher, Media Pool
Tektronix test and measurement
Chyron iNFiNiT!
Leitch terminal equipment
Miranda terminal equipment
DPS 465 frame synchronizers
Snell & Wilcox HD upconverter
Panasonic DVCPRO studio decks
ADC patchbays
Pinnacle DVE

Serial Digital Component
AV Synchronizers
& Remotes

Slow Motion
Instant Replay
Systems

The DPS Digital Universe

Non-Linear Editing,
Animation &
Compositing

Modular Products

TBCs & Transcoders

From Post To Broadcast DPS Has the Digital Video Tools You Need

For performance, features and value, DPS leads the pack. We offer the industry's widest assortment of TBCs and synchronizers, including the immensely popular "everything in and everything out" DPS-470AV, the preferred choice of networks, broadcasters and mobile operators.

DPS non-linear editing and animation products, available as card-based or turnkey systems, are second to none. Other products include our incredibly affordable DPS Whiplash slow motion system, remote controls and test equipment.

For complete details, visit DPS online or call 800-775-3314.

Our Full Line Catalog is yours for the asking. Order online or call 800-775-3314

DPS™

www.dps.com

Transmission & Distribution

Winterizing the antenna site

BY DON MARKLEY

Before the nastiest of the nasty weather arrives, it would behoove one to visit the tower and associated goodies again. First, it is a nice place to go to get away from the telephone and, second, there are some things that need to be checked while work can still be reasonably done. The most obvious is the coolant for those who have liquid cooled systems. While it is probably checked regularly and tested semiregularly, it can always benefit from one more careful check before facing the possibility of freezing. Verify there is an adequate supply of the chemicals of choice (for the transmitter, not the staff) on hand to cope with any unexpected catastrophic leaks. Check the pumps again, along with any associated filters for both liquid and air and, again, check for spares.

De-icer checks

Now, on to the fun stuff. Many stations have antennas equipped with de-icers. Somewhere, there should be a record of the line current when the de-icers are energized. The de-icers should be turned on and the currents remeasured to ensure that all elements are somewhat intact and working. If no data is available, a check by your tower crew du jour would be in order. This should be accompanied by current measurements to establish the correct values. Of course, the tower crews can only do this when the antennas are turned off to avoid violating a whole bunch of FCC and OSHA standards. Any tower man worth his belt can quickly determine if a heater is working by a simple touch.

At the same time, a good check of the overall physical condition of the tower is in order. One last check now can avoid nasty work when the temperatures are unpleasant, as well as that situation's attendant higher service rate.

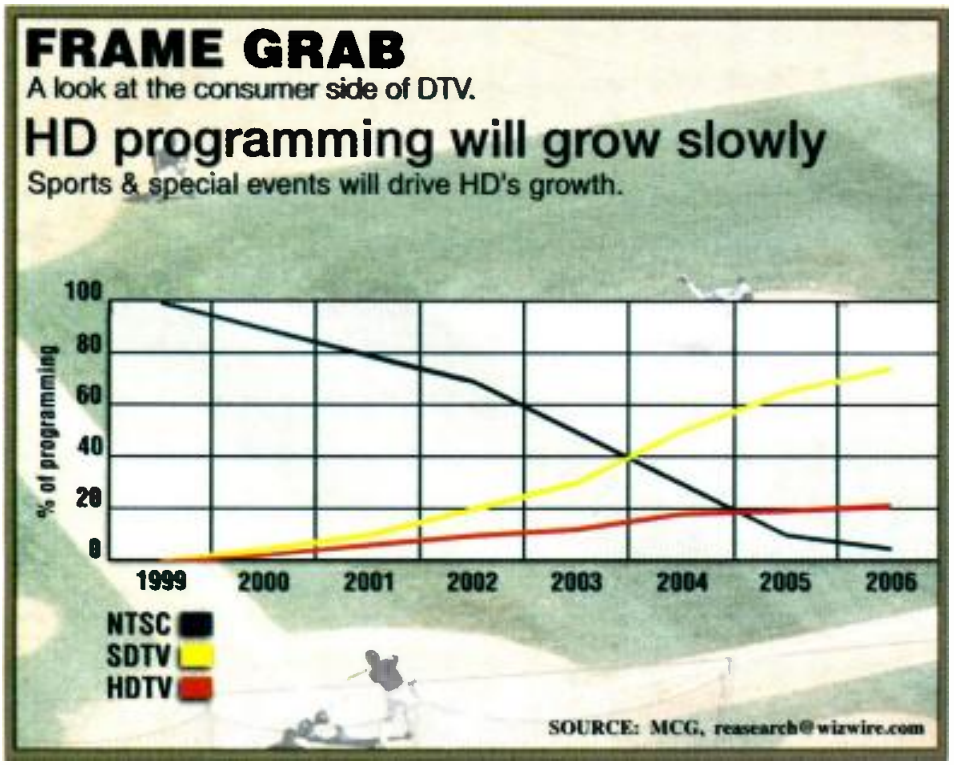
A wide crack indicates the existence of a real structural problem that the average station engineer is totally incapable of dealing with.

Particular attention should be given to dish alignment and mechanical condition prior to the high winds that accompany winter storms.

Back to the de-icers. A clip-on ammeter will yield an accurate check of each phase current to the elements. Besides, ammeters are fun to use because you are measuring variables that can be understood in real terms rather than the more exotic values used in solid state electronics. If the station has an automatic system to energize the heaters, they probably don't work given today's state of maintenance. Heaters can be a little tricky to test because one can't easily supply a source of freezing rain. This might be a good time to drag out the instruction book and review the testing procedures.

Tubular troubles

One little characteristic of some towers can present a nasty surprise. On towers with tubular steel legs, some manufacturers used bolt plates that are open in the middle, causing a very tall open area to exist inside each leg for the full length of the tower. Over the years, condensation causes water to form inside the legs, which will, naturally, accumulate at the bottom. On such towers, a weep hole is provided through the



Finally a digital news solution tuned for hard news.

We won't tell you how fast you need to be. You know. But you may not know about Vibrint's digital news production system which combines the speed of your current tape-based system with the power, flexibility and openness of computer technology.

The fastest turnaround you've ever seen. With Vibrint FeedClip,™ you can record news feeds to disk and play trimmed clips directly to air. No tapes. No sprinting to the edit bay. You don't even have to baby sit the feed to catch all of the action.

As easy as tape-to-tape. You can also edit your clips into stories with Vibrint NewsEdit,™ the only editor designed to replace the record deck in cuts-only edit bays. NewsEdit provides the speed and functionality of deck-to-deck editing, with the flexibility of non-linear. When the edit is done, play back stories instantly from the Vibrint server platform under local control or linked to your Newsroom Automation System.

Integrated. Open. Standards-based. For a complete system, tie FeedClip, NewsEdit and the Server Platform together. Vibrint takes advantage of Pentium II processors, the Microsoft Windows® NT file system, off-the-shelf networking and storage, and MPEG2 media.

Priced like a tape deck. The best part. Vibrint's digital news production platform is modular and priced right. In fact, the cost of one server and application is about the same as a record deck. Buy one now. Add more whenever you like.

Visit www.vibrint.com and request a copy of our free white paper: *Cost-Effective Alternatives for Workgroup Centered News Production*

Isn't this what you've been waiting for?

1 - 8 7 7 - 8 4 2 - 7 4 6 8

vibrint

Tuned for news.

Circle (137) on Free Info Card

steel at the bottom of each leg to allow such moisture to drain out. The hole can be plugged by bug nests or by an accumulation of rust. If this happens, the water will freeze when the weather gets cold and split the steel tubing like a cheap pair of size small pantyhose on an extra large leg. The solution is quite simple: regularly clean the weep holes with a piece of wire so they can drain freely.

If such a leg split does occur, it does not necessarily mean total ruin. The split may appear as a very narrow crack, looking almost like a hairline running down the leg. In such a case, get a structural engineer to direct the welding of a reinforcing piece over the split. If the crack is gaping wide, run. A wide crack indicates the existence of a real structural problem that the average station engineer is totally incapable of dealing with. Structural work, including immediate action to reduce the loads on the leg is in order and must be done as soon as possible. Otherwise, there is a definite risk of tower failure. Explain that one to the front office.

Obviously, if your tower uses solid steel legs, the problem won't exist. Another problem with hollow steel legs is that they can rust out from the inside. Most reputable manufacturers galvanize both the inside and outside of the legs. However, in years gone by, that was not always the case. Some manufacturers plugged the ends of the legs before they went to galvanizing to save material. While the legs may not be open all the way to accumulate sufficient water for splitting, they will rust away at a significant rate. The first indication of this can be the appearance of holes, usually at points where welding may have reduced the thickness of the steel slightly. This should be checked carefully. Unfortunately, the fix for the problem is not simple or cheap. If the legs are rusting out from the inside, it's time for total replacement. Again, a planned voluntary replacement is vastly preferable to the alternative.

In addition to the tower, there are numerous other items such as outdoor heat exchangers, generators and the generator's fuel supply that all need to be readied for the cold weather ahead.

If rusting is encountered, an experienced structural engineer should immediately evaluate it. He should be able to determine the urgency of required replacement. This problem is most common in the areas where there is a lot of moisture in the air, such as on the coasts, but can occur in dry areas as well. It is much nicer, although more difficult, to find this problem while the tower is in its normal position, rather than inspecting the tower sections after they have come into the transmitter building to get out of the weather. ■

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

SEND Send questions and comments to: don_markley@intertec.com

you can mix apples & oranges

Drawing on over 15 years experience, Tadiran Scopus maximizes your digital TV broadcasting applications by bringing you cutting edge video compression, meeting MPEG-2 and DVB standards. We deliver seamless convergence, integrating video, audio and data capabilities, while maintaining the performance integrity of each technology. Our expertise and flexibility have made us a world leader.

When you need a professional end-to-end tailored solution, with Tadiran Scopus you get the mix that brings a smile to your face and expands your possibilities.

Isn't it time we talked about affordable convergence?

Next Generation Video Compression Solutions

TADIRAN SCOPUS

Tadiran Scopus Ltd. - Headquarters
P.O.Box 267, Holon 58102, Israel
Tel: +972-3-5576200, Fax: +972-3-5576249
Email: info@scopus.co.il, Web: www.scopus.co.il

Tadiran Scopus - USA
12265 World Trade Drive, Suite G
San Diego, CA. 92128
Tel: (858) 618-1600, Fax: (858) 618-1615
Email: info@scopususa.com, Web: www.scopususa.com

See us at: ib '99
Booth No. 1.239

Circle (138) on Free Info Card

Recording in stereo with a single microphone

BY ALLAN SOIFER

Much has been written about stereo microphone techniques. It seems that every generation of engineers and producers brings about some form of change – usually a repeat of or slight modification to existing methods. However, the live recording (in stereo) of classical music presents some interesting challenges. Ottawa recently hosted the annual Ottawa Chamber Music Festival, the largest of its kind in the world. The goal was to capture a number of performances for archival purposes and to enable the players, producers and technicians to fine tune their styles toward successful broadcasts of the event on TV, radio and the Internet.

The festival hosted a variety of chamber music styles, from amplified avant-garde groups to traditional ensembles. In all of these concerts, the intent was to be as unobtrusive (both aurally and visually) as possible and to capture as much of the live essence of the concert as technology permits without resorting to multimic and multitrack techniques. Ultimately, the varying venues, mostly church halls and sanctuaries with lots of reverberant ambience narrowed choices of recording styles to coincidence stereo technique.

The festival presented several unusual scenarios. Not only were the musicians spread widely on stage, but several pieces during a particular concert also required playback support loud enough to impact upon the audience but not so loud as to overpower the live players. The solution was to use a single, coincident stereo condenser mic (M-S format) positioned somewhat nearer to the musicians, and use amplified tripod-mounted loudspeakers for the playback. The speakers were positioned in such a way as to play off the bounce of the walls of the concert hall.

The classic problem with multimic placement for stereo broadcasting (A-B, ORTF and the like) is the phase imbalance (flanging and cancellation effect) when the signal is received in mono format. Too many mics equal lots of panpots and too much twiddling for the engineer — who is generally not a classical musician with full understanding of the composer's orchestral intent. The coincidence stereo technique relies on two microphone *capsules* that are placed in or very near the same point, eliminating the phase relationship problems. The best known examples of this method are X-Y stereo, M-S stereo and Blumlein stereo. The X-Y method is difficult because two identically matched cardioid mics must be used with a specialized mechanical mounting bar. One variation on X-Y, which requires the necessary height for rigging, is to place two small lapel-type condenser mics 12-15 inches apart and 15 feet above the musicians.

Blumlein stereo uses two bidirectional mics, which unfortunately includes a great deal of room ambience — not at all suitable for this project. The M-S method uses one mic body, with a first-order cardioid capsule facing front, and a bidirectional capsule oriented 90°, looking left and right immediately behind. The extreme proximity of the two transducers negates any time/phase differences. This type of mic uses a matrix, either transformer, internal summing amps or both, to create a stereo signal (front plus side = left, front minus side = right).

The matrix makes use of the phase cues between the center and the surround mic capsules to produce broadcast-suitable stereo, which is fully mono-compatible. This matrix technique is popular when recording live dialogue for sitcoms and dramas, so that mono reproduction can be had for both editing purposes and to avoid alienating viewers who do not have stereo TV reception available.

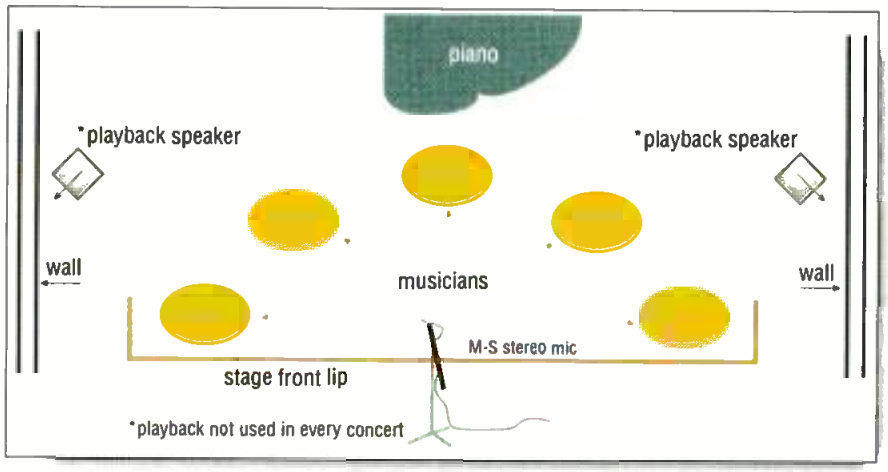


Figure 1. The M-S microphone positioning method places a single condenser mic close to and above the musicians. Where needed, playback support can be gained by using loudspeakers angled so that the sound bounces off the venue walls.

Figure 1 shows a typical ensemble on a church platform about two feet above the floor. The M-S mic was boomstand mounted with an appropriate shock mount for isolation. The approximate positioning was three to five feet in front of the most forward-sitting musician, and about three feet overhead, looking down at about 45°, pointing toward the midpoint of the arc. The exact centering of the mic was determined by which instruments were being used. The M-S technique provided excellent room tone and audience response, and good levels without sacrificing correct orchestral (aural) placement.

The resulting sound (captured in RDAT format) was warm, airy and very lifelike in the playback. Multimic technique is fine for the studio or where there is an experienced conductor or leader who can make subjective judgments regarding balance and aural imaging. The purist approach of one stereo mic sometimes proves more worthy than a more intensive hands-on approach. ■

Allan Soifer is an independent audio recording engineer in Nepean, Ontario, Canada.

When your audio project list is growing,
but your rack space and budget are shrinking,

Merlin® has it all in 1 rack unit for under $3,000.

Yes, you can believe your eyes! Merlin™ works like magic in ANY audio facility, allowing you to perform complicated tricks with simplicity you never thought possible. At a price you never thought you'd see. Merlin can be configured with up to 4 inputs and 8 outputs, analog or AES-EBU digital, or a combination. The base unit's built-in DSP power gives you the ultimate in flexibility. The included VUE-IT software gives you immediate access to any of the above functions in a wide variety of combinations with on-screen controls that are instantly familiar to any audio operator. Quick! Need a 60 Hz notch filter? Touch a button and, presto, you've got it.

Merlin gives you the power to do it all with:
User selectable presets · 107dB of dynamic range · 48 kHz · 24-bit sampling · AES-EBU and analog i/o

For the ultimate solution that fits within your racks and your budget, just say the magic word: MERLIN.

For more information call 1-800-234-6831 or visit our web site at www.eviaudio.com/merlin

Circle (141) on Free Info Card

Digital audio solutions

Audio processing for TV 82

Jitter in digital audio systems 86

Understanding Dolby E 90

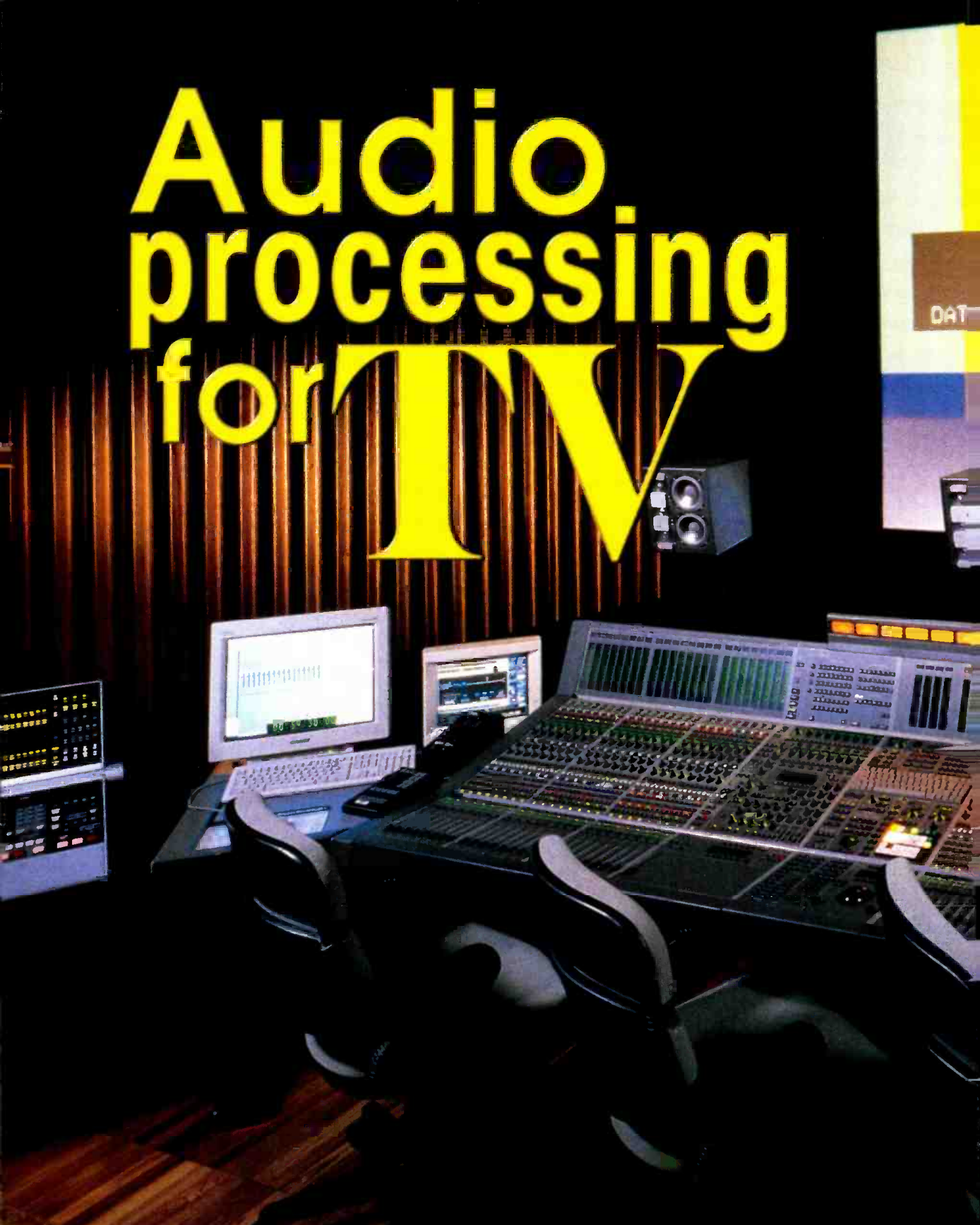
ALSO:

Newsroom automation 94

Graphics in post 100

Gamut: An old problem with several new faces 106

Audio processing for TV



The Arena (or Studio A), one of Burbank, CA-based Enterprise Post's 5.1 rooms, is equipped for television, film and video post mixing. The multistage control room is 5.1 THX certified and features a Neve Capricorn console, high-resolution Barco line-doubled video projection, and M&K 5.1 monitoring. Photo courtesy M&K Professional.

By Robert Orban

With the assistance of Dolby Laboratories, Orban has developed a unique and effective approach to audio processing in a DTV plant. This new system will ease the integration of local and network two-channel programming, and fully exploit the extra features offered by the Dolby Digital (AC-3) system for 5.1-channel programming.

There are three important pieces of metadata in the AC-3 bitstream:

- Dialog normalization, which, in essence, sets the receiver's volume control to complement the dynamic range of the program material being transmitted.
- Line-mode dynamic range control, which allows the receiver to perform a wideband compression function if the listener chooses.
- RF-mode dynamic range control, which applies heavier processing.

The question that arises is how are these signals to be generated in a real-world operational facility, and, indeed, in which situations should they be generated.

The marketing landscape is littered with features that seemed to be a good idea at the time but proved to be of little or no interest to consumers. CDs have always offered the ability to deliver auxiliary data. According to the original CD hype, consumers were supposed to see the lyrics of the songs scroll by as they played them and they would see still pictures of the band members by connecting their CD player to their television set. Where are these features now? The answer, of course, is that the public did not find them compelling enough to justify the additional production expense to add them to the CD datastream or to justify the increase in manufacturing cost necessary to add video outputs or LCD screens to the CD players.

Another example is the SAP channel in BTSC stereo television. Very few viewers understand it, yet a number of them manage to turn it on by accident. They then can't understand why the sound becomes low-fidelity mono — and why everyone suddenly speaks Spanish. Consequently, many consumer manufacturers bury the SAP control very deep in the menu structure of receivers or VCRs to prevent this confusion from occurring in the future.

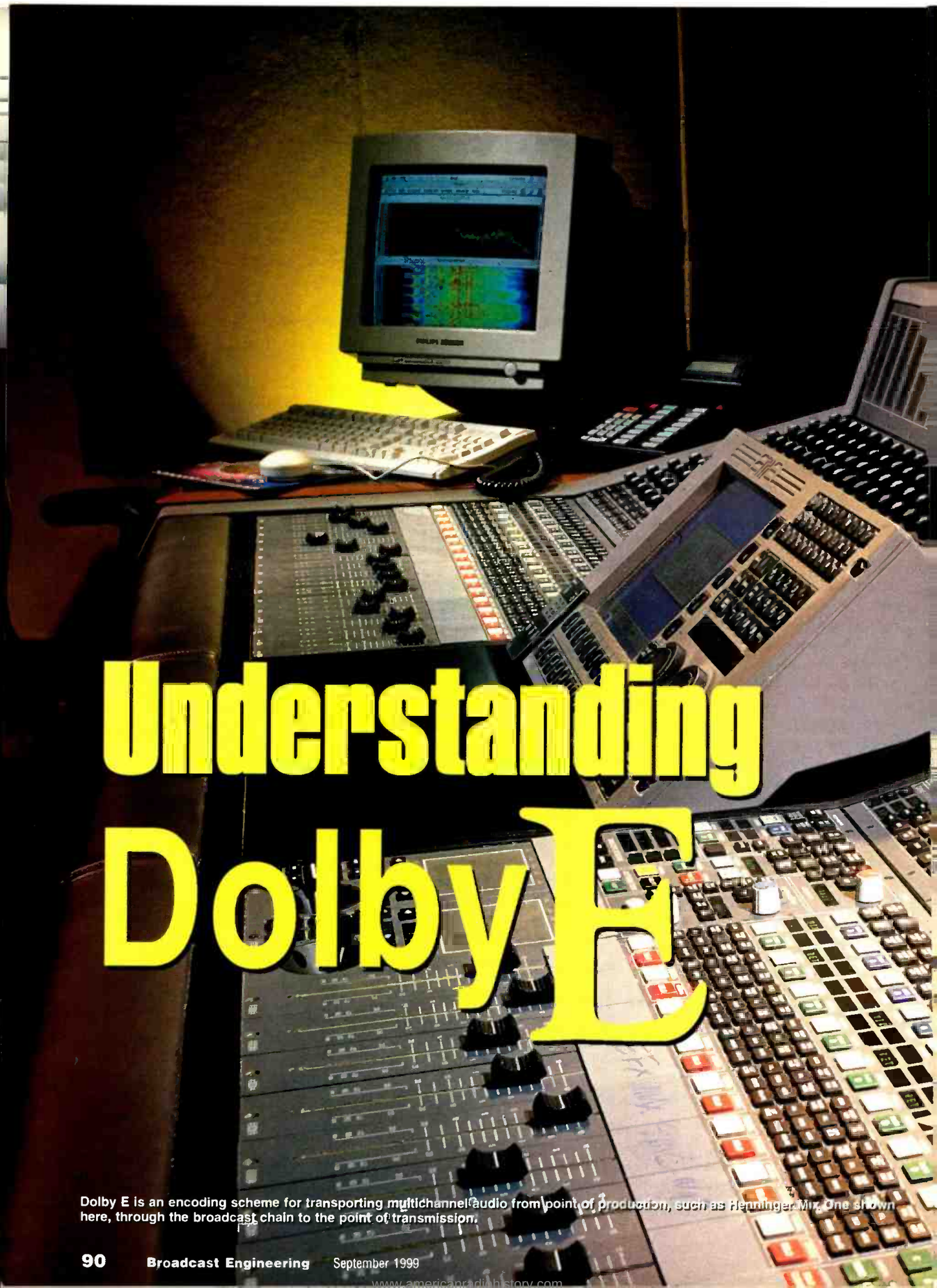
With regard to the Dolby Digital metadata, Dolby Laboratories specified that dynamic range compression would be the receiver default, because they realized that most consumers would never want full dynamic range audio. Dolby did leave the option for this default to be modified by those who do desire full dynamic range.

Experience shows that a vast majority of viewers want two things. First, dialog should be comfortably intelligible, and second, commercials should not be irritatingly loud in comparison to program material.

Home theater owners may want the opportunity to watch feature films while hearing a wide dynamic range signal. However, even these viewers usually consume television in a much more passive way when viewing garden-variety programs. If television is to be an acceptable part of the domestic environment, then sound cannot overwhelm nonviewing household members (not to mention neighbors, particularly in multifamily dwellings). For a variety of reasons, the dynamic range of sound essential to the intelligibility of the program should not exceed 15dB in a domestic listening environment. Underscoring and ambient sound effects will, of course, be lower than this.

September 1999 Broadcast Engineering

Understanding Dolby E



Dolby E is an encoding scheme for transporting multichannel audio from point of production, such as Henninger Mix One shown here, through the broadcast chain to the point of transmission.

By Stephen Lyman

The ATSC audio system allows listeners to tailor the presentation of the audio portion of a program to their specific requirements. Some may want to hear programs that originate as 5.1 channels in that format; others may want or be restricted to a stereo or even a mono presentation by their receivers or environment. Some listeners will want the full original dynamic range of the material; others will need a lower dynamic range version that does not disturb light sleepers.

The existing signal distribution infrastructure upstream of the transmitter does not meet the needs of a digital television broadcasting system. It would be very difficult to replace the existing two-channel audio infrastructure with a system that could handle the required number of channels and the metadata. It might be possible to enlarge an audio router, but other plant equipment cannot be expanded to handle the necessary six or eight audio channels and the metadata. The same applies to interfacility links because of limited spectrum availability or the cost of leased facilities.

Dolby E is a new multichannel audio bit rate reduction system that is designed to tolerate the multiple encoding and decoding operations required by contribution and distribution systems. It encodes up to eight audio channels plus the necessary metadata and inserts this information into the "payload space" of a single AES digital audio pair. The metadata is multiplexed into the compressed audio stream; it stays in sync with the audio and can be switched with it. Because the AES/EBU protocol is used as the transport mechanism for the Dolby E encoded audio, digital VTRs, routing switchers, DAs and any other existing digital audio equipment from the point of production to the input of the Dolby Digital encoder at the transmitter can now handle multichannel programming.

Understanding Dolby E

Metadata parameters

Metadata (data about the data) is information that describes the audio program material. It is transmitted in the same transport stream as the audio program. It acts in combination with information provided by each listener, and allows individual receivers to produce the audio format each listener wants. The ATSC audio system is built around the metadata concept; without it the system cannot provide the listener with all the desired features.

The most obvious parameter is the channel count that enables custom downmixes. The Dialog Normalization (or dialnorm) parameter allows the receiver to present different programs to the listener at a uniform loudness level. Each program style, if not each program, has specific headroom requirements that dictate where in the available dynamic range the average loudness of the material falls. The receiver can use dialnorm to attenuate each program just enough to place the representative loudness level at (in the case of ATSC-compliant receivers) 31dB below the clipping level. Because only the level is changed, the original program dynamics are untouched.

The choice of program dynamics is also enabled by metadata. The system establishes a "dead band" around the average program loudness (as defined by the dialnorm value) where no gain processing is done. Levels above the deadband can be reduced, and those below it can be brought up independently. This process leaves the loudness of the most important parts of the program (usually the dialog) unaffected.

The production crew has controls over the dynamic range reduction process. They can select the "dynamic range profile" that gives the most artistically acceptable effect for a specific program, rather than relying on the processing applied by individual TV stations as is done today. The desired profile's name is included in the metadata carried through the contrihution and distribution system with the program.

Ideally, metadata would be created at the same place as the program material, and carried with the program through the extensive series of contribution and distribution circuits required by a typical broadcast system. The post-production stage is probably the most logical place to author the metadata because it is where most of the production value decisions are made. Figure 1 shows a device in the monitoring path that allows the operator to select various metadata parameter values, then emulates the effect of these values on the program.

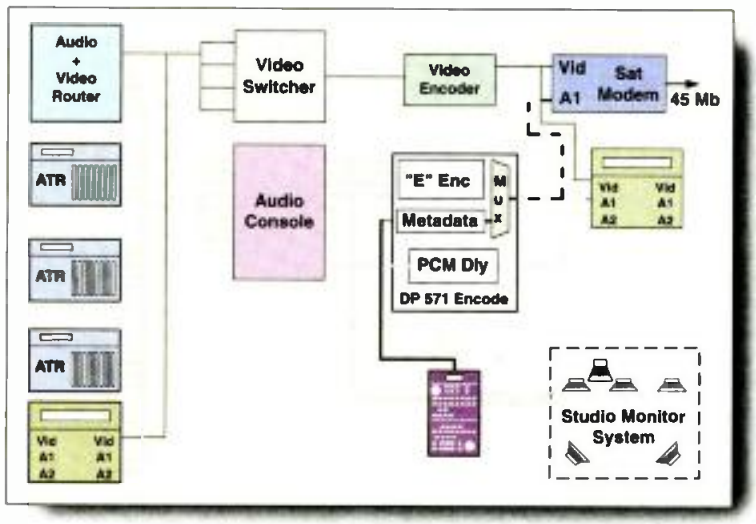


Figure 1. Dolby E allows post-production facilities to determine metadata parameters and encode and multiplex a 5.1 channel version of the audio program, Lt, Rt Dolby Surround versions, an NTSC version and metadata on one AES/EBU pair.

Program contribution and distribution

Post- production facilities have to find a new release format for finished HD multichannel programs. The facility shown in Figure 1 is effectively a sealed environment: Signals don't travel in and out of the facility as they do in a broadcast operation. Adding audio channels is more a matter of patching in additional machines, than providing additional incoming and outgoing links. The problem does appear when a multichannel audio program leaves a post house. The emergence of mezzanine-level video rate reduction codecs allows existing tape formats to carry HD material, thus providing a path for the video, hut the tape format itself is unchanged and limited to four audio channels (or two AES/EBU pairs). The Dolby E encoder shown within the post house facility encodes up to eight channels of audio and multiplexes the necessary metadata (one group of parameters per program) into the same data stream.

This can put a 5.1-channel program (with its metadata) plus an Lt, Rt Dolby Surround version of the program, with two programs worth of metadata, on two channels (or one AES/EBU pair) of the tape. The second AES/EBU track pair can be used to carry another Lt, Rt version of the program that has been created with the required dynamics for NTSC release. This is particularly convenient for stations that have no DTV service or digital infrastructure. They will be able to take the analog output of the NTSC track pair and operate as usual, hut, with the matrixed surround encoding, they will also be able to maintain a Surround presence in their markets. This multiservice release format is particularly well suited to advertisements and programs with high production values, as it allows program producers to tailor the audio to the intended service but uses only one common tape format to carry them all.

Switching, editing and delay

The most common operation in the contribution and distribution process is cutting from one program feed to another. Most cut transitions are made at the vertical interval switch point of the video signal because it is convenient to slave the audio switcher to the video switcher and because transition points can easily be labeled with video timecode. The same idea applies to insert or assemble edits done on tape. The Dolby E system aligns the blocks of rate reduced audio data with the vertical interval switching points, as shown in Figure 2. Switching transients are eliminated by the decoder, which makes short cross fades between the end of one block and the beginning of the next block of audio information. Because the switching point and video frame duration can vary with different video systems, the Dolby E encoder uses the video reference signal ("color black"

or its equivalent) of the video system associated with the audio to generate the clock and timing information it needs.

