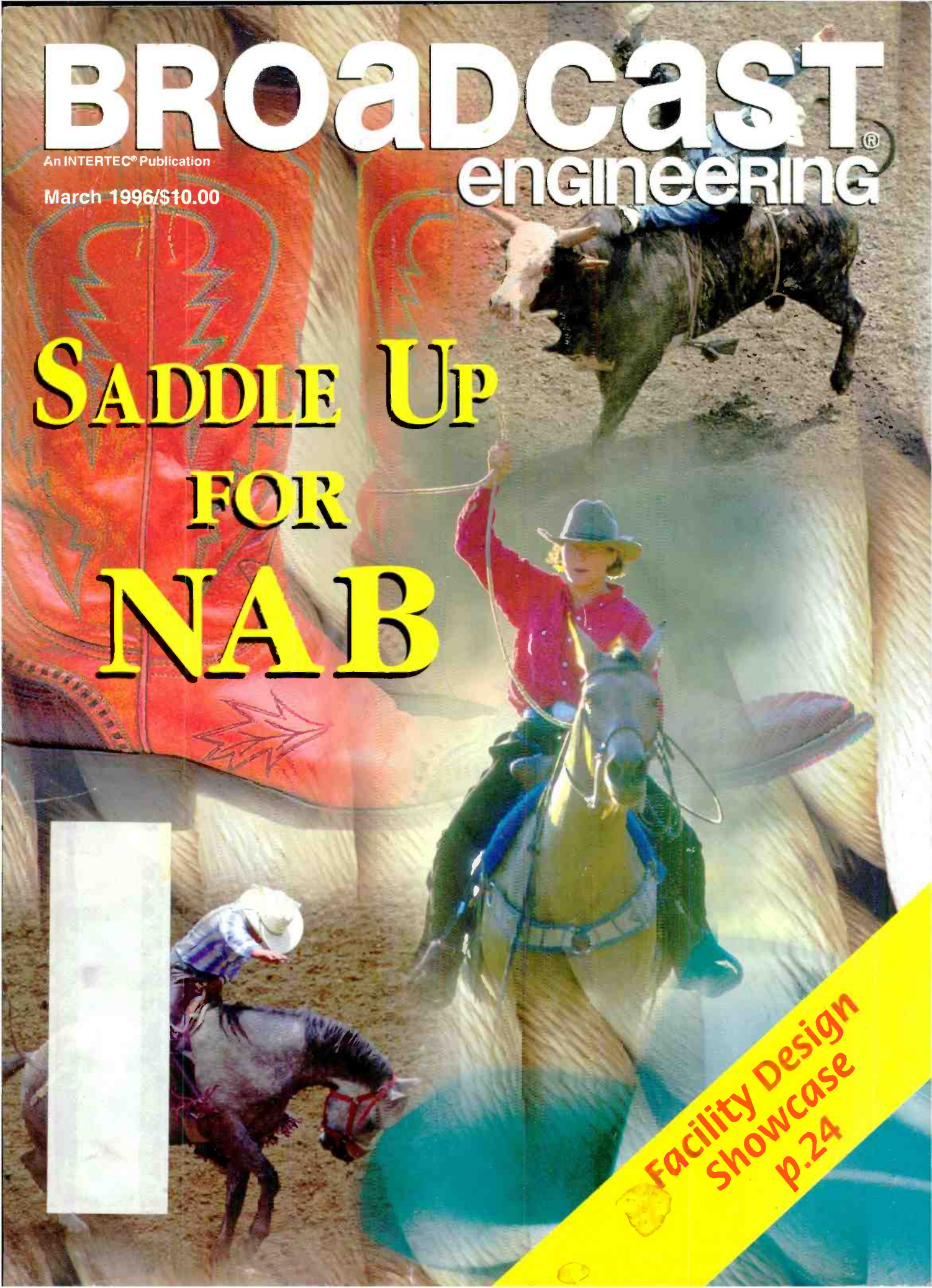
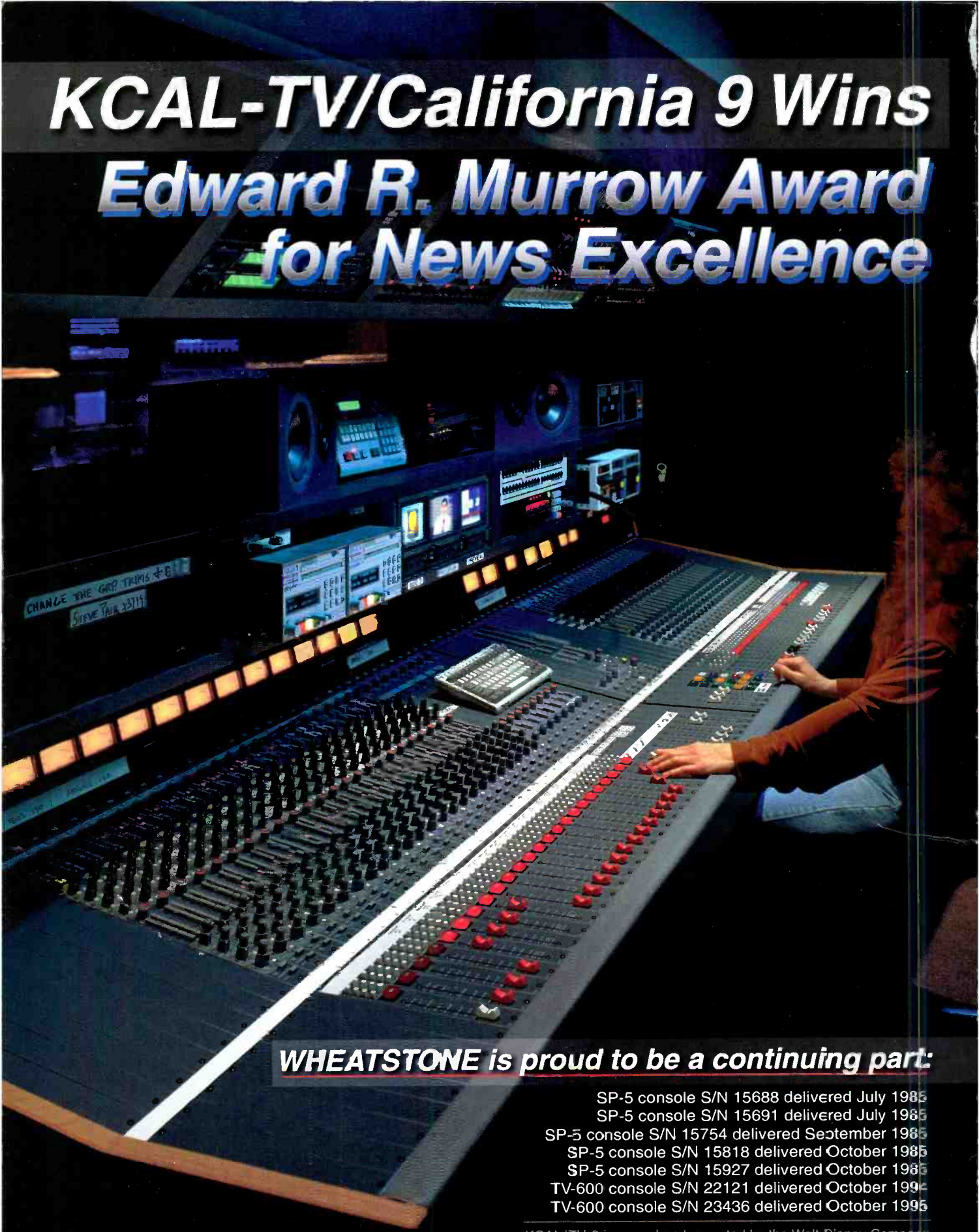
BROADCAST® engineering
An INTERTEC® Publication
March 1996/$10.00



SADDLE UP FOR NAB

Facility Design Showcase p.24

KCAL-TV/California 9 Wins Edward R. Murrow Award for News Excellence



WHEATSTONE is proud to be a continuing part:

SP-5 console S/N 15688 delivered July 1995
SP-5 console S/N 15691 delivered July 1995
SP-5 console S/N 15754 delivered September 1995
SP-5 console S/N 15818 delivered October 1995
SP-5 console S/N 15927 delivered October 1995
TV-600 console S/N 22121 delivered October 1995
TV-600 console S/N 23436 delivered October 1995

KCAL/TV-9 is owned and operated by the Walt Disney Company

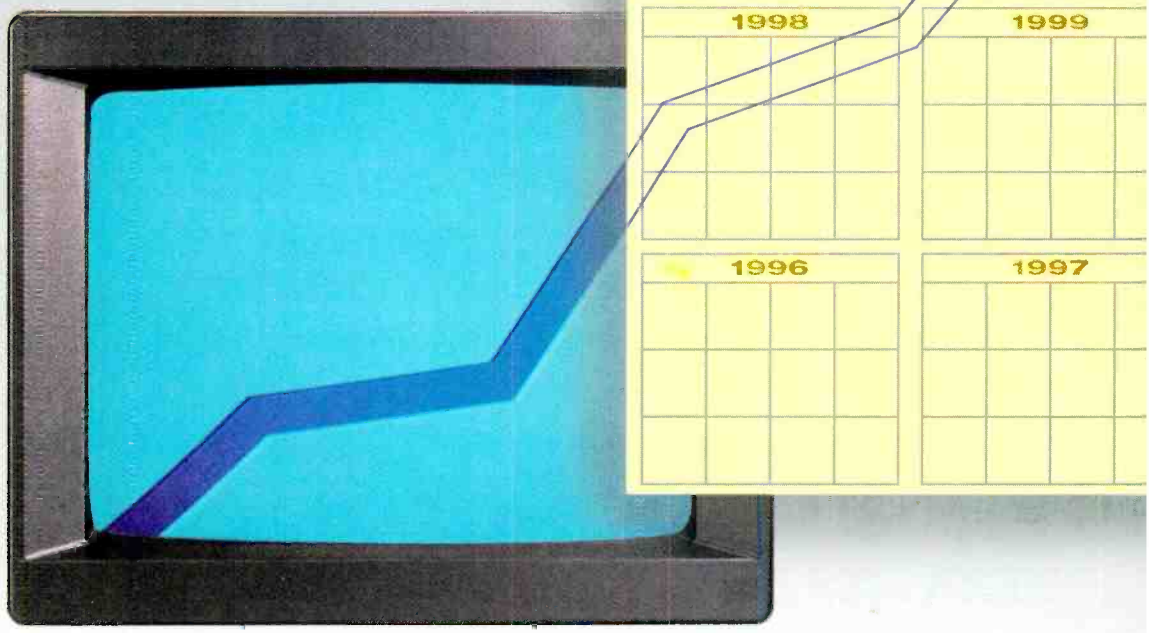
Wheatstone Corporation

7305 Performance Drive, Syracuse, NY. 13212 USA.
tel 315-452-5000 / fax 315-452-0160 / Wheatstone@aol.com

Circle (1) on Action Card

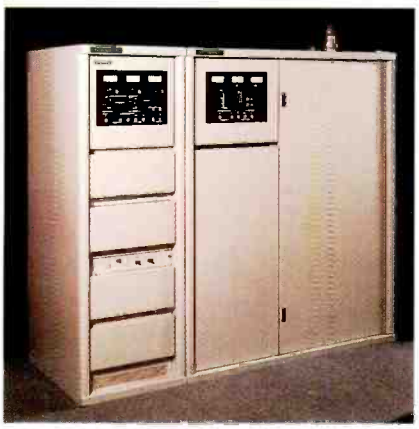
UHF TV TRANSMITTERS

Sigma™ UHF Transmitters will improve your bottom line today,



and be ready for digital TV tomorrow.

The best of both worlds.
You want your transmitter to give you great performance, reliability and value now, and be able to make the jump to digital with minimum expense and no hassle. You'll find that Harris Sigma UHF TV Transmitters, from 20 to 240 kW, give you the best of both worlds. Superb analog today, with features built in to make conversion to digital economical and easy.



Superior linearity.
For example, Harris feedforward correction provides a highly-efficient Class AB IPA that's more linear than Class A. This assures excellent performance with today's analog NTSC and PAL systems, and provides the linearity and headroom you will need for future digital transmission, including Grand Alliance 8-VSB and multi-carrier COFDM systems.

Unmatched long-term value.
Analog or digital, Sigma will give you the best value of any IOT transmitter. These exceptionally redundant systems avoid conditions which compromise reliability, by providing such features as Automatic Level Control circuitry, thyratron crowbar protection, and VSWR foldback. In addition, Sigma Transmitters have 70% typical efficiency — the highest of any IOT transmitter.

You need the best UHF transmitter today. You'll need the best digital television system tomorrow. And you always need a top-quality signal, achieved with minimum investment of money and labor. To learn more about how Sigma Transmitters will provide superb performance and cost savings that can help push your profits right off the chart, call Harris.

HARRIS CORPORATION
BROADCAST DIVISION
US and Canada
TEL: +1 217 222-8200
FAX: +1 217 224-1439
Elsewhere
TEL: +1 217 222-8290
FAX: +1 217 224-2764

HARRIS

Transmitters: Sigma™ IOT UHF – Platinum HT EL and Platinum Series® Solid State – UltraVision Solid State UHF – UM Series Depressed Collector Klystron • VHF, UHF and HDTV-Ready Antennas • Remote Control Systems – Digital HDTV/ATV Systems

Circle (4) on Action Card

BROADCAST® ENGINEERING

March 1996 • Volume 38 • Number 3

NAB Preview

Facility Design Showcase

DEPARTMENTS:

284

COLUMNS:

ON THE COVER: Saddle up and head on out to NAB. It's time once again to visit NAB's roundup of new products. It'll be as easy as leading your horse to water — just follow our handy dandy FASTtrack of companies. Cover concept by *BE's* own creative cowgirl, Stephanie Masterson.

BROADCAST ENGINEERING (ISSN 0007-1994) is published monthly (except semi-monthly in June and December) and mailed free to qualified persons by Intertec Publishing, 9800 Metcalf, Overland Park, KS 66212-2215. Second-class postage paid at Shawnee Mission, KS, and additional mailing offices. POSTMASTER: Send address changes to *Broadcast Engineering*, P.O. Box 12902, Overland Park, KS 66282-2902. CORRESPONDENCE: Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2215. Phone: 913-341-1300; Edit. fax: 913-967-1905. Advert. fax: 913-967-1904.

See us at NAB Booth #11025

Introducing

The DSA309 Digital Studio Analyser

All Format Digital Video Analyser: Tests component and composite serial digital video signals in both 525 line and 625 line formats.

Real Time Measurements: Continuous real time, on-line measurements of all key parameters permits live monitoring of:

- **Serial Jitter**
- **Signal Amplitude**
- **Color Levels**
- **Non-Recommended Value Errors**
- **EDH Errors**
- **Parity Bit Errors**
- **TRS Errors**
- **Bit Activity**
- **Reserved Code Errors**

Real Time Color Level Monitoring: Monitors component digital video in real time for RGB or NTSC/PAL color space infractions.

Extensive Error Logging: Permits system performance monitoring and documentation by logging system errors on either the built-in LCD display, external printer, or on the built-in 3.5" disk drive.

Alarm Interface: Provides immediate notification when user defined thresholds are exceeded.

Comprehensive Digital Displays: Complemented by simulated analog waveforms, these displays help bridge the gap between analog and digital testing, creating a user friendly interface for both operations and engineering staff.

Easy To Use: The touch screen interface and easy to use menu system permits full instrument utilization while minimizing user reference to the manual.

Designing Excellence

Circle (5) on Action Card

For a comprehensive information packet, call 1-800-769-AAVS (2287).

AAVS by Sencore

The Name To Know In Digital Video Testing

Advanced Audio Visual Systems by Sencore
3200 Sencore Drive, Sioux Falls, SD 57107
Direct (605) 339-0100 Fax (605) 339-0317

By Dawn Hightower, senior associate editor

Broadcasters fight proposal for digital-TV auction

Broadcasters are waging war against efforts on Capitol Hill to make them pay for licenses that they need to launch the next-generation of digital TV service.

Ads that recently appeared in the Washington Post and the Washington Times, warn that such a move could mean the death of free over-the-air television, because broadcasters can't afford to pay for the digital spectrum while also having to invest millions of dollars for new equipment needed to air digital programs. The ads refer to a proposal by Senator John McCain, R-AZ, that would tie an auction of the licenses to a plan to lift the nation's debt limit. The plan aims to raise about $30 billion from the auction.

According to broadcasters, tying a spectrum auction to a debt limit bill would keep broadcasters and the public out of the debate. Broadcasters favor a plan that would give them the licenses to air programming in a digital format, while letting them keep their analog channels during the transition. Once most of the nation's households are equipped to receive digital signals, broadcasters would return their analog licenses. The government could then sell the analog spectrum to the highest bidder.

TFT's decoder accepted for FCC certification

TFT has been granted FCC Type Certification for its EAS 911 EAS encoder/decoder.

In December 1994, the FCC approved a digital EAS pioneered by TFT and tested with the FCC in Denver and Baltimore prior to its adoption. The system should save the industry more than $60 million each year in EBS operating costs by reducing lost air time, audience tune out, recordkeeping and personnel training. EAS equipment must be installed by Jan. 1, 1997. Cablecasters are subject to the rules by July 1, 1997.

Details of the EAS 911 are provided in the EAS Handbook, free-of-charge. For a copy, contact TFT by telephone at (408)727-7272; by fax at (408)727-5942; or by E-mail at TFTInc@aol.com.

SCTE relocates

The Society of Cable Telecommunications Engineers (SCTE) has moved to a new location. The new address is 140 Philips Road, Exton, PA 19341-1318. The new phone number is (610)363-6888; (800)542-5040. The fax number for membership and administrative inquiries is (610)363-5898; the fax number for information about training and conferences is (610)363-7133.

Winter SMPTE Conference held in Seattle

The 30th Winter Conference of the Society of Motion Picture and Television Engineers, held in Seattle Feb. 1-3, focused on the convergence of computer technology and television. Registration for the conference, the first held in Seattle, was about 450. The event featured 28 papers and a day-long course on digital video presented by Charles Poynton.

Next year's conference will be held in February in New York City.

In other society news, SMPTE has unveiled its technical session plan for the World Media Expo Convention in Los Angeles, slated for Oct. 9-12. Under the umbrella of "Film and Video: Creation to Delivery," SMPTE has three days of sessions planned, plus three full-day tutorials, which are new to the fall program.

For information on registration, contact SMPTE at (914)761-1100. The deadline for advance registration is Sept. 13.

Supreme Court reconsidering cable must-carry

Once again, the Supreme Court will consider the constitutionality of federal rules that require cable-TV systems to carry local TV stations.

The must-carry provisions of the Cable Television Consumer Protection and Competition Act was passed in 1992, and the cable industry has fought against them since the beginning. The industry claims that the rules violate their First Amendment rights.

In a 1994 decision, the Supreme Court ruled that the FCC had not done enough to justify the rules. Now, after more litigation, the Supreme Court will take another look. A decision should be made later this year.

The must-carry rules require that all but the smallest cable systems transmit local TV stations, taking up as much as one-third of a cable system's channel capacity, and to set aside more space for non-profit stations.

Lawmakers, under pressure from broadcasters, have concluded that cable operators' potential to create bottlenecks has given the cable-TV industry an unfair advantage over some broadcast stations.

Broadcast museum nears completion

The Museum of Television & Radio in Beverly Hills, CA, will open March 18. The museum houses more than 75,000 programs that cover more than 70 years of broadcast history.

The privately funded museum is the sister facility of the Museum of Television & Radio in New York.

The museum uses a computer software system that patrons can use to browse the catalogs to select particular TV or radio programs, which have been digitally rerecorded.

The 2-story museum consists of a state-of-the art theater, with robotic cameras and satellite hookups.

Nielsen Media gets patent for meter

Nielsen Media Research has received a patent for its A/P Meter, a line of electronic meters to measure TV programming regardless of source, distribution pattern or time of viewing.

The system includes independent audio and video technologies for identifying programs and a backup technology for identifying a program when the program identification codes are missing or unreadable.

Broadcasters support ratings system

Broadcasters plan to provide parents with more information about TV programs by setting up a system similar to the Motion Picture Association of America's (MPAA). The ratings will be applied by the program distributor and should be in place by next January.

The group will also formulate a ratings review process, which from time to time will examine the ratings of specific programs and their appropriateness.

The joint statement was signed by the networks, including TBS, PBS, as well as the National Cable Television Association, the National Association of Broadcasters, the MPAA and the Association of Local Television Stations.

The debate has become politically charged recently, with Republicans worried that the White House could win credit for any ratings system put in place. House Speaker Newt Gingrich, R-GA, is reminding everyone that the issue was a Republican one, broached three years ago by former vice president Dan Quayle.

V-Chip limitations

The V-Chip is an electronic system promoted by the government to give parents control to program what their children watch on television. Within the next year, the networks will be required to add a code to each program indicating the amount of violence, sex and objectionable language. With the passage of the Telecom Bill, all new televisions will have to feature this capability, but no time frame has been set. Existing TV sets would not be able to use this feature.

For up-to-date information on FCC rules and regulations, check out the Broadcasters' Law and Regulation Conference April 15-17 at the LVCC at the NAB '96 Convention.

We let Rick Dees use one and now he won't give it back!

"Nope. No way. Forget it. This Instant Replay is mine."

Hey, we understand. After all, Instant Replay puts 1,000 of his favorite noises right in front of him — ready for instant playback. No other audio player makes it so easy to be spontaneous and creative. It's fast, it's easy and it's fun.

Check it out. One Instant Replay can store up to 16 hours of stereo sound. That's 16 hours of sound effects, spots, promos, even entire songs — anything — and you can play any of them back instantly just by pressing one of 50 Hot-Keys! There's no need for a computer and no need for training. It's self-contained and it works right out of the box — just push the buttons and go!

Try Instant Replay Free!
Call 818-991-0360

To prove how Instant Replay can make your station better, you can Test Drive one with no obligation! Call us now for free overnight delivery of your Test Drive unit. And like Rick Dees, once you get your hands on Instant Replay you won't want to give it back either.

D-NET

Transfer one cut or one thousand between machines using the D-NET high-speed digital audio network.

Print hard copy lists of all stored cuts so you always know what's where!

Store up to 16 hours of CD-quality digital audio on Instant Replay's internal hard disk.

360 Systems®

PROFESSIONAL DIGITAL AUDIO

5321 Sterling Center Drive • Westlake Village, CA 91361 • (818) 991-0360 • fax (818) 991-1360

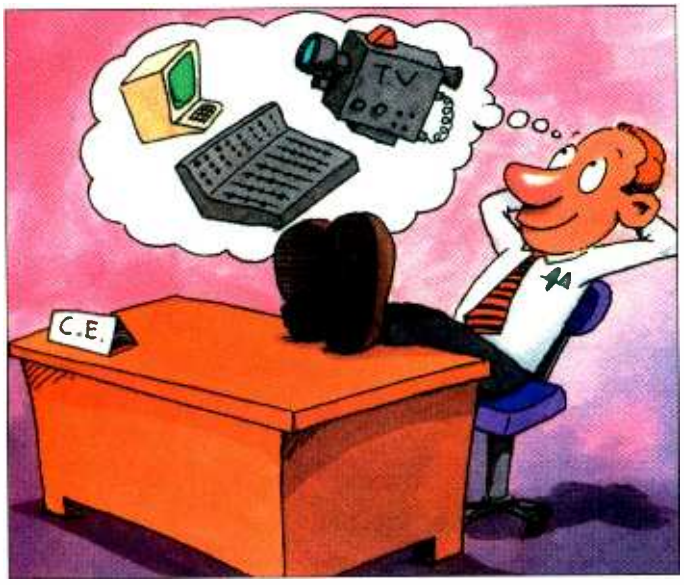
If you're a call-letter station, you can try Instant Replay for 10 days with no obligation. If you decide to buy Instant Replay, we'll make arrangements through one of our authorized dealers. Offer good in the continental US only. Offer expires July 1, 1996.

*Suggested retail prices: $2995 for 4 hours of storage; $3495 for 8 hours of storage and $3995 for 16 hours of storage.

Circle (13) on Action Card

All I want for NAB is...

Our cartoon technical manager is dreaming of all the "goodies" he wants at this year's NAB Convention. New cameras, a switcher, desktop video..., the list never ends. The industry's largest show provides attendees with the year's best opportunity to plan for facility expansion and equipment replacement. No where else can you see so many products and vendors.



Because this year's show is expected to be even larger than last year's record-breaking exhibition, you will need to plan ahead if you don't want to be overwhelmed and waste valuable time.

To make your task easier, we've designed a package of special convention features. Combined, they will guide you through the exhibit halls and session rooms. Whether it's equipment, services or sessions, you'll find help locating it here.

First, the *BE Map* is your schematic to finding the companies that you want to see. Both the Las Vegas Convention Center and the Sands exhibition halls are detailed for easy booth location.

FASTtrack p.148
Map p.185
Exhibitor Listings p.202

Second, our exclusive *BE FASTtrack* provides you with a direct path through the vast exhibition halls to the technology you want to see. Need a new console or DVE? The *BE FASTtrack* shows you the companies that make them and provides you with the shortest path between their booths.

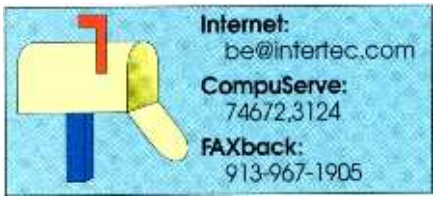
Third, the *Exhibitor's Highlights* provide a thumbnail glimpse of what each company will be showing on the exhibitor floor. Check carefully and you will discover some nuggets of new technology and a lot of really innovative new products.

Finally, we've provided easy-to-use "clip-and-take" session schedules. So cut out the schedules you need and leave that heavy 2-pound program book in your room.

So, if all you want for NAB is...just grab your list and your copy of *BE* magazine. Everything you need for a successful show is inside this issue.

Brad Dick

Brad Dick, editor



We Do Windows

The recognized leader in audio testing announces software for the world's most popular graphical user interface.

Audio Precision is proud to announce Windows-based *APWIN* audio testing software for the System One and System Two audio analyzers

- APWIN may be purchased as an upgrade for use with all existing System One hardware
- APWIN is standard with System Two hardware
- APWIN for Microsoft Windows 3.1™ or Windows for Workgroups 3.11, now
- APWIN for Microsoft WIN95 available at WIN95 release time
- High level display and control of AES/EBU status bits
- Multiple instrument control panels per screen page
- 5 screen pages of settings and graphs store with each test
- Up to 6 parameters per color graph
- Dual graphics cursors with delta readouts
- View multiple readouts and bargraphs simultaneously with control panels
- Standardized Windows interface for ease of use
- Copy and paste to Windows word processors and spreadsheets

Audio precision

P.O. Box 2209
Beaverton, OR 97075-3070
(503) 627-0832, 800-231-7350
FAX: (503) 641-8906

The recognized standard in Audio Testing

INTERNATIONAL DISTRIBUTORS: **Australia:** IRT Electronics Pty. Ltd., Tel: 2 439 3744 **Austria:** ELSINCO GmbH, Tel: (1) 815 04 00 **Belgium:** Trans European Music NV, Tel: 2 466 5910 **Brazil:** INTERWAVE LTDA., Tel: (21) 325-9221 **Bulgaria:** ELSINCO, h.e. Streibishte, Tel: (2) 58 61 31 **Canada:** GERRAUDIO Distribution, Tel: (416) 696-2779 **China, Hong Kong:** A C E (Int'l) Co. Ltd., Tel: 2424-0387 **Croatia:** AVC Audio Video Consulting, Tel: (41) 624 622 **Czech Republic:** ELSINCO Praha spol. s.r.o., Tel: (2) 49 66 89 **Denmark:** npn Elektronik aps, Tel: 86 57 15 11 **Finland:** Genelec OY, Tel: 77 13311 **France:** ETS Mesureur, Tel: (1) 45 83 66 41 **Germany:** RTW GmbH, Tel: 221 70913-0 **Greece:** KEM Electronics Ltd., Tel: 01-6478514/5 **Hungary:** ELSINCO KFT, Tel: (1) 269 18 50 **India:** HINDITRON Services PVT, Tel: 22 836-4560 **Israel:** Dan-El Technologies, LTD., Tel: 3-6478770 **Italy:** Link Engineering s.r.l., Tel: 0521/648723 **Japan:** TOYO Corporation, Tel: 3 (5688) 6800 **Korea:** B&P International Co., Ltd., Tel: 2 546-1457; B&P (Kumi Office), Tel: 0546 53-7347/8 **Malaysia:** Test Measurement & Engineering Sdn. Bhd., Tel: 3 734 1017 **Netherlands:** Heynen b.v., Tel: 08851-96300 **New Zealand:** Audio & Video Wholesalers, Tel: 7 847-3414 **Norway:** Lydconsult, Tel: (47) 66-988333 **Poland:** ELSINCO Polska sp. z o. o., Tel: (22) 39 69 79 **Portugal:** Acutron Electroacustica LDA, Tel: 1 9414087 / 9420862 **Singapore:** TME Systems Pte Ltd., Tel: 747-7234 **Slovakia:** ELSINCO Bratislava spol. s.r.o., Tel: (7) 784 165 **South Africa:** SOUNDFUSION Broadcast, Tel. 11 477-1315 **Spain:** Telco Electronics, S.A., Tel: 1 531-7101 **Sweden:** TTS Tal & Ton Studioteknik AB, Tel: 31-803 620 **Switzerland:** Dr. W.A. Gunther AG, Tel: 1 910 41 41 **Taiwan R.O.C.:** Cha Wei Electric Trading Co., Tel: 2-5612211 **Thailand:** Massworld Company Ltd., Tel: 662-294-4930 **United Kingdom:** Thurlby Thandar Instruments, Ltd., Tel: (1480) 412451

Circle (14) on Action Card

By Harry C. Martin and Andrew S. Kersting

Telco Bill passes

In February, the first major overhaul of the statutory framework governing telecommunications since 1934, was signed by President Clinton. Here is a summary of the major provisions affecting the TV industry.

- A single entity may own TV stations reaching as many as 35% of the nation's TV households (the previous limit was 25%).
- A single entity may own or control any number of TV stations provided the 35% cap is not exceeded.
- The commission is required to conduct a rulemaking to determine whether to retain, modify or eliminate its local ownership limitations for television. (Such a proceeding was initiated last year and is in progress.)
- With respect to enforcement of its one-to-a-market ownership rules, the commission is required to extend its waiver policy to any of the top 50 markets. (Previously, the waiver policy applied only in the top 25 markets.)
- The renewal period for broadcast licenses is extended to eight years (from the previous five years).
- Renewal applicants are protected from competing applications unless the commission finds serious violations of the FCC's rules or the Communications Act. Then, and only then, would new applications for the incumbent's facilities be accepted.
- The commission is required to adopt regulations allowing holders of ATV authorizations to offer ancillary or supplementary services so long as those services do not degrade over-the-air ATV broadcasts.
- Fees will be collected by the FCC for non-broadcast ATV services offered to the public on a subscription basis.
- When the commission grants an ATV license to an existing TV station, the commission is required to condition the ATV license so as to require that either the additional license or the original license be surrendered for reassignment.
- Federal rate caps will be removed on all cable systems on March 31, 1999, for all types of service except the basic tier. The caps will be removed sooner for cable systems subject to "effective competition." Smaller, independent cable systems are freed from rate regulation now.

FCC closing to cause delay

The commission's shutdowns in December and January due to budgetary and weather problems will have profound effects that will be felt for months.

The FCC shut its doors at the close of business on Dec. 15, 1995, because of lack of funding. It was scheduled to reopen on Jan. 8, 1996, but major snowstorms kept it closed until Jan. 11, and then closed it again on Jan. 12. The commission did not reopen for business as usual until Jan. 16.

During the month that it was closed, the FCC's staff could not process applications, rulemakings or any other matters. Nevertheless, applications requiring fees could be filed in Pittsburgh. Thus, when it reopened, the FCC was greeted with a mountain of new applications to add to the backlog of applications pending prior to the shutdown. One division chief estimates that his division has 75 boxes, each containing hundreds of new applications waiting to be processed. Furthermore, the reopening also brought an avalanche of other filings not involving fees, which had to be held during the shutdown.

DATELINE: April 1

Commercial TV stations in the following states must file their annual ownership reports or report certifications on or before April 1: Indiana, Kentucky, Tennessee, Texas, Delaware and Pennsylvania.

All TV stations must place their Issues/Programs Lists for Jan. 1-March 31 in their public files by April 10.

Because of the huge volume of applications facing the commission, processing delays are sure to be much longer than usual in all branches.

In January and February, the FCC's staff still was sorting out what had come in during the furlough and snow closings and was setting processing priorities. Now, the staff must process not only all of the new applications and other matters that would have been filed during the shutdown, but also everything that was already pending and could not be worked on during the closing. In the meantime, new filings are coming in every day.

Accordingly, it is unlikely that the FCC will be able to return to "normal" processing times for at least several more months.

Cable TV must-carry rules in flux

Regulatory actions affecting cable TV must-carry are continuing to occur in the courts and at the FCC. The outcome of these actions could substantially impact TV broadcasters and cable operators.

Late last year, the U.S. District Court for the District of Columbia, upheld the must-carry provisions of the 1992 Cable Act. Although this is at least a temporary victory for broadcasters, the court's decision was far from a ringing endorsement of must-carry. The cable industry has sought expedited processing of its appeal of the decision to the Supreme Court. The Supreme Court has denied that request for expedition, and while the case is moving forward, it most likely will not be heard until this fall, with a decision expected in the spring of 1997.

While the court may not issue an opinion on the constitutionality of must-carry until the spring of 1997, the deadline for broadcasters to elect between must-carry and retransmission consent is Oct. 1, 1996. Such elections will become effective Jan. 1, 1997, and will be good for three years. Broadcasters who fail to make an election by Oct. 1, will automatically be deemed to have elected must-carry on all cable systems in their ADIs.

Finally, the commission has extended the deadline for filing comments in the rulemaking proceeding reviewing the definition of local TV markets for the purposes of cable TV must-carry and retransmission consent. The proposals include:

1) Continuing use of Arbitron's 1991-92 ADIs;

2) Substitution of Nielsen DMAs for Arbitron ADIs; or

3) Retention of the existing market definitions (the 1991-92 ADIs) for the 1996 election period, and switch to a Nielsen-based standard thereafter. ■

Harry C. Martin and Andrew S. Kersting are attorneys with Fletcher, Heald & Hildreth, P.L.C., Rosslyn, VA.

EQUIPMENT CHECK

At least every three months, all stations must inspect all automatic or mechanical control devices, indicators and alarm systems associated with tower lighting to ensure that such devices are functioning properly.

New AirPlay MP Playback Server

If you made this many improvements, you'd want to broadcast it too.

Faster processing with new Avid Media Processor and PowerPC 601 CPU

Plays up to 1,000 spots in a single playlist

Turbo uploading and downloading of spots

More efficient one-box design with broadcast connection panel

CCIR 601/SMPTE 125 sampling with new Avid Broadcast Video Board

Increased storage capacity for larger spot inventories

Composite/component analog video or serial digital input/output

Improved reliability with multiple redundancy strategies including RAID-3

Today, hundreds of broadcasters worldwide are using the Avid AirPlay® system for news and commercial playback. That's an impressive following. Even more impressive is Avid's new AirPlay MP playback server, designed for better performance, faster operation and superb images. Learn more about AirPlay MP and the broadcasters who have already made the move to disk-based playback. To request a free Avid AirPlay Case Study Portfolio, call Avid today at 1-800-949-AVID (1-800-949-2843) PRESS 1.

A · V · I · D®

Circle (15) on Action Card

EAS update

The national EAS

By Leonard Charles

For years, many national broadcasting organizations have been jointly and voluntarily providing the first tier of the Emergency Broadcasting System (EBS). All of the major broadcast networks, wire services, common carriers and program suppliers were linked to the White House to receive an emergency message from the president and pass it along to their affiliates. Key affiliates within each system would authenticate the received message, encode it with the EBS 2-tone signal and eventually alert the public.

This first level of the system was controlled by the Federal Emergency Management Agency (FEMA). As the FCC developed and wrote the new Emergency Alert System (EAS), it structured the top level around this same infrastructure. Originally called the *Emergency Action Notification* (EAN) network, FEMA replaced EAN last November with the *Primary Entry Point* (PEP) system of large-coverage broadcast stations. PEP has now become the first tier of the EBS and the new EAS.

The national message path

By now, you're probably familiar with the web concept of emergency-message relaying. The EAS web involves multiple paths from source to destination for emergency messages. Although this web usually describes local-area systems, the FCC hopes to create a web through the upper levels of the system as well. The upper-level web will be accomplished by specifying a priority order for the monitoring assignments of each State Emergency Communications Committee (SECC). (Each SECC is responsible for creating its state's emergency alerting plan.) The goal is to create two paths into each state for national-level emergency messages.

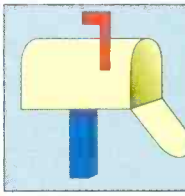
In a national emergency, the president's message will reach the PEP stations as voice (only) traveling via undisclosed links. The PEP stations are responsible for encoding the message into EAS protocol. Each *State Primary* station will receive the nearest two PEP stations along with a feed from the state's Emergency Operations Center. The messages then work their way through the multiple state relay stations to *Local Primary-1* and *Local Primary-2* stations in each operational area. These stations will also be monitoring either the State Primary station directly or a different area's Local Primary station on the second decoder input. Each participating station in the Local Operational Area would then monitor both the Local Primary-1 and the Local Primary-2 stations to complete the dual path to the end of the relay system.

This is a *main channel web*, the success of which depends on adequate over-the-air reception. If reception of the first priority assignment is not possible, the FCC has second-through-fifth monitoring preferences specified for each level's participants. The web structure that will work in your state will be diagrammed in your state's EAS plan.

Next month, this column will consider issues of security for the EAS — an area of rising concern. ■

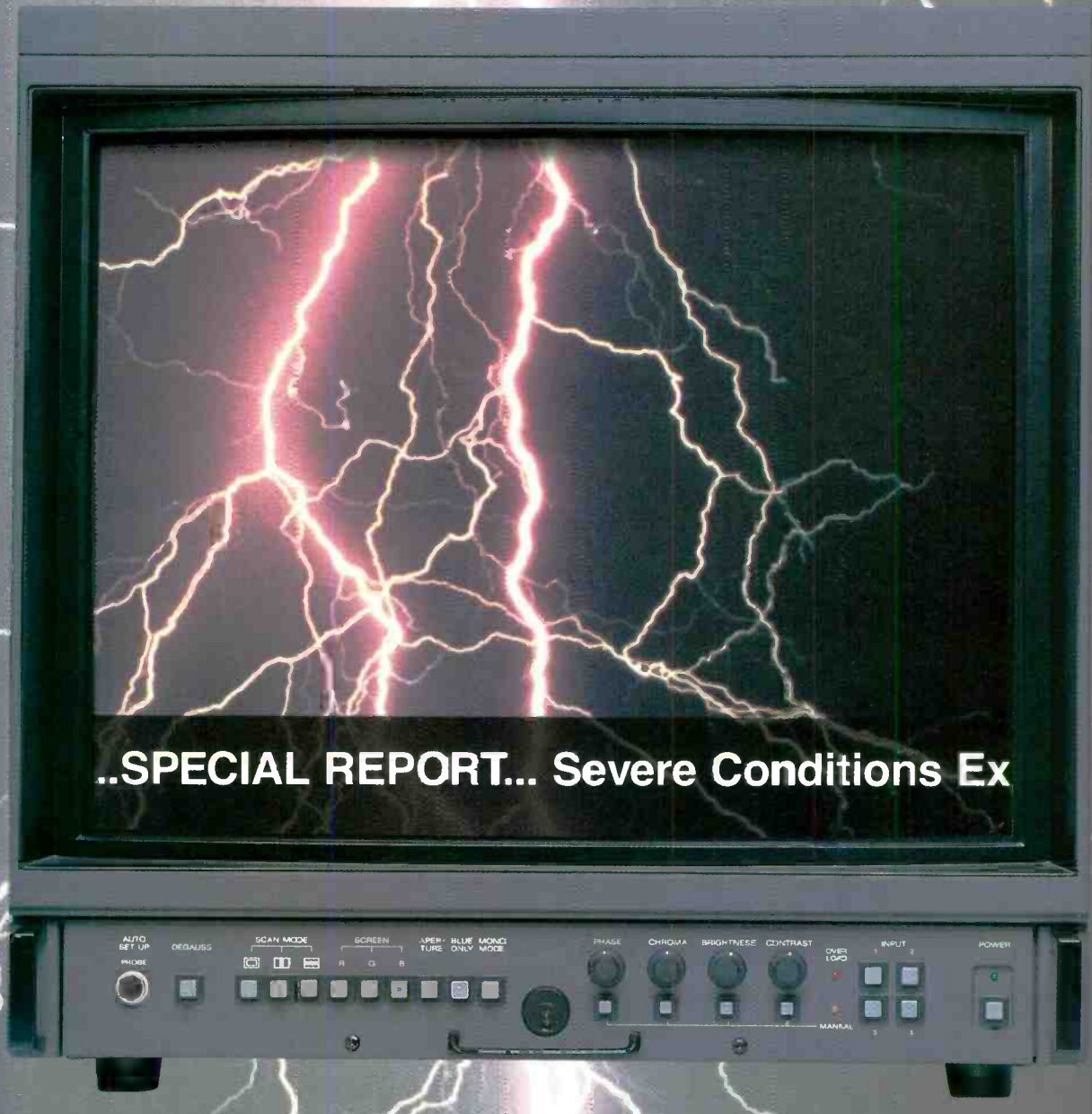
Leonard Charles is chief engineer at WISC-TV in Madison, WI, and chairs the SBE National EAS Committee.

The SBE National EAS Committee has published a primer detailing the EAS, SECC responsibilities and construction of a local system. The primer is available through the SBE National Office at 317 253-1640.



Internet:
be@intertec.com
CompuServe:
74672,3124
FAXback:
913-967-1905

IT'S THE LAW!



Nothing makes it simpler to comply with the FCC's emergency broadcast regulations than the CODI Emergency Alert System. Developed by industry leaders Chyron, TFT INC and Broadcast Software Solutions, the CODI EAS receives emergency alert messages required by the FCC's new EAS rules and automatically generates a high resolution video text message in real time.

CODI EAS is FCC Type Certified and meets all FCC EAS requirements. Available now to meet the compliance deadline of January 1, 1997. Call Chyron today for more information.

codi®
EMERGENCY ALERT SYSTEM

CHYRON
THE COMPANY THE WHOLE WORLD WATCHES™

pro-bel trilogy RTSET LIBERTY CMX

See CODI EAS at NAB Booth #10700
516.845.2103
FAX 516.845.3895
http://www.chyron.com

Circle (17) on Action Card

By John Joannou

Choosing a systems integrator, part 3

For the last two months, we have discussed the systems integrator's role in the conversion process. This month, in the final installment, we will take a close look at the systems integrator himself or herself. It is important for the systems engineer to possess the proper skills and experience to enable him or her to design the best possible configuration for the application. If your systems design engineer has the following education and experience, it will help to avoid costly mistakes. It also will be invaluable when the system reaches the checkout stage, where most problems are discovered and resolved.

Formal education

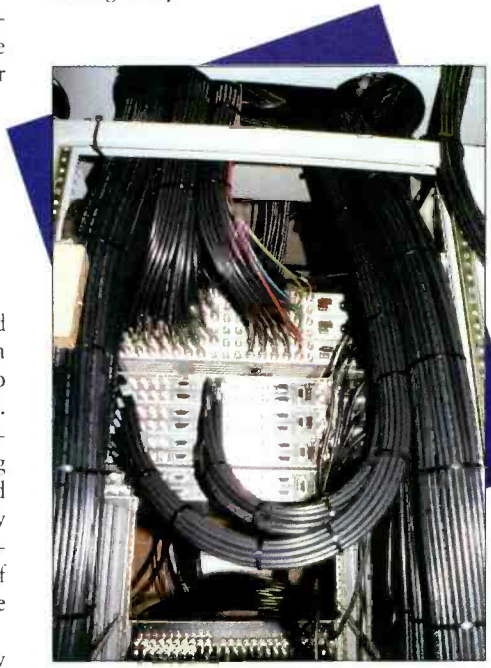
Television is an electronic medium and formal training in electronics, such as a college degree in electronics, is important to help understand the technical issues involved. Furthermore, a solid foundation in TV basics and the evolution of the different analog formats is required to fully understand and appreciate the new digital formats. Many technical terms and jargon are used in casual conversation, but only a small number of people that use them fully understand the terms and how they were derived.

Take a simple term, such as *setup*. How many know that it was introduced when monitors needed it for retrace blanking and that it is no longer required? In addition, due to the negative amplitude modulation used to transmit the TV signal, black at 0IRE required more power and also caused overmodulation. Japan uses NTSC without setup, getting 7.5% more dynamic range.

In the proper hands, waveform monitors and vectorscopes can show a lot more than just luminance, hue and saturation levels. One can tell if the encoder's balanced modulators are properly nulled or if there are any quadrature modulation errors. To understand this, you must know how the signal is encoded from RGB into composite NTSC. The basics of television and the various formats did not change with the advent of digital television. New terms and concepts have been introduced, but with a solid background in TV basics and a little work, you can quickly get up to speed in digital.

Experience

With a solid formal education, you then need experience in different types of systems. This is usually gained by working with a team of experienced engineers and steadily acquiring additional responsibilities. The knowledge of how to operate and set up various types of equipment is a big plus. This includes edit systems, production switchers, DVEs and routing switchers, especially now that integration and intercommunication amongst these products is increasing daily.



An example of the type of installation that can be done when well planned.

Apart from the technical issues involved in designing a system, many other areas are just as important. Systems exist that are wired technically correct, but are so badly laid out that they are functionally inefficient, stressing the operators. The best way for a systems engineer to understand the end-user's needs is to have done the work. This helps him or her easily interface with and understand the operator's and maintenance engineer's needs. A well-rounded systems design engineer has experience in at least some of the following areas:

- Equipment maintenance in a studio system environment (not bench work).
- Editing experience with linear (and possibly non-linear) editing systems.
- Has shaded cameras during a live production, known as "vision control" in European countries.
- Knows how to set up a digital production switcher with integrated control from a digital picture manipulator (build effects and time lines).
- Has broadcast operations experience.
- Has patched around faulty equipment.

The more experience your systems engineers has, the less you will hear such comments as:

- Has he or she ever worked in a production environment? Have you seen where he or she placed the control panel, monitor, speakers, etc?
- If the switcher ever breaks or needs adjustments, we are out of luck; there is no way you can put these boards on an extender.
- How can you set up and adjust this machine? You cannot reach the adjustments or see the scopes from here.
- This patchbay is so badly organized I can never find what I need.
- Some of the most important signals are missing from the patch.

All of these comments have two things in common: 1) the systems integrator that designed the facility did not understand your needs, and 2) it is already too late.

Documentation

It is scary to think that there are facilities out there without any documentation or the documentation they have is so outdated it is worthless. Documentation is absolutely necessary. The amount of detail may vary, however, the basic package should consist of at least:

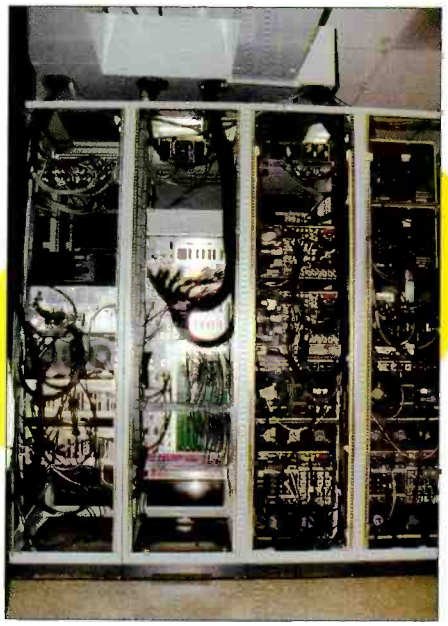
- Line drawings of video, audio, time code and control flow;
- Cable numbers should be on the line drawings; wire run sheets should show at least the cable number, signal source and destination;
- Rack layouts and elevations;
- Patchbay layouts with clear easy-to-read labels;
- Each cable must be labeled on each end, showing number, source and destination.

More detailed documentation can include room and rack locations of equipment within line drawings. For each source and

destination, cable run sheets should also include:

- Equipment type with connection name, connector type, signal type and nominal level, room and rack location and cable length.
- The numbering scheme should make it easy to identify the signal type and cable location based on the cable number alone. However, a detailed discussion of numbering schemes is beyond the scope of this article.
- Files of the CAD drawings and the database files of the wire run lists should be included in the documentation. As soon as the "as installed" documentation is handed over, assign someone, either in- or out-of-house, to be responsible for keeping all documentation up-to-date.

Patchbay layout is more important than most realize. Inputs and outputs should be laid out by logically grouping functions together. Equipment outs should be on the top row and ins on the bottom row of each patch panel. If space is available, use patch panels that have the wider labeling strip. This way, the label can read: VTR-5, DVW500, D/A #12, instead of just D/A #12. It should be quick and easy to find your way around.



When properly planned, rack layouts and wiring can be neat and tidy.

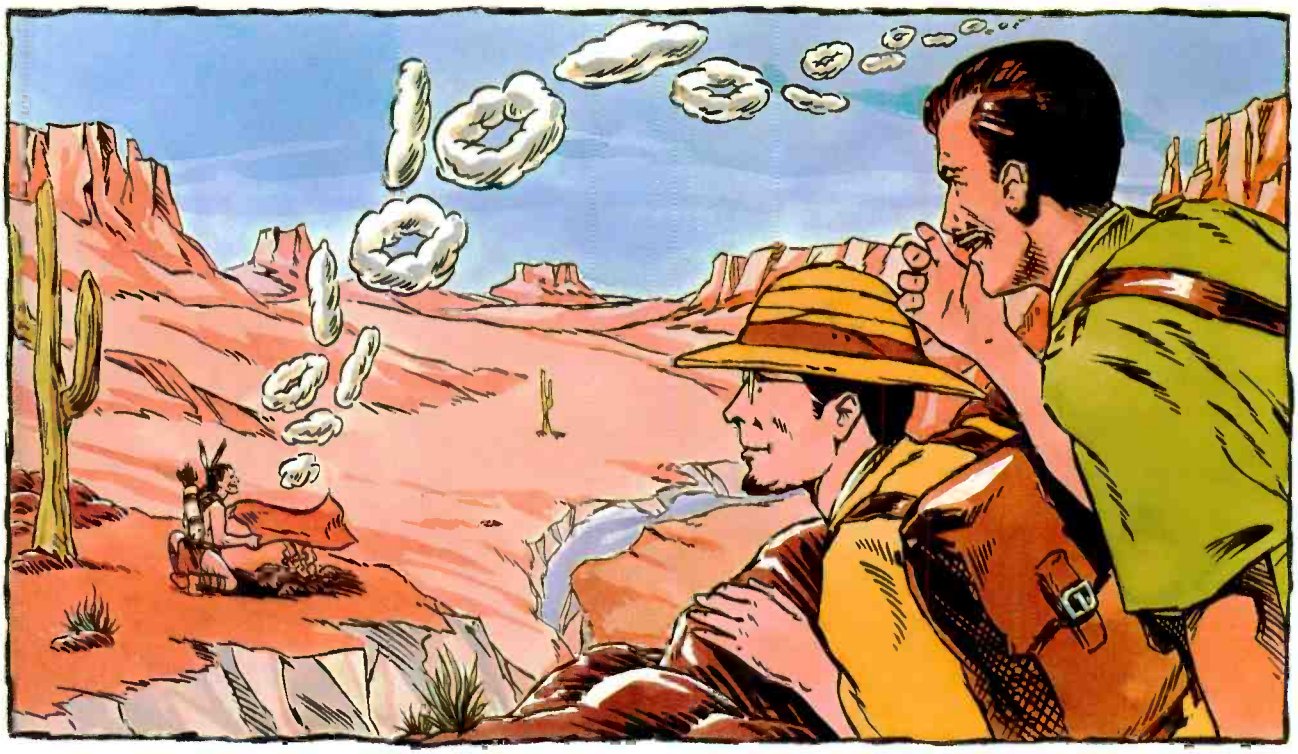
Flow drawings should be logical and easy to read. Normally, equipment inputs are shown on the left and outputs are on the right. This way, signal flows naturally from left to right. Reference, sync, monitor and test equipment inputs are always shown on the bottom of the block. If blocks have ins and outs shown on all four sides, it complicates matters when tracing a signal.

Blocks should be laid out to minimize the crossing of signal lines. Cluttered drawings make it difficult to determine signal flow quickly, even for the person who designed them.

Problems occur when too many items are placed on the same sheet of paper. For example, keep video flow separate from pulse and reference flow. They are two separate functions to begin with, so don't try to mix them. Note, that during installation, wiremen like to see all signals associated with a piece of equipment grouped together. This is best accomplished by sorting the wire list accordingly.

Wiring

Good and experienced video and audio wiremen do not come cheap. What may seem to be a bargain at first may end up costing multiple times the total wiring cost.



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

Consider this:

- Slow progress of work can delay project completion by weeks.
- Wiring errors can be costly and time-consuming to correct.
- Good signal connections hold your system together, therefore, poorly installed connectors undermine system integrity, signal quality and reliability.
- Machines on rack rails require proper service loops for easy access during maintenance.
- Neat and well-dressed cables can impress your clients, which in turn helps improve the facility's image.

The importance of formal agreement

By this time, you have chosen the company to be responsible for design and installation of the digital system. It is of utmost importance that an agreement is drawn up and signed by all parties. The agreement describes the responsibilities of each party involved. In many cases, it may appear as though everyone has a clear understanding of each party's responsibility and a contract seems frivolous. However, without an agreement, both sides may make erroneous assumptions, which can lead to major problems later.

What was included in the proposal will most likely be included in the contract as well. Some additional items may be:

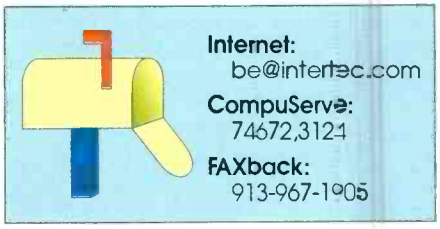
1. A list of major equipment items and description of functional areas. For example, VTRs, production switchers, router size, DVEs, number of edit rooms, studios and telecine rooms.
2. Details of the various phases and time line, indicating critical paths, milestones and deadline dates.
3. Specifications of the design process, i.e., the data-gathering stage, design reviews and design-acceptance procedure. In addition, the definition of system completion and acceptance.
4. Detailed progressive payment schedule.
5. Change-order procedures and so on.

Good signal connections hold your system together, therefore, poorly installed connectors undermine system integrity, signal quality and reliability.

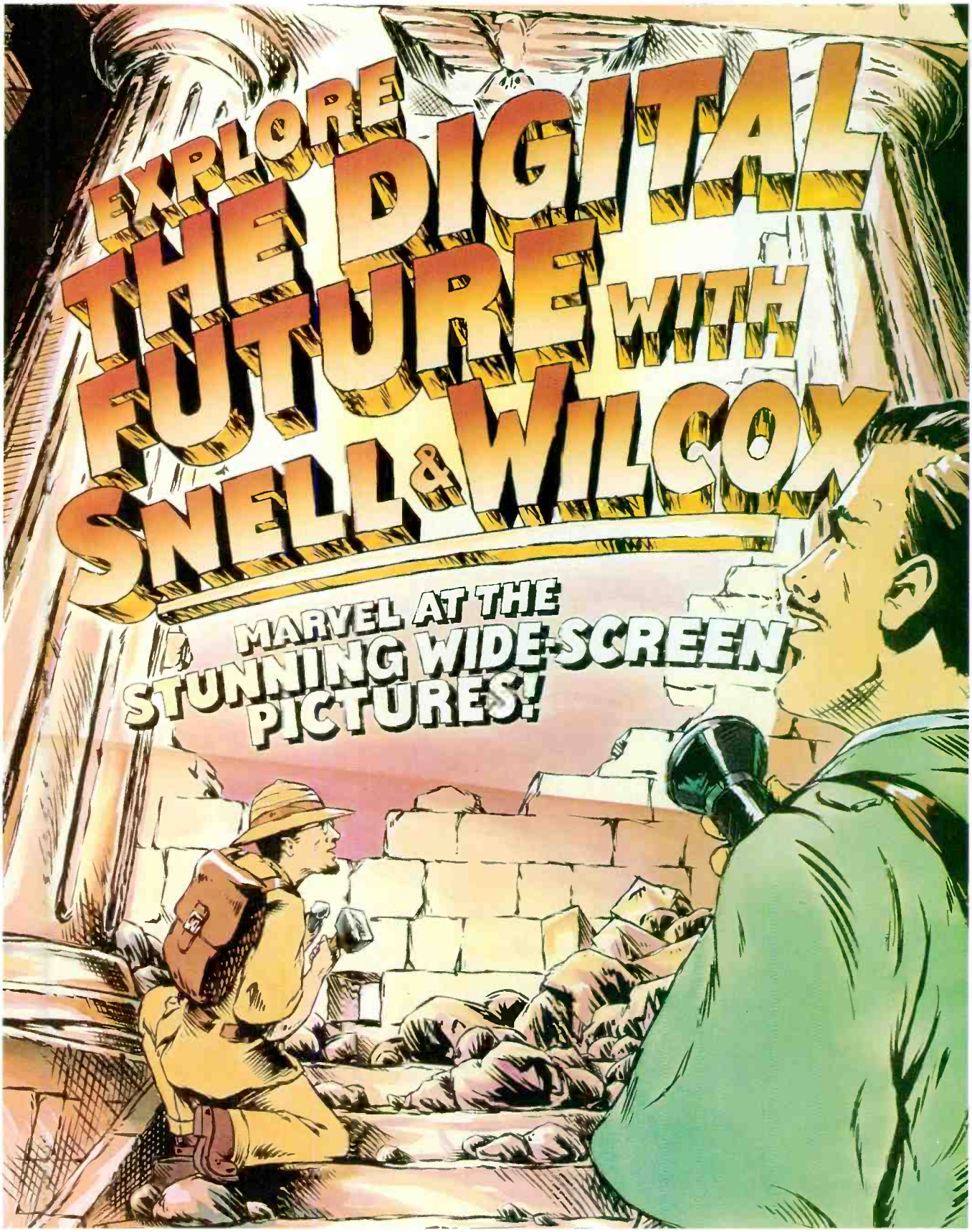
Among the advantages of a formal agreement, is the fact that it forces both parties to clearly define what is expected and what needs to be done.

It brings misunderstandings up front before they become a problem and can minimize future disputes. In the long run, it increases the probability that all of the parties involved will be satisfied with the final outcome — your new digital facility. ■

John Joannou is the owner of Teklogic Systems, a consulting firm based in Woodland Hills, CA.



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



See us at NAB SNELL & WILCOX **Booth #8849**

Engineering with Vision

Circle (6) on Action Card

By Curtis Chan

Swimming in shark-infested waters

The modernization and downsizing of corporate America (broadcasters included) has all but eliminated the middle manager. This has created a feeding frenzy among survivors (sharks) that are clamoring for the next rung of the ladder or just playing corporate chess to survive.

In this chaos and pandemonium (infested waters), a company's culture becomes liquid, leaving the feeling of permanence and belonging by the wayside. Also, many companies and facilities (O&Os, affiliates and networks included) are redrawing their boundaries, trying to get the same output or more with less staff.

This unpredictability creates ambiguity for those who are trapped, because responsibility trickled down to every individual, leaving you to wonder about your self-worth and contribution to the company.

In the end, people tend to resist the changes that are taking place. A common result is that people grasp for comfort zones. Unfortunately, it's these same people who are left adrift by others with more flexibility, more tolerance for uncertainty, and a higher capacity for accepting and anticipating change. For those of you that are left swimming in shark-infested waters, this month's column is addressed to you.

Managing change

To survive in the years ahead, *look* and *do* two things. First, look for companies that have a long-term view of their employees, have easy and informal relations and have a good foundation to build upon.

Second, if you are in a position to effect change, try to build a better work environment. Establish a mission vision, leverage existing resources, upgrade the quality of your management team and evolve your commitment to quality.

Companies that don't know how to manage change have a short view of their horizon. Or, if the company is built upon micromanagement, it often becomes a breeding ground for gossip, backstabbing, and ultimately attrition.

On the other hand, a good company's work environment and its continued growth is a blend of the heritage left from its past leaders and the strength and direction from its new leaders. In time, these change agents exert influence over their workplace by setting goals and performance standards. This creates guidelines in which to operate and to establish business and personnel policies consistent with company milestones and values.

Although you can give a person a title and more responsibility, the power base to effect cohesive change, hence respect from your peers and your direct reports, can only be guaranteed through the result of your actions. It is this unifying force that great leaders have that influence the way people respond to opportunities and problems.

Companies usually have a ripple effect as seen from the bottom up. If you are a nonbeliever, how many places have you gone to where the order of the day is long memos and even longer meetings? Look to the top of the heap to see who is setting the example. On the other hand, a facility where everyone hops around as if intravenously fed with caffeine, can usually be pinpointed to the "hands-on" leader.

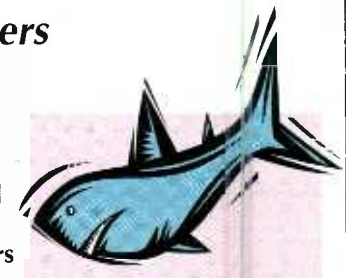
The ethical tone of a company can be traced to leaders' integrity, fairness, interpersonal abilities and the standards and goals that they set for their employees.

Empowering managers

Progressive companies allocate their hard and soft resources. *Hard* being cash, your office/facility and equipment, and *soft* being people and intangibles like technological advantages. So, if you don't want to drown and get nipped by sharks, take responsibility and make those hard decisions that you have been empowered to do. Be accountable for your actions instead of passing the proverbial buck.

Strive toward quality commitment from all levels of operation. This means involving yourself with defining what you and your facility's mission is, how you're going to get there, what it's going to take, how you'll measure the progress and what feedback mechanisms are going to be put in place to correct minor mistakes. Also, you need to ensure adequate compensation programs and promotional opportunities.

Here are some last thoughts about surviving the turbulent waters. If you want to command respect, then lead by example. For most middle and upper managers, this can be tough given the fact that you must do more with less staff. However, some simple, but effective techniques, will prove invaluable toward your continued success.



To avoid troubled waters, managers should:

1. Create a positive work environment
2. Establish a mission vision
3. Commit to quality
4. Have integrity, be fair
5. Hone interpersonal skills
6. Be responsible and accountable
7. Institute feedback mechanisms
8. Lead by example
9. Commit to your staff
10. Have a positive attitude

First, allocate time to show your commitment to your staff and their projects or to the overall strategy of your facility. Second, adopt persuasive techniques in your conversation, memos, E-mail or in meetings to emphasize your passion for any chosen strategy. Third, give promotions where deserved. And last, review your policies and guidelines to ensure a level of consistency, thereby making your staff's leap of faith a small one.

Leap of faith

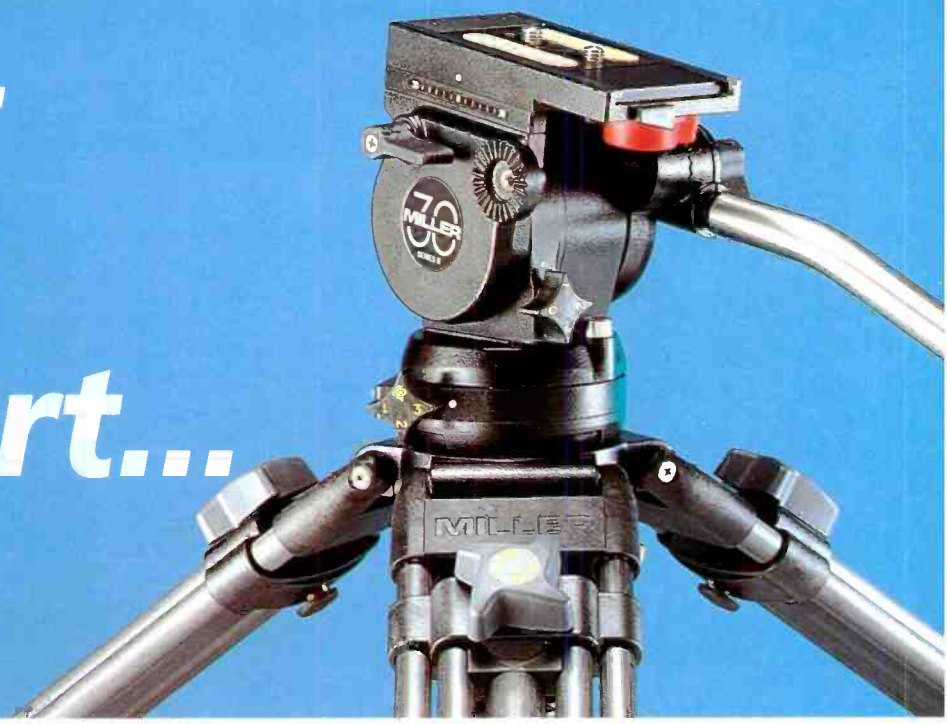
What does this mean? First, you people will not change unless they see a shift in your allocation of time in their favor. As a manager, the rule is that you work for your employees, not the other way around. It is your job to align their personal and business goals to the company's. By allocating your time and your staff's time, you gain the advantage of time to chat with the people on the front lines and bypass management filtering.

Add passion, challenge and fun into your routine. It's a great way to bring up the emotional buy-in factor from your staff. Attitude is a small thing that makes a BIG difference. Last, be consistent. Many of your smaller consistent actions will combine to create a pattern signaling perceived priorities. If you want your troops marching in the same direction, then you had better make sure that all of the signals that you send out support your objective and ideals.

So, if you're being hit with a short-term austerity program, don't take limos, fly first class or eat in fine restaurants while your staff follows the coach routine. Make sure that your memos and reports are checked and proofed, your image is clean, and above all else, don't hide behind your office. ■

Curtis Chan is president of Chan & Associates, a marketing consulting service for audio, broadcast and post-production. Fullerton, CA.

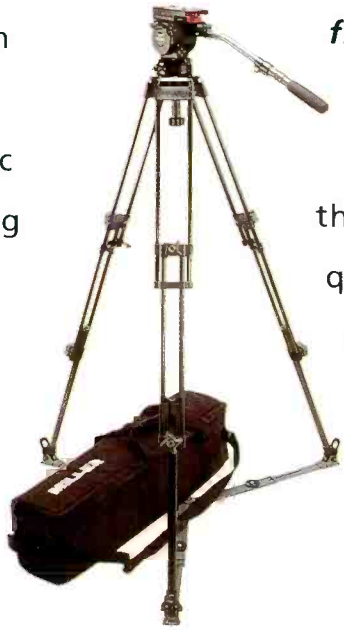
Miller-
Total
Support...