Figure 1 shows the signal prepared for NTSC service passing through a one-frame PCM Delay path in the Dolby E encoder. This is done to match the delay in the non-encoded PCM signal path to the encoding delay of the E encoder, so that all the audio signals on the tape are in sync. The individual blocks of Dolby E encoded material must start and stop on video frame boundaries to ensure that audio-follow-video edits do not corrupt the encoded audio data, so the Dolby E encoding delay has to be matched to the frame rate of the video system in use.

The encoded data is fed to the decoder in one-frame blocks. The Dolby E decoder also has a one-frame decoding delay. This is not as cumbersome as it first sounds. The HD video encoder shown in Figure 1 takes a variable number of frame periods, depending on the desired data rate, to encode a HD video signal. Because this takes at least one video frame period, the audio encoding and decoding delays will be matched by the delays in the video path. From a system's point of view, audio and video signals leaving a process should always be in sync with each other to avoid building up offsets.

Dolby Digital (or AC-3) codecs are not intended for contribution and distribution service because of their limited concatenation ability. Dolby Digital also has a longer encoding (about 180ms) and decoding (about 40ms) delay than Dolby E, complicating the system timing issues.

Professional metadata

Dolby E carries metadata in a multiplex with up to eight channels of audio. Any one of the eight channels, or any combination of up to eight channels can be defined as a program, and thus have a group of metadata parameters associated with it. Most of the metadata is used by the Dolby Digital decoder to tailor the audio presentation to listeners needs, and so is referred to as *consumer metadata*. Dolby E also carries *professional metadata* that is used to autoconfigure the codecs in the signal path downstream of the origination point. The broadcaster can use other parameters in the professional metadata to resynchronize, monitor and modify the level of decoded audio on a program-by-program basis. Professional metadata is never sent to the home DTV receiver.

SMPTE timecode, including the Drop Frame flag and user bits, is multiplexed into the data stream and recovered by the decoder. It time stamps the associated blocks of rate reduced audio, so it can be easily laid back in sync with the video signal. Decoders have a separate timecode output for the recovered signal to make it as simple as possible to integrate them with other systems.

Other information is included with the professional metadata, with a view to making the system easy to integrate. To avoid having to decode the Dolby E data stream just to drive a set of meters, individual channel level information is included with the professional metadata by the encoder. Measurements of the greatest peak level and of an RMS signal level of each channel are made over the entire encoded block. The amplitude resolution of the measurements is approximately 0.1dB. There is no attempt to provide a combined signal level for multichannel program groups.

Dolby E professional metadata also carries gain words that can instruct a decoder to change the level of a received signal. Each block of data carries two gain words, one applicable to the beginning of the block, and one that applies to the end of the block. If they are different, the decoder interpolates a linear ramp over the duration of the block (or over one frame of the associated video) to avoid "zipper noise" as the level changes. The gain range is from +6 dB to minus infinity and is applied to all channels in the program group equally. This provides a way to do V fades between program segments without losing a generation. Gain words within a few frames of the end of one program segment instruct the decoder to ramp the level of the program down to silence, the switcher cuts to the next program segment whose gain words cause the decoder to ramp the level back to unity during another few frames.

The transport mechanism

The AES/EBU signal consists of two subframes that start with a four-bit preamble or sync word and are followed by 24 bits of audio data payload space. The subframes end with four additional bits (one each for the Validity, Channel Status, User and Parity bits) with a total of 64 bits for both subframes. Using the first 20 MSBs of the audio payload space for Dolby E data works well, as this is the maximum number of bits that can be recorded on typical studio level digital VTRs. It also makes the Dolby E signal compatible with the rest of the digital audio equipment in the plant. It can be switched, recorded, edited (cuts and insert or assemble edits) just like any other digital audio signal, as long as some basic precautions are observed. The data must not be changed by any part of the system it passes through, as this would destroy the coded audio information (and the metadata). Changes that would cause problems include: changing the gain, truncating or dithering the data, cross fades at splice points (butt splices avoid this problem) and any sample rate converters in the signal path.

Dolby E audio coding thus provides a point of production to transmitter path for multichannel audio and the necessary metadata, using the same codecs operating at the same data rates throughout the system. ■

Steve Lyman is senior staff engineer for Dolby Laboratories, San Francisco.

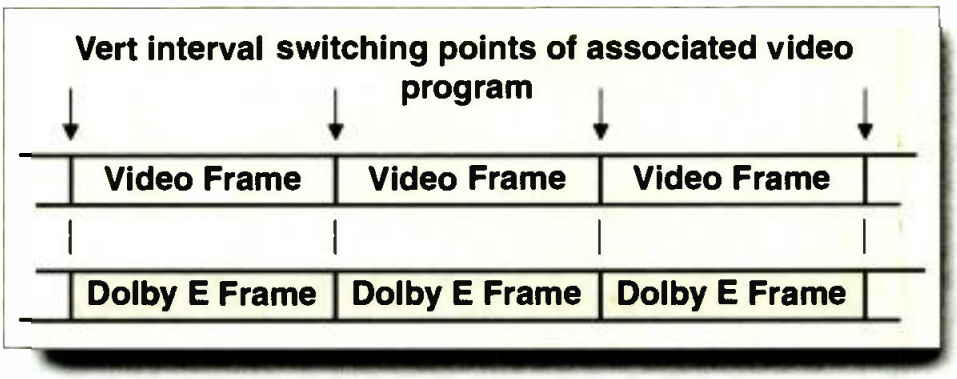
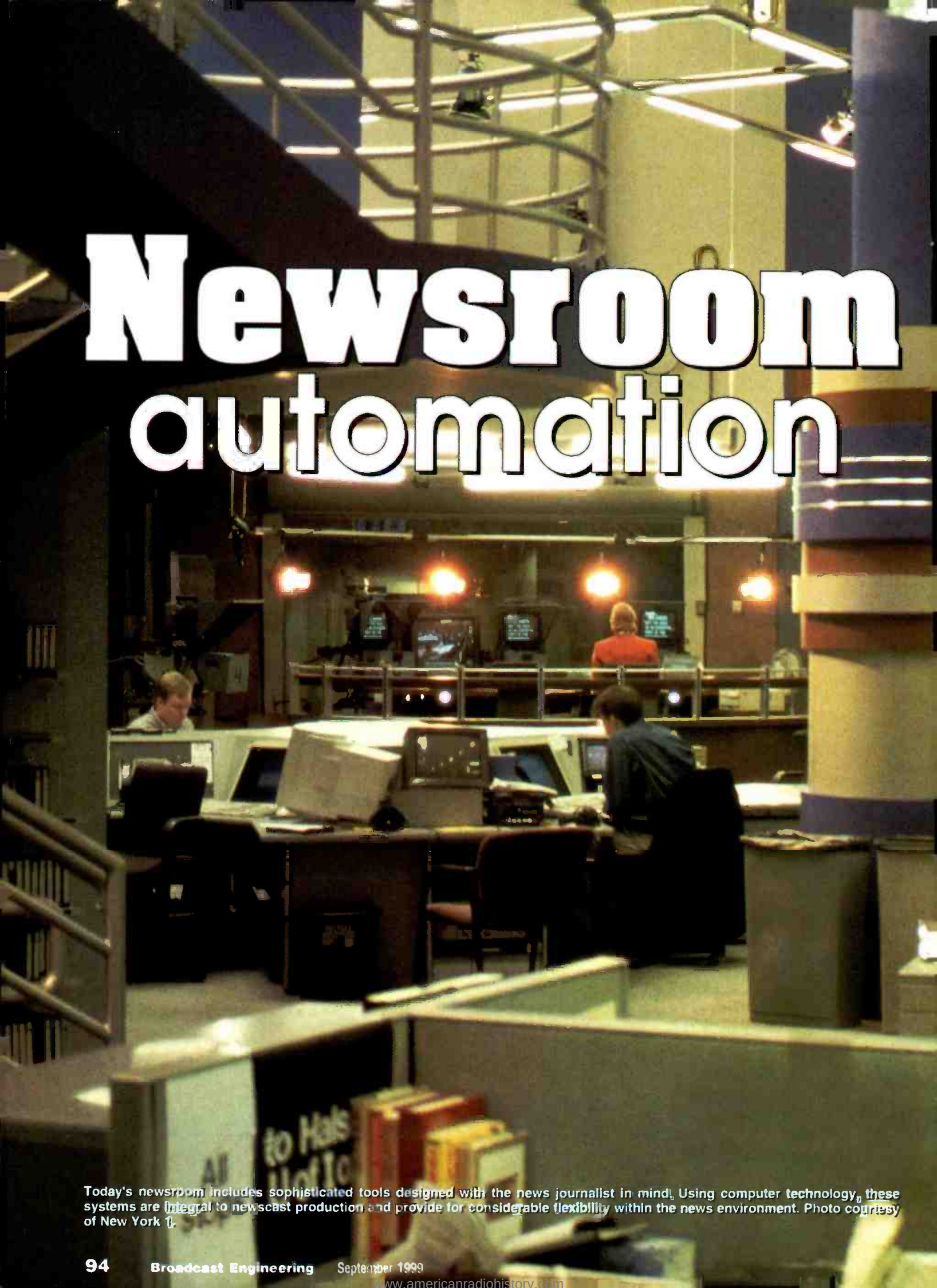


Figure 2. To prevent corruption of audio data during audio-follow-video edits, encoded blocks of audio data are aligned with the video's vertical interval switching points. During the decoding process, audio and decoding delays are aligned with video frame delays to ensure sync.

Newsroom automation



Today's newsroom includes sophisticated tools designed with the news journalist in mind. Using computer technology, these systems are integral to newscast production and provide for considerable flexibility within the news environment. Photo courtesy of New York 1.

By Dean Kolkey

Once upon a time, newsroom systems were simply scripting tools customized for television news. Today, these systems are more than just tools to organize and write a newscast. They can be complete automation systems capable of managing all the elements of a modern newscast.

Newsroom automation

Fully integrating the newsroom computer system with the newsroom automation system allows for the free flow of database information between the two applications. For example, the process of association can be simplified by having the newsroom computer system access the automation asset database and present the user with the current list of clips. After the user selects a clip its ID and timecodes can be automatically pushed into the newsroom computer database by the selection routines.

The association can be further aided if the production system includes a low-resolution proxy database. Lists of clips with displayed key frames can be presented to the user. The user can then verify a clip by viewing the MPEG copy before making a selection. Once selected, the clip information can be automatically moved from the automation system to the newsroom system database.

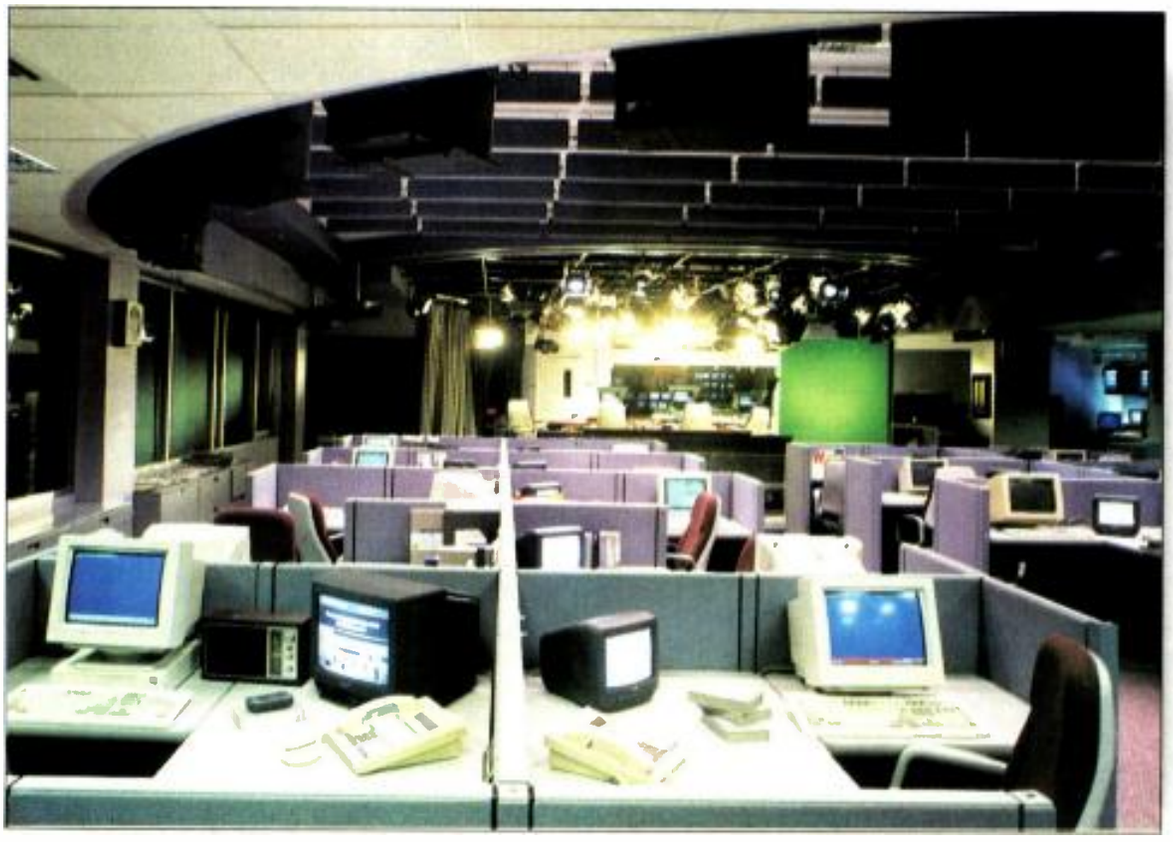
The second point of contact is where the program that controls clip playout monitors the newsroom rundown. It does so to detect story or run-order changes. This too can be aided by a single vendor level of integration. If the playout program is a component of the automation system, with native level access to the rundown database, responses are faster than an interface that communicates changes via a protocol.

With newsroom automation systems managing video and graphical assets as well as controlling the video production equipment, the production process changes.

Graphics production

Today's newsroom computer systems can also be integral in the production of graphics for air. This process includes importing graphics into the production system, capturing associated metadata and creating a low-resolution proxy of the graphical asset. Tools are provided to allow graphic artists to create standard templates that showcase the station's look. Specifying backgrounds and defining regions for the placement of text and graphics creates these templates.

A stand-alone application is then used to create full-screen templates with defined background and foreground regions. Each region can be designated for text or graphics input. The writer, while entering the script text, can then select a template, drag and drop graphics into place and add key text. On screen WYSIWYG previews of graphics and character keys can be viewed on the journalist's workstation using only standard PC hardware.



Older newsroom systems required a separate (typically RF) feed to route video to journalist workstations. Today, this can be done using high-speed networks and low-resolution MPEG encoders, saving space on desktops and increasing functionality. Photo courtesy The Systems Group.

While editing scripts in the newsroom computer system, writers may request a list of predefined templates. Once a template is selected, it is displayed. Users can add text to the appropriate areas. If a graphic region is selected, then the user is presented with a list of available pictures and is shown proxies. The key advantage to this approach is the ability to preview the final output on the journalist workstation. With this capability, users, within the newsroom

Advances in server technology, coupled with the evolution of newsroom systems, have removed the emphasis on the control room switchers and tape-based cart machines. Photo courtesy TV4.

computer system, may create their own graphics.

Evolution of the production process

With newsroom automation systems managing video and graphical assets as well as controlling the video production equipment, the production process changes. In traditional news production, much of the focus was on control room switcher.

Today, playout of news material from video servers can be done using the functionality once provided by tape-based cart machines. In the server, multiple channels should be loaded with the next clips in sequence. The technical director can manually roll clips as needed. Channels can be played, stopped, recued or ejected. The virtually instantaneous load and cue time of video servers allows for up to the second run order changes. While cart machines could take 30-45 seconds to adjust to changes, a newsroom automation system with a video server can typically react within five seconds.

In an alternate production model, almost all material is prerecorded. Instead of recording segments or even whole shows, each story is recorded as multiple elements. The introduction to the story is a separate clip from the story itself. This gives broadcasters the cost savings of producing a story once but using it many times. Because everything is a distinct element, the rundown can be shuffled from show to show making each show appear unique, even though it contains old material. If stories become out of date, they can be updated or simply replaced.

Use of this model has allowed some 24-hour news operations to staff their entire facility for round-the-clock operation at a manpower level comparable to that required by a single show produced at a major market network affiliate. This model creates an opportunity for today's local stations. During those periods the station is not broadcasting in high definition, an all news channel can be created using local content. A secondary revenue stream can be created through the modest incremental investment of a video server to contain the playout inventory.

Because everything is a distinct element, the rundown can be shuffled from show to show making each show appear unique, even though it contains old material.

Since the station already has the control room, talent, writers, material and video production equipment, creation of an all news channel requires only a modest additional investment. ■

Dean Kolkey is a founder of NewsMaker systems, Agoura Hills, CA, a member of the Nexus-Informatics ASA Group.

Graphics in post

Henninger has networked its facilities to allow designers to pass files between suites and even facilities to meet client needs. Photo courtesy Henninger.

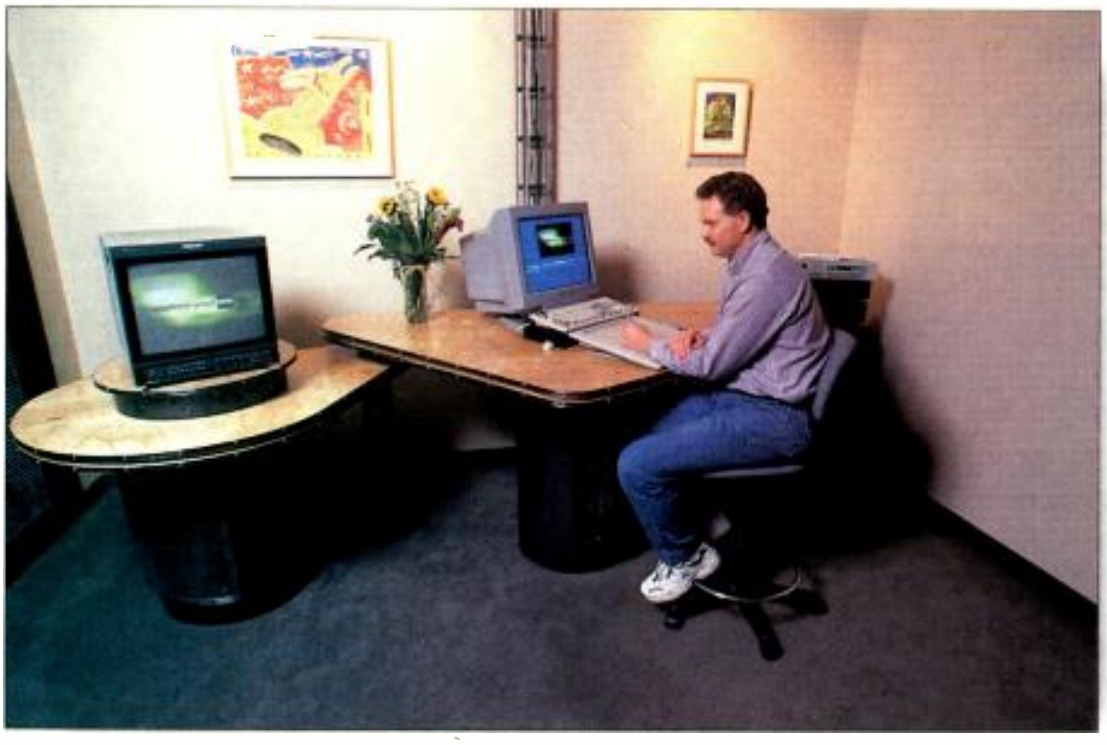
By Steve Wiedemann

While the digital age has had a far ranging impact on all aspects of production, perhaps its greatest impact has been on graphics. Exploding demand for new tools of the trade make being at the forefront of graphics technology central to the success of companies in the post production business.

Graphics in post

graphics into projects. They can create the material and then post it on Henninger's FTP site in a password-protected area, allowing Henninger to download that material at any of its sites to begin to incorporate them into the project.

Networking also provides an ability to accommodate clients' schedules, even if the primary facility they work with is booked. For example, if the Richmond facility's Flame suites are fully booked, the project can easily be sent over the network to another Flame at another facility.



The popularity of Henninger's Flame suites makes it necessary to schedule smaller jobs to other resources. The facility's cross-platform capabilities make this technically and economically feasible.

Scheduling can be completely online, allowing account reps can see what is happening in rooms over the entire five site operation.

Keeping up with the technology and the network that connects it, allows the use a wide array of tools in completing projects in the right room, at the right price, in the right time frame. A full array of all of graphics capabilities is available to clients, no matter what location they choose to work in.

Good communication

Because projects often are worked on in disparate parts of the company, a password-protected area of its website provides easy-to-use information about what services are available at Henninger and at which facility. For example, account managers can have access to a glossary to keep them up to date on technical issues, terms and equipment. They can communicate with any member of the staff, from graphics to editing with a simple e-mail about what might be available and where.

This ability is critical in a time of rapidly expanding capability and technology. Many clients rely on Henninger's expertise to help them budget and plan. They cannot do this unless they have help from a knowledgeable staff.

The pluses and minuses

With increased reliance on an entirely computer-based environment, there are a few things to take into consideration to safeguard that the system works smoothly. Files occasionally get corrupted when they are sent over any network. As such, backups need to happen on a regular basis.

> **Being able to produce quality graphics that are visually stunning and pleasing to watch on time and on budget is an art in itself.**

The benefit of these technologies far outweighs the additional safety precautions necessary to back up the system. The technologies and the manner in which they are configured provide unlimited layers for compositing, rapid transfer of elements between machines in the network and random access of files and clips. This flexibility, combined with unlimited correction without loss of elements is a major plus. The acknowledged risks of storage cannot outweigh what has been gained.

Henninger is dedicated to the integration of the entire system — from technology to personnel, to create the best possible graphics for its customers. It takes talented individuals to make high-quality graphics with the various technologies available today. Being able to produce quality graphics that are visually stunning and pleasing to watch on time and on budget is an art in itself. Success depends on integrating technology and talent to take abstract concepts into the realm of reality. ■

Steve Wiedemann is vice president, technology at Henninger Media Services.

EditStream™ networked news editing from Philips takes the headaches out of tape-based news gathering. Network up to 100 workstations to access the same media files at the same time. No more fighting and waiting for source material. No more looking for lost tapes right before air. No more multiple dubs. EditStream gives your editors the tools they need to work more efficiently—producing higher quality material in less time. To learn more, call toll free 1-800-962-4287, or visit our web site at www.broadcast.philips.com.

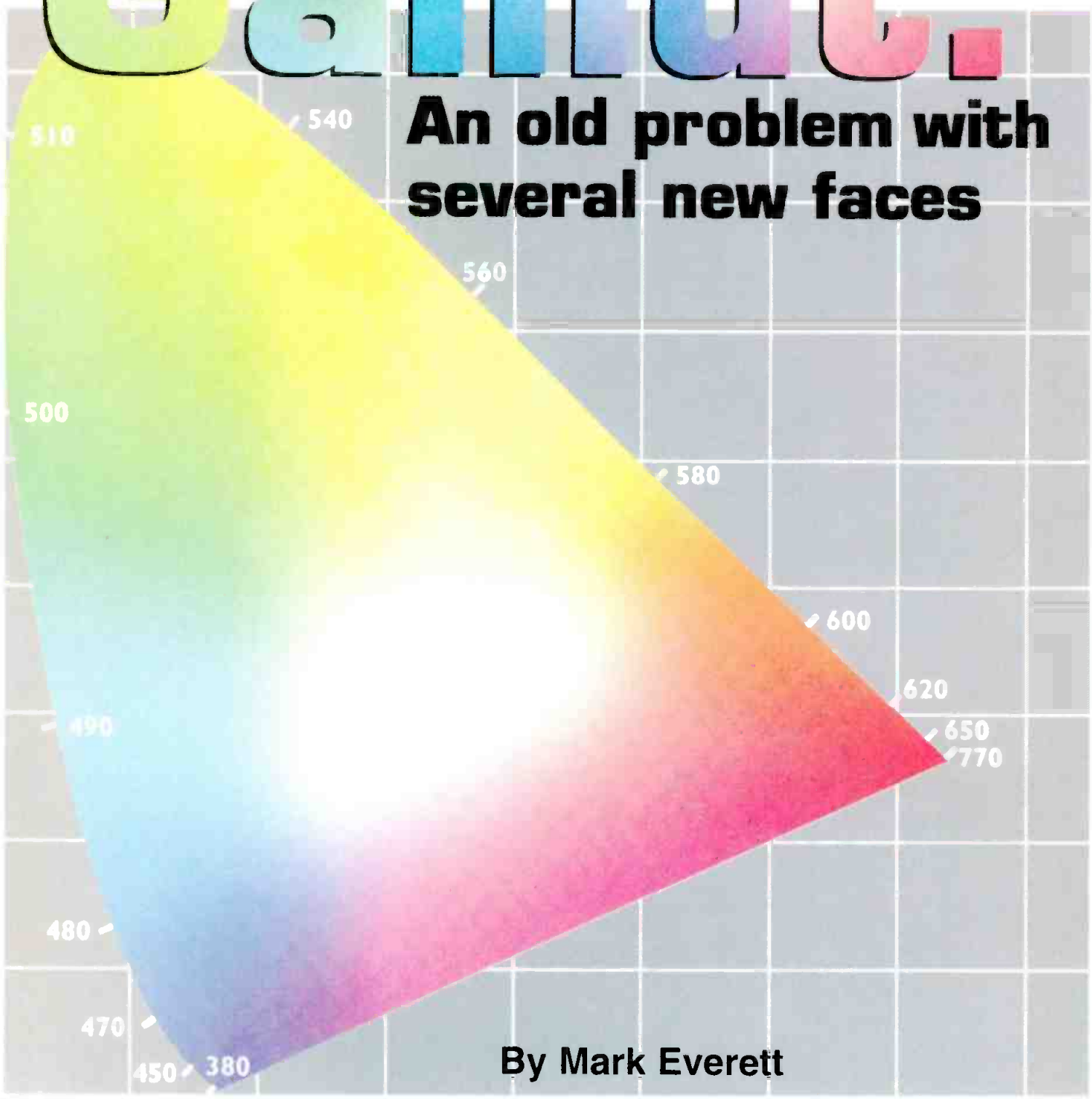
PHILIPS

Let's make things better.

Circle (140) on Free Info Card

Gamut:

An old problem with several new faces



By Mark Everett

Gamut, color space, over modulation, sparkles — these and other terms have been used (some correctly, some not) to describe a problem broadcasters and production engineers have been fighting for at least the last decade. Unfortunately, the problem is getting worse. The primary activators of this problem are improved equipment and the growth of 601 and HD digital production. Put simply, 601 and HD-based digital video are capable of producing a wider range of colors than is allowed in RGB or encoded formats. This, then, is the crux of the problem: When converting from 601 or HD-based serial digital video, some colors may not be acceptable (legal) in RGB or encoded formats.

The CIE chromaticity chart attempts to show the body of colors viewable to the majority of people. Various color reproduction schemes are representative of only a segment of the chart. No present reproduction scheme can portray the entire gamut.

Leader Does It Better!

Model LV5836B

Model LV5152DA

PICK HIT
Broadcast Engineering
1999

Now, the Most Complete HDTV Audio/Video Test Solutions You Can Use!

See it to believe it! **This new Leader Instrument system offers both digital video and digital audio testing in a single rack-mount package. It honors Leader's tradition of creating complete, flexible test systems with analog monitoring capabilities built-in to expand versatility. Here are some feature highlights:**

LV 5836B - Surround Digital/Analog Audio Monitor

- Receives Extracted Digital Audio (AES/EBU) from LV 5152DA or use stand-alone.
- Monitors 6-CH of Dolby Digital and 5-CH of Analog Audio
- Innovative Sound Image Display Enables Fast Sound Setup in Production.
- Matrix Multi-CH Display Permits Audio Component Phase Comparisons.
- Simultaneous Level and Phase Monitoring Screens.
- 5-CH Bargraph Display.
- CH Status Data Screen and Bit Dump.

LV 5152DA - HD Digital/Analog Waveform Monitor

- All the features of the Award Winning LV 5150D and LV 5152D

PLUS:

- Multi-Format HD Monitor sets up for: 1080i (60/59.94/50), 1080p (30/29.97/25/24/23.98/24sF/23.98sF), 1035i (60/59.94) and 720p (60/59.94).
- Waveform, Vector, Picture Monitor and X-Y Modes.
- 8-CH AES/EBU Digital Audio Outputs (16, 18, 20 or 24 bit).
- RGB Gamut Error and P-P Readout of Waveform Components.
- Hex Data Dump, Extensive Error Logging, Custom Alarms.

Prove It To Yourself!
Call 1-800-645-5104 For A Free On-Site Evaluation Today

Some of Our Customers...

• ABC • Bexel • CBS • Crawford Communications • DaVinci • Foto-Kem • Laser Pacific • Lighthouse Digital • N-Vision • Pacific Video • PESA • Sony Pictures (HD) • Tapehouse Editorial • Universal Studios • Utah Scientific • Warner Bros.

1 800 645-5104 / www.leaderusa.com

LEADER
FOR PROFESSIONALS WHO KNOW THE DIFFERENCE

LEADER USA TEST INSTRUMENTS 1969 30th ANNIVERSARY 1999 YOUR SUPPORT IS OUR SUCCESS

380 Oser Avenue, Hauppauge, New York, 11788 Tel: (516) 231-6900 Fax: (516) 231-5295
6484 Commerce Drive, Cypress, CA 90630 Tel: (714) 527-9300 Fax: (714) 527-7490
Regional Offices: Chicago, Cleveland, Dallas, Los Angeles, Atlanta

Circle (142) for Product Info Only Circle (143) for Product Info & Demo

Gamut:

Gamut is defined as the complete range or extent of something. Color gamut, at least for this discussion, has to be further defined to describe the limits applied by the specific color space. The gamut of color is quite different, depending on the color space in question. Visual color, the range seen by the human eye, is the largest and most comprehensive color space or gamut with which most of us are familiar. CIE chromaticity charts, a plot of all colors visible to a large sample of humans, are often used in these types of discussions (see p. 106). Whenever these charts are used in television discussions, a triangular subset of that visible color is shown to describe the gamut of the device under discussion–SMPTE phosphors, imaging tube gamut or magazine print color limits. You get the idea; all are different and none include all visible colors.

Television color space

The television industry has, over the years, developed three basic means of color space definitions. Each is significantly different in definition and the resulting gamut. They are known as Y/Cb/Cr, RGB and HSL. All component-based digital formats – 601 and the HD variations – are Y/Cb/Cr defined formats where Y is the luminance and Cb and Cr are the color difference signals. Crudely defining these, Y describes the luminance or monochrome element of the video, and Cb/Cr are close relatives to B-Y (Cb) and R-Y (Cr), which are the primary colors Blue and Red minus the luminance (Y) element. The exact definition of Y varies from one format to another, and that affects, among other things, the exact interchange of colors between formats. The discussion and the definition of specific colors are not included in this article. Suffice it to say that there are differences. RGB refers to red (R), green (G) and blue (B), the primary colors used in our additive color system. Many video sources and storage devices are computer based, and these, as well as many video and computer monitors, operate in the RGB color space. HSL refers to hue (H), saturation (S) and luminance (L) and is generally applied to encoded video formats. These are the three very different and common ways to describe color video.

The real problem goes back to one of my initial statements and needs some further definition. The limits of colors allowed in the three color spaces are different. As it turns out, 601 and HD color space is the largest of the three, and includes almost all of the other two. Almost all? There is one exception: analog composite super black. Many years ago, an idea referred to as super black was developed to assist keyers. In the U.S. version of NTSC, the black level is 7.5 IRE. In other forms of NTSC and PAL, the black level is 0 IRE or units. Super black lowers the black level of the background of, for instance, the character generator to 0 or lower in the U.S. version of NTSC and to -10 or lower in other formats. 601 and serial HD definitions can not handle super black. The lowest a U.S. NTSC from 601 conversion can go is approximately 1.5 IRE and the lowest the others can go is about -6.5 units. Excluding that historical anomaly, digital color space includes all other video color spaces and has plenty of colors unique to digital gamut.

The various SMPTE and ITU mapping formats for digital definitions describe the mapping of the luminance and color difference signals to data values. These coding rules allow for color saturation and luminance values beyond comparable colors available in RGB or encoded color space. A common view of Y/Cb/Cr color space in a 3D perspective (see Figure 1) shows a traditional view of 601 or HD component digital video color space. It has 1024 (numbered 0-1023) samples in all three axes. Note that black is located at the midpoint of Cb and Cr samples at the 0 luminance level and that white is also at the similar midpoint at the

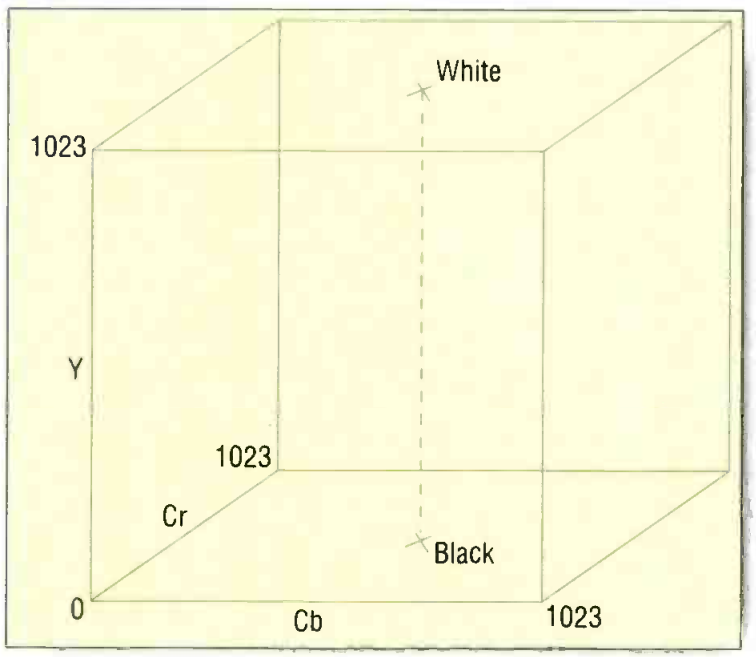


Figure 1. Y/Cb/Cr color space consists of a cube with 1024 (numbered 0-1023) samples in all three axes. Black is located at the midpoint of Cb and Cr samples at the 0 luminance level and that white is also at the similar midpoint at the 1023rd luminance sample.

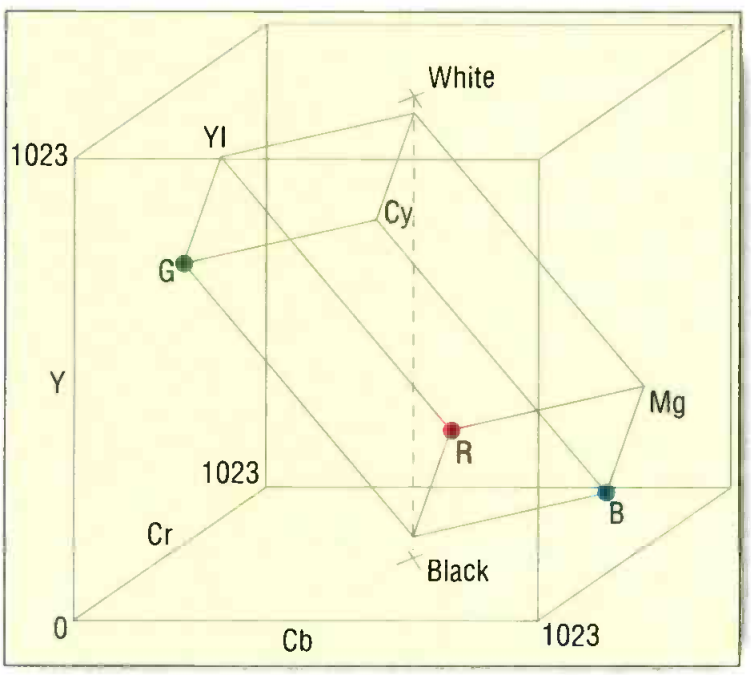


Figure 2. Y/Cb/Cr and RGB color space. The RGB cube is oriented entirely differently than the Y/Cr/Cb cube, and all the sides of the RGB cube are of equal length. For RGB, black is the point at the origin of 0 R, 0 B and 0 G, and white is diagonally across the cube at the point of all colors (additive white).

TWO MORE REASONS TO STICK WITH THE HOTTEST BRAND IN METAL.

maxell

BE SURE TO VISIT THE MAXELL BOOTH AT NAB! Booth L24512

Meet the newest members of the Maxell metal family: DVCPRO and D-5.

Digital video is clearly the definition of television's future. And whether you're shooting or editing in the field with DVCPRO or recording in HD with D-5, stick with the metal particle tape that the biggest players in the industry know and trust: Maxell.

Our DVCPRO family is fully compatible with 25 Mbit/s and 50 Mbit/s recorders. It's the perfect choice for everyone entering the digital domain. And just like DVCPRO, our D-5 family employs Maxell's most advanced tape technologies, including ceramic armor metal particles, to faithfully capture the stunning clarity that HD provides. It's compatible with all television standards and handles data rates up to 288 Mbytes/s.

DVCPRO and D-5 join our extensive line of metal particle tape products for digital video recording, including Betacam SP, Digital Betacam, D-2, D-3, DAT, and 1-in. HD. Each one is engineered precisely to meet the stringent demands of digital recording.

Maxell's DVCPRO and D-5 media. The hottest brand in metal keeps growing. For details, ask for our new product brochure by calling the Maxell Professional Media Products Group at 1-888-44MAXELL.

maxell

Technology for the next generation.

Circle (144) on Free Info Card

Gamut:

1023rd luminance sample.

The more traditional RGB color space is defined as separate R, G and B video signals of equal bandwidth and limited in amplitude from 0- to 700mV. This, of course, assumes a non-composite signal. The RGB (sometimes called production) gamut limits are clearly defined and without dispute throughout the world. Gamut problems occur when video is introduced to an RGB based system that exceeds the lower or upper limits. In some cases, the video will be distorted, folded, clipped or passed depending on how the particular device handles that particular out-of-gamut video. That distortion, clipping or other unexpected color is a result of a conflict in gamut spaces. The representation of the RGB color space is shown in Figure 2, and is superimposed over the Y/Cb/Cr cube. Notice that the cube is oriented entirely differently than the first cube. In the case of RGB, black is the point at the origin of 0 R, 0 B and 0 G, and white is diagonally across the cube at the point of all colors (additive white). All sides of the RGB cube are of equal length, as are the sides of the Y/Cb/Cr cube. Notice there are a number of spaces (colors) in the Y/Cb/Cr cube, which are not included in the RGB cube. What may not be so apparent, is that all colors represented in the RGB cube are included in the Y/Cb/Cr cube.

For encoded signals, the issue is more clouded. This concept is a bit more difficult to grasp because the encoded rules (both NTSC and PAL) define the video space with a more complex consideration including both luminance and saturation. Hue is not a base issue in this definition. In the case of NTSC video, allowable luminance is from 7.5 to 100 IRE, and allowable chroma is from -20 to +120 IRE. Now already some of you are saying, "In my facility we use 110 IRE maximum." OK, just stick with me for a bit. There are many variations, but the concept should be explained first. If I have a video signal with a luminance value of 50 IRE, the chroma modulated on that video is allowed to transition from 120 to -20 IRE. If that same video with that same chroma is simply raised in luminance from 50 to 60 IRE, then the modulated chroma exceeds the limits — it goes to 130, 10 units over the limit. The chroma saturation must be reduced by 10 units in consideration of this new luminance level. Judgments relating to color space of encoded signals must consider both the luminance level and the color saturation of the video signal. It turns out that we all (NTSC and PAL) agree that luminance goes from either 0 or 7.5 to 100. Different color systems, governments, networks and broadcasters have their own rules about maximum chroma, which varies from 100 to 133 and from 0 to -33.

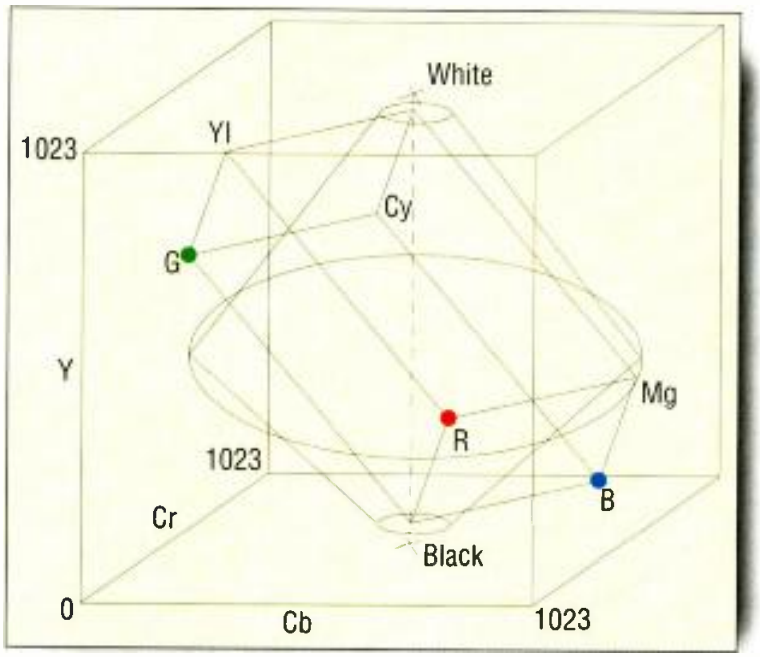


Figure 3. Y/Cb/Cr, RGB and encoded color space. The encoded space follows the luminance of the Y/Cb/Cr color space. The allowed white and black points are flattened and only a relatively small amount of chroma is allowed at these limits. As the luminance changes, from either limit towards the luminance midpoint, the allowed saturation increases.

Hue, as stated earlier, is not an issue in encoded gamut limits. Do not be confused by the saturation of various colors of bars in encoded color bars. The highest and lowest luminance color bars have the lowest saturation. The higher saturations in encoded color bars belong to the middle luminance color bars. The hue of yellow or red is still in the family of yellow or red, no matter what the luminance value. Figure 3 includes the third element to this issue of gamut. The encoded addition first follows the luminance of the Y/Cb/Cr color space. The allowed white and black points are flattened and only a relatively small amount of chroma is allowed at these limits. As the luminance changes, from either limit towards the luminance midpoint, the allowed saturation increases. The resultant diagram looks something like two truncated cones. It is now more apparent that some colors that fit in the RGB color space do not fit in the encoded chroma space, and conversely, some colors that fit in the encoded color space do not fit in the RGB color space.

The problem of gamut is not a problem if the video in question remains in only one color space. It only becomes a problem when video is originated in one color space, HD serial digital, for instance, then downconverted and encoded into NTSC for broadcast. There are any number of colors which are included in the digital color space which will not fit and can not be transcoded into the RGB or encoded color space. This affects the saturation of green leaves, the color of the commercial product, and sometimes colors simply change from one hue to another. Prevent surprises, be aware of gamut differences and be prepared to deal with them. ■

Gamut differences affect the saturation of green leaves, the color of the commercial product, and sometimes colors simply change from one hue to another.

Mark Everett is vice president, advanced technology for Videotek Inc., Pottstown, PA.

Archive it now... or lose it forever.

Maxell offers a solution.

In a few months, we'll enter the twenty-first century, and we'll bring with us hundreds of thousands of hours of videotape on which the events of nearly a half century are recorded. Sad to say, some of the older tape is more than three decades old and near the end of its operational life. Unless these priceless images are screened, edited, and archived digitally onto a new medium, they'll be lost forever. No one appreciates the urgent need for preserving these images more than we do at Maxell.

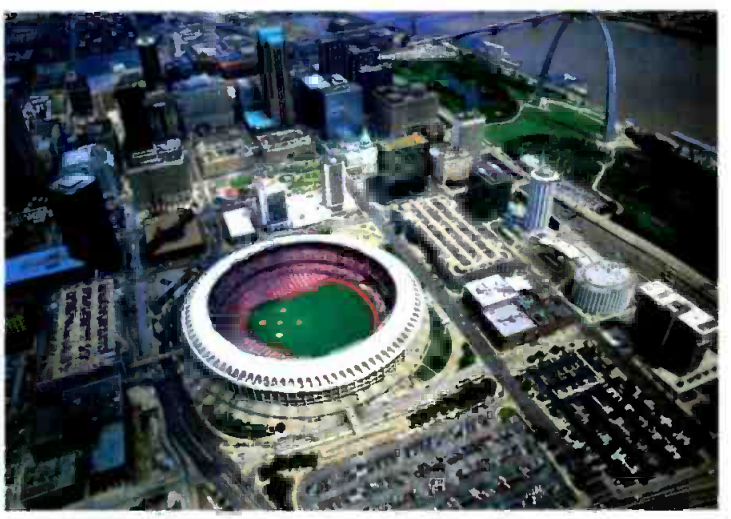
From the tragedy of war...to the exhilaration of peace...Maxell has been trusted by more networks to archive more footage of our nation's heritage than all other blank media companies combined.

The choice for posterity

We've participated in dozens of archival projects throughout the world, and our videotape is chosen after competitive testing more frequently by archivists worldwide. From news to sports to entertainment, Maxell D-5, Digital Betacam, and DVCPRO metal particle tapes are the right choice for archiving analog material in digital form.

It's not price or promotion, but performance, that built this reputation. Archivists aren't casual when it comes to entrusting their irreplaceable images to a particular media. They compare candidate media head to head on parameters like head wear and clogging, longevity, and bit-error rate, as well as traditional benchmarks such as signal-to-noise ratio and dynamic range. When the votes are in, Maxell is usually the victor.

Whether it's Holocaust survivors' stories for the Shoah Foundation, or recording the tales of TV's pioneers for the Archive of American Television in Hollywood, professionals choose Maxell media time after time for once-in-a-lifetime archiving opportunities.



You've never seen video of Babe Ruth's 60th home run, but your grandchildren will be able to look at McGwire's 70th, thanks to Maxell and its partnership with the National Baseball Hall of Fame, where all the great moments of baseball history are now recorded and archived on Maxell professional media.

Top performance over the long haul

You can attribute our success to our goal of producing media that consistently delivers top performance over the long term. For example, each tiny metal particle is encased in a protective envelope of ceramic armor, which ensures magnetic strength and resistance to corrosion and rust.

Our binder system has been refined over more than 30 years of tape manufacturing, and maintains its structural integrity for decades and thousands of hours of operation. Bit-error rate is exceptionally low and dynamic range high, thanks to precise process control, from materials screening to the finished media.

A safe choice for every application

Of course, you probably don't give any thought to boasting in 30 years about the media choice you made today, but it's nice to know you've chosen the videotape used by the people who do. After all, the recordings archivists create are their legacy.

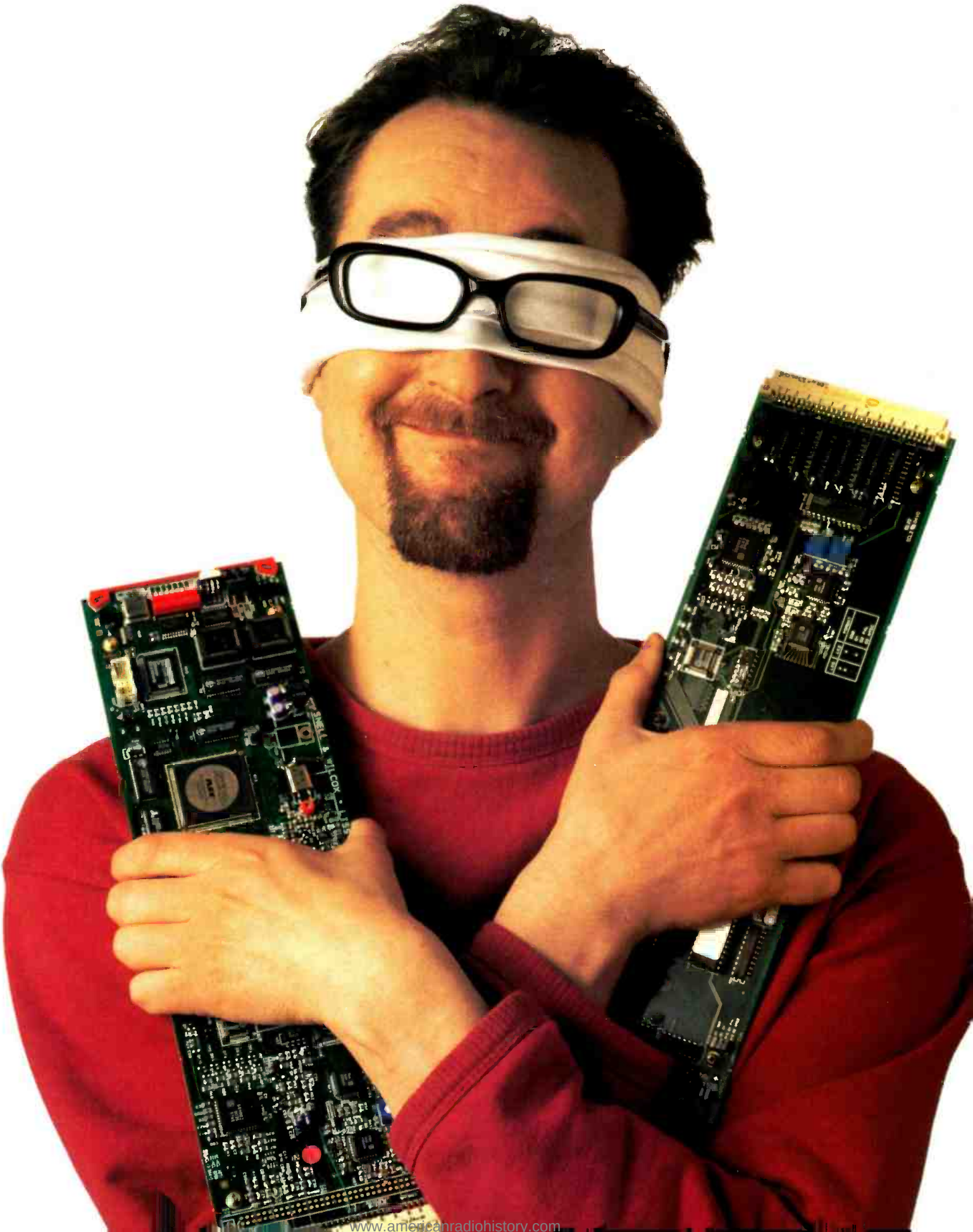
So the next time you buy videotape, choose one of Maxell's broad line of metal particle professional-grade media. It's simply the best choice now — and the safe choice for the future.

Maxell's family of professional archival media solutions...make them your family today—for the future!

maxell

Technology for the next generation.

PICK ANY CARD.



ANY BOX. ANY COMBINATION.

You've got enough to do without worrying about the configuration of your system.

So use your IQ and you can put your network together with your eyes shut.

For a start, the modules in our IQ Modular™ system are all on the same size cards. Then, there are only two boxes – 1RU and 3RU – and any module fits either.

SIMPLY MORE INTELLIGENT

And finally, you can place video, audio, analog or digital modules, in any combination, side by side, in the same box. Up to sixteen in one 3RU box.

So sensible. But then this is just one of the many intelligent ideas that make our unique IQ Modular system look perfectly equipped for the digital era.

Roll Call™ Controllable

IQ MODULAR by SNELL & WILCOX

For more information on the IQ MODULAR System contact:

UK Tel: +44 (0) 181 607 9455, Fax: +44 (0) 181 607 9466, e-mail. into@snellwilcox.com **China** Tel +86 10 64 991421 Fax +86 10 64 023729, e-mail swchina@snellwilcox.com **France** Tel: +33 (0) 1 45 28 1000, Fax: +33 (0) 1 45 28 6452, e-mail. swfrance@snellwilcox.com **Germany** Tel +49 611 99 0840, Fax +49 611 910 2400, e-mail: swgermany@snellwilcox.com **Japan** Tel. +81 33446 3996, Fax +81 35449 7392, e-mail swjapan@snellwilcox.com **Russia** tel +7 095 248 3443, Fax +7 095 248 1104, e-mail: swrussia@snellwilcox.com **For Latin American enquiries** Tel: +1 408 260 1000, Fax +1 408 260 2800 e-mail snellusa@snellwilcox.com website www.snellwilcox.com

Circle (154) on Free Info Card

pered, if it were capable of functioning at all.

Your statement regarding third party tapes, "Third party tapes are not the answer (neither manufacturer recommended them)," also appears to lack some tape manufacturing enlightenment. Any tape cassette bearing the name or logo of a particular format, with the possible exception of VHS, must be approved by the format owner. To obtain approval from the format owner, a tape manufacturer must design and internally test new format products and then submit samples to the format owner for qualification. The format owner then tests and evaluates the physical, magnetic and electrical attributes of the cassette shell, the tape, and the overall performance of the finished product prior to granting a license to the manufacturer's cassettes for a specific format. Therefore, it is highly unlikely that any third party tapes would create any kind of incompatibility issue within the specific format they were designed, approved and licensed for, or in another compatible format.

In response to the $800 estimate for the repair of Leland's DCR VX 1000: It is a fairly common practice in the TV industry, when acquiring new recording equipment, and especially when changing formats, to use media bearing the same name as the equipment until the problems and issues are resolved.

For an equipment manufacturer to make a statement such as, "they would not guarantee any repair that didn't include the replacement of the head drum and the entire tape path due to the use of non-Sony or non-Panasonic tape which caused deposits," could be construed as a violation of the Sherman-Clayton Anti-trust Act and readily end up in litigation. I continually advise customers who receive statements like this to approach the source of such a statement and ask them to put it in writing. And because it is purely a scare tactic to augment tape and spare parts sales, it is amazing how quickly they back down.

In closing, almost all media manufacturers strive to produce recording media that is virtually transparent to the format it is used in. This is especially true with media used in digital transports as they are recording ones and zeros in a very near saturation recording vs. analog recorders that generally use an FM recording system, which is typically more susceptible to "screwdriver drift" and/or ambiguous or misunderstood alignment techniques. I can still clearly recall the preposterous statement from an editor at a large post house, "brand 'X' tape looks warmer than brand 'Y'," while viewing playback from a Digital Beta unit.

It really boils down to the brand of equipment and tape users are most comfortable with and most loyal to. The differences between brands of tape used in today's digital recorders are virtually insignificant leaving the procurement folks in a terrible quandary when trying to decide what to buy.

It is highly unlikely that any third party tapes would create any kind of incompatibility issue with the specific format they were designed, approved and licensed for, or in another compatible format. — George McBride, Maxell

Sincerely,
George McBride
Maxell Corporation

Dr. Digital responds:

There's some new light on an old subject. I've been digging into this tape/VTR matter and Bob's comment regarding following the recommended maintenance schedule is very important. Sometimes, it is easy to forget that times have changed. Today's small format VTRs bear little resemblance to 2" Quads, but many of us insist upon using those tried-and-true maintenance routines that worked so well in the days of the four-headed beasts (when was the last time you tried clearing a head clog with your fingernail?). These new decks are different animals and need to be maintained accordingly. Along those lines, the use of cleaning tapes (something many of us dreaded five to 10 years ago) is typically a necessary part of the maintenance routine.

As I mentioned in that July column, a lot of science goes into today's products. The same is true regarding product maintenance. I recently had some restoration work done on my wife's car. After picking it up I discovered there was some sticky residue from the masking tape left on one of the fenders. Not wanting to mess anything up, I called the shop and spoke with the gentleman that painted it to find out what solvent I could use to remove the residue. Much to my amazement, he gave me a chemistry lesson! He went into how the paint base was constructed and why several solvents would not cause it problems because of the molecular structure of the product, etc., etc. The point here is that the manufacturers know far more about these products than you and I. To get the most out of our money, we need to follow their recommendations – at least within reason.

What kind of problems are you having? What has been your biggest maintenance headache in the last six months? Drop me a note at drdigital@compuserve.com.

CEC

CONTINENTAL ELECTRONICS CORPORATION

So reliable, you just plug it in and forget about it.

(Well, you could if people would quit asking how you found something so reliable.)

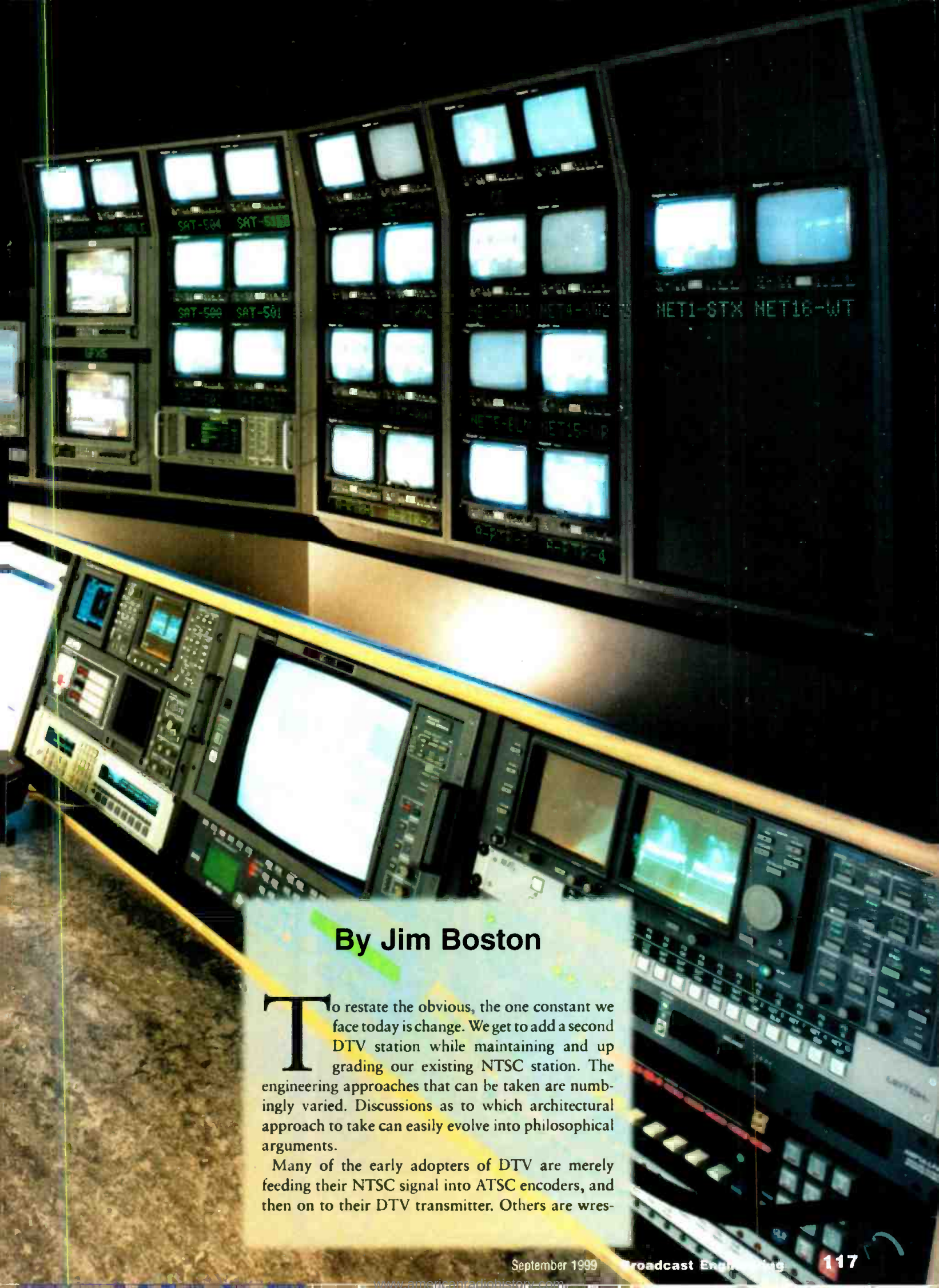
It's no wonder more and more people are choosing CEC. Over the years, we've built a reputation for quality products that are simple to use and work from day one without a glitch. But that's just the beginning. Our customers also know us for utilizing leading edge technology, especially into the digital age. It all stems from our goal of providing you with a superior product. When you choose CEC, you'll notice the difference. In a good way.

1-800-733-5011 www.contelec.com
P.O. Box 27D879 Dallas, Texas 75227

Circle (155) on Free Info Card

Managing your transformation to DTV

The better a facility is designed and built in the beginning, the more likely it is to operate reliably over its long life. The master control room at the new production and broadcast facility for Thirteen/WNET, New York City, provides ample room for both equipment and personnel. Photo by Andy Washnik – Capricorn. Photo courtesy A.F. Associates.



By Jim Boston

To restate the obvious, the one constant we face today is change. We get to add a second DTV station while maintaining and up grading our existing NTSC station. The engineering approaches that can be taken are numbingly varied. Discussions as to which architectural approach to take can easily evolve into philosophical arguments.

Many of the early adopters of DTV are merely feeding their NTSC signal into ATSC encoders, and then on to their DTV transmitter. Others are wres-

DTV

digital video layer, there are usually layers for analog video and stereo audio, along with AES audio and, possibly, a layer for RS-422 control. All inputs and outputs to all routing layers should appear at patch panels. Many facilities that build extensive digital video infrastructure still use analog audio. This is usually because digital audio is much more expensive to implement than analog audio. Digital audio can also be much harder to troubleshoot than digital video. Analog audio can also provide some flexibility at the patch panel that is not possible with AES audio. Many facilities now wire analog audio between equipment with low Z out, to hi Z in. This means that the source impedance is at the traditional 110Ω at the output of a device, and the input of the receiving device is at 10,000Ω or higher. Although this configuration results in reflections, runs are short for audio wavelengths, so they can be ignored. But there are two benefits. Signal-to-noise drops by half because the received signal is twice the terminated amplitude. Therefore, the drive level can be dropped by 3dB with a corresponding drop in S/N. It used to take power to drive audio devices. When this was true, impedance matching was important to maximize power transfer. Now it takes voltage, with very little current. Therefore, maximum applied voltage is desired and impedance matching is not as important. The second benefit of this approach is that the audio patch panels can be wired in what is known as half normal. This configuration means that if a patch cord is inserted in the top jack in the patch field, the path isn't broken, just bridged across the source. If the patch is inserted in the lower jack, the signal from the top jack is interrupted. This means that audio monitoring can occur without interrupting the feed. This is only possible because of the low-feed Z/hi-receive Z approach.

DTV facilities must handle several layers of data, including video, audio, control and metadata, plus legacy analog signals. KHOU, Houston, routes both standard and high-definition signals through its dual master control rooms. Photo courtesy of Tektronix.

The scope

One of the most common afflictions of a failed project is scope creep. New objectives are often added to the plan even after the project's mission and strategy are determined, the objectives and budgets are defined, and the project has been started. The project can grow in size even though the resources remain fixed. Even if you manage to stay within budget, the project will take longer than promised; shortcuts will be taken or attributes cut; and the reliability and flexibility of the system produced by the project will suffer. A common maxim among project managers is the choice between done fast, done inexpensively and done right. You can only achieve two. You can pick which two, but the third won't be met. Managing the scope of a project is often the project manager's toughest job.

A word about doing the project right should be offered here. Most facilities become more chaotic as they age. Even meticulously designed, assembled and wired facilities can become unruly with time. As the system is amended, modified and troubleshot over time, patch bay labeling, wire bundles, wire lists and synoptic drawings become inaccurate and disorganized. It is the rare maintenance supervisor who can prevent this slow atrophy of organization.

The best facilities start off as well designed and thoughtfully implemented. The better designed and built the facility is at the start is generally a good indication of how well it will be maintained over time. Cabling a rack is equal parts science and art. Knowing what pitfalls to avoid and still make the cable bundles neat yet serviceable is the installer's bread and butter. The old saying about clean cars running

Good engineers are tenacious. They research, ask questions, and listen.

There's strength in numbers.

DIGITAL-S

The reasons are becoming clearer than ever.

Introducing the 4-channel BR-D92 Studio Recorder and BR-D52 Player.

Today you need a strong video tape format that will preserve the quality of your original footage through multiple generations, whether you edit on disk, tape or spool to servers. With this in mind, greater numbers than ever are choosing the strength of DIGITAL-S.

Leading the line of low-maintenance DIGITAL-S products is the BR-D92, the definitive digital video tape recorder. Broadcasters can rely on features like 4-channel PCM audio, multiple cue point control, front-panel editing and digital TBC control.

And, with video pre-read for layering and the ability to accept and convert various AES/EBU digital audio sampling rates, the BR-D92 is a welcome addition to high-end post production suites.

For powerful digital performance, there's just one more number you need to know: Call 1-800-JVC-5825 to receive our new brochure.

* While we cannot guarantee this level of wear, FOX Television and other major DIGITAL-S users have experienced well over 4,000 hours head life on similar machines.

JVC
DIGITAL BROADCAST SYSTEMS GROUP

D-9

www.digital-s.com

Circle (146) on Free Info Card

DTV

better than dirty ones translates to neat, orderly installations running better than a rat's nest. To keep the installation neat and serviceable, things like service loops, manageable bundle size and proper cable routing must be adhered too.

Professional implementers also color code cables. The coax used for digital video is a different color than the coax for analog video. This makes it easier to quickly acquire your bearings when dealing with racks that have various signal types. The hurdle is that your engineering department must have the discipline to maintain the color-coding.

Because digital audio can be much more expensive to implement than analog audio, many facilities are sticking with analog for the time being. However, some stations like ABC TV7, New York City, have taken a wholesale approach, planning for and implementing AES audio during their upgrades. Photo by Andy Washnik Studio. Photo courtesy A.F. Associates.

One of the most important components of a television facility is the cable that interconnects the equipment and weaves the various discrete devices into a system. Many underestimate the impact that cable and connectors have on signal performance. Digital component video stresses coax on the order of a couple magnitudes over what analog video does. Rarely does analog video have frequency components over 10MHz. SMPTE 259M (SD digital component video) has energy approaching 1.5GHz. SMPTE 292M (HD digital component video) has energy well over 3GHz. Why? Bit shuffling algorithms in 259 and 292 are designed to produce as many edges as possible. This makes it possible to think of these bitstreams as square waves. How do we build square waves? We take the fundamental and add odd harmonics. That means that for 259, the fundamental is half the 270Mb/s rate, or 135MHz. The third harmonic of this 135MHz fundamental is 405MHz. The fifth is 675MHz, etc. As the higher harmonics disappear, our square wave becomes more like a sine wave. For most digital devices receiving the signal, the third harmonic must be 8- to 10dB above the noise floor. The fundamental for 292 is 750MHz, and its third harmonic is 2.25GHz. For a coax cable to pass digital signals any distance, its rolloff of higher frequencies must be kept to a minimum.

Coax used for digital video bitstreams should have solid copper center conductors. This offers better skin effect than stranded center conductors do. The shield should be braided, with coverage as near to 100 percent as possible. There should also be a layer of foil with the braid, as this also offers better skin effect at higher frequencies. The dielectric should produce as low a shunt capacitance value as possible. Coax that is good for digital signals has low shunt capacitance. This equates to high-velocity propagation. The cable should also be flexible, with minimal center conductor migration. Any impedance mismatches along a digital signal path push you closer to the error cliff due to the resulting reflections.