...from the ground up

Whether your expertise is Broadcast ENG, EFP or Corporate production, Miller's extensive range of 36 custom Camera Support Systems are designed to meet the specific needs of the most demanding camera operators.

Using the latest camera support technology - ***multi-step leakproof fluid drag control, fully variable counterbalance systems, torque-limited leg clamps*** - and materials such as ***robust die-cast bodies, carbon fibre and hard-anodised alloy***, Miller Camera Support Systems deliver the ultimate in quality and choice for all your support needs.



MILLER
VISCOSITY DRAG

See us at NAB, Booth #6138

Miller - Designed for the world's most challenging conditions

Miller Fluid Heads (Australia) Tel: +61 2 439 6377, Fax: +61 2 438 2819
Miller Fluid Heads (USA) Inc. Tel: (201) 857 8300, Fax: (201) 857 8188

Circle (7) on Action Card

By Andrew McHaddad

Communicating in the field

An intercom system's users do not care how the system works, as long as it helps them do their jobs. On the other hand, an intercom system's designers care greatly how it works. Today's technology helps these designers do *their* jobs by making integration and efficiency the primary design criteria of a world-class field communications package.

Any new intercom system's design must also include quick-and-easy acceptance by its users. If you introduce a new intercom that is vastly different from systems that users are familiar with, at least some of them will have problems. Try instead to minimize the users' learning curve. Configure the new system to fit the existing staff's and facility's frame of mind, then introduce features and options that were previously unavailable. Users may soon find these new features essential — so much so that they can't imagine working without them.

For example, one recently introduced digital intercom system allows listening to multiple sources with user-control of the volume for each source. This can be a substantial improvement over other systems, and it has already become critical to the way some operators use their new intercoms. Some digital intercom systems also require much less rack space for a given number of ports — especially important for field systems — and their digital I/O and/or control functions allow them to fit well into future digital audio and video production systems.

Note that "digital" intercoms can come in three varieties: 1) digital control with analog audio; 2) digital control with digital audio in the matrix and analog audio to/from the stations; and 3) digital control with digital audio throughout. Note also that some of these new intercom systems may require a 4-wire, centralized-crosspoint system, as opposed to a 2-wire, distributed-crosspoint ("daisy-chain") method.

System design

The first decision you may have to make when designing a 4-wire intercom system is how many ports are necessary. This process doesn't really apply to 2-wire, distributed-crosspoint systems because almost any number of stations can connect to its party lines. Because port quantity also equates to system cost, the design must be completed before any cost evaluation can be made.

Many users today require stereo interruptible foldback (IFB). This allows communication to be presented in one earpiece only, making it easy to distinguish communications voices from the on-air audio. This may increase your system requirements, however. For example, on some systems, a fully featured 12-channel stereo IFB requires 24 ports. For this and other reasons, design your system to easily accommodate future expansion.

The second decision is how to sequence the ports. It may seem like overkill to have 96 ports in a truck with only 16 master station positions, but they add up fast. A typical large remote might use 15 cameras, 24 IFB outputs, three stage announce (SA) outputs, 12 2-to-4-wire converters, four telephone/intercom interfaces and two radio repeater channels. Keeping some ports unassigned to allow for last-minute expansion on larger events is also a good idea.

The Nashville Network's Remote Unit No. 2 uses a Telex/RTS ADAM system, an example of a digital matrix intercom using 4-wire analog audio paths to its stations.

The intercom-port inputs and outputs should appear on patchfields. This allows much easier troubleshooting and it also provides a permanent map of the port allocations.

Advantages of today's systems

The greatest benefit of newer intercom systems is their ability to totally integrate all of a remote's communications needs into a comprehensive system. Telephone-line interfacing is one example of this. Each intercom station can dial out on a phone line through the system's telephone hybrids. In the past, you had to use a designated phone in the truck that was connected to the hybrid, dial the number, then latch it over to the intercom station that needed it.

With the interfaces available on today's systems, any station at the remote site can connect back to your master control room via a phone line, send out a telephone feed to another location or send/receive multiple IFB signals. This can greatly alleviate the chaos at live events, simplifying setups for features like post-game interviews with studio talent or guests who are not at the remote site.

Routing of communication signals on these systems can be controlled via hardware or software. The seamless mapping of signals within the intercom eliminates the need for external mixing or temporary patching. Additionally, a small electronic telephone switch can be installed in the truck. Among other things, this allows you to electronically transfer incoming calls to the intercom hybrids, which appear as extensions on the switch.

You will also benefit from the connection architecture of 4-wire intercom systems. Previous generations of intercom hardware only allowed user control of individual sources' levels with distributed-crosspoint architecture. This made it cumbersome to place multichannel master stations outside the remote truck. Now, for example, you can set up an external master station with telephone interface control, IFB, program audio and radio repeater access using only three audio pairs. This makes it easy to run such a station out to an announce booth, a second truck or anywhere else it's needed.

Leveraging assets

No matter how sophisticated a master-station system is, you may still have to use 2-wire beltpacks and many other items that do not lend themselves to a 4-wire environment. The interface of the new intercom to 2-wire equipment is critical. The right 2-to-4-wire converter can make a significant difference in total system usability. Experiment with various types before choosing one. Consider their tolerance to varied system impedances and the range of side-tone null that is available. (See "Intercoms: No Longer an Afterthought," May 1995.)

A system of this magnitude also requires some human assets. An engineer who is well-versed in the system's hardware and software functions is essential. The whole intercom may be too complex for everyone to be an expert on it, so one or more technical personnel should be designated as its key operators. Although the learning curve may be steep and the transition a bit rocky, the end result will be worth the effort. ■

Andrew McHaddad is an audio maintenance engineer for the Communications Group at Gaylord Entertainment Corporation, Nashville, TN.

For more information on intercom systems for field use, circle (326) on Action Card. See also "Intercoms," p. 68 of the BE Buyers Guide.

IMPROVED AUTO-TRACKING INSURES UNINTERRUPTED OPERATION.

OUR OPTICAL WIRELESS, BI-DIRECTIONAL SYSTEM EXPANDS YOUR COVERAGE.

Canobeam is an optical wireless, high-quality transmission system that features fast set-up time for up to four video paths, optimum flexibility, 2/2 or 3/1 (3 iso cameras with return video), path security, freedom from interference and remote operation with uninterrupted monitoring of all video and audio channels.

No FCC license is required to operate this bi-directional, multi-channel system which can free-up valuable microwave channels, transmit up to 2.5 miles, and features a bandwidth of 500 MHz.

A unique Auto-Tracking Adjustment System insures uninterrupted operation even from the tops of buildings prone to sway and vibration to provide continuous, high quality communications.

A built-in "videc camera" feature automatically sets-up the bi-direct onal HS-40B Heads.

The CA-30N Transceiver Control unit provides a maximum of 4 channels of video (8 channels of audio) plus 2 channels for intercom, so videc can be sent back and forth from one point to another, with full communications and enhanced production values.

As live broadcasting becomes an increasingly important requirement for news, sports and special events coverage, broadcasters can benefit from Canobeam's unique advantages.

For more information on Canobeam please call Canon's Broadcast Division at 1-800-321-4388.

See us at NAB Booth #9838

CANOBEAM II

DISCOVER CANOBEAM'S ADVANTAGES:

- **Fast Set-Up. Go On-Air Within Minutes.**
- **Free-Up Valuable Microwave Channels.**
- **License-Free Operation.**

Canon

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

Circle (8) on Action Card

By Steven Blumenfeld and Mark Dillon

How to find technical information on the web

For the past few months, we've been explaining how to get onto the World Wide Web. We'll now give directions to some of the first places you might like to go.

There is almost too much out there on every topic imaginable — and some unimaginable as well. We are forever discovering valuable sites, often stumbling across these jewels embedded in the text of another site.

There are three ways to retrieve information from the web: First, simply wander around. Point and click from site to site, rummaging for nuggets of information. This may be the most human and rewarding process. You are the search engine/detective, so finding new sites can generate deserved self-satisfaction.

Suggested strategies

Since no artificial intelligence engine has the unique associative powers of your specific home-grown brain, your search will often find off-beat and tangential web sites passed over by more rigorous search strategies. Effective yes. Efficient, not really. Two suggestions:

1. Start on a site with a topic of interest to you. (We've provided you starting points for this type of search below.)
2. Use the bookmark function of your browser to lay down a trail of crumbs along the way. Finding your way back can otherwise become a challenge.

A second way to retrieve information is to use pointer sites like Yahoo. (For more sites, click on "Net Directory" on the Netscape menu bar.) These groups filter the net then publish an index of their findings. As with any index, they are only as good as the indexing process. Most use a combination of approaches.

• *Submissions*: Web site developers are encouraged to announce their sites to these services. (If you are launching a new site, take advantage of http://www.netcreations.com/postmaster, a kind of a bulk mailer-announcer-service to many of these pointer sites.

• *Visitations*: Submissions are categorized after a person or a "webcrawler" (a program designed to seek out key words) has surveyed the site. It is then placed into one or two of the index's categories. Webcrawlers are often sent to roam the galaxy in search of new sites and report back regularly. As with most indexes, they are often blunt tools, forced to describe complex sites in just a few words.

Third, the way we find something when we need to get serious is to deploy a search engine. (You can click to a list of these by going to "Directory Search" on the Netscape menu bar. The two we use most frequently are Lycos and Alta Vista — http://www.lycos.com, http://altavista.digital.com.)

These engines ask you to supply key words upon which to base a search. Click "Submit" and you'll be presented with a custom list based upon current web data and your search criteria. The advantage of search engines over pointer sites is the potential to quickly find more sites that meet your immediate requirements — not someone else's. Here are a few suggestions:

• Be specific. Limit your search by a clever combination of key words, or you'll get hundreds, thousands or even hundreds of thousands of matches. This definitely takes practice, but you'll get the feel of it.
• Make the same search with two or more engines. Each has its strengths and weaknesses, which may vary on a case-by-case basis.
• The web changes everyday, so the results of your searches will change over time. Conduct this process every few weeks.

Getting technical

As a broadcast engineer, you need to know about new equipment and products from manufacturers, so suppliers' home pages will be discussed in next month's article.

For now, let us focus on acquiring useful background and technical information. Access to this knowledge is essential to your future planning process. The web provides unique access to new technologies and insights to understanding its implications to your facility. With the above-mentioned search strategies, it is almost like causing a custom edition of your favorite technical journal, complete with cover article, to be delivered to your screen.

Here are some starting points. Check them out, then follow the links...

• http://www.inforamp.net/~poynton/ — This is one of our favorite sites for basic technical information. The site is not attractive, but it has tons of information about video and is a good place to have your novice engineers browse and study.
• http://www.doceo.com/edit1202.html — MPEG is everywhere today. Here is a page that has good basic information about the technology and explains some of its uses.

With all of the attention being focused on DVD, it will become an important aspect of many broadcast stations in the future. http://www.unik.no/~robert/hifi/dvd/ — This page seems to have a link to all that is DVD. Stop here before going anywhere else.

Next, you should check out the major partners in this new technology:

• http://www.toshiba.com/tacp/SD/brochure1.html
• http://cons3.sel.sony.com/SEL/consumer/dvd/appendix.html

These three sites have good explanations about AC-3 audio technology:

• http://www.sdinfo.com/v2n3h.html
• http://www.dolby.com/dfs.html
• http://www.unik.no/~robert/hifi/hifi.html

ISDN is being used for such things as remote recording of audio, video conferencing, telecommuting and entertainment. You can find out more about ISDN at the following sites:

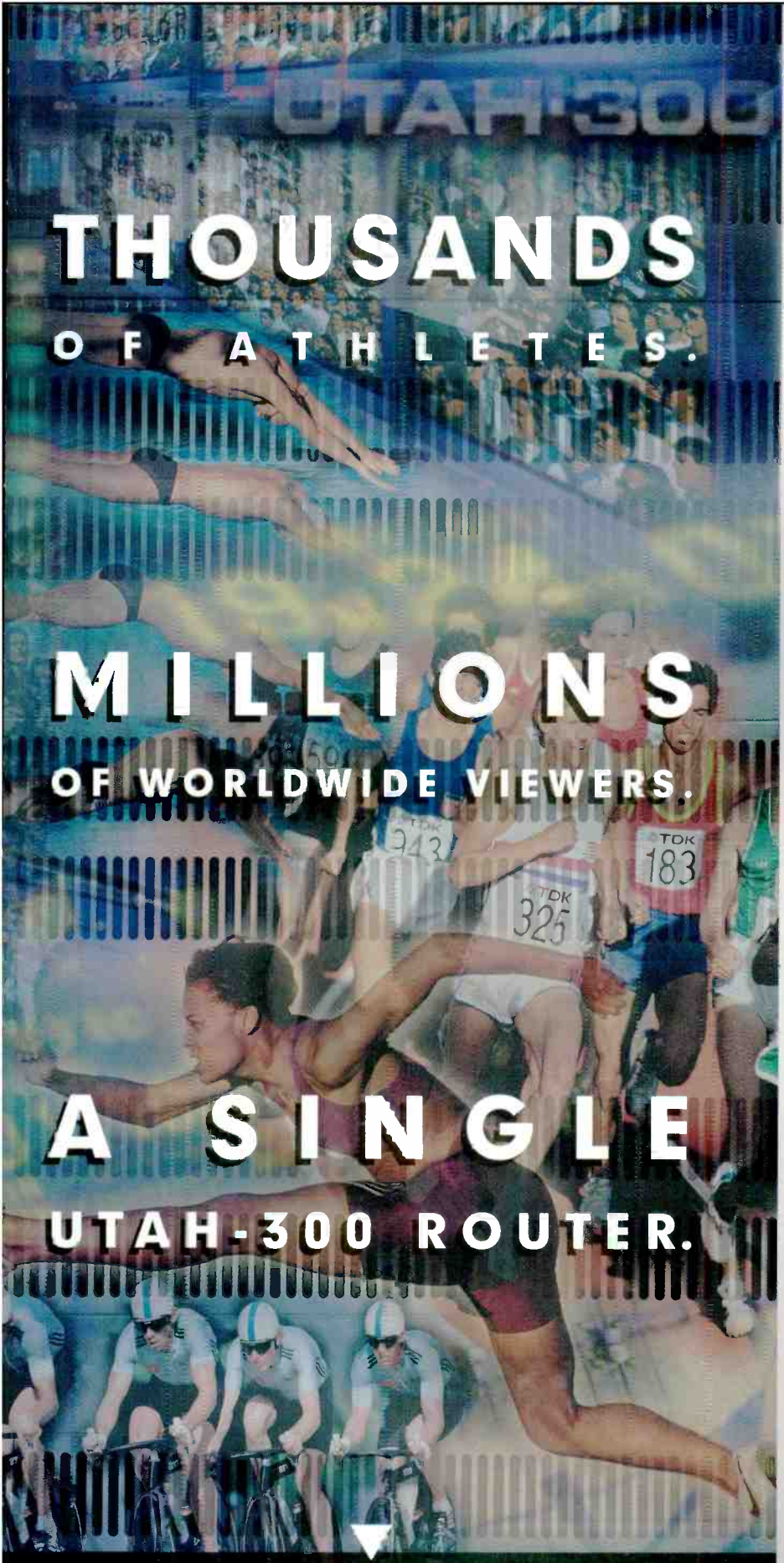
• http://isdn.ocn.com/
• http://www.ednet.net/
• http://www.pacbell.com/Products/SDS-ISDN/Mag/96.1killer.html#RTFToC7
• http://www.intnet.net/GTE/

And while you are there, don't forget to visit our site: http://www.im.gte.com.

Finally, when you need to get your hands on the printed word in a physical form, you can visit sites like San Diego Technical Books (http://www.sdtb.com/main.html), OpAmp (http://www.opamp.com/), Powell's Technical Books (http://www.technical.powells.portland.or.us/Welcome.html), Wordsworth (http://www.wordsworth.com/) or Amazon Books (http://www.amazon.com).

And remember, if you find something you think we should broadcast from these pages, let us know. ■

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



When NBC affiliate WXIA-TV was named Atlanta's *Official Station for the Olympic Games*, the first reaction was high-fives. The second was to order a new UTAH-300 Routing System from Utah Scientific. It was no contest. The UTAH-300 handles analog and digital signals in one compact frame. It's designed for easy expansion, to go the distance as your facility grows. And, reliability is built-in and backed by the best warranty in the business for a full 10 years. Call 1-800-246-6744 ext. 5009 for your free *Technical Planning Guide*, and see how a single UTAH-300 Router can put your facility in a whole new arena.

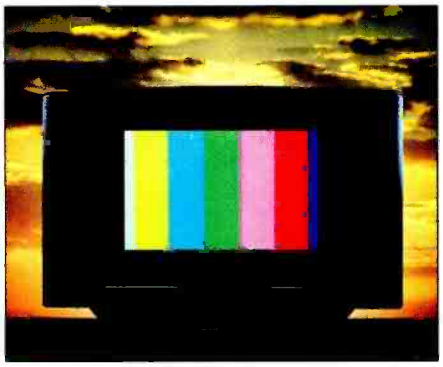
At 128 x 128 VAA, with redundant power and control, the UTAH-300 takes up only 27 rack units of space.

UTAH SCIENTIFIC

- *Americas 1-801-575-8801*
- *Europe/Africa/Middle East 44-1635-521939*
- *Asia/Pacific 852-2868-1993*
- *info@dvg.com*
- *http://www.dvg.com*

Circle (18) on Action Card

By Louis Libin



Digital transmitters: The one necessity for the big transition

Early on in the ATV process, broadcasters took an active role with industry and government as the FCC Advisory Committee on Advanced Television Service worked to develop the final recommendations for the new broadcast system. The FCC made several key spectrum decisions that also helped spark innovation. In early 1990, the commission decided that new ATV systems would share TV bands with existing services and would use 6MHz TV channels as presently defined.

The FCC process

The commission decided on a "simulcast" approach; this meant that the new ATV signals would be broadcast on currently unusable TV channels and that broadcasters would be temporarily assigned a second channel for the transition to ATV. All of this had an impact on transmitter technology and the future TV transmitter market.

The ATV standard-setting process has been a public, open process. The Grand Alliance worked closely with the FCC's Advisory Committee to complete the standard and begin the launch of ATV. We have approached the finish line of an 8-year process and you should be preparing for the rollout of ATV.

Since 1987, the networks have been working on the development of ATV and planning for the distribution and broadcast of ATV pictures. Once licensed for the ATV service, many broadcasters will move quickly to commence the service, which will grow even before consumer demand for ATV receivers and set-top converters peaks.

The introduction of ATV will be a gradual process, and the initial ATV market will be small. But as ATV broadcasts begin, viewer interest and demand for ATV receivers will increase. Ordering the production equipment can wait until the station is prepared for full-blown ATV production, but the transmitter is a necessity.

The timetable

According to the FCC's current transition plan, TV stations will continue to broadcast in NTSC for the first 15 years. These same TV stations must also begin an ATV transmission within the first six years of the transition. However, the commission is re-examining the timetable to perhaps shorten the 15 years, as well as the six years. Shortening the six years could pose major problems for broadcasters and manufacturers; if the 6-year timetable is shortened, there may not be enough transmitters available.

The ATV transmitter

The bad news is that the ATV transmitter will be different from any device that is familiar to you. The good news is that the newly designed transmitters will be inexpensive, averaging less than $300,000. The ATV transmitter will be a more advanced, but simpler, device that will be smaller and require less maintenance.

The first-generation generic ATV transmitter will probably be an IOT device. Some believe that the silicon-carbide transistor technology will be viable for the first-generation ATV transmitters. But the expectations are that it will probably not be commercially viable until at least 1998.

TV transmitter manufacturers are tooling up for the great transmitter grab of the digital age.

Until then, there is no guarantee that the devices will be broadcast reliable. Therefore, it is likely that the small IOT device will be prevalent for at least the first five years. Then broadcasters will be able to reassess the technology for coverage upgrade and facility enhancement.

The transmitter marketplace

TV transmitter manufacturers are tooling up for the great transmitter grab of the digital age. There are less than 10 companies who supply the industry with TV transmitters. Theoretically, many of the 1,700 TV stations will place their orders at the same time or in a fairly short window.

The TV transmitter market will be entirely different than the market we have today. Today's market is essentially a replacement market. For the past 10 to 15 years, the market has been essentially transmitter flat, with new transmitter sales rates running at approximately 50 to 100 new transmitters a year, including VHF and UHF.

The U.S. producers are working hard in designing a dedicated ATV transmitter. They are also working hard to assure that the ATV market will be sustainable by the domestic makers.

The transmitter manufacturers: are they prepared?

Most of the transmitter manufacturers agree that production cannot simply be increased. It is not as simple as hiring additional workers and stretching the assembly line. The manufacturers have been preparing for the new ATV for years by expanding their factory capacity, as well as hiring and training new specialists.

So, are the manufacturers prepared? They are as prepared today as they can possibly be. The major transmitter makers have already moved the necessary capital to the manufacturing side. The assembly lines are not moving, with workers just waiting around. A lead time is involved to bring the factory up to speed, and the best guess is a year to come up to full production.

New transmitter competition?

Some NTSC UHF and VHF transmitter manufacturers believe that there will be some significant new players in the transmitter field at the beginning of the transition date. At this point, the introduction of new offshore transmitter manufacturers into the U.S. market is an unknown. The concern for you is that there is the potential for some new players to come in quickly and be soft on the follow-up and support.

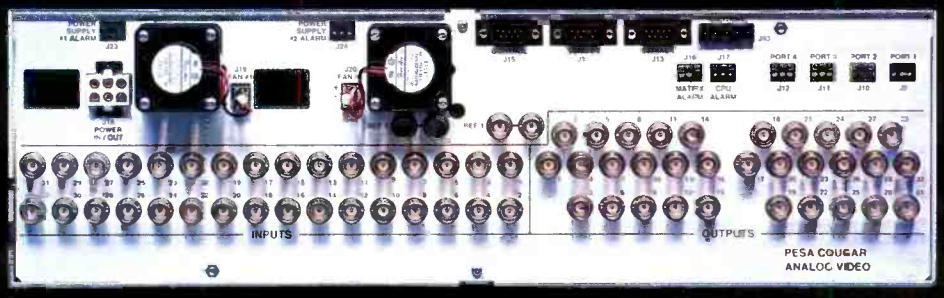
When to order

You should look closely at the transmitters at this year's NAB conference. It is getting close enough that you should be ready to identify the transmitter your station will purchase. The exact timing, of course, depends on the specific market and your stations' plans for ATV transmission. Will the initial ATV coverage be full replication or will the initial ATV station be at half power at 100 meters?

Individual stations have the potential to be on the air early in their market. It can probably be accomplished for less than $500,000. Remember, the ATV broadcast service is coming, and in a matter of only months, the FCC will assign each TV station a new channel. At that point, the clock begins to tick! ■

Louis Libin is director of technology for NBC, New York.

Killer Switcher.



Cougar Analog/Digital Routing Switcher & 3300 Controller

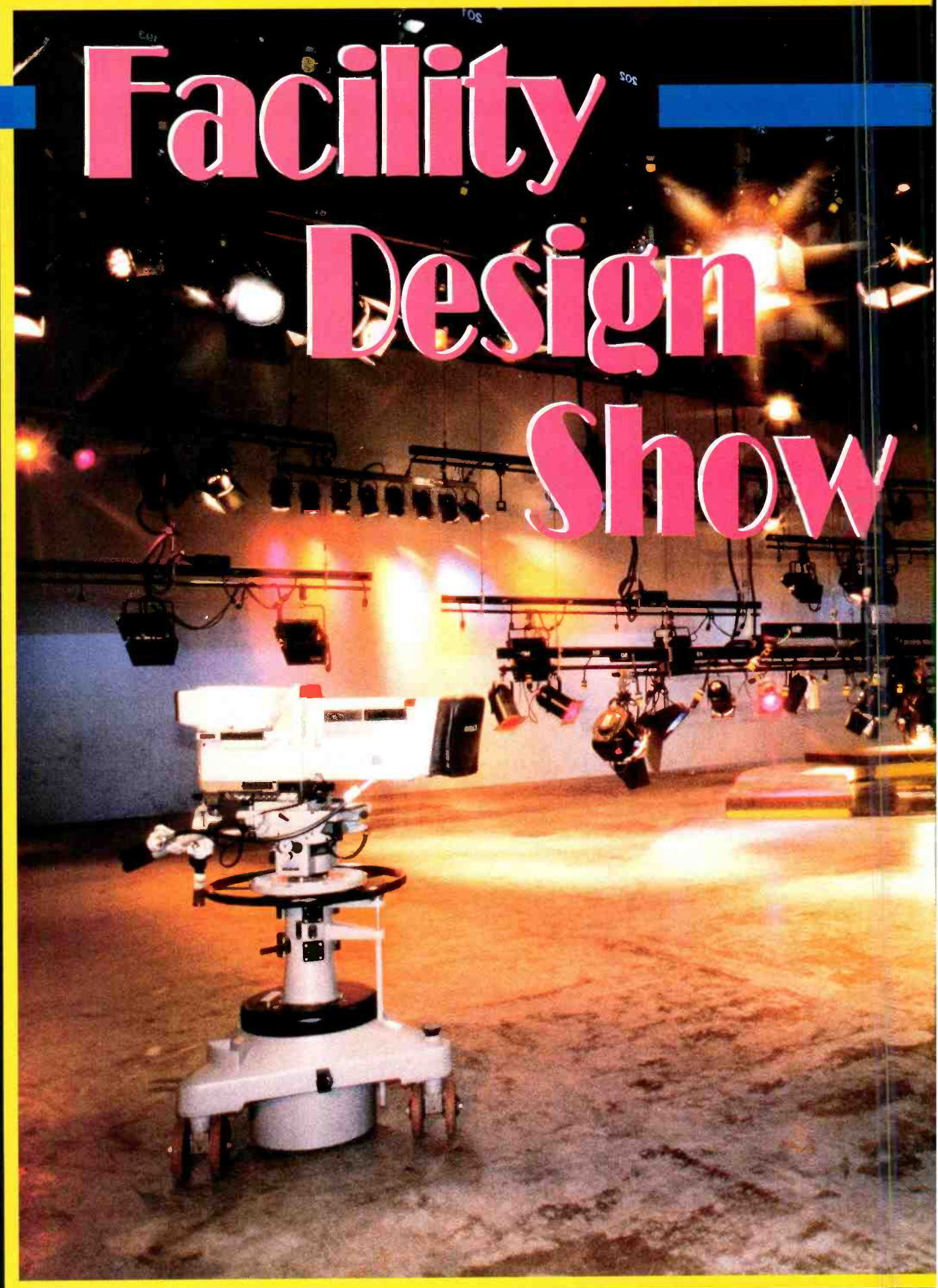
It won't give up. PESA's audio/video Routing Switchers are sleek and responsive. The compact design manages skillfully in small to mid-size matrix applications and can grow as your needs change. Each 32x32 matrix is housed in a 3RU chassis, expandable to 64x64. Plus a wider bandwidth provides the flexibility you need for future expansion.

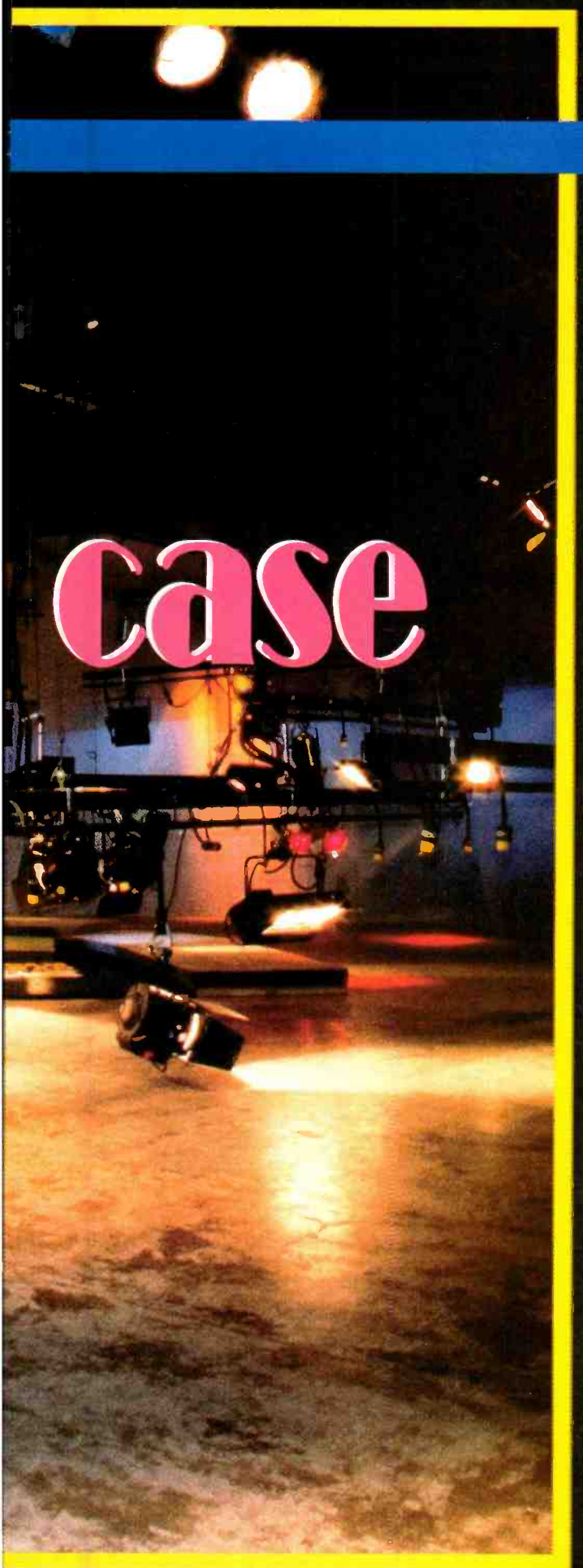
When combined with the PESA 3300 Controller, the Cougar is ideal for educational, broadcast, government and corporate jungles where minimal operator training is required. PESA's 3300 features user friendly Windows® interface software, 8 character alphanumeric control, software reentry capability, plus Virtual Matrix mapping. Redundant in frame controllers and power supplies are also available. The Cougar's got what it takes to survive. To make the leap to PESA, call today.

PESA Switching Systems

330A Wynn Drive • Huntsville, AL 35805
TEL: (205) 726-9200 • FAX: (205) 726-9271
CORPORATE SALES: (800) 328-1008

Facility Design Show





case

I've never met a fellow engineer who didn't relish the thought of building new facilities. Although the ardor for such projects often fades somewhere about midstream, building something new is where it's at for most of us.

Also, whether producing products or programs, in our competitive, quality-oriented and multiple-choices society, there's no room for error. The competition won't allow it. That goes for producing commercials or switching the 6 p.m. news. Our audiences expect perfection and recognize when the result isn't.

For engineers and technical managers, the best time to help ensure high-quality results is from the beginning — when new systems are built. Properly designed operational and technical areas with adequate working room, ventilation and lighting, may mean the difference between success and failure. So, the question then becomes, how does the CE or manager go about designing new facilities?

First, don't do it yourself. Not only is there too much to risk, but your current staff probably has their hands full just keeping the daily operation going.

Second, select a trained professional or company who understands your business. Often, their cost may be offset by the savings in design time, installation and "tricks-of-the-trade" only they know about. This may be your first major project. You want someone who has done it many times.

Third, read everything you can about other top-notch stations and facilities. Look for ideas that you can use. Don't try to reinvent the wheel. Steal (okay, borrow) every useful idea you can find.

This year's *Facility Design Showcase* package focuses on digital and multichannel applications. The installations shown here represent some of the best ideas in broadcast, cable and satellite facilities. If you need some winning ideas for your design, read on. The answers may be just a page or two away.

Photo: ABS-CBN's newly renovated Studio 4. Work in each of the eight studios included structural upgrades to support new lighting systems; air-conditioning upgrades; installation of remote-controlled motorized lighting battens; and a 3,200k SCR programmable lighting control system. (Photo courtesy of ABS-CBN.)

By Kenric B. Stone

Manila's ABS-CBN ready for 21st century

1970s-era facility transformed into a world-class broadcast center.

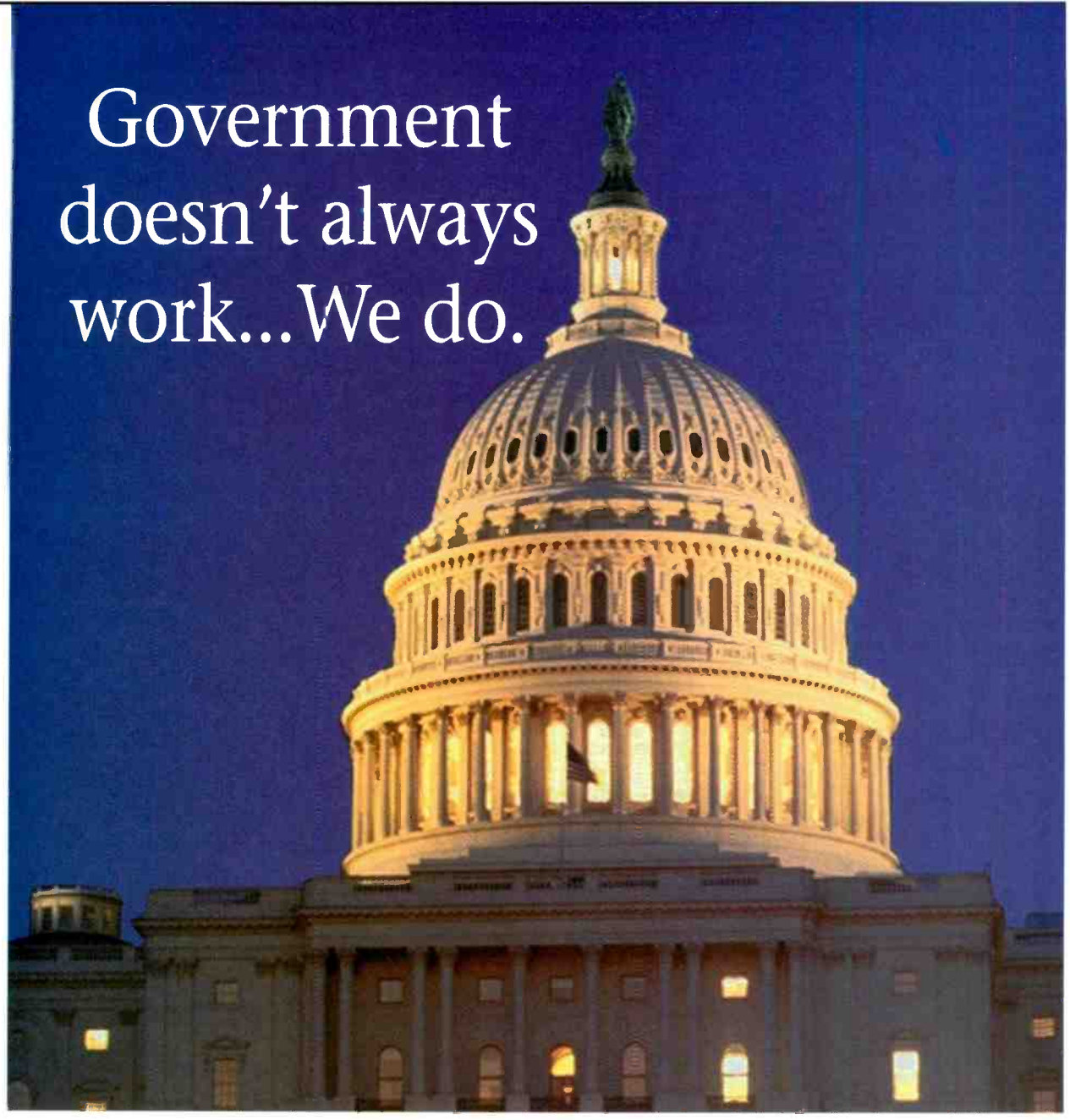
The Bottom Line:

ABS-CBN's goal was to transform a 269,000-square foot broadcast center, which had been neglected for more than 13 years, into a highly sophisticated facility to meet the network's needs into the 21st century. To maintain existing operations, implementation of the project had to be accomplished without interference to a 24-hour schedule of local and international programming. An implementation and integration plan ensured that all work was correctly sequenced. The result: a cutting-edge facility, designed with flexibility to accommodate the changing technology and programming requirements of tomorrow. $

To catch up, then pull ahead of the pack. That was the goal of ABS-CBN Broadcasting Corporation in 1992 when it selected The Austin Company of the United States to lead the planning, design, engineering and implementation of a multimillion-dollar program modernizing its production and broadcast center at Quezon City, near Manila, the Philippines.

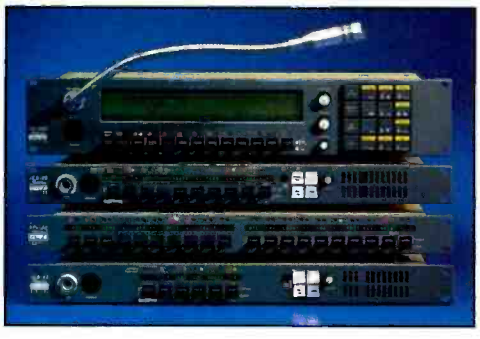
ABS-CBN is the largest and leading TV/AM-FM network in the Pacific Rim, reaching approximately 12 million households in the Philippines, a

Above photo: ABS-CBN's new engineering TOC/videotape operations. (Photo courtesy of ABS-CBN.)



Thanks to Matrix Plus II Digital Intercoms

True leaders are made, not born. Since 1968 Clear-Com Intercom Systems has served our customers by keeping promises and delivering solutions. That's why our systems are used in more government facilities than all other intercoms combined.



From the top, a 12-key LCD display station, a 9-key LED display station, a 20-key LED expansion panel, and a 5-key LED display station.

If you need to communicate between many people in a building or multiple locations on a map, our products, knowledge and expertise help you meet your goals.

Clear-Com products are not subject to term limits! We offer none of the empty promises that are associated with other one-term intercom systems. Everything we make—even our very first product—is compatible with today's Clear-Com products.

All our products are backed with the most comprehensive warranty, factory, engineering and customer service support in the industry.

The numbers don't lie. With over 65,000 intercom systems and 250,000 belt packs in active service, Clear-Com wins by a landslide.

See us at NAB Booth #10359

Domestic Sales: Clear-Com Intercom Systems. 945 Camelia Street. Berkeley. CA 94710. Tel: (510) 527-6666
Export Division: Clear-Com International PO Box 302. Walnut Creek. CA 94597. Tel: (510) 932-8134

Matrix Plus® II
FROM CLEAR-COM INTERCOM SYSTEMS

Circle (20) on Action Card

Manila's ABS-CBN

country of 60,000,000 people living among 7,000 islands. With market penetration in excess of 70%, ABS-CBN's programming is broadcast in several languages to multiple time zones from a number of prime and repeater transmission sites.

Austin's assignment was to transform ABS-CBN's existing 25,000-square meter (269,000-square foot) broadcast center into a highly sophisticated facility capable of meeting the network's needs well into the 21st century.

More than 13 years of neglected maintenance and upgrades

ABS-CBN's existing broadcast center, constructed in the early 1970s, included eight sound stage/production studios and control rooms, a master control room, editing and technical terminal areas, as well as offices and support facilities for network television and provincial AM and FM radio. In 1973, shortly after its construction, the facility was taken over by the Marcos regime when martial law was declared. As a result, facility maintenance was neglected and the need to upgrade was ignored for more than 13 years. Even after democracy was restored in 1986, ABS-CBN's priority was on programming and major investment in its facility continued to be deferred.

Austin's assignment was to transform ABS-CBN's 25,000-square meter broadcast center into a highly sophisticated facility capable of meeting the network's needs well into the 21st century.

A staggering list of existing problems and challenges

By the time that Austin became involved in 1992, facility problems were staggering. These included out-of-date equipment; a cabling system beyond workability; a highly unreliable electrical power service; extensive electrical service and distribution hazards; continuous interference from lightning and electrical utility disturbances; an incongruous grounding system; high-humidity and high-temperature conditions, as well as undercapacity and unreliable air-

Solid. Metal.

The 3M™ BC-Metal Betacam SP™ Videocassette. A positive force that delivers nothing short of a picture-perfect image. A solid performer. One try and you'll see the attraction. Call 1-800-752-0732.

3M *Reliability*

conditioning systems; and absence of fire-protection systems. There also was an extreme shortage of operational space; and space use that had evolved through time without the ability to respond to growth or change, and virtually no consideration for effective working adjacencies.

The plan: a series of specific objectives

With ABS-CBN's goals clearly stated, and the list of existing problems all too clear, Austin's first step was to define specific project objectives. These included development of a long-range technical equipment and cable management plan; installation of new digital-capable cabling; installation of a new, redundant, electrical service and distribution system, including continuous, full-site standby power generation; installation of a completely new integrated grounding and bonding system; addition of a central facility chilled-water air-conditioning system; and addition of full-site fire protection with on-site reservoir and fire pumps. Other needs included complete renovation of all studios, control rooms, editing suites and technical terminal areas; development of a long-range space utilization plan supporting a new technical operations center (TOC), an expanded newsroom and new AM and FM radio facilities. Accommodations for HDTV requirements and all-digital operations were included in all areas.

The challenge

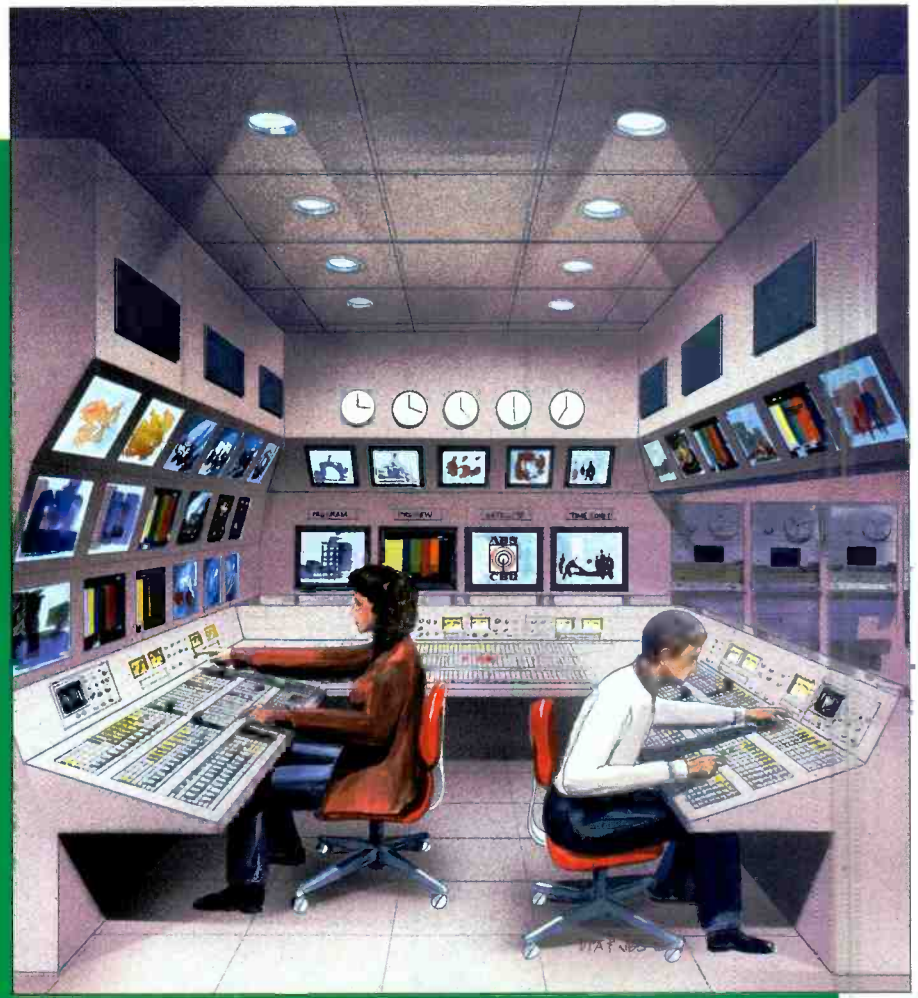
The overall challenge was to develop an implementation master plan that would not interfere with ABS-CBN's 24-hour-per-day, 365-day-per-year operations. Local and international TV newscasts, live variety and drama programming and videotape productions are among the network's most critical activities.

Defining the solution

Austin began this effort by defining specific areas, as well as technical and building systems, that required expansion, upgrade or replacement. At the same time, Austin projected in detail the future requirements for staffing, space, technical equipment and building systems. This resulted in a "Program of Requirements," which formed the basis for a preliminary critical path milestone schedule, as well as a 5-year master plan progress benchmark.

Austin developed a series of equipment and facilities planning alternatives, which it then evaluated against ABS-CBN's established objectives. Each of these alternatives incorporated a combination of new and existing equipment and outlined facility modifications to accommodate improved adjacencies and adequate "move-in" space, as well as long-range growth and flexibility. In addition, the scenarios were designed for implementation without disruption to ongoing operations.

The alternative selected by ABS-CBN was then defined in detail, outlining various aspects of the project, such as broadcast systems; technical architecture; electrical; heating, ventilating and air-conditioning; fire protection; plumbing; and building monitoring and control systems. A detailed integration plan was developed to accommodate the use of existing and new equipment within new and renovated technical areas.



Artist's rendering of ABS-CBN's new multiple facility master control. (Rendering courtesy of The Austin Company.)

Implementation of the plan

Work on the project was initiated in several areas simultaneously, beginning with site work and utility services. This involved the installation of a new 35kV electrical service entrance; new standby power generators (used on a near daily basis due to the serious shortages of electrical power in the Manila metropolitan area); construction of a fire water reservoir and pumping system; installation of a pressurized domestic water storage tank and reserve supply water well (the drop in water pressure from the serving utility mains regularly renders fixtures inoperative); installation of a central chiller plant to support facility air-conditioning; and installation of site security and fiber-optic signal transmission systems.

Renovation of studios and control rooms was also initiated at this time, as was upgrading of electrical distribution systems. Remodeling within the studios consisted of asbestos abatement; structural upgrades; studio lighting upgrades; air-conditioning upgrades; new audience seating with balconies; and complete architectural and technical renovation of control rooms.

NO WORRIES

10 years of vision

NAB 8500

You used to be able to sleep nights. But over the last ten years things have changed. Today's television systems are now so complex and demanding that, at times, they resemble your worst nightmare.

To succeed, you need the combination of experience and vision provided by Vistek. A company at the heart of television's technological revolution throughout the last ten years. Vistek, whose innovative Emmy Award winning products have set the standards to which others aspire.

Vistek's comprehensive range of standards and format interchange products unravel the complexities of digital processing in multi-channel environments for which the company also provides a well-proven range of automation solutions. And routers and switchers from Vistek are to be found in installations of all sizes throughout the world.

The modern broadcaster's requirements for high performance MPEG-2 and ETSI codecs for contribution and distribution over satellite and communications networks, are served by Vistek to the same exacting standard that has brought peace of mind to some of the best known names in broadcasting.

It doesn't have to be a nightmare.

I want to sleep better.
Send me more details.

Circle (10) on Action Card

Vistek

Because the World is Watching

U.S. Sales Contact: Preferred Video Products, 4405 Riverside Drive, Burbank, CA 91505. Tel (818) 562 6544 Fax (818) 562 3342

Vistek Electronics Ltd, Wessex Rd, Bourne End, Bucks SL8 5DT. England Tel (+44) 01628 531211 Fax (+44) 01628 530980

Manila's ABS-CBN

Upgrades and "face-lifts" to building exteriors, as well as remodeling of administrative office areas, were also implemented.

Reorganization and efficient planning of office and support areas provided the additional space required for construction of a 1,100-square-meter (11,836-square-foot) TOC. The TOC comprised a master control room; on-air continuity and videotape operations; post-production editing facilities; multilanguage networking facilities to deliver audio programs in seven different dialects; a technical core rack room; an emergency command center for news; and a library with high-density storage facilities for more than 70,000 tapes. Among other challenges, construction of the TOC required removal of the existing floor, followed by excavation, to accommodate the new access flooring system.

When the project is fully implemented, ABS-CBN's facility will be the most sophisticated broadcast center in the Pacific Rim.

New AM and FM radio facilities were also constructed within the existing complex, as well as an expanded and completely reconstructed TV newsroom and studios for international news and live local production.

In order to accommodate new equipment and operational requirements, a digital-capable cabling system was installed throughout the complex. An integrated grounding and bonding system was also installed to ensure design-level performance from all technical equipment. RF shielding was included in all technical and studio areas.

Every aspect of the renovation and modernization program included provisions for high-definition television and all-digital operations, as well as the flexibility to adapt to and accommodate future changes and innovations in TV production and broadcasting.

The latest ergonomic design concepts were incorporated in all technical areas, including the TOC, control rooms, editing suites and radio facilities to ensure maximum operational efficiency and effectiveness, as well as worker comfort.

The Austin Company prepared all design and engineering documentation (including

Circle (12) on Action Card →

HIGH QUALITY DIGITAL EDITING IS FINALLY WITHIN YOUR GRASP.

JVC
PROFESSIONAL

INTRODUCING DIGITAL-S FROM JVC.

Everything About It Says Digital Except The Price.

In the race to satisfy the demands of the digital age, JVC finishes first with Digital-S—the first affordable, high quality, digital video recording and editing system.

Digital-S reproduces an astounding image that is far superior to any analog system, any 4:1:1 digital format, and even rivals the highest priced digital systems. It offers the robustness and reliability you've come to expect from a 1/2-inch format. It achieves and sustains its excellent quality through multi-generation dubbing by utilizing 4:2:2 8-bit component processing, and a very mild 3.3:1 compression ratio that yields a 50 Mbps data rate.

4:2:2
COMPONENT DIGITAL

JVC has applied this quality with equal emphasis to both acquisition *and* editing. Digital-S has the flexibility to easily integrate into any digital or analog system, regardless of the format—tape or disk. It's a format that you can use today and well into the future.

But the real breakthrough with Digital-S is its price. You can have all of this and more for about the same price you'd expect to pay for the lowest cost component analog system.

Digital-S starts with the versatile BR-D40 Dockable Recorder. You can edit your tapes with your choice of two powerful Editing Recorders, the BR-D85 with pre-read and digital I/O, and the economical BR-D80. Completing the line is the BR-D50 Player, and flexible BR-D51 Player with S-VHS playback.

Super Flexibility Means No Compromise.

The beauty of Digital-S is that it puts digital power in your hands today. Whether you purchase the entire system or one component at a time, its flexibility allows you to utilize your existing equipment, while upgrading at your own pace to the undeniable power of digital.

Its RS-422A control interface provides seamless integration with computer editing, graphic tools, plus S-VHS or Betacam systems. And, since the BR-D51 Player boasts S-VHS playback capability, you'll get the most out of your present tape library. Complete with analog inputs/outputs: composite, Y/C, Y, R-Y, B-Y and XLR audio, as well as digital inputs/outputs: SMPTE 259M and AES/EBU, Digital-S lets you take advantage of maximum performance with the minimum amount of degradation in either digital or analog environments. Plus, with an eye on the future, Digital-S is also designed to be applicable to disk-based, non-linear editing systems.

Digital-S is also first to offer video pre-read*—an outstanding feature never before available on a system in this price range. Pre-read enables layering and A/B roll editing with only two VTRs instead of the traditional setup requiring three units. This not only enhances performance, but also increases the economy of Digital-S.

Add it all up and you'll agree, the only thing Digital-S doesn't offer is compromise.

(Pre-read available only on the BR-D85.)*

Aggressively Priced To Turn Your Digital Dreams Into Reality.

Affordability. It may be the one word that has kept you from entering the world of digital recording and editing. And until Digital-S, getting the benefits of high-quality digital was only possible for the most well-heeled professionals. But because we believe that a product is only truly revolutionary when it's practically priced, affordability is as high a priority as performance.

With Digital-S, you can have the power of digital for the price of analog. Digital-S is a full, robust digital format, and when you consider its level of performance and incredible flexibility, the value of Digital-S easily surpasses that of any other analog or even digital system in its price range. Corporate, educational, industrial, and broadcast—the picture quality of Digital-S makes it the perfect choice for any application.

The revolutionary Digital-S from JVC, today's most aggressively-priced, high-quality digital recording and editing system.

Powerful Digital-S Performance.

Why 4:2:2 digital component signals? Because when it comes to the rigors of multi-generation editing, computer graphics, chroma-keying, special effects, blue-screen compositing, and matting, only 4:2:2 signals can still deliver an astounding image reproduction. The Digital-S image is not only composed of the highest resolution and finest color detail, 4:2:2 also adds a richness and warmth unobtainable with any lesser technology.

To sustain this level of performance during multi-generation editing and to provide digital search, Digital-S also employs a compression ratio that is set to an extremely mild 3.3 to 1 with DCT-based intra-frame coding, yielding a data rate of 50 Mbps. Plus, it pumps out horizontal resolution of 720 pixels or 540 TV lines*. Working together with wide-band component recording, these specifications enable Digital-S to reproduce the finest colored details and subtlest contrasts while significantly minimizing artifacts. And with a very high signal-to-noise ratio of 55dB**, you're assured of the cleanest possible image.

The audio quality of Digital-S is just as impressive as its picture quality. The sound is recorded by 2-channel, 16-bit PCM (pulse code modulation) signals with a sampling frequency of 48 kHz, which ensures digital audio performance equal to today's most exacting recording standards. The audio is superior to compact-disc, and also allows frame-accurate editing.

While standard analog input/output provide outstanding performance for the majority of applications, virtually perfect dubs can be created using direct digital SMPTE 259M video and AES/EBU audio. These industry standards are the most widely used for direct professional connections to digital switchers, to disk-based recorders and digital tape recorders.

(When using digital input/output, standard on BR-D85 Editing Recorder. ** Digital input, component analog output.)*

Digital Acquisition For The Sharpest Raw Footage.

Every professional will agree, the quality of your original footage is crucial to the end product. That's why when we designed the BR-D40 Dockable Recorder, we made sure it could produce the highest quality raw footage—so it could be utilized well into the future and still sustain an astounding image. And, because it's dockable, the BR-D40 has the flexibility to operate with your preferred professional video camera.

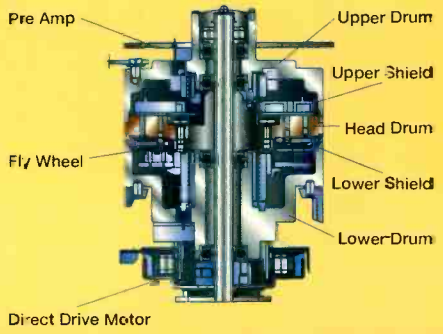
We made sure the BR-D40 was built with the same attention to detail, quality, and features, as the rest of our Digital-S components. To ensure perfect, frame-accurate in-camera edits, we equipped it with automatic editing which utilizes a built-in time-code reader/generator. Editing the tapes from multi-camera or iso-cam shooting is also facilitated with the BR-D40's time-code input and output slave-lock function. And, shooting in any lighting condition is made easier with its highly visible LCD display with back light.

Superior Construction For The Utmost Reliability.

Digital-S incorporates the type of components and assembly that will withstand the test of time.

All Digital-S editing recorders and players begin with a super-durable, die-cast aluminum chassis that maintains true alignment. Its drum is created from a material with a high silicone content for improved wear resistance.

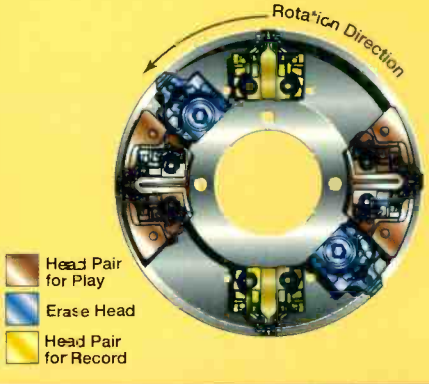
Digital-S Drum Assembly



To ensure S-VHS compatibility, the drum structure features an upper stationary drum, a middle rotary drum, and a lower stationary drum. To eliminate the need for a thicker air film at the drum inlet and to provide stable head-to-tape contact, the thickness of the rotary drum is very narrow. The end result of this configuration is the truest track linearity. The inner drum's tapered shape also reduces tape damage, powder drop, wear and burn.

For precise tracking and alignment, there's not only a linear control track, but an auto-tracking servo system which utilizes tracking signals imbedded into the rotary tracks. By using tape guides with sapphire flanges, as opposed to ceramic or steel, they maintain perfect alignment of the tape path far longer. Realizing how superior precious stones are, Digital-S also employs a sapphire tape cleaner, which provides an edge that keeps tapes amazingly clean. As an extra precaution, there's an auto head cleaner which automatically wipes the heads when a tape is being loaded or ejected.

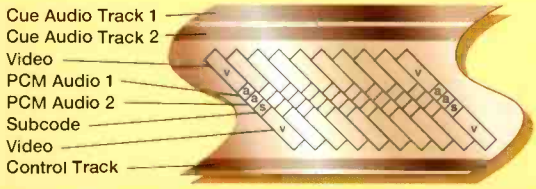
Digital-S Head Assembly



The Advantages Of Advanced Digital Editing.

With a track-width of 20 µm—extra wide for improved stability and reliability—one frame consists of 10 tracks with the video area on either side of the audio track. The longitudinal tracks include two auxiliary audio (cue) tracks and a CTL track for tracking purposes. An auxiliary video (sub-code) area stores two user selectable uncompressed lines of video, which are suitable for recording closed caption or other information located in the vertical blanking interval.

Tape Tracks



Tape Speed	57.7mm/s
Head Drum Rotation Speed	4,500rps
Writing Speed	14.5m/s
Track Pitch	20µ m
Tracks per Frame	10:NTSC 12:PAL
Cue Audio Track Width	0.35mm X 2
Control Track Width	0.75mm

To help achieve our super-high image quality, Digital-S also utilizes a robust, 1/2-inch metal particle cassette tape. Although the cassette dimensions are the same as VHS, the cassette housing features a newly developed dust-proof structure which increases the life of the tape, as well as your images. Plus, tape speed is set at 57.8 mm/s, offering a recording time of 104 minutes.

Equipped with powerful error correction, it can replace missing data in the unlikely event of a tape dropout. In fact, its error correction is so powerful, Digital-S can continue to play back a picture even with a clogged head. Its error check indications, located on the front panel, inform you of the tape condition. To safeguard tapes in case of a malfunction, it has a self diagnostic warning system. To ensure proper operation, it also employs an RS-232 diagnostic service port which measures digital data performance during playback. And, an hour meter helps in planning maintenance.

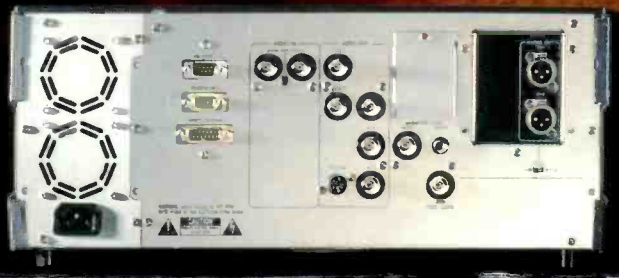
Nothing puts a video system to more of a test than editing. And when it comes to the powerful benefits of digital, nothing delivers more than Digital-S. Whether it's simple two machine editing or high-end on-line auto-assembly, Digital-S is a robust stand-alone system for performing the highest quality, yet cost-effective editing in any environment.

The Digital-S edit suite incorporates a host of advanced features to provide the solid foundation you require to build a total digital audio/video system. In addition to pre-read, Digital-S is equipped with variable slow motion, which can be accessed by standard editing commands. Smooth and noiseless, our slow motion has an image quality equal to regular playback, and it's available within a range of ±1/3X. Plus, visible picture search is available in color at speeds up to ±32X.

Digital-S includes two audio cue tracks for easy locating of edit points which can be heard at any tape speed. Either of the PCM audio channels may be edited independently. For accuracy and repeatability of editing, there's built-in time code (VITC/LTC) recording.

Because of its linear control track, Digital-S has a short lock-up time which eliminates long pre-rolls. This feature achieves a stable picture faster, saving precious editing time. Other convenient features include comprehensive inputs/outputs, video and audio monitor output, and industry standard RS-422A editing interface.

▼ Back panel BR-D50



▼ Back panel BR-D85

Controlling Digital Power Has Never Been Easier.

Power is nothing without control. That's why incorporating user-friendly features is just as important as an astounding picture quality.

Locating the right function button is never a problem, even in a darkened environment, because the buttons are large, illuminated, and color coded. Audio level meters are also easily visible. System timing controls are conveniently located on the front panel, as well as search/jog dial. The versatile range of search speeds are within quick reach through the jog/shuttle control, which permits footage to be searched in color at speeds up to ±32X. Proc-amp controls for making fine picture adjustments are available remotely through the video control connector. And an EE mode ensures that what you are capturing on tape is of the highest quality. Additional user-friendly features include flying erase head, rack mountability, and compact size.

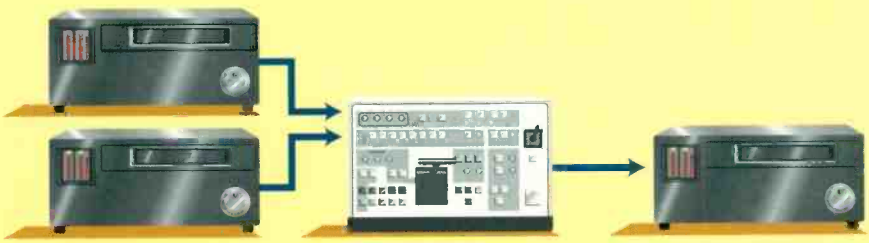
The Added Value Of Pre-Read Editing.*

At one time, digital video pre-read was an exclusive feature of high-end digital systems. But with Digital-S, our BR-D85 Editing Recorder makes it available for the very first time at a very affordable price.

The true value of pre-read is that it eliminates the need for an extra VTR. Operable with either digital or analog signals, pre-read lets you perform layering and A/B roll editing with only two VTRs, instead of the traditional setup requiring three units. Plus, it also makes multi-format editing practical. Pre-read not only empowers you with a high-performance editing feature, but it also saves you the cost of an additional VTR.

(Pre-read available only on the BR-D85 Editing Recorder.)*

Classic A/B Roll System



Pre-Read System

DIGITAL S Specifications

NTSC

General

• Format:	DIGITAL-S
• Tape:	1/2-inch metal particle
• Power requirement:	120 V AC, 60Hz
• Power consumption:	180 W (BR-D85U/80U), 160 W (BR-D50U)
• Dimensions:	429 (W) x 188 (H) x 567 (D) mm (16-15/16" x 7-7/16" x 22-3/8")
• Weight:	23kg (50.7 lbs.) (BR-D85U/80U), 22kg (48.5 lbs.) (BR-D50U)
• Temperature	
Operating:	5°C to 40°C (41°F to 104°F)
Storage:	-20°C to 60°C (-4°F to 140°F)
• Humidity:	30% to 80%
• Tape speed:	57.737 mm/s
• Recording time:	104 minutes (using DS-104 tape)
• Picture search:	±32 times with visible color picture
• Slow motion:	±1/3 times with full picture quality (requires remote control)
• Remote control:	RS-422A
• Remote diagnosis:	Via RS-232C
• Drum rotation speed:	4500 rpm
• Tracks:	2 audio cue, 1 control, 10 video/audio per frame
• Track pitch:	20 µm
• Head drum:	62 mm (same as S-VHS) Tri-layer structure with rotating inner drum High silicon material used for long life

Video

• Sampling:	4:2:2 8-bit component Y;13.5 MHz R-Y/B-Y;6.75 MHz
• Compression:	3.3:1 DCT based, intra-frame coding
• Data rate:	50 Mbps
• Video control adjustment range	
System sync phase:	±3 µs or more
System SC phase:	360° or more
Video phase:	±1.5 µs or more
Video level:	±3 dB or more (only remote control)
Chroma Level:	±3 dB or more (only remote control)
Chroma phase:	±30° or more (only remote control)
Setup level:	0 mV or less to 100 mV or more (only remote control)

Audio

• 2-channel PCM, 48 KHz, 16-bit	
• Each channel individually editable	
• Input/output:	Analog Digital (AES/EBU); optional for BR-D80U/50U, standard for BR-D85U
• Frequency characteristics:	20 Hz to 20 KHz +1/-1.5 dB
• Dynamic range:	90 dB or more (at 1 KHz)
• Distortion:	0.1% or less (1 KHz, at operation level)
• Crosstalk:	-75 dB or less (at 1 KHz)
• Headroom:	20 dB
• Emphasis:	Automatic switching in play (OFF in recording)

Accessories

• Provided:	Power cord
• Optional:	SA-D80U digital input/output interface, standard for BR-D85U SA-D50U digital output interface SA-K67U rack-mount kit

BR-D40U Specifications

GENERAL

• Format:	DIGITAL-S
• Tape width:	12.65mm
• Tape speed:	57.737mm/s
• Video signal system:	Component digital signal with Digital-S compression (DCT based)
• Timecode:	based on SMPTE 12M
• Dimension:	247 x 253 x 142mm (tentative)
• Weight:	less than 3.5kg (tentative)
• Power consumption:	less than 1.6A (tentative)
• Power requirement:	12 V DC 11 V to 15 V DC (permissible voltage range)
• Maximum voltage:	17 Volts DC (less than 5 min.)
• Recording/PB time:	104 min. (with DS-104 tape)
• FF/REW time:	approx. 4 min. (with DS-104 tape)

VIDEO

• Input:	Camera (50 pin) component Y:1/R-Y,B-Y:0.7Vpp,75 Ω unbalanced
• Output:	Composite (BNC) 1.0Vpp,75 Ω unbalanced
• External sync input:	none

AUDIO

• Inputs	
Camera (50 pin):	-20dBs, 3k Ω, balanced X2
Line (XLR):	-60/+4dBs, 10k Ω/3k Ω, balanced X2
• Outputs	
Line:	-6dbs, low-impedance, unbalanced X2
Headphone:	-17dBs, low-impedance
• Number of PCM tracks:	2
• Number of cue tracks:	2
• PCM Frequency Response:	20~20,000Hz +1/-1.5dB
• PCM Dynamic Range:	more than 85dB
• Wow & Flutter:	less than measurable limit
• Timecode(LTC only)	
Input:	0±6dBs, high-impedance, unbalanced
Output:	0±6dBs, low-impedance, unbalanced

MAIN FEATURES

- 50 pin camera interface
- Automatic Editing Function
- LCD display with back light
- Built in Timecode Reader & Generator
- Timecode Input & Output/Slave lock function (Jam sync)
- Time/Date Generator recorded on separate track
- Remaining tape & battery indication
- Balanced Audio Input (camera/microphone/line selectable)
- Monitor speaker
- Self-diagnostics function
- Remote pause connector

Design and specifications subject to change without notice.

JVC PROFESSIONAL

JVC PROFESSIONAL PRODUCTS COMPANY
DIVISION OF US JVC CORP.
41 Slater Drive, Elmwood Park, NJ 07407
Tel: (800) 582-5825 Fax: (201) 523-2077

JVC CANADA INC.
21 Finchdene Square, Scarborough, Ontario M1X 1A7
Tel: (416) 293-1311 Fax: (416) 293-8208

INTERNET WEB SITE
http://www.jvc.ca/jvc

EMAIL
103162.2556@compuserve.com

ABS-CBN's new engineering TOC/master control operations. (Photo courtesy of ABS-CBN.)

drawings through a design development level of completion) and performance-level specifications for all technical and production areas and systems, as well as main utilities and services. Final construction documents for architectural, structural, mechanical and electrical work were provided by local firms. Austin provided overall implementation program review, while on-site project management was provided by a local construction management firm.

Technical equipment and systems

At the heart of ABS-CBN's new capabilities are its technical equipment and systems. To ensure compatibility between new and existing equipment, The Austin Company, in partnership with its subcontractor, Chicago-based Swiderski Electronics, assumed complete responsibility for the specification and engineering of all technical systems, including total integration of broadcast systems and technical cable management. In addition, Austin and Swiderski assumed responsibility for the purchasing, assembly, pre-testing and installation supervision of key broadcast and technical equipment and systems. The Austin-Swiderski team also provided systems operations training.

The core of ABS-CBN's technical complex is a new master routing system. This system, a 400x400 input/output matrix, has full stereo-audio capability. The system also provides additional levels of tally, serial control, machine control and SMPTE time-code functions.

The TOC houses 125 equipment racks providing space for a serial machine control system for studio and post-production; 200 stereo-audio distribution amplifiers; 325 video distribution amplifiers; a 2,880-position video patchbay; and a 3,380-position stereo audio patch field. The camera control center supports a total of 27 cameras, assignable to any studio.

Linking the entire production and technical complex is a cable management system consisting of more than 50,000 meters (165,000 feet) of 8281 double-shielded coax cable; 106,000 meters (350,000 feet) of 8451 shielded audio cable; 5,000 meters (17,000 feet) of serial control cable; and 12,000 meters (40,000 feet) of triax camera cable.

Post-production facilities include six computer-edit-equipped suites, with the 28 VTRs assignable to any suite. There are also an additional 18 A/B roll-edit suites. Each of the eight studios is equipped with a minimum of three cameras, with the capability of expansion to six cameras each. Individual studio control rooms include dual mix/effects switchers; dual-channel DVE systems; 24-channel stereo-audio mixing boards; dual-channel character generators; multichannel facility intercom; and remote serial machine control.

New studio lighting includes remote-con-

When *a* television

show is *a* hit,

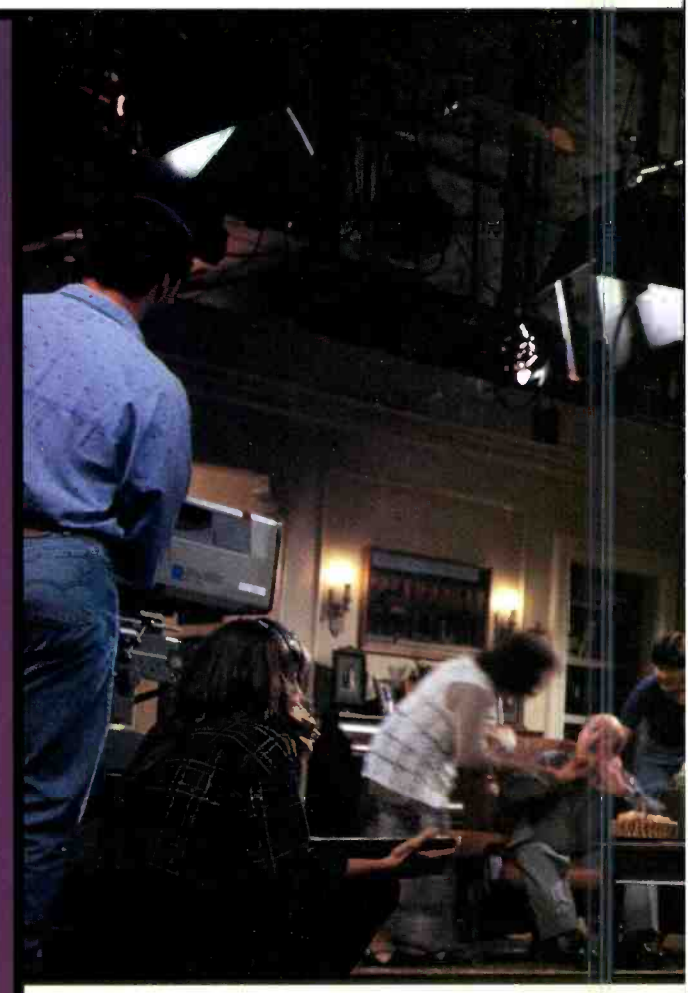
there's usually

a spin-off.

The same *is* now

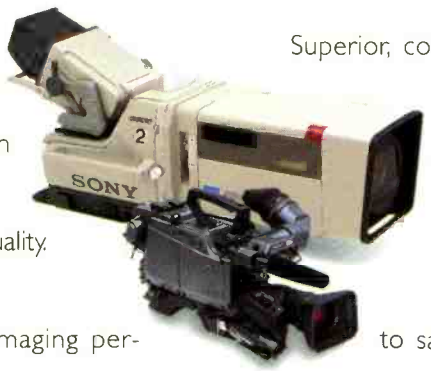
true for

television cameras.



Given the popularity of the BVP-700/750, which set a new standard in high-end studio and field production, we figured it was time for a sequel. Presenting the BVP-500/550: cost-effective cameras that spin off the advantages of Digital Signal Processing into a wide variety of new applications. But here's the real crowd-pleaser.

These new studio and portable cameras can be configured with any one of three plug-in assemblies. Each delivers its own level of CCD quality. That means you've got the imaging performance your application needs. Our new BVP-500/550 also maintains the benefits that made Digital Signal Processing such a big hit. Superior, consistent picture quality. Easier setup and instant recall. Long-term stability and reliability. So it's probably safe to say this is one spin-off that won't be canceled after the pilot. For more information, call 1-800-635-SONY, Ext. 500.



SONY

Manila's ABS-CBN ready for 21st century

Cable installation in TV technical area. (Photo courtesy of Swiderski Electronics.)

trolled motorized battens and a 3,200k SCR programmable lighting control system.

The new equipment for the TOC, technical areas and control rooms was purchased in the United States where it was assembled, tested and debugged as an operating system by Swiderski Electronics prior to shipment to the Philippines. This alleviated the requirement for lengthy testing and troubleshooting at the ABS-CBN broadcast center in Manila.

ABS-CBN engineers participated in the testing process and approved and accepted the system before the equipment was custom crated and shipped to Manila. The equipment was re-assembled and installed on site by ABS-CBN engineers under Austin's and Swiderski's supervision.

Taped broadcasting, as well as live performances with audiences, have continued throughout the renovation. The last phase of the project, which entails interior finishes and final equipment installations, is scheduled for completion later this year.

Capabilities

When the project is fully implemented, ABS-CBN's facility will be the most sophisticated broadcast center in the Pacific Rim and among the most modern in the world. It will be capable of producing and airing multiple, simultaneous live and videotape productions. This will enable the network to respond to an ultradiverse market's rapidly growing demand for more, and a greater variety of, broadcast programming.

This cutting-edge facility, designed for flexibility to accommodate rapidly changing technology and variations in daily operations, will position ABS-CBN for growth and leadership well into the 21st century. ■

Kenric B. Stone of The Austin Company is manager of business development for the broadcasting, communications and entertainment industries. He is based in Austin's Western district office in Irvine, CA.

DESIGN TEAM

Client: ABS-CBN Broadcasting Corporation, Quezon City (Manila), the Philippines; Mercedes Vargas, project executive director
Program Manager: The Austin Company, Irvine, CA (Headquarters: Cleveland, OH.)
Planner/Architect/Engineer: The Austin Company
Broadcast Systems Integration: Swiderski Electronics, Chicago, IL
Interior Design/Architecture: Recio & Casa, Manila
Structural, Mechanical, Electrical Engineering: DCCD, Manila (final construction document)
Construction Manager: Design Coordinates, Manila

10 Bits. 4 Fields. $2495.

Like these numbers? Then call this number: 1-800-455-8525.

A 10-bit, 4-field video synchronizer with dual video outputs, multiple hot switch modes, multiple freeze modes (1-2-4 field), variable strobe, GPI, adjustable black/white clip, dual blanking widths and vertical line advance for under $2,500? How about a dual channel version for less than $4,500? Believe it or not, both of these systems are available today thanks to the new DPS MicroSYNC-X 10-bit synchronizer card.

With thousands of 8-bit MicroSYNC™ cards already in use, DPS is the industry leader for modular synchronizer systems. Our approach makes it easy to add additional channels at any time by simply plugging in another module. And at $1,995, the MicroSYNC-X card will deliver premium performance at a budget price. A variety of rack mounting and remote control options are available, including 12-slot frames with redundant power supplies, 2-slot frames and combination audio/video frames. DPS frames also accept our TBC, VDA, waveform/vectorscope, audio synchronizer and monitor switcher cards.

From the MicroSYNC-X to the legendary DPS-265, the DPS family of synchronizers offers a spectrum of capability and performance that no one else can match. And we include something else that can't be beat, too. The reliability, durability and value that only DPS can offer. We'll be glad to tell you more or even arrange a demonstration in your facility. So if you like our numbers, just call our number. 1-800-455-8525.

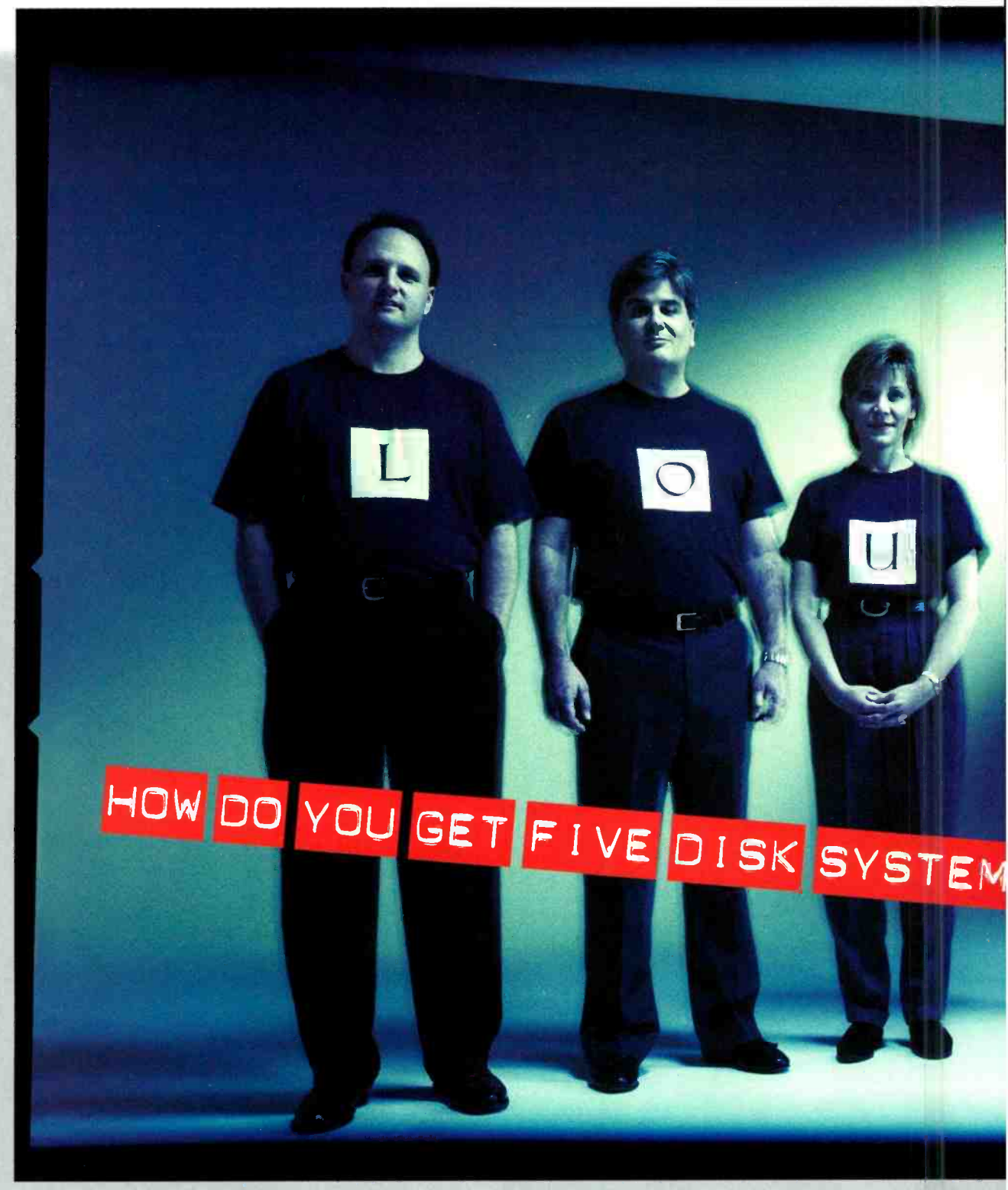
DIGITAL
PROCESSING SYSTEMS INC.

In the U.S. call (606)371-5533 Fax: (606)371-3729
In Canada call (416)754-8090 Fax: (416)754-7046

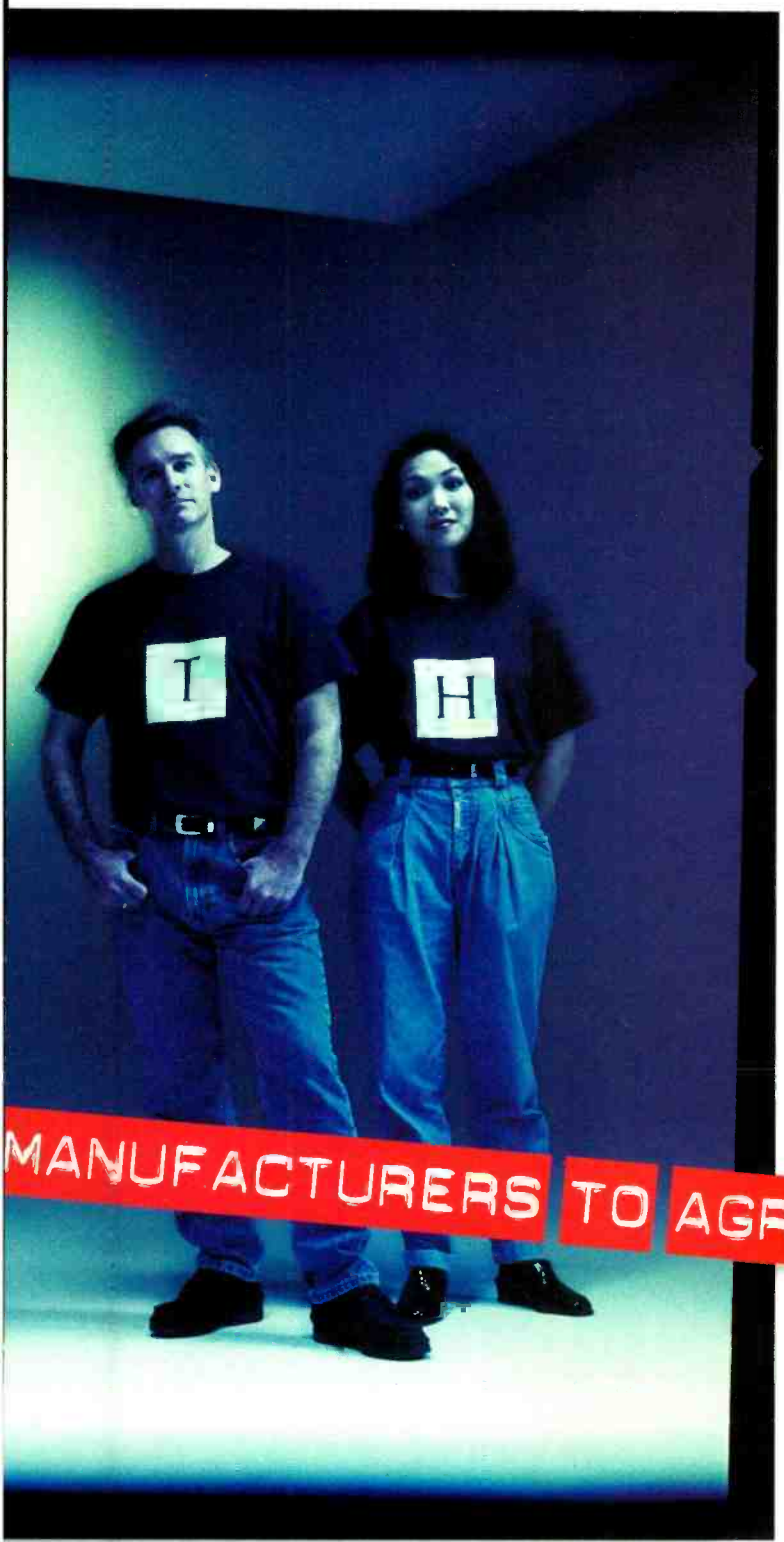
MicroSYNC™ is a trademark of Digital Processing Systems, Inc. Prices shown are suggested U.S. list prices for NTSC products.

See us at NAB Booth #6754

Circle (68) on Action Card



MAIN OFFICE: LOUTH AUTOMATION, 1731 EMBARCADERO ROAD, PALO ALTO, CALIFORNIA 9430



MANUFACTURERS TO AGREE ON ANYTHING?

Actually, when it came time to standardize on one disk interface protocol, it wasn't that hard. The top ten manufacturers of disk systems overwhelmingly chose the Louth Protocol.

We'd like to tell you it was our impressive track record in broadcast automation that did it. Or our reputation for pioneering object oriented programming to make automation faster, easier and more flexible. But the truth is, disk manufacturers chose the Louth Protocol because it works. It's open. And it's free. 100% public domain.

LOUTH WORKS

Now, whether you call it enlightened self-interest or investment spending, the fact is we didn't give the Louth Protocol away for nothing. We were looking ahead.

It has not only simplified applications such as Ad Insertion, Caching, Program Acquisition, Time Delay and Multi-Channel Management, it has made the future easier for everyone. By opening a pathway that is free of gatekeepers, toll takers, and proprietary potholes.

That's why we agreed to make the protocol available to *our* competitors in automation, as well.

We believe in working with anything. Even when it's hard.

L O U T H

WORKS WITH ANYTHING

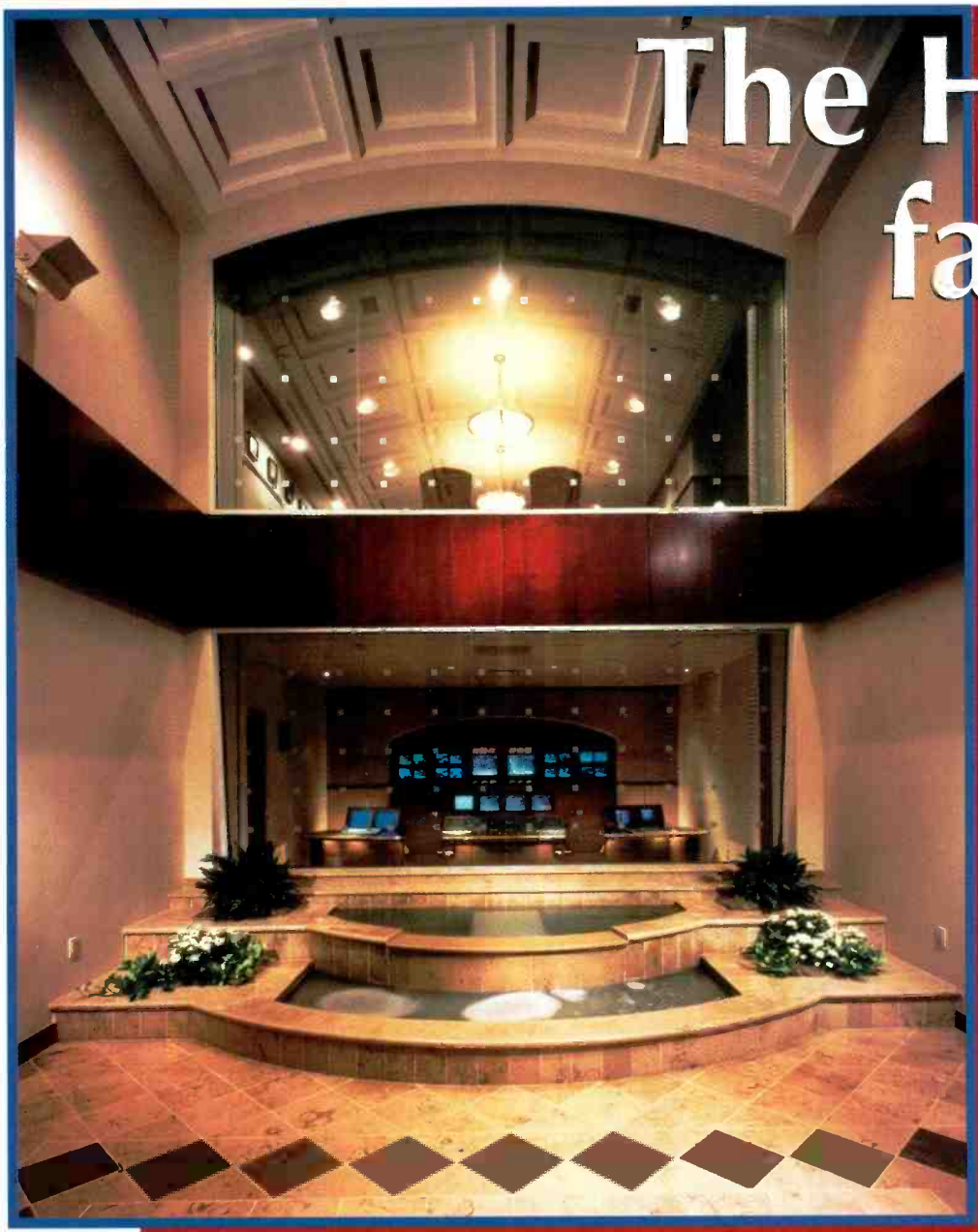
415-843-3665, [FAX] 415-843-3666, [E-MAIL] SALES@LOUTH.COM

See us at NAB Booth #S2022

Circle (69) on Action Card

By Mark Hale

The HGTV facility build



Timing is everything.

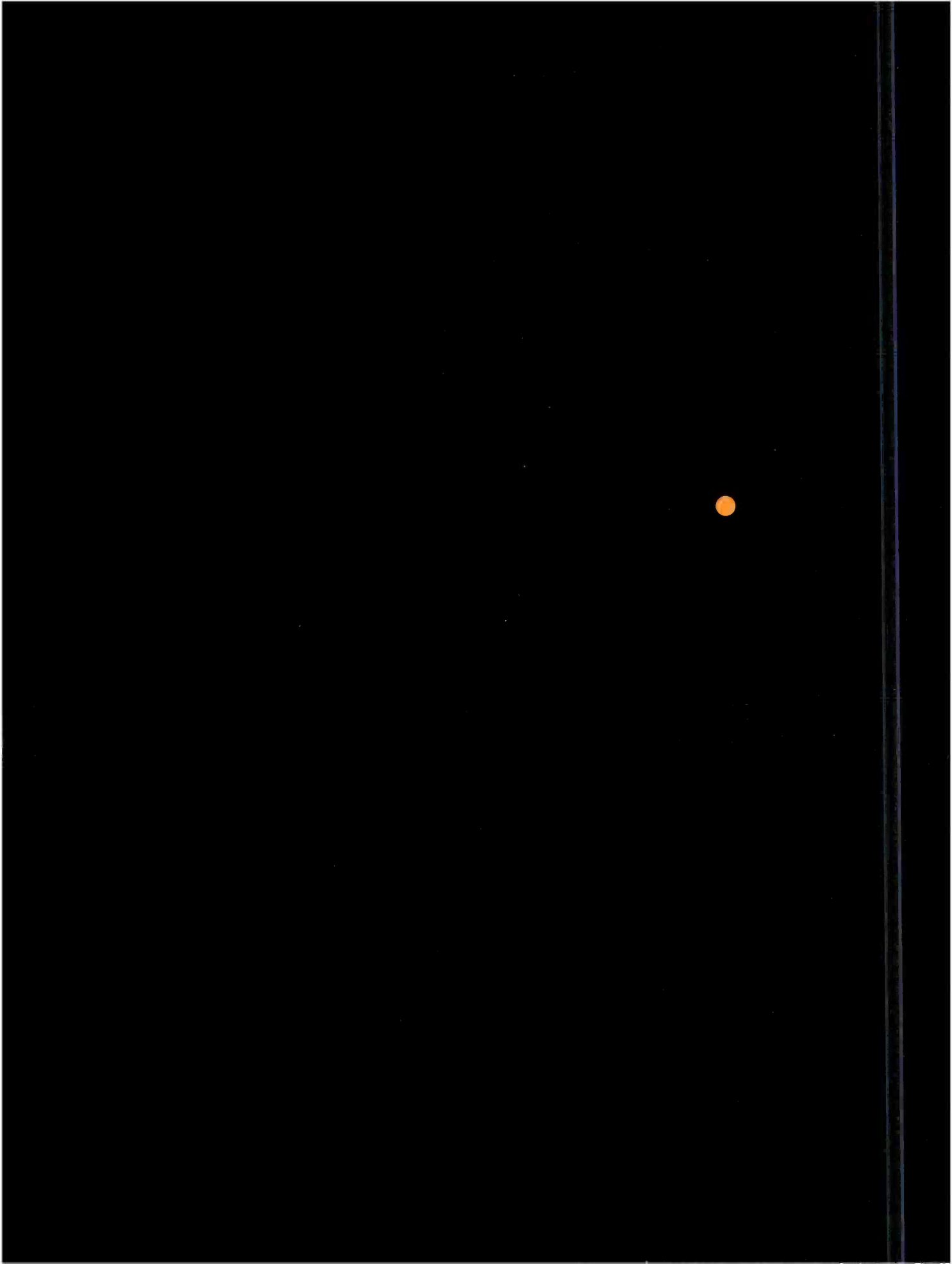
The Bottom Line:

Business opportunities often rely on technological advancements for progress to be made. Home & Garden Television recently took advantage of the digital revolution's opening window to future-proof its new facilties. The timing was such that for the new cable network, the future is now.

"Being at the right place at the right time" best describes the events surrounding the recent launch of Home & Garden Television (HGTV), The E.W. Scripps Company's recent venture into the arena of cable TV networks. The network's home-base location of Knoxville, TN, became a reality by chance when the network, in the market for programming, stumbled upon Cinetel Productions in early 1994. Cinetel, a producer of cable TV programming, had existing facilities already in place including editing, studios, graphics and music sweetening. Months later, the opportunistic purchase of Cinetel provided the network with the jump start it needed for a late '94 launch schedule, well ahead of the impending completion date of the network's facility.

Above photo: The lobby entrance showcases the network's operations control room below and the facility's conference room above.

At the same time, a window of opportunity was opening on the technology front. The market for component digital products had finally come to the point where a complete facility build could be accomplished using this new technology. This would ensure that HGTV's product would be of the highest quality level available today and in the future. With the location now set, signal format selected, and the immediate production needs handled, the



First compressions count - in more ways than one.

If your source material is not as clean as it could be, then valuable bandwidth will be wasted compressing noise, sparkle and other imperfections.

And if the compression system itself is not performing to specification, how can you be sure of finding out - before the viewer does?

Now a new range of powerful compression products from Snell & Wilcox provides the solution to both these problems.

High-performance compression pre-processing equipment guarantees input pictures as perfect as they can be.

And to troubleshoot MPEG2 video compression systems in *real time* as well as off-line there's a unique series of test and measurement tools.

If you want to make the best possible compression, whether you're a broadcaster, post-production house, program maker, teleport operator or equipment manufacturer, don't miss the launch of this exciting new range at NAB on booth number 8849.

First Compressions Count

SNELL & WILCOX

Engineering with Vision

Circle (71) on Action Card

stage was set for the network's facility build to take place.

In planning the design of the facility, we first had to assess a wide variety of needs. Like a giant jigsaw puzzle, many elements needed to be considered before completing the picture. First, we evaluated the needs of the network. We then matched these needs against the existing capabilities of Cinetel Productions. By complementing the existing facilities and adding capabilities only where needed, we maximized each company's capabilities and, therefore, minimized production expenses. Our next task was to select equipment, factor in lead times for delivery and the costs associated for all facets of the build.

The market for component digital products had finally come to the point where a complete facility build could be accomplished using this new technology.

Graphics room No. 3 uses SGI computers, iNFiNiT! workstations and Macintosh computers.

Physical design

The facility addition encompasses 44,000 square feet. Three floors were constructed with provision for a fourth floor to be built in the future. The first floor houses eight production rooms, a dedicated network operations environment, media center, engineering workshop, mechanical and electrical rooms. For production, five edit rooms were built (three on-line, two off-line). Three graphics rooms complete the production environments. These rooms surround a central equipment corridor that houses all of the components of each post-production room.

The entrance lobby is designed to make a dramatic statement for visitors of the network. Structural columns, materials of wood, marble, etched glass and a fountain/planter area create a focal point in the 2-story foyer. Seen above on the second floor is the facility's main conference room, and below is the network operations control room. The desired effect is to marry the leading-edge technology prevalent throughout the facility with the Home & Garden appeal of being in a comfortable surrounding.

Softening the high-tech impact of network control was accomplished through the use of maple- and cherry-lined consoles, construction materials of fabric and cherry wood for the monitor wall, tinted etched glass and carpeted floor tiles for the raised access floor. A framed picture of the uplink antenna site finishes the detail and is highlighted using a recessed framing projector lamp. This attention to detail in the lobby design is particularly important, because for many visitors, this is their only glimpse of the network and its technology.

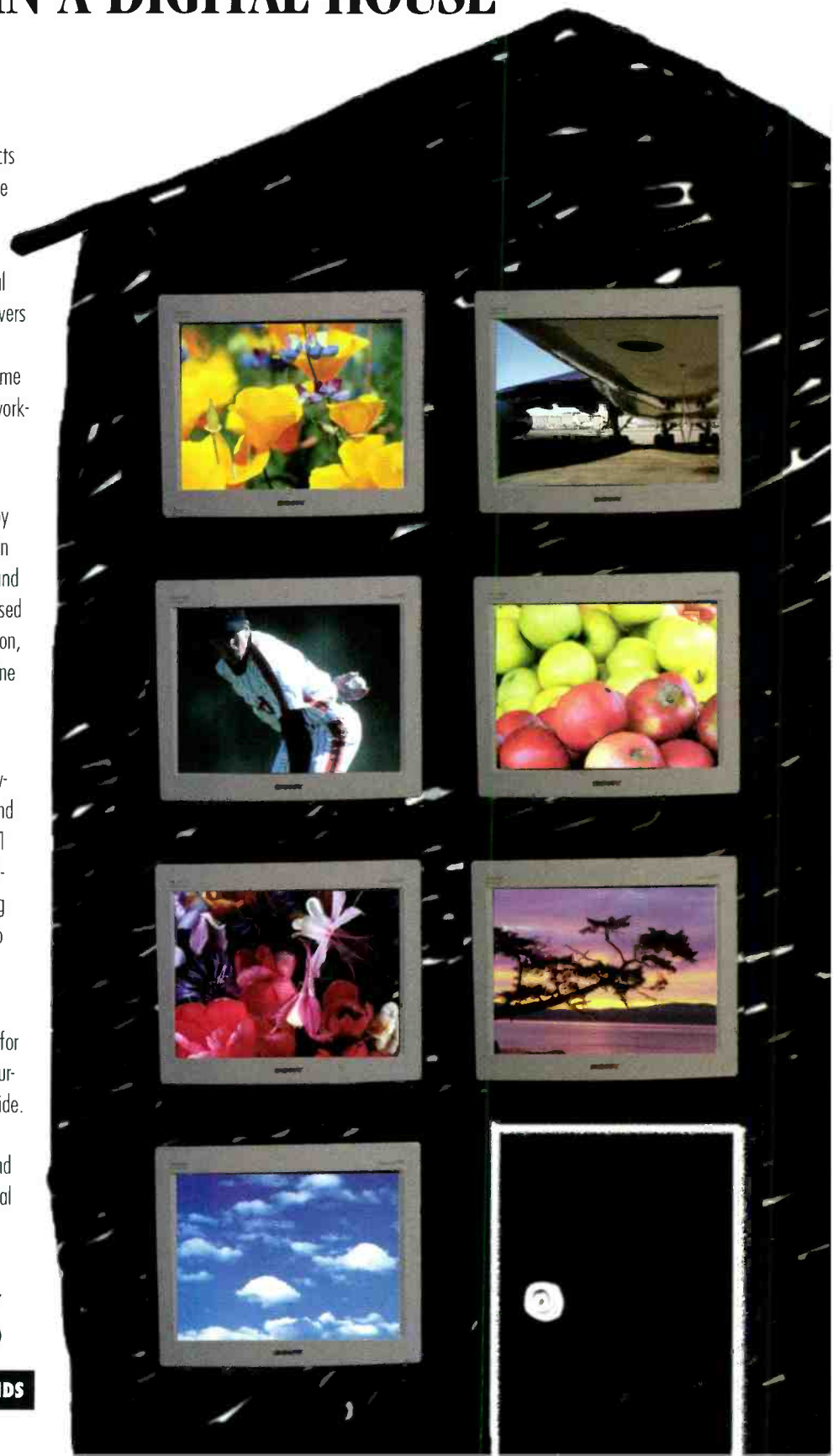
The main equipment corridor acts as the central nervous system to all of the production rooms. The long hallway houses 38 racks clustered in groups of three to seven units. Rack pedestal bases are used to raise the racks' height and allow access through the corridor's raised floor tile. The hallway has recessed sections for patch cord storage, a track lighting system and linear diffusers in front of each rack section. Access to the rear area of the racks is accommodated through enclosed closet walkways. The racks are left open on the backside for access to wiring and for ventilation.

Each production room is approximately the same physical size. This allows flexibility as production needs change: what is an edit room today may need to be a graphics room tomorrow. The rooms are furnished with producer consoles, recessed lighting, separate dimmer controls for producer and operator, and individual room thermostats for temperature control.

All rooms have two entrance/exit doors: one is off of the main hallway for clients, the other opens to the equipment corridor for changing room setups or accessing shared equipment.

QUICK-FRAME™

AT HOME IN A DIGITAL HOUSE



At a nearby digital studio, a dozen animation/effects workstations are positively humming, piloted by twelve talented operators, each with their favorite application. And though they're all working with uncompressed 4:2:2 component digital video—in real time—you won't find their cubicles cluttered with towers of disk storage. That's because all the digital material required by the entire team is stored by one Quick-Frame Video Disk System and channeled seamlessly to the workstations via Sierra Design Labs' new SCSI Framer.

Roomy Storage in Tight Quarters.

Quick-Frame revolutionized digital video recording by providing from 3 to 24 minutes of uncompressed D1 in just 5¼ inches of valuable rack space. With Ethernet and SCSI interfaces—plus support from all leading SGI-based applications—Quick-Frame now plays host to animation, paint and 2D/3D effects. No wonder broadcast, telecine and post facilities welcome the Sierra solution.

Architects of Network Storage.

Sierra innovation continues with SCSI Framer, a low-cost combination of SCSI, real-time frame buffering, and serial D1. High-speed access to uncompressed CCIR601 video is provided for 1 to 24 applications with no additional workstation hardware investment. Built-in analog video output supports the display of Quick-Frame video data being recorded or played back.

Remodel Your House with Quick-Frame.

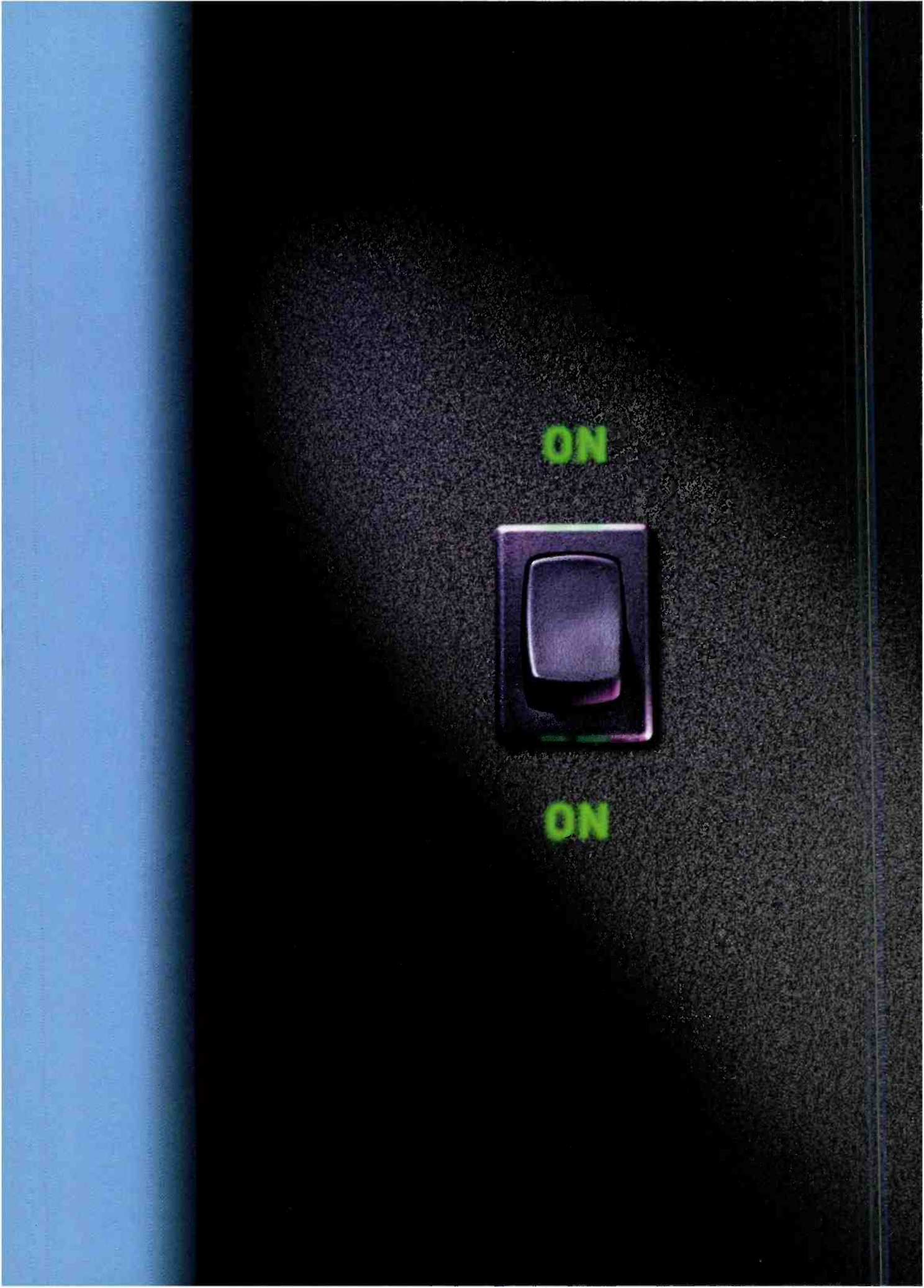
Quick-Frame has rapidly become the VDR of choice for post houses, animation and effects software manufacturers, production facilities and television stations worldwide. *Video Systems* even named it a Pick-Hit of NAB '94.

Call Sierra Design Labs today and find out how to furnish your digital studio with Quick-Frame.

SIERRA
DESIGN LABS

Tel: (702) 831-7837
Fax: (702) 831-5710

SEE US AT NAB BOOTH #S2606 AT THE SANDS


ON
ON

From the very beginning, our broadcast video servers have enjoyed a unique reputation.

They're the only servers reliable enough to be called Hewlett-Packard.

Our video servers have been on-air from stations in Arizona to South Africa without missing a beat. Which should come as no surprise, considering our bullet-proof system architecture, our engineering track record and HP's 24-hour worldwide service and support.

HP servers are also designed to work for you well into the future. They provide up to 6 channels and 50 hours of storage – and since they can be easily networked, you can add even more channels and storage as you grow. And our open systems approach ensures compatibility with a wide variety of third-party hardware

Our position in the video server industry since 1994.

and software vendors. That way you don't have to try to predict the future. You can simply adopt it when it arrives.

Maybe the most surprising piece of engineering is the price tag. HP's newest servers start at $100,000. Which makes the HP Broadcast Video Server one of the few that truly serve your bottom line.

As broadcasting turns to digital, more and more broadcasters are looking to Hewlett-Packard. After all, who knows more about computing and networking solutions than we do?

For more information and free product literature about HP Broadcast Video Servers, stop by booth #9177 at NAB. Or call us at 1-800-FOR-HPTV, Ext 1444. We'll show you how easy it is to get your server on-air and stay on. And on. And on. And on...

There is a better way.

Award-winning video quality in one powerful package. Starting at $100,000.

HEWLETT® PACKARD

Circle (61) on Action Card

Uplink

The uplink facility consists of two Andrew 7.6-meter transmit/receive earth stations and a single 4.57-meter receive-only dish. The transmission shelter is located across a lake from the main building and houses four 700W TWTAs. The exciters, receivers and control computer system are located in the transmission area of network operations. The two buildings are tied together with roughly five miles of coax, control and fiber-optic cable. Power for critical loads in the transmission shelter, specifically the TWTAs, is provided from the UPS in the main building for continuous operation. Less critical loads, like antenna morors, heaters and HVAC are powered through the gen-ser transfer switch. The two uplink antennas are de-iced using a natural gas, hot-air system while the RO is electrically de-iced.

Graphics

The computer-animation area consists of three tightly integrated rooms. The first room consists of a Quantel Hal and the second room contains the DFX Composium. The third room is our multipurpose room and houses two SGI workstations, a Mac 9500, a Chyron iNFiNiT! workstation, a Quantel Picturebox and an Abekas Diskus.

The main goal was to tie all three rooms together for the fastest output at the highest quality. The rooms are all component digital except for two analog camera copy stands. They are also networked together through Ethernet and the serial digital router. A still image and moving animation can be sent to any room instantly. The Quantel Picturebox, which carries picture and key together, is used as our still-image server. The eventual goal is to access the Media Pool as a server for all moving animations by all three rooms at the same time.

Editing

The three on-line editing bays are based on Sony's digital Betacam, with each bay having three dedicated machines. The controller in each bay is the BVE-9100, chosen primarily for its interface with the rooms' components. The switchers in two of the bays are the Sony DVS-2000C, which includes one M/E, with two keyers, and a DSK. The third room uses the DVS-8000C switcher, with the traditional two M/E and PGM/PST bus layout, with a total of five independent keyers.

We think of the facility more as a production complex than a TV station.

Each of the three rooms uses a dedicated channel of Sony DME-3000 and Chyron iNFiNiT!. All audio is digital, non-imbedded, using the Zaxcom DMX-1000 as the audio mixer board. In addition, each bay is equipped with an RS-422-controlled Fostex DAT machine with time code.

All rooms have a BTS router control panel that allows routing of Picturebox Still Store, shared VTRs and additional channels of Chyron or DME, as well as future channels of the Media Pool video file server.

The two non-linear off-line rooms include the Avid Media Composer 4000 and 8000 systems with system 6.0 software. Both rooms use multiple fixed and removable 9GB drives, with a digital linear tape backup system serving both rooms. A router control panel allows any signal in the facility to be routed in and out of the room.

See the future of ATV at NAB Booth #7109!

The World Leader in UHF TV Transmitters.

Yesterday. Today. And especially tomorrow.

As ATV approaches, who's setting the pace in UHF transmitters? The same company that's led the way for the past 10 years—Comark.

In 1986, we invented the first IOT amplifier. In 1988, we placed the first IOT into full-time service. And over the past three years, we've supplied the overwhelming majority of IOT transmitters worldwide.

We've also been at the center of ATV research and development from the very beginning. In 1992, Comark had the first digital ATV transmitter on the air at WETA in Washington, DC and was selected to provide the transmitter to the Grand Alliance for full system field testing.

But it's just the beginning. Comark is the first manufacturer to introduce a transmitter designed specifically around the requirements of the Grand Alliance digital standard. A system engineered from the ground up, it will set new technical standards as well as provide ease of use, simple maintenance and no-hassle installation.

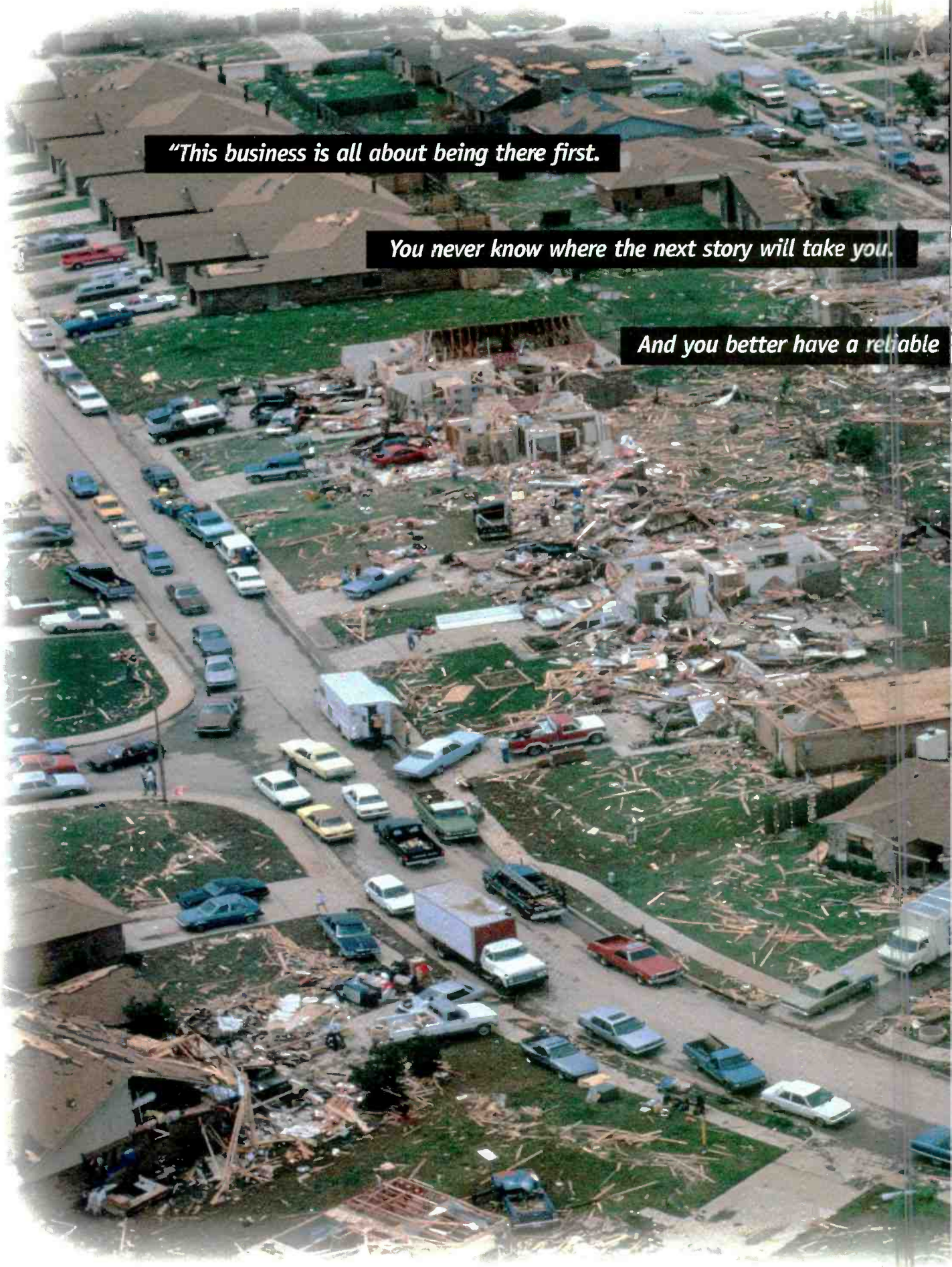
So before you plan your ATV strategy, team up with the company that's set the standard for transmitter innovation and excellence for over a decade—Comark.
For more information, call us today at (215) 822-0777.

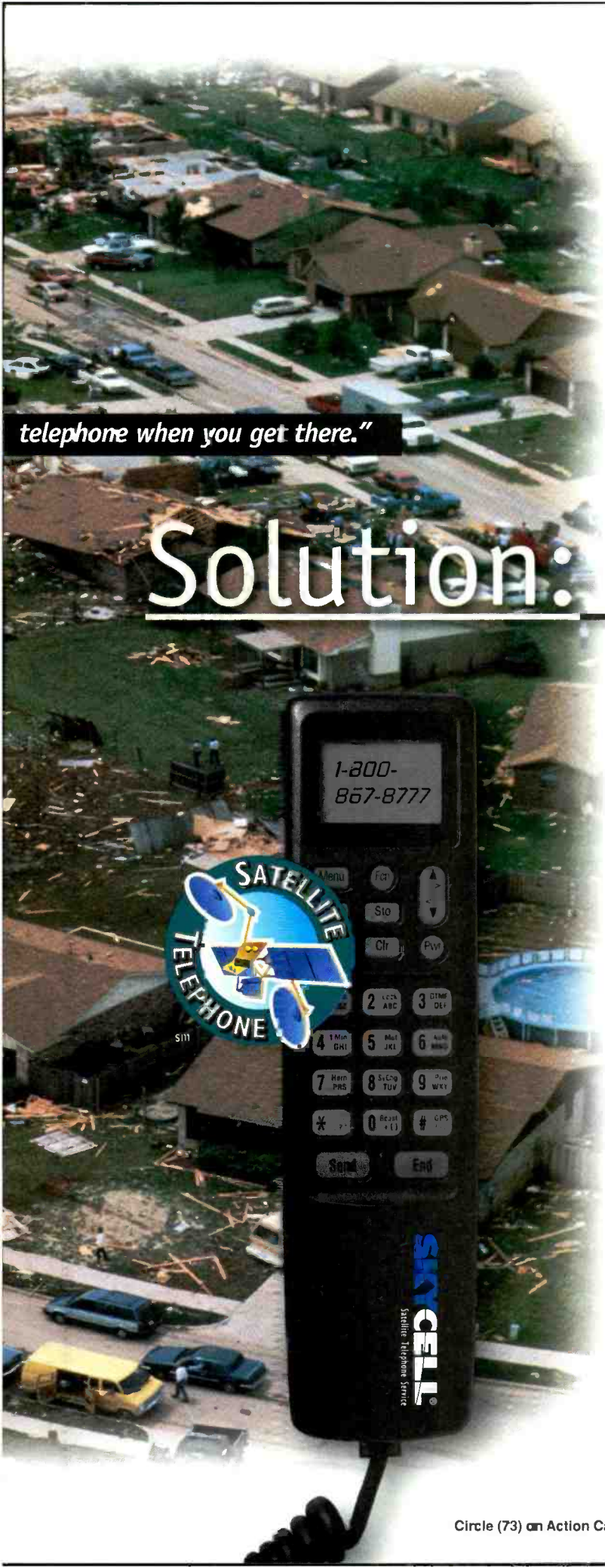
COMARK

Emmy Award Winner for Engineering Excellence

Route 309 & Advance Lane • Colmar, PA 18915
TEL: (215) 822-0777 • FAX: (215) 822-9129

Circle (72) on Action Card


"This business is all about being there first.
You never know where the next story will take you.
And you better have a reliable



SKYCELL Service Coverage Area Includes Virtually All Of North America.

For the first time ever, a wireless telephone service is available with virtually complete North American coverage. This is not a cellular phone. This is a brand new satellite phone that works virtually everywhere you take it in North America. It can be installed in almost any vehicle and is easy to use - make and receive calls as easily as from the phone in your

Solution: SKYCELL®

home or office. And, because the satellite is 22,000 miles in space, this phone service is not affected by natural disasters like earthquakes, floods, and hurricanes. This new satellite phone enables you to access SKYCELL® Satellite Telephone Service, a product of American Mobile Satellite Corporation (AMSC). AMSC is primarily owned by telecommunications industry leaders Hughes Communications, Inc., and AT&T Wireless Services, Inc. So, you know you're getting the most advanced technology available. Are constant communications for your business a must? The solution is SKYCELL Service.

- *Expansive service coverage area.*
- *24 hour customer service.*
- *Directory assistance and operator services.*
- *Digital communications provides clear connections.*
- *Each phone has its own toll-free 800 number for incoming calls.*

SKYCELL®
Satellite Telephone Service

a product of

American Mobile Satellite Corporation

1-800-867-8777
EXT. 1230

Circle (73) on Action Card

UNSURPASSED

TH 680 Diacrode®
(full scale)

UHF POW

60 kW common amplification plus highly compact design.

The TH 680 Diacrode® is the world's first and only high power tube capable of delivering 60 kW in common amplification.
It gives you the best of both worlds : grid tube technology for oustanding reliability, and innovative, double-ended output for unsurpassed power. In fact, Thomson Tubes Electroniques is the first to apply this new concept to UHF amplification. The result : two times more output power compared to the most powerful tetrode on the market.
With its characteristics of power, linearity and efficiency, the TH 680 is ideally suited for 40 to 240 kW UHF transmitters.
These features have also made it an excellent and proven solution for highly demanding digital TV.
Of course, whether your needs are analog or digital, you'll benefit from the TH 680's highly compact design, simplified installation and long service lifetime, estimated at over 20,000 hours.
The TH 680 has been designed, developed and manufactured in an ISO 9001-approved site.
Today, it's already providing unbeatable performance to customers throughout the U.S.

Visit us at NAB '96, Booth #5331, Main Hall

THOMSON TUBES ELECTRONIQUES

Headquarters: 18, avenue du Maréchal Juin
92366 Meudon-la-Forêt cedex - FRANCE
Tel: (33-1) 30 70 35 00 - Fax: (33-1) 30 70 35 35

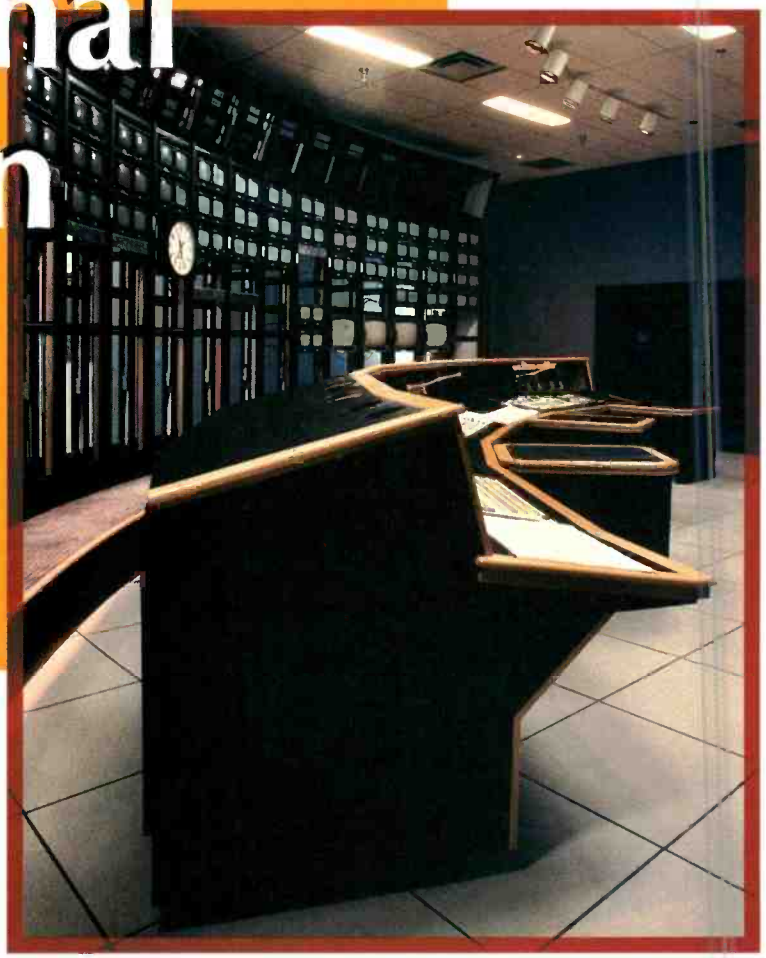
Representative office USA: Thomson Components & Tubes corp.
40G Commerce Way - Po Box 540 - TOTOWA NJ 07511
Tel: (1-201) 812 90 00 - Fax: (1-201) 812 90 50

ER

By Shawn McBride

South Carolina Educational Television

Handling 135 channels simultaneously can be a daunting task, especially on a shoestring.



The Bottom Line:

Big is not always better. However, when properly designed and implemented, a large facility can provide tremendous economies of scale and operational efficiency. Careful planning and attention to detail allowed one of the nation's largest facilities to be constructed cost-effectively, while still allowing considerable flexibility to meet current and future needs. $

Until recently, a visit to the home of South Carolina Educational Television (SC ETV) could mean a sidewalk trek to as many as 23 different buildings in and around its "old supermarket" site. Although that may have been good for the cardiovascular fitness of visitors and employees, it was an inefficient way to operate the nation's leading educational broadcast facility.

Above photo: The monitor wall of SC ETV's master control room incorporates 140 monochrome monitors to track outbound signals for more than 135 channels of simultaneous programming.

For the past 35 years, SC ETV's growth in capabilities has been as purposeful as its facilities' expansion has been organic. Committed since its inception to providing quality in TV and radio broadcasting, the management and board of directors determined in 1988 that it was time to give the organization a physical presence to match and enhance the national reputation of SC ETV's services.

This time best-laid plans succeeded

Working with Rees Associates, a leading broadcast design firm, SC ETV management identified a number of objectives that could be accomplished through the consolidation of all of the station's functions under one roof.

South Carolina's expanding interest in educational television and distance learning is a testimony to the abilities of the SC ETV commission and its staff and to the

If You Think D1 Quality Editing Limits You To Tape...

THINK AGAIN.

NOW THERE ARE

D-Vision® PostSUITE™ breaks through the limitations of other non-linear editors to give you full CCIR-601 resolution — the definition of broadcast quality set by the Society of Motion Picture and Television Engineers (SMPTE). Now for about half the cost of one D1 VTR, you can get an *entire* D1 studio.

And D-Vision PostSUITE gives you something you won't find in any tape-based studio: true non-linear editing. Insert, delete or rearrange scenes regardless of their length. Then *instantly* see the results with network approved full screen video. No need to go online. And no more limits on your creative freedom.

Best of all, PostSUITE is designed by D-Vision with totally open architecture. We're focused on creating the best digital media software in the industry, not on proprietary hardware. And with PostSUITE we offer a complete family of *upgradable* products.

So you're assured of always working with the latest in digital media technology. And that the PostSUITE you buy today will still meet your needs in the future.

Call for details.

Come see us at NAB Booth #8823

D-Vision Systems, Inc.
Making Digital Media Work For You.™

+1-800-8DVISION (+1-800-838-4746)
Outside the U.S.: +1-312-714-1400

Now Shipping PostSUITE!

Circle (67) on Action Card

video services (DVS) and data. As funds allow, a digital level will be added. Sources include almost three-dozen tape transports and numerous land, microwave and satellite feeds, as well as the six studios.

The red and green broadcast networks can be divided into at least six individual feeds. DigiCipher encoding and compression is used to uplink more than 20 channels of satellite programming. There are three 8.1-meter steerable Ku-band transmit and receive systems and one C-band uplink and downlink system. For linking with schools, master control can access addressable set-top boxes. Two-way audio between SC ETV and the schools is handled through an 80-input telephone bridge.

The high-tech nature of SC ETV is more than simply image. In the heart of the new complex is state-of-the-art technology that exceeds current needs.

A 128x128 production router is connected to the master control router over numerous tie lines. The system is capable of supporting three master control switchers, with two planned for the near term. Either of the two master control operators can insert their switcher into any single or group of outbound channels. A Utah Scientific Total Automation System (TAS) normally runs the schedule for each outbound channel. However, any switcher can be inserted to take manual control or provide effects.

Daily schedules are downloaded from traffic using software written by Charlton Bowers, vice president of engineering for SC ETV. The software runs on a DEC VAX system and is transferred via Ethernet to the TAS computers.

Visitors to the master control facility are immediately impressed by the dominating monitor wall that incorporates 18 equipment racks housing more than 140 monochrome monitors. Each monitor has an LED display indicating the channel assignment and current program material. Operators can track the outbound signals looking for abnormal conditions on the wall. Should a problem arise, they can bring the channel up on their larger color picture and audio monitors and into waveform monitors and vectorscopes.

Transport control is distributed over Ethernet to each tape machine. The system is also capable of recalling two still-store and CG channels. Self-contained keyers are provided downstream on the broadcast chain for logo insertion.

For intercom, a Clear-Com Matrix system is used throughout the facility. It consists of a 100x100 matrix with numerous direct and party lines interconnecting the facility. The system also incorporates dial-in access for remote feeds.

Three computer networks were designed for the facility by CDA. The first is administrative, connecting to the VAX and other servers. The second is used for graphics exchange and general production work, including all of the Leitch StillFile stores, Chyron character generators and PC graphics stations. The third computer network is used for master control. Although connected through bridges for exchange of information, each of the three computer networks has its own backbone.

Recording bays

Recording and tape delay operations are separate from master control. Through tie lines between the two routers, master control can send any external signal to any one of six record bays. Each record bay contains numerous tape transports, primarily 1-inch, BetaSP, S-VHS and 3/4-inch. One record bay is set up with a small production switcher and character generator providing some production capabilities.

Production studios

There are two main production studios, with space on the site for a third. Studio A, used for news and public affairs programming, is 3,000 square feet. For larger productions, Studio B is more than 5,000 square feet. The two studios share a common engineering facility, camera control room, six Ikegami HK-355 cameras and one Ikegami HK-355P camera. Each studios' primary control-room equipment list includes an Abekas A-82 composite digital switcher and an Abekas A-51 2-channel DVE, a Wheatstone TV-600 audio console, a Chyron Max! 2-channel character generator and a 2-channel Leitch StillFile.

Microphones from both studios come up on the A/B buses of the audio console. The Wheatstone TV-600 is configured with 32 inputs, with any input assigned to any of 32 mix-minus feeds.

Studio A has a pipe-grid rigging system. Studio B uses a moving-grid system consisting of eight large plaques and battens around the perimeter. Touchscreen computer control is currently being added by Barbizon Lighting to provide instant recall. Each studio has individual dimmer "per circuit" lighting systems. One operator, located in the central camera-control room, can control the lighting for both studios.

Distance-learning studios

Each of the four distance-learning studios is approximately 1,200 square feet and is set up to operate with one instructor and one control operator. Small production switchers are used with cameras on Telemetrics pan-tilt heads. Each studio is installed with still-stores and CG. Studio lighting consists of color-balanced fluorescent fixtures. At present levels of operation, each studio is in use more than eight hours a day during the school year and provides live interactive instruction to more than 250,000 students daily.

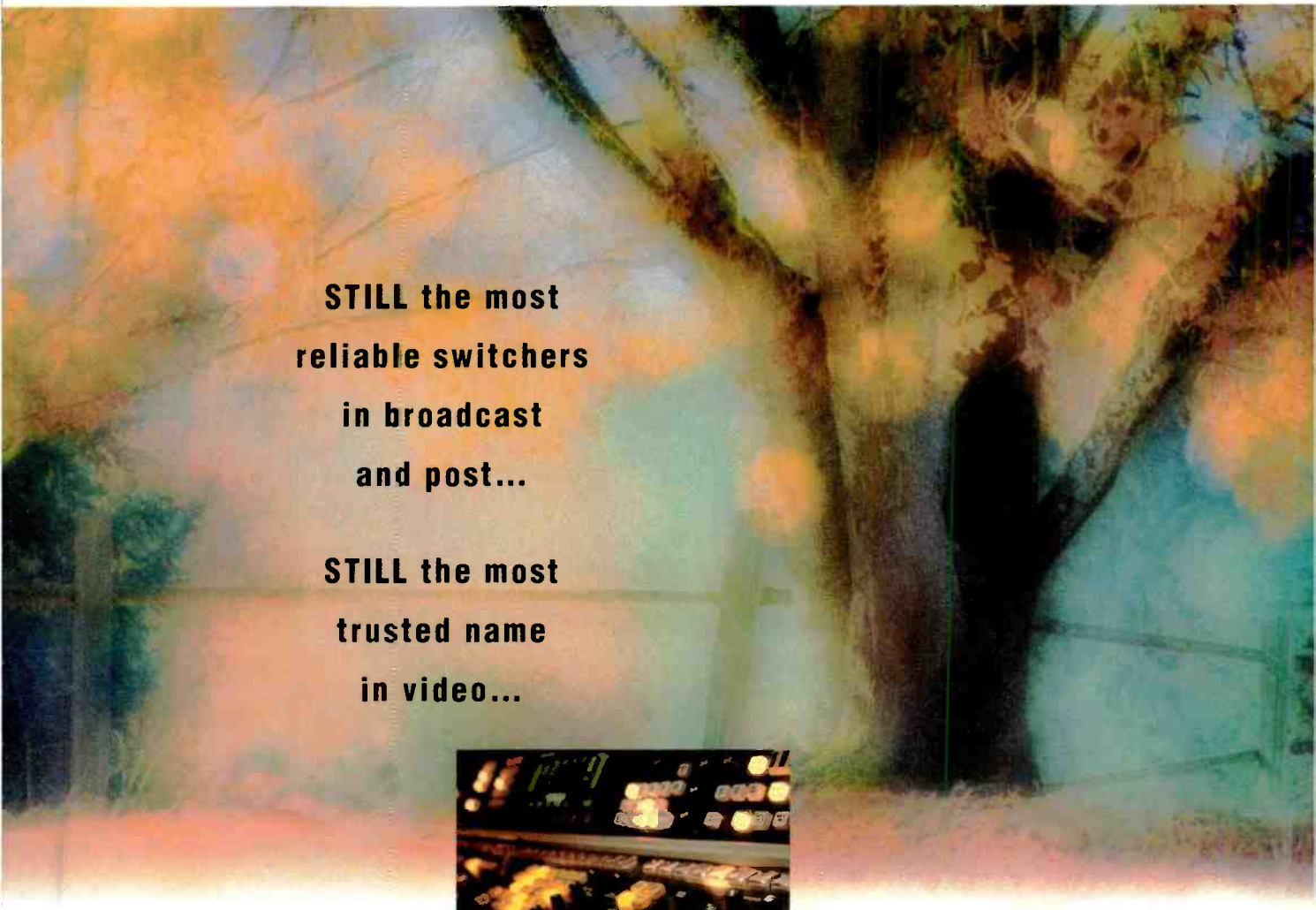
Teleconferencing facilities

State agencies, businesses, medical and higher education clients participate in more than 1,000 teleconferences each year through SC ETV's facility, which is the busiest state teleconference center in America. Program formats include 1-way video combined with 2-way audio, 2-way constant-presence video, multisite origination from major cities, satellite downlinking, terrestrial retransmission and audio-bridge teleconferencing. SC ETV's audio bridge can connect up to 48 interstate locations at one time and also is capable of simultaneously handling eight audio conferences.