The intangibles

As DTV rolls out, demands placed on television engineers will be acute. Many of us will be betting our jobs and reputations as we engineer our employers into the digital domain. Good engineers don't necessarily know everything. In fact, with all the new technology engulfing us, who can? Good engineers are tenacious. They research, ask questions and listen. They have a sense of history, so they can combine experience with theory. They take what has worked in the past and add new methods and technology to solve new problems. This is the engineering method.

Some of us will be blessed with large budgets and the best equipment to throw at the problem, most of us will not. To compensate for limited monetary and physical resources, good engineering must be applied. The goal is to be the best steward of your facility's information content as possible. That used to mean the video and audio signals. Now it also means not only the continuous analog voltage streams, but many discrete digital number sequences, or bitstreams.

Engineering is always about compromise and tradeoffs. Good engineers know where to give and where to stand firm. A well-designed facility will be fault tolerant and flexible. It will be easy to monitor, and problem isolation will be straightforward. It must also be as future proof as today's technology will allow. ■

Jim Boston is a project engineer for Scripps Howard in Cincinnati, OH.

HBO Master Control Room, New York

Clear Choice
HDTV and DTV Monitoring.

Multiple format display needs? BARCO has your monitoring solution.

1080p

1080i

720p

480i

480p

••• Master your Digital Future

BARCO

BARCO Communication Systems • Argentina tel. +54 1 855 3357 • Australia tel. +61 3 9646 5833 • Belgium tel. +32 56 23 32 11
Brazil tel. +55 11 822 16 56 • China (Beijing) tel. +86 10 6526 8002 • Israel tel. +972 9 955 6444 • Japan tel. +81 3 5950 8100 • Malaysia tel. +60 3 7156 788
Mexico tel. +52 5 211 64 92 • Russia tel. +7 095 785 52 63 • The Netherlands tel. +31 30 634 0422 • United Kingdom tel. +44 118 926 4091
USA tel. +1 770 590 3600 / toll free 1 800 992 5016
Web site: http://www.barco.com • E-mail: sales.bcs@barco.com

Circle (147) on Free Info Card

Applied Technology

Philips' Venus routing switcher HD module expansion

BY JOOP JANSSEN

With the advent of DTV and the decision of broadcasters and national cable networks to distribute programming in high definition, one of the challenges to facility design engineers, chief engineers and operations managers is how to distribute a variety of signal types throughout facilities. Today, a single facility might have to route analog video, digital video, HD digital video, analog audio, digital audio, and machine control data. Every Venus routing switcher system built since 1992 can route any or all of these signal types, including high definition at 1.5Gb/s, with the proper modules. What makes this happen is the high-speed Philips COBRA system.

COBRA (Crosspoint Output Bus Router Architecture)

The COBRA system allows current and future Venus owners to mix-and-match signal types within a single frame – analog video, digital video, HD video, analog audio, digital audio and machine control data. All without sacrificing crosspoints. The system is built around the Zero-Insertion-Force (ZIF) connector system that has been successfully used in the Venus routing switcher frame since its introduction in 1992. While ZIF connectors are not new in the design of professional video equipment, the ZIF connectors used in the Venus are self-cleaning and top-mounted (top-plane) to prevent debris from accumulating in the connector. For example, each Venus router frame has 24 matrix module slots, associated cabling and panels, two sets of cooling fans, dual power supplies for redundancy and up to two optional accessory modules, all in 11RU. That means that four Venus frames can be installed in a single 45RU rack, allowing up to 96 matrix modules with ventilation in a single equipment rack.

Modular expandability

It is a popular misconception, especially among those manufacturing fixed frame video routers, that bus structure-based routers are not capable of handling the high data rates associated with uncompressed high-definition digital video. While the Venus analog video router inputs utilize a looping bus, the Venus Serial digital video router inputs utilize a unique passive parallel distribution (PPD) architecture. Similarly the Venus HD routers use an input distribution system that is optimized for the HD signal characteristics. Our COBRA structure avoids busing problems and makes it possible to connect the crosspoint modules to the output modules, allowing the HD Venus to use the same architecture as all other Venus switchers.

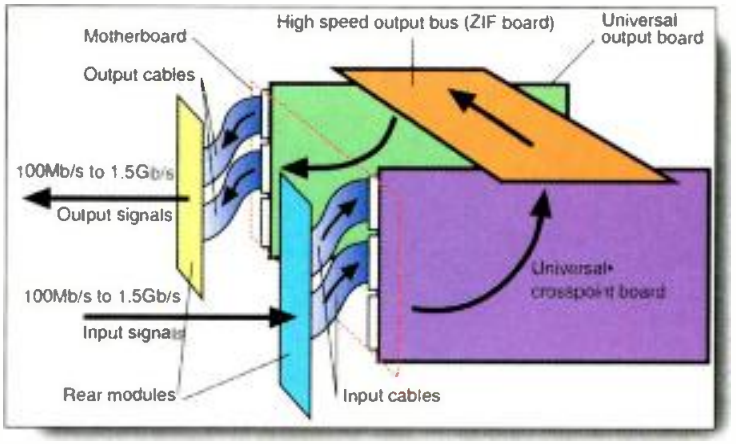


Figure 1. COBRA's structure avoids busing problems and makes it possible to connect the crosspoint modules to the output modules.

Engineering COBRA interconnectivity

Busing of signals from multiple sources and/or to multiple destinations is possible if no significant impedance discontinuities are introduced onto the transmission line. This is similar to the situation with analog video where the return loss of video inputs must be good (usually better than –40dB) in order to permit looping of video through several pieces of equipment. The good return loss performance minimizes reflections of the video signal. Philips developed the COBRA method of moving signals from multiple sources without introducing significant impedance discontinuities and their inherent signal reflections.

In the COBRA system, one end of the interconnection bus is terminated at the matrix end of the ZIF board. (See Figure 1.) The other end of the bus is terminated in the output board. The matrix boards feed the bus through isolation networks that isolate the ZIF connectors and matrix boards from the bus. This isolation prevents the ZIF connectors and matrix boards from causing impedance discontinuities on the interconnection bus, thus eliminating reflections caused by the matrix board connections.

Separate matrices for SD and HD—cost effective upgrades

The Venus digital video approach allows HD router capacity expansion as needed. For example, a 64x64 HD router that is prewired for 128x128 allows expansion on demand. This is especially important as a facility migrates from SD to HD signals in small blocks.

Transparency is another benefit of the Venus routing switcher HD modules. The same HD I/Os can be used for SD and HD signals. In fact, Venus HD modules support signals of less than 100Mb/s all the way up to full uncompressed HD at 1.5Gb/s. Venus users do not have to purchase different I/O modules for HD and SD, and

CLARITY

The Definitive High Definition Character Generator, Paint System, & Still Store

Powerful Tools

Only Clarity integrates the core graphics tools of CG, Paint and Stills Store in a single high performance HD system designed to meet the demands of advanced television production.

Ease of Use

Combining Pixel Power's dedicated video processing hardware with a Windows NT graphical user interface Clarity is extremely intuitive to use. Users are free to prepare text and art off-line using their favorite creative tools. Clarity also works with Pixel Power's new Collette WYSIWYG off-line entry software.

Ease of Integration

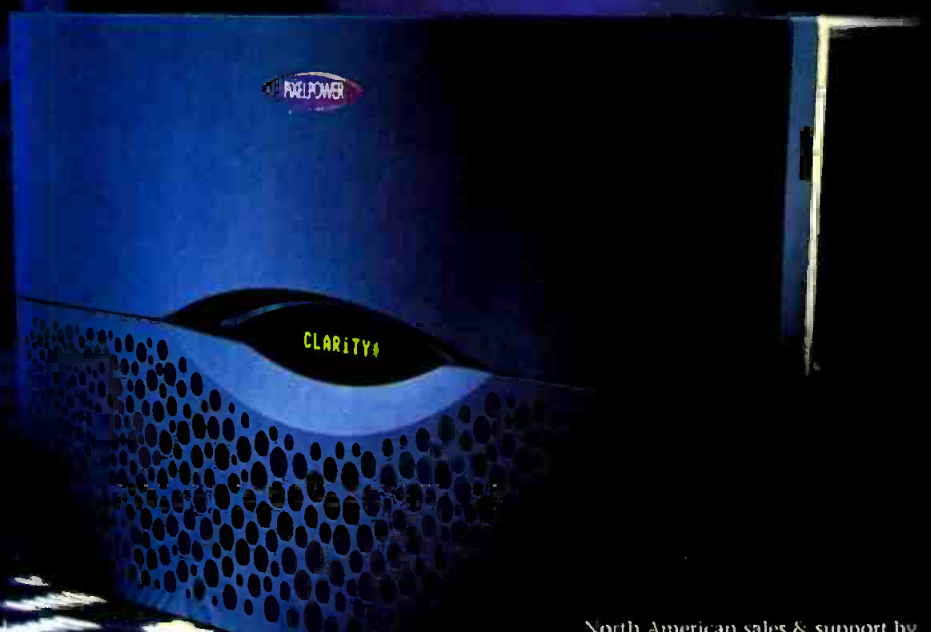
Clarity comes standard with an interface to newsroom computer systems, a 2GB Jaz disk, CD-ROM drive and 100Base-TX TCP/IP networking. It also features file import and export capability including the most common image and font types.

Designed for the Future

Clarity is like no other HD graphics system. Available in single and dual channel configurations Clarity is software switchable between 1080i, 720p and 1080p24. Looking forward Clarity has the hardware headroom to allow operation at 1080p60 (3 GB/s) as standards evolve into the future.

See for yourself

Most importantly Clarity is real. Contact Majortech for details on how to see Clarity at trade shows and demonstrations across North America this summer.



Manufactured by

PIXELPOWER

UK

www.pixelpower.com 011 44 1223

North American sales & support by

Majortech

www.majortech.com 905.890.6338

Circle (148) on Free Info Card

do not have to worry if I/O modules will continue to be available. Venus HD modules are capable of handling SD up to 100 meters, just by changing the cabling and flipping a switch.

The upgrade to HD

Field upgrading any Venus routing switcher to HD is a simple task. Let's take an example of a user who wants to add 32 x 32 HD routing capability to an analog or digital video router that has unused (uninstalled) slots. Four empty slots (out of the 24 total) and the HD expansion kit are needed. The procedure is simple, with the Venus remaining online throughout the procedure:

1. Remove blank rear board.
2. Install new rear panel with new connectors.
3. Attach rear panel cables to matrix board.
4. Install or replace the ZIF connector at the inside front of the frame.
5. Plug-in HD modules and output cards.

All power used by the ZIF circuitry is supplied by the matrix and output board. No power is applied directly to the ZIF connector board itself.

That's it. Cable up the HD sources and destinations. Replacing analog and SD digital video modules with HD modules is just as simple.

Making things better

For broadcast facilities, the addition of the Philips HDVP-3500 HD Video Processor to a Saturn Master Control switcher provides a comprehensive solution for hybrid master control operations where HD, SD and analog channels are

The COBRA system allows current and future Venus owners to mix-and-match signal types within a single frame – analog video, digital video, high definition video, analog audio, digital audio and machine control data.

controlled from a single control position. The HDVP-3500 also works in conjunction with the Philips GS-400 Gigabit router for HD island applications. Broadcasters integrating current systems now have the choice of installing separate HD Saturn and HD Venus systems to operate as an HD island, or integrating the system with an already existing analog or digital Philips system. In addition, the Venus HD modules will be capable of handling signals with data rates less than 100Mb/s for increased flexibility.

The Venus High Definition Modules are scheduled for delivery in early Q1 of 2000. Matrix sizes range from 32x32 to 1024x1024 and beyond. ■

For more information on Philips' Venus routing switcher, circle (451) on the Free Info Card.

Joop Janssen is vice president and general manager of routing and master control products for Philips Digital Video Systems.

Inter BEE '99

35th International Broadcast Equipment Exhibition

November 17-19, 1999 Nippon Convention Center (Makuhari Messe)

Make it a Must

Make 1999 a year of celebration. Join us at the 35th International Broadcast Equipment Exhibition "Inter BEE", one of the world's top showcases for professional broadcast, video, and audio technologies.

Together with more than 30,000 other visitors from around the globe, you'll see an exciting future with cutting-edge digital broadcasting and visual production equipment and new audio formats from around 500 manufacturers.

As part of our 35th anniversary celebrations, we will present our best-ever series of symposiums, forums, and seminars, which will cover the spectrum of improvements achieved through digitization.

So, mark Inter BEE '99 down in your calender and come and join in the fun.

For more information on Inter BEE '99, contact:

Japan Electronics Show Association

Sumitomo Shibadaimon Bldg., 2 Gokan, 1-12-16, Shibadaimon, Minato-ku, Tokyo 105-0012, Japan

Fax: +81-3-5402-7605 E-mail: bee@jesa.or.jp URL: http//bee99.jesa.or.jp/

INTERNATIONAL BROADCAST EQUIPMENT EXHIBITION
Inter BEE
Nov.17-19'99

Exhibition Categories

- Audio Equipment
- Cameras
- VCRs
- Disk Recorders
- Video Equipment
- Output Systems
- Relay Systems
- Transmission Systems
- Lighting Equipment
- Measuring Equipment
- Transmission Cables
- Power Units HDTV-EDTV Systems
- Satellite Broadcasting Systems
- Multiplex Broadcasting Systems
- Virtual Sets
- Video Servers
- Nonlinear Editing Systems
- CG Systems
- Multimedia Systems
- Other Related Items

Applied Technology

Pinnacle's Thunder storms the server market

BY PAUL TURNER

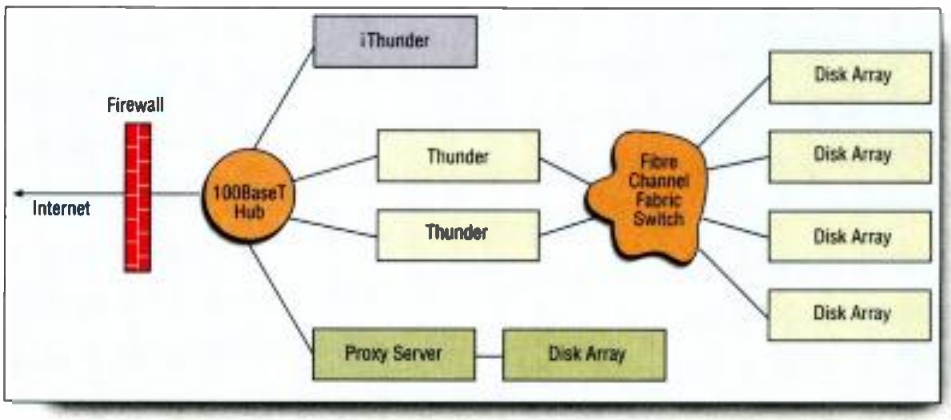
With its recent entry into the server market, Pinnacle Systems continues to realize its goal of becoming a comprehensive broadcast industry supplier. The new Thunder family of broadcast and webcast servers includes the MCS 4000 four-channel broadcast server, the MCS 2000 two-channel broadcast server, and the iThunder Internet server for real-time webcasting.

The design goal for the Thunder family was to create a next-generation server architecture that would surpass the capabilities of first-generation systems, including radically expanding the functionality of the video server with new capabilities like picon-based asset management, fully symmetrical operation, and support for multiple compression schemes. Each channel needed to record and play back video and key signal as a standard feature, rather than tying up a second channel for video plus key. The Thunder architecture needed to deliver integration with multiformat broadcast environment, where DV field acquisition and MPEG-2 program distribution are standards.

Thunder's engineering team accomplished these goals by combining Pinnacle broadcast technologies (like BroadNeT connectivity) with leading-edge technologies from other vendors, including C-Cube Microsystems' DVxpress MX-50 codec chip. With its implementation of C-Cube's DV/MPEG-2 chip, Thunder is the first server that can record and playback source material in both MPEG-2 and native DV formats.

Thunder architecture allows DV and MPEG-2 material and uncompressed still images to co-exist on the same server (and even to play back-to-back on the same channel) without the need to restripe the disk array. Source material in 525 and 625 can also reside on the same server without the need to restripe the array.

The Thunder MCS 2000 and MCS 4000 are completely symmetrical. Any Thunder channel (or combination of channels) can record or play back source material, and the user can freely select the record/playback mode for each channel at any time. During record operations, each channel has access to any of the four system inputs, and each input includes video, key, four-channel audio, timecode and ancillary data. The system can perform concurrent record and playback using any combination of channels.



This is a basic four-channel Thunder system. With the addition of iThunder on the network, clips and programming are now available on the Internet. Clips are accessible over the web by copying those clips to iThunder and converting them to RealPlayer format. This gives the capability of streaming video and audio.

In the box

Both the MCS 4000 and the MCS 2000 are dual-chassis systems. In each case, the system's 4RU video processor houses the CPU, video processing electronics, I/Os and networking hardware. Standard I/O is CCIR 601 for video, and AES/EBU for audio. Analog I/O and IEEE 1394 (FireWire) I/O are available as options.

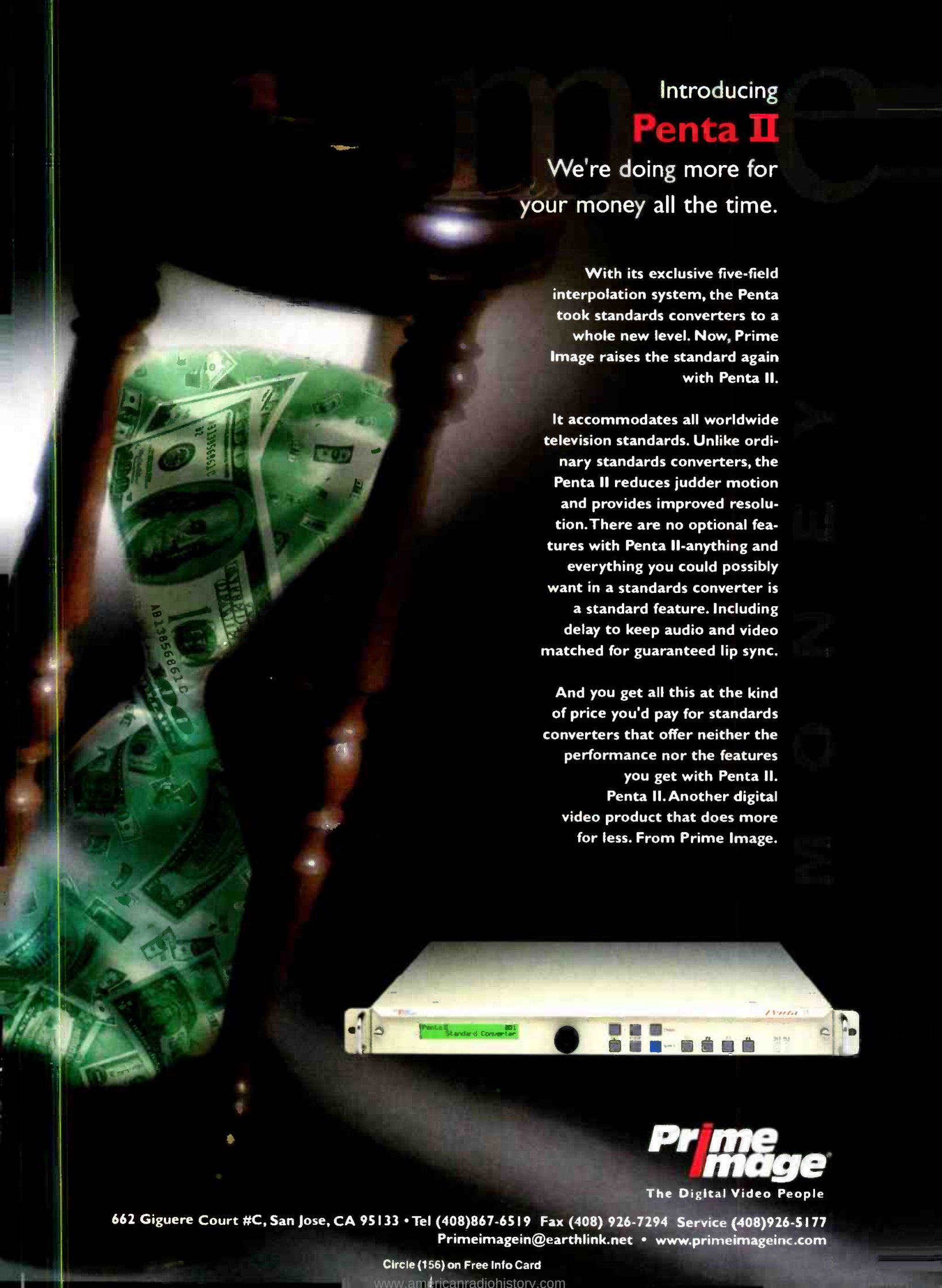
Thunder's storage chassis houses a Fibre Channel disk array. Compression rates are user-selected during the record process, with data rates from 2- to 50Mb/s per channel. At a data rate of 20Mb/s, Thunder ships with storage for about four hours of video and key. Additional Fibre Channel arrays can be added via off-the-shelf Storage Area Network software, using Fibre Channel hubs or fabric switches.

The video processor and storage chassis are connected via a Fibre Channel link, with an available bandwidth of 1Gb/s. Each chassis offers redundant power supplies and alarms for power supply failure. Redundant storage at user-selectable RAID levels can be implemented easily through additional Fibre Channel drive arrays.

Thunder is designed for plug-and-play integration with station automation systems from Louth, Odetics and other vendors. It also offers external control through GPI and RS-422 ports, using the BVW-75 protocol.

Channels are No. 1

A fundamental design goal for Thunder was to provide functionality and power within each channel—so that a single channel of Thunder could deliver capabilities that previously required two server channels. Multiple features accomplished this goal. For example, each Thunder channel stores both video and an associated key signal (i.e. 4:2:2:4



operation) within a single channel, while older servers require the use of two channels to store video and key signal, if they can do this at all. Each channel also stores four streams of uncompressed 20-bit digital audio, along with timecode and ancillary data.

Thunder's built-in downstream keyer allows for a clip station logo or other element to be keyed over any background input, without a master control or production switcher. When a Thunder channel executes a video transition, it automatically performs a cross-fade on the accompanying audio channels. In addition, each Thunder channel can create real-time transitions between back-to-back clips within a single channel. Thunder can dissolve, wipe and cut between two clips on the same channel, rather than requiring the use of an external switcher to transition between clips playing on two separate channels.

The design goal for the Thunder family was to create a next-generation server architecture that would surpass the capabilities of first-generation systems.

The Thunder user interface builds on the intuitive front-end and powerful asset-management capabilities of Pinnacle's Lightning stillstore family. Like Lightning, the picon-based Thunder interface offers a high-speed database search engine that allows users to locate footage by date, title, category or other user-determined criteria.

Proxy power

One of Thunder's most powerful features is its ability to instantly generate MPEG-1 proxy copies of all source material during its record process. These high-quality, low-data-rate proxies can be stored on the Thunder drive array or on an external proxy server.

Proxies are standard Windows files that can be viewed in MediaPlayer on Windows PCs. With a data rate of approximately 1Mb/s, proxies can be viewed quickly and easily by PC users throughout a networked facility. With Thunder's optional Browse software on networked PCs, users can concurrently access the proxy footage, create their own subclips and even create their own playlists.

Thunder's ability to generate standard MPEG-1 proxies on the fly also allows for webcasting over the Internet when paired with the companion iThunder server. The rackmountable iThunder system integrates the RealSystem G2 video streaming software from RealNetworks.

iThunder makes clip-browsing and playlist creation available over the Internet, allowing authorized users to instantly view and refine projects on desktops—or anywhere in the world. iThunder supports connection rates from T1 to modem rates as low as 28.8k baud. With Thunder and iThunder, broadcasters now have an integrated solution for on-air applications and the Internet. ■

For more information on Pinnacle's Thunder family of broadcast and webcast servers, circle (454) on the Free Info Card.

Paul Turner is new product development business manager at Pinnacle Systems Inc. in Mountain View, CA.

CALREC AUDIO MANUFACTURE HIGH PERFORMANCE BROADCAST AUDIO CONSOLES. IF YOU REQUIRE AN ANALOGUE OR DIGITAL SOLUTION CONTACT CALREC.

Believe everything you hear

Calrec Audio

the right solution

For Further Information Contact:

Studio Consultants (New York)
Tel : (212) 586 7376 Fax : (212) 582 2169
e-mail : scidoug@aol.com

Redwood (LA & Nashville)
Tel : (615) 871 0094 Fax : (615) 872 7080
e-mail : redwood@isdn.net

Calrec Audio Ltd
Nutclough Mill, Hebden Bridge,
West Yorkshire, HX7 8EZ, UK
Telephone : +44 (0) 1422 842159
Fax : +44 (0) 1422 845244
E-mail : enquiries@calrec.com
Website : www.calrec.com

Circle (159) on Free Info Card

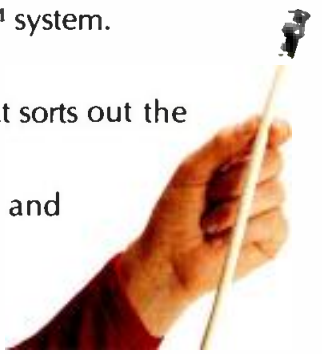
WHY SYNC

UNDER ALL THAT CABLE?

In conventional systems, every frame synchronizer needs a physical link to its tracking audio delay unit.

But use your IQ and you won't get tangled up with all those cable-runs between audio and video modules.

RollTrack™ is exclusive to our IQ Modular™ system. It's a connection-free automatic tracking delay that sorts out the sync process automatically without the mess and configuring problems of external cabling.



Just one wire links all boxes in the network to our RollCall™ remote control system. So now you can place audio and video modules as far apart as you choose.

SIMPLY MORE INTELLIGENT

So uncomplicated. But then this is just one of the many intelligent ways that our unique IQ Modular™ system unravels the complex demands of the digital era.

Roll Call™ Controllable

IQ MODULAR by SNELL & WILCOX

For more Information on the IQ MODULAR System contact:
Tel: (408) 260 1000, Fax: (408) 260 2800, e-mail: info@snellusa.com website: www.snellwilcox.com

Circle (160) on Free Info Card

Applied Technology

Grass Valley Group's ContentShare: global asset management

BY STEVE BILOW

Until now, broadcasters' ability to access media assets was hampered by two major factors: first, content production systems that are isolated by virtue of proprietary and incompatible media storage and media management strategies; second, applications that lack adequate search tools for locating media across a variety of sources. Typically, accessing the content requires that it all reside on compatible storage devices and be controlled through a compatible application. Unfortunately, the ability of disparate applications and storage systems to work together is actually rare.

Managing more than video assets

Digital television has resulted in the use of specialized applications with more media being created and stored digitally. The need to exchange that media via data networks soon becomes critical to a facility's operation. The way to provide access to a variety of media is through a type-independent search and retrieval system.

Tektronix developed the ContentShare software platform to solve these problems. It provides those who write applications with a common language for exchanging a variety of information about diverse media assets.

The ContentShare software platform does not replace any of the wide variety of applications in the broadcast environment or their application-specific databases. It does provide a framework and a set of software components that enable application developers to locate and interchange assets across multiple sites, as well as to create and track links between those assets. The software platform accomplishes this goal by creating a common language for requesting and providing information.

Users want systems that can interoperate and provide a unified approach to locating and moving material.

The ContentShare software platform has its roots in several years of research at Tektronix under a grant from the National Institute for Science and Technology. It is based on a software technology commonly called agents and is referred to as an "agent architecture for media management." This architecture consists of several pieces called components, which fall into four categories: messaging framework, system agents, brokers, and user agents.

System framework

The messaging framework consists of a set of low-level tools that allow the environment to function. The first language tool is called the Knowledge Query Manipulation Language (KQML). The second language tool is Extensible Markup Language (XML). These two language constructs comprise the system share information portion, and allow cooperative problem solving. This combination system provides location and data format independence.

System agents are those pieces of software that fit into the agent architecture to allow various applications to register data with the system, thus enabling distributed storage with easy cross-platform access. These agents are knowledge agents, called ASK, which give applications a place to register the description of system capabilities (video format, metadata fields, etc.) and resolvers, which manage and store relationships and name services, or ANS, which provide security.

Brokers are the software components that actually provide access to a given application's database. Any application that fits into the platform must have one or more brokers. Brokers handle registration with ASK and also expose the subset of data that is to be made publicly available. A ContentShare application contains brokers that assist with the exchange of assets

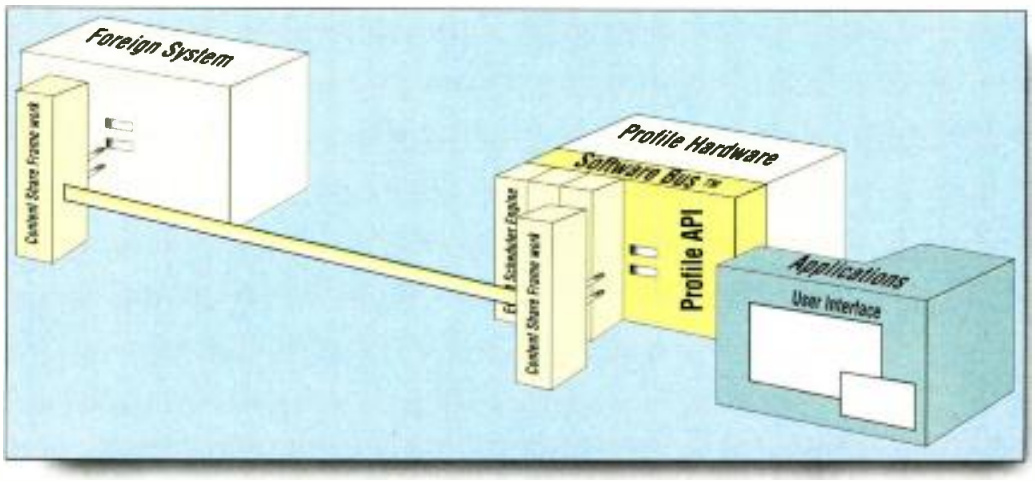


Figure 1: ContentShare integrates tightly with the Profile software architecture while concurrently providing access to a wide variety of applications.

CS3100B

broadcast audio production systems

The Euphonix CS3100B ON-AIR Broadcast console is designed to perform in the most demanding broadcast environments. With over 50 broadcast installations, the CS3100B's proven track record of technical excellence continues to win over premier ON-AIR studios worldwide. ABC, CBC, CBS, FOX, NBC, NHK and many other major networks have chosen Euphonix. Experience the Euphonix difference today.

- ✔ High Reliability
- ✔ Modular & Expandable
- ✔ Superior sound quality
- ✔ Instant Snapshot Recall™
- ✔ Precision surround panning
- ✔ High performance dynamics

Call to set up your own personal test mix to hear and experience the Euphonix power.

Mixing Consoles

Digital Recording

Euphonix

HIGH PERFORMANCE AUDIO SYSTEMS

www.euphonix.com

650-855-0400

Circle (151) on Free Info Card

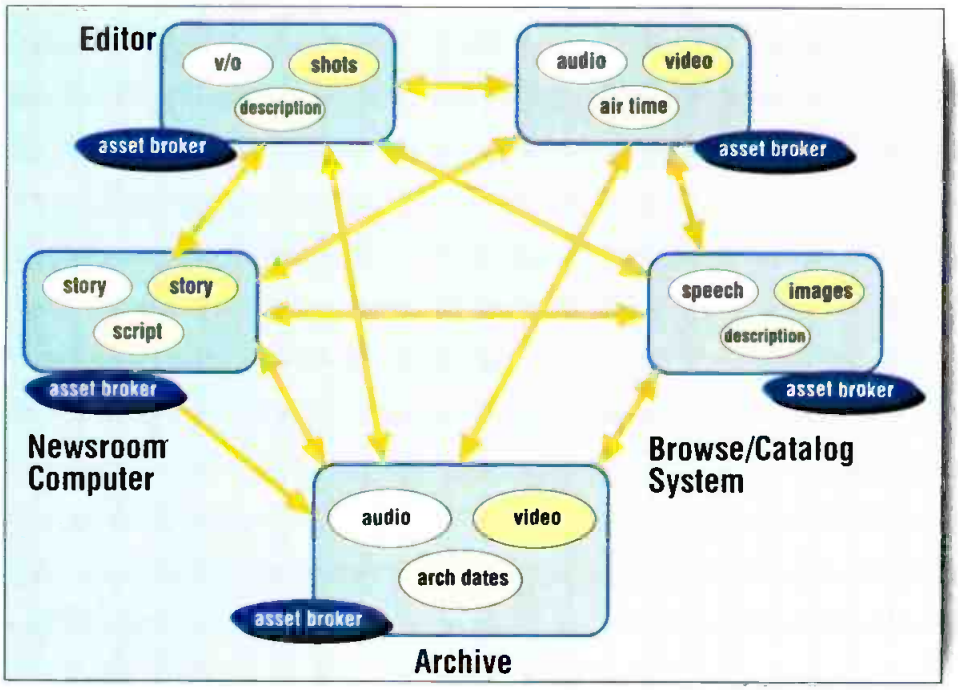


Figure 2: ContentShare brokers allow access to heterogeneous devices across multiple databases.