State agencies, businesses, medical and higher education clients participate in more than 1,000 teleconferences each year through SC ETV's facility, which is the busiest state teleconference center in America.

SC ETV's teleconferencing is particularly attractive to businesses, due in large part to the reasonable cost. For less than $5,000, a company can invest in the equipment that is necessary to originate meetings for secure closed-circuit broadcast to local and regional divisions.

Grass Valley



STILL... Grass Valley

Chances are, you know us by more than our reputation.

After all, Grass Valley production, routing, and distribution systems are the premiere choice of video professionals everywhere. In fact, major broadcast and production facilities around the world use Grass Valley products.

So more than likely, you know first hand what it's like to work with Grass Valley equipment. The superb fit and finish. The precision and control. The perfect assurance and unfettered creativity that come from using tools that are so well designed, so reliable.

Grass Valley...still the most trusted name in video because the trust we've earned is yours. And, we're pleased to say, that puts you in pretty good company.

SEE US AT NAB
BOOTH #9313

Call us at 1-800-395-9478 ext. 901

Tektronix

http://www.tek.com/VND

Circle (78) on Action Card

It's not the cost; it's the savings

The nation's first live domestic satellite transmission was organized in Columbia when William F. Buckley, Jr. agreed to bring "Firing Line" to public television via SC ETV. That event placed SC ETV in the forefront of TV broadcast technology and established it as a major content provider to PBS.

Perhaps, beyond the bells and whistles of new technology, the most remarkable thing about SC ETV has been its ability to accomplish all of this on a limited budget. For example, the cost of delivering 32 channels of satellite service to all South Carolina schools is less than one cent per hour/per channel/per school. The new complex, one of the largest broadcast facilities in the United States, was constructed for a mere 12 million dollars. Overall, SC ETV provides its remarkable range of services for less than one percent of the state's education budget.

The value of SC ETV's fiscal restraint is not simply in its talent with small budgets; its services actually result in measurable savings to the taxpayer. A single teleconference, produced and transmitted statewide by SC ETV for the South Carolina Department of Corrections, trains more than 1,000 law enforcement and correctional officers at a cost of approximately 39 cents per officer. In a single year, the total savings of SC ETV's teleconference services to the state exceeds the cost of the renovation and construction of the new complex.

Clearly, at a time when funding for public broadcasting is eyed with suspicion in many quarters, SC ETV has demonstrated that the benefits can significantly outweigh the costs — at least when it is done right. ■

Shawn McBride is a free-lance writer based in Oklahoma City.

DESIGN TEAM

Client: South Carolina Educational Television; Henry J. Cauthen, president; Ronald L. Schoenherr, senior vice president; Charlton W. Bowers, vice president, engineering; Thomas L. Clark, vice president, production; Samuel E. Craig, manager, technical operations; Jeffrey R. Abrams, staff architect; Teri DeBruhl, photographer

Architects: Rees Associates, Dallas; Ralph S. Blackman, AIA, NCARB, vice president; project manager, Michael R. Parkinson, AIA, NCARB, project architect; Stevens & Wilkinson, Columbia, SC; Mal Williams AIA, Jerry Sudeth, PE,

Audio, Video, Structured Wiring Systems Design & Engineering: Communications Design Associates, Norwood, MA; Stuart B. Randall, project manager; Greg T. Vincent, project manager for radio, audio

Engineering: Robert P. Hemenway, video engineer

Lighting and Rigging Systems Design: Berner & Brill Lighting Design, New York; Steven Brill, principal designer

HVAC Designer: Davenport Associates, Oklahoma City, OK; Steve Davenport, PE, president

Electrical Engineer: EE Systems Engineering, Oklahoma City; Roger Edwards, PE, president

Structural Engineer: Stevens & Wilkinson, Columbia, SC; Jesse Burke, PE

Studio B Moving Grid Systems Design: Barbizon Light of New England, Woburn, MA; Bill Capps, systems engineering manager

LIGHTWORKS

Events wait for no one. And when that hot tape comes screaming in during a broadcast, wouldn't it be nice to be able to pop it right on the air before your competitor even gets wind of it? The amazing Newsworks™ non-linear editing system from Lightworks lets you do just that. You can mix and match material from tape footage of late breaking news with material already on disk. So you don't waste vital minutes digitizing. And the editor-friendly design of Newsworks user interface makes putting together a newscast a thing of ease. To find out more about this revolutionary new editing system, call 1-800-395-9478, ext. 801.

NEWSWORKS™
The Editor's Friend

Visit our booth #9313 at NAB

1-800-395-9478, EXT 801

Tektronix

http://www.tek.com/VND

Circle (89) on Action Card

By Farley Barge

WAGA goes cable

New cable facility showcases unique cable/ broadcast alliance.

The Bottom Line:

In a ground-breaking move, Media 1, a cable TV station, and WAGA, a traditional broadcast TV station, joined forces to market a broadcast TV product — news/weather telecasts — through a cable TV network. By building a state-of-the-art video facility filled with the most modern equipment available, Media 1 is able to deliver top-quality broadcasting. More and more broadcast TV companies are recognizing that teaming up with cable television can be a potentially lucrative business agreement for both parties.

On Dec. 15, 1995, a new cable facility came on-line in metro Atlanta. A unique joint venture was announced between Media 1, a local cable TV company, and WAGA television, the local Fox Network affiliate. On that day, Media 1's Channel 33 began offering 24-hour continuous local news and weather, a service that is only available in about six other American cities.

The Media 1/WAGA joint venture is unique because it is the first time in the Southeast that a broadcast TV product — news/weather telecasts — has been marketed through a cable TV network. As such, the joint venture heralds the coming of age of cable television as an equal partner with traditional broadcast television. The Channel 33 news and weather are actually taped "rebroadcasts" of earlier live news/weather telecasts from WAGA.

Above photo: Multiformat dubbing and compilation station with A/B roll edit system.

The "news" behind the joint venture is the state-of-the-art video facility that Media 1 had built to handle the recording, distribution and rebroadcast of the WAGA telecasts. Located in Norcross, GA, the former warehouse building was completely renovated to make room for the network master control room, an adjoining multiformat dubbing area, a studio, a production control room, two A/B/C roll Betacam SP edit suites, a video compiling room, offices and space for support functions. The facility and its equipment were designed, engineered and installed by Technical Industries, an Atlanta-based visual communications company.

Planning and design for the entire facility began in the early summer of 1995, and construction began in mid-September. Because Media 1 wanted to begin transmitting programming on Channel 33 in January 1996, the network master control room had to be completed by mid-December 1995,

Profile

WE CAN THINK OF A THOUSAND USES FOR TAPE.

(EDITING VIDEO ISN'T ONE OF THEM.)

You know, of course, that tape is dying. At least for video editing it is. One reason is the Profile™ PDR 100, the world's first practical disk recorder.

The Profile PDR 100 is the machine the editing world has been waiting for. You can simultaneously play or record any of four channels. For just a little more than the price of a single VTR, one Profile PDR 100 can make it seem as if you're editing in a three-machine session. So when you're ready to make the leap to nonlinear on-line the PDR will make it a short one.

And installation is a cinch. Just plug a PDR 100 into your existing VTR rack and get to work. With the Profile PDR 100 you also avoid the maintenance and wear that comes from head-to-media friction. You'll save on precious tape, too. So you can use it for a thousand other things.

To find out more about the Profile PDR 100, call 1-800-395-9478, ext.701. Tape this ad to your wall so you won't forget.

Visit our booth #9313 at NAB

1-800-395-9478, EXT 701

Tektronix

http://www.tek.com/VND

Circle (90) on Action Card

only three months after construction began.

Besides this short deadline, the project was complicated by the unique requirements of the joint venture. Specifically, Media 1 wanted to be able to insert local commercials for each of its 13 cable head-ends in the metro-Atlanta area. This capability would allow viewers fed by any one of the remote head-ends to view commercials from their local advertisers, while viewers fed by another head-end would see a different set of commercials. The nature of live news meant commercial breaks might not occur at predetermined intervals as in most cable network programming.

Automation of the process was required to minimize cost. This meant that a custom solution had to be devised to allow Media 1 to reliably insert commercials on the rebroadcast of WAGA's news. Another requirement was that the product not be altered in any fashion from its live version.

The solution to the problem was provided by Tom Norris, director of engineering and chief project engineer for Technical Industries. Using off-the-shelf components, the master control operator logs the taped news program noting the specific time-code in/out addresses of each break. After the tape is logged, a Windows-based 486 computer running third-party software generates a contact closure at the specified time-code points. This closure is then interpreted into DTMF tones that are transmitted to each of the head-end locations where they trigger a commercial insertion system to roll the local spots. The entire process is controlled by software created by Tech Electronics of Atlanta, which handles scheduled record and playback of the WAGA news broadcast.

Network master control. L-R rack No. 1--- fiber receive/transmit. Rack No. 2 and 3--- audio/video patching. Rack No. 4 --- character generation and control. Rack No. 5 --- network monitoring. Rack No. 6 (corner)--- engineering station and monitoring. Rack No. 7--- network record and playback. Racks No. 8-12--- commercial insertion.

The network master control room

The network master control room is the "heart" of the production facility. It contains the 64-channel fiber-optics system that connects WAGA and distributes to each of the 13 head-end locations. Maintaining image quality was a prime consideration of Media 1. For this reason, only broadcast-quality equipment was selected for use in the facility. The network master control room, as well as the rest of the production facility, has standardized on Betacam SP equipment because of the excellent image reproduction and multigeneration capabilities of the format.

Briefly, this is how the network master control room operates: WAGA transmits the newscasts, Accu/Weather reports and Doppler radar images via the fiber-optics network to Media 1. The video and audio signals are distributed via a PESA multilevel routing system (a 32x32 video router and a 48x32 audio router) and Tech Electronics program video controllers (PVCs) and then recorded on Betacam SP VTRs. All equipment is first connected to a video/audio patch system should the need arise to bypass the router. The PVCs are microprocessor-based and can be programmed for up to 1,000 events on a 7-day basis. Scheduling is performed on the Windows-based 486 computer (in the programming control con-

Master control console. L-R logo inserter control and monitoring, network monitoring, router control and logging computer display.

Stability, simplicity and compatibility

The innovative design of the TH 760 IOT - 40 kW in common amplification - features excellent stability and long life.
Electron-gun operation benefits from full use of the thermal and mechanical properties of pyrolytic-graphite for the grid construction.

The TH 760 IOT and its circuits have been designed for ease of use : the simple plug-in concept means you can install the tube in a matter of minutes.

The TH 760 IOT and its cavity are mounted on a roll-in rack unit which offers full electrical and mechanical compatibility with existing IOT transmitters.

Visit us at NAB '96, Booth #5331, Main Hall

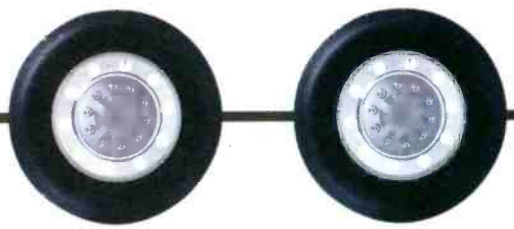
THOMSON TUBES ELECTRONIQUES

Headquarters: 18, avenue du Maréchal Juin - 92366 Meudon-la-Forêt cedex - FRANCE
Tel: (33-1) 30 70 35 00 - Fax: (33-1) 30 70 35 35

Representative office USA: Thomson Components & Tubes corp.
40G Commerce Way - Po Box 540 - TOTOWA NJ 07511
Tel: (1-201) 812 90 00 - Fax: (1-201) 812 90 50

HIGH GAIN YOUR GAIN

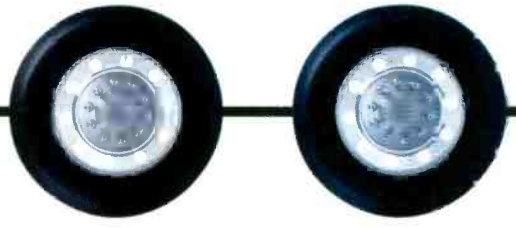
Confidently making the transition from the editing room to the road, Sony's DVS-7000 Live Production Switcher is designed for the demanding pace and creative challenges of live production. Right from the start, operators will notice how comfortable they feel behind the wheel of the DVS-7000. Its 3.5 M/E control panel is like second nature to experienced technical directors. Its multiple downstream keyers and multiple re-entry capabilities make it faster and simpler to layer graphics and DME moves into a show. And it shifts truck efficiency into high gear, by reducing the size and power consumption of its electronics—plus adding special mobile support features like redundant power supplies and advanced diagnostics. Sony has also created a revolutionary link between our DME effects system and our DVS-7000. It's called DME-Wipe



To *create* our *live* digital *switcher*, we *broke* down *four* walls *and* added *four* wheels.

—and it adds keying power by turning DME's into additional keyers, freeing the M/E keyers for more key layers. TD's can now have a full range of powerful DME effects at their fingertips as quickly and easily as wipe patterns. In addition, it has three memory systems: Timeline effects, Snapshot memories, and E-File registers, making it extremely effective for quick changes in live telecasts or on-line editing. The DVS-7000 is also designed for today's fast-changing TV station environment. It can be configured for either analog or digital inputs. You can convert from digital composite to component 4:3/16:9 at the touch of a button. It handles 525/625 signals. And it's available in multiple control panel configurations. For more information, just call 1-800-635-SONY, ext. 7000. We'll help you get your show on the road.

SONY



sole) and then downloaded to the PVCs.

The graphics systems consist of three Chyron Maxine character generators. They are connected via the fiber network to the WAGA TV studios to provide access to the station's graphic data. This system is actually an extension of WAGA's Ethernet LAN system for graphics. The information is then used to recreate the look of a WAGA TV news broadcast. These 32-bit full-color systems produce full-page slides, pushes, wipes, row slides/pushes and scan line wipes. All of its capabilities are used extensively to create the distinctive look of a WAGA news broadcast. In addition to the Chyrons, a Leitch LGI 1302 logo inserter is used to produce animated and static logos for channel identification.

The network master control room contains 27 equipment racks and a 4-bay programming control console. The racks are positioned from 20 inches to 24 inches away from the room walls to allow easy access for maintenance. Incandescent lights are also placed inside the racks for convenience. Individual racks are 30 inches deep by 70 inches high, with 40 rack units of vertical equipment space. Racks are loaded with equipment to allow for proper air flow and ample growth.

The 4-bay programming console handles three main functions: character generation, program monitoring and scheduling. The keyboard and monitors for the Chyron character generator are located in the first bay. Program monitoring is handled in the next two bays using router rotary control panels, audio monitoring, waveform and vector units and four TBC remote units. In the fourth bay is the 486 computer that runs scheduling software.

The network master control room also contains several 3/4-inch VTRs that provide program playback for the leased access, public access, government and education channels and commercial insertion. Similar 3/4-inch VTR setups are in operation at each of the head-ends. This arrangement provides flexibility in that the head-ends can either transmit their own local programming/commercials or they can transmit network programming/commercials from the master control room.

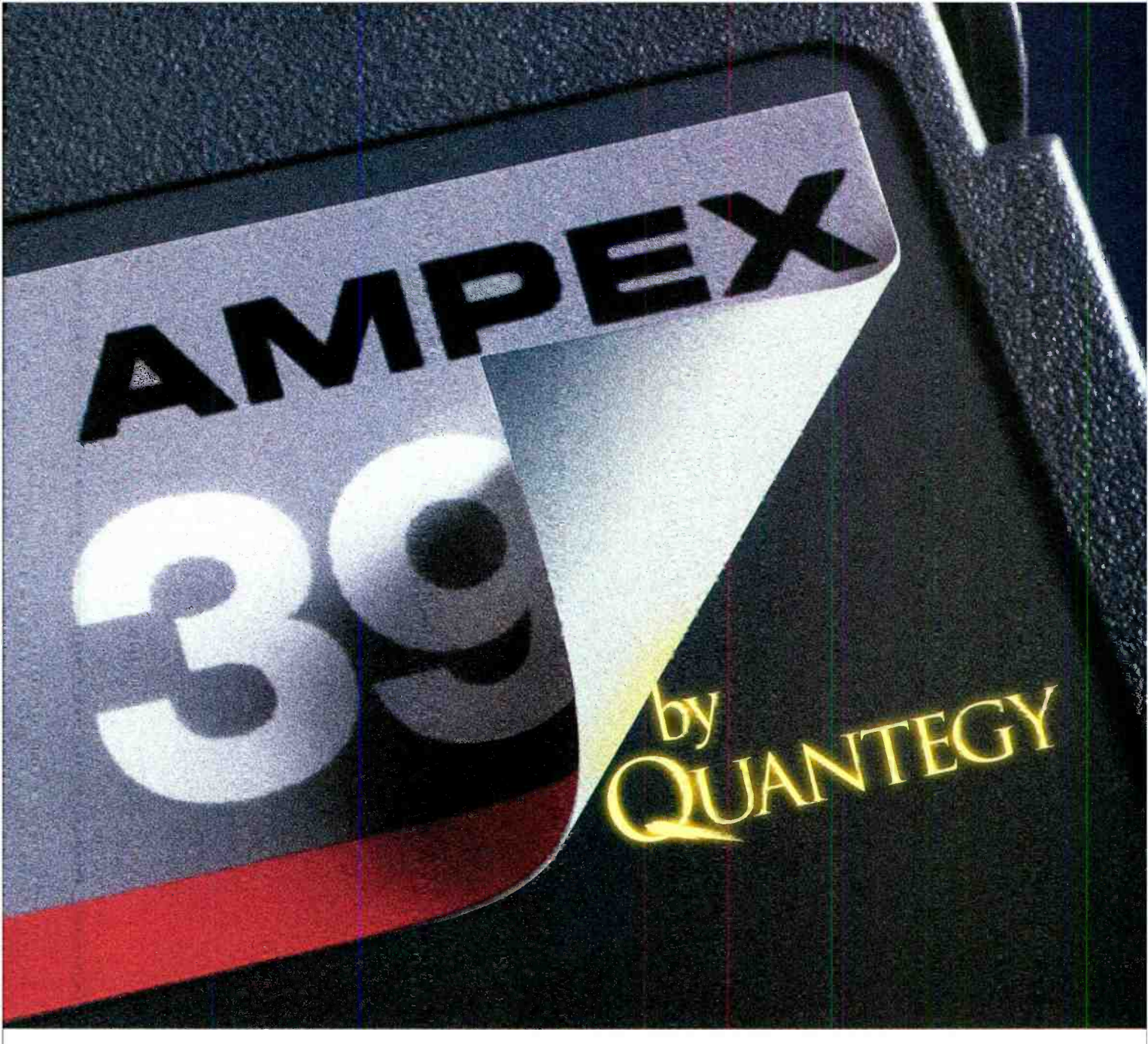
The significant advantage of fiber's improved picture quality played an important role in the look of the 24-hour news channel.

In another part of the network master control room is a multiformat dubbing system that produces air-play master tapes for commercials. This system includes an A/B/C roll Betacam SP edit system as well.

The fiber-optics network

For several months, Media 1 has been replacing existing microwave feeds to each head-end with single-mode fiber. The significant advantage of fiber's improved picture quality played an important role in the look of the 24-hour news channel. This was first demonstrated during a test in which a signal was sent out 35 miles to the head-ends and then back to the production facility, for a total trip of 70 miles. The return signal was virtually identical to the original.

Other advantages of the fiber-optics system are increased signal capacity, multiple-channel capacity and improved data transmission. For the viewers, the result is news and weather programs that match the quality of the original broadcasts.



INTRODUCING QUANTEGY. THE NEW COMPANY THAT'S BEEN MAKING AMPEX TAPE FOR OVER 35 YEARS.

Nothing's changed, really.

You still get the audio mastering tapes that go gold more than all other brands combined.

The same top quality video tapes used by broadcast and creative professionals around the world.

The same market-leading instrumentation tapes used by aerospace and government.

And the same manufacturing, technical support and sales people.

You even get the same Ampex™ brand name.

The difference is that we're now the *only* media company dedicated exclusively to you, the recording professional.

So call us today and we'll tell you more about Quantegy.™

After 35 years, we're just getting started.

QUANTEGY™

Quantegy Worldwide Sales Offices

Northeast (New York)	(201) 472-4100	South Central (Dallas)	(214) 620-9033	UK & Ireland (London)	44-1-734-302240	Middle East & Africa (London)	44-1-734-302208 ext. 213	Latin America & Caribbean (San Francisco)	(415) 903-1132
Mid-Atlantic (Washington, D.C.)	(301) 530-8800	Northwest (San Francisco)	(510) 881-7341	Italy & Iberia (Rome)	39-6-523-3330	Benelux (Nijmegen)	31-24-3750484		
Southeast (Atlanta)	(770) 491-7112	Southwest (Los Angeles)	(818) 566-1089	Germany & Austria	49-69-8007540	Scandinavia (Stockholm)	46-8-590-75100	Asia (Hong Kong)	852-2735-1866
Midwest (Chicago)	(708) 590-5100	France & North Africa (Paris)	33-1-4731-7171	Central Europe (London)	44-1-734-302208 ext. 209	Canada (Toronto)	(905) 821-8840	Australia & New Zealand	61-2-864-0600

Circle (79) on Action Card

WAGA goes cable

When the news recording is completed, it is transmitted to two master head-ends located in the towns of Vinings and Stone Mountain. In turn, they distribute the signal to the local head-ends in their respective zones. Both master head-ends have enough capacity to handle distribution for all zones.

On a typical weekday, Channel 33 cable viewers can now see high-quality taped rebroadcasts of the news/weather from the early morning "Good Day Atlanta" show from 9:00 a.m. until noon. The noon news/weather show is rebroadcast from 1:00 p.m. to 5:00 p.m. The "Eyewitness News at 5" and "Eyewitness News at 6" programs are rebroadcast from 7:00 p.m. to 10:00 p.m. The "Eyewitness News Primetime" show airs live at 10:00 p.m. and is rebroadcast from 11:00 p.m. to midnight, and then again from 2:00 a.m. to 3:00 a.m. The remaining hours are filled with live Doppler radar and Accu/Weather updates.

The TV studio

The 40'x40' TV studio has a 17-foot-high ceiling with a lighting grid set at 15 feet and is large enough to house two complete sets. To ensure good sound quality, the studio walls are lined with four inches of K-13 acoustic wall treatment. This sprayed-on treatment was chosen over prefab foam products for its excellent sound-absorbing qualities, ease of use and cost.

Lighting in the studio is handled by a high-frequency fluorescent lighting package by Videssence. This is a directional lighting system that is color-corrected for TV applications. This system also offers reduced electrical power requirements and reduced HVAC loads. In addition, there is also a standard incandescent lighting package to add depth and highlights.

The production control room

The 18'x22' production control room is linked to the TV studio, network master control room and the editing suites by the house routing system. The production control room contains a fully configured Grass Valley 250 video production switcher, which is complete with streamlined effects, E-MEM and a full complement of linear and chroma-keyers. Also included are two channels of Pinnacle Prizm 3-D digital effects and a Chyron Maxine character generator.

The three studio cameras are Sony DXC-637s in studio configuration. There is also a 5-station IFB remote subsystem for the on-air talent and a Clear-Com Master Intercom system with 20 stations.

The editing suites

There are two fully equipped editing suites in the production facility; one is located next to the production control room and the other is located across a hallway from the network master control room. However, both are linked via the house routing system.

Both editing suites feature Grass Valley 110N switchers and Sony BVE 2000 editors. They also have A/B/C roll Betacam SP recorders, dual-channel Pinnacle Prizm 3-D digital effects and Chyron Maxine character generators. As with the rest of the facility, the editing suites are standardized on Betacam SP tape formats.

Special features

To ensure high quality, Belden 1505A video cable and Belden 9451 audio cable are used throughout the facility. Strict standards were also maintained for all wiring work. Specifically, every wire is individually numbered and then correlated to the wiring list and to the schematics. This means that if any wire is accidentally disconnected, it can be readily identified and correctly reinstalled. Wire bundles are also fastened together for a neat appearance and service loops are provided for all rack-mounted equipment. The result is that all equipment can be quickly and conveniently serviced.

Fire protection is handled by an FM200 fire-suppression system. This system uses the environmentally friendly FM200 gas instead

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

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

1 Continuous column stroke, for shooting from sitting to standing person's hight – Vario Ped 2 - 75.

2 Rock steady and 50 kg/110 lb lightweight, to carry equipment up to 90 kg/200 lb – Vario Ped 1 - 90.

3 Carriage and column can be disassembled in seconds – compact modules for ease of transportation.

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

5 Track width, narrow and wide, symmetric and asymmetric – set in no time and you well can expect precise, easy steering and crabbing, smooth and jerkfree column movement thanks to the patented Sachtler pneumatic system. Test for yourself the optimum camera support for all compact Studio/OB cameras, now!

See us at NAB Booth #11016

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

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

sachtler
corporation of america

Circle (82) on Action Card

of a Halon system, which has been banned because of its ozone-depleting characteristics.

This project is also unique in that the installation of all equipment was performed by ICIA CTS-certified installers. The ICIA institute is an organization dedicated to providing quality instruction to the visual and audio communications industry. Using ICIA-certified installers assures quality installation and procedures on the job site for Media 1. Technical Industries director of engineering Tom Norris, is an instructor at the ICIA institute.

The house routing system links the electronic equipment in all of the work areas. The cables are routed under computer flooring with carpeted tiles and linked into the routing system in the network master control room. This feature allows for easy access and eliminates the need for raceways throughout the building. The most important benefit is that this setup allows for future growth or redesign without having to consider raceway locations. Static-control carpet tiles are installed in all of the work areas.

The potential of cable TV

This cable TV network production facility clearly demonstrates that Media 1 recognizes the importance of top-quality programming to its viewers and the company is willing to invest in the technology needed to deliver that programming. The Media 1/WAGA joint venture demonstrates that broadcast TV companies recognize the tremendous potential that cable television offers and they are willing to enter into potentially lucrative business agreements with cable TV companies. ■

This project is also unique in that the installation of all equipment was performed by ICIA CTS-certified installers.

Farley Barge is vice president of sales and marketing for Technical Industries, Atlanta.

DESIGN TEAM

Client: Media 1 Cable
Senior Management: Ed Dunbar, John Brady, Media 1 Cable
General Project Design and Implementation: Ed Matthews, Tom Norris, Technical Industries, Atlanta
General Contractor: Scott Newman, Conmac
Acoustic and Lighting Consultant: Roger Zobel, TPS/Television Production Services
Broadcast Systems Design: Technical Industries, Atlanta

Switching-Control-Automation!
At the Heart of your System

At NAB:

NEW! ❤ XD ROUTING SWITCHER SERIES

NEW! ❤ TM-32 SMALL FRAME ROUTING SWITCHER SERIES

❤ TX-220 DIGITAL MASTER CONTROL

NEW! ❤ MAPP: OPERATING SYSTEM FOR BROADCAST VIDEO SERVERS

❤ COMPASS: BROADCAST AUTOMATION

❤ PROCION: WINDOWS-BASED CONTROL/AUTOMATION

NEW! ❤ MENTOR PLUS: DIGITAL SPG/TSG

❤ COMMANDER DIGITAL INTERCOM

SEE US AT NAB IN CHYRON BOOTH 10700

pro-bel INC

4480 North Shallowford Rd.
Dunwoody, GA 30338-6410

Telephone: (770) 396-1971
Fax: (770) 396-0595

Circle (213) on Action Card

A CHYRON Company

By Altan C. Stalker

Group W Satellite Uplink

Group W Network Services and Yarra Films break new ground with the creation of Asia Broadcast Centre.

The Bottom Line:

The fast-changing Asia-Pacific region offers businesses a unique and dynamic market opportunity that is unsurpassed by any other in history. For the TV industry, the area's rapid economic growth means diverse new markets comprised of millions of TV viewers. When U.S.-based Group W Network Services and its Singaporean partner, Yarra Films Pte Ltd., decided to create Asia Broadcast Centre in Singapore, they were determined to serve these robust markets by creating the most comprehensive, technologically advanced TV operations facility in the region. $

After establishing what many programmers consider the pre-eminent, largest satellite distribution center of video programming in the United States, Group W Network Services (GWNS) set out to do what no one else had done before — design the largest, all-digital, full-service TV operations center in Singapore to reach the entire Asia-Pacific region.

Today, Asia Broadcast Centre in Singapore, the 50-50 joint venture of GWNS and Yarra Films Pte Ltd., is already operating and serving the demands of programmers in the region, before it officially opens this spring.

When you look at the demographics, it is easy to understand the demand for the facility's services. Research has shown that the potential market of TV viewers in Asia, Australia, Africa and across the diverse Asia-Pacific region — home to two-thirds of the world's population — will eventually number in the hundreds of millions. These markets, in addition to the widely predicted boom in the Asian economy, are expected to create perhaps the largest growth opportunity in history for U.S. and local programmers.

GWNS and Yarra films have invested more than $28 million in their full-service, state-of-the-art TV operations facility, staking their claim in a prime location that is at the center of this robust marketplace for TV programmers and others.

As a team, GWNS and Yarra Films offer a unique set of complementary skills

Above: Artist's rendition of Asia Broadcast Centre.

A Star Performer Destined To Become A Legend.

If your destiny as a multimedia professional is tied to the products that serve you, let Centaur help you become a rising star.

Centaur is a full-featured MPEG encoding solution for the broadcast and production professional desiring an easier approach to digital video compression. Its highly efficient batch encoding system works through a Graphical User Interface (GUI), allowing materia to run locally on the encoder, or remotely across a network. Ethernet, Fast Ethernet, FDDI, CDDI, and ATM...Centaur supports them all. And movie encoding is almost effortless thanks to Centaur's support of long form encodes and its pause & resume features. In addition to supporting video resolutions from SIF (320 x 240 pixels) to ITU-R-601 (704 x 480 pixels), Centaur transparently supports closed captioning for the hearing impaired.

Maybe it's time for you to reach for that next level. The Centaur MPEG Encoding System from Vela Research. A star performer destined to become a legend in the proper hands. Like yours.

The Solution Is In The Stars.℠

© 1996 Vela/CRG7

Vela Research™
The Wave Of The Future.℠

1-813-572-1230

http://www.vela.com

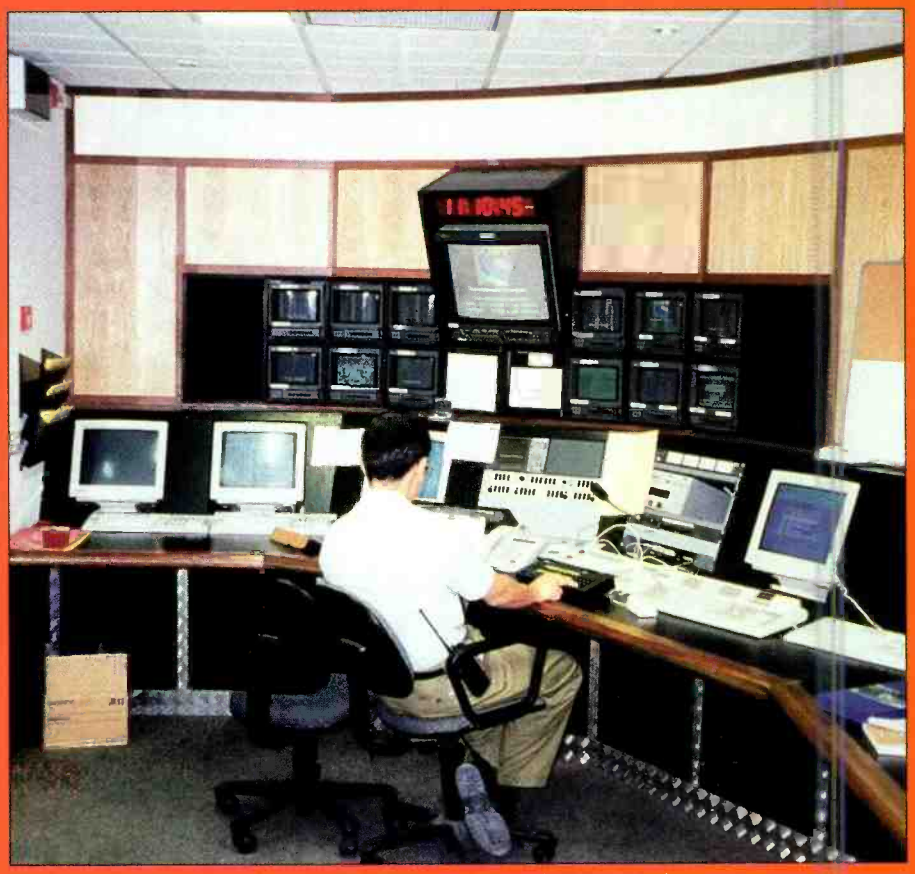
2501 118th Avenue North · St. Petersburg, Florida 33716

Circle (85) on Action Card

See us at NAB, Booth #M3835

to clients. GWNS, based in Stamford, CT, is North America's largest independent, full-service program origination and satellite distributor of video programming. Yarra Films Pte Ltd. is Asia's fastest-growing video production and post-production company. (Yarra Films is marketed throughout the region as the Yellow River Network.)

The companies' joint venture represents Southeast Asia's most advanced, full-service TV hub and the largest and newest operations center for video production and satellite transmission for cable networks, broadcasters and corporate video networks. It is now providing production and distribution services for the Discovery Channel's Asia service, Discovery Asia, Liberty Sports-Communications and Sony Entertainment Television. The region's only operations facility of this caliber, Asia Broadcast Centre, is equipped and staffed to handle many more clients as companies seek to compete in this fast-growing market.



Employee at work in control room for the Discovery Channel at Asia Broadcast Centre.

An optimal location

Asia Broadcast Centre is located in The Republic of Singapore. The nation state was selected primarily because of its central location, which is ideal for U.S. programmers wanting to reach Asia-Pacific TV viewers and others. Its government policy is pro-business, and its 2.9 million citizens are well-educated and English-speaking. Of equal importance is the fact that Singapore has one of the most technologically advanced telecommunications infrastructures in the world.

These attributes made Singapore the perfect place to set up a virtual TV hub from which programmers can reach the burgeoning Asia-Pacific markets, a market that is reported to be growing faster than any other in recent history.

For GWNS, Asia Broadcast Centre presents a strategic opportunity to be positioned on the ground floor, as programmers recognize the need to expand their services to this market. The potential TV audience is huge.

Other programmers, including Disney, ESPN, HBO and MTV, have already set up operations in Singapore to serve what is being called the next frontier for the TV industry. Companies are beginning to understand the allure of the Asia-Pacific markets.

Targeting the growing, untapped market of TV viewers

Today, 400 million Asian homes have access to television, and at least 99% of the households in Taiwan, South Korea, Singapore and Japan own televisions. One Singaporean cable TV company offers subscribers access to 30 channels, and soon, every Singapore household will be able to choose from 100 cable channels.

Many of the developing countries of Asia — specifically China, Singapore, Malaysia, Thailand, South Korea, Taiwan, Indonesia and India — are experiencing annual growth in their gross domestic product that is more than double that of mature economies of countries like the United States, Germany and Japan. From a TV programming standpoint, that growth means an increase — between 1993 and 1995 — in the number of installed satellite dishes ranging from 50% in Indonesia to more than 300% in Malaysia and more than 400% in Thailand.

In deciding to create Asia Broadcast Centre, GWNS and Yarra Films were clearly breaking new ground.

In deciding to create Asia Broadcast Centre, GWNS and Yarra Films were clearly breaking new ground. Not only is the facility a central point from which programmers could reach this new growth market, but it also represents one of the most advanced operations centers in this part of the world. It is completely digital and offers clients the convenience of one-stop shopping. While the facility operates primarily as a program origination and broadcast transmission site, a full range of in-house TV production, post-production and satellite distribution services are available. The facility also offers playback, traffic, graphics and studio production, in addition to many ancillary services, including on- and off-line editing services.

Outfitting the facility for optimal results

Experienced GWNS engineers were responsible for designing the 85,000-square-foot Asia Broadcast Centre. They modeled it after the Stamford operation, and installed systems that provide flexible, efficient and highly reliable operations 24 hours a day, seven days a week. They

Going Digital? MPEG? Widescreen? High Definition?

Thank goodness there's always a

when you really need one.

More than 30 new products to be launched at NAB '96

Kudos IQ Modular

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

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

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

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

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

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

France Tel: +33 1 45 28 10 00 **Germany** Tel: +49 611 99 0840

India Tel: +91 11 6481740 **Italy** Tel: +39 6 66 38 594 **Japan** Tel: +81 3 3446 3996

Russia Tel: +7 095 1926992

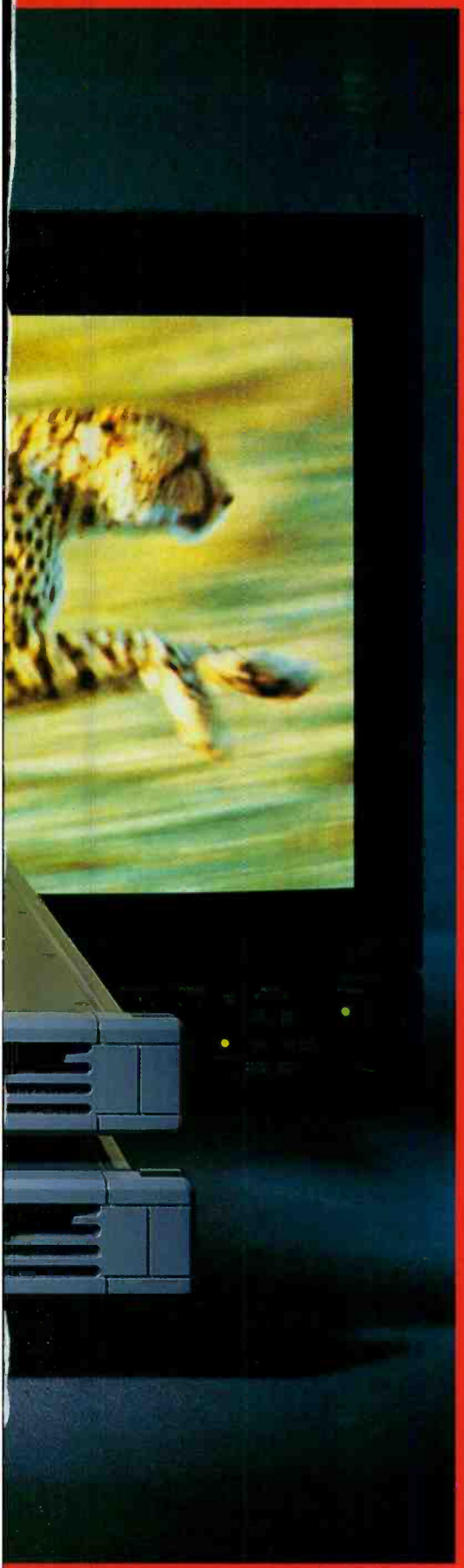
SNELL & WILCOX

KUDOS IQ

©NATAS

Circle (94) on Action Card

MDD500 & MDD1100 Multi-standard Digital Decoder



Maximum quality decoding. Minimum delay.

To achieve the decoding quality required for today's component digital systems, you need to use field comb technology. But with most field comb decoders, there's a delay.

The new Snell & Wilcox MDD decoders incorporate a minimum delay mode to provide the sharp resolution of field-comb decoding, without the penalty.

These products are part of a comprehensive Snell & Wilcox range of decoders and encoders providing solutions for every requirement.

To find out more please contact us at: USA Tel: +1 408 734 1688

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

France Tel: +33 1 45 28 10 00 **Germany** Tel: +49 611 99 0840

India Tel: +91 11 6481740 **Italy** Tel: +39 6 66 38 594 **Japan** Tel: +81 3 3446 3996

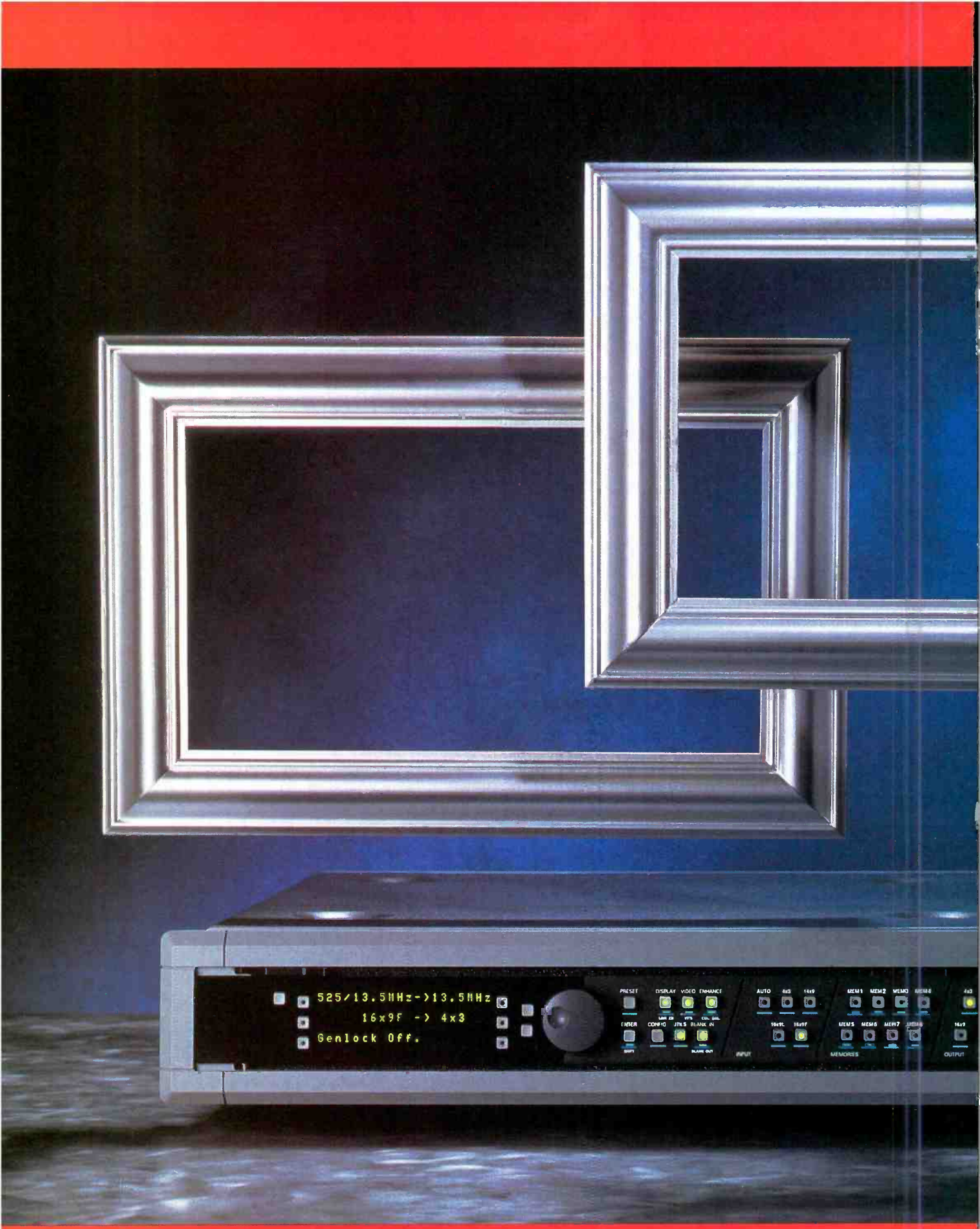
Russia Tel: +7 095 1926992

SNELL & WILCOX

KUDOS

©NATAS

Circle (95) on Action Card



ARC100 Aspect Ratio Converter

Now your pictures can be seen more widely.

Going widescreen - or coming back again - needn't involve major expense, whether in live transmission, post-production or presentation.

The ARC100 aspect ratio converter is a dedicated widescreen processor which provides continuously variable, bi-directional conversion between 16:9 and 4:3 formats.

With full control over all parameters of the selected picture window, together with front panel or remote operation, the ARC100 is a powerful production tool.

To find out more about our widescreen & HDTV range please contact us at:

USA Tel: +1 408 734 1688 **UK** Tel: +44 (0)181 607 9455 Fax: +44 (0)181 607 9466

E-Mail: Info@Snell.co.UK **France** Tel: +33 1 45 28 10 00 **Germany** Tel: +49 511 99 0840

India Tel: +91 11 6481740 **Italy** Tel: +39 6 66 38 594 **Japan** Tel: +81 3 3446 3996

Russia Tel: +7 095 1926992

SNELL & WILCOX

KUDOS

©NATAS

Circle (96) on Action Card

equipped the editing suites and control rooms with the latest products available from manufacturers.

Asia Broadcast Centre has four available master control rooms, but it has the potential to expand to as many as 16. Each master control room is configured uniquely to support each client's needs. The facility is currently operating two Sony-equipped digital on-line editing suites, but plans call for four editing suites to be outfitted, and there is the capacity for even greater expansion in the future.

A 4,000-square-foot studio is under construction and will be available for production purposes. Space also has been allocated for a smaller presentation studio. Because a full array of tape duplication, program origination, playback and traffic services are available to clients, it was important that the facility provide sufficient space for an extensive tape library. The 5,000-square-foot library can house up to 400,000 tapes in secure, biologically and climate-controlled storage areas.

Four Odetics TCS90 CacheMachines provide clients with primary playback capabilities. These video file server-equipped units are used to support multichannel subregional feeds and to insert regional channel spots.

The system, augmented by the GWNS proprietary Traffic/Master (T/M) computer system, offers flexibility in managing multiple channels from a single location. It handles a full day's run of program material and provides on-line storage of commercials or other short-segment material.

The master-control switchers are the new Sony DVS-M1000C, which are fully integrated serial digital video switchers. The product provides a seamless interface for playback to air, which is essential in each of the facility's control rooms. Sony's Digital Betacam technology is used in all tape storage and playout applications.

The GWNS engineers designed the facility to support multiple types of compression platforms. Compression systems provide a practical solution to the transponder shortage and a huge saving for broadcasters, since they make it possible to compress up to six channels onto a transponder that previously handled only one.

Backup systems ensure 24-hour reliability

No single failure will cause a disruption of a primary program service, because all critical path equipment is redundant or can be bypassed, and all facility support systems are backed up. The redundant base facility equipment includes generators, uninterruptible power systems, chillers and air handlers. Suitable fire-protection and security systems also are provided.

Standby electrical power for the facility is provided by 1.8MW of on-site diesel-generating capacity. A 1:2 protection system is used. This is a configuration consisting of three generators, with one generator backing up the other two. The generators automatically start, synchronize and transfer all technical loads in the event of a primary power failure. Sufficient fuel is stored on-site to provide three days of continuous operations.

A 1:2 protection system also is used to back up the UPS system. This ensures that critical technical equipment never experiences a power outage of even the shortest duration. Safeguards also protect the equipment from the effects of any fluctuations in the incoming primary power. The air-conditioning equipment is redundantly configured in all technical spaces where continuous programming is handled.

Around-the-clock maintenance is provided to support all program origination and transmission facilities. The size of this technical operation justifies the maintenance of a substantial on-site inventory of spare parts and maintenance materials so that failed equipment can be quickly restored to service.

Asia Broadcast Centre is capable of distributing programming from its Singapore site to a region that extends from South Africa across the Indian subcontinent and throughout the entire Pacific Rim. Four 11-meter C-band antennas on the site provide services to the PanAmSat-2, PanAmSat-4, APSTAR-1 and PALAPA-B2P satellites. Additional antennas will be added as necessary to accommodate occasional-use clients and others.

Satellite antenna farm. Note the disks have yet to be aimed.

From the beginning, there was never a question about whether GWNS and Yarra should design a fully digital operations center.

Drawbacks of deploying emerging technology

From the beginning, there was never a question about whether GWNS and Yarra should design a fully digital operations center. The strategic partners saw several reasons why it made sense. First, a fully digital facility was the most cost-effective in the long run. Second, it was clear that the digital world was rapidly approaching and clients would be requiring a state-of-the-art facility. Finally, designing a facility from start to finish provided an excellent opportunity to make use of the latest technology available, which was in keeping with the business approach of both companies.

While a fully digital facility was the primary goal, it also meant working with untested technologies. The companies were breaking new ground in adopting some of these newly manufactured products and certain problems, while not major, were expected. The newness of the technology and the fact that

Reliable tubes are in store for you.

Varian-Brand UHF External Cavity Klystrons From CPI

Imagine a tube factory with responsive service – right next door. Then think of CPI.

Get emergency shipments of klystrons from factory stock. Expect same-day response on orders of new or refurbished tubes, or requests for engineering support. We'll even give you trade-in allowance on repair of other manufacturers' compatible klystrons.

As part of North America's largest UHF TV klystron manufacturer, we offer wide-band external cavity tubes with output power to 60 kW. Our Varian-brand klystrons are fully tested and proven compatible with EEV and Philips tubes.

The best in klystron tube manufacturing, delivery, and service is in store for you – from CPI.

Communications & Power Industries Canada, Inc.
45 River Drive,
Georgetown, Ontario L7G 2J4
(905) 877-0161 Fax: (905) 873-7416

ISO 9001 REGISTERED

Communications & Power Industries
communications & power industries canada, inc.

formerly
varian
canada microwave products

See us at NAB Booth #7131

Call toll-free for emergency service: 1-800-267-5387

Circle (86) on Action Card

the new personnel had been on a learning curve led to some creative problem-solving in getting operations up and running.

One instance clearly illustrates the staff's analytical approach to dealing with emerging technologies. Just two days before air time, engineers discovered an incompatibility between serial digital video distribution equipment vendors. To solve the problem, they used Sony Digital Betacam tape machines as digital-to-analog video and audio converters. This was clearly not the most economical solution, but it was necessary given the time constraint.

Think globally, act locally

The long-term goal of GWNS and Yarra is to invest in the talent and skills of the Singaporeans and have them totally manage and operate the facility. As a start, experienced GWNS employees flew in from Stamford to give an intensive 8-week training course to the first 90 employees hired. This staff is expected to grow.

Although Asia Broadcast Centre was modeled after GWNS' Stamford facility, it has the added appeal of being completely digital. The editing ability also is considerably greater than it is in the United States, particularly from the audio "layback" (the insertion of an additional audio track), subtitling and translation capabilities. All are services that allow the programming to be customized to the unique cultural, political, language and religious differences of the region.

Unlike in the United States, one size does not fit all in Asia. Successful programmers must present their product formatted to meet the cultures and languages of their target audience. Asia Broadcast Centre was strategically designed as a one-stop-shop operation that can adapt programming — whether it's produced in the West or created locally — to a particular culture or language of an audience.

Recognizing a major growth opportunity

Asia Broadcast Centre actually began operations when it started providing production and distribution services for the Discovery Channel's Asia feed rollout this past September.

The Discovery Channel, one of the five largest cable networks in the United States, originates its U.S. networks from the GWNS facility in Stamford, CT, and was the first client to launch from Asia Broadcast Centre. The informative entertainment network's Asia broadcast — Discovery Asia — is reaching TV audiences throughout the Asia-Pacific region. A second Discovery Channel service — the Australia/New Zealand feed — will move from the GWNS facilities in San Francisco to Asia Broadcast Centre in April, when the compression equipment is operational.

The Discovery Channel's senior vice president for International Networks, Dom Fioravanti, has described Asia Broadcast Centre as a logical next step in the programmer's continuing policy of localizing its Asia services. According to Fioravanti, "The warm reception our programming has had in Asia is directly tied to its availability, either dubbed or with subtitles, in individual languages, including Thai and Mandarin. This world-class facility will be a definite part of our continuing expansion in the Asia-Pacific region."

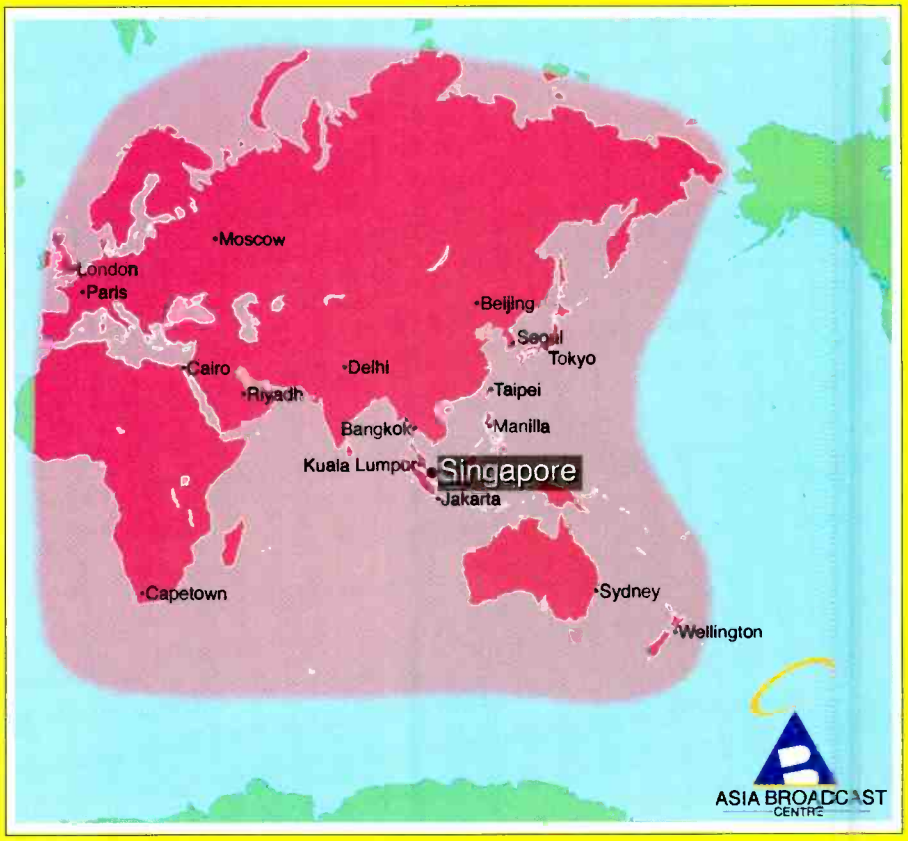
More recently, the new Sony Pictures Entertainment Channel and Liberty SportsCommunications have signed on to produce and distribute programming from the new facility.

Sony signed a multimillion dollar agreement to provide program playout, editing and distribution services for Sony Entertainment Television (SET). The company launched this new Sony Pictures Entertainment channel in partnership with Argos Communications to service the India market in the Hindi language. SET originates from Asia Broadcast Centre and is transmitted via PanAmSat-4 satellite.

Asia Broadcast Centre is supplying Sony with program origination, traffic, satellite transmission, post-production editing and graphics support along with required video library services and related support functions. Clients readily acknowledge that their relationship with the new operations center is important to the success of their venture in the Asia-Pacific.

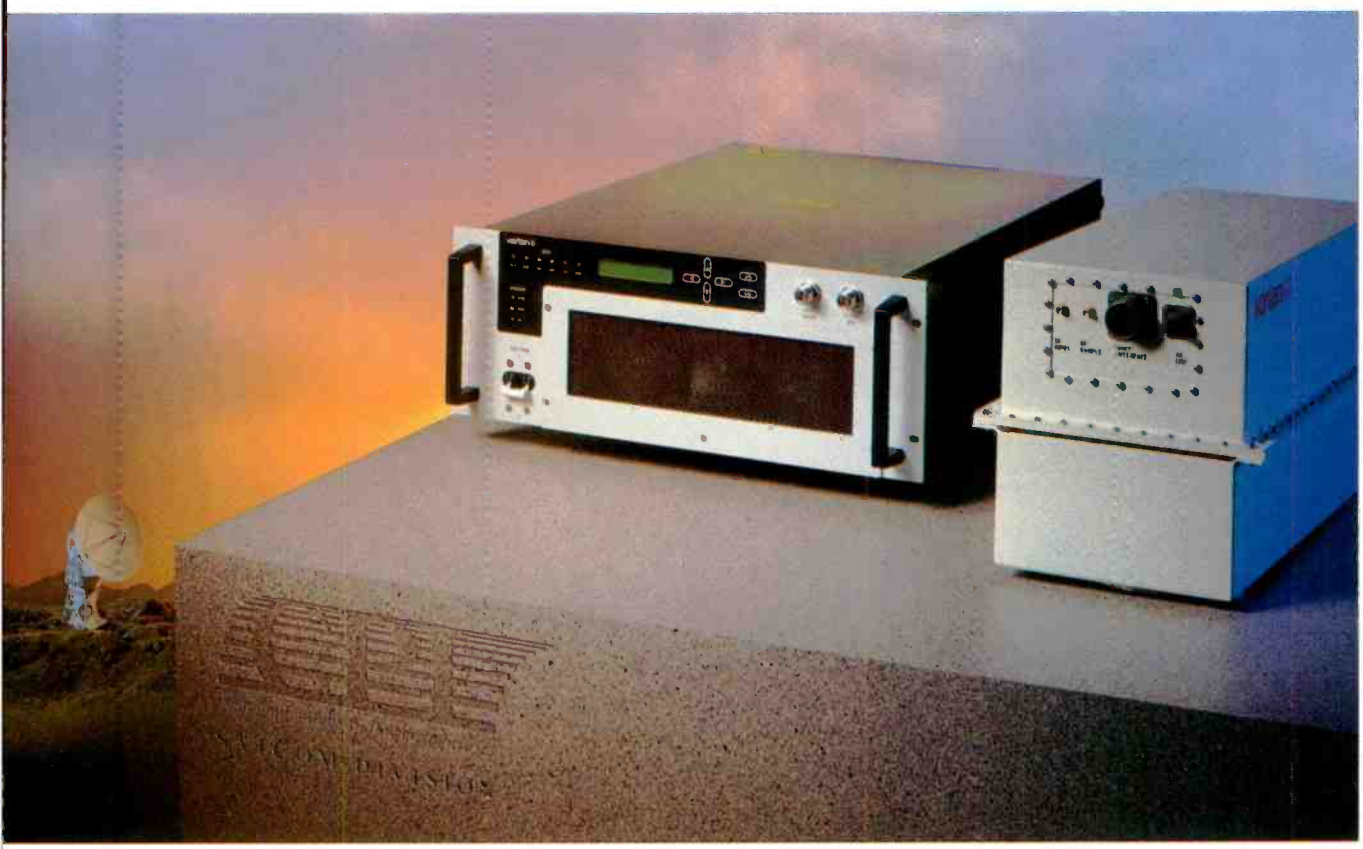
"Asia Broadcast Centre is a strategic part of Sony Entertainment Television's goal to provide high-quality, original Hindi programming to the Indian market," noted George Leitner, senior vice president, International Networks, Columbia TriStar International Television, a Sony Entertainment company. He also added that with the expertise GWNS and Yarra Films bring to Asia Broadcast Centre's full-service operations support, Sony Entertainment Television is ensured a successful ongoing presence in one of the fastest-growing regions of the world.

Liberty SportsCommunications signed a 5-year contract for Asia Broadcast Centre to provide transmission services for Liberty



From its Singapore site, Asia Broadcast Centre can distribute programming to a region that extends from South Africa, across the Indian subcontinent and throughout the entire Pacific Rim.

Solid Company. Solid State.



Proven. Reliable. Secure. Complete. That's what solid means. And that's why CPI Satcom Division is the solid choice in high-power amplifiers and networks for satellite uplinks.

As a division of Varian for nearly 25 years, we built a rock solid reputation for manufacturing the industry's most reliable and advanced TWT amplifiers.

Now, we're building on that firm foundation by introducing two new solid state power amplifiers. For outdoor as well as indoor use, they deliver high linearity that minimizes third-order harmonics for multi-carrier applications, built-in 1:1 redundancy, and on-board microprocessor driven monitor and control functions. And like all CPI Satcom solutions, they're supported by eight service centers in the U.S., Europe, and Asia.

Call us to learn more about our new solid state solutions. And find out how — now more than ever — CPI Satcom Division can keep you on solid ground.

A Solid Solution.

See us at NAB Booth #7131

CPI Satcom Division
3200 Patrick Henry Drive
Santa Clara, CA 95054 USA
Tel: (408) 496-6273
Fax: (408) 496-6235

CPI
Communications & Power Industries
SATCOM DIVISION
formerly
varian mep

ISO 9001

Circle (87) on Action Card

Sports and other TCI/Liberty Media entities. The company is now handling Asia Business News, its 24-hour news channel, which was recently launched to PanAmSat-4. Late this spring, it will launch a new music programming network, Music Zone.

Clients choose Asia Broadcast Centre not only because it offers such a good location, but also because it provides the latest in a wide range of production and distribution services.

According to Kelly Miller, director, telecommunications and distribution, Liberty SportsCommunications, "Because we are still growing our neighborhood of programmers, we needed a facility that could provide the broadest spectrum of services. Asia Broadcast Centre was chosen for the geographic location, the reputation of the partnership and the ability to service the future needs of Liberty SportsCommunications."

Supporting global business television

In addition to providing production and distribution services for such recognizable names in the TV business, Asia Broadcast Centre also expands the fast-growing business TV services of GWNS globally, and in many cases, to places where its clients now have operations. It provides the convenience of a local facility from which skilled personnel can design, install and operate a private TV network or produce occasional broadcasts.

Managing for the future

As the economies of nearly all of the Asia-Pacific countries continue to progress faster than anywhere else in the world, more and more programmers — including cable, corporate and special-events networks — will want to expand their reach to these new, untapped TV markets. The possibilities for Asia Broadcast Centre are endless. The only real challenge ahead will be in finding ways to provide for the unprecedented growth in the region in the years to come.

At the moment, GWNS and Yarra Films are putting finishing touches on their Asia Broadcast Centre — seeding the lawn, polishing the furniture — prepping it for the official opening this May. ■

Allan C. Stalker is senior vice president and general manager, Group W Network Services, Stamford, CT.

DESIGN TEAM

Transmission Facility: Edward B. Olson, senior director, Transmission Facilities, GWNS; Richard Rosevalt, manager, Transmission Facilities Engineering, GWNS; Ricky Holman, senior engineering technician, GWNS

Playback Facility: Paul Swedberg, senior director, Operations & Engineering, GWNS; Jonathan Perkes, maintenance supervisor, GWNS; Donald May, manager of engineering GWNS

Post Facility: Paul Swedberg, senior director, Operations & Engineering, GWNS; Donald May, manager of engineering, GWNS; Rodney Jay, general manager, Asia Broadcast Centre

Smart.

Any way you look at it.

VVCR

The smart high quality Digital Disk Recorder that meets the needs of professionals today and tomorrow.

VVCR has the smarts to provide a standard, fully functional front panel and industry standard rear panel connections.

The standard RS-232/422 serial connections allow VVCR to be plugged into any standard edit controller, animation controller or desktop video production system. Optional LTC, MIDI and GPI control also help VVCR integrate into any environment.

Of course, what is inside is smart too. VVCR plays and records in PAL or NTSC Composite, Component, S-VHS, or D1 video, at full CCIR 601 resolution, along with two or four channels of balanced audio.

VVCR delivers a visually-lossless image at a compression ratio of 2.5:1. Ratios of up to 20:1 are selectable for rough cut editing and to maximize storage.

VVCR combines the familiar aspects of a traditional VTR with the freedom of a nonlinear recorder. With smart features like nonlinear playback, still store, and variable play speed and loop record, the applications are limitless.

See us at NAB Booth #S1452

DRASTIC TECHNOLOGIES

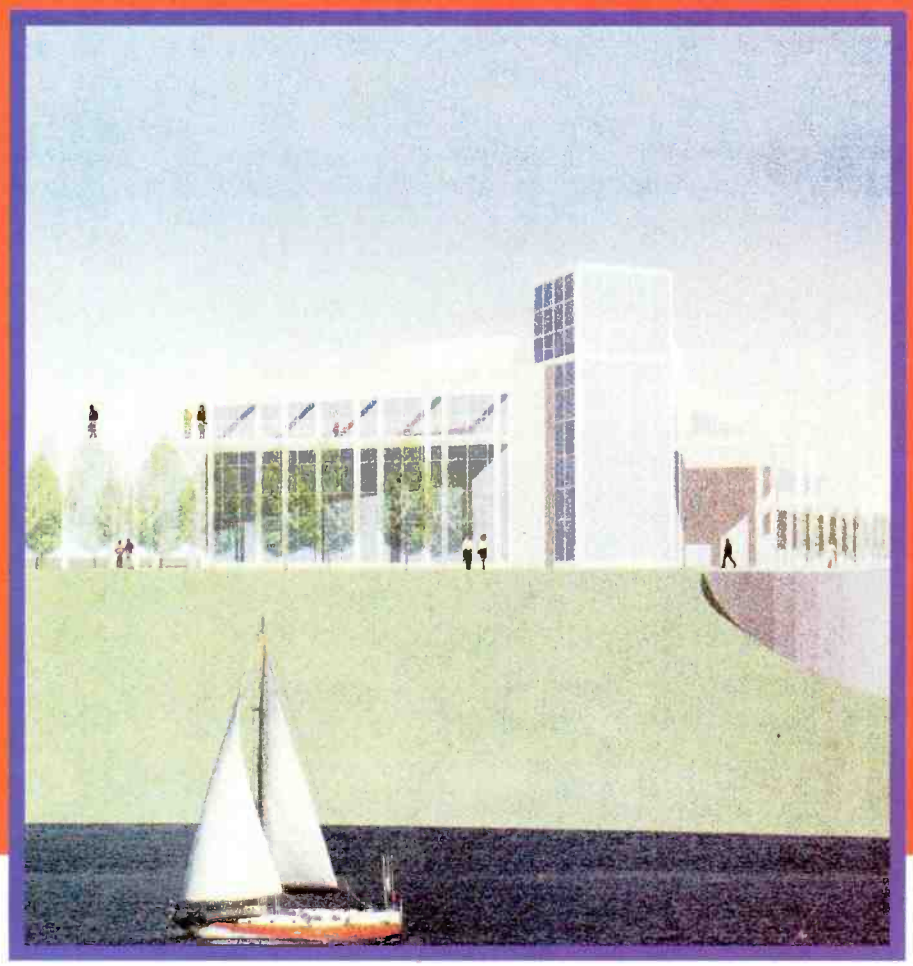
For South American sales contact:
Gendra Broadcasting Corporation
Tel: (305) 372-8845
Fax: (305) 372-0757

For all other inquiries contact:
Drastic Technologies
37 Kodiak Crescent #6
Downsview Ontario Canada, M3J 3E5
Tel: (416) 636-4444 Fax: (416) 636-4454

DRASTIC VVCR

Circle (97) on Action Card

By Jerry Whitaker



KPTV leaps to the digital future

This pioneering station is still planning ahead.

The Bottom Line:

The accrued knowledge of a veteran is always worth observing, so when a fortysomething TV station decides to build a new home, it's time to pay attention. This project also provided some unexpected lessons, courtesy of Mother Nature. $

It doesn't happen very often in the life of a TV station, but when it does, watch out. No effort can quite compare with the work, exhilaration, frustration and rewards of relocating a TV station to a new facility. And when you're facing a tight timetable and terrible record-breaking weather — including wind storms, ice storms, torrential rain and widespread flooding — the fun is almost too much to bear. Such was the case as KPTV (owned by Chris Craft Broadcasting and an affiliate of the United Paramount Network) Channel 12 in Portland, OR, began and finally completed (on time) its change of venue. (See sidebar, "Test of Fire," p. 105.)

Above: Artist's conception of the new KPTV building in Portland, OR.

The lessons learned in this project tell us something about where local broadcasting is headed, and how future-minded stations are preparing for it.

A long overdue move

KPTV, Oregon's first TV station, has a rich tradition as an industry and community leader. When its signal aired for the first time in September 1952, KPTV was the world's first UHF TV station. (See sidebar, "In the Beginning, There Were Coils," p. 106.)

The station's old building has a history similar to many other TV stations. Over the past few decades, it expanded to adjoining space as leases expired and opportunities permitted. The end result was a confusing, inefficient maze of offices, technical areas and studios. New employees considered making maps of the floor plan so they could find their offices. Clearly, the time had come and passed several times, for construction of a new facility.

But TV stations being the bottom-line-oriented operations that they are, any serious effort to move the station was delayed, and then delayed some more. The staff did the best they could with what they had available.

WHEN HUGO BLEW OUR ANTENNAS AWAY,

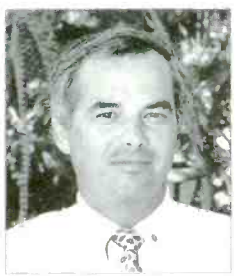
UPDATE: STILL WATCHING!

Dozens of towers went down in the record breaking '95 Hurricane Season. *EVERY* PiRod tower is still standing!

For custom engineered tower design in high wind areas, call PiRod at (219) 936-4221.

Solid rod, free-standing or guyed towers custom designed to your specifications.

OUR PIROD TOWERS JUST STOOD THERE AND WATCHED.



David Sharp
Vice President, Operations
The Virgin Islands
Telephone Company

"When Hugo hit, our solid rod PiRod towers just stood there and took it. The storm ripped away many structures in this area . . . I think our PiRod towers were among the very few towers left virtually undamaged. I remember . . . I purchased new antennas, called the people at PiRod for new brackets and we were back in business!"

Solid Rod, Solid Service, Solid Value

For a free guide to tower selection and fast, courteous response to your requests for quotation, contact:

PiROD INC.
P.O. Box 128
Plymouth, Indiana 46563-0128
Telephone (219) 936-4221

Circle (98) on Action Card

Old building, new technology

Despite the less-than-ideal layout of the physical facility, KPTV has been a leader in the move to digital television. The station was a test bed for Sony's library management system (LMS), working with engineers in the United States and Japan to optimize the software for reliable and efficient on-air operation. The station also embraced the D-2 tape format early on and has moved to digital fiber-optic program delivery to its transmitter site.

Technical improvements at KPTV, under the direction of chief engineer Val Roberts, have been steady and numerous. It is no surprise, therefore, that when given the opportunity to construct a new facility from the ground up, Roberts and his team jumped into it without hesitation.

The central component of the new facility is the Sony serial digital master control switcher.

New building, new technology

The design of a new TV station provided KPTV with a golden opportunity to accomplish several goals that it saw as critical to its long-term success:

• It offered the ability to redefine the operating paradigm of KPTV. The physical constraints of the old building enforced a certain set of operating parameters for the station. Like many other stations, departmental divisions and organizations are dictated as much by the physical facility as by logic. Building a new facility from a vacant lot provides management with the opportunity to quite literally start with a clean piece of paper and ask, "How do we want our station to function?"

• It offered the opportunity to incorporate new technology into the new facility. The move actually *encouraged* the use of new technology in the facility, especially for key components of the technical center like the master control switcher. The KPTV/Sony development partnership came together again for this project, with the purchase and installation of a new DVS-M1000C component serial digital master control switcher, a Sony library management system cache and BZA-8100A multichannel transmission software for the Sony LMS. KPTV is the first U.S. broadcast station to purchase and to use the multichannel transmission software on air.

• Finally, the move provided the vehicle with which to launch a new public image for the station. The promotional value of the new facility, situated on the east bank of the Willamette River, was not lost on KPTV's management. The station is located adjacent to the popular Oregon Museum of Science and Industry (OMSI) and directly across from Portland's Riverfront Place development, an upscale area of restaurants, shops, condos and a marina. Plus, the new building (and its 12-foot tall neon "12" sign) is clearly visible from any one of several heavily traveled freeways across and around the river.

The importance of the latter point should not be dismissed too lightly. A TV station needs to be more than just a conduit for programming to viewers. Twenty or even 10 years ago, just delivering a good signal to viewers was enough for a station to be successful. That's clearly not the case today. It is KPTV's desire to use this new visibility as a springboard to increased involvement in the community. Coincident with the new facility are a new news set and, this fall, a new all-local morning newscast.

The technical facility

Ground was broken for the new facility on Aug. 1, 1995. Just over seven months later, personnel began moving into their offices in the 45,000-square foot, 3-story building. The transfer of technical facilities was (predictably) a delicate tightrope walk. As much of the technical center as possible was built up and checked out before any key pieces of equipment were removed from the old facility. The previously mentioned purchase of a new master control switcher and other related hardware helped in this regard.

The first critical move involved one of the station's two LMS systems. In typical operation, one of the LMS units is used for program record and playback, and the other for spot record and playback. The program machine was moved first. This required operators to take over the duties of the LMS on a manual basis for a period of a week or so. Those duties were significant: recording 130 programs each week and playing

The exterior of the building is impressive. A riverside terrace on the ground floor is available for employees during lunch, and another terrace on the third floor is available for VIPs.

Where do we go after 44 years of leadership in television test and measurement?

Here. And here.

Our all new MTS100 MPEG Transport Stream Test System is the first instrument of its kind, integrating creation, generation and analysis of MPEG-2 transport streams.

Multi-format analog and digital test signal generation, plus a modular, expandable architecture, enable the new TG2000 to meet today's needs as well as future requirements.

Year after year since 1952, the test instruments used to create an industry have come from Tektronix. This year is clearly no exception.

For 525 or 625 line standards, for digital and analog formats, and even for the latest MPEG-2 compressed video and audio, only Tektronix continues to deliver all the design and manufacturing test solutions you need for today's evolving worldwide television technologies.

Our two latest instruments – the MTS100 MPEG Transport Stream Test System and TG2000 Signal Generation Platform – will help TV test engineers take analog and digital television to the next level.

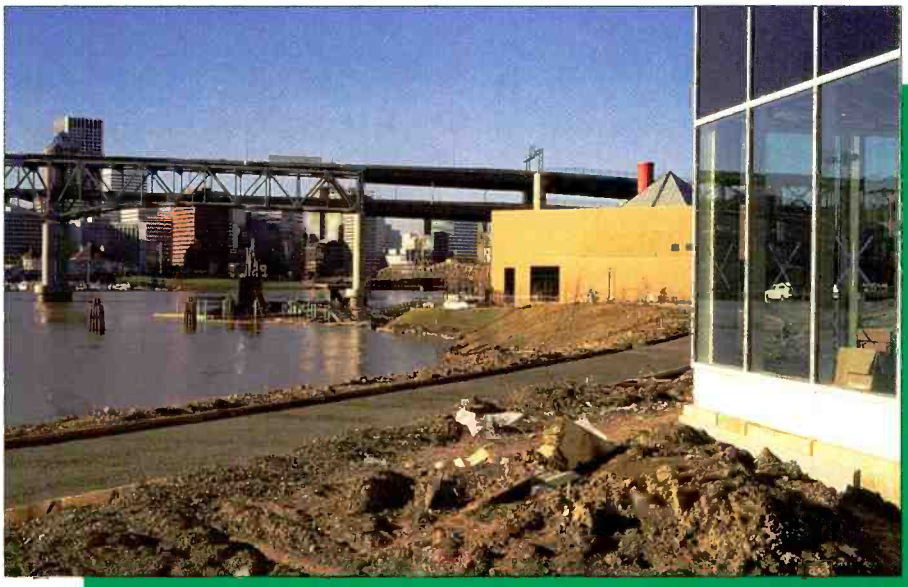
Wherever you're going in the world of television, Tektronix instruments will be there. Year after year.

For information on Tektronix communications test solutions, just call 800-426-2200. (When prompted, press "3" and ask for program 455.) Or, find us on the Web at http://www.tek.com/mbd/w455

TESTING THE CHANGING WORLD OF COMMUNICATIONS

Tektronix

Circle (108) on Action Card



The new KPTV studios are located on a tract of land along the Willamette River in Portland that is being developed as a business/residential waterfront complex.

back to air 220 programs a week. Next, came the spot LMS. During its leave of absence, spot reels were made for on-air playback. The staff had the opportunity to remember how they did it in the "good old days." The experience was not particularly enjoyable.

The effects of the changeover rippled throughout station operation. For example, the traffic department was required to finish the log far earlier than normal, and there was no such thing as a salesman filling an availability in the 10:00 news at the last minute. Schedules were set, and they were kept.

The KPTV engineering staff orchestrated the change from one facility to the next with no discernible disruption to viewers. There were, however, many long days and harried trips from the old facility to the new one. The news operation was the last to move out of the old building. During the tail end of the changeover, the news programs were switched out of the station's remote production truck.

Pulling cable

Naturally, construction of the new building was handled by a variety of contractors. All of the technical facilities, however, were designed and installed by chief engineer Roberts' staff. This work included everything from cutting cable holes in concrete to pulling cables to final system checkout. The project proved to be a monumental task for the engineering and operations departments. Keeping a station on the air during a move is one thing; keeping it on the air while you build a new facility and then move into it is quite another.

A number of innovations and process shortcuts were devised to move the project along, while maintaining a high degree of reliability. Clearly, the engineering staff had to do it right the first time. There simply was no room for extensive troubleshooting. It had to work on schedule.

Figure 1 shows a simplified floor plan of the new technical facility. The core equipment/rack rooms are flanked by master control, tape control (LMS) and tape storage. The production suite is located across the hallway, with its own tape machine room and audio booth. The station's two studios are down the hall from master control. The larger of the two (60'x56') is used for program and production work; the smaller (60'x44') is dedicated to news. Engineering management, repair and storage areas complete the technical center.

Backup air conditioning under computer control is provided for the technical center and the studios. Security card readers are installed at all entrances to the technical areas to prevent unauthorized entry.

The move to the new building was accompanied by new computer systems for news and traffic. The interconnecting network for the facility also was designed and installed by Roberts' staff.

The big switch

The centerpiece of new technology at KPTV is the serial digital master control switcher and the supporting LMS cache, which integrates smoothly with the station's two LMS systems. KPTV's purchase of the Sony LMS cache/BZA-8100A control software gives the station an automated non-linear access buffer to the LMS that houses its library of commercials. The cache minimizes wear and tear on the spot LMS, which plays out approximately 500 events a day. The cache also positions the station to take advantage of future ATV possibilities.

The combination of a tape and hard-drive system offers a number of advantages and efficiencies. The caching system consists of a 32GB RAID system that provides about 3½ hours of randomly accessible 4:2:2 digital video. The LMS acts as the server, filing and holding all of the station's inventory of commercials. Material is automatically fed to the RAID, where it is available for nonlinear playout to one of several channels.

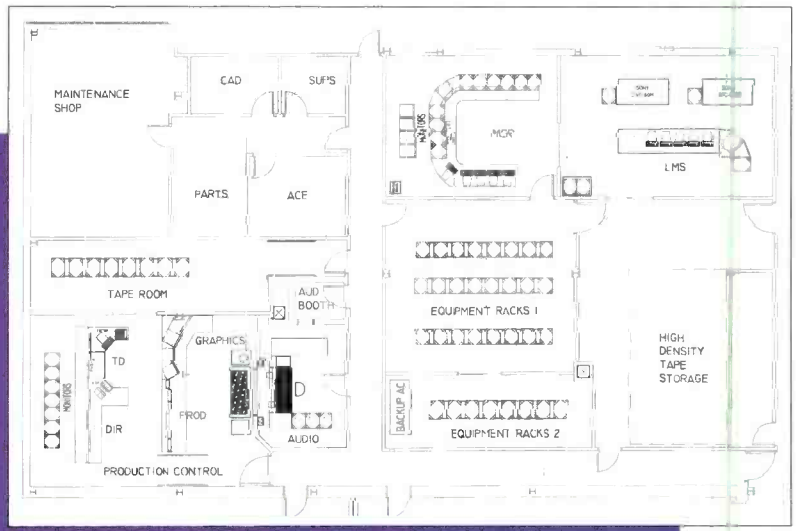


Figure 1. Simplified floor plan of the technical areas of the new KPTV building. All broadcast functions are built around a centralized technical core, which includes two equipment rooms and master control. (Courtesy of KPTV.)

Hard Disk. Easy Choice.

Who Says You Can't Buy Experience?

A disk system is just another piece of computer hardware—until you add the decades of broadcast experience that only Odetics offers. Broadcast expertise makes the SpotBank™ from Odetics your most flexible, cost-effective, and dead-on reliable choice in on-air disk systems.

Actually a complete family of format-independent disk automation systems, SpotBank integrates network sources, programs and spots as well as tags and other still images for single and multi-channel applications. It has all the features you need:

- Control of up to 24 devices—digital disks, VTRs, and a variety of switchers
- RAID3 disk controller provides redundancy to protect against data loss
- MicroSpot™ option for easy news replay
- Interfaces for all popular traffic systems
- MediaPrep™ software automates dubbing new spots to disk
- Four playlists on one screen allows single operator control
- *Smart* management of disk storage prevents fragmentation

So don't compromise on your bottom line. Odetics knows disk technology as well as we know broadcast. That equals an easy choice for you.

Call today to (800) 243-2001.

See us at NAB Booth #8237

Director of Sales	Northeast	Southeast		West	South Central	Canada
Bill Keegan	George Anderson	Emerson Ray	Odetics Broadcast	Chuck Mart n	David Scally	Applied Electronics
(714) 774-2200	(609) 953-9101	(813) 960-0853		(702) 256-7001	(404) 917-9506	(905) 625-4321

Circle (109) on Action Card

In addition to controlling the KPTV LMS cache, the BZA-8100A software incorporates basic control of the master control switcher. The serial digital switcher was a logical choice because of the flexibility that it offered over the long term. Replacing a critical element, such as a master control switcher, is not something that stations like to do any more often than absolutely necessary. The average life of a switcher at most stations is 10 to 15 years. Serial digital clearly is a safe choice for the next decade.

A critical part of planning the core technical operations of the LMS/cache/switcher was how to optimize the station's move from a hybrid analog/digital facility to an all-digital facility without replacing the large inventory of valuable analog equipment. Another important aspect was software. The capabilities built into the core system had to provide flexibility and reliability. Efficient file management was important as well, in order to minimize operator intervention, as was the human interface. KPTV worked with Sony to optimize all of these criteria.

Looking toward the future

KPTV management has built in as much flexibility as possible into its new facility. In some areas, the likely future uses are clear, while in others they are not. For example, chief engineer Roberts sees a day not too far off when the room dedicated to tape-cassette storage will be significantly reduced in size or even eliminated altogether. When that day arrives, the tape-storage facility will be converted into another production control room. Other future areas of operation, however, are not so obvious. What the future holds for HDTV and/or multichannel broadcast television is anybody's guess. Rather than placing their bets today on how the business will look in five years, KPTV maximized versatility in the new building's physical layout.

KPTV has built as much flexibility as possible into its new facility.

Although certainly not a unique project, the renovation of KPTV illustrates the work being done at many facilities to maximize the potential of existing resources, and to lay the groundwork for broadcast television in the year 2000 and beyond. Such efforts are necessary to ensure that broadcasting as we know it survives and prospers in the face of a multitude of new services and competitors. ■

Jerry Whitaker is a contributing editor to *Broadcast Engineering* magazine and chairman of the NAB/SBE Engineering Conference Committee.

DESIGN TEAM

Architect: Zimmer Gunsul Frasca Partnership
Builder: Baugh Construction
Developer: Melvin Mark Properties
Key KPTV Personnel: Martin Brantley, president and general manager, Val Roberts, chief engineer, Dennis Beauchamp, assistant chief engineer

Test of fire

When you are rushing to complete a big project, the last things you need are unexpected delays and lost work days. The KPTV project endured more than its share of these, in the form of environmental calamities. The new facility and its construction process were subjected to (and passed) a number of tough tests, including:

- **The wind test:** This past winter, northwest Oregon experienced some of the strongest wind storms in recent history, knocking down power lines and trees, and leaving large parts of the metropolitan Portland area without power for days. Construction at KPTV continued, but delays were unavoidable.

- **The ice test:** Portland is not accustomed to snow and ice storms, so when they do arrive, the city basically shuts down. So the ice came, and everybody stayed home. Naturally, construction at KPTV slowed down during these periods, as well.

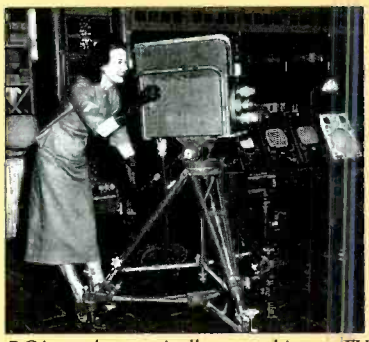
Water everywhere. In the Northwest, they're used to rain, but not this much, this fast. So much and so fast, in fact, that thousands were left homeless by rising, out-of-control rivers.

- **The flood test:** Portland is accustomed to rain, and sometimes lots of it, but not nearly as much as it got in February. This was enough rain to bring President Clinton to Portland to view flood damage in the region. Thousands were driven from their homes by rising flood waters and, for a time, the downtown Portland waterfront was threatened. The new KPTV building was in a precarious location right on the Willamette River, as the river inched up to near-record levels. Of course, construction slowed again as workers fought the rain and the mud. Fortunately, the river crested several feet below the front door.

Workers at KPTV were tempted to ask, "What's next?" but they were afraid of what the answer might be. ■

In the beginning, there were coils

On Sept. 20, 1952, at 4:30 p.m., KPTV aired its first telecast. It was a historic event, because KPTV was the world's first commercial UHF station. The station was built and owned by the Empire Coil Company. The firm was started in New Rochelle, NY, by Herbert Mayer in 1944 with five employees. Mayer was a New York lawyer until World War II, when he became involved in the electronics business to help the war effort. After VJ Day, his company began to manufacture radio coils and transformers. In 1949, Mayer bought and developed WXEL-TV, a VHF station in Cleveland, OH.



RCA made practically everything a TV station needed in those days, from cameras to transmitters.

In August 1952, Empire Coil purchased a 2½-year-old RCA experimental UHF station in Bridgeport, CT. The transmitter was dismantled and shipped to Portland, where it was reassembled by the same RCA engineers. The first program was broadcast just 26 days after ground was broken for the transmitter building — rapid progress by any measure of comparison.

KPTV signed on with a speech given by Mayer, followed by NBC's *All Star Revue* with Jimmy Durante and Margaret Truman. *Your Show of Shows* with Sid Caesar and Imogene Coca followed at 5:30 p.m. Regular full-scale programming began on Oct. 1 with the World Series. (The Yankees beat the Brooklyn Dodgers, four games to three.)

As in other parts of the nation, TV mania swept the region. Etiquette columns in the local paper urged consumers to purchase sets for the dining room to prevent families from eating in the front room. "Meals can be eaten properly and comfortably and Junior's bread crumbs and father's pie á la mode present no danger to expensive rugs," read an ad in *The Oregonian*. Non-TV set owners

The original KPTV building, built in the early 1950s, shows the station's original UHF frequency, Channel 27. The station moved to Channel 12 in 1957.

The First Affordable Studio Automation System For Less Than $20,000.

ParkerVision's Three-Chip CameraMan® Systems

For a broadcast-quality camera system that offers maximum performance *and* value, look no further than ParkerVision's three-chip CameraMan® product line. Designed for those applications that require a high-performance three-CCD camera, ParkerVision Three-Chip System II CameraMan® Systems provide high resolution, high signal-to-noise ratio, and excellent color fidelity. Plus, these systems incorporate all of ParkerVision's exclusive camera-control technology with features such as *auto*TRACK™, *Whisper*DRIVE Plus™, Digital RF-900™ keypad control, and exceptional location preset accuracy. And with prices starting under $20,000, it's easy to see that ParkerVision offers unmatched systems at unbeatable prices.

Direct the camera's movements from a PC with our exclusive Windows™ Interface.

Standard Features Include

- Integrated Pan/Tilt Camera System
- Studio Automation
- Multiple-Camera Control With RS-485
- Up To 125 Location Presets (±.125° Location Preset Accuracy) Presets Store: Pan/Tilt, Zoom, Focus, And Image
- *Whisper*DRIVE Plus™ For Quiet Operation
- Controlled by RS-232, Digital RF-900™, Or Hard-Wired Keypad Control
- Field-Upgrade Capability
- 13x Or 17x Lens Option

Optional Features Include

- Integrated *auto*TRACK™ Capability With Wireless Audio
- Windows™ Interface, Front-End Control With Shot Profile Recall

ParkerVision's three-chip camera systems allow you to control multiple cameras from a single point.

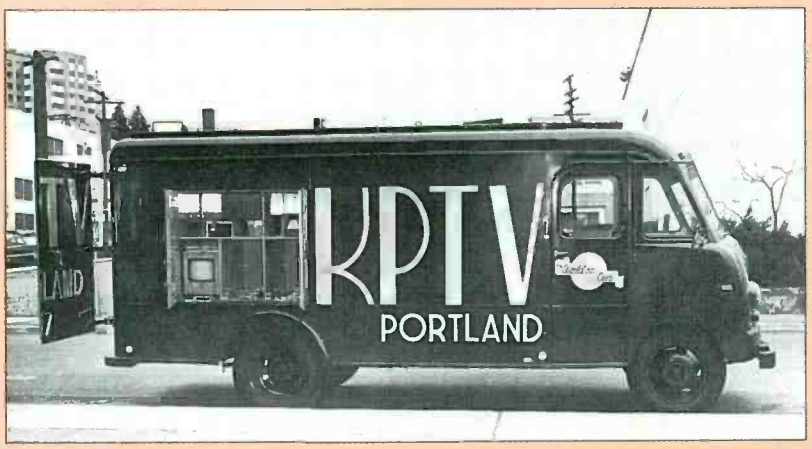
See The Three-Chip CameraMan® Systems Demonstration At NAB '96, Booth S1464.

PARKERVISION®
Visibly Better.™

Schedule a videoconference or on-site demonstration.
Call 1-800-532-8034 Today.
International, call 904-737-1367.

Windows is a trademark of Microsoft Corporation.

Circle (111) on Action Card



The KPTV remote truck, pictured in 1955.

watched an average of 12 hours a week at others' homes, and it was rumored that in some communities, baby sitters snubbed non-set owners.

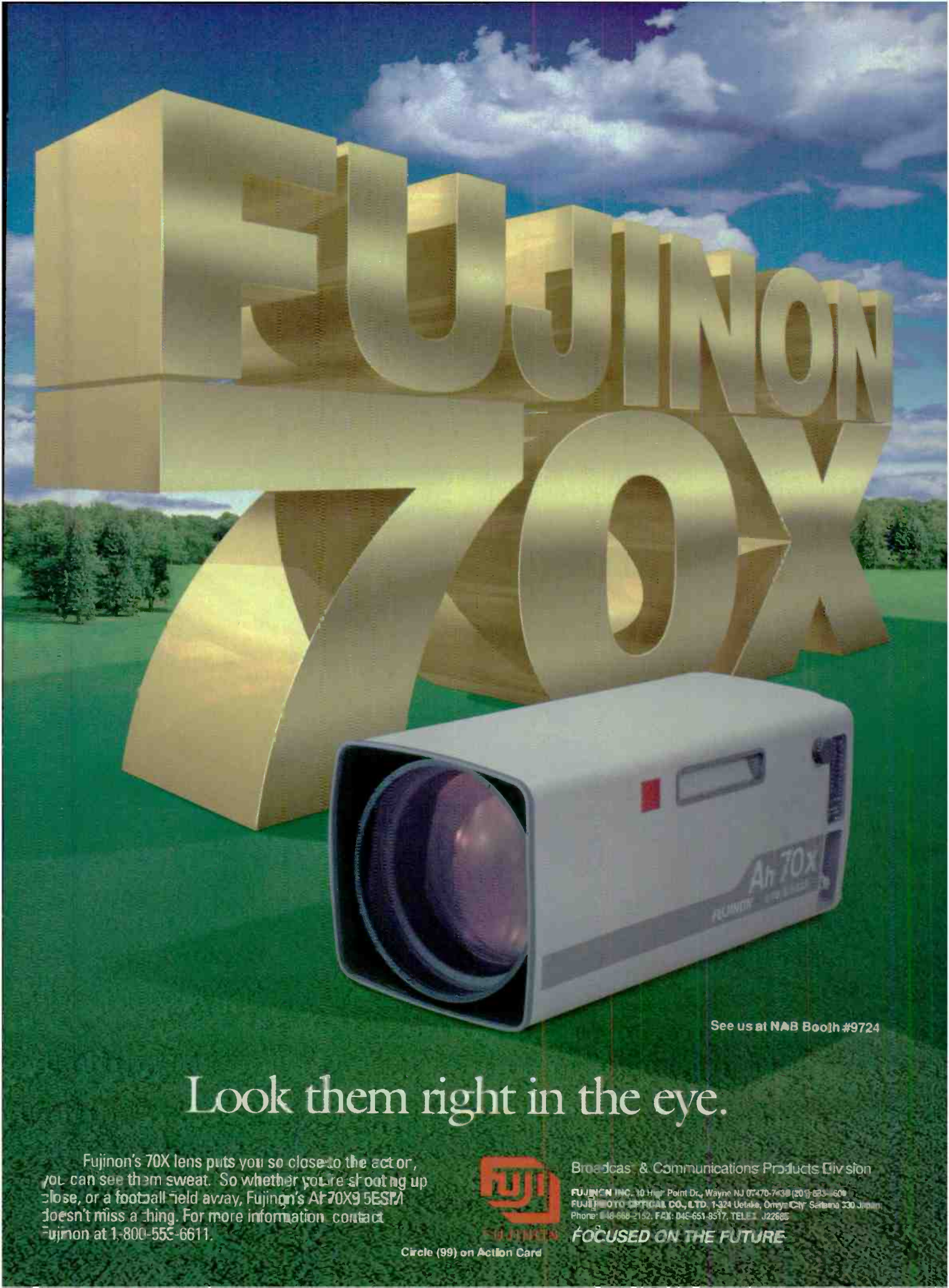
Optometrists offered special TV-watching glasses to prevent "telestrain" and viewers were advised to shift their gaze when viewing for long periods to prevent other undefined eye problems. In studies done at the time, two-thirds of those polled said they did less reading, and two-thirds did less visiting. Magazine readership went down 25%, as did patronage in local bars and taverns.

Because KPTV was a UHF station, new receivers had to be modified at the factory for sale in the region. Dealers could not keep sets in stock, and waiting lists of up to six months were reported. Sets were expensive by 1952 standards, and even by today's standards, with costs ranging from $200 to $400 (remember, that's for monochrome). Nevertheless, six months after the station signed on the air, more than 70,000 sets had been sold in the Portland area alone.

After three weeks on the air, KPTV's commercial schedule was sold out. Eight seconds of air time went for $17.50, one minute for $35 and 52 half-hour programs were sold for $127 each. Viewer polls showed that 24% of viewers preferred animated cartoon-type commercials. Only 1% preferred the pitchman-type commercials that advertisers thought would be perfect for the medium.

Some things haven't changed much since 1952. In November of that year, Mayer was quoted as saying that, "Some of the programs were downright improper for children. I don't let my own watch it too much."

In 1957, after a change of ownership, KPTV was switched to Channel 12, having given UHF the good fight. More than a decade would pass before UHF became a strong medium for television. UHF stations today owe a great deal to pioneers like KPTV who tackled the tough technical problems and educated and interested viewers in the new band. ■



See us at NAB Booth #9724

Look them right in the eye.

Fujinon's 70X lens puts you so close to the action, you can see them sweat. So whether you're shooting up close, or a football field away, Fujinon's Ah 70X9.5ESM doesn't miss a thing. For more information contact Fujinon at 1-800-553-6611.

Circle (99) on Action Card

Broadcast & Communications Products Division

FUJINON INC., 10 High Point Dr., Wayne NJ 07470-7438 (201) 633-5600
FUJI PHOTO OPTICAL CO., LTD. 1-324 Uetake, Omiya City Saitama 330 Japan
Phone: 048-668-2152, FAX: 048-651-8517, TELEX: J22605

FOCUSED ON THE FUTURE

By Charles Waltner

ATV: the price of admission

Stations must choose between staying with traditional programming or multimedia experiments.

The Bottom Line:

Local TV stations face a difficult transition into the digital era. Switching over to the new advanced TV (ATV) broadcasting standard could cost each operation as much as $15 million. How will stations be able to afford it? Many hope that ATV will not only deliver the high-definition digital picture promised by the technology, but will also bring in new revenue opportunities. Where are these opportunities? That's the big question. —*S*

TV broadcasting executive Don Wilkinson, vice president and director of engineering at Fisher Broadcasting Inc., Seattle, is caught between a rock and a hard place. Like many of his peers, he bravely accepts advanced TV (ATV) technology as the industry's future broadcasting standard, but he is fearful of its costs.

Executives estimate the setup cost for ATV will be from $2 million to $15 million per station. Even for the largest companies the investment to switch to ATV will be a tremendous burden. Wilkinson and others, however, realize that they must make a commitment to ATV if local broadcast stations are to survive the digital revolution. "ATV is the price of admission to the future," Wilkinson said.

This financial quandary leaves broadcasters with one looming question: how will they make money from this breakthrough technology and recoup their investment? For some broadcasters, the current answer is that they won't make any significant new revenue from ATV and will simply have to swallow the costs of moving into the digital era. They believe that broadcasters will be best off by sticking to what they do best — providing local programming content and generating revenue by selling advertising for their shows.

Other broadcasters tentatively expect to find some benefits from the ancillary data services ATV will make possible for broadcasters to provide. Then there are the optimists who believe that ATV is TV broadcasting's oyster and will offer local stations a world of new revenue opportunities.

Stick to the basics

The first scenario for broadcasters is to do more of the same with ATV. Broadcast veterans, such as Jack Clifford, president of the Providence Journal Broadcasting Corporation, Providence, RI, who owns a cadre of stations across the country, are cynical about the brave new world of digital television. Currently, he and others are unconvinced that there are any services they can profitably offer with ATV besides traditional TV programs.

Clifford was in the business the last time the industry switched standards — when it went from black-and-white broadcasts to color. Clifford said that he and his colleagues thought that technological

The biggest name in studio lenses.

In television studios around the world, Fujinon zoom lenses continue to set new performance benchmarks. Our Ah20X8 is the industry standard for newsroom production, and the Ah20X7 has an extremely wide angle for creativity. The Ah24X7 combines this wide angle of view with high zoom ratio to deliver unparalleled flexibility. For more information about these exceptional studio lenses, contact Fujinon at 1-800-553-6611.

See us at NAB Booth #9724

Circle (103) on Action Card

Broadcast & Communications Products Division

FUJINON INC. 10 High Point Dr., Wayne, NJ 07470-7434 (201) 633-5600
FUJI PHOTO OPTICAL CO., LTD. 1-324 Uetake, Omiya City, Saitama 330 Japan;
Phone: 048-668-2151, FAX: 048-651-8514, TELEX: 22885

FOCUSED ON THE FUTURE

improvement would bring in a flood of new revenues, but it didn't. They even set up two different advertising rate cards, one for programs broadcast in black-and-white and one for color. This historic scenario is akin to broadcasters' current contemplation of using ATV in two formats, ATV and lower-resolution standard definition television (SDTV).

"We thought, 'Oh, boy, we're going to make more money with color.' But instead, advertisers told us to go to hell. We never got one thin penny back from our investment in color," Clifford recalls.

But this historic precedent does not mean that broadcasters will not make money from ATV. It simply means that their revenue will come from the same place as always, advertising sold to accompany quality local programs. And though broadcasters such as Clifford are cynical about finding a pot of gold at the end of the ATV rainbow, they haven't ruled out the possibility.

"If I could find some service in the DMA that would be in demand, I would do it," Clifford said.

Multimedia close to home

The digital nature of ATV will allow broadcasters to not only send video signals for TV programming, but also allow them to send ancillary data communications signals. Some of the technically viable options would be Internet or multimedia data communications, stock quotes, paging services or audio feeds similar to radio. Basically, the remaining megahertz capacity of an ATV system (that portion of the 6MHz system not taken up by ATV) would allow broadcasters to provide most types of over-the-air data communication.

The digital nature of ATV will allow broadcasters to not only send video signals for TV programming, but also allow them to send ancillary data communication signals.

The problem with broadcasters offering these services is that most are already provided effectively by existing industries. Many companies offer easy Internet access, albeit with ground wires, while phone companies cover paging, and, of course, most radio stations do their work just fine.

But industry veterans, such as John Abel, the former National Association of Broadcasters' point man on ATV, believes that broadcasters can reap additional revenue from the auxiliary bandwidth. To do so, they must stick to their forte just as Clifford suggests. But instead of simply broadcasting linear video feeds of their programs, TV stations can repackage their content, such as news and local information, into a multimedia format similar to what is now available on the Internet. This service will be provided free and supported by ads, much in the way that content on the Internet is now sponsored by advertising.

Up to 75% of a local broadcasting station's news coverage is never aired. Abel said that ATV will also allow stations to repackage this type of excess information cheaply on SDTV channels. Fisher's Wilkinson said that this solution is not as easy as it sounds. Creating quality programming is expensive any way you cut it. It is challenging enough for a local station to produce compelling content for one channel, let alone two or more.

Another of Abel's scenarios is for broadcasters to charge a company, such as Chrysler, for providing additional multimedia information about its product via an ancillary data system. For example, the car maker would run a traditional image ad about its Jeep Grand Cherokee during a traditional newscast. The ad, however, would include a reference to the station's ancillary service. If consumers were interested in a Jeep, they could call up the information either on their television or PC to find detailed information about the various models or options for Jeeps, information on other Chrysler cars and trucks, lists of dealers in the area or any other information a potential Jeep buyer might want. Broadcasters would benefit by charging extra for this advertising option.

Like Clifford, Abel emphasized that broadcasters must stick to their roots of delivering free programming and information that is supported by advertising. He said that subscription services for data communications is a field already tilled by many other companies. Opportunities for gaining revenue from transmission-for-hire services may develop after the early stages of the technology, however.

Unlimited options

Other TV broadcast industry soothsayers are even more bullish on the profitability of ATV than Abel. Walter Miao, a vice president with the Framingham, MA, research consultancy IDC/Link Inc., said that broadcasters will have an abundance of opportunities for selling access to additional information via ATV. Unlike many industry observers, Miao said much of broadcasters' revenues with ATV will come from subscriptions in a pay-per-program structure, rather than from advertising. In his view, ATV will meld with some aspects of the PC, but the PC and television will remain as separate electronic appliances. Like Abel, he sees success for broadcasters tied to their ability to link data and information to traditional programming. Unlike today's NTSC, ATV will free broadcasters to deliver data in any multimedia format, including text, graphics, video streams and audio streams. Likely targets of this service would not just be general consumers, but also educational institutions or businesses.

Content quality will ultimately determine broadcasters' success in the digital future.

"What we're seeing here is information on demand," Miao said. Broadcasters will also need to make searching through ATV's information options easy for the average couch potato. As such, broadcasters must develop some simple, yet powerful, navigation tool — an interactive TV guide of sorts.

Basically, Miao's vision of ATV approximates today's concept of interactive television. But to make ATV interactive, broadcasters will need to find an avenue for a return signal from consumers' homes. Miao said that the regional Bell operating companies could prove the perfect partners for this cause. Broadcasters could deliver the bulk of data over the air to consumers homes, while telephone lines could carry out the less data-intensive return signal. This arrangement would help the Bell companies get a piece of the TV pie while staying out of the content business, which they are far from prepared to enter. Also, partnering with broadcasters will allow Bell companies to defer the costly build-outs necessary for creating a data communications infrastructure capable of handling interactive TV signals.

Content quality will ultimately determine broadcasters' success in the digital future. But even Miao couldn't guess at what the configuration of this content will be. The correct model for delivering multimedia information will only emerge after several reiterations. In other words, broadcasters will need to gamble with real tests of their services rather than waiting to be handed a safe answer.

Regardless of what revenue options broadcasters believe will evolve from ATV, they know one thing for certain: it is crucial to their survival. "If we don't embrace this technology, we will be the last buggy whip manufacturer," Wilkinson said. ■

Charles Waltner is a free-lance writer based in Seattle covering new media technology.

The broader your vision, the better we look.

When you need satellite communications services, our fleet of Galaxy and SBS satellites can deliver the broadest possible range of services in the business. All with the unequaled level of quality and reliability you expect.

As the world's premier satellite operator, Hughes Communications' satellites provide service to business and entertainment leaders around the globe. So, if telecommunications are vital to the vision of your business, give us a call at 1-800-542-2538. We'll show you just how much better we look.

HUGHES
COMMUNICATIONS
A HUGHES ELECTRONICS COMPANY

Circle (101) on Action Card

CBS on (digital) course

By the *BE* staff

You can talk about the ideal way to make the transition from analog to digital, from composite to component, from tape to server technology, to high definition and beyond — but "The map is not the territory." Darcy Antonellis, vice president, Technical Operations for CBS Inc., discusses how the network has charted its course.

BE: *Of the major networks, CBS is the only one that seems committed to a composite digital approach. Why is that? What defined that course?*
Antonellis: Interestingly, we found ourselves committed to that approach some years ago. At that time, the big push came from our need to replace ACR25s. At that point, you had the MII option, you had Beta options and you had a digital composite option, D-2. A decision was made that as an entree into the digital domain and in the interest of preserving quality through multiple generations, D-2 would be a good investment. At that time, we began to eliminate our ACR25s and purchase 10 LMS (Sony Library Management System) machines using D-2 VTRs.

BE: *Your programming plays back from what?*
Antonellis: Ninety-nine percent of our programming plays back from D-2. We are a D-2 house. We have the 10 LMS machines that are all D-2 format. We have a D-2 playback area within our Broadcast Origination Center, the BOC, which is where the LMSs live. We have, within the past two years, renovated the facility on our central tape floor, which is primarily D-2 format, with renovated videotape editing cubicles.

BE: *And that's mostly D-2?*
Antonellis: Mostly D-2. We support other formats, but we are primarily a D-2 house.

BE: *How many VTRs are you talking about?*
Antonellis: Between the central videotape area, our broadcast origination center and our tape rooms, I would say we have 100 to 150 machines, and those are mostly D-2s. One of the projects I'm working on is our coverage of the Nagano Olympics (Winter Games) in Japan in 1998. We are investigating the feasibility of building that whole facility as a D-1 component digital

"Like any of the big facilities, we would love to be component. Unfortunately, it's difficult and extremely costly to make that conversion on a large-scale basis," says Darcy Antonellis, vice president, Technical Operations for CBS Inc.

Who Says It's Lonely At The Top?

Maxell is ALWAYS at the TOP with the Exacting digital performance of our D-2 and D-3, Digital BETACAM and BETACAM SP videocassettes. Using advanced magnetic tape technology, featuring Ceramic Armor Metal particles, Maxell has produced the perfect production tapes for every recording application from ENG/EFP to broadcasting. Maxell's "*top line*" videocassettes feature unmatched error rate and consistant quality, even under severe operating conditions. Add an incredibly strong binder system for increased durability and lower error rates, and you'll be using the superior digital videotapes that keeps Maxell creating innovative tape technology for demanding professionals.

In Your Hands, Our Science Turns To Art

maxell

22-08 Route 208, Fair Lawn, New Jersey 07410
1-800-533-2836

Circle (102) on Action Card

ATV: the price of admission

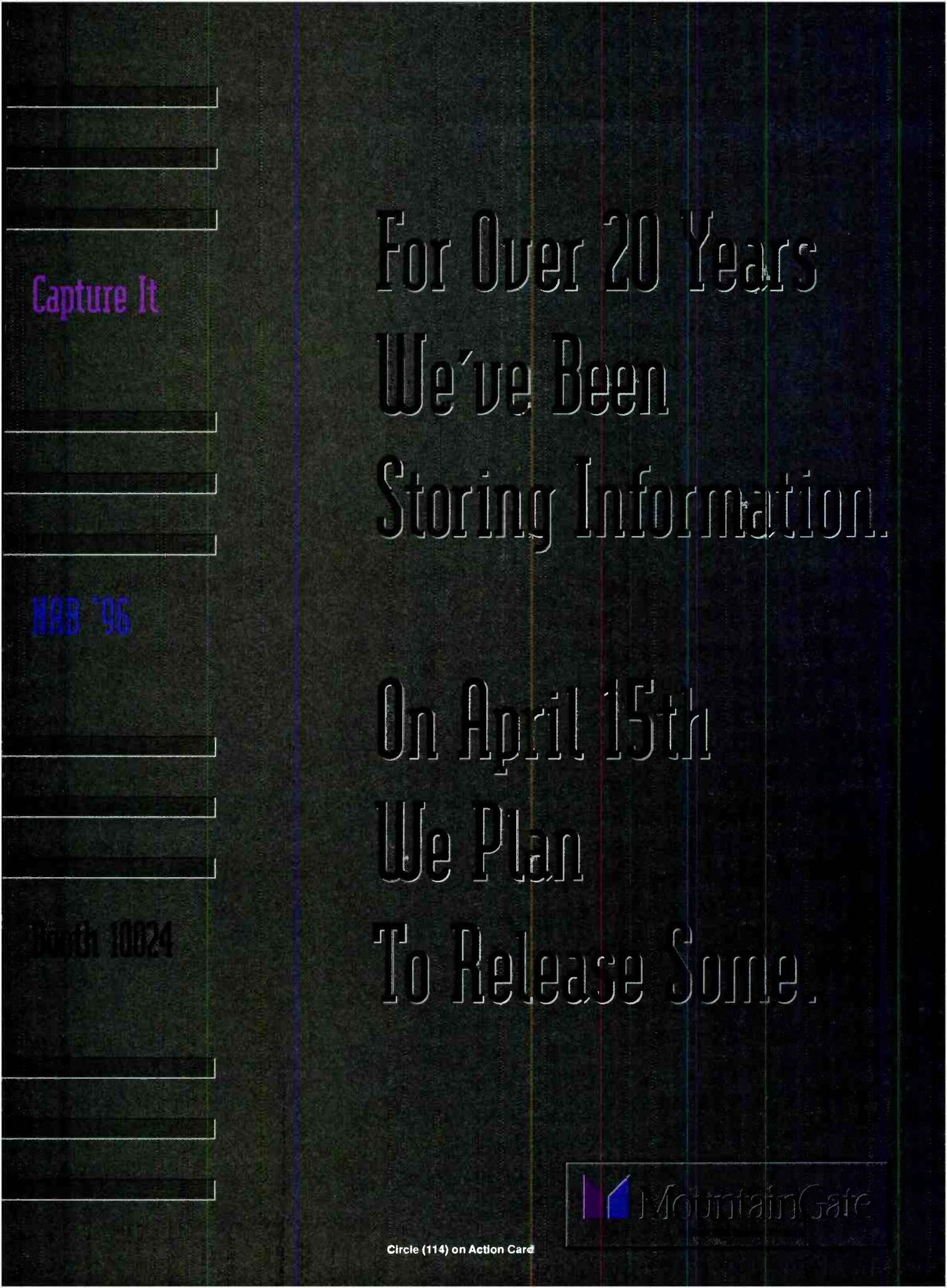
facility that would include two control rooms, a number of edit rooms, graphics and studio facilities and transmission. Our thinking is that whenever you do a project of that size, you want to take advantage of any economies that you can, and it seems silly for us to invest in an analog or composite digital system knowing that the D-2 machines we currently have are aging.

BE: *What ties it all together?*
Antonellis: All of that's tied together through our new master exchange routing switcher, MAX, a Grass Valley 7000 serial digital router. It's a large system — a 256x256 frame currently populated at 176x224. Attached is a D-1 submatrix with a 64x64 frame populated at 48x48.

BE: *Why did you choose this system?*
Antonellis: The old master exchange system was made up of old relays and was approximately 40 years old. It had the ability to switch 16 different levels at once. Our reason for picking that router — and currently we have A-to-D and D-to-A conversion going on into and out of it — is because the rest of our plant is analog. We want something to carry us beyond today's requirements. Our long-term goal with that new router, which is that it will be able to support the bandwidth requirements of high-definition television in compressed form can support, and has the bandwidth to support, high definition.

"Our long-term goal with the new router, which is the heart of the building, is that it has the bandwidth to support high definition."
—Antonellis.

BE: *Is the 7000 populated with component digital modules now?*
Antonellis: No. It supports our D-2 composite digital plant. We know that the formats will change. If you look at the current server market and non-linear editing, that all lives within the component domain — that's the direction we want to head and are planning to head — this router can support that world. The difference is the front-end, the I/O section of it changes when we make that conversion to component.
BE: *So, you were looking immediately at the bandwidth that different switchers would support and figuring to deal with the I/O portion as needs be?*
Antonellis: Correct. Unfortunately, when you start with an existing facility, you don't have a clean piece of paper. You can't build from the ground up; you have to figure out a way to safely make these conversions. Everyone's read several hundred different articles on the pains of the composite vs. the component world, and it's all true. There is no easy way to do it, especially in a facility this size. We knew we had to replace our master exchange router first and that we would migrate from composite digital to component digital. However, we recognize the difficulties in the transcoding process between composite and component through several passes. There are artifact issues that have to be dealt with.



BE: *Then the way you see it, one would presume there's also a point in time when you begin swapping out the D-2.*
Antonellis: Correct. In the next phase of this several things have to happen: We have already begun swapping out our production switchers and have installed Grass Valley 3000-3 ME (composite digital) switchers in some of our studios and mobile units, and we are working on our editing rooms. That's an ongoing project. We've made provisions that will accommodate upgrading those 3000s to Grass Valley 4000 or similar component switchers when the time comes. We know that the DVEs you buy these days are all component, and these switchers will support a component environment. We'll then address our videotape areas and hope to gradually introduce servers.

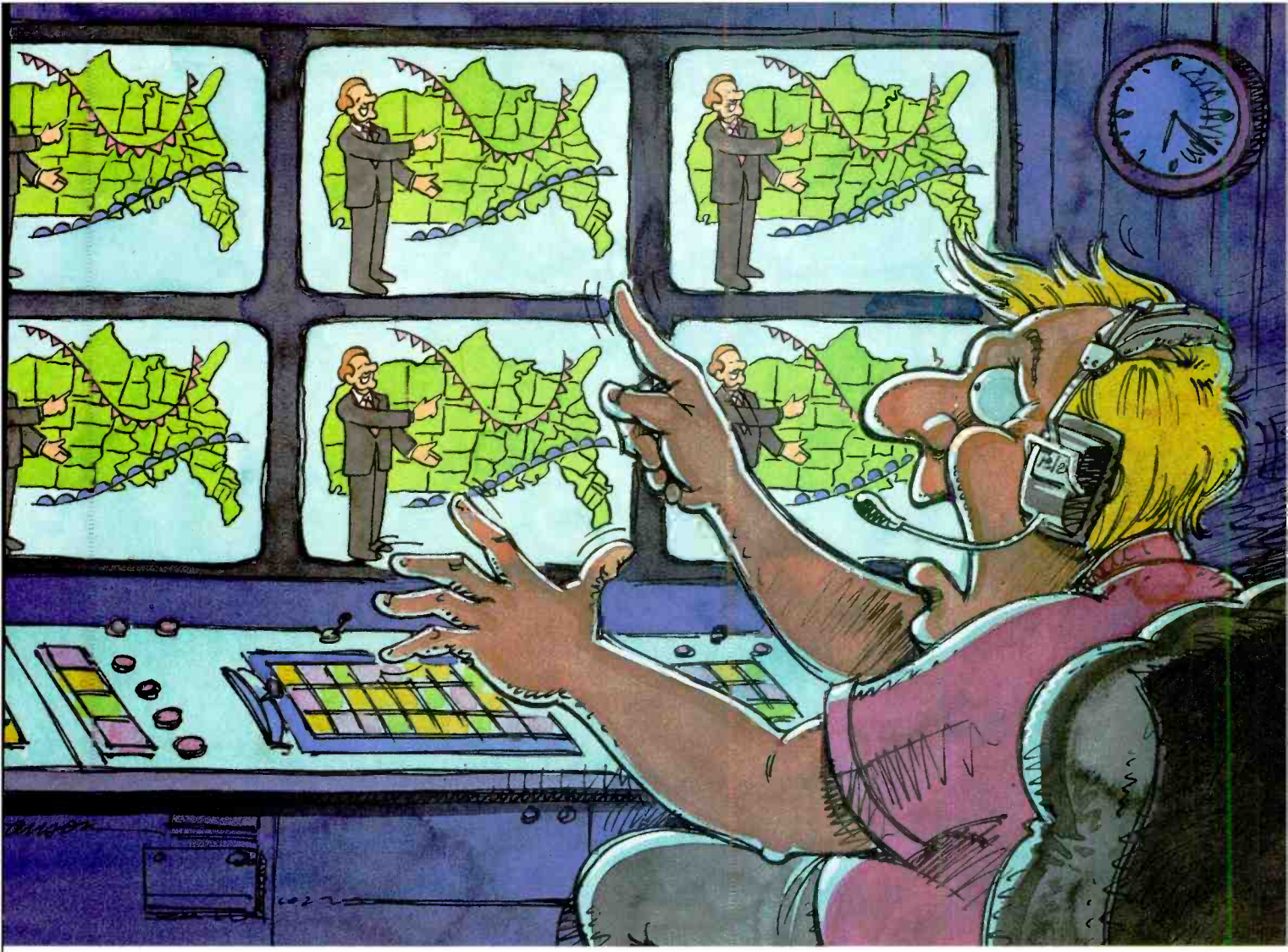
BE: *Do I hear the hoof beat of server technology?*
Antonellis: Yes, and we're doing a lot of investigating, planning and research around server technology. We've sent out RFPs to several vendors; we've received responses based on conceptual ideas of how our distribution system would work based on server technology. What we envision, and this is like anything else — subject to change, is probably our distribution system being converted first in a rollout type of scenario where we would begin to replace the LMS machines.

BE: *So you'd actually work back from transmission toward the rest of the plant?*
Antonellis: The reason is that the distribution system is more predictable. As we began to look at servers for production, there were a lot of positives and a lot of things that we would like to do. We just want to make sure that the hardware and the user interface can support the vast number of clients that we service, namely news, sports, entertainment, all our outside businesses; so we're being methodical in our approach.

BE: *There's a lot of people who will put capital into that end of the game too.*
Antonellis: Yes. The common concern is handling the databases of the size we're talking about — and we're talking about supporting massive organizations. What type of data-management system will you have? That's critical for us. We're working with our clients, and we have a committee put together with representatives from all of the client areas. Evaluation of the engineering and operations requirements under the various models are made continuously — even as we begin building for server-type environments.

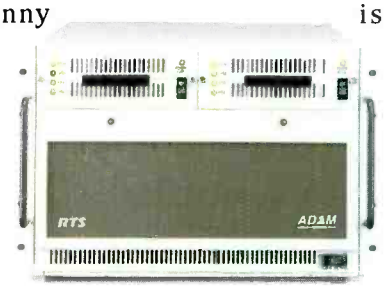
BE: *But at this stage, your production facilities are largely component, are they not?*
Antonellis: Our production facilities are largely composite, except for graphics. Our new MAX router has a small router attached to it that supports D-1 graphics. To that extent, we support D-1, but because we still have such a mix of formats we're not there yet.

BE: *Is it fair to say that the distribution requirements are what's driving this strategy?*
Antonellis: We see strategic and competitive advantages



At times like this, you better have an intercom system you can count on.

Things could go from warm and sunny to partly cloudy rather quickly on the set if you're unable to communicate effectively. That's why Telex developed ADAM,™ the most advanced intercom system ever designed. It allows communication with up to 1,000 people with CD quality audio and takes up minimal space, eliminating unnecessary clutter. ADAM™ (Advanced Digital Audio Matrix) is cost effective, all digital and backward compatible, so it will work with your existing RTS™ CS9000 series key panels. And because there is no size limitation, you'll never outgrow ADAM™. These features make ADAM™ a system of the future, available today. Exactly what you'd expect from a sound company like Telex. Give us a call, we'll help you keep your sunny disposition.



RTS™

RTS™ Intercom Systems. A Product of Telex.

9600 Aldrich Avenue South • Minneapolis, Minnesota 55420 USA • 612-884-4051 Fax 612-884-0043

Circle (115) on Action Card

heading into the non-linear server world, access times, ability to change playlists and the data that's available on a real-time basis. Those are advantages that everyone sees in the business. The trick is figuring out how to incorporate that technology and be able to build and successfully operate large-scale facilities. We're currently testing a small server in our BOC for delay distribution, essentially to get our feet wet. It's really just used for mountain time zone re-feeds. We're moving very carefully with it, learning as we go.

BE: *What's been the most difficult part? It seems to me that the way CBS has been engineered, there hasn't been much of a role for component other than graphics, although I would presume that digital effects is pretty much an island.*
Antonellis: Like any of the big facilities, we would love to be component. It's much easier now. It's easier to route, it's very efficient. Unfortunately, it's difficult and extremely costly to make that conversion on a large-scale basis. About the Olympics, we're using that opportunity to build a facility and hopefully bring those facilities back here and incorporate those control rooms into our facilities. Because they'll be component and because that will work with our non-linear and file server types of applications, it will be an investment in our future.

BE: *Where does MAX fit in the architecture?*
Antonellis: MAX could be considered the heart of the CBS facility or broadcast center. It supports all of our studio, graphics, tape facilities, transmission, broadcast origination and essentially allows for routing throughout the plant. It is the main matrix. There are some subrouters attached to it that are analog nodes onto MAX, and they're connected via tie lines. We have an INX router, and it's essentially the incoming router that supports all of our remotes primarily for network and local. Our processing chains are built onto those incoming router positions so when you take a remote in, signal QC adjustments can be made then input into the INX router. We have another router called NDX, which is our network distribution router, which sits on our output side. Our BOC channels have the ability to feed 12 channels out of this building simultaneously, meaning commercially integrated channels using automation. Those channels feed it to network designations and then those network positions are assigned to various carriers via yet another router, which is called the NTLX router or the net-to-line router. One of our goals, with our new MAX installation, is to consolidate a lot of that switching and over the next couple of years, expand MAX and consolidate what resides on those other routers into the whole master exchange system.

BE: *Is that really just a matter of efficiency?*
Antonellis: It's a lot safer; there are a lot less components to fail. It'll make it much easier on our operators. When they have a problem, they have to track it down through several systems. When taking a remote, you can go through as many as four or five routers. Consolidating that will certainly help the process and signal quality.

BE: *Is there a clock for the phase-in of component systems? Will it be practical to do it in phases?*
Antonellis: Our plan is to do a phased approach. Probably our biggest investment will come from the facilities we field at the Olympics. We're already beginning to re-evaluate whether it makes sense to take delivery component systems. We have the new router in, we have the infrastructure built, every time we now look at a major purchase we ask, "Does it make sense to go component?"
BE: *Will it make any difference to operators? Will they notice the transition?*
Antonellis: Certainly from a QC point of view it will. They're going to need to learn the differences and attributes of component, the benefits, the things you have to watch out for; so we expect that certainly there will be a learning curve.

BE: *But with the changeover paced the way it is, are you anticipating any areas that could become critical for lack of component solutions before you get to where you want to be?*
Antonellis: Actually, no. On some level, CBS was criticized for making the change from composite (analog) to digital, but when you look at the time line, the machines and peripheral equipment, we've gotten full use out of it.

BE: *And you're running very little Digital Betacam.*
Antonellis: Our facilities don't support Digital Betacam, at least not in New York. We do have some in our TV City facility. We are looking to Digital Betacam as we make our plans for a component digital facility in Nagano. We would use a portion of those machines back here for source material to support sports in terms of archives and the tape that gets generated from the activities in Nagano.

BE: *I would imagine the only place you would have felt the crunch would have been in integrating graphics.*
Antonellis: Again, there are few shortcuts, and you'll find yourself doing some transcoding somewhere. The trick is trying to figure out how you can most efficiently do that. It was one of the reasons for our new master router, when it went in. Its ability to handle multiple formats made it make sense to attach a D-1 router to support graphics and make graphics a "source" on the router.

BE: *Will CBS convert its O&Os directly to a component environment?*
Antonellis: Possibly, wherever it technically and financially can be justified. It's not clear how much of an afterlife, if any, our composite digital equipment will have. Like the network, our stations must consider the implications of HDTV and, where possible, make provisions for it. Unfortunately, daily operations and aging equipment often don't provide us with the luxury of time to wait. ■

(On the 1998 Olympic Games in Nagano): "Our thinking is that whenever you do a project of that size, you want to take advantage of any economies you can. It seems silly for us to invest in an analog or, for that matter, component digital system knowing that the D-2 machines we have are aging." —Antonellis.

INTRODUCING A LINE OF RECORDABLE MEDIA FOR PERFECTIONISTS. THE TDK PRO LINE. IT'S **PURE PRECISION.** BECAUSE EVERY FORMAT, EVERY LENGTH, EVERY GRADE IS 100% SPECIFICATION GUARANTEED. FOR YOUR FINEST WORK. IT'S MORE INNOVATION FROM THE PEOPLE THINKING ABOUT WHAT YOU DO, AND THE TOOLS YOU NEED TO GET AHEAD. FROM THE COMPANY THAT'S TAKING PROFESSIONAL RECORDING FAST FORWARD.

For more information on our complete line of recording products, please call 1-800-TDK-TAPE or check out our site on the World Wide Web.

TDK

http://www.tdk.com

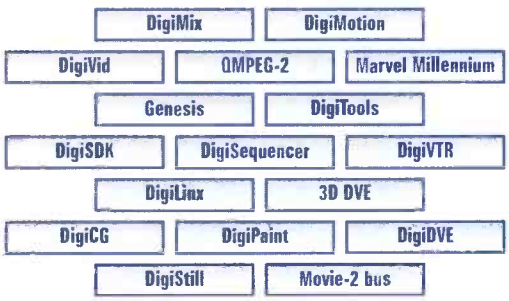
Circle (164) on Action Card

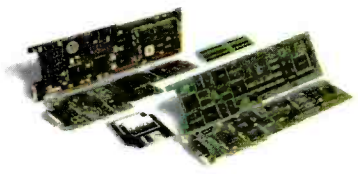
Build on a SOLID Foundation

OEMs, Systems Integrators and Developers...

It's no secret. The video industry is in the midst of a mass migration to digital technology. PC-based open systems are the wave of the future. You can make the transition quick and painless for your product by building it on Matrox DigiSuite — a solid foundation of digital video hardware and software development tools that you put together in myriad configurations to meet your exact requirements.

Move from expensive black





MATROX DIGISUITE

What do you need to build?

- Nonlinear Editing Systems (NLE)
- Digital Disk Recorders (DDR)
- Virtual VTRs
- Video-on-Demand Servers (VOD)
- Near Video-on-Demand Servers (NVOD)
- Interactive TV
- Live Video Switchers
- M-JPEG to MPEG Transcoders
- Commercial Insertion Systems
- Instant Replay Systems
- Time Delay Systems
- CATV Barker Channels
- 2D and 3D Animation Stations
- Animation Recorders
- Graphics/Paint Workstations
- Character Generators (CG)
- Closed Captioning and Teletext Systems
- Digital Audio Workstations (DAW)
- Visual Effects/Compositing Systems

boxes to competitively-priced, PC-based open systems.

Use only the best materials.

Choose the building blocks you need for your application from the extensive Matrox collection, the growing list of board-level components from third parties or design your own digital video hardware around the open standard Movie-2 bus. DigiSuite components are modular, highly-integrated, true 10-bit CCIR-601 and take full advantage of the PCI-bus.

- Matrox DigiMix™ — digital video/graphics mixer and 2D DVE unit
- Matrox DigiMotion™ — dual channel motion-JPEG codec/digital audio mixer/Fast-20 SCSI controller
- Matrox DigiVid™ — multi-channel analog video I/O and serial communication interface
- Matrox QMPEG-2™ — four channel MPEG-2 audio/video decoder
- Matrox Marvel Millennium™ — video-in-a-window console display controller
- Matrox Genesis™ — DSP-based application accelerator
- Seriol digital (D1) I/O interface, realtime 3D DVE, MPEG encoders and other third party Movie-2 bus compatible products

And the best tools for the job.

Matrox DigiTools™ are based on the new Microsoft multimedia software architecture with OpenDML extensions. A comprehensive selection of proven software modules from Matrox and third parties speeds your application development.

- Matrox DigiSDK™ — Component Object Model (COM) software development kit for Windows NT 3.51 and Windows 95
- Matrox DigiSequencer™ — infinite-layer audio/video/graphics compositing and sequencing engine
- Matrox DigiVTR™ — VTR control software
- Image North Technologies DigiCG, DigiPaint, DigiDVE and DigiStill — application modules

Our solid foundation of state-of-the-art boards, advanced software development tools and world-renowned OEM engineering support lets you make a smooth transition to the digital domain and get your PC-based product to market quickly.

For more information, please call:

1-800-361-4903 or (514) 685-2630

Matrox Electronic Systems Ltd.
1025 St-Regis Blvd., Dorval
Quebec, Canada, H9P 2T4
Fax: (514) 685-2853
Internet: http://www.matrox.com/video

matrox
20 YEARS OF EXCELLENCE

Circle (118) on Action Card

Consumer video goes digital

DVD, DSS and DV dominate the Winter Consumer Electronics Show in Las Vegas.

By Marjorie Costello

As broadcasters plan their annual trek to the NAB convention, they are arriving in Las Vegas three months after the Winter Consumer Electronics Show (WCES), the event that kicks off the convention year at the same venue. Although the WCES is primarily geared toward consumer electronics retailers, the new products dominating the 1996 WCES will kick off or extend new media trends that also affect broadcasters and production professionals.

Like NABs since the late 1980s, digital technology has taken the consumer world and the WCES by storm. The major product introduction of the 1996 Winter CES was the digital video disc, with digital satellite systems and digital video camcorders also important products at the show. The digital world unleashed by the PC was also prominently displayed, as computer and consumer electronics companies presented their visions of the PC/TV.

DVD debuts

Throughout most of 1995, there were two incompatible digital video disc approaches vying for support: SD developed by Toshiba/Time Warner and MMCD from Sony/Philips. Fortunately, for retailers, consumers and manufacturers, a single standard and name were negotiated in early December 1995 among the major consumer electronics companies.

Now officially called DVD, which according to the agreement, stands for digital versatile disc, the new format became the focus of the press conferences and booths staged by Thomson (RCA), Sony, Philips (Magnavox), Toshiba and Pioneer at the 1996 WCES.

Because of its huge storage capacity, DVD-ROM is expected to be embraced by the computer industry as the successor to the CD-ROM.

The new home video "media" format holds up to 133 minutes — or 4.7GB per side — of digital video and audio on a 5-inch disc, the size of an audio CD. It's slated to arrive by late summer 1996, probably first from RCA and Toshiba, with RCA promising the lowest price yet quoted for a player: $499. As a playback-only system that doesn't record, the hardware's launch will depend upon the simultaneous release of software, which will be coordinated with support from several motion picture studios.

Because of its huge storage capacity, another DVD-based product, DVD-ROM, is expected to be embraced by the computer industry as the successor to the CD-ROM. DVD-ROM drives were also demonstrated at WCES, as they had been in the same Las Vegas hall during the 1995 Fall COMDEX.

DVD is a component video system and its picture quality — in terms of resolution and color purity — is often compared to D-1. However, to pack 4.7GB of information on a 5-inch disc — which is seven times the capacity of a CD — DVD uses MPEG-2 compression. As a result, the trained eyes of TV professionals can catch the artifacts in DVD, which they won't see in D-1.

The DVD audio system for North America is AC-3, which is also the recommended audio system for HDTV in the United States. Developed by Dolby, AC-3 is a 6-channel (five full bandwidths, plus one effects channel) digital surround-sound system.

In addition, DVD supports 4:3 and 16:9

Top photo: It is anticipated that DVD-ROM will replace CD-ROM. This photo shows a prototype of the Philips DVD-ROM player.

THE BIG PICTURE

A complete vision of broadcast? No one has a clearer view than Thomson Broadcast Systems. By focusing the most advanced broadcast technologies within a single company of the THOMSON multimedia group, today we offer customers a comprehensive approach to meeting their needs. From cameras to digital studios to MPEG2 satellite systems to multiservice cable network systems, our broad vision translates to clear competitive advantages for you. Including guaranteed, end-to-end system compatibility. World-class solutions and product expertise. And the ability to provide rapid, individualized service. The big picture from Thomson Broadcast Systems. From our unique vantage point in digital technology, it's never been easier to picture your success!

THOMSON BROADCAST SYSTEMS

Head Office: France - THOMSON BROADCAST SYSTEMS
17, rue du petit-Albi - BP 8244 - 95801 Cergy-Pontoise Cedex
Tél: (33-1) 34 20 70 00 - Fax: (33-1) 34 20 70 47

USA & Canada: THOMSON BROADCAST inc.
49, Smith Street, Englewood, NJ 07631
Tel: (1-201) 569 16 50 - Fax: (1-201) 569 15 11

Circle (105) on Action Card

BIG
Noisy
HEAVY
HOT

CONVENTIONAL
SCR
DIMMERS

COMPACT, QUIET, LIGHTWEIGHT, COOL...