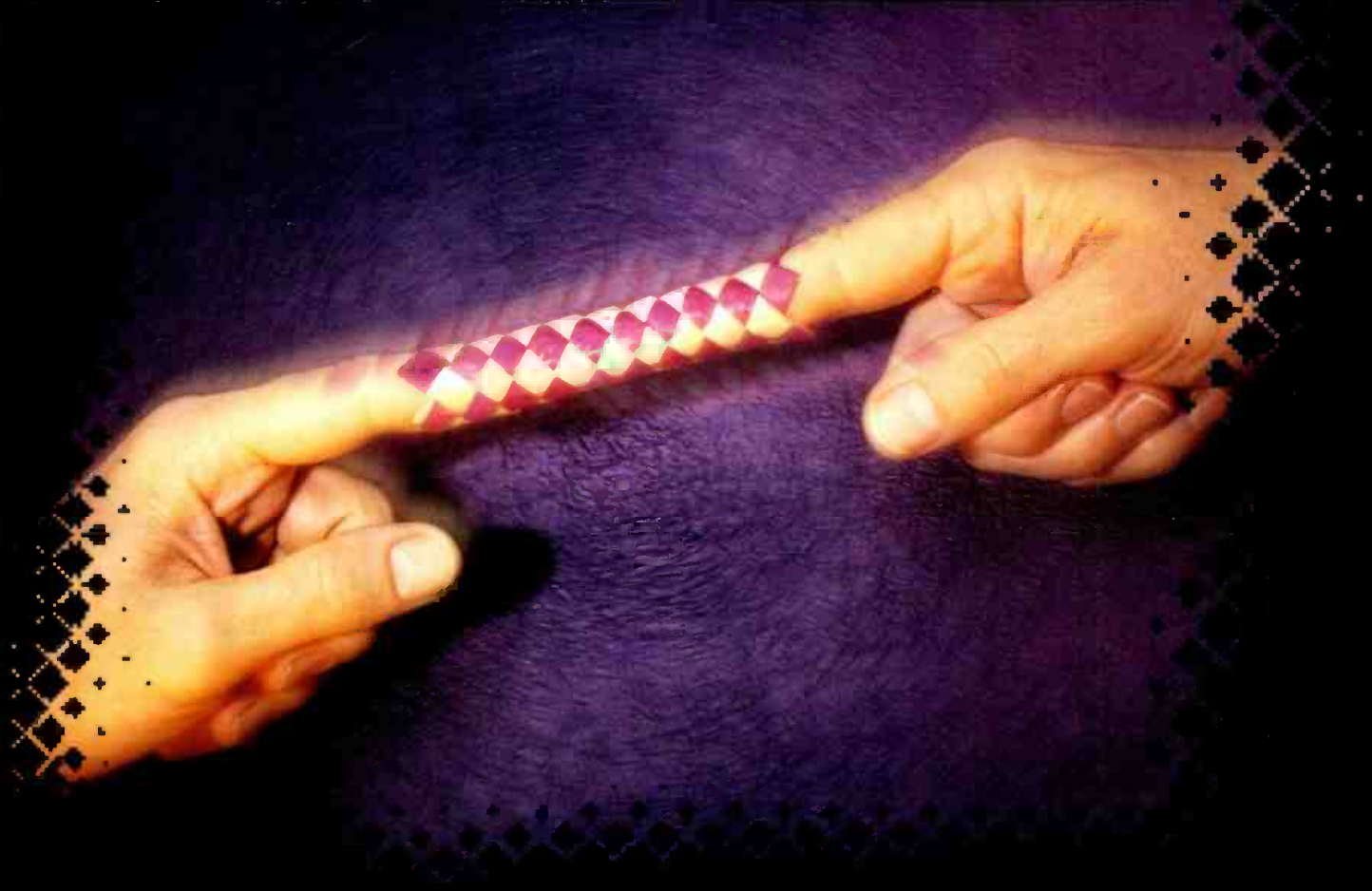
and their descriptions, query and search functions, and transfer activities.

All of these software elements combined, when used as the foundation for broadcast systems, allow flexibility in broadcast system design. Specialized applications for newsroom automation, acquisition, editing, archiving, traffic management and sales, station automation and other activities are becoming more prevalent. The system software provides an open platform for the creation of distributed media management applications that both overcomes the need for custom applications and enables cross-platform, cross-application integration. It does not solve global media management problems at the application level; rather, it makes possible media management applications development with greater flexibility.

Ultimately, broadcast application developers will be required to deal with one another's data in one form or another. Users want systems that can interoperate and provide a unified approach to locating and moving material. This need increases as station groups grow, as consolidations and acquisitions occur and as new networks are created. For those who write applications, the ContentShare software platform will decrease integration time and development costs. For users, there will be unprecedented access to information, more creativity, and faster response to the pressures of the broadcast environment. ■

For more information on Grass Valley Group's ContentShare, circle (452) on the Free Info Card.

Steve Bilow is ContentShare and Profile application programming interfaces product marketing manager and business development manager for Profile application development partners at Grass Valley Group.



ONCE YOU CHOOSE A "CLOSED" DTV SYSTEM, IT CAN BE DIFFICULT TO GET OUT!

DIVICOM DTV SOLUTIONS FOR ATSC ARE TRULY OPEN AND FLEXIBLE.

DTV is in its infancy. As the market matures, you're going to want the flexibility to grow with it. Choose a rigid, proprietary solution and you're stuck. However, with our open MPEG-2 solutions, you'll remain free to evolve your systems and services by integrating best-of-breed elements to meet your future needs.

The powerful hardware architecture of our MediaView™ family of SD and HD encoders enables you to meet future requirements through software upgrades. Should you later offer new services to generate additional revenues, our high-performance MPEG-2 compression technology enables you to better utilize existing bandwidth while maintaining optimum signal quality.

As the leaders in open solutions for digital television, we offer a robust portfolio of encoders, multiplexers, data broadcasting products, network management systems, DSNG/ENG solutions, and flexible integration and support services. If you're ready to get into DTV and know you're going to need the freedom to move with the market, call your DiviCom representative today or visit our web site.

www.divi.com
North America +1 408 944 6700
Europe/France +33 1 4862 9212
Europe/UK +44 1753 714 367
Latin America +1 561 692 1131
Asia Pacific/HK +852 21921799

DIVICOM™
Open Solutions for Digital Television

DVB • ATSC • HDTV • SDTV • 4:2:0 • 4:2:2

See us at IBC, stand #1.262

Applied Technology

TeraNex's PixelComp DTV format converter

BY JED DEAME

As broadcasters and post production houses gear up for digital television, the need to use DTV format converters becomes essential. Upconverters solve the problem of not having enough HD material to broadcast. Downconverters enable high-quality SD masters to be derived from HD productions. Downconverters also allow HD signals to be processed in SD facilities. Format converters enable post houses to convert any incoming material to and from their native format. Unfortunately, DTV formats are changing so rapidly that the initially deployed converters are quickly becoming obsolete. New production formats such as 1080p24 are not supported by many of the current generation DTV format converters. Many of the hard-wired, nonreconfigurable converters are not easily adaptable to the new formats.

One solution to this problem is to implement DTV format conversion in a programmable, software-based system. This capability exists today in ultra high-end computer workstations; however, those systems are not capable of performing the conversions in real time, due to the tremendous computational requirements of DTV format conversion. High-quality DTV format conversion requires hundreds of billions to trillions of operations per second. Massively parallel multiprocessor systems are clearly required to handle that magnitude of processing load.

GAPP technology

Technically, GAPP (Geometric Arithmetic Parallel Processor) is a massive parallel super-computer organized in a two-dimensional single instruction multiple data (SIMD) architecture. Traditionally, SIMD systems have been large and expensive, but due to recent advances in semiconductor and processor technology, highly efficient SIMD systems are now practical to implement in compact 19-inch rack mount units. TeraNex has packaged GAPP technology in a 6RU rack mount black box that provides a reconfigurable platform supporting all existing and emerging format conversions using the highest possible quality algorithms. The result is a DTV format converter that can adapt to new formats and processing techniques as fast as they evolve.

De-interlacing and resampling

The most important feature of a format converter is image quality. Image quality is driven by two variables: the quality of the de-interlacing algorithm and the quality of the resampling algorithm. Ultimately, the final quality of the videostream is dependent upon the type and the refinement of the image processing algorithms that are applied to it. For instance, with respect to upconversion from 480i to 720p, the first and most complex step is to convert the interlaced image to progressive (480p). This is necessary because the odd lines of the image are spatially shifted from the even lines, due to inter-field motion. (See Figure 1A.) Note especially the double images of the sheep's eyes. This is due to camera motion in interlaced TV systems. This field offset must be dealt with in order to create visually pleasing progressive images. Once a clean 480p image is created, it may then be resampled to the desired new image format.

There are three basic methods for de-interlacing an image. The first type of de-interlacing algorithm is field interpolation. Here, every other line of the input image is discarded, reducing the image size from 720x486 to 720x243. The 1/2 resolution image is then resampled to the desired HD image size. The results of this process are shown as Figure 1B.

The second de-interlacing method is motion adaptive. In this method, the amount of inter-field motion is measured and used to make the decision of whether to use the entire input frame (in the case where there was no inter-field motion), or discard one field (in the case where there was significant

Figure 1. 3x-zoomed image upconverted from 480i to 720p . Original odd lines are spatially shifted because of inter-field motion (A). Results of field interpolation (B) show an oblong shape of the sheep's eyes, indicating the loss of resolution. Motion adaptive conversion produces a higher quality image (C) than field interpolation on stills; however, double images can result as shown. Using TeraNex's PixelComp process (D), de-interlacing measures the inter-field motion and properly realigns the data between fields. The result is improved resolution. Compare this image quality (noting especially the round sheep's eyes) against that of the other methods.

The PESA Tiger is quickly becoming the router of choice for studio and mobile broadcasting around the world. It's no wonder the competition is nervous!

The PESA Tiger size advantage is undeniable - a 144x144 video switcher requires only 12RU, while the audio switcher packs two channels of analog or AES audio into a scant 8RU. And there's plenty of muscle behind those good looks. Both Tiger switchers support mixed analog and digital matrices in the same frame.

The Tiger delivers absolutely unbeatable packaging, bullet-proof performance, and the flexibility to take on new challenges. It's a killer combination.

It's a jungle out there...and it's full of Tigers. Anything less is just lunch.

PESA Switching Systems

Corporate Sales Office • 35 Pinelawn Rd • Suite 99E • Melville, NY 11747

1-800-328-1008 • Tel: 516-845-5020 • Fax: 516-845-5023 • www.pesa.com

25th Anniversary

PESA Switching Systems, Inc.

Circle (161) on Free Info Card

Broadcast graphics systems: Where the PC workstation drives the show

BY DOUGLAS GRANT

The modern desktop PC workstation, appropriately equipped and configured, is amazingly powerful in its ability to rapidly create and display graphics from either user input (mouse, tablet, keyboard) or from dynamic data feeds (news, weather, financial or sports). The availability, affordability and ease of use of common PC workstations account for their popularity. Such systems are responsible for a good share of graphics creation or playout in today's TV facilities.

Both high-end and lower-cost systems have their advantages, but you get what you pay for.

How do you decide which broadcast graphics system is right for you? Careful selection of features is crucial to getting the right platform and software. Both high-end and lower-cost systems have their advantages, but you get what you pay for.

To add further confusion, some popular mass-market graphics programs appear attractive for broadcasters looking for an economical graphics solution. However, close examination reveals that such programs may not deliver the functionality required for broadcaster applications. Some products provide platform-based solutions that combine broadcast graphic software and standard PC core hardware with specialized video processing hardware in broadcast-environment-friendly rack-mount configurations. Such systems may deliver a good combination of performance, features and cost for many broadcast applications.

Consider these key points:

- Is the system based on delicate pieces of equipment or a piece of rugged video gear? Are the PC boards firmly clamped in place, or just plugged in like desktop computer systems? Vibrations can cause boards to loosen and affect performance.
- Does the system have dual power supplies? If so, you have a back up already in place if brown outs or PS failure occurs.
- What type of connectors are used? Look for BNCs, not RCA plugs. A BNC is the standard professional video connector; RCA plugs are not.
- Do a feature check for your application. Can the system do what you need to do in a way that's convenient for your operators? For instance, can you paint to video? This lets you edit your images online to make any necessary last-minute changes.

The ability to upgrade to HD, while possible with many of today's systems, might better be accommodated with an entirely new system as hardware costs drop.

- Determine the system's output signal format. If the graphics platform outputs SDI today, can it be upgraded to HD tomorrow?
- How about single frame capture? It's often useful to be able to store one or more frames of video for later use as background.
- Video frame buffering allows an artist to accurately preview the work before it goes to air.
- Does the system recognize illegal colors?
- Determine system resolution. An Alpha or Key channel may require 32-bit processing to provide the alpha channel for graphics overlay. Not all systems provide this level of resolution.
- Aspect ratios. Does your application require 16:9 operation? If so, can the graphics system easily switch between that and 4:3?
- Is the software mouse centric? While operators can do anything with a mouse, it's never as fast as single keystrokes. Look for productivity and flexibility features including keyboard shortcuts and a logical shortcut layout.
- What other I/O devices are supported? Can you use graphics tablets and remote shuttles?
- Speed is difficult to determine, but needless to say, broadcast applications require fast updates and the provision for last-minute changes. Is rendering required? Can you tolerate a delay in broadcast situations?
- External data interfaces. Can the system interface with automated data service feeds. This is particularly important for news, weather, sports and election applications.
- Does the system support full 3D graphics?
- What expansion options exist: RAM, additional processors, external drives and storage, additional I/Os?

World-Class Intercoms

All over the world, Matrix Plus® digital intercoms are working in today's most demanding communications environments.

You'll find them linking news production teams from Argentina to Zimbabwe. Bringing you financial news from Wall Street, Olympics coverage from Nagano, and fast-breaking election coverage from Washington DC to Warsaw.

We're helping NASA track the Space Shuttle and Globalstar launch satellites. We're there, producing the worship service at Crystal Cathedral and in post production at Universal Studios.

Worldwide, production teams choose Matrix Plus digital intercoms for their performance, their flexibility, and their reliability. And for the support they receive – from a company that has pioneered intercommunications technology for 30 years.

To learn more about Matrix Plus and our broad range of communications products, please call or visit us on the web.

Clear-Com
Intercom Systems

30 YEARS

©1999 Clear-Com 510.496.6666 FAX 510.496.6699 www.clearcom.com International: 925.932.8134 FAX 925.932.2171

Circle (162) on Free Info Card

Product life

Your selected system should last three to five years. If your facility will broadcastDTV in that timeframe (and who won't), system upgradeability is important. While NTSC operation is adequate today, you'll need SDI soon and shortly the ability to do both 4:3 and 16:9. The ability to upgrade to HD, while possible with many of today's systems, might better be accommodated with an entirely new system as hardware costs drop. It could be possible to purchase a new system for not much more than upgrading your current system.

Fortunately, today's PC-based broadcast graphics systems offer unprecedented functionality and performance. All you have to do is keep in mind the above key factors as you consider what system would best meet your needs. ■

Douglas Grant is marketing coordinator for Inscriber Technology, Waterloo, Ontario, Canada.

Alias/Wavefront	www.waveframe.com	416-362-9181		416-369-6139	Circle (401)
Artel Software Inc.	www.BorisFX.com	617-451-9900	888-77-BORIS	617-451-9916	Circle (402)
Aston Electronic Designs Ltd.	www.astondes.com	+44 1252 836221		+44 125 283 7923	Circle (403)
Avid Technology	www.avid.com	978-640-6789	800-949-AVID	978-851-0418	Circle (404)
AVS Graphics Ltd.	www.avsg.co.uk	+44 1990 003220		+44(0)1990 003203	Circle (405)
Broadcast Software Solutions	www.broadcastsoftware.com	561-776-8462	800-273-4033	561-776-8464	Circle (406)
Burst Electronics Inc.	www.burstelectronics.com	505-898-1455		505-898-0159	Circle (407)
Cayman Graphics	www.CaymanGraphics.com	801-254-6979		801-254-6994	Circle (408)
Chyron/Pro-Bel	www.chyron.com	516-845-3871		516-845-3888	Circle (409)
Compix Media	www.compixmedia.com	213-487-8222		213-487-9251	Circle (410)
Digimation	www.digimation.com	504-468-7898	800-854-4496	504-468-5494	Circle (411)
Electric Image Inc.	www.electricimage.com	818-577-1627	888-RENDER1	818-577-2426	Circle (412)
Evolving Video Technologies	www.evt.com/evt	303-456-1556		303-465-2012	Circle (413)
For-A Corporation of America	www.for-a.co.jp	714-894-3311		714-894-5399	Circle (414)
Getris Images	www.getris.com	+33 76 909777		+33 76 907234	Circle (415)
Horita Co Inc.	www.horita.com	949-489-0240		949-489-0242	Circle (416)
InnoVision Technology	www.invt.com	510-732-3122		510-732-3120	Circle (417)
Inscriber Technology	www.inscriber.com	519-570-9111	800-363-3400	416-391-1999	Circle (418)
Interactive Effects	www.ifx.com	714-247-1200		714-573-9424	Circle (419)
Knox Video	www.knoxvideo.com	301-840-5805		301-840-2946	Circle (420)
Leitch Inc.	www.leitch.com	757-548-2300	800-231-9673	757-548-4088	Circle (421)
McRoberts Software	www.cometcg.com	317-842-5097		317-842-0084	Circle (422)
MicroVideo Ltd.	www.microvideo.co.uk	+44 1223 834119		+44(0)1223 834471	Circle (423)
Multidyne Inc.	www.multidyne.com	516-671-7278	800-4TV-TEST	516-671-3362	Circle (424)
Newsroom Solutions Inc.		704-377-1496		704-377-6336	Circle (425)
NewTek	www.newtek.com	210-370-8000	800-847-6111	210-370-8001	Circle (426)
Nothing Real	www.nothingreal.com	310-664-6152		310-664-6157	Circle (427)
Pilot Broadcast Systems USA	www.pilot.no	212-453-4893		212-453-4884	Circle (428)
Pinnacle Systems	www.pinnaclesys.com	650-526-1600		650-526-1601	Circle (429)
Pixel Power Ltd.	www.pixelpower.co.uk	+44 1223-721000		+44(0)1223-721111	Circle (430)
Pixelan Software	www.pixelan.com	360-647-0112		360-647-7601	Circle (431)
Play Inc.	www.play.com	916-851-0800	800-306-PLAY	916-851-0801	Circle (432)
Princeton Video Image		609-912-9400			Circle (433)
Quantel Inc.	www.quantel.com	203-656-3100	800-218-0051	203-656-3459	Circle (434)
Softimage	www.softimage.com	818-365-1359	800-576-3846	514-845-5676	Circle (435)
Vegas FX	www.vegasfx.com	512-469-9160		512-474-5322	Circle (436)
Video Data Systems	www.videodatasys.com	516-231-4400	800-858-5850	516-231-4405	Circle (437)
Videonics	www.videonics.com	408-866-8300	800-338-EDIT	408-866-4859	Circle (438)

Digital HDTV

We invented it · We perfected it

We're delivering it.

0 1 0 1 0 1 0 1
0 1 0 1
1 0

Since 1990, GI's pioneering work has been leveraged into a practical implementation of our most advanced technology — the ATSC compliant, DigiCipher® II High Definition encoder. Designed to satisfy the high expectations of the broadcast, cable and satellite programming industries, the DigiCipher® II encoder features:

- Superior video compression
- Compatible with Dolby® Digital 5.1 sound
- Full ATSC DTV compliance
- Integrated STL configurations
- Seamless SD/HD operation

Nobody delivers DTV better than GI. Contact us at ***1-888-800-8346*** *for more information.*

GI General Instrument®

Listen to lead

BY KARE ANDERSON

In a time-pressed, relationship-diminished world, you can demonstrate a caring attitude easier through compassionate, complete listening than through talking or even asking questions. Yet we are so rushed that slowing down to listen — without interruption — is an increasingly rare occurrence. You'll really stand out when you do. Seeing the rewards of listening may help you become motivated to practice the stillness required.

I admit that what I'm proposing here is often hard for me to practice. Learning to listen is more difficult than learning to ask good questions, but there are rich and immediate rewards for being a thoughtful listener. With less stress and energy on your part, you naturally bring others closer when you listen because speakers feel heard when they observe your open expression. By fact gathering in listening, you can confirm what you have most in common with those people, in that moment. Only then can you consider where to build bridges to deepen relationships.

Listening may seem like a passive task, but, in fact, it requires more mental and emotional energy to do correctly than speaking.

In a crowd of active speakers, you may feel left out or shunted aside when you speak less, but if you wait until others speak first, you can propose your suggestions or ideas as specific extensions or examples of what others have already said is important to them.

Quieting the chattering mind promotes directed action

Listening may seem like a passive task, but, in fact, it requires more mental and emotional energy to do correctly than speaking. Why? Because our gut reaction is to perceive that other people mean the same thing that we would mean if they say or act a certain way.

Research shows that Americans are more likely to trust and support a new kind of leader who exhibits strong listening and action skills. Unlike the John F. Kennedy model of charismatic leadership that worked in the past, people find other kinds of behavior and group interaction more satisfying and inspiring.

Here is a summary of behavioral traits for you to consider:

1. Go slow to go fast.

At the beginning of every task or interaction, do everything lower and slower to get in sync and establish a common direction and involvement. When you pick up speed later on, everybody is eager to be on board.

2. Create the common vision.

Vividly characterize the listener's direct benefit up front, even if it is a part of his or her job anyway. Then characterize how the expected support directly relates to one of the top goals of your organization, the up side and down side of doing the work.

3. Play straight.

Announce the rules up front — penalties and rewards for participation in a team activity, project or job — and don't change them in midstream without a compelling reason.

4. Play it back.

Seek and reward candid feedback on an ongoing basis. Respond specifically and soon to what you've been told, including the rationale about the action you will or will not take, based upon that feedback.

5. Synthesize the best.

Listen, ask, ask more, then synthesize others' ideas as a way of proposing new action.

6. Give third-party endorsements.

Offer specific, genuine praise for others' contributions from anywhere in the company; praise them to those who are important to them and in ways that reflect their highest self-image and values.

7. Walk your talk.

Demonstrate a congruency in all that you do; make and keep agreements; reflect a clear set of core personal values that people can trust you'll keep, regardless of whether they share those values.

I always enjoy getting your e-mail reactions to these columns and your ideas of communication-related topics to cover in future columns, so please share them at kareand@aol.com. I'll answer each e-mail, not just to practice good e-mail listening but because your feedback is fascinating.

For more ideas about listening, consider reading one of these well-written books on the topic: *Listening — Forgotten Skill* by Madelyn Burley-Allen; *Active Listening: Building Skills for Understanding* by Marc Helgesen; *The Art of Listening* by Fromm; *Between People: Communicating One-to-One* by John A. Sanford; *Changing the World, One Relationship at a Time: Focused Listening for Mutual Support & Empowerment* by Sheryl Karas; *Dealing with Someone Who Won't Listen* by Lisa K. Adams; *From the Listening Place; Languages of Intuition* by Margaret Blanchard; *Getting the Picture: Everyday Listening/Speaking with Idioms* by Nancy Herzfeld-Pipkin; and *How Will They Hear if We Don't Listen?* by Ronald W. Johnson. ■

Kare Anderson is a speaker and author.

SEND Send questions and comments to: kare_anderson@intertec.com

8VSB PROVEN

THE POWER OF CHOICE

What's new in UHF DTV from Thomson Tubes Electroniques?

- The new **TH 770 IOT** with 25 kW average DTV power.
Thanks to its high flat gain characteristics and stability, the TH 770 enables your digital transmitter to deliver **25 kW across the whole UHF band.**

- The **TH 755 IOT** fully compatible with your **existing** 40 to 50 kW analog transmitter modules.

These IOTs round out today's broadest range of UHF tubes: IOTs, Diacrodes® and tetrodes.

By choosing IOTs from Thomson Tubes Electroniques, you'll discover the benefit of saving on the operational cost of your transmitter.

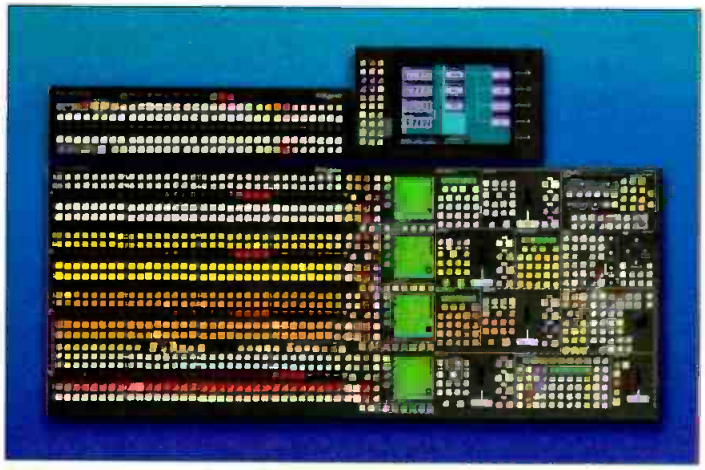
Put the power of choice to work for you. You'll get the solution you need to meet your current and future requirements in both digital and analog applications.

THOMSON TUBES ELECTRONIQUES

Headquarters: 18, avenue du Maréchal Juin - 92366 Meudon-la-Forêt cedex - FRANCE - Tel: +33 (0)1 30 70 35 00 - Fax: +33 (0)1 30 70 35 35
Web Site: http://www.tte.thomson-csf.com
US office: Thomson Components & Tubes Corp. - 40G Commerce Way - PO Box 540 - TOTOWA NJ 07511 - Tel: (1-973) 812 90 00 - Fax: (1-973) 812 90 50
Web Site: http://www.tctus.com

Circle (175) on Free Info Card

THE CHOICE OF POWER



Video production center
GRASS VALLEY GROUP KALYPSO

:includes up to six channels of integrated digital effects that support 2D transforms in 3D space as well as 2D effects such as blurs and mosaics; each channel processes video and key information; performs digital effects transitions, using internal and/or external channels as transitional effects. 800-547-8949; fax: 530-478-3347; www.grassvalleygroup.com

Circle (358) on Free Info Card

Digital video server
GRASS VALLEY GROUP PROFILE XP

:600 Mbs of bandwidth; up to eight channels; features Tektronix SoftwareBus open software architecture, SNMP-based remote monitoring, as well as Tektronix ContentShare plug-ins. 800-547-8949; fax: 530-478-3347; www.grassvalleygroup.com

Circle (359) on Free Info Card

Hard-disk multitrack recording system
OTARI CORP RADAR II HDR SERIES

:second-generation enhancement of the RADAR I hard-disk multitrack recording system; a stand-alone 24-bit, 48kHz sampling, 24-track hard-disk recorder; features a standard 9GB removable hard drive and an all-new remote-control console that emulates the operation and feel of a remote-controlled analog tape recorder; features a detachable remote meter bridge so RADAR II can be located away from the control room; an optional T/DIF link with 24-track digital I/Os allows RADAR II to communicate directly with digital consoles. 800-877-0577; 818-594-5908; fax: 818-594-7208; www.otari.com

Circle (360) on Free Info Card

Digital stereo monitoring system
GENELEC OY 2029A

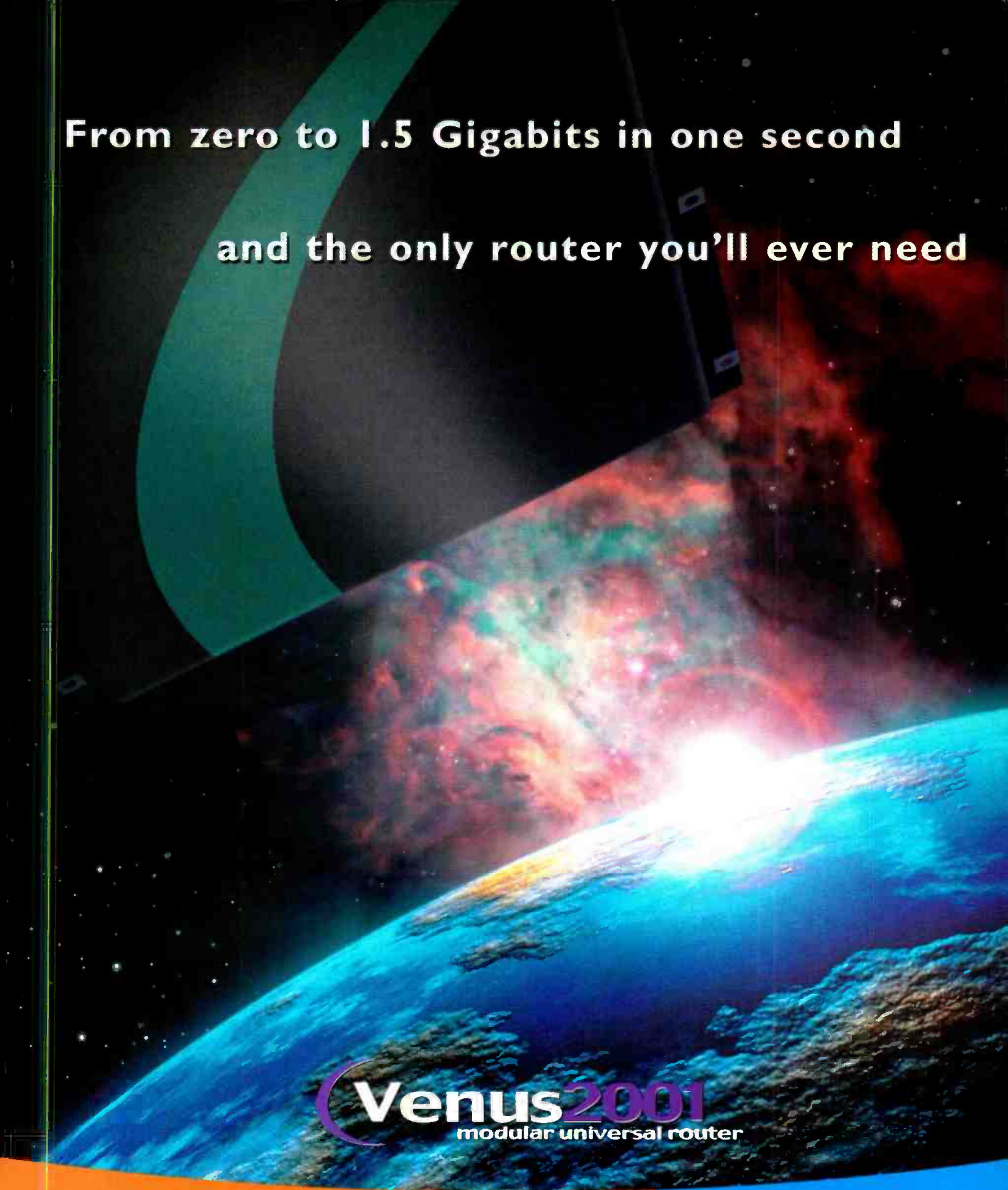
:a compact (9 3/4 inches high x 6.0 inches wide x 7.5 inches deep) two-piece, nearfield monitoring system designed for sound professionals working in a wide range of critical listening environments including digital audio workstation music production and editing, digital broadcast confidence monitoring, multimedia projects and location/live sound recording; comprised of one right master speaker and one left speaker. 800-228-4821; 508-652-0900; fax: 508-652-0909; genelec.com

Circle (361) on Free Info Card

Digital enhances studio and sports lenses
ANGENIEUX DIGITAL OPTION

:for Angenieux's 22x7.5 AIF studio lenses, 62x9.5 AIF OP and 72x OB sports lenses; uses same controls as the standard versions; features five focus laws, three zoom laws, anti-breathing device to maintain the angle of view when focusing, Assisted Internal Focus (AIF). +33 47790 78 00; fax: +33 47790 78 03; www.angenieux.com

Circle (362) on Free Info Card



The new Venus2001 modular universal router is ready to take you into the next millennium by handling all your signal types today—including high definition video—from the same chassis. Both SD and HD can be routed using the same modular card so there is no need to rewire your facility—just plug it in. Own the original Venus? Use a Venus2001 card to easily upgrade your router to HD. To learn more, call toll free 1-800-962-4287, or visit our web site at www.broadcast.philips.com.

PHILIPS

Let's make things better.

Circle (177) on Free Info Card

Digital ENG microwave transmitter

NUCOMM/NEC DIGITAL ENG TRANSMIT AND RECEIVE SYSTEM

:combines Nucomm's PT6/RX6 series digital-ready portable transmitter and receiver or Nucomm's MMPT6 NewsCaster digital-ready ENG van transmitter and CR6 series central receiver system with NEC's COFDM modulation and MPEGII encoding system. 800-9-NUCOMM; 908-852-3700; fax: 908-813-0399; www.nucomm.com

Circle (363) on Free Info Card

Link between virtual and spatial reality

VINTEN BROADCAST IMAGETRACKER

:creates an accurate link between a person being viewed through a TV camera and a computer-generated virtual background by tracking the image within the focal plane of the camera; works by mounting mechanical targets to each TV camera, which are then viewed by infrared cameras placed throughout the studio; cameras triangulate the position of the targets, then feed the data into the computer generating the virtual set; resulting corrections accurately place the foreground talent in the VR background. +44 1284 752 121; fax: +44(0)1284 750 560; www.vinten.com

Circle (364) on Free Info Card

Hardware Interface

EUPHONIX SL156

:a hardware interface that provides machine control of the Euphonix R-1 multitrack recorder from all SSL G-series and AMS NEVE V series mixing consoles; allows 48-track record ready arming with lamp tallies from SSL consoles as well as direct cue control from SSL automation systems and NEVE Flying Faders automation systems. 818-766-1666; fax: 818-766-3401; www.euphonix.com

Circle (365) on Free Info Card

HD mastering VTR

PANASONIC AJ-HD3000 D-5

:switchable between 1080 interlace and progressive modes, is also capable of recording and playback at various frame rates include 60i, 50i, 24p, 25p and 30p; provides full bandwidth, 10-bit 4:2:2, uncompressed ITU-601 recording and playback, plus full bandwidth, 10-bit 4:2:2 HD recording and playback using low compression ratio, 235Mb/s I-frame only compression. 800-528-8601; 323-436-3500; fax: 323-436-3660; www.panasonic.com/PBDS

Circle (366) on Free Info Card

Program quality of service monitor

TEKTRONIX PQM300

:allows users to identify the most common visual impairments, including blockiness, frozen and repeated frames, loss of service and Gaussian noise before they become customer complaints; monitors all pixels and all fields continuously; identifies an image defect or impairment and signals an alarm, identifying the channel on which the problem resides. 800-547-8949; 503-627-7275; fax: 503-627-7275; www.tektronix.com/VND

Circle (367) on Free Info Card

It's never been easier. Or quicker. Thanks to the Q-G® Twist. The Q-G Twist is Switchcraft's latest addition to our family of innovative Q-G® connectors.