THE NEW IPS DIMMER SYSTEM.

ENTERTAINMENT TECHNOLOGY

rosco

Circle (134) on Action Card

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

aspect ratios. It can present sound tracks in eight different languages and up to 32 distinct subtitles.

Unfortunately, those who dream of a single, worldwide video and audio standard for a home video system will have to wait. There will be an NTSC version of DVD for North America and other countries using that TV standard, and PAL/SECAM for Europe. The audio system for PAL and SECAM markets will also differ, with the agreement specifying MPEG, instead of AC-3.

The major consumer electronics — including some that have their own motion picture interests — have been developing DVD through a cooperative dialog with the film industry. As a result, DVD will respect the staggered release schedules or "windows" for United States and foreign motion picture and home video distribution. That way, Hollywood is assured that consumers in England won't be able to play at DVD from the states of the latest Batman movie when the film is in London's theaters.

In predicting the success of DVD, executives at RCA, Toshiba and Sony — among others — cited the acceptance of other digitally based technologies. First and foremost, was the public's positive reaction to the high-quality digital pictures delivered by the Digital Satellite System (DSS), which has shipped more than two million systems to dealers. In addition, they mentioned the enormous success of the 5-inch compact audio disc.

StarTAC, the new Motorola flip phone, is about the size of a large pager that can fit in a jeans' pocket or in its specially designed holster.

RCA is promising a marketing campaign for DVD "rivaling any previous consumer electronics introduction." Toshiba predicted that more than $200 million will be spent by all companies in the launch.

During the next year, the impact of DVD on broadcasters and production operations will translate into work on promotional tapes and TV commercials, as well as airtime purchases. In the longer term, if DVD

Acrodyne's New Diacrode® High Power UHF Television Transmitter Is On The Rise.

Introducing Our New Single Tube 40kW-60kW System. High Efficiency With High Reliability.

If you're considering a new 40kW to 60kW UHF television transmitter, Acrodyne has exciting news! The success of our tetrode equipped water-cooled transmitters from 10kW to 30kW output has spurred the development and introduction of a new transmitter featuring a Diacrode® (double-ended tetrode) capable of producing up to 60kW in common amplification using just one tube.

The New TH 680 Diacrode High Power Tube

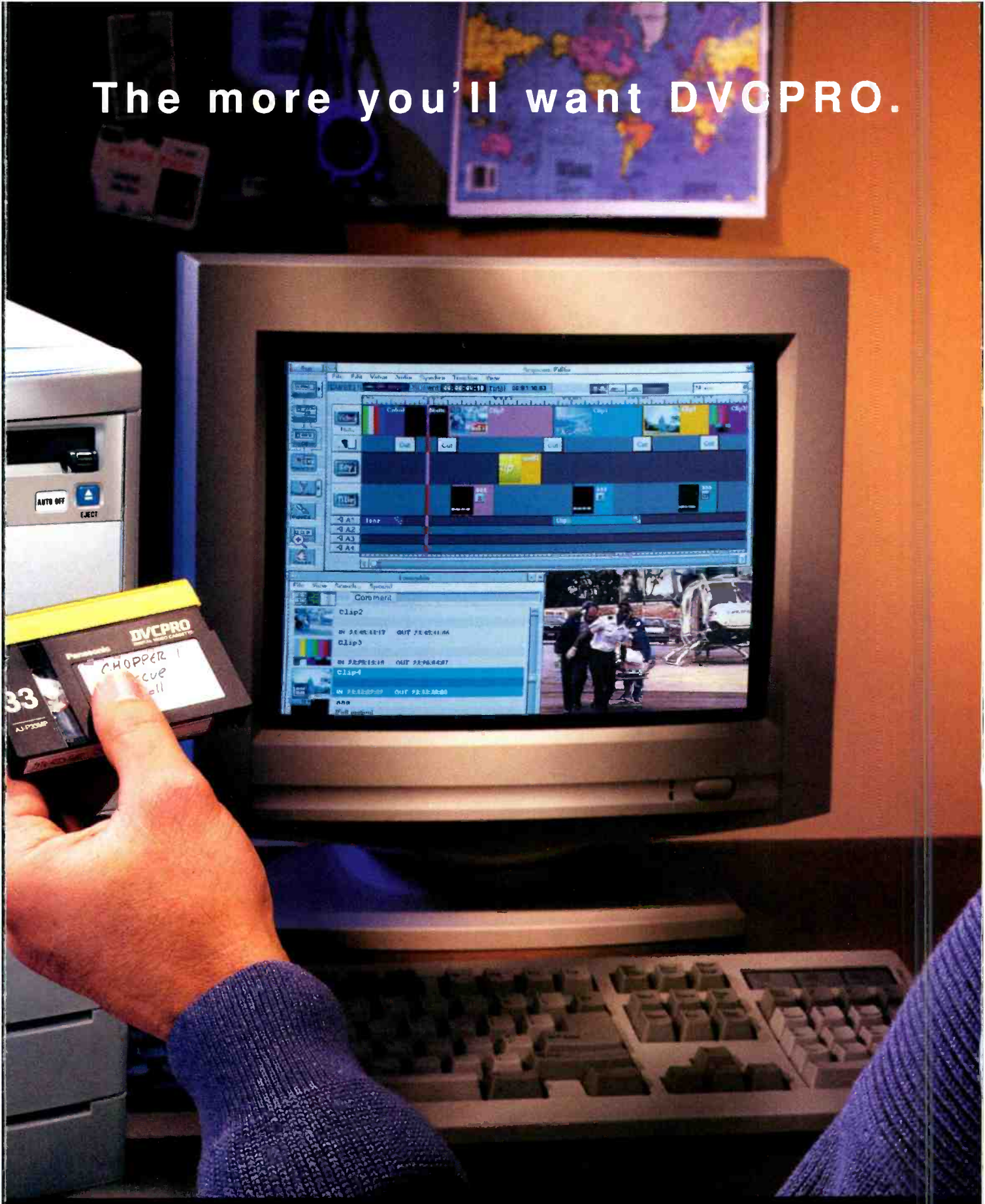
Our high efficiency tetrode transmitters perform superbly and are the lowest cost transmitters to operate and maintain. The tetrode is the most linear UHF amplifying device type and, combined with our high-end TR Series exciter and "super linear" solid state driver, makes it an excellent choice today and ideal for future digital broadcasting. Water-cooled tetrodes have routinely exceeded 20,000 hours of life. The Diacrode, constructed of the same grid material and similar, yet improved cooling system, will meet and exceed these life times.

If you have concerns over the reliability of other high efficiency transmitters, or their complexity, or their cost to operate, consider the Acrodyne alternatives– Diacrode and tetrode transmitters. All Acrodyne high power transmitters are built and fully tested at our factory in Blue Bell, Pennsylvania.

ACRODYNE

More Power To You.

Acrodyne Industries, Inc. 516 Township Line Road, Blue Bell, Pennsylvania 19422 • *Phone:* 800-523-2596 / (215) 542-7000 *Fax:* (215) 540-5837



DVCPRO component digital recordings edit directly in the Panasonic integrated PC-based linear/nonlinear video workstation.

4X DVCPRO faster-than-real-time transfer overcomes the digitizing delay with full component digital quality. Material is transferred faster, edited faster, on-air faster.

Official Broadcast Equipment Supplier of the 1996 Olympic Games

36 USC 380

Panasonic

Broadcast & Television Systems Company

Digital video is changing our world, and DVCPRO is already changing news, production and professional video operations across the country. Lightweight, low cost ENG cameras and full-featured studio decks integrated in today's news systems are just the beginning.

Products that are uniquely DVCPRO, like the laptop portable edit system, a four-times player, integrated video workstations, and affordable news server systems will change the way we work.

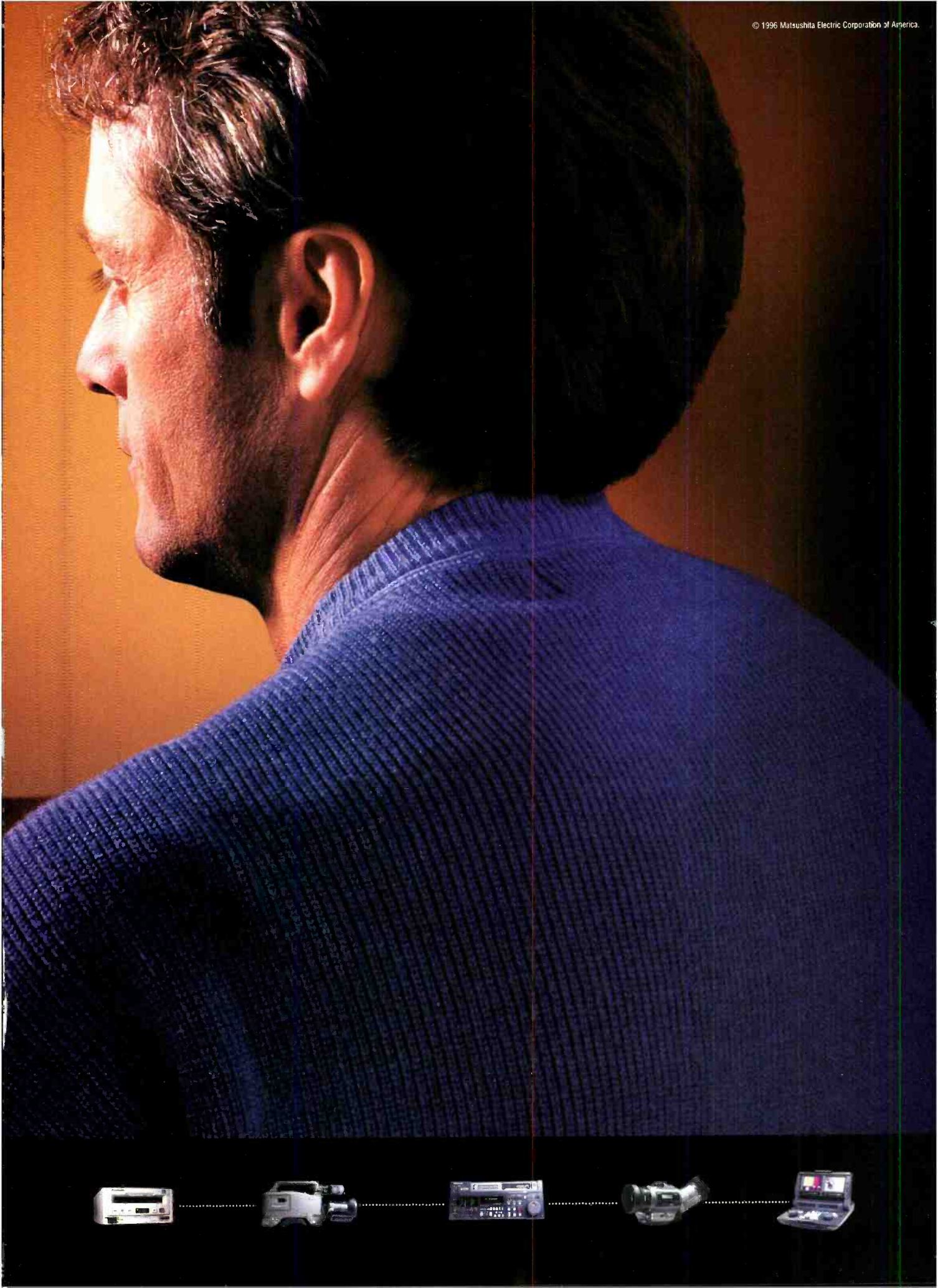
Component digital video and CD-quality audio on pocket-sized digital cassettes; lower equipment costs, lower media costs, and lower operating and maintenance costs are revolutionizing broadcasting and newsgathering.

DVCPRO is the promise of the digital era realized.

SEE YOUR FUTURE AT BOOTH 10,000 AT NAB.

For more information call 1-800-528-8601 (Upon request enter product code 15) One Panasonic Way, Secaucus, NJ 07094


The more things change...
Panasonic
DVCPRO
VTR
VTR 2
EJECT
SET UP
DVCPRO



dazzles the public the way its backers predict, the American public's appreciation for high-quality pictures could pave the way for acceptance of digital HDTV.

DSS update

In a return to a manufacturing agreement that moved the VHS VCR into the forefront of home video, Matsushita will be making the DVD players sold under the Thomson/RCA and Panasonic brand names in the United States. And, as part of the cross-sourcing agreement, Thomson announced at the 1996 WCES that it will make the digital satellite systems that Panasonic will start selling this year. Both companies will begin their own manufacturing operations for their sourced hardware after 1996.

As a result, the list of companies selling DSS during 1996 will expand beyond Thomson and its three brands — RCA, GE and Proscan — and Sony, to include not only Panasonic, but also Toshiba, Uniden, Hughes, Sanyo, Samsung and Daewoo. And since the show, AT&T announced it would be selling DSS during 1996. Thomson is also expected to announce an additional manufacturing agreement with another major electronics brand.

A DSS announcement of special interest to broadcasters is the addition of three West Coast network affiliate feeds on DirecTV, the larger of the two DSS programming services. In January, PrimeTime 24 began supplying DirecTV with KNBC (NBC, Los Angeles), KPIX (CBS, San Francisco) and KOMO (ABC, Seattle).

These West Coast feeds join DirecTV's current PrimeTime 24 package of WABC (ABC, New York), WNBC (NBC, New York), WRAL (CBS, Raleigh), WFLD (Fox, Chicago) and KRMA (PBS, Denver). And starting this month, WFLD will be replaced by FoxNet, the national Fox satellite feed.

The PrimeTime 24 feeds are available from DirecTV either individually or as a package. However, only DSS customers who can't receive their local broadcast channels and do not subscribe to cable can subscribe.

A theater in every home?

The arrival of DSS and America's cocooning trend have contributed to the growing popularity of home theater. WCES 1996's introductions underlined the fact that home-theater systems are now available in a range of prices and with new, simplified "home-theater-in-a-box" systems.

Despite uncertain economic times, consumers with money in their pockets are buying projection TV systems in record numbers. During 1995, according to Electronic Industries Association (EIA) data, projection TV sales reached 820,000 units, nearly a 29% increase over 1994. For 1996, the EIA predicts unit sales will grow more than 18%, reaching nearly one million units. In terms of dollars, sales of home-theater audio components jumped 45% in 1995, reaching $755 million.

Broadcasters should take notice of the new consumer digital video camcorders, such as the Panasonic PV-DV1000. TV stations are finding that these camcorders are useful backups for difficult assignments.

According to the EIA's newly renamed consumer electronics group, the Consumer Electronics Manufacturers Association (CEMA), there were more than 10 million home-theater households at the end of 1995.

The arrival of DSS and America's cocooning trend have contributed to the growing popularity of home theater.

According to CEMA, only six million home-theater households existed a year ago.

In anticipation of a widescreen future, Sharp introduced a 43-inch LCD rear-projection television, the 43HWP1000. The model will be available in April, with pricing in the $4,000 range. Sony also showed widescreen 37-inch and 50-inch LCD rear-projection models, with at least one of the models expected to arrive by 1997. Also on view was a prototype of Sony's 25-inch plasma display in widescreen.

The new digital light processing (DLP), all-digital display technology, developed by Texas Instruments, was also shown at CES. The U.S-bound models, shown in prototype by Runco, Vidikron and Projectavision, should start shipping during the second half of the year at $7,000. Also known as the micromirror projection system, DLP business projectors will be available from nView and Proxima by April.

Because of the importance of the AC-3 audio system, audio manufacturers were showing receivers and amplifiers with built-in AC-3, components that were AC-3-ready, as well as AC-3 decoders. Companies moving into AC-3 included Yamaha, Kenwood, Pioneer, Denon, Harmon Kardon and Marantz, among others.

Until the arrival of DVD later this year, consumers who spring for these new audio components will have their AC-3 listening confined to laserdisc. Several recent laserdisc player models are now AC-3-compatible with a growing selection of disc titles encoded with AC-3 tracks.

To make it easier for consumers to move into home-theater audio, several companies — such as Sherwood, 3M, Kenwood, Altec Lansing and Celestion — introduced prepackaged or "home-theater-in-a-box" systems. Typically, these packages include main, center and surround speakers, a subwoofer, and often a Dolby Pro Logic decoder, remote control and cables. This so-called "idiot-proof" approach to home-theater audio is available from as low as

CHALLENGE

Until recently the Satellite Communications industry has faced serious limitations on the critical issue of antenna placement. Due to increased demand for voice, data and video services — including direct broadcast satellites (DBS) and satellite-delivered cellular applications — Ortel thought it was time to improve remote antenna technology.

SOLUTION

Ortel first demonstrated the viability of wideband microwave fiberoptics for use in the commercial satellite communications industry. This technology greatly contributed to increased transmission distances (up to 65 km), mitigating previous limitations. By connecting satellite antennas and to control rooms with linear fiberoptics instead of bulky waveguide and coaxial transmission lines, Ortel's interfacility links product series expands on that success.

RESULTS

Those using satellite antennas can now design remote facilities for optimum performance and minimal cost by allowing ALL interconnections to be put out on fiberoptic links — including satellite operating frequencies. Immunity to electromagnetic interference, elimination of redundancy, centralized equipment benefits, location selection and system design flexibilities all add up to enhanced signal reception — and significant cost savings.

WHERE ON EARTH WILL I PUT ALL THESE ANTENNAS?

FIBEROPTICUPDATE

Ortel devotes considerable resources to staying ahead of critical SatCom industry remote transmission system technologies. For free information on the Interfacility Links Product Series, please call, write, fax or e-mail Ortel directly.

See us at NAB Booth #5044

ORTEL CORPORATION

SATELLITE COMMUNICATIONS

ORTEL CORPORATION 2015 W. Chestnut Street Alhambra, CA 91803
Phone: (818) 281-3636 Fax: (818) 284-8231 Internet: mktsc-a@ortel.com

Circle 199 on Action Card

corders report that many customers are TV stations and production houses. And it's no wonder: the pictures produced by these digital consumer camcorders rival what professionals are accustomed to seeing from many broadcast camcorders.

Some TV producers are turning to these lightweight digital consumer camcorders when they are denied permits to bring traditional broadcast equipment into foreign countries. Others are using them as primary or backup camcorders for difficult assignments.

Models currently available include the Sony DCR-VX1000 (3-CDD, $4,199) and DCR-VX700 (1-CDD, $2,999) and the Panasonic PV-DV1000 (3-CDD, $4,200). There is also a pro version, the AG-EZ1, sold at a slightly higher price by Panasonic's broadcast division. The Sharp VL-D5000, part of the Viewcam series, is a 3-CDD model, featuring a 5-inch LCD monitor and is scheduled to be available in May for $4,600.

Producers who are looking for a digital camcorder they can literally take anywhere will have to wait until spring. That's when the JVC GR-DV1 and its identical twin, the RCA CC900D, arrive at less than $3,000. When you see the small size and high performance delivered by these digital wonders, you may not be able to resist the urge to take one on the road.

The JVC and RCA models weigh just over one pound, even with the battery and cassette. The camcorder is the size of a Walkman and the cassette looks like a matchbox.

Sony also demonstrated a DV deck at the show, which the company plans to sell eventually, once copyright issues are worked out. A drawer on the DHR-1000 slides out to reveal a full range of buttons. Editing can also be performed using a compact edit controller.

Of special significance is the deck's incorporation of FireWire, the high-speed digital serial bus transfer protocol. Also known as IEEE 1394, FireWire first appeared in Sony's DV consumer camcorder models, and makes it simple to transfer digital video to a computer for editing and other image manipulation. Camcorder footage can also be copied to the digital deck for editing without any loss in picture and sound quality.

Pictures produced by some of the new digital consumer camcorders rival what professionals are accustomed to seeing from many broadcast camcorders.

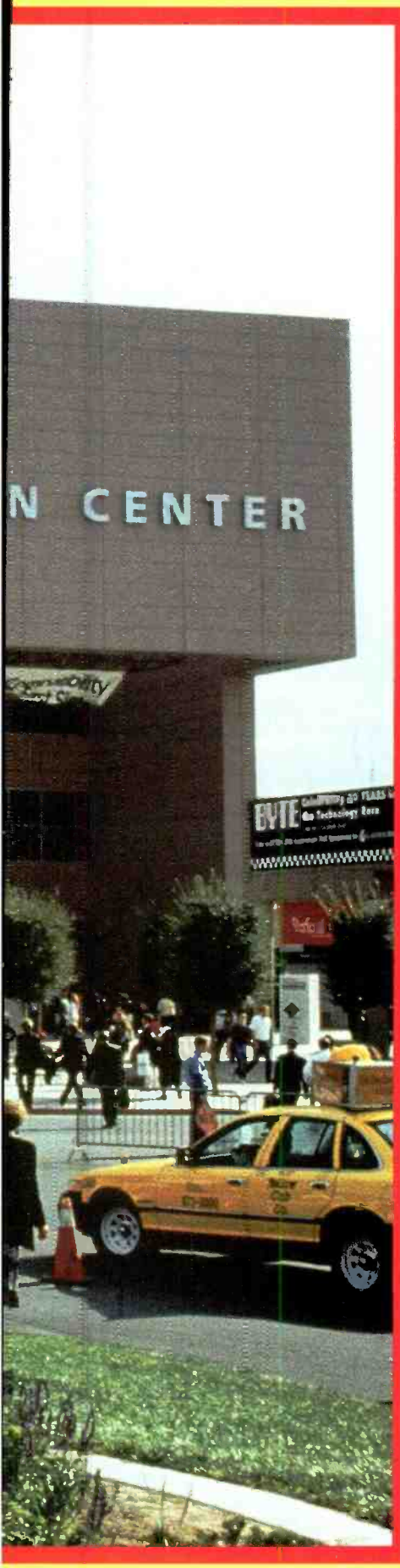
Wearing the phone

Because broadcasters also have a need to communicate from wherever their assignments take them, one more product is worth mentioning. It is the smallest and lightest cellular phone ever introduced, weighing in at just little more than three ounces and is available now.

Called StarTAC, the new Motorola flip phone is about the size of a large pager. It can fit in a jeans' pocket or in its specially designed holster. That's why Motorola is calling StarTAC the first wearable cellular phone. However, the small size carries a heavy price tag: $1,000. Maybe you can convince your GM or boss that if the company buys you a wearable phone, they can always reach you in the field or at the transmitter. ■

Marjorie Costello is a broadcast and video industry consultant and *Broadcast Engineering* contributing editor based in New York.


Las Vegas
CONVENTI
ACE CAB
736-8383
873



NAB made easier

Welcome to *Broadcast Engineering* magazine's 1996 NAB Preview. Over the years, as the convention has grown, so too has the coverage provided by *BE* magazine. And, our coverage this year is no exception. Several new features have been added to make your visit to the NAB Convention more productive. So don't wait until you've picked up your badge to begin planning your visit. Start now and save time and hassle. Here's how we've made your task easier.

First, we've summarized the technical sessions into three tables. These convenient tables are designed to be cut from the magazine and used instead of the heavy, 200-page program you had to carry before.

Second, the exclusive *BE FASTtrack* provides you with the shortest path to finding vendors for the products you need. No more wandering around looking for manufacturers of specific products. We've already done your homework for you. Simply select the type of product that you are looking for and the *BE FASTtrack* will show you the shortest path between the exhibitors who make it.

Third, on page 185, you'll find the world-famous *BE* exhibit hall map. The map displays all booth locations and numbers, as well as a complete list of exhibitors by exhibit hall. All *BE* advertisers are listed in red for convenient identification.

Fourth, our exhaustive exhibitor highlights contain information about the products to be displayed by each vendor. Armed with this information, you can determine which exhibitors are worthy of your first visits.

So, there you have it. With your copy of *BE* and a little advance work, you might even have time to enjoy some of the "other" sites in Vegas.

Clip-and-take schedules:

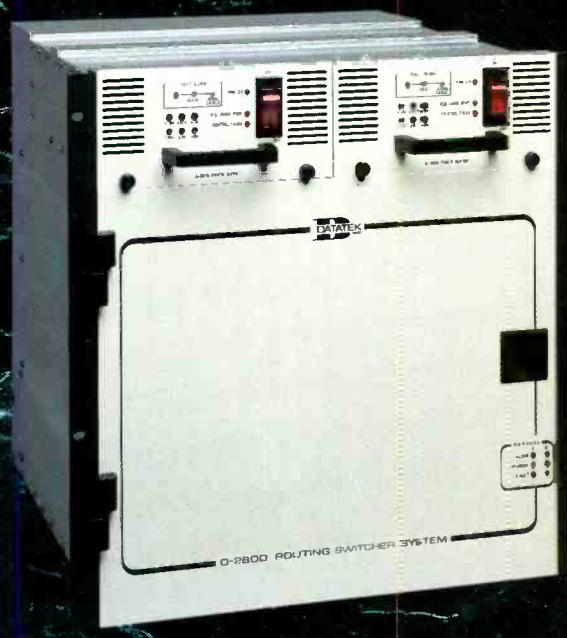
Special coverage:

BROADCAST ENGINEERING CONFERENCE

	Sat. 4/13	Sun. 4/14	Mon. 4/15	Tues. 4/16	Wed. 4/17	Thur. 4/18
8:00			8:00am - 6:00pm MULTIMEDIA WORLD EXHIBITS - SANDS & LVCC 8:30am - 6:00pm OUTDOOR EXHIBITS - LVCC 9:00am - 6:00pm EXHIBITS - LVCC (all exhibits close at 2:00pm on Thursday)			
9:00	VIDEO COMPRESSION TUTORIAL	OPENING ADVANCED TV - PART 1 DAB - PART 1	ALL-INDUSTRY OPENING	IMPLEMENTING VIDEO DATACASTING	MOBILE TV: ENG, DSNG, REMOTE VEHICLES RADIO AND TV REG. ISSUES - PART 1 DIGITAL VIDEO BROADCASTING IN EUROPE	HIGH-QUALITY RF FOR RADIO HIGH-QUALITY RF FOR TV
10:00			DATACASTING FOR TV DATACASTING FOR RADIO	TV ON-LINE: INTERNET APPLICATIONS RADIO ON-LINE: INTERNET APPLICATIONS		
11:00						
12:00		EXHIBITION	EXHIBITION	EXHIBITION	ENGINEERING LUNCHEON	EXHIBITION
12:30						
1:00	EXHIBITION	ADVANCED TV - PART 2 DAB - PART 2	VIDEO SERVERS DIGITAL AUDIO STORAGE	FACILITIES: RADIO'S MISSING DIGITAL LINK RADIO AUTOMATION & LIVE ASSIST	COMPETITIVE VIDEO MEDIA: DSS, CELLULAR VISION RADIO & TV REG. ISSUES - PART2	
1:30				FACILITIES: THE TV NEWSROOM TALKS TO THE FILE SERVER		
2:00	WORKING WITH DIGITAL AUDIO/VIDEO IN THE TV PLANT					
3:00						
4:00						
5:00						

ADVANCED TELEPRODUCTION CONFERENCE

	Sat. 4/13	Sun. 4/14	Mon. 4/15	Tues. 4/16	Wed. 4/17
8:00			8:00am - 6:00pm MULTIMEDIA WORLD EXHIBITS - SANDS & LVCC 8:30am - 6:00pm OUTDOOR EXHIBITS - LVCC 9:00am - 6:00pm EXHIBITS - LVCC (all exhibits close at 2:00pm on Thursday)		
9:00			ALL-INDUSTRY OPENING WITH KEYNOTE ADDRESS		
10:00	RETHINKING THE DIGITAL REVOLUTION	NEW FORMATS & STANDARDS FOR 21ST CENTURY TV		ITS SESSION	
11:00					
12:00					
1:00					
2:00	MILLENIUM TV: IMAGING & ENGINEERING THE FUTURE	TELE-TECHNOLOGIES & TELEPRODUCTION	MAGIC & IMAGINATION - HOW'D THEY DO THAT?: THE COMMERCIAL	MAGIC & IMAGINATION - HOW'D THEY DO THAT?: THE FEATURE FILM	MAGIC & IMAGINATION - HOW'D THEY DO THAT?: EFFECTS IN TV LOGOS, ID's & OPENINGS
3:00					
4:00					
5:00					



25 Years of Leading Routing Switcher Technology

D-2800 Series, systems 32x32 to 1024x1024

D-2600 Series, systems 16x8 to 32x32

No system too small... No system too large.

Datatek's Routing Switchers. Meeting the needs of every broadcaster...and every budget.

At Datatek, we've been supplying leading-edge routing switchers for large and small broadcast systems for over 25 years. That tradition continues with our newest additions, the D-2800 and D-2600 series. These new switchers support all signal formats: serial digital video, AES/EBU digital audio, data, analog video, analog audio, and time code. The D-2800 and D-2600 also deliver a number of other advantages:

- Total Upgradability—Each switcher uses a common control system, so the smaller D-2600 can be integrated into the larger D-2800 system...when you're ready
- You can mix formats and levels...in the same rack frame
- An advanced virtual tally system
- Serial digital video to 400 Mb/s with auto equalizing and reclocking
- Tie-line control management, your gateway to mixed digital/analog facilities
- Central control panel management with no system interruption
- No external common control system is required
- A full line of control panels is also available with your choice of 4 to 8 character alphanumeric displays

See us at NAB Booth #10324

Datatek. The routing switcher company that's been ahead of the pack for 25 years.

For more information, please call or Fax:
Datatek Corporation
1121 Bristol Road, Mountainside, NJ 07092
Tel: 908-654-8100 • 1-800-882-9100 • Fax: 908-232-638

DATATEK CORP.

Circle (182) on Action Card

MULTIMEDIA WORLD CONFERENCE

	Sat. 4/13	Sun. 4/14	Mon. 4/15	Tues. 4/16	Wed. 4/17	Thur. 4/18
8:00			8:00am - 6:00pm MULTIMEDIA WORLD EXHIBITS - SANDS & LVCC 8:30am - 6:00pm OUTDOOR EXHIBITS - LVCC 9:00am - 6:00pm EXHIBITS - LVCC (all exhibits close at 2:00pm on Thursday)			
9:00			ALL-INDUSTRY OPENING & KEYNOTE	KEYNOTE		INTERNET COMMERCE DISTANCED MULTIMEDIA
10:00				PLENARY: CEO PERSPECTIVES	INTERACTIVE TV LOCAL SERVICES - WWW MANAGING DESIGNERS	
11:00						
12:00						
1:00	IMA BOOTCAMP: PART 1 TO WEB OR NOT TO WEB?	IMA BOOTCAMP: PART 3 MEDIA DESIGN MANAGING GRAPHICS		MANAGING THE MEDIA WEB SITE vs. MULTIMEDIA OBJECTS VIRTUAL REALITY	BROADBAND SERVICES ADV. & MKTG. - INTERACTIVE MEDIA FUTURE OF ON-LINE	
2:00						
3:00	IMA BOOTCAMP: PART 2 GRAPHICS IN INTERACTIVE MEDIA	TITLE AUTHORING ASSET PROTECTION	INTERACTIVE TRAINING DVD& CD-ROM	MPEG ENCODING CD-ROM TITLE CHAIN	ROUNDTABLE DISCUSSION POINT COUNTER-POINT	
4:00						
5:00			6:00 RECEPTION			

Why Settle For Less Than 100% Digital?

The Hitachi SK-2600 is the only *fully digital triaxial camera system* in the world.

Fire, floods, world upheavals — whatever the year 2000 brings, the "2600" is the camera you'll want to shoot it with. This is the camera that will not only make you look good today, but will keep on making you look good 10 to 12 years into your buying cycle — well into the new millennium.

We start with a completely digital triaxial system and add such advanced technologies as a 4:3 aspect ratio, easily switchable to 16:9. Of course we offer flesh tone detail that keeps your talent as youthful as your system. Our six-vector color corrector allows you to paint and fine tune individual colors to make matching extremely easy. The unique LSI processor processes RGB in a single wafer, eliminating cross talk and noise. And only with digital technology can you set up one camera the way you like and transfer the information precisely to all other cameras for an exact match.

These ahead-of-their-time features are just part of the reason that, whatever the next millennium brings, if you own a 2600 the one thing it won't bring you is regrets.

Hitachi's SK-2600 Offers You All These Breakthrough Technological Advantages:

Full digital transmission system

4:3 aspect ratio, easily switchable to 16:9

Flesh tone detail for a softer, more youthful look

Six-vector color corrector and true linear matrix operating simultaneously

Single LSI does RGB processing for ultra-pristine image

13 to 18 bit digital processing

Precision digital file transfers

Extreme range of detail in viewfinder, even in low-level lighting

For the full story and a free copy of our white paper, "Advanced Digital Camera Technology For The New Millennium," call 800-762-6405.

Not just digital, Hitachi digital.

HITACHI

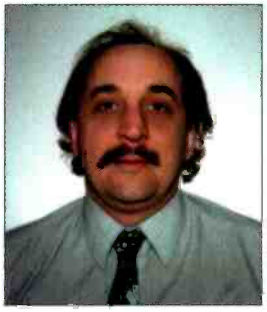
Hitachi Denshi America, Ltd.
Hitachi Denshi, Ltd.

New York (516) 921-7200 Atlanta (770) 242-3636 Los Angeles (310) 328-6116
Dallas (817) 488-4528 Chicago (708) 250-8050 Canada (416) 299-5900

Visit us at Booth #6303 at NAB in Las Vegas

Circle (135) on Action Card

Meet the editors



STEVE EPSTEIN

Steve Epstein will be discussing the pros and cons of dedicated hardware vs. general-purpose devices. Steve applies his knowledge of high-performance video equipment to tomorrow's multichannel digital radio facilities, where performance and reliability are critical. Can a general-purpose computer platform perform as well as dedicated hardware in this demanding environment? Stop by and find out.

Dedicated vs. General-Purpose Hardware
Tuesday, April 16, 1996
1:00 - 1:30pm
LVCC Room N109-110

SKIP PIZZI

Skip Pizzi will deliver a presentation in a NAB 96 management session entitled *New Technologies in Plain English*. It will cover many of the emerging systems and formats that broadcasters need to know about today, including on-line/Internet services. These technologies will be presented specifically from the perspective of broadcast managers, with emphasis on the business opportunities that these new systems provide.

New Technologies in Plain English
Monday, April 15, 1996
12:30 - 1:45 pm
LVCC Room N235

The roof is about to Collapse. . .

Quick!

How Long's 10% of 66 Watt Hours?

When the action's breaking fast, a fuel gauge display of your battery's charge isn't good enough. That's why PAG invented System RTI —the world's first accurate read-out of time remaining on a battery's charge. No more bar graphs to interpret. No more missed shots due to inaccurate information.

Down To the Second.

System RTI—actually a micro-computer contained in the Paglok adapter—evaluates the charged state of the battery and the energy being consumed, and displays in the viewfinder the time remaining—in hours, minutes *and* seconds.

Moment to Moment Accuracy.

As the load characteristics change, such as when a camera light is added or subtracted, the time remaining is instantly recalculated. In *standby*, the system assumes that the last load will be resumed, and shows *time-to-run* for this load with only the *standby* current subtracted. When a battery is replaced, the system immediately interrogates it and displays the charge status in amp hours. Switch to *record* and amp hours are replaced with a precise readout of time remaining.

Direct from Paglok to Finder.

The video overlay signal intercepts the composite video signal and can be routed—internally or externally—from the Paglok adapter to the finder, without interfering with the camera's electronics.

Upgrade your Camera.

The Paglok connector with System RTI fits any popular broadcast camera.

No More Guesswork.

Not knowing precisely how many minutes you have left on a battery can cost you the shot you came to get. When every second counts, let PAG's System RTI account for every second.

Circle (125) on Action Card

PAG

ADVANCED BATTERY SYSTEMS

PAG LIMITED
565 Kingston Rd, Raynes Park, London SW208SA
Tel:44 (0)181-543 3131 Fax:44(0)181-540 4416

SYSTEM RTI™

DO YOU HAVE TIME TO RUN?

PAG USA

ADVANCED BATTERY SYSTEMS

2755 Alamo Street, Suite 103
Simi Valley, California 93065
Tel:805-520-4911 Fax:805-520-7342

See Us at NAB Booth #7680


ACRODYNE
DATATEK
Scientific Atlanta
of the
1996 Atlanta
Olympic Games

BE FASTtrack

Bigger than a 10-gallon hat and busier than a bee's nest.

NAB is big. How big? So big that without help, you'll never get around to seeing all of the products and companies you want. So, if it's help you need, *Broadcast Engineering* magazine is here to provide it.

FASTtrack

BE's FASTtrack is the industry's exclusive shortcut to finding the products and companies you need to see at NAB. In addition to arranging companies alphabetically, *BE* provides you with this innovative way to locate vendors for the products and services you want.

Companies are first grouped according to product category. This allows you to immediately know what companies produce the type of product you're interested in.

The companies are then ordered within the product category by booth location. The result is the *BE FASTtrack*, which provides you with the shortest path between those companies. The result will be a more efficient use of your time. (And, less time on your feet!)

So hurry up pardner, and walk your boots on down to that exhibit floor and do some shopping. Then, while others are wander'n around looking lost, you'll be done and back at the ranch drink'n a long, tall cool one.

BE FASTtrack

Audio Mixers — Portable

Shure Brothers	L 5312
AMS Neve plc	L 6819
AMEK Consoles	L 6944
TASCAM	L 8226
Micron Audio Products	L 8331
ATI Audio Technologies	L 8460
Dongseo Electronics	M 4752-3
Cellcast	R 1524-5
Logitek	R 1802
Yamaha Music	R 1805
AEQ	R 2617
Audio Developments	R 2823
Euphonix	R 3123
Fostex	R 3314, 5544
Audio Services Corporation	R 3700
Henry Engineering	R 4108

Audio Mixers — Studio, On-air, Recording

Harrison by GLW	L 5318
AMS Neve plc	L 6819
Siemens Audio Inc.	L 6819
AMEK Consoles	L 6944
Hallikainen & Friends	L 7032
Mark IV Audio Group/MIDAS	L 8026
TASCAM	L 8226
ATI Audio Technologies	L 8460
Zaxcom	L 8482
FOR.A Corporation	L 8513
Ramsa Audio/Panasonic	L 10000
Ward-Beck Systems	L 10300
ADM Systems	L 10318
Graham-Patten Systems	L 10542
Otari	L 11029
Wheatstone Corporation	R 1211
Logitek	R 1802
Yamaha Music	R 1805
Pacific Research & Engineering	R 2301
Solid State Logic	R 2311
Fidelipac	R 2405
Broadcast Electronics	R 2601
Arrakis Systems	R 2611
AEQ	R 2617
Auditronics	R 3005
Euphonix	R 3123
Studio Technologies	R 3308
Fostex	R 3314, 5544
Autogram Corporation	R 3405
Calrec	R 4013
Mackie Designs	S 1245

Audio Processing (Compression, Limiting, Expansion, Equalizing, Noise Reduction); Telephone Hybrids, Telco-related Products, Bandwidth Extenders, Audio Codecs; EBS Equipment

Sony Electronics/Business & Prof.	L 5828
Siemens Audio Inc.	L 6819
Comrex	L 7009
Harman Pro Audio	L 7126
Manhattan Production Music	L 7977
Mark IV Audio Group/Klark Teknik	L 8026
Hotronic	L 8373-4
Alesis	L 9374
Audio Intervisual Design/Sanken	L 9383-4
AJ Technology	L 10381
Dolby Labs	L 10552
Dorrough Electronics	L 10953
NVision	L 11021
Apogee Electronics	R 1200
Roland Corporation	R 1215
Professional Sound Corporation	R 1411-2
Symetrix	R 1511
Modulation Sciences	R 1517-18
Cellcast	R 1524-5
Logitek	R 1802
Aphex Systems	R 1808
Circuit Research Labs	R 2008
Orban/Harmon Pro Audio	R 2011
Gentner Communications	R 2016
Eventide	R 2020
Solid State Logic	R 2311
Moseley Associates	R 2316
Penny & Giles	R 2323
Audio Developments	R 2823
Superscope Technologies/Marantz	R 2927
Studio Technologies	R 3308
Gorman-Redlich Mfg. Company	R 3323
Harris Broadcast Division	R 3517, 5809
Audio Processing Technology Ltd.	R 3702
Intraplex	R 3900
Calrec	R 4013
Telos Systems	R 4023
JK Audio	S 1026
Minerva Systems	S 2416
Pixel Instruments	S 2624

Recording & Playback Equipment (Tape, Hard Drive, CD)

Multidyne Electronics	L 4942
Nagra Kudelski SA	L 6804
AMS Neve plc	L 6819
Siemens Audio Inc.	L 6819
Studer International	L 7116
PEP	L 8000
TASCAM	L 8226
Broadcasters General Store	L 8446, 1617
FOR.A Corporation	L 8513
Alesis	L 9374
Optical Disc Corporation	L 9784
Ramsa Audio/Panasonic	L 10000
Otari	L 11029
JMR Electronics	M 4757
Digidesign	M 9338
DENON	R 1020
Roland Corporation	R 1215
HHB Communications Ltd.	R 1424
360 Systems	R 1605
Sonic Solutions	R 1623
Crouse-Kimzey Company	R 1719
Sprague Magnetics	R 1721
Yamaha Music	R 1805
Audi-Cord	R 1817
International Tapetronics/ITC	R 2005
Solid State Logic	R 2311
Fidelipac	R 2405
Superscope Technologies/Marantz	R 2927
Fostex	R 3314, 5544
Harris Broadcast Division	R 3517, 5809
Audio Services Corporation	R 3700
IMC/AKAI Digital	R 4031
ENCO Systems	R 4105

Audio Routing & Distribution — Routers, Audio DAs, Audio Patch Panels

Herman Electronics	L 4845
Multidyne Electronics	L 4942
Beck Associates	L 4959
Video Accessory	L 5227
Link Electronics	L 5342
Audio Accessories	L 5362-5461
Di-Tech Inc.	L 6348
Siemens Audio Inc.	L 6819
Omicron Video	L 6847
Television Equipment Associates	L 7030-1
DYNAIR Electronics	L 7113
Nemal Electronics International	L 7965
Avitel Electronics	L 8183
Videotek	L 8231
Pro-Bel Ltd.	L 8269
OpAmp Labs	L 8283
Knox Video Products	L 8336
Broadcast Video Systems/BVS	L 8376
Burst Electronics	L 8385
ESE	L 8434

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

FUNNY HOW WEAKNESSES YOU CAN'T SEE AT FIRST CAN CAUSE BREAKDOWNS YOU CAN'T AVOID LATER.

As we move into the digital future, things are looking better and better. Digital transmission standards for satellite, over-the-air, and cable systems, digital video cassette and disk formats — they all deliver picture quality far superior to anything in today's NTSC world.

But why confront the issue of picture quality now? Because a signal that's good enough for NTSC may hide flaws that can become problems down the road.

In today's broadcasting and production communities, new video servers and non-linear editing systems are being tested and evaluated. To accomplish their goals of fast multi-channel access and storage efficiency, most servers rely on video compression. And to help reduce picture distortions caused by high levels of compression, most systems use pre-filtering and sub-sampling to reduce the data that must be compressed. Instead of studio quality 4:2:2 component signals, they work with 4:2:0. Or 4:1:1. Or even 3:1:1.

These sampling structures produce pictures that are acceptable for some applications and may look okay to the eye. But even with no compression, they can prove to be inadequate for high-quality broadcast video productions. Because once chrominance and/or luminance information has been lost through pre-filtering and sub-sampling, it can never be restored.

Only 4:2:2 digital component signals and high-quality compression schemes will stand up to the rigors of sophisticated chroma-keying. Multi-generational editing. Special effects. Blue-screen compositing. Matting. ATV up/down conversion. And multiple transconversion between compression systems.

That's why Sony is developing new compression algorithms that can use 4:2:2 signals to produce broadcast pictures that retain their high quality through the rigors of studio editing and post-production.

In the brave new world of digital pictures, "good enough" will no longer be good enough. To protect your investment—and prevent breakdowns in quality—you need to work with the best picture you can get.

And the first step toward maintaining the picture quality you need is to use nothing less than 4:2:2 Digital Component Video.

Sony explores digital issues in depth with a new series of technical papers. To receive them, call 1-800-635-SONY, Ext. 11.

SONY

BE FASTtrack

Image Video	L 8452
ATI Audio Technologies	L 8460
Wohler Technologies	L 8566
Digipath Video	L 8657
BTS Broadcast Television Systems	L 9300
Grass Valley Group	L 9313
Dynatech Video Group	L 10013
Dynatech Video/Utah Scientific	L 10013
Datatek	L 10324
PESA Switching Systems	L 10844
ADC Telecommunications	L 10849
Lightwave Systems	L 10938
AVP Manufacturing	L 10961
Ross Video	L 11013
NVision	L 11021
Dongseo Electronics	M 4752-3
Leitch Inc.	M 9349
360 Systems	R 1605
International Tapetronics/ITC	R 2005
Benchmark Media Systems	R 2320
Auditronics	R 3005
Studio Technologies	R 3308
Autogram Corporation	R 3405
Target Technology	S 1027
Bittree	S 1370
Pixel Instruments	S 2624
Interlace Engineering Corporation	S 2825
Adrienne Electronics	S 2830
Milestek	S 2917
QuVIS	S 3323

Digital Workstations

Nagra Kudelski SA	L 6804
Siemens Audio Inc.	L 6819
Harman Pro Audio	L 7126
Fairlight ESP Pty Ltd.	L 7668
Broadcasters General Store	L 8446, 1617
Otari	L 11029
Soundscape Digital Technology	M 4760
AVID Technology	M 9338
Digidesign	M 9338
Roland Corporation	R 1215
SADiE	R 1223
TimeLine	R 1226
360 Systems	R 1605
Crouse-Kimzey Company	R 1719
Yamaha Music	R 1805
Adams-Smith	R 1814
Orban/Harmon Pro Audio	R 2011
Eventide	R 2020
Pacific Research & Engineering	R 2301
Solid State Logic	R 2311
Broadcast Electronics	R 2601
Arrakis Systems	R 2611
Harris Broadcast Division	R 3517, 5809
IMC/AKAI Digital	R 4031
ENCO Systems	R 4105
ComStream Corporation	S 2027
AAVS/Sencore	S 2626

Microphones, Accessories — (Lavaliere, Wireless, Hand-held, Pre-amps, Mounting Devices, Mult-Boxes); Speakers, Monitors, Amplifiers; Headsets, Headphones

Herman Electronics	L 4845
Shure Brothers	L 5312
Audio-Technica US	L 5646
beyerdynamic	L 6632
Siemens Audio Inc.	L 6819
R-Columbia Products	L 6844
Nady Systems	L 6941

AS YOU MOVE INTO THE DIGITAL FUTURE, WILL THE TECHNOLOGY YOU NEED BE DISK-BASED OR TAPE-BASED?

YES.

Evolution is a process, not a place.

There is no final destination. The goal is always to make the most of changing conditions. Take advantage of emerging opportunities. And get the jump on your competitors. So allow us to suggest a strategy that makes use of the advantages of all the technologies at your command.

The issue – and your ultimate goal – is system flexibility. The flexibility to use any technology that fits the function it performs best by maximizing performance and cost-efficiency for the requirements of the application at hand.

Server gurus may claim that disk technology is the answer to every need. In other words, that one size fits all. But does it?

For immediate access to video clips of relatively short duration, the best storage technology is a hard disk drive. So non-linear, disk-based server systems are indispensable, particularly in multiple editing operations.

But for acquisition, no technology beats tape. The cost is very low. The recording capacity is enormous. Camcorder size, power consumption – in sum – overall system performance is superb. And the convenience is persuasive.

For off-line, long-form, and archival storage, a tape-based system is more cost-efficient: just pennies per megabyte, instead of dollars. The media is removable. The access time is acceptable. And the system configuration is expandable.

And as we move ahead into the digital future, there's one more skill that video servers haven't mastered. Maintaining compatibility to the analog past.

That means you don't leave behind your installed base of Betacam® equipment. Or your valuable, even irreplaceable archive of Betacam tape.

So "tape-based or disk-based" is a baseless dilemma. What you really need is the best of both worlds: a flexible Sony solution, combining elements with proven fitness to solve the complex problems of the ongoing digital revolution.

Sony explores digital issues in depth with a new series of technical papers. If you'd like a complete set, call 1-800-635-SONY, Ext. 33.

SONY

BE FASTtrack

Sennheiser Electric	L 6948
Harman Pro Audio	L 7126
Lectrosonics	L 7865
Systems Wireless	L 7983
Mark IV Audio Group/Electro-Voice	L 8026
Mark IV Audio Group/Vega Wireless	L 8026
Micron Audio Products	L 8331
Connectronics	L 8335
Wireworks	L 8443
ATI Audio Technologies	L 8460
Countryman Associates	L 8471
Wohler Technologies	L 8566
Alesis	L 9374
Sanken/Developing Technologies	L 9383-4
Audio Intervisual Design/Sanken	L 9383-4
ComTek	L 9981
Ramsa Audio/Panasonic	L 10000
Telex Communications	L 10863
Professional Sound Corporation	R 1411-2
Rycote Mic Windshields	R 1818
Bryston	R 1920
Crown International	R 2523
Audio Ltd.	R 3309
Audio Services Corporation	R 3700
J L Fisher	S 2858

Automation Systems — Radio, Radio Business

Alamar Electronics USA	L 6048
Nagra Kudelski SA	L 6804
Computer Engineering Associates	L 8280
Comprompter	L 8869
Pioneer New Media Technologies	L 10457
Adtec Productions	L 11066
International Tapetronics/ITC	R 2005
Azden	S 1032
EVS Broadcast	S 1224
Louth Automation	S 2022
AAVS/Sencore	S 2626

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

Automation Systems — Video, TV, Newsrooms, TV Business

Sony Electronics/Business & Prof.	L 5828
Tel-test	L 6033
ADT Applied Digital Tech	L 6033
Alamar Electronics USA	L 6048
Nagra Kudelski SA	L 6804
DCM-Data Center Management	L 7675
Odetics Broadcast	L 8237
Pro-Bel Ltd.	L 8269
Computer Engineering Associates	L 8280
Columbine Systems	L 8521
Comprompter	L 8869
BTS Broadcast Television Systems	L 9300
Quantel	L 9329
Panasonic	L 10000
Dynatech NewStar	L 10013
Dynatech Video/Utah Scientific	L 10013
Dynatech Video Group	L 10013
ASACA ShibaSoku	L 10024
IBM Telecommunications & Media	L 10338
FloriCal Systems	L 10383
Pioneer New Media Technologies	L 10457

MOST SERVER TECHNOLOGIES CREATE ONE ISLAND AFTER ANOTHER.

MAY WE SUGGEST A BOAT?

Getting there, and getting back in one piece. That's the first issue you should settle if you're planning to visit the digital islands. But today's hot new server technologies have created a different reality. Beautiful islands, that prove to be difficult to access and integrate.

The issue here is networking. How to find a reliable and affordable solution that carries high-quality digital video, audio, and data from island to island. The solution lies close at hand – because of our knowledge of video and audio networks for the broadcast and production environments.

We led the way with Serial Digital Interface, or SDI. The pipeline that became the SMPTE 259M standard, serving as the backbone of many of today's TV stations and production facilities. SDI handles studio 4:2:2 component digital video signals, composite video, even digital audio. SDI is a standard with proven success. To reach the new digital islands, we propose to build a boat that builds on that success.

It's called Serial Digital Data Interface, or SDDI.

SDDI can carry multiple channels of compressed video signals, audio, and routing information. Best of all, you won't need to change your routing switcher and cabling – because SDDI uses your existing SDI infrastructure of digital routers and BNC coaxial cable.

The SDDI network maintains the full integrity of video and audio compressed bitstreams required for demanding operations such as real-time editing, special effects, and all other necessary steps in production and post-production.

Other networking solutions have been proposed for broadcast and production applications. But SDDI is the only SDI-compatible route to link digital servers and non-linear editing systems with speeds faster than real time.

So to route your signal safely throughout the digital islands, we propose a smooth, comfortable voyage in the good ship SDDI.

Welcome aboard.

Sony explores digital issues in depth with a new series of technical papers. If you'd like a complete set, call 1-800-635-SONY, ext. 44.

SONY

BE FAST track

Matco	L 10565
Channelmatic	L 10875
NewsMaker Systems	L 11038
Leightronix	L 11044
Adtec Productions	L 11066
AVID Technology	M 9338
Genelec OY	S 1039
Parkervision, Inc.	S 1464
Enterprise Systems	S 1621
Nesbit Systems Inc./NSI	S 1849
Louth Automation	S 2022
AAVS/Sencore	S 2626

Cameras, Lens Systems, Camera Optical Filters, Matte Boxes, Viewfinder Shades

BURLE INDUSTRIES	L 5201
ProSource	L 5345
Toshiba Corporation	L 5744
Sony Electronics/Business & Prof.	L 5828
TECNEC/Technical Necessities	L 6162
Arriflex	L 6808
Angenieux SA	L 6812
Thomson Broadcast Systems	L 7109
Innovision Optics	L 8080
JVC Professional Products	L 8505
FOR.A Corporation	L 8513
BTS Broadcast Television Systems	L 9300
Philips Components	L 9300
Fujinon	L 9724
Ikegami Electronics	L 9829
Canon USA/Broadcast Optics	L 9838
Panasonic	L 10000
Nikon Electronic Imaging	L 10881
Electrophysics Corporation	L 10983
Century Precision Optics	L 11035
Tron-Tek	M 3954
Elmo Manufacturing	M 4245
Broadcast & Surveillance Systems	S 1063
Network Video Technologies	S 2837
Concept W Systems	S 2909
Hitachi Denshi	S 6303

Camera Support Products, Pedestals, Tripods, Pan/Tilt Heads, Robotics Equipment and Controls

CSI/Camera Support International	L 4641
O'Connor Engineering Labs	L 5556
Miller Fluid Heads	L 6138
Cinema Products	L 6546
Arriflex	L 6808
Quickset	L 6815
Radamec Broadcast Systems	L 7147
Cartoni USA	L 7680
Cammate	L 8084
Cinekinetic	L 8180
K&H Products	L 8472
Stanton-Video Services Unltd.	L 9283-4
Vinten Broadcast/TSM	L 10329
Telemetrics	L 10372
Bogen Photo	L 10872
Egripment	L 10975
Sachtler	L 11016

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

The Agile Omni Global VU option gives you one touch access to all satellite formats.

More channels, more signals, more frequencies — life in the down link is becoming more complex every day.

What you need is something to simplify your life.

What you need is the Global VU Model CAM830 Control Access Monitor from Standard Communications.

Direct or remote control.
Used in conjunction with the Agile Omni receiver, the Global VU gives you simplified access to all satellite formats from easy front-panel controls or from a PC comfortably situated on your desk, miles away.

Directly or using the straightforward Windows®-based software, the CAM830 lets you add or modify formats, then scan them by RF frequency and/or audio subcarrier. It gives you complete control over all three audio subcarrier demodulators, as well as international video features such as PAL, SECAM and NTSC. It gives you control of video and audio output levels with individual channel memory.

And we're just getting started.

Spectrum analysis.
Want to really see what's going on? The Global VU gives you a screen-filling display of the RF spectrum for each satellite or your remote PC. It also gives you a real-time look at the C/N ratio without any time-consuming precalibration.

And there's more. As a field retrofit or optional add-on, the CAM830 gives your Agile Omni more easy-to-use control than you may have ever thought possible. To get the full story fast, including complete specifications, fax Standard today at 800/722-2329 (California and International numbers, 310/532-0397) and we'll fax it right back to you.

Be a know-it-all. Get your hands on a Global VU.

The Right Technology for Right Now.

Standard Communications
SATELLITE & BROADBAND
PRODUCTS DIVISION

P.O. Box 92151
Los Angeles, CA 90009-2151
310/532-5300 ext. 280
Toll Free 800/745-2445
Fax: 800/722-2329 (Toll Free)
310/532-0397 (CA & Int'l Only)

Circle (136) on Action Card

Knows all. Tells all.

BE FAST track

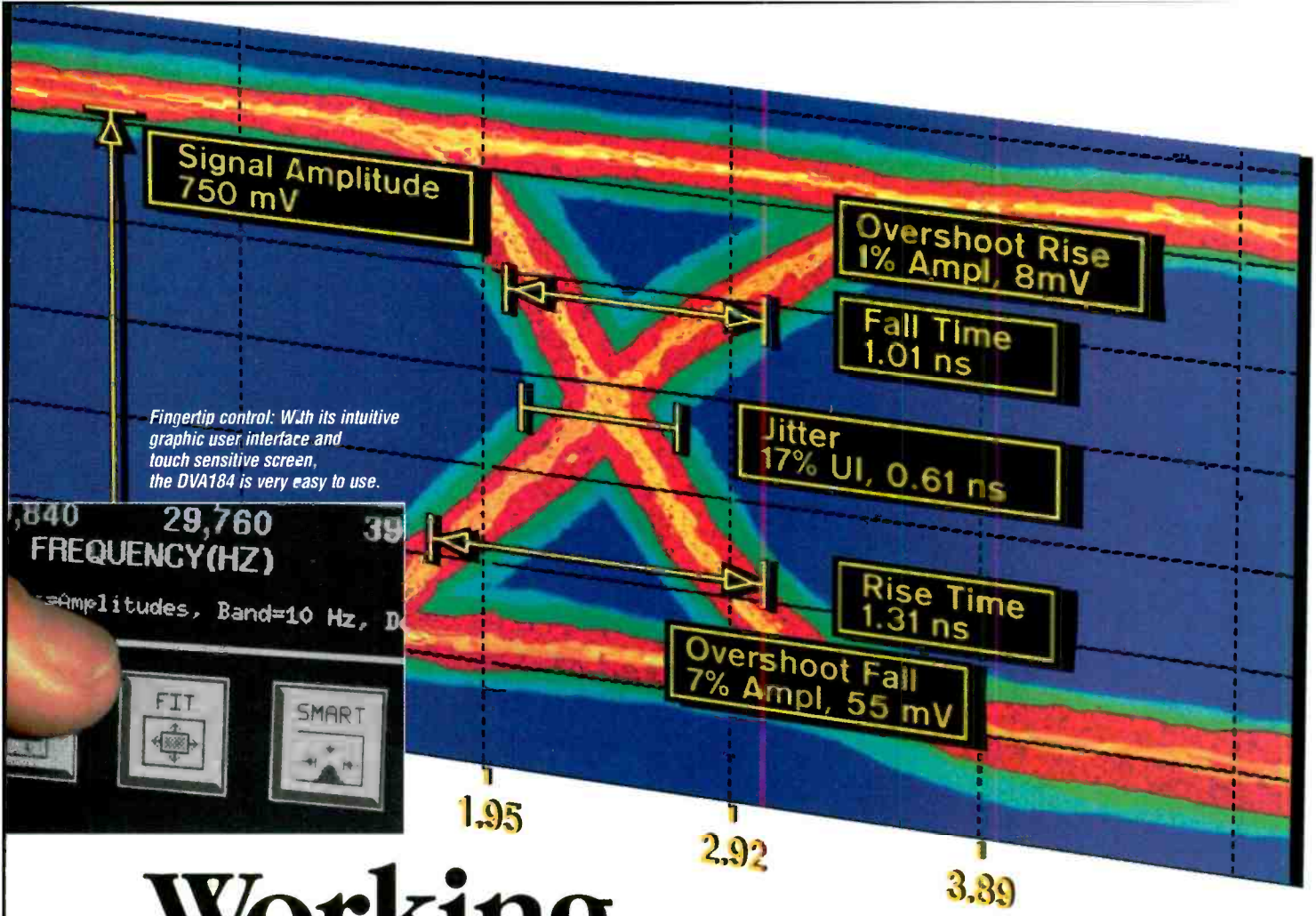
Shotmaker Dollies/Camera Platforms	L 11049
B&H Photo	S 1421
Camrobotic Systems/M S Russin Group	S 1941
Chapman/Leonard Studio Equipment	S 2338
J L Fisher	S 2858
Treetop Systems	S 3340
Band Pro Film/Video	S 4759

Character Generators, Production Titlers, Prompters, Captioning Equipment

Horita	L 4956
Image Logic Corporation	L 5361
Q-TV	L 5556
Scitex Digital Video (Abekas)	L 6058
Shereff Systems	L 8177
Knox Video Products	L 8336
QSI Systems	L 8352
Listec Video	L 8635
Comprompter	L 8869
BTS Broadcast Television Systems	L 9300
Quanta/Dynatech Video Group	L 10013
Tekskil Industries	L 10463
AVS Graphics	L 10521
Digital Graphix	L 10613
Chyron videoComputer	L 10700
ChyronGraphics	L 10700
Telescript	L 10838
Computer Prompting & Captioning Company	L 10949
Audio Video Design	L 11065
Compix Media	M 5240
Mirror Image Teleprompting	S 1051
Evolving Video Technology	S 1455
Texscan MSI	S 1644
SoftTouch	S 1870
Ultech	S 1974
Video Data Systems	S 2030
Cheetah Systems	S 2452
Magic Teleprompting Inc.	S 2815
Dubner International	S 2820
Inscriber/Mainframe Graphics	S 3326

Desktop Video Equipment

Toshiba Corporation	L 5744
FOR.A Corporation	L 8513
D-Vision Systems	L 8823
Pinnacle Systems	L 9157
Discreet Logic	L 9163
Silicon Graphics	L 9170
Hewlett-Packard	L 9177
BTS Broadcast Television Systems	L 9300
Grass Valley Group	L 9313
Nova Systems	L 9377
Scitex Digital Video (ImMix)	L 10163
United Media	L 10321
FAST Electronics USA	L 10475
Comprehensive Video Supply	L 10721
Adobe Systems	M 3842
Elmo Manufacturing	M 4245
Matrox Electronic Systems	M 4267, S 2630
OptImage Interactive Services	M 4732
RGB Computer & Video	M 5048
Divicom	M 5132
Intelligent Resources	M 5238
Data Translation	M 9772
Merging Technologies	S 1030
Newtek	S 1952
Play	S 2606
Millennium II Digital Systems	S 2622



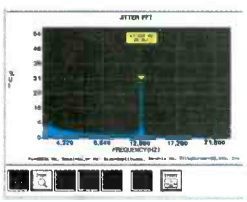
Working *on the* Edge

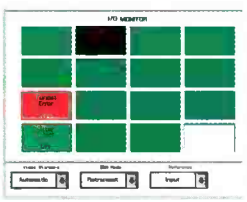
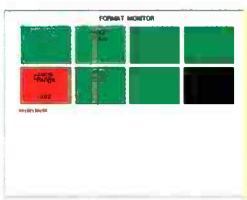
The DVA184 Video BitAlyzer™ is the digital video engineer's toolbox

Introducing the first all in one digital video analyzer. Offering in one great product features of an oscilloscope, waveform monitor, jitter spectrum analyzer, logic analyzer, Error Detection and Handling (EDH) monitor, format analyzer, and test pattern generator that will perform complete serial link and format tests. For use in designing, manufacturing, and maintenance of digital video equipment.

DVA184 Video BitAlyzer Features

- Jitter FFT and Histogram
- Multi-format Compatibility:
  - 360 Mb/sec - 525 and 625 4:2:2, 16x9
  - 270 Mb/sec - 525 and 625 4:2:2
  - 143 Mb/sec - 525 4 f_{SC}
- Automatic Edge Measurements
- Test Pattern Generator (up to 100 Frames)
- EDH Monitoring and Insertion
- Bit Error Insertion
- Jitter Insertion



Jitter has frequency components which spectrum analysis can identify. Monitor displays give you complete link status.

We offer the Digital Video Engineer a comprehensive "tool box:" the DVA184. Contact SyntheSys Research today and find out how the DVA184 can give you the edge in digital video analysis.

- In-service Error Identification
- Automatic Grab of Errored Frames
- Laser Quality Hard Copy Print
- Remote Control (IEEE-488, RS-232C)

SyntheSys Research Incorporated
3475-D Edison Way Menlo Park, CA 94025
415-364-1853 Fax: 415-364-5716

See us at NAB booth #s1470

SYNTHESYS RESEARCH, INC.

Patent Pending

Circle (139) on Action Card

BE FASTtrack

Advanced Digital Imaging	S 2943
Micro Computer Products	S 4039

Graphics & Animation Systems; Software for Mac/PC, Dedicated Computer Systems

Advanced Designs Corporation	L 5042
Toshiba Corporation	L 5744
Alden Electronics	L 6960
Getris Images	L 7768
Kavouras	L 7880
Bencher	L 8078
Shereff Systems	L 8177
Alias/Wavefront Technologies	L 8249
Accu-Weather	L 8563
Pinnacle Systems	L 9157
Discreet Logic	L 9163
Silicon Graphics	L 9170
Quantel	L 9329
Parallax Graphics Systems	L 9584
Radius	L 9777
Dynatech/Colorgraphics Systems	L 10013
Dynatech Video Group	L 10013
Microsoft Corporation	L 10349
Sierra Video Systems	L 10549
Digital Graphix	L 10613
Chyron videoComputer	L 10700
ChyronGraphics	L 10700
Chyron pictureWare	L 10700
Comprehensive Video Supply	L 10721
WSI	L 10883
Autodesk	M 4019
Linker Systems Inc.	M 4055
Matrox Electronic Systems	M 4267, S 2630
Immersion Corporation	M 4451
Extron Electronics	M 4532
Digimation	M 4658
Intelligent Resources	M 5238
Spencer Technologies	S 1024
KUB Systems Inc.	S 1237
B&H Photo	S 1421
Oxberry	S 1535
Boeckeler Instruments	S 1871
Pinnacle Micro	S 2012
5D	S 2153
Microvideo Ltd.	S 2246
Mark Roberts Motion Control	S 2276
Millennium II Digital Systems	S 2622
Baron Services	S 2667
Interlace Engineering Corporation	S 2825

High-Definition TV Equipment, Line Doublers, All Non-RF HDTV Products

Toshiba Corporation	L 5744
Eastman Kodak Company	L 8829
Snell & Wilcox	L 8849
BTS Broadcast Television Systems	L 9300
Ikegami Electronics	L 9829
ASACA ShibaSoku	L 10024
Faroudja Laboratories	L 10903
Yamashita Engineering Mfg./YEM	M 4023

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

Just Digital Isn't Enough

MPEG-2 digital video? Get *more* than just a boost in channel capacity. Get network control *and* save rack space.

Save space. Pack digital video encoding, three stereo digital audio channels *and* your QPSK modulator into 5 1/4 inches of rack space. Wrap it in a package so rugged it thrives in SNG trucks. Only Wegener delivers this much in this little space!

Get control. Boost programming flexibility with the industry's most advanced network control system. Go beyond addressability!

Control each receive site, groups of sites or all sites simultaneously. Deliver localized programming. Switch external devices. Transmit messaging and e-mail. Send data.