With the Q-G Twist, you have just two parts to assemble: a front-shell with a pre-loaded insert, and a combination strain relief and handle. In fact, the two pieces are what makes the Q-G Twist so simple to build.

Step One: Slide the handle onto your cable.
Step Two: Solder to the insert in the front shell.
Step Three: Twist on the handle.

If you would like a twist with your Q-G Twist, we also offer black finishes, gold plating, rugged die-cast handles, or just about *any* variation—just ask.

So if you're looking for a quick and easy, durable connector, just ask to do the twist—the Q-G Twist, that is. Call us and we'll be happy to partner with you.

Switchcraft®

www.switchcraft.com

Switchcraft, Inc.
5555 North Elston Avenue
Chicago, IL 60630
Phone: 773-792-2700
Fax :773-792-2129
sales@switchcraft.com
www.switchcraft.com

Circle (179) on Free Info Card

Serializer and deserializer

MIRANDA TECHNOLOGY SER-800E AND SER-800D

:automatically detects the incoming signal format and supports 480p, 720p, 1035i, 1080i and 1080p image formats at 60, 59.94, 50, 30, 29.97, 24 and 23.98Hz scan rates; plugs directly into a D-Sub connector, eliminating the need for a frame or parallel cabling. 800-224-7882; 514-333-1772; fax: 514-333-9828; www.miranda.com

Circle (368) on Free Info Card

Component digital camcorder

JVC GY-DV500

:camera portion delivers the equivalent of 750 lines of horizontal resolution, 14-bit digital signal processing, full auto white, black stretch/compression, built-in Genlock, zebra level indicator; can be operated in full manual mode or switched to full auto shooting; provides IEEE 1394 FireWire in and out. 800-JVC-5825; 973-315-5000; fax: 973-315-5030; www.jvc.com/pro

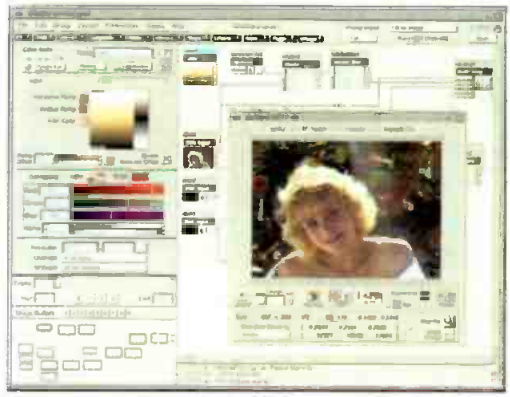
Circle (369) on Free Info Card

Multichannel distribution system

TELECAST FIBER SYSTEMS PYTHON

:handles eight channels of digital video; format independent from 19.4Mb/s to 1.5Gb/s uncompressed HD; laser outputs for digital requirements, including router interfaces in facilities, STLs and mobile field production. 508-754-4858; fax: 508-752-1520; www.telecast-fiber.com

Circle (370) on Free Info Card



2D compositing software

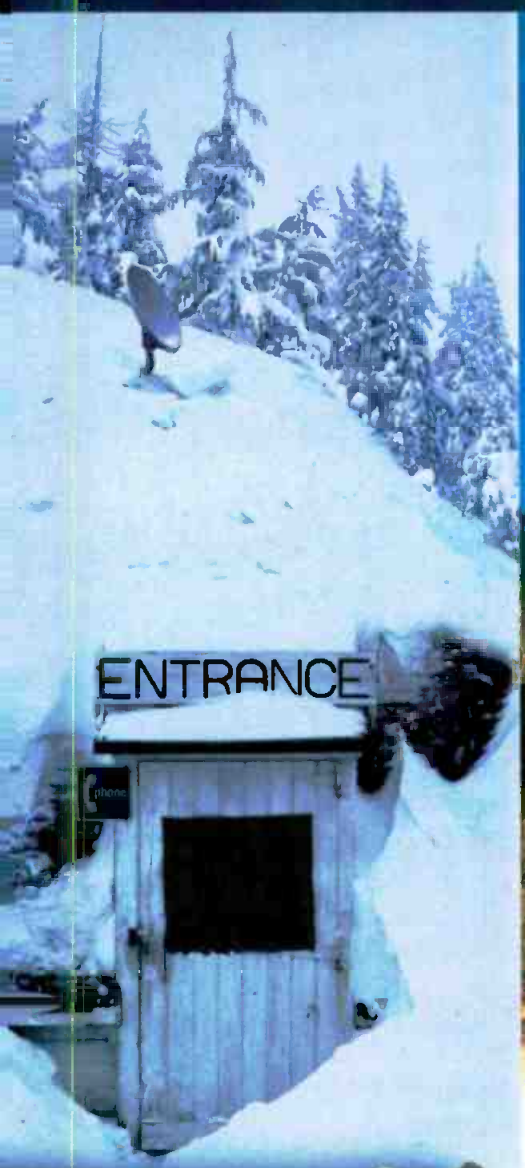
SILICON GRAIL CHALICE 2.0

:improved GUI; new proxy and monitor splicing; in-monitor slicing system integrated throughout; images are subdivided into horizontal strips for separate processing, significantly decreasing the time required to process effects functions, a feature that is especially useful when working with large images. 213-871-9100; fax: 213-871-9199; www.sgrail.com

Circle (371) on Free Info Card

PLLs from California Amplifier

GOING TO EXTREMES



At California Amplifier, we understand your demands for a Phase Locked LNB can be extreme, so we make sure our testing procedures are ever more so.

Your site drops to -20°F in winter; we test to -40°F. The site rockets to +120°F in summer; we test to +140°F. Your site gets 300 inches of rain; we immerse every LNB in water before it leaves the factory. Our tests are extreme, so you will have a product you can depend on.

Our complete line of C & Ku Band PLL LNBs are available in a variety of frequency ranges and L.O. stability options. All this performance at a price you won't believe.

ATTRACTIVE VOLUME PRICING
AVAILABLE FOR LARGE ACCOUNTS.

ISO 9001
Certifiec A #3505

CALL TODAY FOR MORE INFORMATION: (888) 767-7988
VISIT OUR WEBSITE: www.calamp.com

World Headquarters: 460 Calle San Pablo, Camarillo, CA., USA 93012 Tel: 805-987-9000 Fax: 805-987-8359
Latin America Sales: California Amplifier do Brazil Tel & Fax: 55/12-341-2264
Europe, Middle East and Africa Sales: Cal Amp sarl Paris, Tel: 33/1 49 19 89 20 Fax: 33/1 48 64 52 55
Asian and Pacific Sales: California Amplifier Thailand, Tel: 662-231-8235 Fax: 662-231-8245

California Amplifier

Circle (163) on Free Info Card

Personal monitor

WANDEL & GOLTERMANN RADMAN

:provides a warning up to 40GHz in radio transmission and telecommunications; new shaped probes Type 25 to 27 evaluate all incoming signals on the basis of frequency-dependent limit values, which permits measurements to be made in accordance with norms, even in unknown multifrequency environments such as in the vicinity of radio and TV transmission. 49 7121 86 16 16; fax: 49 7121 86 13 33; www.emf.wg.com

Circle (372) on Free Info Card

NiMh battery brick pack

ASPEN ELECTRONICS NHP-65 BANTAM BRICK

:NiMh battery brick pack, weighing only two pounds; water resistant ABS housing; 65W of power (14.4V/4.5Ah); digital fuel gauge that automatically displays remaining power while the brick is in use. 714-379-2515; fax: 714-379-2517; www.aspenelectronics.com

Circle (373) on Free Info Card

Multitrack console

SOLID STATE LOGIC AXIOM-MT DIGITAL MULTITRACK CONSOLE

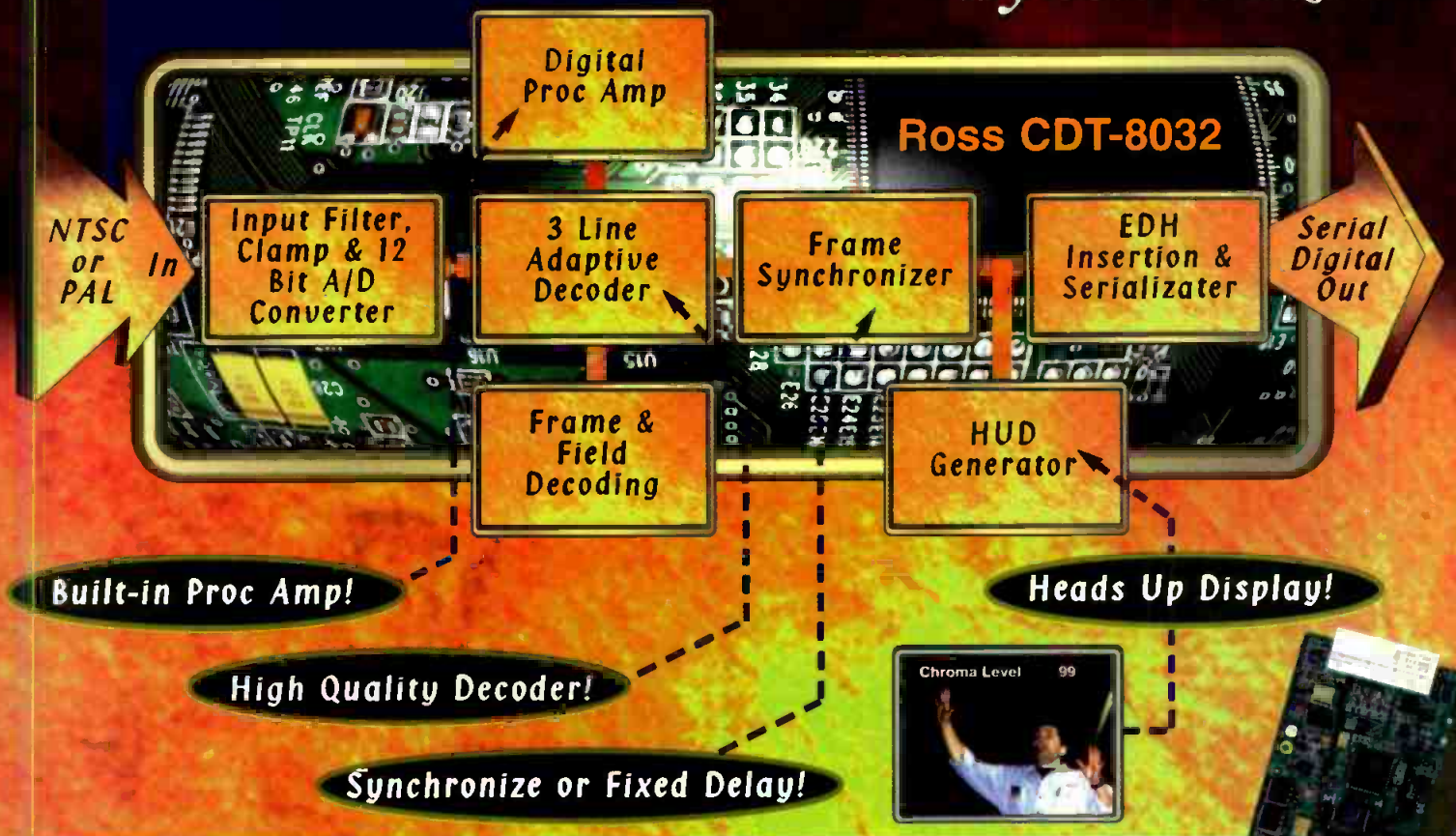
:48 multitrack buses, 12 main mix buses, 12 aux buses, more than 200 mix returns and up to 96 fully featured channels; provides all of the traditional SSL in-line facilities with every control dynamically automated, including the surround panning on large and small faders. +44 1865 842300; fax: +44(0)1865 842118; www.solid-state-logic.com

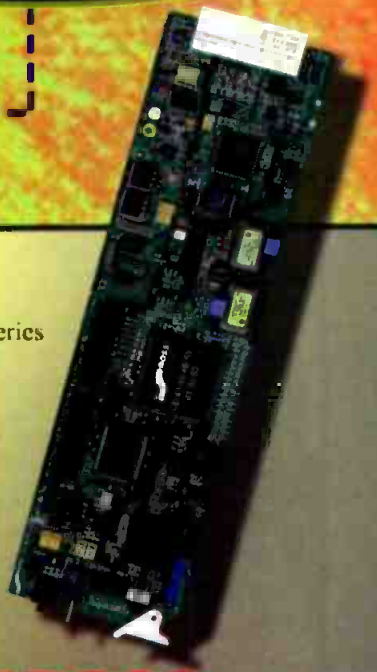
Circle (374) on Free Info Card

Hot Gear!

Ross Gear
Terminal Equipment

NTSC/PAL to 601 Decoder/ Synchronizer





ADC-8032
NTSC/PAL to 4:2:2 Decoder
with 3 Line Adaptive Comb Filter
$1,595

ADC-8032-S
NTSC/PAL to 4:2:2 Decoder
with 3 Line Adaptive Comb Filter
& Frame Synchronizer
$2,495

ADC-8032-F
NTSC/PAL to 4:2:2 Decoder
with 3 Line Adaptive Comb Filter,
Frame/Field Decoding
$2,495

ADC-8032-SF
NTSC/PAL to 4:2:2 Decoder
with 3 Line Adaptive Comb Filter,
Frame/Field Decoding
& Frame Synchronizer
$2,995

- Compatible with Ross 8000 Series or Leitch* 6800 Series frames
- 5 Year Warranty!

ROSS
Switchers, Keyers, & Terminal Gear

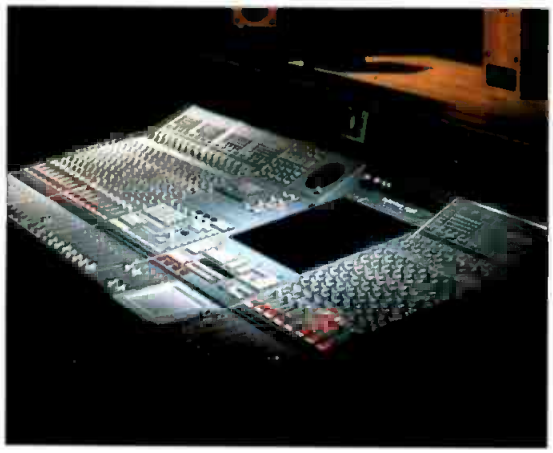
25 YEARS

Tel: (613) 652-4886
Fax: (613) 652-4425
Email: solutions@rossvideo.com
Ross is a trademark of Ross Video Limited
*Leitch is a trademark of Leitch Technology Corporation

www.rossvideo.com

Circle (165) on Free Info Card

Call us today at (613)652-4886 to get your free Ross 1999/2000 Product Catalog!

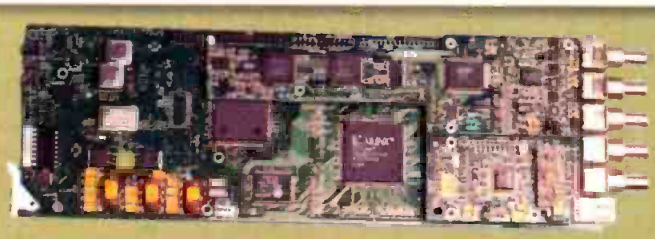


Digital broadcast console

SOLID STATE LOGIC AYSIS AIR W/ V3 SOFTWARE

:enhanced version of the Aysis Air digital broadcast console; provides up to 96 fully featured channels; offers numerous important new facilities, including improved surround sound operating modes for 5.1, for AC3 or Dolby Surround with a simultaneous stereo mix; can route 48 clean feed buses from any or all channels (mono or stereo) post-fader, via front panel controls; select up to 256 sources from the whole range of console sources and mixes, analog or digital. +44 1865 842300; fax: +44(0)1865 842118; www.solid-state-logic.com

Circle (375) on Free Info Card



HDTV monitoring downconverter

EVERTZ MICROSYSTEMS 7710MD

:an HD downconverter for monitoring 1.5Gb/s signals on an standard definition monitor; accepts 1080i or 720p input and offers four outputs of two 1.5Gb/s reclocked outputs, two NTSC or two serial components. 905-335-3700; fax: 905-335-3573; www.evertz.com

Circle (377) on Free Info Card

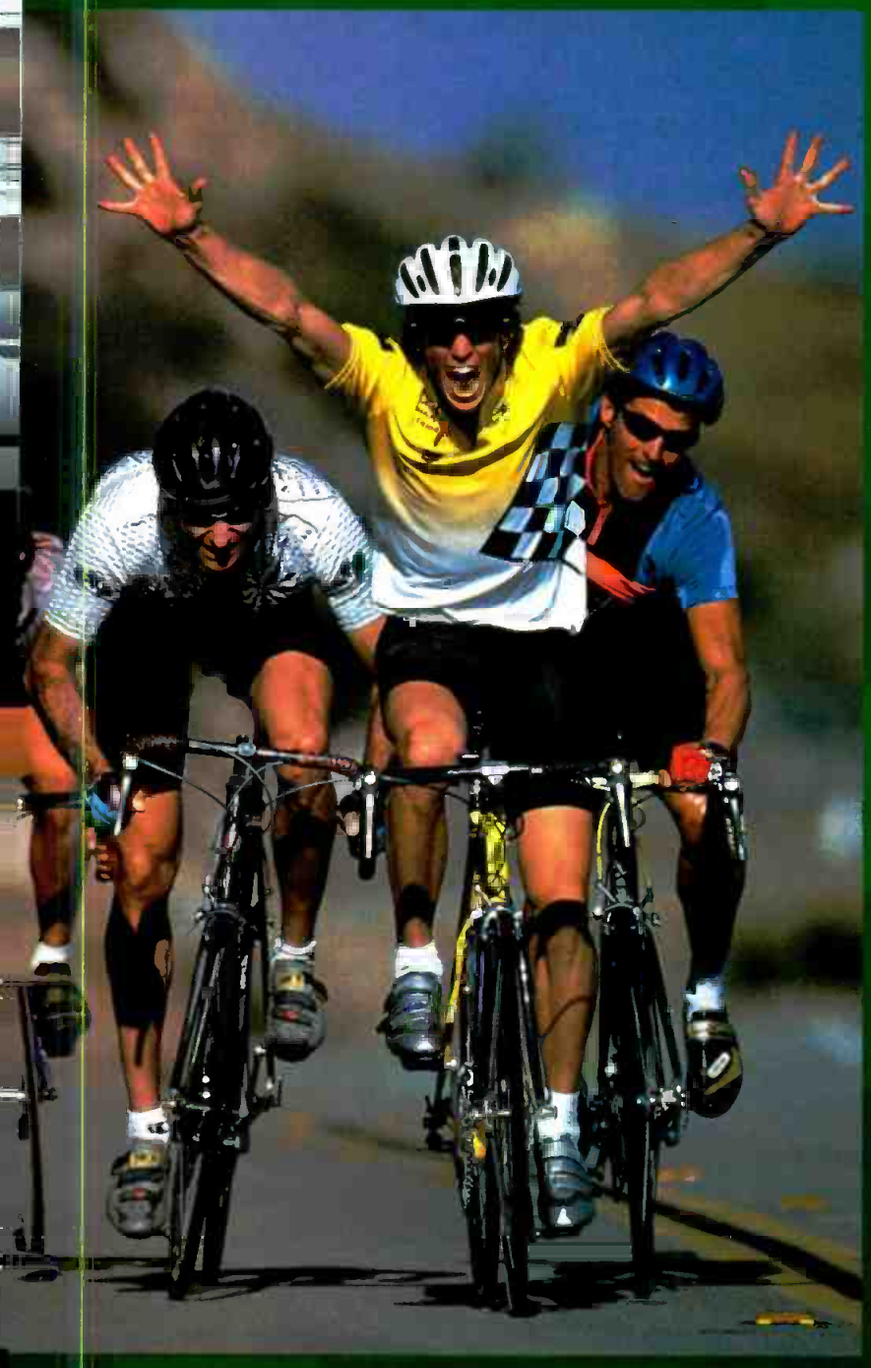
Communications towers

PIROD SU SERIES

:flexible-design series of towers that includes customization of each application; solid-rod legs and solid structural members assure long service life and eliminate dangerous internal corrosion; single-rod legs also reduce ice accumulations, resulting in lower wind load; features knock-down design for cost-effective shipping and easy assembly, welded climbing loops for secure access and adaptability to most existing antenna mounts; backed by a 10-year warranty. 219-936-4221; fax: 219-936-6796; www.pirod.com

Circle (378) on Free Info Card

Tour de force.



There is a new force in the world of digital electronic news gathering and live sports coverage. A highly mobile system that lets ycu cover all the action—even when you're on the move. Without the need to raise a 40-foot mast.

No more missed shots, no more competitors taking the only transmission spot. How? NDS has combined state-of-the-art encoding technology with its market leading COFDM modulation. The result is crystal clear images without the ghosting or multipath interference.

In conjunction with NDS Business Partners Adaptive Broadband™ and Wolf Coach,™ NDS' digital ENG has proven itself around the country, from Los Angeles to New York, Boston to Chicago.

Be first in the race for news and ratings with the NDS digital ENG—the system that captures stories on the move or in the heart of downtown. Call us, or visit one of our web sites today.

Compare the difference!
NDS digital ENG vs conventional ENG systems

To learn more about the NDS digital ENG at the RTNDA show, visit Wolf Coach, booth #151, and Adaptive Broadband, booth #434

NDS
WORLD LEADER • WORLD VISION
www.ndsworld.com

WOLF COACH™
508.791.1950
www.wolfcoach.com

ADAPTIVE BROADBAND
978.671.5700
www.adaptivebroadband.com

Circle (167) on Free Info Card

Circle (170) on Free Info Card

Audio snake cable

BELDEN WIRE & CABLE BRILLIANCE AUDIO SNAKE CABLE

:enhanced NEC ratings; features the 1408R Series CMR-rated audio snakes (UL 1666): for installations that require penetrating multiple floors, this riser-rated cable is economical, eliminating the need for metal raceways, fireproof shafts and firestops. 800-BELDEN1; 765-983-5200; fax: 765-983-5294; www.belden.com

Circle (384) on Free Info Card

Now Shipping

video editing system

PINNACLE SYSTEMS DVD1000

:real-time playback of effects and titles; designed for DVD authoring; features MPEG-2 technology. 650-526-1600; fax: 650-526-1601; www.pinnaclesys.com

Circle (350) on Free Info Card

MPEG-2 nonlinear editing system

PINNACLE SYSTEMS DC1000

:dual-stream MPEG-2 nonlinear editing system; provides pro-sumer environment to digital editing; allows user to capture, edit, effect and output content in MPEG-2 format. 650-526-1600; fax: 650-526-1601; www.pinnaclesys.com

Circle (351) on Free Info Card

LVD storage enclosure and drive subsystem

AVID TECHNOLOGY MEDIADOCK

:an LVD storage enclosure and drive subsystem; designed for Avid's 9GB and 18GB iS Plus MediaDock LVD Shuttles. 800-949-AVID; 978-640-6789; fax: 978-851-0418; www.avid.com

Circle (352) on Free Info Card

Open networking and central storage technologies

AVID TECHNOLOGY UNITY MEDIANET 1.0

:connects editors, artists, sound designers and effects specialists throughout a digital facility to the same network; includes direct connection of the Macintosh platform, as well as network attachment of Windows NT and SGI IRIX platforms. 800-949-AVID; 978-640-6789; fax: 978-851-0418; www.avid.com

Circle (353) on Free Info Card

Software plug-in bundle for Direct X

TC ELECTRONIC TC NATIVE BUNDLE 2.0

:a high-end software plug-in bundle for Direct X compatible audio applications; features TC NATIVE L, a single band limiter and maximizing tool for audio production and mastering. 800-738-4546; 805-373-1828; fax: 805-379-2648; www.tcelectronic.com

Circle (354) on Free Info Card

Plug-in bundle for Pro Tools

TC ELECTRONIC TC TOOLS 3.0 FOR PRO TOOLS

:a high-end reverb, EQ and chorus TDM Pro Tools' plug-in bundle; features MegaReverb hi-end Reverb plug-in, user interface of TC EQSat and TC Chorus/Delay. 800-738-4546; 805-373-1828; fax: 805-379-2648; www.tcelectronic.com

Circle (355) on Free Info Card

3D modeling, animation and rendering system

AVID TECHNOLOGY SOFTIMAGE 3D VERSION 3.8 SP2

:takes advantage of mental ray v. 2.1; features global illumination, caustic effects, shadow mapping and polygon displacement mapping. 800-949-AVID; 978-640-6789; fax: 978-851-0418; www.avid.com

Circle (356) on Free Info Card

2-D cell animation software

AVID TECHNOLOGY SOFTIMAGE TOONZ 4.3

:features a new Mattedit module, improved Xsheet feature set, text improvements in which textures can be animated and corner-pinned for pin positioning, enhanced palettes supporting 256 inks and 256 paints while fully supporting existing palettes. 800-949-AVID; 978-640-6789; fax: 978-851-0418; www.avid.com

Circle (357) on Free Info Card

A Bright Idea, A Sound, A Vision

become magic.
ADX Routers

ADX by Sigma.
Switch over to the ADX Router System, where high expectations are rewarded.

The **ADX** system is the solution for large routing applications. Engineered for expansion, systems can be configured from 16 x 16 to 128 x 128, for any combination of analog or digital audio, analog or digital video, pulse, Y-C, CAV and RGB switching. As an added benefit, all components are covered by Sigma's 5-Year Parts & Labor Warranty.

Contact us now for product information or to locate your nearest Sigma dealer.

SIGMA ELECTRONICS INC.
www.sigmaelectronics.com

1184 Enterprise Road
PO Box 448
East Petersburg PA 17520-0448
(717)569-2681 TELEPHONE
(717)569-4056 FAX

See us at IBC, Stand #3.358

Circle (182) on Free Info Card

HD video and AES router

EVERTZ MICROSYSTEMS 4X1 HD VIDEO/AES ROUTER

:a full bandwidth router that accepts a generic SMPTE 292M video signal and SMPTE 276M audio signal; key features include automatic input cable equalization, genlock referenced switch, GPI switch control, RS 232/422 control and front panel control; optional remote control panel and redundant power supply also available. 905-335-3700; fax: 905-335-3573; www.evertz.com

Circle (382) on Free Info Card

Keyer

PSP DIGITAL TRIKEY

:provides three downstream keyers with an A/B digital vision mixer; each downstream key can be independently controlled and can be prioritized over the background and the other keys. +44 1635 522534; fax: +44 (0) 1635 551995; www.psp-digital.co.uk

Circle (386) on Free Info Card

Master control switcher

PHILIPS SATURN MCP 4000

:new technology features include an eight or ten-bit 3-D digital video effects box, AES audio and full integration with the new Barco Vilvaldi video monitors; the modular design provides full configuration flexibility in either 480i, 720p or 1080i. +31 40 273 24 20; fax: +31 40 273 63 00; www.broadcast.philips.com

Circle (383) on Free Info Card

Bi-directional DV-to-SDI/AES converter

MIRANDA DV-BRIDGE

:designed to work with DV camcorders, DV-VCRs or DV-based storage and editing systems equipped with the IEEE-1394 interface; converts compressed DV format video and audio to and from SDI (4:2:2/ITU-601) digital video and AES audio. 800-224-7882; 514-333-1772; fax: 514-333-9828; www.miranda.com

Circle (385) on Free Info Card

Video compression systems

PHILIPS STREAMFLEX

:available in either six-slot or a larger 14-slot version; DVB compliant multiplexer; suited to a wide range of applications, ranging from simple standalone encoders through local headend applications to complex systems cascading StreamFlex units. 31 40 27 33615; fax: 31 40 27 36300; www.broadcast.philips.com

Circle (387) on Free Info Card

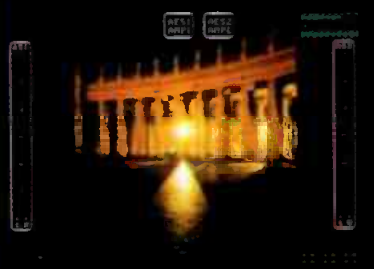
TWT Amplifiers

CPI SATCOM DIVISION TWT AMPLIFIERS

:a new line of hub-mount TWT Amplifiers (TWTAs) for uplink service in SNG, VSAT, high data-rated IP connectivity and other small terminal applications; available in Ku-band at 80 and 125W and in C-band at 170W. 650-846-3700; fax: 650-424-1744; www.cpii.com/satcom

Circle (388) on Free Info Card

NOW HERE'S A SERIAL DIGITAL MONITOR THAT'S USEFUL FOR EVERYBODY.



FINALLY!

The cool thing about Magni's Serial Digital Monitor is how much it does for everyone across the whole technical range. In a word, this box is a no-brainer. Graphic designers and video operators find it a snap to check video and audio signal levels and gamut compliance. Video engineers use it for complete qualitative and quantitative signal measurement. And depending on the configuration you choose, the SDM delivers everything that's useful from simple status monitoring to complete quantitative measurements. **EASILY.**

It shows right now what you need to know to eliminate illegal color, weak signal or missing audio surprises. It monitors signal strength, gamut and EDH, jitter, audio levels, and ancillary data presence. It also decodes the signal into component and composite formats and can monitor all the key analog parameters. Its pop-up icons and bar graph displays show you any out-of-limit conditions. And it works where you work – right on your color picture monitor.

Magni SDM. The monitor that's right for you is here at last.

Waste no time getting yours.

1990-91 Engineering Emmy Award Recipient

Emmy© NATAS

Magni Systems, Inc.
22965 NW Evergreen Parkway
Hillsboro, OR 97124 USA

Email: sales@magnisystems.com
Toll-free phone: 800-237-5964
Phone: +1-503-615-1900
Fax: +1-503-615-1999

www.magnisystems.com

MAGNI®
Now it's looking good

Circle (183) on Free Info Card

motion). Advanced motion adaptive techniques can vary the percentage of the previous field's data that is retained as the inter-field motion increases. The challenge in implementing an effective motion adaptive algorithm is properly managing the trade-off between double images, when too much uncorrelated previous field information is used, and lost vertical resolution, when not enough is used. Another challenge in varying the temporal aperture is doing so in a manner that avoids resolution pumping as objects start or stop moving. The processing requirements for motion adaptive de-interlacing are higher than that of field interpolation, but the result is somewhat higher output image quality (Figure 1C).

The third and most advanced method of de-interlacing is motion compensation. This technique, often used in advanced SD standards converters, is beginning to show up in high-end DTV format converters. Motion compensated de-interlacing measures the inter-field motion, and then aligns data between the two video fields on a pixel-by-pixel basis, maintaining the full vertical resolution of the imagery even when significant motion is detected. TeraNex format converters implement an enhanced version of motion compensation called PixelComp, which includes advanced techniques for filtering motion vectors to ensure their accuracy. The results of the PixelComp process are shown as Figure 1D. Compare the roundness of the sheep's eyes in this photo with that in Figure 1B and in Figure 1C. Note the improvement in image accuracy.

TeraNex format converters implement an enhanced version of motion compensation called PixelComp.

Benefits of format conversion

DTV format conversion is an enabling process that allows broadcasters and post houses to gradually shift to digital television without abandoning their current investments in SD equipment. Unfortunately, the flexibility inherent in DTV systems creates the requirement for a format converter that can grow with the needs of the facility. The conversion process itself is quite complex and, if not handled properly, can result in poor image quality.

The TeraNex SIMD technology, applied to DTV format conversion, addresses both of these problems. The reconfigurable nature of the internal SIMD processor array allows software updates to add new formats, features, functions and improved quality algorithms via a CD-ROM. In addition, the one TeraOp throughput of the system enables the finest motion compensated de-interlacing algorithms to be applied to the video signal. This ensures that the HD outputs are truly high-definition. ■

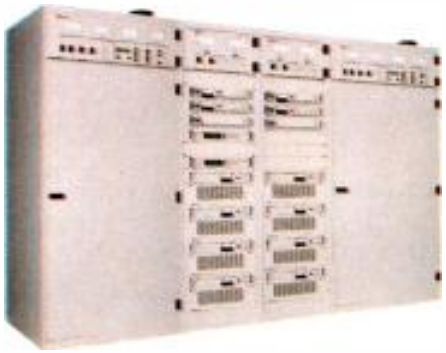
For more information on TeraNex's PixelComp, circle (453) on the Free Info Card.

Jed Deame is DTV product manager, TeraNex Inc.

Business Wire

Business highlights from broadcast and production

BY SANDRA FERGUSON, EDITORIAL ASSISTANT



ADC Telecommunications announced that KM Communications chose the company to supply a dual-tube 140kW inductive output tube (IOT) transmitter for its Iowa City UHF TV station.

Birns & Sawyer expanded its line of lenses to include Canon's EJ6mm, 10mm, 15mm, 24mm and 35mm lenses.

Several markets have purchased or ordered Wheatstone consoles: WOWT-TV in Omaha purchased a TV 1000; WCCB-TV in Charlotte and WCYB-TV in the Johnson City/Bristol/Bridgeport TN/VA area ordered TV 80s and KBTX-TV in Bryant, TX, purchased an SP-8 console.

Time Warner selected Chyron's Duet/Duet HD platform integrated with Nexus ASA Group's NewsMaker StarDrive/OpenMedia as its graphics and effects solution for News 8 Austin.

WDSU-TV in New Orleans purchased a substantial amount of Panasonic DVCPRO equipment. KJRH-TV in Tulsa recently purchased more than $1 million of DVCPRO equipment.