Change video data rates on the fly—2.5 to 15 Mbps—to adapt to broadcast material, weather conditions and available bandwidth. Select FEC coding rate (DVB compliant, of course), output power and frequency.

Locally, use front-panel controls or a remote serial port. Over the network, a new drag-and-drop graphical interface makes Wegener's advanced Addressable Network Control System even more powerful.

Get more than just digital video. Get the Wegener difference in MPEG-2 digital video. Cut your costs and build your profits. Call our Fax-On-Demand toll-free at (800) 711-1142 for a fact sheet that will help you compare digital video products—or e-mail zmpeg2@wegener.com.

Do it today. We'll respond immediately.

See us at NAB Booth #11033

WEGENER® COMMUNICATIONS

(770) 623-0096 FAX: (770) 623-0698

Circle (141) on Action Card

BE FASTtrack

Intercom/IFB Products

Swintek Enterprises	L 5228
R-Columbia Products	L 6844
Anchor Audio/ROH	L 7980
Mark IV Audio Group/Vega Wireless	L 8026
Ward-Beck Systems	L 10300
ADM Systems	L 10318
Clear-Com Intercom Systems	L 10369
Telex Communications	L 10863
SoftTouch	S 1870

Lighting Equipment, Instruments, Lamps; Light Modification Filters, Reflectors; Lighting Controls, Dimmers

Chimera	L 4958
Frezzolini Electronics	L 5217-8
The Great American Market	L 5321
Cinemills	L 5332
ProSource	L 5345
American Studio Equipment	L 5456
VIDESSENCE	L 5459
L E Nelson Sales	L 5547
Strand Lighting	L 5552
Matthews Studio Equipment	L 6312
LTM Corporation of America	L 6333
Union Connector	L 6360
Walter Brewer Corporation	L 6746-8
Lowel-Light	L 6822
Mole-Richardson	L 6831
Balcar	L 7875
Dedotec USA	L 8331
Cine 60	L 8338
Tiffen Manufacturing	L 8835
DeSisti Lighting/DESMAR	L 9183
ETC-Electronic Theatre Controls	L 9379
Colortran	L 10429
Anton/Bauer	L 10533
The F J Westcott Company	L 10984
Lightmaker Company	L 11057
Electronics Diversified Inc.	L 11085
K5600	S 1446-7
Kino Flo	S 1449
Cool-Lux	S 2252

Multimedia Products; Video Compression Equipment

FAST Electronics USA	L 10475
MMS Multi Media Systems	L 11069
Adobe Systems	M 3842
Pacific Bell	M 3854
Mega Drive Systems	M 3858
Autodesk	M 4019
Crestron	M 4058
AmPro	M 4251
Matrox Electronic Systems	M 4267, S 2630
Apple Computer Company	M 4516
Proxima Corporation	M 4573
Truevision	M 4650
LegaSys International	M 4654
Optibase Inc.	M 4722
OptImage Interactive Services	M 4732
Communications Specialties, Inc.	M 4745
Micropolis	M 4762
Sigma Designs	M 4766
FutureTel	M 4841
LEL Computer Systems	M 4953
Divicom	M 5132
Intelligent Resources	M 5238
Data Translation	M 9772

IKEGAMI/AVID'S DIGITAL DISK CAMERAS...

BE READY FOR ANYTHING.

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

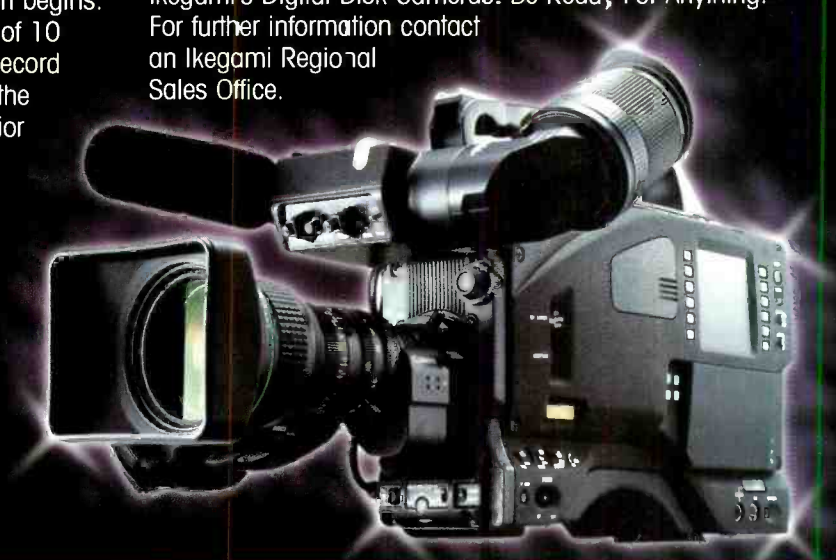
RetroLoop™ solves this dilemma. RetroLoop captures the moments before and the moments after the action begins. Simply set the record mode in continuous loops of 10 to 60 seconds. When the action begins, hit the record trigger and you've got the whole story including the "footage" contained in the loops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

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

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

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

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



DIGITAL DISK CAMERAS: NEW FRONTIERS AWAIT

Ikegami Electronics (U.S.A.), Inc. 37 Brook Avenue, Maywood, NJ 07607 East Coast: (201) 368-9171
West Coast: (310) 534-0050 Southeast: (954) 735-2203 Southwest: (214) 869-2363 Midwest: (708) 834-9774

Ikegami®

BE FASTtrack

Merging Technologies	S 1030
Electric Image	S 2017
Minerva Systems	S 2416
Multimedia Accessories	S 2656
Advanced Digital Imaging	S 2943
Crystal Graphics	S 3330

Production & Master Control Switchers

Sony Electronics/Business & Prof.	L 5828
Tel-test	L 6033
Scitex Digital Video (Abekas)	L 6058
Echolab	L 6740-3
Thomson Broadcast Systems	L 7109
Videotek	L 8231
Pro-Bel Ltd.	L 8269
Image Video	L 8452
Vistek Electronics	L 8500
FOR.A Corporation	L 8513
BTS Broadcast Television Systems	L 9300
Grass Valley Group	L 9313
Dynatech Video/Utah Scientific	L 10013
Dynatech Video Group	L 10013

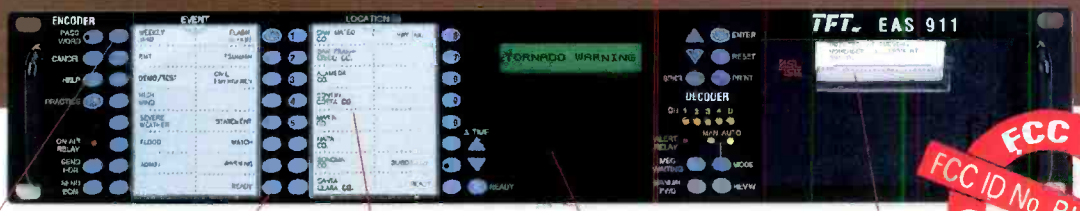
J-Lab	L 10938
Ross Video	L 11013
Arrakis Systems	R 2611
Ampex	S 3313

Routing & Distribution Switchers, Video DAs, Pulse DAs, Video Delays

Herman Electronics	L 4845
Multidyne Electronics	L 4942
Video Accessory	L 5227
Link Electronics	L 5342
TECNEC/Technical Necessities	L 6162
Di-Tech Inc.	L 6348
Omicron Video	L 6847
Television Equipment Associates	L 7030-1
DYNAIR Electronics	L 7113
Nemal Electronics International	L 7965
Avitel Electronics	L 8183
Videotek	L 8231
Pro-Bel Ltd.	L 8269
OpAmp Labs	L 8283
Knox Video Products	L 8336

Kings Electronics	L 8346-7
Broadcast Video Systems/BVS	L 8376
ESE	L 8434
Image Video	L 8452
Digipath Video	L 8657
BTS Broadcast Television Systems	L 9300
Grass Valley Group	L 9313
Sigma Electronics	L 9768
Dynatech Video Group	L 10013
Dynatech Video/Utah Scientific	L 10013
Datatek	L 10324
Sierra Video Systems	L 10549
PESA Switching Systems	L 10844
ADC Telecommunications	L 10849
Lightwave Systems	L 10938
Ross Video	L 11013
Extron Electronics	M 4532
Inline	M 5051
Leitch Inc.	M 9349
Pixel Instruments	S 2624
AAVS/Sencore	S 2626
Interlace Engineering Corporation	S 2825
Adrienne Electronics	S 2830
Milestek	S 2917

Save Lives! Save Money!
Switch to EAS - Today!



FCC TYPE CERTIFIED
FCC ID No. BIOEAS911

Practice/Help
These keys allow training and practice without interrupting the broadcast in progress.

"User-definable 'Event' and 'Location' keys"
These keys guide the operator through the encoding process and allow fast and easy required weekly tests.

User-friendly programmable front panel
Large, easy-to-use lighted keys are as easy to use as your familiar bank ATM.

Digital Voice Recorder
Allows unattended operation that plays back the audio portion of messages received for either manual or automatic forwarding.

24-column printer
Logs every EAS and SAME message received and transmitted and prints comprehensive Help Menus and instructions.

FREE EAS Handbook
($29 value)

- *Amended* FCC Rules
- Installation Guide
- Products & Pricing

TFT EAS 911 EAS Encoder/Decoder Now FCC Type Certified

After 4 years of development & testing, TFT leads again with a new EAS Encoder/Decoder that will save lives and protect property by speeding emergency messages to the public at risk in seconds. At the same time TFT could save the industry over **$60-million** annually in EBS operating costs and reduce EBS test tune-out by more than 88%.

All the details are in a new comprehensive EAS Handbook, the only complete reference. **Yours FREE for the asking**. In it we show you the low cost, easy solution to EAS.

For your FREE *new* TFT EAS Handbook (A $29 value)
Call: 1-800-347-3383

See us at NAB Booth #3002

TFT INC
Sound Quality for Over 25 Years!

3090 Oakmead Village Drive
Santa Clara, CA 95051-0862
Phone: (408) 727-7272 Fax: (408) 727-5942
E-Mail: eas911@aol.com

Circle (131) on Action Card

BE FASTtrack

Standards Converters; Scan, Format, A-D/D-A Converters; Encoders, Decoders

Link Electronics	L 5342
Sony Electronics/Business & Prof.	L 5828
Prime Image	L 5852
Thomson Broadcast Systems	L 7109
Tekniche Ltd.	L 8221
Accom	L 8356
Vistek Electronics	L 8500
FOR.A Corporation	L 8513
Video Int'l. Development	L 8672
Snell & Wilcox	L 8849

Nova Systems	L 9377
AJA Video	L 9483
Dynatech Video Group	L 10013
Compression Labs	L 10175
NTL	L 10344
James Grunder & Associates	L 10363
AJ Technology	L 10381
Miranda Technologies	L 10852
Faroudja Laboratories	L 10903
Intelvideo	L 10972
Wegener Communications	L 11033
Vela Research	M 3835
Yamashita Engineering Mfg./YEM	M 4023
Extron Electronics	M 4532
Communications Specialties Inc.	M 4745
LEL Computer Systems	M 4953
Inline	M 5051
Leitch Inc.	M 9349
Axon Digital Design	S 1040
Optivision	S 1430
Raytheon/Semiconductors	S 1641
Ultech	S 1974
Microvideo Ltd.	S 2246
RGB Spectrum	S 2249
Digital Vision	S 2326 L8221
Tiernan Comm	S 2453
Rapid Technology	S 3161
Nortel/Northern Telecomm	S 3319

Time-Base Correctors, Frame Synchronizers

Prime Image	L 5852
Digital Processing Systems	L 6754
Videotek	L 8231
Hotronic	L 8373-4
Zaxcom	L 8482
FOR.A Corporation	L 8513
Nova Systems	L 9377
Digital Graphix	L 10613
Ensemble Designs	S 3209

Video Accessories; Clocks, Timers

Options International	L 4761
Rank Cintel	L 6344

ASC

What digital ought to be.

Virtual Recorder Systems: Multi-Channel · Commercial Insertion · Network Delay · Nonlinear Editing

✆ 818.843.7004

See us at NAB Booth #5353

Circle (145) on Action Card

BE FAST track

Sprocket Digital	L 6660
Digital Processing Systems	L 6754
Garner Industries	L6840
Thomson Broadcast Systems	L 7109
Research Technology Int'l./RTI	L 7144
Lipsner-Smith Company	L 7144
Videotek	L 8231
Accom	L 8356
Broadcast Video Systems/BVS	L 8376
ESE	L 8434
EEG Enterprises	L 8449
Macrovision	L 8583
Video Int'l. Development	L 8672
Snell & Wilcox	L 8849
Hewlett-Packard	L 9177
Dynatech Video Group/daVinci	L 10013
Dynatech Video Group	L 10013
Evertz Microsystems	L 10181
NTL	L 10344
Allen Avionics	L 10713-4
Comprehensive Video Supply	L 10721
Miranda Technologies	L 10852
Faroudja Laboratories	L 10903
J-Lab	L 10938
Nytone Electronics	L 10957
Intelvideo	L 10972
Genesis Microchip	M 3927
Sanders Media Adventures/C MAC	M 3937
Folsom Research	M 4032
Dongseo Electronics	M 4752-3
LSI Logic	M 5119
LSI Logic	M 5119
Leitch Inc.	M 9349
Autogram Corporation	R 3405
Digital Vision	S 2326 L8221
Ensemble Designs	S 3209
Pandora International	S 3343
Video Associates Labs	S 4026

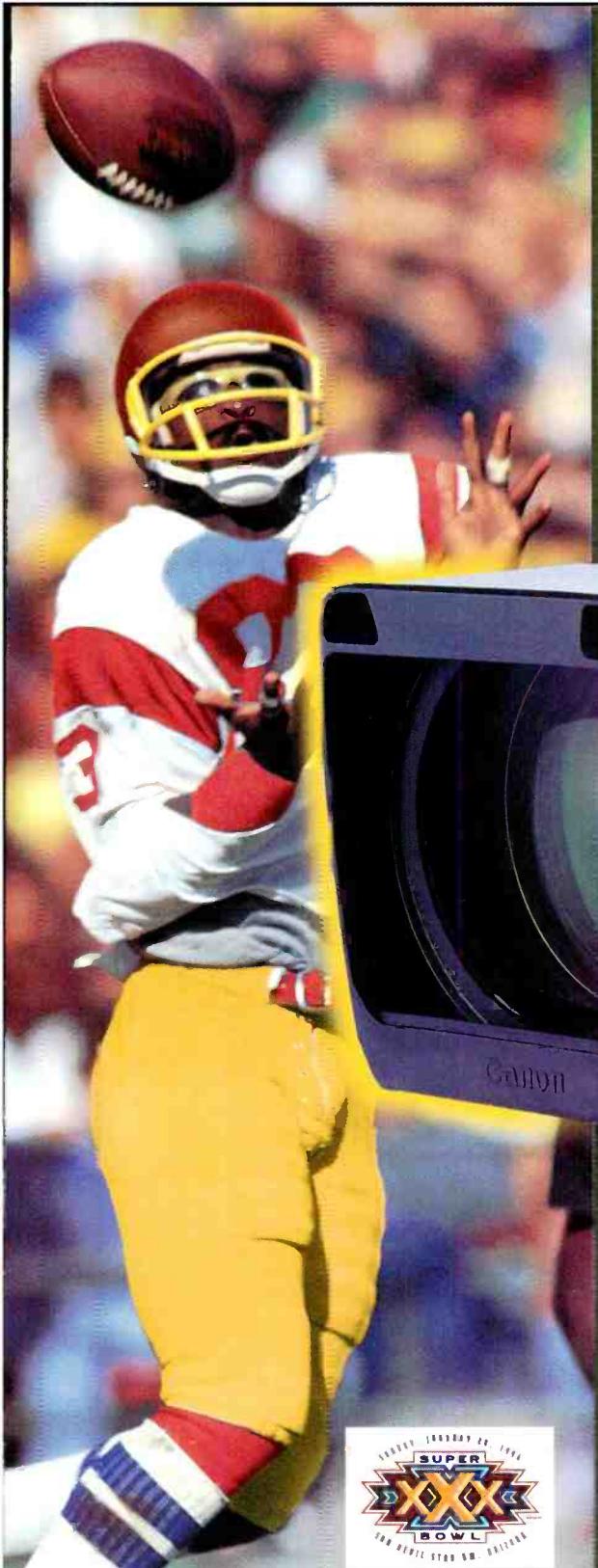
Video Editing Control Systems; Time-Code Equipment

Horita	L 4956
Fast Forward Video	L 5158
Montage Group	L 5241

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

ProSource	L 5345
Sony Electronics/Business & Prof.	L 5828
PEP	L 8000
Accom	L 8356
DNF Industries	L 8446
Broadcasters General Store	L 8446, 1617
JVC Professional Products	L 8505
FOR.A Corporation	L 8513
D-Vision Systems	L 8823
BTS Broadcast Television Systems	L 9300
Quantel	L 9329
Audio Intervisual Design/Sanken	L 9383-4
Brainstorm Electronics	L 9383-4
Editing Technologies Corporation	L 9484
Imagine Products	L 9584
EMC/Dynatech Video Group	L 10013
Scitex Digital Video (ImMix)	L 10163
Evertz Microsystems	L 10181
United Media	L 10321
FAST Electronics USA	L 10475
Videomedia	L 10538
VideoLab Para Technologies	L 10572
Chyron CMX	L 10700
Comprehensive Video Supply	L 10721
Lightworks	L 11025
Adcom Electronics Ltd.	M 3913
Matrox Electronic Systems	M 4267, S 2630

HOW THE INDUSTRY GOES LONG.



...CANON'S DIGI-SUPER70 IS THE 70X LENS OF CHOICE.

More users are choosing to 'go cng' with Canon's new 70X Digi-Super 70. Users like ABC Sports, Bexel Corporation. Dome Productions, Duke City West, Modular Video Systems, and NEP Mobile Production Services.

Canon's new Digi-Super 70 (PJ70x9.5B IE) provides the longest telephoto and widest angle combination of any lens —an advantage that opens up a wide range of shooting options, while incorporating Canon's unique internal focusing technology for long-range telephoto applications.

The Digi-Super 70 also provides extremely high performance without regard to object distance, as opposed to other lenses on the market, which are generally optimized for certain distances.

For more information on the Digi-Super 70, please call 1-800-321-4388. (In Canada call 905-795-2012.)

Canon

The Number One Lens

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

Circle (148) on Action Card

DIGI-SUPER70 SCORES BIG AT SUPER BOWL™ XXX

"Canon's Digi-Super 70 is one heck of a lens. At Super Bowl XXX, it allowed us to get inside the helmet of the players. We were able to show the full range of emotions of the players and coaches to the largest television audience in U.S. history."

— John Gonzalez, Director.

See us at NAB Booth #9838

BE FASTtrack

RGB Computer & Video	M 5048
Interactive Images	M 5122
Promax Technology	M 5242
AVID Technology	M 9338
TimeLine	R 1226
EVS Broadcast	S 1224
B&H Photo	S 1421
SoftTouch	S 1870
Steenbeck	S 1875
TAO Media Systems	S 1964
Dubner International	S 2820
Adrienne Electronics	S 2830
Ensemble Designs	S 3209
Ampex	S 3313

Video Presentation Equipment; Monitors, Video Walls, Projectors, Screens; Video Cards

Viewgraphics	L 4643
Toshiba Corporation	L 5744
Sony Electronics/Business & Prof.	L 5828
DYNAIR Electronics	L 7113
Electrosonic Systems	L 7677
Transvideo USA	L 7680
Hoodman Corporation	L 7967
Sumitomo Electric	L 7978
Advanced Video Designs	L 8221
Videotek	L 8231
Management Graphics	L 8384
Vistek Electronics	L 8500
JVC Professional Products	L 8505
FOR.A Corporation	L 8513
BTS Broadcast Television Systems	L 9300
Radius	L 9777
Ikegami Electronics	L 9829
ASACA ShibaSoku	L 10024
Pioneer New Media Technologies	L 10457
Magni Systems	L 10877
BARCO Industries	L 10900, 4818
Display Devices	M 4030
Folsom Research	M 4032
Target Vision	M 4045
Elmo Manufacturing	M 4245
Hughes JVC Technology	M 4541
Proxima Corporation	M 4573
Avitech Int'l.	M 4728
Dongseo Electronics	M 4752-3
Electrohome	M 5157
Film & Video Systems	S 1037
Electronic Visuals	S 2031
AAVS/Sencore	S 2626
Navitar	S 2656

Video Recorders — All Videotape Formats, Magnetic & Optical Disk & Arrays, Solid-State; Video Servers

Ciprico	L 5143
Fast Forward Video	L 5158
ASC Audio Video Corporation	L 5353
CMC Technology	L 5732
Toshiba Corporation	L 5744
Sony Electronics/Business & Prof.	L 5828
Scitex Digital Video (Abekas)	L 6058
Thomson Broadcast Systems	L 7109
AF Associates	L 7141
Accom	L 8356
DNF Industries	L 8446
JVC Professional Products	L 8505
FOR.A Corporation	L 8513
Pinnacle Systems	L 9157

Editbox is editing

at

11th Street Post

'There it is, everything in a box.'

TNT

EUP

COMPACT VARIETY

Harold Sellers
Vice President

11th Street Post was founded in 1994 with only an off-line edit suite, but owners Harold Sellers and James Klotz wanted to provide a 'one-stop shop' for their customers. They were convinced that digital was the way to go, and set out to find the perfect on-line editing solution. They found it in Editbox™.

QUANTEL

EDIT BOX™

No waiting, no worries, just sheer editing power.

Call our 24 hour Editbox Hotline now: 1 800 218 0051 Ext.142

Quantel Inc., 85 Old Kings Highway North, Darien, CT 06820 Tel: (203) 656 3100 Fax: (203) 656 3459

Circle(161) on Action Card

BE FASTtrack

Hewlett-Packard	L 9177
BTS Broadcast Television Systems	L 9300
Optical Disc Corporation	L 9784
Panasonic	L 10000
Dynatech Video Group	L 10013
ASACA ShibaSoku	L 10024
Videomagnetics Inc.	L 10307
FloriCal Systems	L 10383
Pioneer New Media Technologies	L 10457
FAST Electronics USA	L10475
PESA Switching Systems	L 10844
Wegener Communications	L 11033
MMS Multi Media Systems	L 11069
DVS Digital Video Systems	L 11069
Sierra Design Labs	S 2606
Mega Drive Systems	M 3858
JMR Electronics	M 4757
Micropolis	M 4762
Grey Matter Response	M 5045
AVID Technology	M 9338
Leitch Inc.	M 9349
Superscope Technologies/Marantz	R 2927
Spencer Technologies	S 1024
Film & Video Systems	S 1037
EVS Broadcast	S 1224
Comlinear	S 1270
Calculated Industries	S 1426
Coherent Communications	S 1448
Steenbeck	S 1875
TAO Media Systems	S 1964
Video Data Systems	S 2030
Autologic	S 2254
P E Photron	S 2335
Storage Concepts	S 2558
Advanced Digital Imaging	S 2943
Rapid Technology	S 3161
Ampex	S 3313
Inscriber/Mainframe Graphics	S 3326
FWB	S 3458
Hitachi Denshi	S 6303

Video Duplicators

Dwight Cavendish	L 10733

Video Special Effects — DVEs, Chroma-Keyers, Linear Keyers; Compositing Systems

Sony Electronics/Business & Prof.	L 5828
Scitex Digital Video (Abekas)	L 6058
Alias/Wavefront Technologies	L 8249
Ultimatte Corporation	L 8365
Broadcast Video Systems/BVS	L 8376
FOR.A Corporation	L 8513
Snell & Wilcox	L 8849
Pinnacle Systems	L 9157
Quantel	L 9329
James Grunder & Associates	L 10363
Digital Graphix	L 10613
AVID Technology	M 9338
Spencer Technologies	S 1024
KUB Systems Inc.	S 1237
Newtek	S 1952
Electric Image	S 2017
Interlace Engineering Corporation	S 2825
Ampex	S 3313

Full Service Broadcast Quality In All Our Products...

Including LPTV

When you purchase a transmitter for LPTV or translator service, you should expect the same quality and performance that the higher power stations receive in their transmission equipment — it's just as important to you as it is to them. At ITS, we manufacture all of our products to the same exacting standards that the largest, full service broadcast stations require! Some of the many features include:

- Broadcast quality, ITS built modulator for exceptional signal performance.
- Built-in protection from external and internal disturbances.
- Extensive diagnostic indication — available locally and remotely.
- Solid-state, broadband amplifiers.
- High gain, parallel amplifiers above 500 watts for redundancy. Each amplifier has its own power supply and cooling.
- Conservative design and advanced signal processing for outstanding reliability and performance.
- Full product line from 10 watts to 2 kW for LPTV and translators.

In addition, every product is backed by ITS' deep commitment to customer service after the sale — we simply won't let you down. Join the many broadcasters who are turning to ITS for the best transmitters for both low power and full service requirements.

"Visibly Better Technology"

ITS *information transmission systems*
CORPORATION

Broadcast Systems Division
Freedom Drive
P.O. Box 460
Lawrence, PA 15055-0460 USA
(412) 873-1500 FAX (412) 873-1264

Circle (196) on Action Card

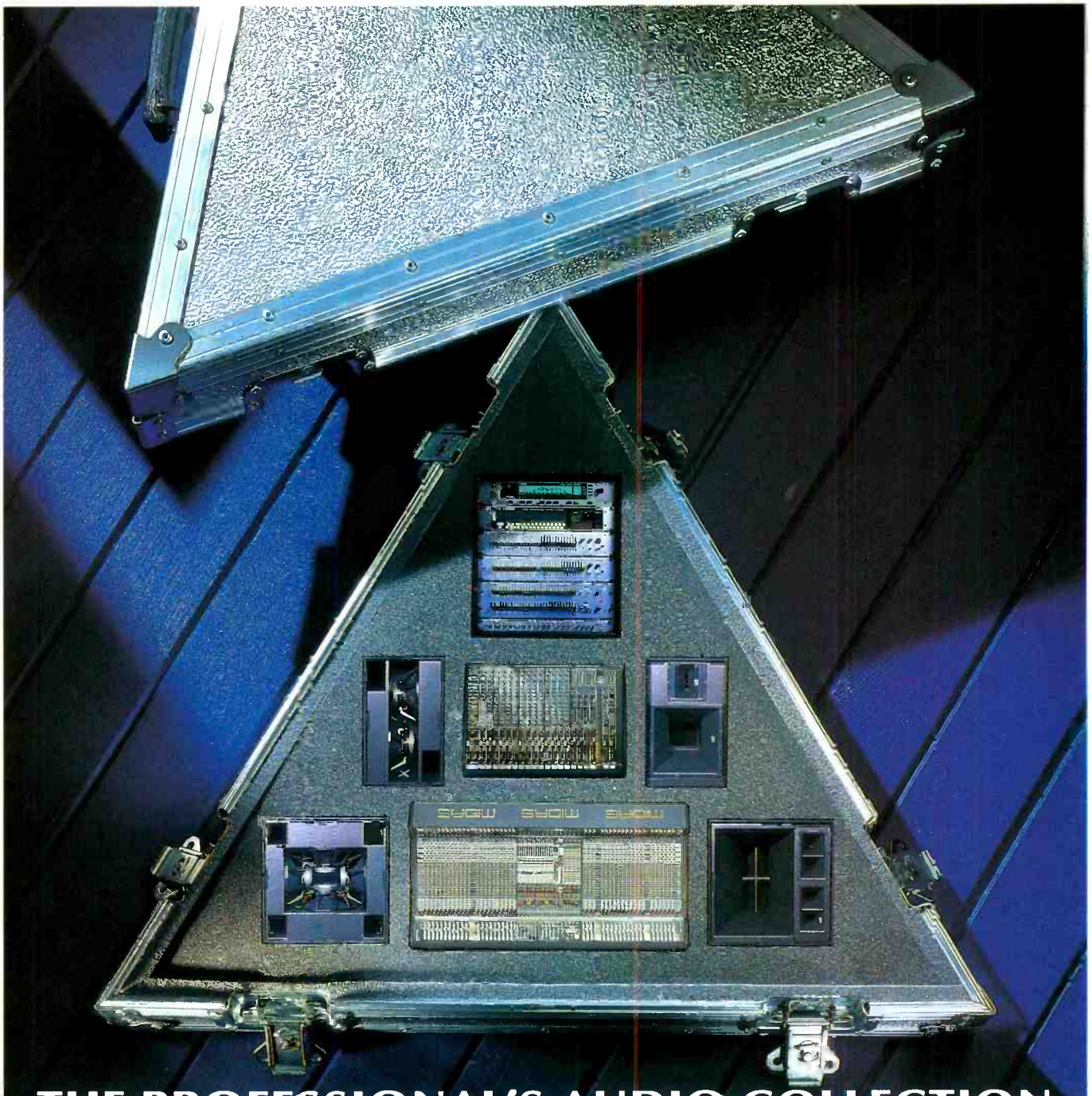
BE FASTtrack

Microwave Equipment — STL/TSL, ENG, MDS, MMDS, ITFS, ICR; Remote Production Control Products

CommSpec	L 4842
Troll Technology	L 5041, L 6308, S 2035
Toshiba Corporation	L 5744
ITS/Information Transmission	L 6760
Broadcast Microwave Services	L 7000
Scala Electronic	L 8362
AVCOM of VA	L 8480
Conifer Corporation	L 8670
Cablewave Systems/RF Systems	L 9468
Ikegami Electronics	L 9829
EMCEE Broadcast Products	L 10313
NUCOMM	L 10366
COMWAVE/Communications Microwave	L 10545
Dolby Labs	L 10552
Andrew Corporation	L 10857
RF Technology	L 10869
Continental Microwave	L 10869
N Systems/NSI	L 10910
Utility Tower	R 1900
Gentner Communications	R 2016
Moseley Associates	R 2316
TFT Inc.	R 3002
TEM/Tecnologie Eletronniche Milano	R 3419
BEXT	R 3511
Intraplex	R 3900
General Microwave Services	S 1736
ABE Elettronica SPA	S 1844
Premier Wireless	S 1961
Alcatel	S 2641
Loral Microwave-Narda	SS 1034

Satellite Transmission & Reception Equipment; Satellite Program Transmission Services

Intelsat	B 101
Toko America	L 4653
Antenna Technology Corp./ATCi	L 4955
Aydin West	L 5242
Scientific Atlanta	L 5812
COMSAT Corporation	L 6958
GE American Communications	L 7121
CPI-Satcom Division (Varian MEP)	L 7131
Communications & Power Industries	L 7131
Comtech Antenna Systems	L 8350
Conifer Corporation	L 8670
Standard Communication	L 9983
Cycle Sat	L 10183
NTL	L 10344
FloriCal Systems	L 10383
Sure Shot Teleproductions	L 10471
Hughes Communications	L 10525
ITELCO spa	L 10724
BAF Communication	L 10841
Andrew Corporation	L 10857
Continental Microwave	L 10869
RF Technology	L 10869
MCL Inc.	L 10963-4
Miralite Communications	L 10966
Norsat International	R 1417-8
LNR Communications	R 3708
Bird Electronic Corporation	R 4011
ComStream Corporation	S 2027
Vertex Communications	S 2038
Dawn Satellite Inc.	S 2149
IDB Communications	S 2921
Advent Communications	S 7671



THE PROFESSIONAL'S AUDIO COLLECTION

Mark IV Professional Audio Group is much more than just a new name. It's the name behind a unique collection of sound reputations. Yours and ours.

To develop those reputations for the future, Mark IV PAG aims to build on the innovative ideas and design talents of DDA, Electro-Voice, Klark Teknik and Midas.

With a single team, listening to you at every step, you'll find your views reflected in an exciting, evolving collection of audio technology.

And when you're on the road, Mark IV PAG's internationally co-ordinated professional back-up service puts fast technical support and rapid advice at your disposal.

Our latest audio technology includes the DDA QII VCA and compact DS3 consoles. Newly enhanced Electro-Voice MT PA systems. Klark Teknik's DN6000 analyser, DN3600 programmable graphic equaliser and remote controller. And from Midas, the acclaimed XL4 and XL200 live performance consoles.

For more details of the professional's audio collection and our international support services, contact Mark IV Pro Audio Group today.

MARK IV. THE NAME BEHIND SOUND REPUTATIONS

MARK IV

THE MARK IV PROFESSIONAL AUDIO GROUP

DDA CONSOLES

EV CONCERT SERIES

KLARK TEKNIK SIGNAL PROCESSING

MIDAS LIVE PERFORMANCE CONSOLES

Circle (167) on Action Card

MARK IV PRO AUDIO GROUP, KLARK TEKNIK BUILDING, WALTER NASH ROAD, KIDDERMINSTER, WORCESTERSHIRE DY11 7HJ, ENGLAND. TEL: (01562) 741515 FAX: (01562) 745371.
MARK IV PRO AUDIO GROUP, 448 POST ROAD, BUCHANAN, MI 49107, USA. TEL: (616) 695 4750 FAX: (616) 695 0470. TOLL FREE WITHIN USA: 800 695 1010.

BE FASTtrack

Radio, TV Transmitters, Translators, Antennas; Towers, Guys, Tower Lights; Waveguide, RF Feedline; RF Power Devices, Receivers

Technosystem SpA	L 4645
BURLE INDUSTRIES	L 5201
Stainless	L 5212
Aydin West	L 5242
MYAT	L 5301
Shively Labs	L 5304
Jampro Antennas	L 5308
SWR Inc.	L 5328
Thomson Tubes Electroniques	L 5331
ITS/Information Transmission	L 6760
Micro Communications	L 6801
Richardson Electronics	L 7004
Hallikainen & Friends	L 7032
Thomcast France	L 7109
Comark Communications/A Thomcast Company	L 7109
CPI	L 7131
Acrodyne Industries	L 7136
Kline Towers	L 7877
Dielectric Communications	L 8016
Lightning Eliminators & Consultants	L 8343
Scala Electronic	L 8362
Tennaplex Systems	L 8362
Kathrein-Werke KG	L 8362
Will-Burt	L 8580
Davicom Technology	L 8657
Cablewave Systems/RF Systems	L 9468
Alan Dick & Company	L 9844
LDL Communications	L 9844
Rohn	L 10310
EMCEE Broadcast Products	L 10313
Electronic Associates	L 10472
Allen Osborne Associates	L 10570
ITELCO spa	L 10724
Andrew Corporation	L 10857
EEV	L 10906
MCL Inc.	L 10963-4
Advanced Broadcast Systems	R 1024
Svetlana Electron Devices	R 1123
Kintronic Laboratories	R 1220
Flash Technology	R 1408
Central Tower	R 1515
Modulation Sciences	R 1517-18
LBA Technology	R 1524-5
Utility Tower	R 1900
GEC-Marconi Communications Systems	R 2002
Prodelin Corporation	R 2326
Broadcast Electronics	R 2601
Continental Electronics	R 2605
3dbm	R 2826
Magnum Tower	R 2923-4
Electronics Research - ERI	R 3000
TFT Inc.	R 3002
DB Elettronica	R 3126
Larcan-TTC	R 3311
Larcan	R 3311
Hughey & Phillips Inc.	R 3317
TEM/Tecnologie Eletronniche Milano	R 3419
CCA Electronics	R 3505
BEXT	R 3511
Harris Broadcast Division	R 3517, 5809
California Amplifier	R 3526
Antenna Concepts	R 3711
TWR Lighting	R 3903

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

Consider This:
Without Light Sources
And Texture
This Would Be Just
Another Crappy Day.

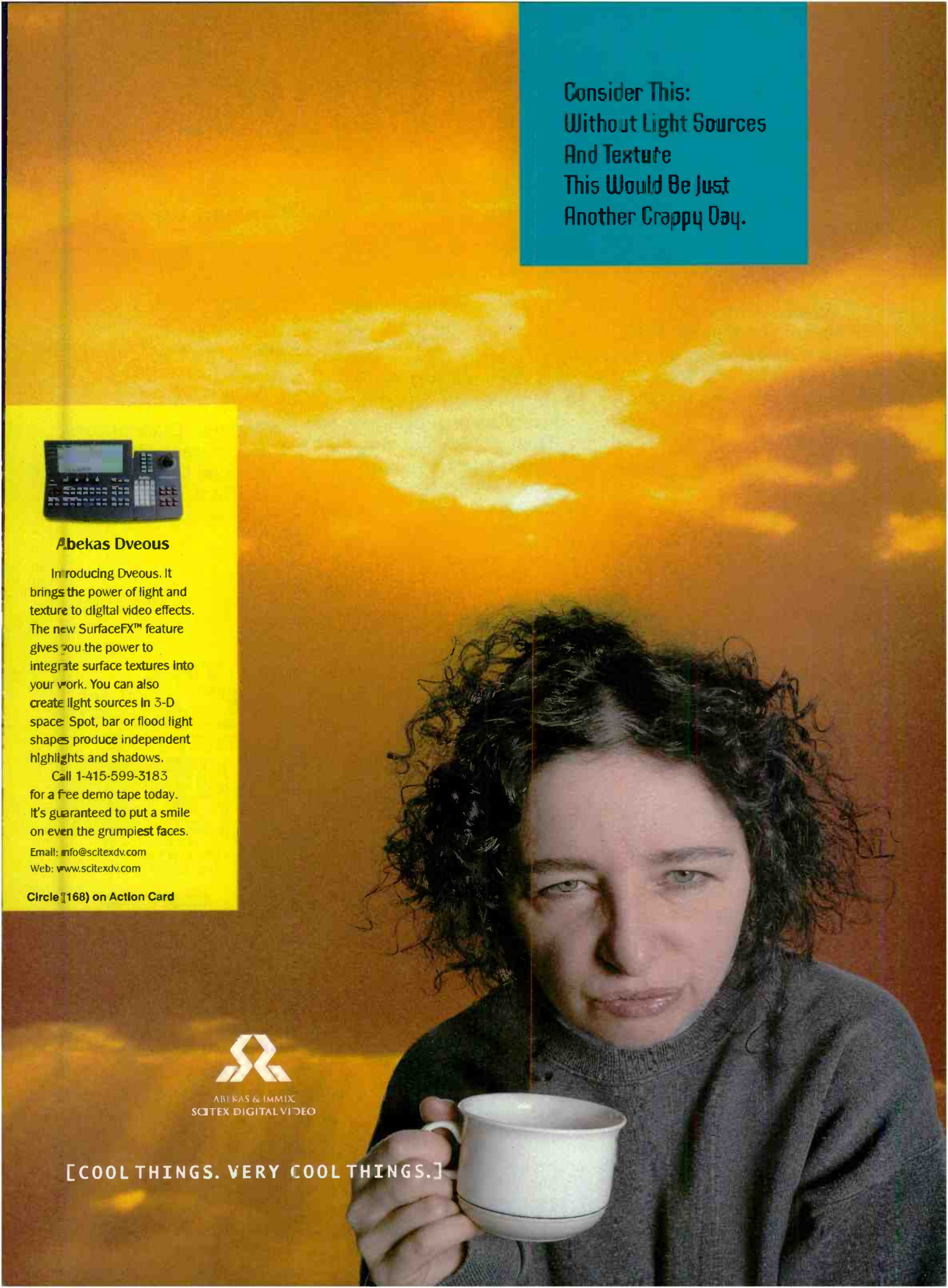
Abekas Dveous

Introducing Dveous. It brings the power of light and texture to digital video effects. The new SurfaceFX™ feature gives you the power to integrate surface textures into your work. You can also create light sources in 3-D space. Spot, bar or flood light shapes produce independent highlights and shadows.

Call 1-415-599-3183 for a free demo tape today. It's guaranteed to put a smile on even the grumpiest faces.

Email: info@scitexdv.com
Web: www.scitexdv.com

Circle (168) on Action Card



ABEKAS & IMMIX
SCITEX DIGITAL VIDEO

[COOL THINGS. VERY COOL THINGS.]

BE FAST track

Econco Broadcast Service	R 3911
ABE Elettronica SPA	S 1844
Penta Laboratories	S 2370
Doty Moore Services	S 2832

Power Products — Batteries, Chargers, UPS, Power Converters, Power Protection, Lightning-Protection Products

Christie Electric	L 5204
Frezzolini Electronics	L 5217-8
IDX Technology/IKON Video	L 6338
Victory Battery Company	L 6846
ENG Mobile Systems	L 7143
PAG Ltd.	L 7680
Pulizzi Engineering	L 8067
Cine 60	L 8338
Lightning Eliminators & Consultants	L 8343
Paco Electronics USA	L 10481
Anton/Bauer	L 10533
United States Broadcast	L 10715

Control Concepts/Leibert	L 10946
Professional Sound Corporation	R 1411-2
Electronics Research - ERI	R 3000
Superior Electric	R 3912
Best Power Technology	S 1427-8
K5600	S 1446-7
Hipotronics	S 1970
Cool-Lux	S 2252

Consultants — Engineering, System Integration, Facilities Design, Engineering Software, Training Programs

Tentel Corporation	L 5220
Television Engineering	L 6331
NDG Phoenix	L 6362
Micro Communications	L 6801
Thomcast France	L 7109
AF Associates	L 7141
Kline Towers	L 7877

Rees Associates	L 8340
RT-SET	L 10700
IHS Communications Products	M 5055
EDX Engineering	R 1523
Broadcast Electronics	R 2601
Rules Service Company	R 4000
Adirondack Software	S 1156
Nesbit Systems Inc./NSI	S 1849
Nigel B Furniture	S 2031
CTE International	S 2526
Doty Moore Services	S 2832

Dealers, Distributors, Equipment Brokers, Financial Organizations, Rental Houses

Antenna Technology Corp./ATCi	L 4955
ProSource	L 5345
Media Concepts	L 5356
Ste-Man	L 7680
Systems Wireless	L 7983
Broadcasters General Store	L 8446, 1617
Yale Electronics	L 8683

Circle (171) on Action Card

Circle (172) on Action Card

EEVs IOT installed base grows weekly!

Over 300 EEV IOTs are in operation, with more on order. EEV IOT equipped transmitters are operating in more than 20 countries throughout the world.

EEV IOTs have proven lifetime!

EEV IOTs have provided more than 3 million hours of service since their introduction in 1991. Individual tube lives well in excess of 20,000 hours have already been achieved and are increasing daily.

Energy Savings

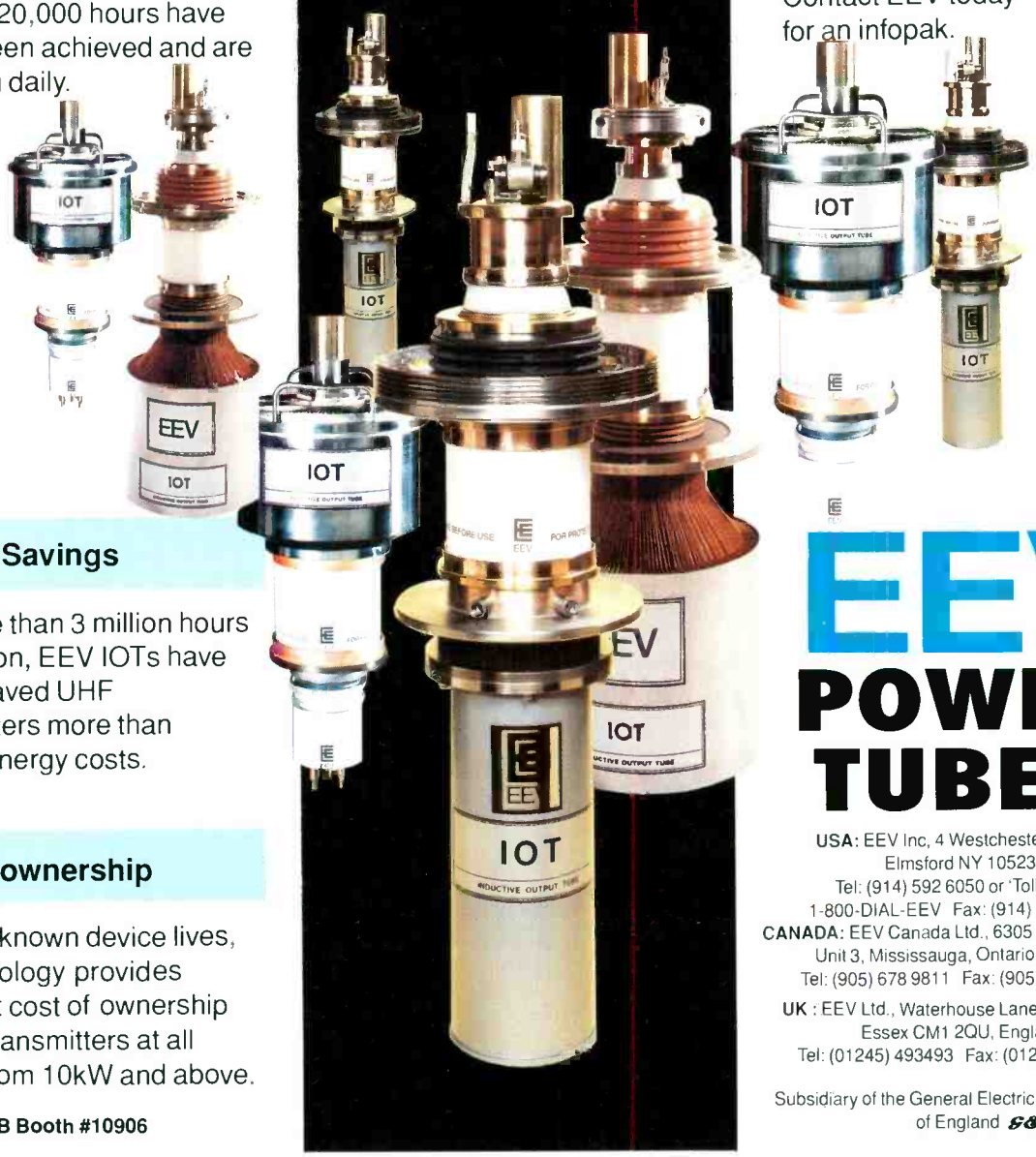
With more than 3 million hours of operation, EEV IOTs have already saved UHF broadcasters more than $12M in energy costs.

Cost of ownership

Based on known device lives, IOT technology provides the lowest cost of ownership for UHF transmitters at all powers from 10kW and above.

See us at NAB Booth #10906

More than 300 EEV IOTs IN DAILY OPERATION



Substantial family - growing all the time!

Whatever power you want between 10 and 60kW, EEV has an IOT to meet your needs.

There are others, but can they match EEV?

Check the achieved lifetimes of EEV IOTs.

Check the product support EEV provides to its customers.

Check EEV's track record.

Contact EEV today for an infopak.

EEV POWER TUBES

USA: EEV Inc, 4 Westchester Plaza, Elmsford NY 10523
Tel: (914) 592 6050 or 'Toll Free' 1-800-DIAL-EEV Fax: (914) 682 8922
CANADA: EEV Canada Ltd., 6305 Northam Drive, Unit 3, Mississauga, Ontario L4V 1H7
Tel: (905) 678 9811 Fax: (905) 678 7726
UK : EEV Ltd., Waterhouse Lane, Chelmsford, Essex CM1 2QU, England
Tel: (01245) 493493 Fax: (01245) 492492

Subsidiary of the General Electric Company plc of England *G&C*

Circle (151) on Action Card

BE FASTtrack

H L Dalis	L 9583
The Equipment Broker	L 10582
United States Broadcast	L 10715
Comprehensive Video Supply	L 10721
Zack Electronics	M 4551
Professional Sound Corporation	R 1411-2
HHB Communications Ltd.	R 1424
Crouse-Kimzey Company	R 1719
Harris Broadcast Division	R 3517, 5809
Hi-Tech Enterprises	S 1409
Balboa Capital	S 1411
B&H Photo	S 1421
BLR Communications	S 1624
BCS Broadcast Store	S 2913, 6952
Band Pro Film/Video	S 4759

Fiber-Optic Equipment, Fiber Materials, Terminal Equipment; Non-RF Transmission Systems

Ortel Corporation	L 5044
C-COR/Comlux	L 5359
Telecast Fiber Systems	L 5856
Mohawk/CDT Broadcast Cables	L 6862
Meret Optical Communications	L 7113
Communications & Power Industries	L 7131
Comm/Scope	L 7884
Fiber Options	L 8076
Tekniche Ltd.	L 8221
Pro-Bel Ltd.	L 8269
Canon USA/Broadcast Optics	L 9838
VYVX National Video Network	L 10157
ADC Telecommunications	L 10849
Lightwave Systems	L 10938
Artel/Chipcom Corporation	S 1065
Force Inc.	S 1842
IPITEK Inc.	S 2936

Studio Support Products,

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

Accessories; Sets, Drapes, Acoustic Materials, Equipment Racks, Furniture

Beck Associates	L 4959
UniSet Corporation	L 5225
Cinemills	L 5332
American Studio Equipment	L 5456
Theatre Service & Supply	L 5846
Professional Label	L 6262
Matthews Studio Equipment	L 6312
ZERO Stantron	L 6336
Hi-Tech Industries	L 6661
AMCO Engineering	L 6828
Acoustic Systems	L 8075
Acoustical Solutions	L 8349
ESE	L 8434
Peerless Sales Company	L 8458
DeSisti Lighting/DESMAR	L 9183
EMCOR Products/Crenlo	L 9372
Industrial Acoustic/IAC	L 10469
Torpey Controls & Engineering	L 10952
Bretford Manufacturing	L 10969
The F J Westcott Company	L 10984
Display Devices	M 4030
Anthro Technology	M 4036
Dongseo Electronics	M 4752-3
JMR Electronics	M 4757
Winsted Corporation	M 6825, M 4027
Illbruck	R 2223
Pacific Research & Engineering	R 2301
Arrakis Systems	R 2611
Nigel B Furniture	S 2031
ERGO 90/Ergo Industries	S 2813
Clipper Products	S 2923
Electrorack Products	S 2930
Computer Expressions	S 5235

Tape, Optical Recording Media; Tape Storage Systems; Degaussers; Videocassette Labels, Software; Music, Video Libraries; Translation/ Voice-Over Services

27th Dimension Inc.	L 5546
Sony Recording Media	L 5828
Sound Ideas	L 5847, S 2937
Data Security	L 5858
Optimum Productions	L 5962
Network Music	L 6031, M 4554
Production Garden Library	L 6062
Professional Label Inc.	L 6262
TRF Production Music Libraries	L 6462
Valentino Production Music	L 6832
Garner Industries	L 6840
Omnimusic	L 6842

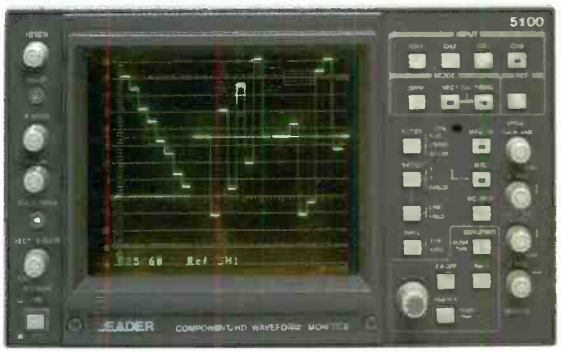
We Still Do It Your Way

4:2:2

Ready for digital component, the LV 5100D monitors two serial inputs **plus** analog component, provides full EDH and reads digital data in hex. The LT 425D generator drives 4 serial inputs with embedded **and separate** AES/EBU digital audio, full EDH, and moving/switched patterns for compression tests. Both operate in 525/60 or 625/50.

COMPONENT

Model 5100 four-channel component/composite Waveform Monitor operates in Betacam, MII, HDTV, and SMPTE formats as well as analog. Model 425A Generator supplies RGB, Betacam or MII in 3 and 2 wire (Y/CTDM) form and analog.

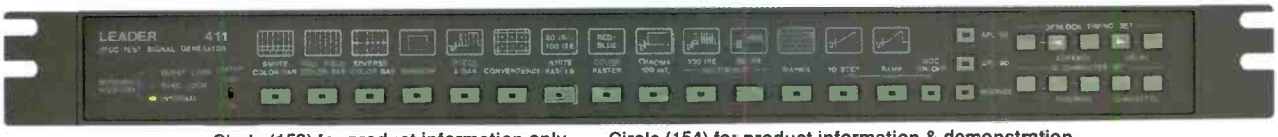


COMPOSITE

Model 5870 Waveform/Vector/SCH Monitor shown sharing a half-rack adapter with the Model 5130 Picture Monitor.

The Model 411 Sync/Test Generator synthesizes precision analog from a 10 bit D/A.

See us at NAB Booth #8369



Circle (153) for product information only. Circle (154) for product information & demonstration.

Call Toll Free
1 800 645-5104
In NY, 516 231-6900

LEADER
FOR PROFESSIONALS WHO KNOW THE DIFFERENCE

Leader Instruments Corporation
380 Oser Avenue, Hauppauge, New York 11788
Regional Offices: Chicago, Dallas, Los Angeles, Atlanta.
In Canada call Omnitronix Ltd., 905 828-6221

BE FASTtrack

Aircraft Production Music Libraries	L 6961
Sanix Corporation	L 7144
Research Technology Int'l./RTI	L 7144
United Ad Label	L 7975
Manhattan Production Music	L 7977
FirstCom/Music House	L 8276
Audio Action	L 8382
Carpel Video	L 8470
H L Dalis	L 9583
Storeel	L10303
Videomagnetics Inc.	L 10307
CBS News Archives	M 4035
NBC News Archives	M 5232
Apogee Electronics	R 1200
U S Tape & Label	R 1717
Fidelipac	R 2405
audiopak	R 3409
Halland Broadcast/Henry Engineering	R 4108
British Information Services	S 1874
Rorke Data	S 2322
Weather Central	S 2373
Promusic	S 2816-7
DIC Digital	S 2941
Quantegy	S 3313

Test and Measurement Equipment; Tools; Electronic Components

Herman Electronics	L 4845
Multidyne Electronics	L 4942
Antenna Technology Corp./ATCi	L 4955
Horita	L 4956
Beck Associates	L 4959
Holaday Industries	L 5219
Tentel Corporation	L 5220
Video Accessory	L 5227
Telecast Fiber Systems	L 5856
Professional Label	L 6262
Veetronix Inc./Reach	L 6744
Techni-Tool	L 7870-1
Minolta	L 8065
Videotek	L 8231
Jensen Tools	L 8344
Leader Instruments	L 8369
Sound Technology	L 8431
Broadcasters General Store	L 8446, 1617
VidCAD Documentation Programs	L 8476
AVCOM of VA	L 8480
Wohler Technologies	L 8566
Davicom Technology	L 8657
Hewlett-Packard	L 9177
Philips TV Test Equipment	L 9300
Tektronix	L 9313
H L Dalis	L 9583

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

ASACA ShibaSoku	L 10024
ADM Systems	L 10318
James Grunder & Associates	L 10363
Hamlet	L 10363
AJ Technology	L 10381
Electronic Associates	L 10472
Techflex	L 10564
Dorrough Electronics	L 10953
Comsonics	L 10941
Microwave Filter/Comband	L 10970
ScheduALL by Visual Inc.	L 11071
Tally Display Corporation	L 11078, S 1615
Faraday Technology Ltd.	L 11083-4
Leitch Inc.	M 9349
Kintronic Laboratories	R 1220
Audio Precision	R 1405
Neutrik USA	R 1600
Logitek	R 1802
Potomac Instruments	R 1917
Belar Electronics Lab	R 2408
Crown International	R 2523
Gorman-Redlich Mfg. Company	R 3323
Altronic Research	R 3508
Coaxial Dynamics	R 3908
Bird Electronic Corporation	R 4011
SyntheSys Research	S 1267
Clark Wire & Cable	S 1414, 1404
Ultech	S 1974
Electronic Visuals	S 2031
Graseby Optronics	S 2154
Microvideo Ltd.	S 2246
Data Check	S 2456
AAVS/Sencore	S 2626
Gennum/Video-Broadcast	S 2819
RCI Systems Inc.	S 2823
Concept W Systems	S 2909
Milestek	S 2917
Elantec Semiconductor	S 2938

Vehicles; Equipment Transport Cases & Bags; Production Services

NS Microwave	L 4756
Wescam Systems Int'l.	L 5041, S 2035
Anvil Cases	L 5315
Keystone Communications	L 5324
Television Engineering	L 6331
Thermodyne International	L 6631
Frontline Communications	L 6761
AF Associates	L 7141
ENG Mobile Systems	L 7143
Calzone Case	L 8275
Will-Burt	L 8580
Lightware	L 8582
Nalpak Sales	L 8675
Telepak San Diego	L 8680
Wolf Coach	L 10617
BAF Communication	L 10841

Hardigg Industries	L 10981
Shook Electronics	O H 101
KD Kanopy	R 4005-6
E-Z UP International	R 4014-5
KATABAND	S 1424
LM Engineering	S 1932
Clipper Products	S 2923
Advent Communications	S 7671

Wire, Cable, Connectors

Herman Electronics	L 4845
Audio Accessories	L 5362-5461
Whirlwind	L 5541
LEMO USA	L 5560
Canare Cable	L 5860
TECNEC/Technical Necessities	L 6162
Union Connector	L 6360
Mohawk/CDT Broadcast Cables	L 6862
Trompeter Electronics	L 7007
VEAM	L 7872
GEPCO International	L 7884
Comm/Scope	L 7884
Nemal Electronics International	L 7965
United Ad Label	L 7975
Connectronics	L 8335
Kings Electronics	L 8346-7
Wireworks	L 8443
Belden Wire and Cable	L 8883
H L Dalis	L 9583
ADC Telecommunications	L 10849
Extron Electronics	M 4532
Inline	M 5051
Switchcraft	R 3320
Bittree	S 1370
Clark Wire & Cable	S 1414, 1404
The Rip-Tie Company	S 1933
Delco Wire & Cable	S 2155
RCI Systems Inc.	S 2823
West Penn Wire/CDT	S 2824
Milestek	S 2917

Choosing A Networked Video Compression Solution Makes You A Hero Or A Scapegoat. Choose Wisely.

Let's face facts.

Selecting the wrong video networking solution puts you on the hot seat. Blown budgets. Missed timelines. Nasty finger pointing. And worst of all, you're supposed to be the expert.

Yet, it's all so easily avoidable by choosing DiviCom.

DiviCom is always there for you. Solving problems. Setting new performance standards. Providing industry leadership. From satellite, direct-to-home, MMDS and network transmission, DiviCom and its standards-setting family of MPEG-2, DVB and ATM digital video networking and set-top technologies is the superior choice. Hands down.

DiviCom has put hundreds of powerful MPEG-2 digital compression systems in place at customer facilities throughout the world. With DiviCom's advanced digital video networking and innovative application specific set-top solutions, you receive the plug-and-play capabilities, inter-operability and superior quality that only DiviCom can deliver. Better still, you receive a partner committed to solving your immediate and long-term challenges with speed and foresight.

So when it's your turn to make a choice, choose wisely. Call DiviCom at +1 408-944-6700 and experience a hero's welcome.

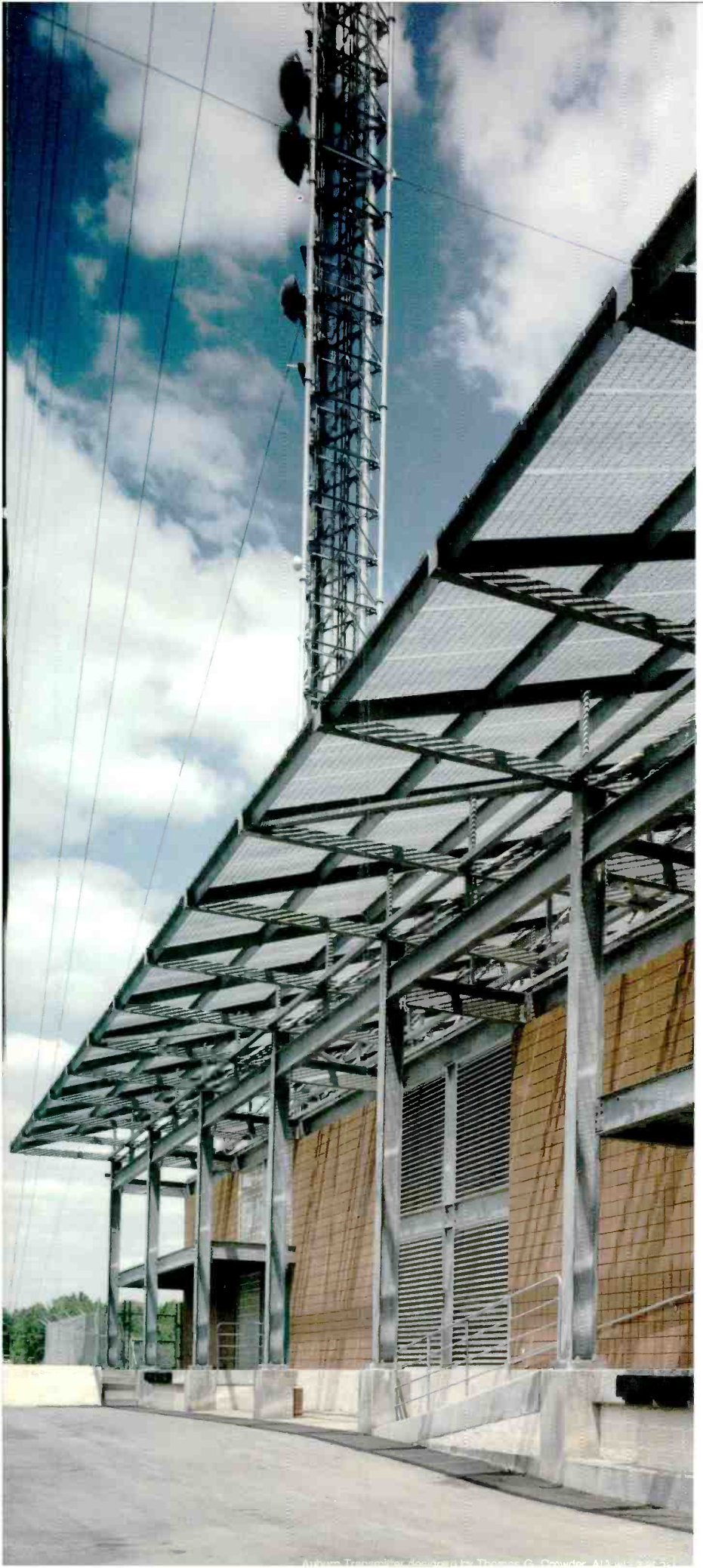
DIVICOM™

Digital Video Networking for Today and Tomorrow

1708 McCarthy Blvd., Milpitas, California 95035 U.S.A.
http://www.divi.com

See us in Booth #4836 in the Sands Expo NAB

Circle (143) on Action Card



KLINE TOWERS NOW COVERS YOUR TRANSMITTER SITE NEEDS FROM –

TOP

Kline Towers, the world's leading designer, fabricator and erector of tall towers specializes in towers with strict design and fabrication specifications.

Kline's capabilities include special antenna structures and guyed, self supporting, platform and multi-array towers for broadcast applications. Many of these structures stand 2,000 feet in height.

Kline also provides structural analyses of existing towers for extending or reinforcing towers to accommodate additional equipment and updating to conform with the latest codes.

TO BOTTOM

Kline Towers completes their turnkey transmitter site package with a state-of-the-art transmitter facility.

The new design by architect Thomas G. Crowder, AIA of ARCHITEKTUR is efficient, economical and features the latest advances in ice protection and component-style construction.

We invite you to visit our booth #7877 at NAB to meet Mr. Crowder and discuss this revolution-ary new design for broadcast transmitter facilities.

THE TURNKEY PACKAGE

The new Kline Towers turnkey package can provide under a single contract:

- transmitter facility
- tower
- transmission lines
- antennas

That means reduced project time, reduced cost and reduced administrative time.

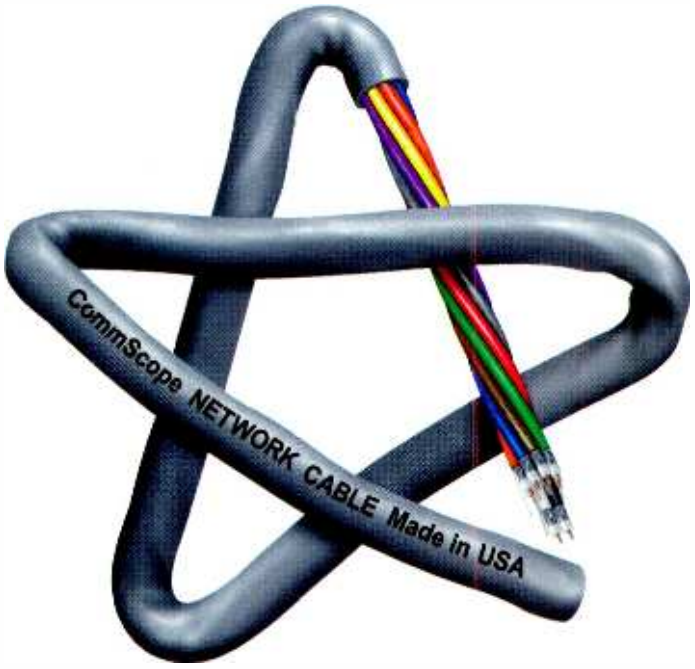
Circle (144) on Action Card

KLINE TOWERS

DIVISION OF KLINE IRON & STEEL CO., INC.

P.O. Box 1013, Columbia, SC 29202 (803) 251-8000

A STAR IS BORN



CommScope - The New Star in Quality Broadcast Cable

Cabling The World's Technology.

The new star in Broadcast Cable is reaching new heights for good reason. Already a top performer in the world's most sophisticated markets, CommScope has quickly become a leader in Broadband and Digital Transmissions. Now we're proud to be a part of your advanced technologies in the Broadcast Market. Since the early 60's, CommScope's focus has been on cables-*and only cables*. Today, we are one of the largest manufacturers of quality cables designed to perform for today's applications and the next generation technologies. Furthermore, all CommScope Broadcast Cable is tested to meet *your* extremely high video and audio standards. For your special broadcast requirements, contact CommScope, today. And discover a full line of star performers.

CommScope
GI General Instrument

See us at GEPCO/CommScope, Booth #7884

For information call 1-800-982-1708 or 704-459-5000. Internet address-http://www.commscope.com.

Circle (155) on Action Card

Photo courtesy of Las Vegas News Bureau

Exhibitor Highlights

A comprehensive listing by company of product introductions for the 1996 NAB Convention.

What's new?
Who has it?
Where is it?

The answers to these questions and more lie just ahead in this year's *Exhibitor Highlights*. Presented in an easy-to-read and concise form is the information you need to plan your visits for NAB. Companies are listed in alphabetical order with the booth number across from the name. Advertisers are colored in red for easy identification. If you want to get an advance peek at what they'll be showing, check out the Advertiser's Index on pages 306-307. The index will direct you to the location of that company's advertisement in this issue.