KTVT-TV in Ft. Worth recently purchased 12 Avid NewsCutter Effects Model digital nonlinear editing systems and two Tektronix Profile PDR400 video servers.

Tektronix announced the Grass Valley Kalypso Video Production Center line for controlling teleproduction environments.

Hewlett-Packard's new diversified technology company is called Agilent Technologies. Agilent's headquarters is located in Palo Alto, CA, at 395 Page Mill Road.

Visuality Media Productions of Madison, WI, selected JVC's DIGITAL-S as its in-house videotape commercial and multimedia production format.

Direct 2 U purchased four Hitachi Z-3000W digital 16:9/4:3 switchable cameras with Hitachi's new RU-Z3 camera control unit for the company's new studio in Bucks County, PA.

Fourteen CBS stations are using Artel Video's HD routing and control system for broadcasting HD. CBS will broadcast an extensive line up of prime time TV series programming in HD for the 1999-2000 TV season with Artel's UTAH 1500 HD router and Mini Master control panel.

Three ACME Broadcast TV stations installed Sundance Digital's FastBreak commercial insertion solution. The stations include WTVK in Naples, FL, WBDT in Dayton and KPLR in St. Louis.

Videotek received an engineering Emmy award on July 8. The award was for its VTM-200 multiformat on-screen monitor.

The WB television network installed a second 64-input Solid State Logic Axiom digital console in its Burbank post production facility.

Quantel and Alias/Wavefront announced the details for a technology partnership to further develop the integration between their 2D and 3D environments. As part of the agreement, Quantel will OEM Alias/Wavefront's Maya Unlimited software application for implementation on its Open Render Engine technology.

Fox Sports Net invested in a StorageTek broadcast archive solution for its regional operation center in Houston.

KOMO-TV in Seattle recently purchased Fujinon HD lenses for its HD broadcasts. The purchase included the

www.nvision1.com

NVISION®

4000 SERIES PROCESSING MODULES

- 4000 Series frames, 1RU or 2RU
- AES analog to digital converters
- AES digital to analog converters
- AES channel swapper/mix module
- SDI embedders and disembedders
- AES delay compensators
- SDI fiber optic transmitters, receivers and transceivers
- HD-SDI fiber optic transmitters, receivers and transceivers
- Reference generators

ROUTERS

- SDI and HD-SDI routing from 8 x 8 to 256 x 256 (and larger)
- AES synchronous and asynchronous from 8 x 32 to 2048 x 2048
- Time code from 8 x 32 to 512 x 512
- Machine control/data routing from 64 ports to 256 ports

ROUTER CONTROL

- ENVY router control system with X-Y and Multi-purpose control panels and easy-to-use GUIs

eNVoy® Universal Digital Routers

Right to left: 6064, 6128, 6256 and power supply for 6256

The ENVOY family of universal digital video routers manages a wide range of signal formats. ENVOY is capable of routing both standard rate SDI and HD-SDI signals within the same frame, at the same time. ENVOY routers can pass pathological signals at both SDI and HD-SDI data rates. Input and output modules include SDI (143, 177, 270, and 360 Mbits) and HD-SDI (1.5 Gbit). In addition, the design ensures that no signal inversions take place on the primary outputs; for systems handling DVB-ASI data streams, this is essential. (DVB-ASI is NRZ coded and cannot be inverted.) A mix of SDI and HD-SDI I/Os can be included in the same switch.

- Simultaneous Routing of SDI and HD-SDI Signals
- Handles 1.5Gb Data Rates
- Passes Pathological Signals without Bit Errors
- Reclocking and Cable EQ
- Compact Frame Sizes
- Expansion From 8 x 8 to 256 x 256 in 8 Input or Output Increments (256 x 256 requires two ENVOY 6256 + input DAs)
- Modules Load Via the Front of the Frame
- Modules can be "Hot Swapped" (No need to power down the frame)
- Dual Output Connectors Reduce DA Requirements
- Optional Redundant Power Supplies
- Controllable by Most Existing Control Systems

ENVOY6064
12RU frame to accommodate up to 64 x 64 with dual outputs

ENVOY6128
18RU frame to accommodate up to 128 x 128 with dual outputs

ENVOY6256
29RU frame to accommodate up to 256 x 128 with dual outputs

Circle (185) on Free Info Card

Click here for your free copy of THE BOOK II ➡

NVISION®
125 Crown Point Court
Grass Valley, CA 95945
+1 530 265-1000

Applications
THEATER, INDUSTRIAL, BROADCAST

Usage
PROFESSIONAL INTERCOMS

Product
TWO WIRE

Brand
RTS

Name
TELEX

first sale of Fujinon's HA26x6.7ESM studio lens.

KSL NBC-5 in Salt Lake City selected THOMCAST for its new digital TV transmission system. WRAL-TV in Raleigh and WRAZ-TV in Durham purchased DiviCom encoding systems, including MV-400 HD and MV-40 SD encoders, the Pearl PSIP Manager and Opal Data Broadcasting Gateway.

National Mobile Television recently purchased $270,000 of Grass Valley HD distribution amplifiers.

Accom announced that Turner Sports chose Accom's APR.Attache digital disk recorder as its travel remote digital disk graphics device for use on Turner's 1999 NBA regular season and playoff telecasts.

PESA Switching Systems announced the delivery of two large wideband analog video routing switchers to AT&T's $91 million Global Network Operations Center in Bedminster, NJ.

Seattle/Portland ABC affiliates KOMO-TV and KATU-TV selected Ampex DST's 312 digital tape drive to archive commercial material and free up space on video servers.

KSTP-TV in Minneapolis/St. Paul recently purchased a Harris Platinum Series solid state transmitter. Harris sold its new UniCoder HD encoding system to WWJ-TV in Detroit, WBBM in Chicago and WBZ in Boston.

Keywest Technology and James Grunder & Associates announced their business combination, effective July 30, 1999. The combined organization will be known as Keywest Technology Inc.

Image Precision International and Brimar Limited have formed a new company named POSTware. The new company will develop advanced data solutions for post production facilities.

National Video Center/Recording Studios Inc. announced the establishment of National/Atlanta AUX-TV, a facility-based design/production company.

Sony received a 1999 Engineering

Stop trying. We already did it.

Bad news for everyone trying to invent an improved MT830: too late. Standard introduces the MT930B.

Standard's new MT930B is the perfect upgrade to one of the most popular multi-format agile satellite receivers in history — Standard's MT830 series.

The MT930B is faster, smaller and packed with features that make it more versatile and easier to use. For example, with the MT930's simplified navigation, you can access all known satellites and channels in NTSC and PAL formats with a straightforward rotary knob and easy-to-follow front-panel LCD display. And when you're done, you can store all the settings in memory for later recall.

We've also added practical features like programmable relay/alarm, automatic video loss and video format detection, and automatic LNB voltage switching. And if remote control is important to you, the MT930B is ready and able to work with your PC or network.

Settling for kluges or clones could be a monstrous mistake. Get the original. From the people who invented it.

Standard Communications

The right technology for right now.

800.745.2445

www.standardcomm.com/satcom

Circle (171) on Free Info Card

Emmy award for its HDCAM HD VTR. KRON-TV in San Francisco recently used Sony HDW-700A HDCAM camcorders to document the arrival of historic tall ships to San Francisco Bay for the 150th anniversary of the California Gold Rush.

People

Charles Steinberg, who retired on June 30 as president of Sony's Broadcast and Professional company, received an Engineering Emmy award for lifetime achievement.

Dennis Speck was promoted to chief engineer for KSPR-TV in Springfield, MO.


Thomas E. Newman

Itelco USA announced that **Thomas E. Newman** joined its staff as director of sales and marketing.

THOMCAST announced the recent appointment of **Wayne R. Hoffman** as vice president of engineering.

Euphonix engineer **Elmo Ponsdomenech** received an Emmy nomination for outstanding sound mixing for a drama series for his work on *NYPD Blue*.

MetaWave recently appointed **Adrian Braine** as director of engineering. ■

Screen Shot

WNDU looks ahead to HD with Ikegami

WNDU-TV in South Bend looks ahead to HD with its purchase of four Ikegami HKD-790D studio/field cameras. Besides being on the set for newscasts, the HDK-790D's will also be shooting for WNDU's video production company, Golden Dome Media. Floating between studios for a wide variety of applications, the cameras will make an impact for syndicated programs and live on the air. The station can work in every production format using the HDK-790D studio/field cameras and the HDK-79D portable companion cameras.

Screen Shot

Panasonic's D-5 format used to produce digital cinema version of *Star Wars: Episode 1 — The Phantom Menace*

Panasonic announced that its D-5 HD equipment played a vital role in the post production and playback of the digital projection version of Lucasfilm's recent *Star Wars: Episode 1 — The Phantom Menace* episode. The D-5 format was used in the production of the digital master of the film and Panasonic's AJ-HDP500 HD processor was teamed with Pluto Technologies' hard disk-based HD digital video recorder for playback of the HD images at four Star Wars test cinemas.

Screen Shot

Orad's CyberSet E creates lunar surface for Discovery Channel Canada's *One Small Step*

Orad announced that its CyberSet E virtual set system was used to create a realistic lunar landscape for Discovery Channel Canada's special *One Small Step: The Legacy of Apollo 11*, broadcast on July 20. Commemorating the 30th anniversary of humankind's first walk on the moon, Orad's pattern recognition technology made it possible to create a set allowing program hosts Jay Ingram and Gillian Deacon to stand in the middle of a lunar landscape. With Orad's pattern recognition technology, it was possible not only to create the set, but to do so using the Discovery Channel's existing camera infrastructure.

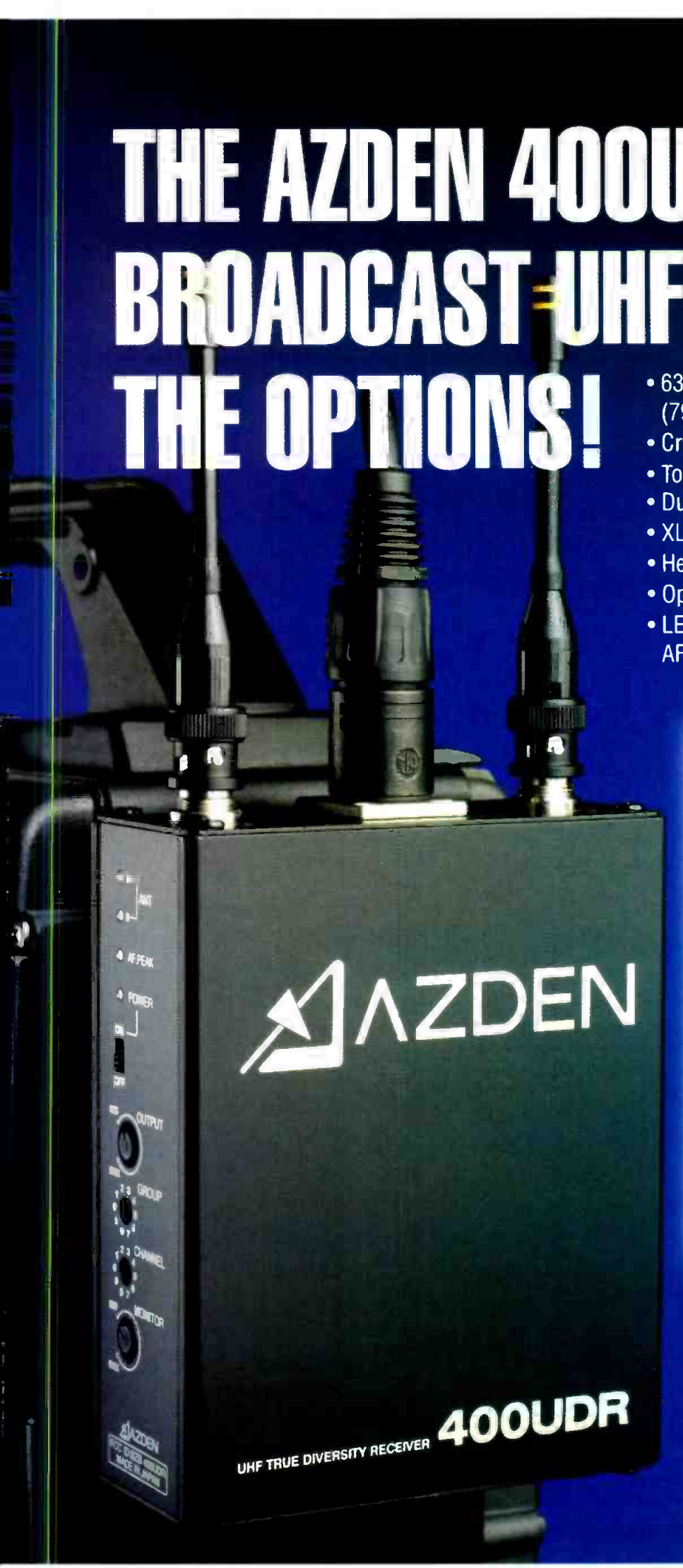
Screen Shot

WBGU-TV future-proofs with Ikegami's HDK-79D cameras

Phasing out of NTSC into HD just got easier for WBGU-TV (PBS) in Bowling Green, OH. The station recently purchased three new Ikegami HDK-79D HD cameras capable of strong performance in both NTSC and HD. The camera's 2.2 million pixel 2/3-inch CCDS provide selectable native-interlace and native-progressive read out modes to enhance performance when switching between 1080i, 720p and 480p. WBGU feels Ikegami has allowed it to future-proof in its transition to digital.

THE AZDEN 400UDR BROADCAST UHF WITH ALL THE OPTIONS!

- 63 User-selectable Frequencies (794-806Mhz)
- Crystal-controlled and PLL-Synthesized
- Tone code squelch
- Dual antennas with BNC connectors
- XLR output with volume control
- Headphone Output with volume control
- Operates on 4 AA or 12V DC
- LED indicators for A or B antenna status, AF peak, Power On/Reception status



41XT Plug-in transmitter to use with your favorite low impedance wired microphone.

41BT Available with omni (EX-503H), uni-directional (EX-503UH) or SONY ECM-44H.

41HT Uni-directional handheld.Also available with AUDIX OM-3 capsule.

AZDEN®

147 New Hyde Park Road, Franklin Square, NY 11010
(516) 328-7500 • FAX (516) 328-7506
E-Mail – AZDENUS@AOL.COM
Azden Home Page: www.azdencorp.com
Circle (172) on Free Info Card

The GALLERY

Windows to the Web

www.winsted.com

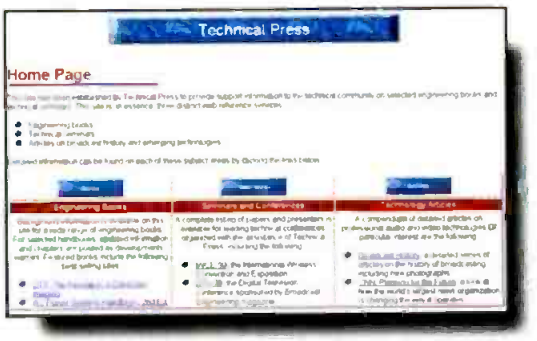
Winsted Corporation: Winsted offers a full line of modular consoles, rack cabinets, file server workstations, tape storage, and editing desks. The most complete line of accessories in the industry complement this extensive offering. Winsted's 164-page fully illustrated catalog includes an easy-to-understand modular components section that allows you to design your own console, or you can receive a free consultation with a Winsted's system design engineer. To receive a free catalog or learn more about Winsted at their website www.winsted.com or call toll free at 800-447-2257.

www.digibid.com

Upgrading equipment? Need to remarket the replaced equipment? Digibid provides a ready online marketplace of equipment buyers. Our online auction format makes it easy to sell your equipment.

info@ntc.com

National TeleConsultants: National TeleConsultants is the largest independent television facility design and system integration company in the world. NTC is known for building creative and cost effective multichannel network facilities, production studios and television stations. Call us at 818-265-4400 and let us put our 19 years of experience to work for you.



www.technicalpress.com

Technical Press is a web-based reference site that supports more than a dozen video engineering books, including *DTV: The Revolution in Electronic Imaging*. Also available are articles on digital video technologies and applications, and a detailed series on the history of broadcast engineering.

www.sennheiserusa.com

Sennheiser: Established in 1945 in Wedemark, Germany, Sennheiser is an Oscar and Emmy award-winning leader in microphone technology, RF-wireless and infrared sound transmission, headphone transducer technology, and most recently in the development of active noise-cancellation. The company is driven by an innovative and pioneering spirit and is committed to ongoing research, precision engineering and meticulous manufacturing standards.

www.broadcastengineering.com

Broadcast Engineering: *Broadcast Engineering* is the only technology-driven online magazine in the industry. Its editorial environment delivers practical, informative articles on digital technology, systems integration, management, how-to installation, and systems and equipment maintenance. It is a package geared toward TV stations, cable/telcom, production, post-production, business TV, satellite and interactive television.

SONY

DSR-200A
3-CCD Digital (DVCAM) Camcorder

Combining a compact and lightweight body with the superior picture quality of DSP (Digital Signal Processing) and the DVCAM format, the DSR-200A is the ideal acquisition tool for video journalists, event and wedding videographers, stringers and production houses. 500 lines of horizontal resolution, 48kHz or 32kHz digital audio, three hour record time, and minimum illumination of 3 lux is only the beginning. Other features include 16:9/4:3 capability, Steady Shot, high resolution 1-inch viewfinder, time code operation, time/date superimposition and an IEEE-1394 interface for direct digital output. Offers full automatic as well as manual control of focus, iris, gain, white balance and shutter speed.

- Variable servo 10X optical power zoom lens goes from 5.9 to 59mm in 1.7 to 24 seconds. The manual zoom rocker is continuously variable right up to where the digital 20X zoom kicks in.
- Sony's Super Steady Shot reduces high frequency camera shake without compromising image quality. SteadyShot uses horizontal and vertical motion sensors that allow it to work accurately while zooming, moving (even shooting from a car), and shooting in low light conditions.
- Has digital effects including audio and video fade, overlap and Slow Shutter.
- Automatic and manual focus, iris, shutter, gain and white balance. Iris is adjustable in 12 levels from F1.6 to F11, shutter from 1/4 to 1/10,000 of a second in 12 steps, Gain from -3dB to +18dB in 8 steps.
- Zebra Pattern indicator, built-in ND filter.
- Custom Preset function lets you preset, store and recall custom settings for color intensity, white balance (bluish or reddish), sharpness and brightness.
- Stores Photo, Date/Time, Shutter Speed, Iris, Gain and F-stop for easy recall. So if you have to re-shoot, you know your original settings for every scene and frame.
- Records Drop/Non-Drop Frame time code. Time code can be read either as RC time code or as SMPTE time code.
- Has a large 1-inch B&W viewfinder with 550 lines of resolution for easy focusing even in low contrast lighting situations. Separate information sub panel displays time code, battery time, tape remaining and other camcorder functions without cluttering up the viewfinder.
- Records 16-bit/48kHz audio on one stereo track or 12-bit/32kHz with two pairs of stereo tracks (L1/R 1, L2/R2), so you can add stereo music or narration.
- One-point stereo electret condenser mic for clear stereo separation. Directivity can be selected from 0°, 90° & 120°.
- Automatic & manual (20-step) audio level record controls. Monitor audio with headphones or from the LCD panel which has an active VU meter.
- XLR input connectors for mics and audio equipment.

DSR-200A Field Package:
• DSR-200A Camcorder • NPA-1000/B Battery Case Adapter
• 3 NP-F930/B 7.2v 4000 mAH Batteries
• AC-V900/B AC Adapter, Triple Battery Charger
• VCT-U14 Tripod Adapter • LC-2000CP System Case

DSR-20
DVCAM Player/Recorder

The DSR-20 is a versatile DVCAM VCR with a very compact chassis and a variety of convenient functions for recording, playback and simple editing. It features auto repeat playback, power-on recording/playback, multiple machine control interfaces, AC/DC capability and i.Link (IEEE1394) input and output. And of course, it offers the stunning image and sound quality inherent to the DVCAM format.

DVCAM Quality

- Utilizing the DVCAM format, the DSR-V10 provides the recording/playback quality and reliability required for professional use. It can also play back consumer DV format tapes without any special adapter.
- Provides two selectable audio modes; a two channel mode with 48 kHz/16-bit recording and a four channel mode with 32 kHz/12-bit recording.
- Dual-size cassette mechanism accepts both mini size (up to 40 minutes) and standard size DVCAM tapes (up to 184 minutes) without an adapter.

Editing Capability

- Equipped with Control L interface, the DSR-20 can perform simple time code-based editing when connected to another DSR-20 or other similarly equipped VCRs/cameras like the DSR-30, DSR-200A or DSR-PD1. When using the FXE-120 or ES 3 EditStation System, the DSR-20 can serve as a feeder player.
- Has DV (IEEE1394) input and output. When connected to other DV equipped machines, the DSR-20 offers digital dubbing of video, audio and data, without any deterioration of image and sound quality. In addition, in the "Digital dubbing including TC copy" mode, full information of video, audio and time code of the original tape can be copied to another tape. Especially useful when making working copies of the original.

Record/Playback Functions

- Automatic repeat function for repeated playback. After reaching either the end of the tape, the first blank portion or the first index point, the DSR-20 automatically rewinds the tape then starts playing back the segment again.
- Power-on recording/playback capability for unattended automatic VCR operation. When connected to an external timer and the VCR's TIMER switch is set to REC, the DSR-20 starts recording as soon as power is turned on. Likewise, when the TIMER is set to REPEAT, the VCR goes into Auto Repeat mode and starts playing back the moment power is turned on.
- In addition to Control L, the DSR-20 also incorporates a Control S and RS-232 interface for remote control operation. Basic VCR functions can be controlled from a PC via RS-232, while Control S allows control via the optional DSRM-10 Remote Control. In addition, with the Control S input/output connector, two or more (up to 50) DSR-20's can be daisy-chained and controlled from one DSRM-10 Remote Control.
- External sync input enables synchronized playback with other VCRs. Especially important in A/B roll configurations.

Conveniences

- The DSR-20 be powered by AC or DC, ideal for mobile applications, the DSR-20 can be connected to a 12V power supply like a car battery or battery belt & powered via the 4-pin XLR DC input.
- Can perform searches for Index Points, which are recorded on the tape as "in-point" marks everytime a recording starts. The DSR-20 can also search for photo data recorded on a DVCAM cassette by the DSR-PD100/200A/300, or where the recording date has been changed.
- Supplied with the RMT-DS20 Wireless Remote for control of basic VCR functions. And again, when two or more VCRs are connected via Control S, they can be simultaneously controlled from one wireless remote by simply sending one command to the master deck.

DSR-30
DVCAM Digital VCR

The DSR-30 is an industrial grade DVCAM VCR that can be used for recording, playback and editing. DV standard 4:1:1 sampling digital component recording with a 5:1 compression ratio provides spectacular picture quality and multi-generation performance. It has a Control L interface for editing with other Control L based recorders such as the DSR-200A DVCAM Camcorder or another DSR-30. It also has a continuous auto repeat playback function making it ideal for kiosks and other point of information displays. Other features include high quality digital audio, IEEE-1394 Digital interface and external timer recording. The DSR-30 can accept both Mini and Standard DVCAM cassettes for up to 184 minutes of recording time, and can playback consumer DV tapes as well.

- Records PCM digital audio at either 48kHz (16-bit 2 channel) or at 32kHz (12-bit 4 channel).
- Equipped with Control L, the DSR-30 is capable of SMPTE Time Code based accurate editing even without an edit controller. Built-in editing functions include assemble and separate video and audio insert.
- By searching for either an Index point or Photo Data recorded by the DSR-200A camcorder, the DSR-30 drastically cuts the time usually required for editing. The DSR-30 can record up to 135 index points on the Cassette Memory thanks to its 16k bits capability.
- Audio lock ensures audio is fully synchronized with the video for absolute precision when doing an insert edit.
- Built-in control tray has a jog/shuttle dial, VCR and edit function buttons. The jog/shuttle dial allows picture search at ±1/5 to 15X normal speed and controls not only the DSR-30 but also a player hooked up through its LANC interface.
- DV In/Out (IEEE 1394) for digital dubbing of video, audio and data ID with no loss in quality.
- Analog audio and video input/outputs make it fully compatible with non-digital equipment. Playback compatibility with consumer DV tapes allows you to work with footage recorded on consumer-grade equipment. Tapes recorded in the DSR-30 are also compatible with Sony's high-end DVCAM VCR's.

Panasonic
Broadcast & Television Systems

AG-EZ1 3-CCD Digital Video Camcorder

- Digital recording delivers 500 lines of horizontal resolution with no noise. (S/N ratio is 54dB).
- 10:1 power and 20:1 digital zoom lens. Both zooms are adjustable in four speeds (3.5-15 sec.) For extreme close-ups the lens can focus up to 1/4" from the subject.
- Two digital audio modes, choose between two-channel 16-bit stereo recording or two sets of 12-bit stereo.
- Huge 1.5" 180,000 pixel color viewfinder with 400 lines of resolution displays all functions on demand.
- Digital Electronic Image Stabilizer (DEIS) compensates for jittery video. Particularly effective when the digital zoom is employed.
- Variable speed shutter from 1/60—1/8000 of a second.
- Built-in SMPTE time code generator.
- Digital Photo-Shot lets you record a still-frame for six seconds, while audio continues as normal. 290 still pictures can be recorded on a single 30-minute tape. TopScan function finds any shot easily.

$1995

AG-EZ30 World's Smallest 3-CCD Camcorder w/IEEE1394 Interface

The AG-EZ30 combines 3-CCDs and the DV format to deliver a level of picture and sound quality that makes it one of the most advanced camcorders of its kind. Weighing just 1.5 lbs. this incredibly lightweight camcorder also incorporates a large 2.5-inch color LCD monitor and has a host of sophisticated auto functions as well full manual control when required.

- 3-CCDs (270,000 pixels each) with a large light-collecting area give the camera high sensitivity and wide dynamic range. Double-density pixel distribution and a gapless dichroic prism further ensure razor-sharp images and extremely faithful color reproduction.
- Selectable 2-channel 48 kHz/16-bit or 4-channel 32 kHz/12-bit PCM audio recording.
- Built-in stereo mic and external mic input as well.
- 180,000 pixel, 2.5-inch color LCD monitor. Also has a 0.5-inch color viewfinder.
- Digital Image Stabilizer for clear, shake and jitter free shots.
- 12X optical zoom as well as 30X and 120X digital zoom functions. Move from wide-angle to full zoom in 1.3 seconds allowing quick framing while in REC pause.
- Offers six digital effects: Wipe, Mix, Strobe, Gain-Up, B&W and still mode.
- Large-diameter focus ring enables a high level of focusing precision. A Multi-Function Push Dial allows easy setting of the 16-step iris, 5-step gain control (+12dB maximum) and 14-step shutter (up to 1/8000 second). Mic input level can also be set in steps (-20/-10/0/+3/+6 dB).
- Five program AE modes for shooting in a variety of different conditions. There is also a five-mode white balance: Set, Fluroescent, Auto, Indoor and Outdoor.

SONY

UVW-1600/UVW-1800
Betacam SP Editing Player • Betacam SP Editing Recorder

The UVW-1600 and UVW-1800 are the other half of the UVW series. They offer the superiority of Betacam SP with sophisticated editing features. They feature an RS-422 9-pin interface, built-in TBCs and Time Code operation. Inputs/outputs include component, composite and S-Video.

All the features of the UVW-1200/1400A *PLUS*—

- Optional BVR-50 allows remote TBC adjustment.
- RS-422 interface for editing system expansion.
- Two types of component output: via three BNC connectors or a Betacam 12-pin dub connector.
- Frame accurate editing is assured, thanks to sophisticated servo control and built-in time code operation. In the insert mode of the UVW-1800, video, audio Ch-1/2 and time code can be inserted independently or in any combination.

PVW-2600/PVW-2650/PVW-2800
Betacam SP Pro Series

Whenever versatility and no compromise performance is needed, there is only one choice. Legendary reliability and comprehensive support for its many users has established the PVW series as the standard in broadcast and post production. The PVW Series includes the PVW-2600 Player, PVW-2650 Player with Dynamic Tracking and the PVW-2800 Editing Recorder. They feature built-in TBCs, LTC/VITC time code operation and RS-422 serial interface. They also offer composite, S-Video and component video inputs and outputs. Most important they are built for heavy, every day duty.

- Built-in TBC's and digital dropout compensation assure consistent picture performance. Remote TBC adjustment can be done using the optional BVR-50 TBC Remote Control.
- The PVW-2600, PVW-2650 and PVW-2800 (generates as well) read VITC/ LTC time code as well as User Bits. Ext/Int time code, Regen/Preset, or Rec-Run/ Free-Run selections.
- Built-in character generator displays time code or CTL data.
- Set-up menu for presetting many functional parameters.
- Two longitudinal audio channels with Dolby C- type NR.
- Recognizable monochrome pictures at up to 24X normal speed in forward and reverse. Color at speeds up to 10X.
- Two types of component connection: three BNC connectors or a Betacam 12-pin dub connector. They have composite and S-Video signals as well.

PVW-2650 Only

- Dynamic Tracking (DT) playback from -1 to +3 times normal speed.

PVW-2800 Only

- Built-in comprehensive editing facilities.
- Dynamic Motion Control with memory provides slow motion editing capability.

800 SERIES UHF WIRELESS MICROPHONE SYSTEMS

Consisting of 5 handheld and bodypack transmitters and 6 different receivers, Sony's UHF is recognized as the outstanding wireless mic system for professional applications. Operating in the 800 MHz band range, they are barely affected by external noise and interference. They incorporate a PLL (Phase Locked Loop) synthesized control system that makes it easy to choose from up to 282 operating frequencies, and with the use of Sony's pre-programmed channel plan, it is simple to choose the correct operating frequencies for simultaneous multi-channel operation. Additional features, like space diversity reception, LCD indicators, reliable and sophisticated circuit technology ensure low noise, wide dynamic range, and extremely stable signal transmission and reception. Ideal for broadcasting stations, film production facilities, and ENG work.

VIDEO and PRO AUDIO

VISA · MasterCard · Discover/NOVUS · American Express Cards

TO INQUIRE ABOUT YOUR ORDER:
800 221-5743 • 212 239-7765
OR **FAX** 24 HOURS:
800 947-2215 • 212 239-7549

New Address:
420 Ninth Ave. *(Bet. 33rd & 34th St.)*
New York, N.Y. 10001

B&H
PHOTO - VIDEO - PRO AUDIO

FUJINON ENG LENSES

While ENG camera technology evolves faster and faster, delivering ever higher performance in ever small bodies, it has been increasingly difficult for lens manufacturers to improve quality while keeping size and weight to a minimum until recently. With Aspheric Technology (At2) Fujinon has succeeded in manufacturing superior quality lenses that are both smaller and lighter than lenses of conventional spherical design. From the widest angle to the highest telephoto, Fujinon's broadcast hand-held style lenses offer unparalleled features and performance. In fact, they are so advanced and so optically superb they will reshape your thinking about how well a lens can perform.

Fujinon's broadcast hand-held lenses feature the very latest in optical and mechanical design, and manufacturing techniques. New EBC (Electron Beam Coating) reduces flare and improves contrast, while AT2 Aspheric Technology improves corner resolution and reduces chromatic abberation. And all except the 36:1 Super Telephoto offer the exclusive "V-Grip" and Quick Zoom.

A15X8EVM Standard Zoom Lens

A versatile performer in a compact package, offers AT2, inner focus, Quick Zoom and the "V-Grip" 6495.95

A20X8EVM
Standard /Telephoto Zoom Lens

Combines additional focal length with AT2, inner focus, Quick Zoom and the "V-Grip" 11,499.95

CHYRON PC-CODI & PC Scribe

Text and Graphics Generator and Video Titling Software

PC-CODI incorporates a broadcast quality encoder and a wide bandwidth linear keyer for the highest quality, realtime video character generation and graphics display. A video graphics software engine running under Windows 95/NT. PC Scribe offers a new approach and cost effective solution for composing titles and graphics that is ideal for video production and display applications. Combined, their a total solution for real-time character generation with the quality you expect from Chyron.

PC-CODI Hardware:

- Fully-antialiased displays • Display and non-display buffers
- Less than 10 nanosecond effective pixel resolution
- 16.7 million color selections • Fast, realtime operations
- Character, Logo and PCX Image transparency
- Variable edges: border, drop shadow and offset
- Full position and justify control of character and row
- User definable intercharacter spacing (squeeze & expand)
- Multiple roll/crawl speeds • Automatic character kerning
- User definable tab/template fields
- Shaded backgrounds of variable sizes and transparency
- Software controlled video timing
- User definable read effects playback; wipes, pushes, fades
- NTSC or PAL sync generator with genlock
- Board addressability for multi-channel applications
- Auto display sequencing • Local message/page memory
- Preview output with safe-title/cursor/menu overlay
- Composite and S-video input with auto-genlock select

PC-Scribe Software:

- Number of fonts is virtually unlimited. Also supports most international language character sets. Fonts load instantly and the level of anti-aliasing applied is selectable.
- Adjust a wide range of character attributes. Wide choice of composition tools.
- Characters, words, rows and fields can color flash
- Character rolls, crawls and reveal modes. Speed is selectable and can be auto timed with pauses. Messages can be manually advanced or put into sequences along with page transitions.
- Multiple preview windows can be displayed simultaneously.
- Transitions effects include: cut, fade, push, wipe, reveal, peel, zoom, matrix, wipe, spiral, split, weave and jitter.
- Import elements to build graphics. This includes OLE objects, iNFiNiT! RGBA and TGA with alpha channel. Scribe also imports and exports TIFF, JPEG, PCX, TGA, BMP, GIF, CLP, ASCII, IMG, SGI, PICT and EPS formats.

PC-CODI and PC-Scribe Bundle 2995.00

TRUEVISION/Avid

Professional Video Production Workstation

Incorporating the award-winning TARGA 1000 video card and Avid MCXpress NT non-linear editing software, this fully-configured workstation meets the needs of production professionals, corporate communicators, educators and Internet authors.

TARGA 1000 Features:

The TARGA 1000 delivers high processing speed for video and audio effects, titling and compositing. Capture, edit and playback full-motion, full-resolution 60 fields per second digital video with fully synchronized CD-quality audio.

- Compression can be adjusted on the fly to optimize for image quality and/or minimum storage space. Has composite and S-video inputs/outputs. Also available with component input/output (TARGA 1000 PRO).
- Genlock using separate sync input for working in professional video suites
- Audio is digitized at 44.1KHz or 48KHz sampling rates, for professional quality stereo sound. Delivers perfectly synchronized audio and video.

MCXpress Features:

The ideal tool for video and multimedia producers who require predictable project throughput and high-quality results when creating video and digital media for training, promotional/marketing material, local television and cable commercials, CD-ROM and Internet/intranet distribution. Based on Avid's industry-leading technology, it combines a robust editing functionality with a streamlined interface. Offers integration with third-party Windows applications, professional editing features, powerful media management, title tool and a plug-in effects architecture. It also features multiple output options including so you save time and money by reusing media assets across a range of video and multimedia projects.

TARGA 1000/MCXpress Turnkey Systems:

- 300-watt, 6-Bay Full Tower ATX Chassis
- Pentium ATX Motherboard with 512K Cache
- Pentium II- 300 MHz Processor
- Matrox Millenium II AGP 4MB WRAM Display Card
- 64MB 10ns 168-Pin (DIMM) S-DRAM
- Quantum Fireball 6.4GB IDE System Drive
- Seagate Barracuda External 9.1GB SCSI-3 Ultra Wide Capture Drive
- Adaptec AHA-2940UW Ultra Wide SCSI-3 Controller Card
- Teac CD-532e 32X EIDE Internal CD-ROM Drive • 3.5" Floppy Drive
- Altec-Lansing ACS-48 3-Piece Deluxe Speaker System
- Viewsonic G771 17-inch (1280 x 1024) Monitor (0.27mm dot pitch)
- Focus 2001A Keyboard • Microsoft MS Mouse
- Windows NT 4.0 Operating System Software
- Avid MCXpress for Windows NT
- Truevision TARGA 1000 or 1000 Pro Video Capture Card

With TARGA 1000 ..... $5995.00
With TARGA 1000 Pro (component input/output) $6495.00

KNOX VIDEO

RS4x4/8x8/16x16/16x8/12x2
Video/Audio Matrix Routing Switchers

Knox's family of high performance, 3-channel routing switchers are extremely versatile, easy-to-use and very affordable. Housed in an ultra-thin rackmount chassis they accept and route (on the vertical interval) virtually any video signal, including off-the-air and non-timebase corrected video. They also route balanced or unbalanced stereo audio. The audio follows the video or you can route the audio separately (breakaway audio). Each of the switchers offers manual control via front panel operation. They can also be controlled remotely by a PC, a Knox RS Remote Controller, or by a Knox Remote Keypad via their RS-232 port. Front panel LEDs indicate the current routed pattern at all times. Knox switchers are ideal for applications such as studio-feed control and switcher input control, plus they have an internal timer allowing timed sequence of patterns for surveillance applications as well.

- Accept and routes virtually any one-volt NTSC or PAL video signal input to any or all video outputs.
- Accept and route two-volt mono or stereo unbalanced audio inputs to any or all audio outputs.
- Video and audio inputs can be routed independently , they don't need to have the same destination.
- Can store and recall preset cross-point patterns. (Not available on RS12x2.)
- Front panel key-pad operation for easy manual operation.
- Can also be controlled via RS-232 interface with optional RS Remote Controller or Remote Keypad.
- Front panel LED indicators display the present routing patterns at all times.
- An internal battery remembers and restores the current pattern in case of power failure.
- Internal vertical interval switching firmware allows on-air switching.
- Housed in a thin profile rackmount 1" chassis.
- Also except the RS12x2 are available in S-Video versions with/without audio.
- Models RS16x8 and RS16x16 are also available in RGB/component version.
- With optional Remote Video Readout, the RS16x8 and RS16x16 can display active routes on a monitor at remote locations, via a composite signal from a BNC connector on the rear panel.
- The RS4x4, RS8x8 and RS16x16 are also available with balanced stereo audio. They operate at 660 ohms and handle the full range of balanced audio up to +4 dB with professional quick-connect, self-locking, bare-wire connectors.

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.

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, 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.

5100D Digital Waveform/Vectorscope

The 5100D can work in component digital as well as component analog facilities (and mixed operations). It provides comprehensive waveform, vector, timing and picture monitoring capabilities. Menu driven control functions extend familiar waveform observations into highly specialized areas and include local calibration control, the ability to show or blank SAV/EAV signals in both the waveform and picture, the ability to monitor digital signals in GBR or YCbCr form, line select (with an adjustable window), memory storage of test setups with the ability to provide on-screen labels, flexible cursor measurements, automatic 525/60 and 625/50 operation and much much more.

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

All the operating advantages of the 5870, except SCH is deleted (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 X4 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 provides 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.

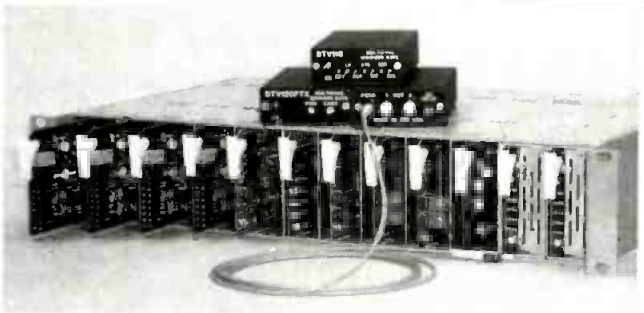
Designed for EFP and ENG (electronic field production and electronic news gathering) operations, they feature compact size, light weight and 12 V DC power operation. Thus full monitoring facilities can be carried into the field and powered from NP-1 batteries, battery belts and vehicle power. Careful 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.

CORPORATE ACCOUNTS WELCOME

Circle (188) on Free Info Card

The GALLERY

The Distribution & Fiber Optic Solution



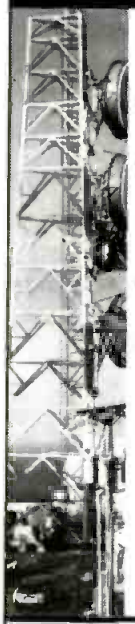
- Digital distribution and fiber optic transport from 1 M to 1.5 Gbps for SDI and HDTV.
- 10 by 1 Serial Digital Routing Switcher
- 12 Bit Composite Video and 24 Bit Audio Fiber Optic Transport System for Broadcast, STL, Head-end & Back-haul feeds available with Tactical Fiber.
- Video & Audio Automatic Gain, EQ & Chroma DAs for constant system levels.

MULTIDYNE
web www.multidyne.com
email info@multidyne.com
1-(800)-4TV-TEST Fax 1-(516)-671-3362

Please CALL or VISIT our WEB SITE for product information

Circle (189) on Free Info Card

TOWER



- Fabrication
- Design
- Engineering
- Installation
- Service
- Maintenance

Swager is your worldwide turnkey tower company.

Phone 1-800-968-5601 or Fax 1-800-882-3414

SWAGER Communications, Inc.
P.O. Box 656
3560 East Swager Drive
Fremont, IN 46737 USA
Phone 1-800-968-5601 • 219-495-2515
Fax 1-800-882-3414 • 219-495-4205
E-mail : sales@swager.com
Internet: www.swager.com

Circle (193) on Free Info Card

MightyCoder d/a

Digital to Analog
Portable Converter
CCIR 601 to Composite
YC, YUV, RGB
PAL or NTSC

4.5" x 3" x 1.2" **$ 595.00**

Serial 601 Input with 2 Reclocked 601 Outputs

3 Selectable Output Formats
Composite plus YUV Composite plus RGB
Two Composite plus YC Color Bar Generator
6 Watt / 6VDC Plug in power supply

FOR-A Corporation of America
Phone (352)371-1505 Fax (352)378-5320

Video GainesVille FOR-A Group

Manufactured in the United States of America

Circle (191) on Free Info Card

8-VSB MODULATOR

- For HDTV Terrestrial Broadcast System
- Conforms to ATSC Specs
- All Solid State Construction for High Reliability
- Digital Implementation for High Performance
- Indications for Lock and Error Conditions
- Options for
  - Non-Linear & Linear Pre-correction
  - External / Internal 10MHZ Reference
  - SMPTE-310M Input
  - Remote Control
  - SNR Quality Indicator
  - Demod / Remod

KTech Telecommunications, Inc.

15501 San Fernando Mission Blvd.
Suite 100
Mission Hills CA 91345
PH (818) 361-2248 FAX (818) 270-2010
INTERNET: www.ktechtelecom.com
Email: skuh@ktechtelecom.com

Circle (190) on Free Info Card

World Class Quality
Fast Delivery
Great Prices
Electronics USA, Inc.

Contact us for your next Turnkey or Rack Ready

ENG, DENG or DSNG VEHICLE

- *Quality, Integrity, Value, Reliability*
- *Engineering, Excellence, Experience*

US	Tel: +1 210 651 5700 Fax: +1 210 651 5220
Europe	Tel: +31 20 669 4668 Fax: +31 20 669 0836
Web:	www.shook-usa.com
E-mail:	shook@shook-usa.com

18975 Marbach Lane, Bldg. 200
San Antonio, Tx 78266 USA

Visit our booth #181 at RTNDA 99
Circle (192) on Free Info Card

Classifieds Help Wanted

WISDOM TELEVISION

Immediate Opening - Chief Engineer for WISDOM Networks: a 24-hour Television, Radio and Internet operations. Responsible for all engineering, maintenance and modifications of technical and physical plant including C-band earth station and Radio/Television production studios. Strong video maintenance background required and design experience a plus. Successful candidate will have an appropriate degree and five years plus experience in both radio and television broadcast engineering management. Component/board level engineering knowledge a must. Strong interpersonal skills are needed to manage engineering support staff. This person will assist in preparation and administration of capital and operating budgets, equipment purchases and installation, and work "hands on" with the maintenance and repair of all equipment. Required to carry a pager.

Send cover letter and resume to:
WISDOM Networks, LLC, P.O. Box 1546, Bluefield, WV 24701
Attn: Employee Relations Department
An Equal Opportunity Employer

FOX 10 is seeking an exp. **Maintenance Engineer/SNG Op.** The ideal candidate must have 2 years coll/tech. Deg., in electronics req. Min. 5 yrs broadcast equipment maintenance exp. Req. Class B commercial DL req. Installation and maintenance of broadcast equipment incl. switchers, digital video effects, VTRs (BETACAM/CART and 1"), studio cameras, character generators, graphics equipment, and ENG/SNG units. Must drive/operate the SNG/ENG vehicles. OT, weekends, and holidays req. Local/nat. travel req. Know computer config. related to broadcast sys. Successful candidate will work with various departments to support all eng. functions. Must work in a fast paced environment on multiple projects. EOE/M/F/D/V. No phone calls please. Qualified applicants send resume and salary history to: Human Resources/KSAZ-TV, 511 W. Adams St., Phoenix, AZ 85003.

WE'RE GOING DIGITAL!! And need some help with plant rewire and night-side engineering. **FOX 4 WFTX-TV** in Ft Myers/Naples market has an immediate opening for a full-time permanent second shift **Maintenance Engineer**, 2-11pm Sun-Thurs. Exp. with plant wiring and systems, schematics, tape machines and board level repair a must. Exp. with computers, news department and UHF transmitter a plus. Please send resume and salary requirements to: Ryan Steward, 621 SW Pine Island Rd, Cape Coral, FL 33991 or e-mail to: rsteward@wftx.emmis.com. Emmis Communications is an Equal Opportunity Employer.

SENIOR MAINTENANCE ENGINEER: Network station in 76th market seeks senior maintenance engineer with at least five years experience. Must be capable of maintaining various broadcast equipment including Chyron MAX, computer graphics systems, with special emphasis on production video switchers, still-store and DVE. Minimum high school diploma plus technical education or equivalent experience. No phone calls please. Send resume to: Dan Steele, WPSD-TV, P.O. Box 1197, Paducah, KY 42002-1197. M/F, EOE.

BROADCAST MAINTENANCE ENGINEER: WVPT Public Television for the Shenandoah Valley is looking for Broadcast Maintenance Engineers. These challenging positions involve maintenance installation, and repair of analog and digital equipment in studio, transmitter and microwave configurations. Specific emphasis on repairing Panasonic MII tape, Phillips/Bosch, Routing & Master Control, Ikegami camera systems, and both NEC & ITS Transmission equipment will be required. Experience with digital non-linear systems like the Media 100, The Virtual Recorder, & the Media Stream are all a plus. Candidate must have a minimum of two years broadcast engineering and operations experience and a current FCC General Class Radio Telephone License, or a Society of Broadcast Engineers Certification. Send cover letter, salary requirements and resume to: Executive Secretary, WVPT-TV, 298 Port Republic Road, Harrisonburg, VA 22801. EOE/AA

REMOTE MAINTENANCE ENGINEER - Southeast Remote Production Company is seeking a Maintenance Engineer to be part of our Engineering team on large production trucks. Qualifications: 5 yrs. analog & digital solid state electronic experience, 1 yr. location experience, and display client skills. This position requires extensive travel, overtime and holidays. EEO M/F Send Resume: F&F Productions, Atten: Bill McKechney, 9675 4th Street N., St. Petersburg, FL 33702 or FAX: 727/577-5011

PHOTOJOURNALIST: Immediate opening for an excellent storyteller with the ability to shoot, edit and gather information. Candidate will be responsible for operating ENG equipment and working out of the only SNG truck in the market. Two years of experience required. Minorities and woman are urged to apply. Send non-returnable VHS tape and resume to: PHJ1-BE, Box 44227, Shreveport, LA 71134-4227. EOE

PRODUCER: This position demands a creative person. The producer must be able to conceive and develop a news program, direct and supervise staff. We are looking for innovative, results-oriented leader with two years experience. Minorities and women are urged to apply. Candidates should send a non-returnable tape and resume to: PRD2-BE, Box 44227, Shreveport, LA 71134-4227. EOE

TRANSMITTER ENGINEER: Northwest Arkansas television station is seeking a transmitter engineer. Must be a self-motivated individual with experience in UHF transmitters. Repair and upkeep on all RF and microwave equipment and two UHF transmitters about 50 miles apart. Send resume to KPOM/KFAA. Attention Charles Hoing P.O. Box 4610, Fort Smith, Arkansas 72914. EOE

Ad Index

	Page Number	Reader Service Number	Advertiser Hotline
ADC Telecommunications	29	122	800-726-4266
ADC Telecommunications	32	111	800-726-4266
Allied Tower	152	164	800-332-0025
Audio Precision	15	105	800-231-7350
Avid Technology	43	130	800-949-2843
Axon Digital Design	44	131	314-241-4500
Azden Corporation	169	172	516-328-7500
BARCO Inc.	123	147	770-218-3200
Beck Associates	183	202	888-422-8600
Benchmark Media Systems	181	195	800-262-4675
B&H Photo-Video	176-179	187,188	800-947-9928
Bogen Photo	154	166	201-818-9500
Broadcast Video Systems	130	15B	905-764-1584
California Amplifier	151	163	805-987-9000
Calrec Audio Ltd.	131	159	+142-284-2159
Canon USA	17	106	800-321-4388
CEMA	163	184	703-907-7628
Clear-Com Intercom	141	162	510-496-6666
Columbine Systems	148	178	303-237-4000
Continental Electronics	115	155	214-381-7161
Digibid.com	183	201	301-571-0790
DiviCom	137	152	408-944-6700
DNF Industries	130	157	818-252-0198
Dolby Labs Inc.	25	120	415-558-0200
DPS	73	127	606-371-5533
Duracell USA	40-41	129	800-548-5489
ESE	46	133	310-322-2136
Euphonix	135	151	650-855-0400
Extron Electronics	31	110	714-491-1500
For A Video	180	191	352-372-0270
Forecast Consoles, Inc.	160	176	800-735-2070
General Instrument Corp	143	174	888-800-8346
Gentner Communications	34	113	800-945-7730
Gepco	76	139	847-795-9555
Global Microwave Systems	156	168	760-631-8021
Harris Corp./Broadcast Div.	3	104	606-282-4800
Henry Engineering	170	173	626-355-3656
Herman Electronics	181	194	888-938-4376
Ikegami Electronics	65	135	201-368-9171
InterBEE '99	127		
Intertec Publishing	170		800-288-8606
Itelco	27	121	303-464-8000
Jones Earth Segment, Inc.	182	200	303-784-8809
JVC Professional Products	121	146	800-JVC-5825
KTech Telecommunications	180	190	818-361-2248
Leader Instruments Corp.	107	142,143	800-645-5104
Leitch Incorporated	39	128	800-231-9673
Leitch Incorporated	192	103	800-231-9673
Louth Automation	7	114	415-843-3665
Magni Systems, Inc.	161	183	502-615-1900
Major Technologies	125	148	905-890-6338
Maxell Corp.	109	144	800-533-2836
Maxell Corp.	111	153	800-533-2836
Miranda Technologies Inc.	11	116	514-333-1772
Multidyne Electronics	180	189	800-4TV-TEST
NDS America	155	167	714-725-2500
News World	162		+441714910880
Northstar Technical Serv.	126	150	800-842-1671
NSI	157	170	410-964-8400
NVision Inc.	119	145	530-265-1000
NVision Inc.	165	185	530-265-1000
Odetics Broadcast	19	108	800-243-2001
Omneon	37	123	408-558-2113
Panasonic Broadcast	4-5		800-528-8601
Pesa Switching	139	161	800-328-1008
Philips Broadcast	105	140	800-962-4287
Philips Broadcast	147	177	800-962-4287
Philips Semiconductors	20-21	109	
Pinnacle Systems	48-49	125	650-526-1600
Pirod, Inc.	126	180	219-936-4221
Prime Image Inc.	129	156	408-867-6519
Professional Communications	63	134	813-888-5353
Professional Audio Supply	156	169	903-737-8478
Quantel Ltd.	9	115	44-635-48222
Ross Video	153	165	613-652-4886
Sachtler GMBH	71	126	893-215-8200
Sennheiser Electronics Corp.	23	118	860-434-9190
Shook Electronics	180	192	210-651-5700
Sigma Electronics	159	182	717-569-2681
SMPTE	59		914-761-1100
Snell & Wilcox	66-67	136	408-260-1000
Snell & Wilcox	112-113	154	408-260-1000
Snell & Wilcox	132-133	160	408-260-1000
Solid State Logic Ltd	33	112	800-343-0101
Sony Electronics	51-58		800-635-SONY
Sony Professional Tape	35		
Standard Communications	167	171	310-532-5300
Swager Communications	180	193	800-968-5601
Switchcraft Inc.	149	179	773-792-2700
Tadiran Scopus	77	138	
TEC Awards	136		
Tektronix	13	117	800-998-3588
Telecast Fiber Systems	18	107	508-754-4858
Telex Communications	79	141	800-392-3497
Telex Communications	166	186	800-392-3497
Thomson Tubes	145	175	201-812-9000
TV One	24	119	606-282-7303
Vibrint Technologies	75	137	781-275-4088
Video International	150	181	516-243-5414
Videotek, Inc.	191	102	800-800-5719
Wheatstone Corporation	2	101	252-638-7000
Windows to the Web	175		
Winsted Corporation	45	132	800-559-6691
3DFX	181	196	972-234-8750
360 Systems	47	124	818-991-0360

Sales Offices

WEST
Duane Hefner
5236 Colodny Ave., Suite 108
Agoura Hills, CA 91301
(818)707-6476
Fax:(818)707-2313
dahefner@worldnet.att.net

Sue Horwitz
809 South Orange Drive
Los Angeles, CA 90036
(323)933-9485
Fax:(323)965-1059
audient@mediaone.net

EAST
Josh Gordon
335 Court Street, Suite #9
Brooklyn, NY 11231
(718)802-0488
Fax:(718)522-4751

EAST/MIDWEST
Joanne Melton
1775 Broadway, Suite 730
New York, NY 10019
(212)333-4655
Fax:(212)459-0395
joanne_melton@intertec.com

INTERNATIONAL
Richard Woolley
Tony Chapman
P.O. Box 250
Banbury, Oxon OX16 8YJ U.K.
+44(0)1295 278407
Fax:+44(0)1295 278408
richardwoolley@compuserve.com

REPRINTS
Jenny Eisele
(913)967-1966
Fax:(913)967-1901

JAPAN
Orient Echo, Inc.
Mashy 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
Brian Huber
P.O. Box 12901
Overland Park, KS 66282
(800)896-9939 (913)967-1732
Fax:(913)967-1735

LIST RENTAL SERVICES
Lisa Majewski
9800 Metcalf
Overland Park, KS 66212-2215
(913)967-1872
Fax:(913)967-1897

CUSTOMER SERVICE: 913-967-1711 OR 800-441-0294

Broadcast ENGINEERING

EDITORIAL
Brad Dick, *Editor*
Steve Epstein, *Technical Editor*
Jim Saladin, *Senior Associate Editor*
Patrick Murphy, *Associate Editor*
Sandra Ferguson, *Editorial Assistant*
Tom Cook, *Dir., Editorial Development*

ART
Andrew Brown, *Art Director*

TECHNICAL CONSULTANTS
Jerry Whitaker, *Conference Consultant*
Brad Gilmer, *Computers & Networking*
John H. Battison, P.E., *Antennas/Radiation*
Michael Robin, *Digital Video*
Donald L. Markley, *Transmission Facilities*
Harry C. Martin, *Legal*
Larry Bloomfield, *News Technology Editor*
Paul McGoldrick, *Industry Watcher*

BUSINESS
John Torrey, *V.P. Entertainment Division*
Dennis Triola, *Group Publisher*
Rachelle Thomas, *Marketing Director*
Kathy Lewis, *Advertising Coordinator*
Mary Mitchell, *Classified Adv. Coordinator*
Sherri Gronli, *Corporate Circulation Director*
Leann Sandifar, *Circulation Manager*

INTERTEC Publishing
Raymond E. Maloney, *Chairman*
Cameron Bishop, *President and CEO*
Ron Wall, *Chief Operating Officer*
Stephanie Hanaway, *Div. Dir. of Marketing*
Doug Coonrod, *Corporate Art Director*

PRIMEDIA Information Group
Curtis Thompson, *President/CEO*

PRIMEDIA Inc.
William F. Reilly, *Chairman and CEO*
Charles McCurdy, *President*
Beverly C. Chell, *Vice Chairman*

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.

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). Subscription information: P.O. Box 12937, Overland Park, KS 66282-2937.

BROADCAST ENGINEERING (ISSN 0007-1994) is published monthly (except semi-monthly in May and December) and mailed free to qualified persons by PRIMEDIA Intertec, 9800 Metcalf, Overland Park, KS 66212-2216. 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 66212-2216 Phone: 913-341-1300; Edit. fax: 913-967-1905. Advert. fax: 913-967-1904. © 1999 by Intertec Publishing. All rights reserved.

EOM

Wonder antennas, broadcasting and the cable system

BY PAUL MCGOLDRICK

It certainly made me sit up and take notice; a flyer in the Sunday newspaper from Radio Shack trying to sell a DSS system with the tag "Surf over 210 satellite channels plus all your local stations." This miracle — for some of us — is achieved by selling the customer a choice of two antennas and a satellite system.

One of the antennas, the lesser model, was described as an attic/outdoor antenna with a range up to 90 miles. The better model was described as a long-range outdoor antenna with a range up to 190 miles. There was small print, of course. The estimated range was based on outdoor reception over flat and open terrain. Maybe they should have added that the antennas would have to be mounted on a 1500-foot tower with zero feeder length between the antennas and receiver. And even then I'm not sure whether — even in Kansas — a usable signal would be obtained.

Added to these miserable claims is the information that the kit of parts includes two diplexers to combine satellite and antenna signals into a single lead-in wire. Presumably the second diplexer is for the split back to the separate feeds to the satellite receiver; but those two diplexers are another minimum 6dB knock to the received signal strength.

Well, I'm not in Kansas anymore and this nonsense gets my goat; I don't like to see Joe P. Consumer being duped by a major corporation. There are plenty of people who are vulnerable, many of whom find themselves in the same situation I have relative to TV reception; they would love for these mileage claims to be true.

In my case, I put myself back into that situation. I recently became entirely fed up with the problems from my satellite provider: the quality of the decoder, black levels all over the place and lip sync shortcomings visible even to a child. In addition, the LNBC was intermittent when switching between odd and even translators, if it got too warm, if it got too cold, if it got too damp — and its technical service people all but ignored me.

Using a VHF antenna with about 20dB of gain, I can receive the entire spectrum of the cable system from within the house

Now, I am in a position that all too many people are in: no network services automatically from the satellite. After three weeks, CBS and Fox were activated, but I have no PBS or NBC from the heavens. I will not complain about ABC because a station about 75 miles away had the commercial common sense to put in a 5W translator that provides the only Grade A signal I can receive. There aren't any other Grade anythings available. The only other translator in town is a 1W box for PBS. It took forever to get up and running and is completely overwhelmed in the neighborhoods by the radiation from the 1970s vintage cable system.

So, what do I do? Go out and buy a regularly priced $139.97 antenna from Radio Shack to get signals from the nearest market of any size, 75 miles away? I don't think so. Those 5000-foot mountains in the middle of the reception path certainly don't offer flat and open terrain. Oh, and the top of my house is probably no more than 45 feet above sea level.

Do you know how helpless this makes me feel, and how angry I am with people who don't understand what they are doing? The nearest CBS affiliate is 25 miles away — the only TV station in a city of 10,000 people. At least they understand that reception from them is impossible. But what NBC station thinks I am able to pick up a Grade A signal? It is now up to me to find out and formally gripe at them, threaten them with adverse publicity and whatever else I can do. But the one that really bothers me is PBS. I would rather get the local state feed of PBS than the satellite rebroadcast PBS-X feed on East Coast time. There is absolutely no reason why I wouldn't be able to receive the station's translator if it wasn't for the cable company. That system is all above ground, has major splices in it, and every time the city has expanded I have the feeling the technicians simply cranked up the signal levels at the head-end so that they would reach further.

As a simple experiment, I set up a VHF antenna with about 20dB of gain. From within the house I can receive the entire spectrum of the cable system; I am not advocating illegal reception of cable systems in this way — and you won't find it happening in my house — but what kind of slaphappy engineering can we allow these people to get away with?

To receive my primary legal off-air feed of Channel 2, I am now going to have to go for enforcement by the FCC. Wish me luck, and if you have similar problems, share your misery with me. ■

Paul McGoldrick is an industry consultant based on the West Coast.

Send questions and comments to: paul_mcgoldrick@intertec.com

HD Routing & Distribution.

RS-12HD

Multi Format with Looping Video Inputs.

Videotek's RS-12HD, the industry's only High Definition 12x1 video router with true passive looping inputs, ensures transparent routing of all video signals from 270Mb/s through 1.485 Gb/s. With support for multiple serial digital input formats (480i, 480p, 720p, 1080i), plus superior specifications and a great price, the RS-12HD is perfect for any high definition routing application. The non-reclocking RS-12HD expands on the proven reliability and straightforward operation of the popular RS-12 family of routers, delivering all the power and control you expect from Videotek, without the complexity.

For distribution of high definition video signals, Videotek's HDA-1500 Series of distribution amplifiers are available with looping or non-looping inputs in either 4- or 8-output configurations. Offered in standalone or OMNIFRAME modular versions, the HDA-1500 Series combines true broadcast quality performance with flexible packaging.

Videotek's 25-year commitment to developing products with advanced technology based on proven designs assures the optimum fusion of innovation and tradition. For more information on the RS-12HD, HDA-1500 Series, and other outstanding high definition products, visit our website at www.videotek.com or call 1-800-800-5719 and talk to one of our expert sales engineers.

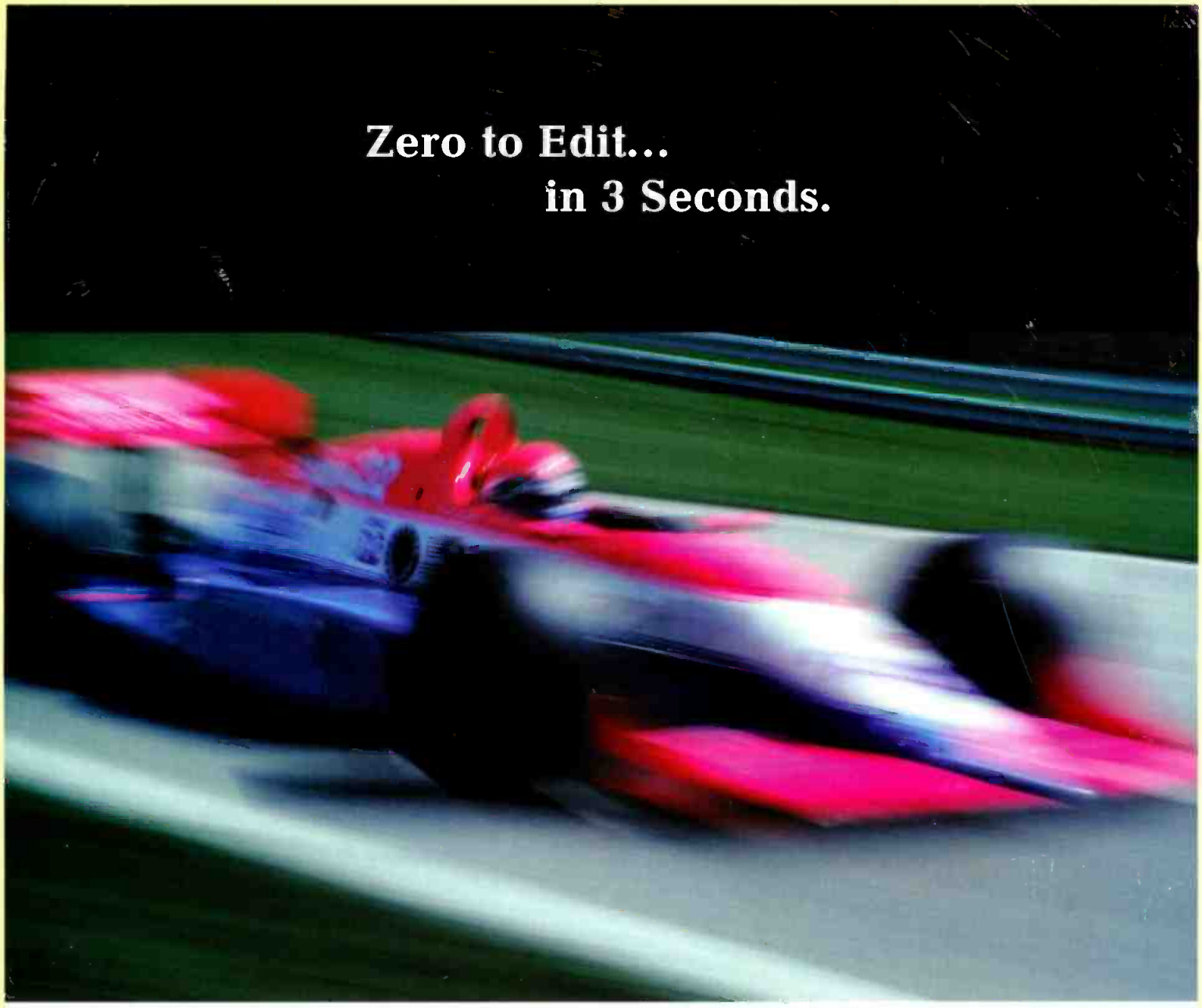
Premium Quality, Intelligent Design, Smart Price...That's Videotek.

VIDEOTEK™
A Zero Defects Company

Five Year Warranty
ISO-9001 Certified

243 Shoemaker Road, Pottstown, PA 19464 Toll Free: (800) 800-5719 (610) 327-2292 Fax: (610) 327-9295
Visit us on the Worldwide Web: www.videotek.com

Circle (102) on Free Info Card



Record - Edit - and Play to Air - with record breaking speed using NewsFlash™ and the Leitch® ASC Digital Newsroom System

In the fast-paced world of broadcast news, the first one on air wins. If you want to be first, you need a system with record-breaking speed. You need the Leitch® ASC Digital Newsroom System–the fastest, easiest, and most efficient way to edit and air news stories today.

Start recording footage into the Leitch ASC Digital Newsroom System and begin editing material in as fast as 3 seconds. That's right, 3 seconds. It's all made possible by NewsFlash™, the world's first fully integrated Windows NT®-based editing system and the Leitch ASC VR300™ video server. NewsFlash is built right into the server, providing an unprecedented level of integration. And what a server it is...The ASC VR300 gives you shared access to all material and is scalable to meet your growing needs. And with instant playout, you can air late-breaking stories in record time. Once edited, your story is ready for air–directly from the server. Not only do you get reduced time to air; but you reduce the complexity of your news operation and eliminate costly errors.

Get on air in record-breaking time with the Leitch ASC Digital News System.
www.leitch.com

ASC
A LEITCH COMPANY

For a test drive contact us at 888-843-7004.

Circle (103) on Free Info Card

LEITCH
ENGINEERING THE BIG PICTURE™

International/Canada +1 (416) 445-9640, (800) 387-0233 • USA East (800) 231-9673, USA West (888) 843-7004 • Latin America +1 (305) 591-0611 • Europe +44 (0) 1483-591000
Australia +61 (2) 9939-3355 • Japan +81 (3) 5423-3631 • Brazil +55 (11) 867-0218