Need help with a subscription to *Broadcast Engineering* magazine or other Intertec publication? Each of our magazines' listing along with booth location is shown in blue. Stop by the booth and you may catch one of your favorite editors there. We'd love to visit with you.

AAVS/Sencore S 2626
DSA309 digital video studio analyzer; radio automation, hard-disk-stored sound editing software.
Circle (400) on Action Card

ABE Elettronica SPA S 1844
RF equipment for TV broadcasting; microwave links for fixed, mobile and ENG applications from 2-14GHz; TV transmitters, translators for VHF, UHF bands with solid-state and thermionic tube technology and output powers to 10kW or greater; panel, parabolic and other antenna arrays; multiplexers, accessories.
Circle (401) on Action Card

Accom L 8356
ELSET virtual 3-D environment to zoom, pan, walk-through computer-generated 3-D backgrounds; digital video disk recorder; Brontostore video server; on-line editor.
Circle (402) on Action Card

Accu-Weather L 8563
UltraGraphix-32 weather system with Virtual Weather Flythru, Shimmering Icons, 32-bit graphics, animated transitions; UltraGraphics ULTRA weather system using SGI technology; FirstWarn 2000, 3000 system for automatic crawls, maps, icons to notify viewers of severe weather; AccuNet On-Line weather information and graphics for your web site.
Circle (403) on Action Card

Acoustic Systems L 8075
Announcer facilities, voice-over booth.
Circle (404) on Action Card

Acoustical Solutions L 8349
Sound and noise control products; AlphaSorb wall panels, hanging baffles; Soundtex fabric wall covering; Alpha pyramid, wedge acoustical foams; Sonex acoustical foams; AlfaTec ceiling tiles; AudioSeal sound barrier, industrial blankets; modular broadcasting/recording booths.
Circle (405) on Action Card

Acrodyne Industries L 7136
Au60D 60kW, TRU/5K 5K solid-state, TRU/30KV 30kW UHF TV transmitters; 4TLU/100 4-channel UHF TV transmitter; TLU/1KE 1kW, TLU/2KE 2kW LPT solid-state UHF transmitters; 4TRM/50 4-channel MMDS TV transmitter with 50W per channel.
Circle (406) on Action Card

Adams-Smith R 1814
Augan digital audio workstations.
Circle (407) on Action Card

ADC Telecommunications L10849
DV6300 single-channel digital transport system featuring remote drop or add from DV6000/6010 and point-to-point; time-delayed patching; delay-compensation video patching system; digital video jacks; analog and serial digital video panels; video audio modular patchbay; CAPS component analog patching system; FL2000 FO cable management system for smaller fiber networks; DV6000 16-channel 2.4Gb/s digital transport system exceeding 250C short/medium haul specs.
Circle (408) on Action Card

Adcom Electronics Ltd. M 3913
Night Suite non-linear production system.
Circle (409) on Action Card

ADC Video Systems 10849
New DV6300 single channel digital transport system; DV6000 universal digital video transport product line.
Circle (410) on Action Card

Adirondack Software S 1156
Multi-event scheduling system, client/server employee scheduling software to automate employee assignments and administer employee benefits.
Circle (411) on Action Card

ADM Systems L10318
Stereo audio consoles; stereo and mono DAs; stereo source selector; mix-minus IFB system; bar graph meters.
Circle (412) on Action Card

Adobe Systems M 3842
Adobe Premiere for Macintosh and Windows.
Circle (413) on Action Card

Adrienne Electronics S 2830
Small routing switchers; machine-control products; time-code products.
Circle (414) on Action Card

ADT Applied Digital Tech L 6033
ADNET disk-based commercial insertion system networks with other manufacturers' equipment, available with MPEG-2 and JPEG; DiskDelay

disk-based time-delay system.
Circle (415) on Action Card

Adtec Productions **L11066**
Ad-Maestro digital or analog commercial insertion controller; Virtuoso digital video codec using scalable MJPEG compression, dual removable media MO drives; Lite-Ning broadcast controller for local origination automation.
Circle (416) on Action Card

Advanced Broadcast Systems **R 1024**
Computer-supervised IOT UHF TV transmitters, remote controls; BCD pulsers for klystron-based systems.
Circle (417) on Action Card

Advanced Designs Corporation **L 5042**
Enhanced 32-bit radar graphics, street-level mapping, Storm Path Analyzer; 32-bit NEXRAD system.
Circle (418) on Action Card

Advanced Digital Imaging **S 2943**
Digital Magic non-linear editing, compositing, special effects and rotoscoping; QuickTime control; Adobe Premiere editing interface; CoSA effects; Photoshop editing.
Circle (419) on Action Card

Advanced Video Designs **L 8221**
HR1440 telecine system based on electromechanical and electronic upgrades for Rank Cintel Mark III with selectable video formats, HR 8:4:4 format; 4:4:4 B\GBR/YCbCr and valid serial and parallel 4:2:2/4:2:2 YCbCR outputs at 10-bit resolution.
Circle (420) on Action Card

Advent Communications **S 7671**
D-SNG Lynx OB vehicle with digital satellite capability; D-SNG Flyaways for Ku-, C- and dual-band with 0.9m, 1.2m, 1.9m, 2.3m antennas; D-SNG test, monitoring system; digital fixed base/earth stations for D-SNG communications system; D-SNG RoadRunner ultimate fast, compact D-SNG vehicles with 0.9m to 2m antennas.
Circle (421) on Action Card

AEQ **R 2617**
Audio codec; hard-disk automation system; studio, portable audio mixers; multiconference telephone system; digital hybrids, line extender; telephone terminal equipment.
Circle (422) on Action Card

AF Associates **L 7141**
Systems integration services including design, engineering, construction of turnkey TV facilities and systems; digital servers, video systems; computer video networks; integration of open network computer video technology; facilities for cable and production, broadcast, corporate video; virtual studio systems; MMS GmbH SCSI video and other digital interface products.
Circle (423) on Action Card

Aircraft Production Music Libraries **L 5961**
New production library of 75+ CDs; The American Music series; Rock Sweepers and IDs; Ads Up! music for commercials.
Circle (424) on Action Card

AJA Video **L 9483**
D10A 10-bit component analog-to-serial digital converter; D10D NTSC/PAL to 4:2:2 serial digital converter; 1RU rack frames for C10, D10 products; D10C serial-to-analog converters; C10 serial/parallel converters; D10E serial 4:2:2 to NTSC/PAL encoder.
Circle (425) on Action Card

AJ Technology **L10381**
Dust M.O.P. noise reducer cleans up noise, spikes and dropouts satellite, microwave, RF, codec and videotape sources; Huey component color corrector, RGB black, white and gamma control with composite, Y/C, component and RGB video inputs and outputs; Huey Jr. format converter/color corrector, full video format transcoding among composite, Y/C, component and RGB video inputs and outputs.
Circle (426) on Reply Card

Alamar Electronics USA **L 6048**
Automation control products and software, including MC-series station automation systems, Media Manager library database and satellite resource management.
Circle (427) on Action Card

Alan Dick & Company **L 9844**
Visit us at LDL Communications; antennas for FM radio, VHF/UHF TV with base station antennas for wireless communications; transmitter combining units, RF switching frames, transmission line components; turnkey broadcast capability with LeBlanc transmitter marketing partner; HDTV center-fed UHF panel and HDTV broadband panel antennas.
Circle (428) on Action Card

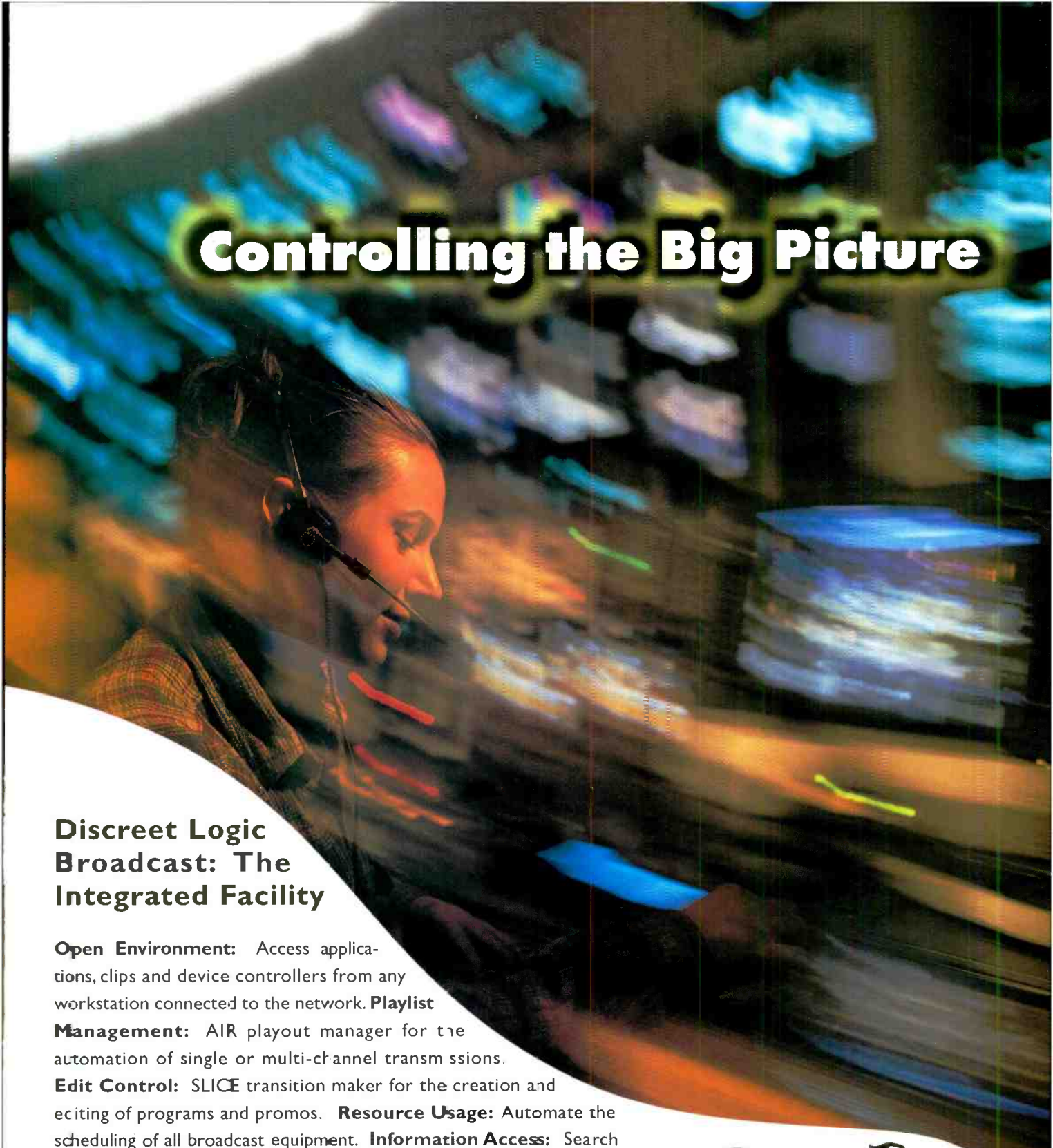
Alcatel **S 2641**
Microwave link products for audio, video.
Circle (429) on Action Card

Alden Electronics **L 6960**
Weather graphics systems; NEXRAD data demonstrations.
Circle (430) on Action Card

Alesis **L 9374**
Digital audio products, multitrack recorder, remote-control equipment.
Circle (431) on Action Card

Alias/Wavefront Technologies **L 8249**
Videographics software packages for artistic composition, animation, 3-D modeling; interactive photorealistic rendering.
Circle (432) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.



Discreet Logic Broadcast: The Integrated Facility

Open Environment: Access applications, clips and device controllers from any workstation connected to the network. **Playlist Management:** AIR playout manager for the automation of single or multi-channel transmissions. **Edit Control:** SLICE transition maker for the creation and editing of programs and promos. **Resource Usage:** Automate the scheduling of all broadcast equipment. **Information Access:** Search for, access and share video and audio over a range of linear and non-linear storage devices. **Project Management:** Create storyboards, assign and monitor project tasks. Completed projects are automatically updated in the EDL or playlist. **Reliability:** Built-in fault tolerance. **Scaleable and Upgradeable:** Interface with traditional broadcast equipment and integrate additional storage, control and new technology requirements.

People. Information. Assets.

AIR™ playout manager

SLICE™ transition maker

DISCREET LOGIC

Discreet Logic Inc.
Broadcast Products
5505, boul. St-Laurent, suite 5200
Montréal, Québec, Canada H2T 1S6
Tel 1 800.869 3504 or 1 514.272 0525
Fax 1 514.272 0585
e-mail product_info@discreet.com

Allen Avionics L10713-4
VNE-75-3 3-channel video noise eliminator; VIT-75-3 3-channel isolation transformer; HEC-3000 3-channel, HEC-2000-H "heavy-duty" and HEC-4000 RGB component hum eliminators; HDTV, CCIR-601, miniature low-pass filters.
Circle (433) on Action Card

Allen Osborne Associates L10570
Hilomast telescopic pneumatic-operation masts for ENG, field testing, surveillance applications.
Circle (434) on Action Card

Altronic Research R 3508
Model 3500W digital calorimetry for water-cooled dummy loads and heat exchangers; model 77300SW 300kW shortwave air-cooled load for the outside.
Circle (435) on Action Card

AMCO Engineering L 6828
Expanded line of monitoring enclosure systems, new 100-page 4-color catalog; enclosures for seismic requirements Zone 4.
Circle (436) on Action Card

AMEK Consoles L 6944
Consoles with 2-input paths, 4-band EQ per input module, multibus routing, aux sends, fader/mute automation, setup recall.
Circle (437) on Action Card

American Mobile Satellite S 2933
Skycell wireless telephone service.
Circle (438) on Action Card

American Studio Equipment L 5456
Motion picture equipment; grip products; rental programs.
Circle (439) on Action Card

AmPro M 4251
Video projectors; models 7200 LightValve, LCD-100, 4600 CRT.
Circle (440) on Action Card

AMS Neve plc L 6819
Logic 2 large multiformat all-digital mixing console, optional Audio-File recorder/editor; Capricorn digital console for classic sound quality, operational flexibility, speed of large-scale multitrack recording, mixing, overdubbing; Logic 3 compact digital mixer companion to Audio File recorder/editor; 55 series analog console, competitively priced, tailors to broadcaster's specific requirements.
Circle (441) on Action Card

Anchor Audio/ROH L 7980
Intercom and sound systems; 2-channel wired PORTACOM, Voyager PB-3000.
Circle (442) on Action Card

Andrew Corporation L10857
Dual HMD antenna; Alpac antenna and tower system; HS9HP Heliax coaxial cable; 2.4m SNG antenna; type-approved earth station antennas; rectangular waveguide; pressurization equipment; terrestrial microwave antennas; rigid transmision line.
Circle (443) on Action Card

Angenieux SA L 6812
Model 22X7.5A1F zoom lens designed for all studio applications, but complements Tele lenses used in OB work; extended range 22X (F7.5-330mm) with wider angle of 60.75 degrees, glass incorporates latest in technologies in coatings and aspherics; fully waterproof, front protective glass; studio or top handle; f/1.5 aperture.
Circle (444) on Action Card

Antenna Concepts R 3711
UHF, VHF antennas in slot, panel and corner reflector designs; high gain CP for LPTV; CP full-band FM panel transmit antennas; transportable omnidirectional VHF antennas.
Circle (445) on Action Card

Antenna Technology Corp./ATCi L 4955
Spectrum analyzer, satellite receiver, monitor; multibeam antennas; PROFLine electronics; voice and data systems; satellite videoconferencing equipment.
Circle (446) on Action Card

Anthro Technology M 4036
Anthro console designed to support video editing stations and other multimonitor systems.
Circle (447) on Action Card

Anton/Bauer L10533
Ultralight system combines on-camera light with Automatique light control; God Mount battery system products; Logic Series InterActive batteries, chargers with Digital Battery fuel computer.
Circle (448) on Action Card

Anvil Cases L 5315
Armor Lite, Speedster II equipment transport cases.
Circle (449) on Action Card

Aphex Systems R 1808
Tube-type 2-channel mic pre-amp; 722 Dominator includes defeatable pre-, de-emphasis.
Circle (450) on Action Card

Apogee Electronics R 1200
AD-1000 20-bit A/D converter system; DA1000E-20 20-bit D/A converter; UV-1000 superCD encoding system.
Circle (451) on Action Card

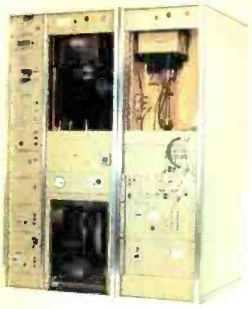
Apple Computer Company M 4516
Personal computers, multimedia equipment
Circle (452) on Action Card

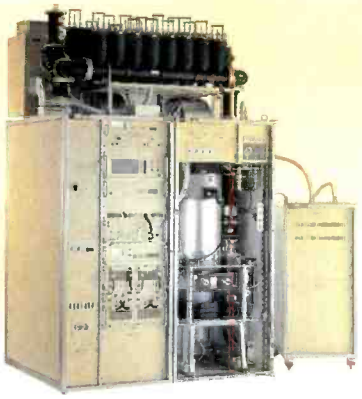
Arrakis Systems R 2611
Radio digital workstations; video switchers with audio follow and control from multiple locations; Digilink upgrades.
Circle (453) on Action Card

See us at NAB Booth #10570

Itelco 1961-1996 35 years of experience

We dedicated
our first 35 years to broadcast success





We celebrate it with
state-of the-art transmitters

itelco

For further details please contact:
ITELCO S.p.A. via dei merciari, s.n.c. - P.O. Box 16 - zona industriale, Sferracavallo - Orvieto (TR) Italy
phone +39 763 316231 • Fax +39 763 316236 Telex 661013 Itelco I
U.S.A. offices: *Miami:* Phone 305 715 9410 Fax 305 715 9414 • *Denver:* phone 303 431 1699 Fax 303 431 2868

Arriflex L 6808
Manufacturer of professional equipment for motion pictures, including cameras and lighting for studio and theatrical applications; cameras include 16SR-3, 535B, Arri 435 MOS; Arri/Zeiss lenses; Arri geared heads; Varicon, Obie Light; Laptop camera control software and time-code editing; Arriflex lighting, compact HMIs, ARRISUN, flicker-free electronic ballasts, ARRISOFT softlights; open face Arrilites; portable lighting kits.
Circle (454) on Action Card

Artel/Chipcom Corporation S 1065
DL-1200 single-, DL-2200 dual-, SL4000 multichannel 12-bit digital fiber-optic video transmission systems.
Circle (455) on Action Card

ASACA ShibaSoku L10024
TP31AX-TV test pattern generator, NTSC/PAL switchable, VBS/RGB output selection; TG21-AX test signal generator; AM51A 2-channel audio generator/analyzer; VH01CZ VTR dropout counter; CM148Z/CM208Z 650-line HR multistandard monitors; CM147/CM207N 700-, 900-line monitors; CM205 900-line monitor; audio/video signal generators, analyzers; closed-caption equipment; color encoders/decoders; envelope delay measuring sets; tape and disk automated libraries; GCR, HDTV equipment; signal, sync, sweep generators; video noise meters.
Circle (456) on Action Card

ASC Audio Video Corporation L 5353
Virtual Recorder (VR) line of digital disk recorders (DDRs).
Circle (457) on Action Card

ATI Audio Technologies L 8460
Nanoamp series BGD200 2-channel VU/PPM meters with phase indicator; L200 2-channel line amplifier; MXS-100 3-input mic/line mixer, XPS-100, XPS-200 expanders; Vanguard series mixers; Nanoamp interfaces, battery packs, DC converters; Encor distribution, pre-amplifiers; MicroAmp series distribution, driver, power amplifier products.
Circle (458) on Action Card

Audi-Cord R 1817
Audio cart recorders/players, DL series and S series.
Circle (459) on Action Card

Audio Accessories L 5362-5461
Audio jack panels, jacks; prewired audio patch panels; patch cords, holders; Polysand; video panels; RS-422 patching; Edac connectors, accessories; nickel-plated patch cords.
Circle (460) on Action Card

Audio Action L 8382
Production music library on CD format.
Circle (461) on Action Card

Audio Developments R 2823
Meter bridges for stereo mic mixer modules; 4-output MS-compatible edit mixer; Portaflex ENG, location mixers; Flexilink system; Flex EQ, constant Q, parametric Q.
Circle (462) on Action Card

Audio Intervisual Design/Sanken L 9383-4
Sanken Audio Systems microphones CSS-5 shotgun stereo, COS-11 lavalier, CU-41 double condenser; JB Technologies dB 3000 digital optimizer, AD122 A/D converter, DA122 D/A converter; Brainstorm Electronics time-code products: SA-1 analyzer, SR-3 repair kit, SR-15+ distripalizer, SR-26 dual distributor-reshaper, SR-1/SR-2 universal refresher, TB-4 remote talkback.
Circle (463) on Action Card

Audio Ltd. R 3309
Audio Ltd. diversity wireless microphone systems.
Circle (464) on Action Card

Audio Precision R 1405
System Two audio analyzer; APWIN Windows software for Systems One, Two; GPIB interface translator for System One; PCMCIA interface for Systems One, Two.
Circle (465) on Action Card

Audio Processing Technology Ltd. R 3702
Hardware implementation of apt-Q audio coding system delivers high-quality stereo at low bit rates over a single, direct-dial ISDN or Switched-56 channel; ADK 200 range of integrated 16- or 20-bit fully featured digital audio PC cards; WorldNet-compatible audio codecs for studio links and remote feeds via direct dial connections: board-level products for audio workstation developers.
Circle (466) on Action Card

Audio Services Corporation R 3700
Distributor for Stellavox, Fostex, Microtec-Gefell.
Circle (467) on Action Card

Audio-Technica US L 5646
UniTools remote-powered in-line microphone accessories; AT@-7174 UHF 16-channel PLL-synthesized wireless system; ATW-1237 VHF wireless system with hand-held mic/transmitter including UniPoint condenser element; 1100 series VHF wireless systems; AT4041 transformerless studio capacitor mic; Quad Mic multi-element boundary mic; AT8446 pop filter.
Circle (468) on Action Card

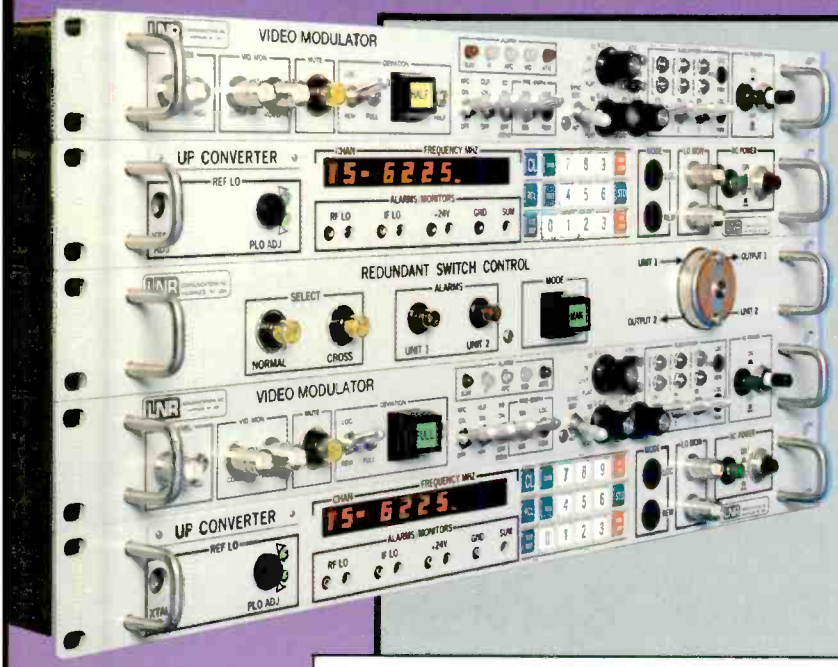
Audio Video Design L 1065
EasyReader DOS, Windows 95 prompting software; AV-series teleprompters with Sony 9- to 17-inch monitors; Trap3 hood/reflector design.
Circle (469) on Action Card

Audiopak R 3409
Tape cartridges; lubricated audiotape formulas.
Circle (470) on Action Card

Auditronics R 3005
Audio mixers for radio on-air, TV news/production; IFB/mix-minus system; program management systems with control console, software and computer.
Circle (471) on Action Card

Autodesk M 4019
Graphics software, 3-D studio animation tools.

The Most Versatile VIDEO EXCITER of All



TYPICAL REDUNDANT CONFIGURATION

LVM Analog/Digital SERIES

LNR Series LVM Low Profile Data Quality Video Exciters are broadcast-quality units that combine a compact satellite video modulator with a low phase noise digital-ready upconverter.

Features:

- Video modulator exceeds RS-250C and IESS-306 standards and has consistently outperformed all others.
- Agile data upconverter for inclusion of an SCPC data channel or digital video.
- Slimline construction - complete system in 3½" rack panel space. Offers a full range of front panel controls, indicators, and monitor points including:
  - Full/half transponder switchable
  - Subcarrier pre-emphasis selectable
  - Subcarrier level/deviation adjust
  - NTSC/PAL/B-MAC/SECAM switchable

Available Models:

C-Band Model	LVM6-D4	(5.925-6.425 GHz)
C-Band Model	LVM6-D4/575	(5.850-6.425 GHz)
Ku-Band Model	LVM14-D4	(14.0-14.5 GHz)
DBS Uplink Model	LVM17-D4	(17.3-17.8 GHz)
IF Output Model	LVM70	(70 MHz)

Option:

- Dual low pass filter (4.2 and 6 MHz)

LVE

GDE

UEV

Also Available...

LVE SERIES
Low Profile Ku-band Video Exciters for SNV Mobile Uplinks

GDE SERIES
Group Delay/Amplitude Equalizers

UEV and DRV SERIES
Video and FM-FDM Exciters and Receivers (C, Ku, IF Output)
Top of the line broadcast quality units for fixed and mobile operations. These modular units are field proven and have been selected by Comsat, AT&T, broadcasters and telecom organizations worldwide.

PROTECTION SWITCHING
1:1 and 1:N Switching Systems for both video and audio.

TURNKEY SYSTEMS
LNR equipment is available in racks on a turnkey basis for INTELSAT, ARABSAT, DOMSAT and related applications.

LNR products are in production for rapid delivery for today's and tomorrow's video applications. Put LNR leadership, product support, and 23 years of experience to work for you. For additional information and assistance, please contact the Marketing Department.

Your Digital and Analog Communications Connection

LNR COMMUNICATIONS INC. 180 MARCUS BLVD. • HAUPPAUGE, NY 11788-3795 • TEL: (516) 273-7111 • FAX: (516) 273-7119

Visit us at NAB Booth #3708, Radio Hall

Circle (177) on Action Card

Circle (472) on Action Card

Autogram Corporation **R 3405**
Audio mixers: R/TV series digitally controlled; Pacemaker series with slider attenuator; AC/IC series with rotary attenuators; Mini-Mix 8-, 12-channel radio consoles; Autoclock time, temperature, count-up timer; RP series relay controllers, audio switchers; CYA-3 prioritized audio switcher; T-8 automatic tone generator.
Circle (473) on Action Card

Autologic **S 2254**
35mm color laser recorder for motion picture use; Nucleus cinema/TV server.
Circle (474) on Action Card

AVCOM of VA **L 8480**
Portable spectrum analyzers (PSA); network/spectrum analyzers; video satellite receivers; microwave transmission equipment; portable test receivers; microwave sweep generators.
Circle (475) on Action Card

AVID Technology **M 9338**
Avid Media Spectrum open-platform on-line environment for editing; Media Composer digital video editing/finishing system; Film Compower, FilmCutter editing systems; Matador, Advance, Beyond Reality software enhancements; NewsCutter news-editing systems; AirPlay playback server; MediaServer; AvidNet/ATM; NewsView, NetStation automation systems; MediaRecorder, CamCutter, Avid News management system; Windows/Macintosh software Real Impact Windows, Elastic Reality, TransJammer, Digidesign Session, VideoShop.
Circle (476) on Action Card

Avitech International **M 4728**
VGA gen-lock/overlay linear key alpha channel; video mutiplexer with integral router as 9-plex (NTSC or PAL) display system or 16-plex (VGA, NTSC or PAL) display with 32x4 router and 16 video windows displayed on VGA, PAL or NTSC system.
Circle (477) on Action Card

Avitel Electronics **L 8183**
Signal corrector; undermonitor displays; serial digital terminal equipment with DAs, D/As, serializers, deserializers.
Circle (478) on Action Card

AVP Manufacturing **L10961**
RPT punch panels and jackfields punch terminal panel eliminates problems associated with current punch terminal technology.
Circle (479) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

AVS Broadcast **L10521**
Standards conversion products, Cyrus Prime; Film Noire video processor; Integra digital vision mixer with effects, routing.
Circle (480) on Action Card

AVS Graphics **L10521**
Manuscript graphic titler; Portfolio still-store; Express dual-channel graphic titler.
Circle (481) on Action Card

Aydin West **L 5242**
HPAs for satellite uplink; TWT, klystron power amplifiers for S, C, X, Ku bands; magnetic assemblies for broadcasters; turnkey TV transmitter upgrades.
Circle (482) on Action Card

Azden **S1032**
WDR-Pro true diversity camera-mount VHF receiver; Pro series wireless systems; Producer series wireless systems; Performance series wireless systems.
Circle (483) on Action Card

BAF Communication **L10841**
SNV-19 satellite news vehicle with 1.5m Centurion antenna, constructed with most small vans weighing less than 9,400 pounds for easier maneuverability and less expense.
Circle (484) on Action Card

Balboa Capital **S 1411**
Financial services.
Circle (485) on Action Card

Balcar **L 7875**
Enhancements to the Fluxlite fluorescent and Quadlite lines with improved dimming system and new mechanical design.
Circle (486) on Action Card

Band Pro Film/Video **S 4759**
Elmo Pen camera 1/3" diameter color camera; DuoPod camera support; featuring CAMS remote-control system, Goblin folding dolly, Genio wireless remote lens control; Crosziel compact bellows matte box systems, lens-mounting brackets, idler gears; Microshot remote pan/tilt head; Sony XC-999 Cigar camera.
Circle (487) on Action Card

BARCO Industries **L10900, 4818**
CVM 3000 series 900-line monitors; 10-bit digital input; digital video link fiber-optic monitor interface.
Circle (488) on Action Card

Baron Services **S 2667**
High-definition Doppler HDD '95 weather radar offers near NexRad capabilities; multilevel intensity, velocity displays; 250kW output with 8-foot dish; FasTrac permits direct manipulation of NexRad data to city street level; high-definition data processing; BaronTech NewsFIRST Video from remote hard to reach locations, transmitted over multiple cellular or land-line and satellite communications.
Circle (489) on Action Card

BCS Broadcast Store **S 2913, 6952**
Broadcast equipment sales, brokerage.
Circle (490) on Action Card

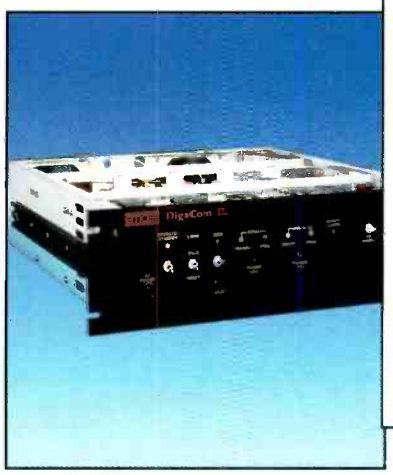
BDL-Autoscript **S 2822**
+Winplus+ Windows prompting software; newsroom interfaces; multilingual, scalable fonts; active run-down manipulation; instant text changes

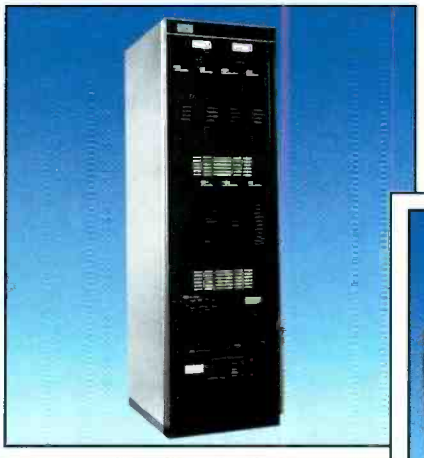
LEADING THE WAY INTO
The Future

THE POWER OF INGENUITY

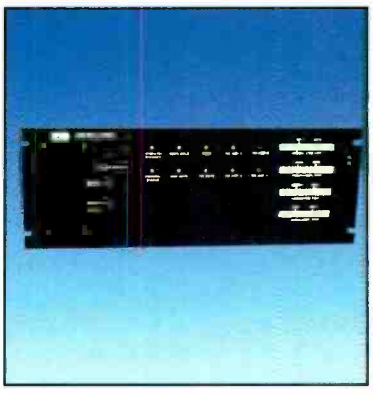
Freedom

DigaCom





True Agility



EMCEE opens new doors with the introduction of the DigaCom Series of wireless cable transmitters. Compact, frequency agile, and dual purpose service in an analog or digital format. DigaCom is designed to protect an operator's investment of today while entering the world of digital transmission tomorrow.

"FREEDOM" describes the new "F" model UHF transmitter series from the most experienced Low Power Television manufacturer in the country. Enjoy freedom from maintenance, freedom to change frequencies on site, and freedom by remote control. Continue the freedom with our 2 year warranty on equipment that is compatible with your budget.

TRUE AGILITY . . . broadcast anywhere in the world, on any VHF channel (2-13), from the land, air or sea! Change broadcast standards (NTSC, PAL, SECAM) and frequency within seconds with EMCEE's TTV 1000 Agile. Its 1000 watts of power in a compact lightweight configuration make it ideal for use anywhere.

your future begins with...

EMCEE

BROADCAST PRODUCTS

See us at NAB Booth #10313

PO Box 68, Susquehanna Street, White Haven, PA 18661 1-800-233-8193 Fax: 717-443-9257

Circle (179) on Action Card

including the on-air story; WGS 7"-17" range of lightweight, purpose-designed on-camera monitors with paper-white CRT.
Circle (491) on Action Card

Beck Associates L 4959
Flexible, durable knock-down console, rack series; combo VU/phase meter; serial control patch panel; audio-level matching unit.
Circle (492) on Action Card

Belar Electronics Lab R 2408
Modulation monitors for TV; The Wizard digital FM analyzer; agile FM amp; digital FM stereo monitor/analyzer.
Circle (493) on Action Card

Belden Wire and Cable L 8883
Serial digital video cable; high-flex AES/EBU digital audio interconnect cable; NEC-rated single-, double-pair digital audio interconnect cable; NEC CM-rated digital audio snakes.
Circle (494) on Action Card

Bencher L 8078
Graphics camera support; copy stands.
Circle (495) on Action Card

Benchmark Media Systems R 2320
DAs, mic-pre DA, remote gain cards; router/switcher.
Circle (496) on Action Card

Best Power Technology S 1427-8
Featuring rack-mount Fortress and UNITY/I 3-phase system.
Circle (497) on Action Card

BEXT R 3511
SF800, SF1200 FM 800W, 1.2kW MOSFET amplifiers; front-panel programmable UHF/VHF exciters; VHF/UHF amplifiers to 40kW.
Circle (498) on Action Card

beyerdynamic L 6632
ZCI600 is a rack-mount computer monitoring system operating under Windows, offering complete reporting of U600, U700 wireless systems and featuring walk test program for antenna location and a user logging file; DT200 series headsets, headphones, on-air broadcast, location microphones and wireless systems.
Circle (499) on Action Card

B&H Photo S 1421
Featuring video camera shoot-out side-by-side comparison of 10 of today's top S-VHS, Betacam SP and DVC camcorders; distributor for Anton/Bauer, NRG batteries; Sachtler, Vinten and Miller tripods; non-linear editing; Truevision Targa 2000 turnkey systems; Avid Real Impact software.
Circle (500) on Action Card

Bird Electronic Corporation R 4011
RF measurement instruments, accessories.
Circle (501) on Action Card

Bittree S 1370
Audio, video, data-patching systems, accessories; 3-pin rear interface connector for audio.
Circle (502) on Action Card

Boeckeler Instruments S 1871
Pointmaker PVI-80 video marker with keyboard, multisync system includes draw, arrows and electronic "chalkboard" features during broadcasts.
Circle (503) on Action Card

Bogen Photo L10872
Gitzo carbon fiber tripods, fluid video head; collapsible frames and fabrics.
Circle (504) on Action Card

Bradley Broadcast Sales R 1611
Distributors: Panascheme studio furniture, racks; Audioarts mixer; Telos, Gentner phone talk systems; Tascam portable DAT.
Circle (505) on Action Card

Brainstorm Electronics L 9383-4
SR-15+ time code distripalizer; SA-11 time code analyzer; SR-3 time-code repair kit; SR-26 dual time code distributor/reshaper; SR-1 universal time-code refresher; SR-2 frame rate counter.
Circle (506) on Action Card

Bretford Manufacturing L10969
Complete line of TV mounts and projector screens designed for demanding presentation and installation requirements.
Circle (507) on Action Card

Walter Brewer Corporation L 6746-8
Integration of fluorescent-based fixtures into the studio design; teleconferencing lighting system design.
Circle (508) on Action Card

British Information Services S 1874
"Newsbreaks from Britain" daily news feature audio actuality service by digital ISDN or toll-free 800 access from London in English and Spanish; "Profiles," "UK Today," "In Good Company," "Inside Britain" monthly news magazine programs about British lifestyle and society; assistance to TV stations covering stories on location in the UK.
Circle (509) on Action Card

Broadcast Electronics R 2601
Alpha line solid-state 4kW FM transmitter; 1kW rack-mount AM transmitter; also displaying high-power FM transmitters; AirTrak and MixTrak consoles; AudioVAULT digital audio systems; programming services, consulting.
Circle (510) on Action Card

BROADCAST ENGINEERING

Broadcast Engineering magazine
L 5207, M 1965

BE

Broadcast Engineering/Radio magazine
L 5207, R 901,

Broadcast Microwave Services L 7000
Microwave radio equipment, portable transmitter, receiver; BMT series ENG MW transmitters; Videocam transmitter.
Circle (511) on Action Card

Broadcast Supply Worldwide/BSW R 1400
Distributors audio, RF/radio products, including Telos, Arrakis, Audion Labs, Roland.
Circle (512) on Action Card

Broadcast & Surveillance Systems S 1063
BS5400 4- or 5-axis gyrostabilized aerial platform housing a full broadcast-quality camera and choice of high-performance, long-range lenses for airborne ENG, sports coverage, traffic reports.
Circle (513) on Action Card

Broadcast Video Systems/BVS L 8376
BUGTRAP self-contained logo store, inserter; MASTERKEY6 serial digital DSK; SID800 VBI identification system; VITS2 video monitor via telco line; ED200 single-unit encoder/decoder; Masterkey analog linear keyers; VBI-232 VBI data encoders/decoders; D100, 101 NTSC decoders; interformat transcoders; EN300, 350, 450 encoders; video delay lines, filters, hum coils.
Circle (514) on Action Card

Broadcasters General Store L 8446, 1617
Distributor for DNF Industries; IQS; Sine Systems; American Recoder Technology.
Circle (515) on Action Card

Bryston R 1920
Audio monitors.
Circle (516) on Action Card

BTS Broadcast Television Systems L 9300
DVCPRO camcorder; studio editing VTR; Media Pool video server production models; further significant developments in the BTS telecine family.
Circle (517) on Action Card

Burk Technology R 2623
Audio test equipment; ARC series transmitter control, walkaway packages, ARC, AutoPilot software; stereo selector switch.
Circle (518) on Action Card

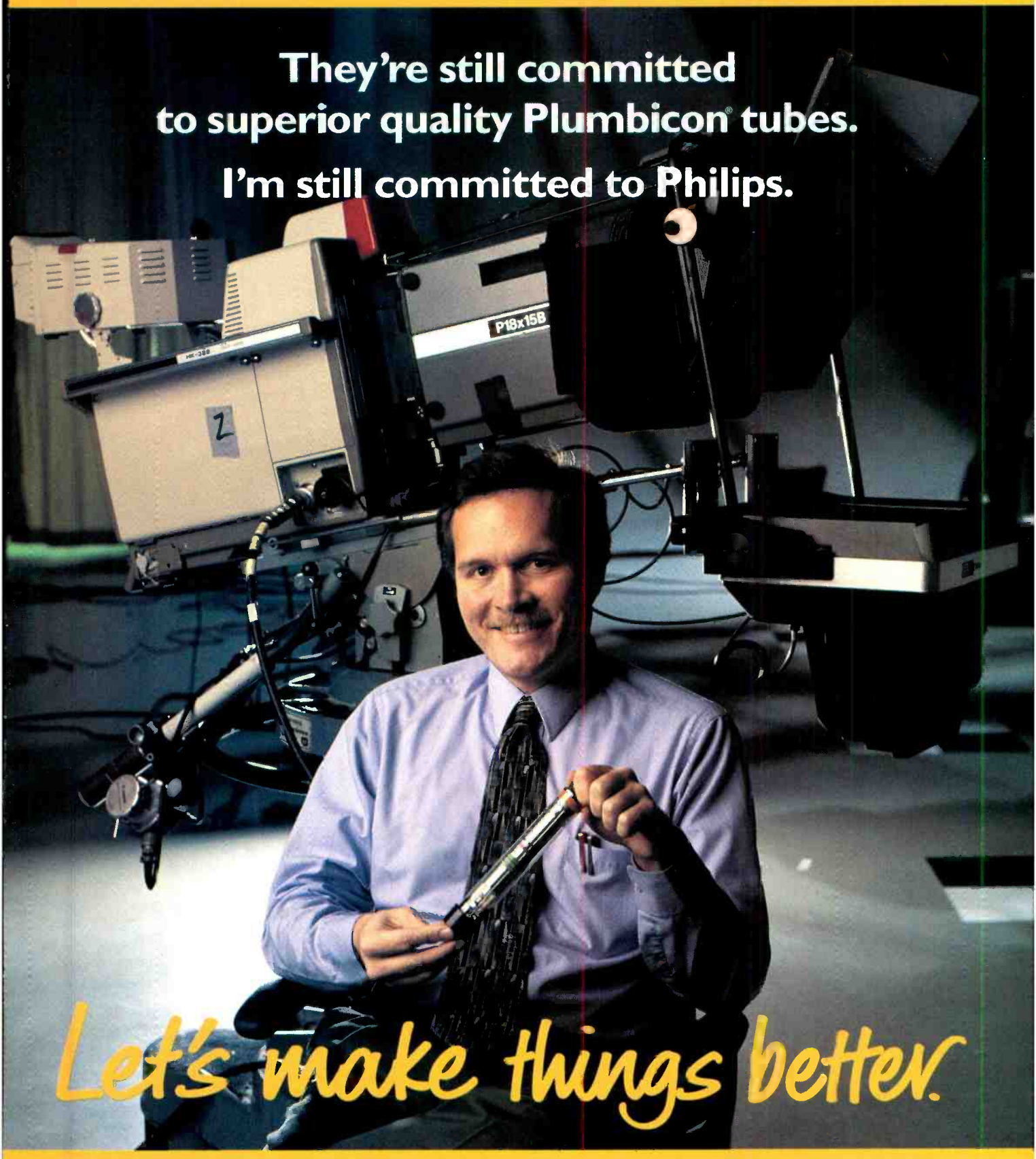
Burle Industries L 5201
Power devices for RF transmission; camera tubes.
Circle (519) on Action Card

Burst Electronics L 8385
Utility audio switchers, audio DAs.
Circle (520) on Action Card

Cablewave Systems/RF Systems L 9468
Antenna products, Bogner wideband and MMDS, ITFS, FM and STL antennas; high-power FlexWell transmission line.
Circle (521) on Action Card

Calculated Industries S 1426
FrameMaster II time code calculator.
Circle (522) on Action Card

California Amplifier R 3526
Digi-ready LNBs for commercial head-ends; Mul-



Philips Components

In a world of constant change, it's good to know Philips Components is still producing their complete line of high-resolution, low lag Plumbicon tubes. And Philips is still standing by the broadcast industry too. So stop by Booth 9300 at NAB to see for yourself. Or call (401) 767-4412 for more information.

Circle (157) on Action Card

PHILIPS

PHILIPS

tiCipher Plus broadband, whole-house scrambling system for CATV, UHF and wireless cable; wireless cable reception equipment for domestic and international system applications.

Circle (523) on Action Card

Calrec **R 4013**

Audio mixing consoles including T-series digitally controlled for production and S series for production and dubbing; RQ series 1U rack-mounted signal processors.

Circle (524) on Action Card

Calzone Case **L 8275**

Cases: EZ-Haul; ESCORT broadcast camera, mobile computer; ESCORT rack tower; floating/shock-mount rack; NEC-MT transport; LD-ATA, Convoy Lightweight, LD, Ultima LCD panel transport case; Executive laptop attache case.

Circle (525) on Action Card

Cammate **L 8084**

Travel Series boom system, a portable, simple-to-assemble support unit with new vertical control bar and optional lens control package; in variable sizes and soft pak cases.

Circle (526) on Action Card

Camrobotic Systems/M S Russin Group **S 1941**

RF-9000P/T Stealth ultraquiet mini pan/tilt unit for small cameras for conventional control systems or RS-422 RF-7070 WTC system; weatherproof tower camera with all-weather pan/tilt, color camera and zoom lens with RS-422 control for local weather coverage.

Circle (527) on Action Card

Canare Cable **L 5860**

Cable and connectors; serial digital 75V coax; RCA-to-BNC recessed panel-mount 75V adapter; AES/EBU digital audio adapters; crimp-on F connectors.

Circle (528) on Action Card

Canon USA/Broadcast Optics **L 9838**

70X Digital Lens, DIGI-SUPER 70 features 70x zoom ratio, provides 33% greater magnification compared to the 55X field lenses; IF plus lenses include J9aX5.2B IRS/IAS, J15aX8B IRS/IAS, J20aX8B IRS/IAS, J33aX11B IAS, J33aX15B IAS; IS-20B image stabilizer adapter for J20aX8B and 1/2" H20aX6 ENG zoom lenses; Canobeam wireless line of sight communciation systems that transmit/recieve bidirectional broadcast-quality video and audio, features auto-tracking adjustment; Next Generation 2/3" HDTV lens series (HDTV), UJ65X9.5B IE, HJ18X7.8B IRS/IAS, HJ9X5.5B IRS/IAS.

Circle (529) on Action Card

Carpel Video **L 8470**

Evaluated blank Betacam SP cassettes; blank cassettes of all formats available wholesale.

Circle (530) on Action Card

Cartoni USA **L 7680**

Action Pro Fluid Head, single-stage AL legs, mid-level spreader; Rubber Ground Spreader adjustable support for uneven topography; non-slip Flip Locks, standard on Alfa, Beta, Delta tripods; Alfa, Alfa II, Delta, Beta series C20, C40 heads.

Circle (531) on Action Card

CBS News Archives **M 4035**

Video libraries.

Circle (532) on Action Card

CCA Electronics **R 3505**

FM100GS high-performance FM exciter; FM4000G, FM45,000G high-performance FM transmitters; AM 10,000F shortwave and medium-wave transmitters; announcing 3-year warranty plan.

Circle (533) on Action Card

C-COR/Comlux **L 5359**

Digital fiber-optic transmission systems for broadcast video, program audio and data, permitting up to 32 channels per fiber; RS-250C short-haul performance redundancy, A/B switching and other options.

Circle (534) on Action Card

Cellcast **R 1524-5**

Remote audio broadcasting uses cellular phone technology; RBS-400 remote broadcast unit combines cellular transceiver, frequency extender, mixer, optional NiCad battery power or A/C power supply.

Circle (535) on Action Card

Central Tower **R 1515**

Towers, monopoles; structural engineering analysis; complete construction services, antenna, line installation; turnkey projects.

Circle (536) on Action Card

Century Precision Optics **L11035**

1.6X teleconverter, extends telephoto end of focal length with no light loss; Super Fisheye adapters for internal focus zoom and industrial zoom systems; double aspheric wide-angle adapter; wide-angle zoom-thru converter; Nikon to 1/2" adapter; 25mm prime lens; wide-angle adapter sets, achromatic diopters; Duplikins.

Circle (537) on Action Card

Channelmatic **L10875**

Digital LITE puts the power of dynamic scheduling, 12-channel ad insertion and digital power in one rack; MVP/VideoStore, digital automation via WAN to transport, store, control and playback video, in association with Sony.

Circle (538) on Action Card

Chapman/Leonard Studio Equipment S 2338

Pedolly pedestal; Super PeeWee III, Hybrid II, Hustler II camera dollies; Sport ATB camera crane; Olympian; CS Base; Lenny Mini, Lenny Arm II Plus Lenny Arm III; Hy Hy base; Super Nova mobile crane; state-of-the-art sound stage and production center (Orlando, FL).

Circle (539) on Action Card

Cheetah Systems **S 2452**

Closed-captioning solutions.

Circle (540) on Action Card

Chimera **L 4958**

Lightbanks, light control accessories for production fixtures, from on-board to 20kW lights; soft source lights.

Circle (541) on Action Card

Christie Electric **L 5204**

Battery chargers/analyzers, CASP series.

Circle (542) on Action Card

Chyron CMX **L10700**

Ver. 14.0 software with advanced disk recorder interface, improved look-ahead performance; Aegis, Omni 1000E, Omni 850, Omni 500 video-editing systems.

Circle (543) on Action Card

POETRY IN MOTION

The AutoCam SP-2000/X-Y is a freely navigating servo pedestal designed to operate with the AutoCam HS-2010MH pan/tilt head. Utilizing many of the features found in our proven AutoCam SP-300/X-Y servo pedestal and AutoCam HS-310P pan/tilt head, the AutoCam SP-2000/X-Y also features a lower profile, sleeker design and new brushless servo motor technology. It is designed to support studio or portable cameras with any combination of lens or teleprompter.

The AutoCam HS-2010MH Pan and Tilt Head is a post head which provides perfect balance and features dual remote/manual operation. Excellent acceleration is achieved by high gain digital/analog servo amplifiers, which combined with an extremely rigid mechanical design, means tight damping without oscillation or overshoot.

When in manual operating mode, Vinten's Lubricated Friction (LF) drag system, incorporated in both the pan and tilt axes, means the ultimate in continuously variable drag.

The AutoCam ACP-8000S Touch Screen Control System is a comprehensive camera command center that provides simultaneous control of the pan/tilt, zoom and focus, as well as the X,Y, and Z axis movements of up to eight cameras.

For additional information call Vinten TSM today.

See us at NAB Booth #10329

AutoCam

Circle (159) on Action Card

Vinten TSM Inc.
709 Executive Blvd.
Valley Cottage, NY 10989
Phone: 914-268-0100 Fax: 914-268-0113

Vinten TSM™

Sales offices in UK, USA, Japan, France, Germany, & Singapore plus worldwide distribution.

Chyron videoComputer **L10700**
CODI title/graphics generator; pc-CODI ISA board for single/multichannel title/graphics generation; CODI EAS broadcast, cable emergency alert systems; CODI Pro Windows application; software for remote, multichannel and scheduled display applications.
Circle (544) on Action Card

ChyronGraphics **L10700**
iNFiNET video file server; iNFiNit! 3-channel titler with extended frame buffers; MAX!> 2-channel titler; MAXINE!> single-channel titler; TVSTOR! still-store software for iNFiNiT! family; IMAGESTOR! single/multiple-channel still-store, recall panel, integrated database; Ver. 3.5 message composite software supports Korean, Thai, Japanese, Chinese fonts and new operating features.
Circle (545) on Action Card

Chyron pictureWare **L10700**
Paint and animation systems for Silicon Graphics workstations; Liberty 64, Liberty 32, Liberty Paint; Ver. 5.5 Liberty software includes Indigo 2 IMPACT video support, real-time image processing, improved storyboard display, animation of macros, noise filters and bump maps.
Circle (546) on Action Card

Cine 60 **L 8338**
Rechargeable NiCad belts, packs; portable battery-operated lighting; charging system.
Circle (547) on Action Card

Cinekinetic **L 8180**
Portable grip, camera support gear; McJib jib arm, Underslinger, Microjib Pro SX, Sawed Board, Pocket Dolly, Saddlecam, Jib Stix, One Man Grip Kit, Rolling Wonder.
Circle (548) on Action Card

Cinema Products **L 6546**
Camera-support products, SteadiCam, Master Series and professional video camera control systems.
Circle (549) on Action Card

Cinemills **L 5332**
Lighting products and systems; studio furnishings.
Circle (550) on Action Card

Ciprico **L 5143**
Spectra 6900 RAID disk array for SG platform workstations with transfer rates to 40MB/s.
Circle (551) on Action Card

Circuit Research Labs **R 2008**
RDS/RBDS receiver for LED motion sign control; DP-100 all-digital FM audio processor; SC-100 RDS/RBDS generator with paging; TVS3003 MTS generator; TVS3001 tri-band audio gain/loudness controller; TVS3004 PRO, TVS3005 SAP generators; BAP2000 mono FM/TV processor; Amigo AM, Amigo FM processors.
Circle (552) on Action Card

Clark Wire & Cable **S 1414, 1404**
Coax for serial digital signals; AES/EBU digital audio cable/snakes; Clark Ergonomic Crimp tools; Hannay reels; Service mult. cables, remote composite cables.
Circle (553) on Action Card

Clear-Com Intercom Systems **L10369**
Auto-nulling telephone interface for party-line and matrix intercom systems; Windows 95 programming software for Matrix Plus II intercom; 2-way radio intercom interface; TV/video production intercoms, multichannel party-line, digitally controlled matrix, wireless intercom, IFB systems, headsets, beltpacks, camera interfaces.
Circle (554) on Action Card

Clipper Products **S 2923**
Rolling equipment cases, luggage carts, tubes, wheel sets; soft-side, padded and hard-shell cases; shipping cases.
Circle (555) on Action Card

CMC Technology **L 5732**
Replacement video head assemblies for VPR 1-inch C; upper drum refurbishing for BVH 1-inch C.
Circle (556) on Action Card

Coaxial Dynamics **R 3908**
Equipment for measurement and termination of RF power and custom design of OEM RF filters and directional power detectors, heavy emphasis given to new line of oil-/air-cooled loads to be previewed.
Circle (557) on Action Card

Coffey Sound Service **R 1621**
Distributor for Ambient slates, boom poles; Audio Limited; Stelladat; Sennheiser; Denecke; HHB Portadat; US Broadcast; Soundcraft; Fostex; Oktava; Ecocharger.
Circle (558) on Action Card

Coherent Communications **S 1448**
Producer's Friend wireless video and audio system for high-quality picture and sound without wires, CVR-3500 true diversity V/A receiver; optional integral time-code reader/generator.
Circle (559) on Action Card

Colortran **L10429**
Lighting products, control systems; compact Elite controllers, ENR series dimmers; lamps; studio fresnels; Encore lighting control software.
Circle (560) on Action Card

Columbine Systems **L 8521**
Master control automation, multistation, multiregional capability; video server automation; Program Scheduler; Asset Management; software for traffic, sales analysis, accounting, finance; Oasis cable advertising sales management
Circle (561) on Action Card

Comark Communications/A Thomcast Company **L 7109**
IOX line of IOT TV transmitters with aural carrier correction, advanced full-band linearity correction, modularized Class A driver amps, advanced technology modular, exciter and IEC 215 compliance; second-generation ATV transmitters; cost-effective AM medium-wave transmitters.
Circle (562) on Action Card

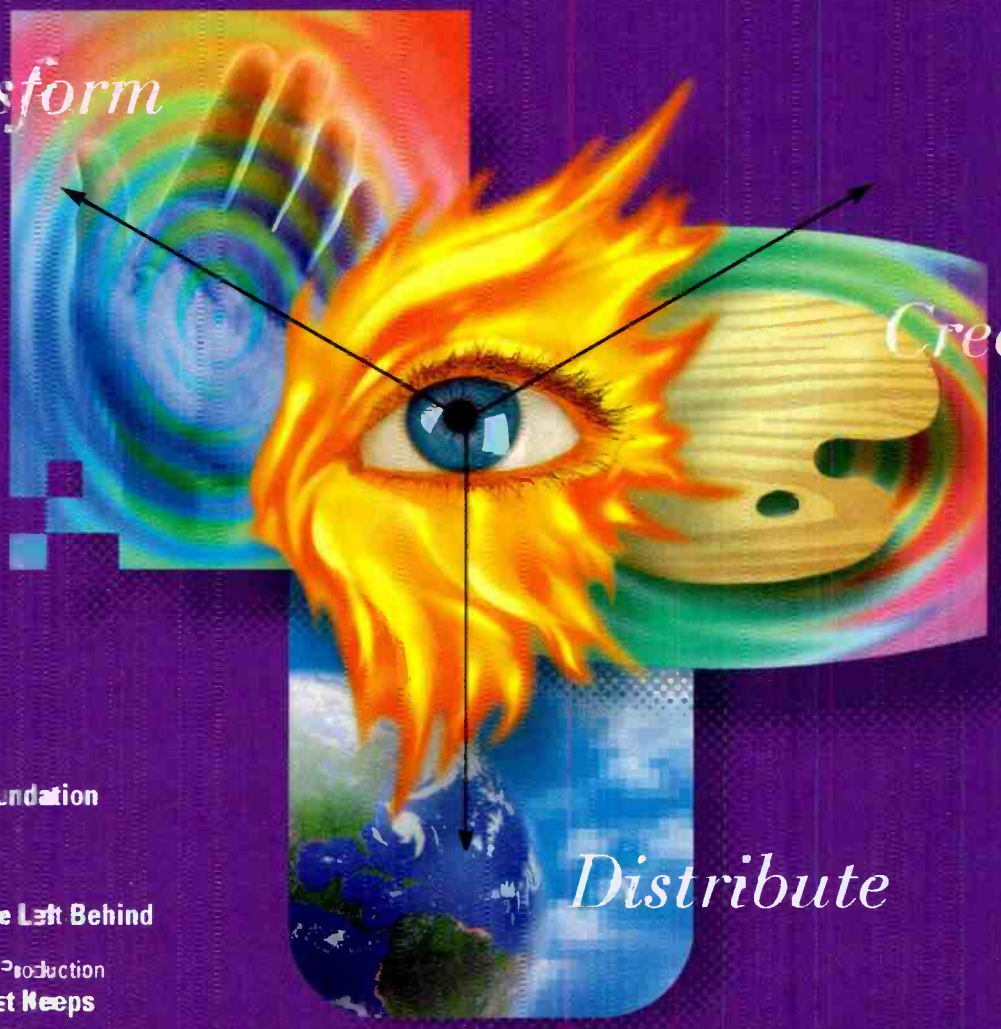
Comlinear **S 1270**
CLC006, CLC007 serial digital cable drivers rated 400Mb/s; CLC014 adaptive cable equalizer for high-speed data recovery for signals attenuated by transmission of any media with dispersive loss characteristics.
Circle (563) on Action Card

Circle (184) on Action Card

Circle (185) on Action Card

Silicon Studio
TECHNOLOGY FOR ENTERTAINMENT

The Silicon Studio



Cover Story
A Digital Foundation to Build On

Broadcast
You Won't Be Left Behind

Video and Film Production
The Cast Just Keeps Getting Better

Digital Noncompressed Editing
The Joy of On-Line Editing Is OverDUE

SiliconGraphics
Computer Systems

Advertising Supplement

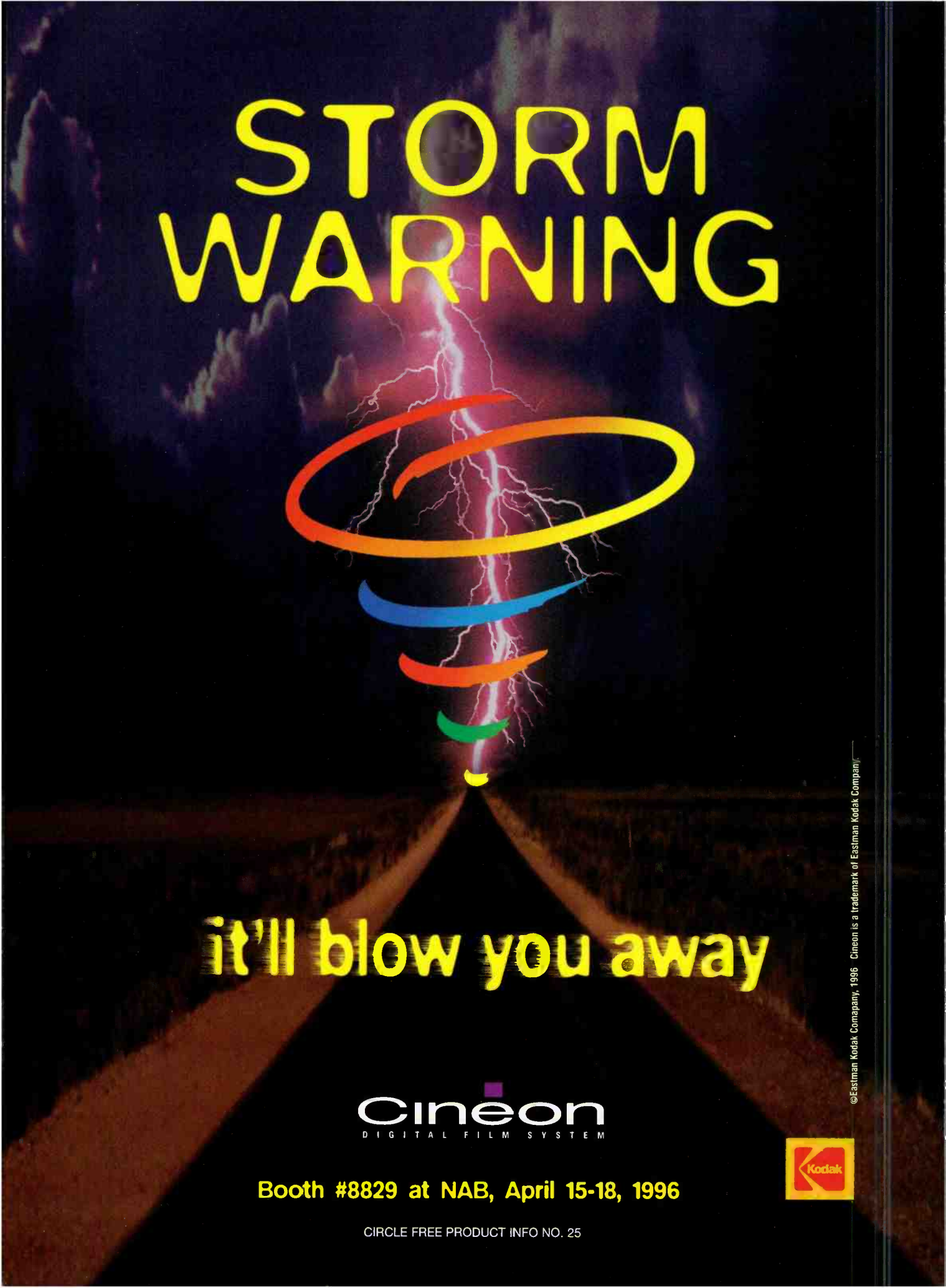

STORM
WARNING
it'll blow you away
Cineon
DIGITAL FILM SYSTEM
Kodak
Booth #8829 at NAB, April 15-18, 1996
CIRCLE FREE PRODUCT INFO NO. 25
©Eastman Kodak Comapany, 1996 Cineon is a trademark of Eastman Kodak Company

Table of Contents

REGIONAL SALES OFFICES

Canada
Calgary, Alberta
(403) 269-5844
Montreal, Quebec
(514) 745-2440
Ottawa, Ontario
(613) 225-4747
Toronto, Ontario
(905) 625-4747
Vancouver, BC
(604) 436-4747

Great Lakes Region
Cleveland, OH
(216) 328-2100
Columbus, OH
(614) 841-9600
Dayton, OH
(513) 258-7441
Detroit, MI
(810) 478-5446
Indianapolis, IN
(317) 595-6363
Pittsburgh, PA
(412) 928-9928

North Central Region
Austin, TX
(512) 346-9342
Cedar Rapids, IA
(319) 396-1509
Chicago, IL
(708) 925-2900
Dallas, TX
(214) 788-4122
Houston, TX–Sales
(713) 293-9292
Houston, TX–Service
(713) 333-5969
Kansas City, KS
(913) 451-6980
Milwaukee, WI
(414) 347-7846
Minneapolis, MN
(612) 893-3600
New Braunfels, TX
(210) 608-9637
New Orleans, LA
(504) 645-9155
San Antonio, TX
(210) 980-3470
St. Louis, MO–Sales
(314) 213-7000
St. Louis, MO–Service
(314) 232-2877
Tulsa, OK
(918) 254-1383
Urbana, IL
(217) 244-4551

Eastern Area
Northeastern Region
Albany, NY
(518) 456-8330
Boston, MA
(508) 562-4800
East Berlin, CT
(203) 828-2024
Rochester, NY
(716) 383-4262
Syracuse, NY
(315) 451-0378

Mid-Atlantic Region
Buffalo, NY
(716) 677-0003
Harrisburg, PA
(717) 730-8484
Long Island, NY–Sales
(516) 424-9445
Long Island, NY–Service
(516) 424-3804
Manhattan, NY
(212) 370-1980
Parsippany, NJ
(201) 263-1661
Philadelphia, PA
(215) 638-3707

Chesapeake Region
Baltimore, MD
(410) 561-8038
Hampton, VA
(804) 827-4461
Midlothian, VA
(804) 378-1999
Silver Spring, MD
(301) 572-1980
West McLean, VA
(703) 790-1980

Southeastern Region
Atlanta, GA
(404) 475-0464
Birmingham, AL
(205) 988-5990
Conyers, GA
(404) 388-0912
Durham, NC
(919) 403-8080
Ft. Lauderdale, FL
(305) 938-8389
Huntsville, AL
(205) 830-5400
Jackson, MS
(601) 956-8122
Knoxville, TN
(615) 531-9171
Orlando, FL
(407) 660-0073
Pensacola, FL
(904) 438-3135
Tampa, FL
(813) 962-8086

Northwestern Region
Colorado Springs, CO
(719) 548-4755
Denver, CO
(303) 796-0022
Portland, OR
(503) 293-3580
Salt Lake City, UT
(801) 531-9070
Seattle, WA
(206) 649-5600

Golden Gate Region
Albuquerque, NM
(505) 884-1400
Alta Loma, CA
(909) 987-0215
Los Angeles, CA
(310) 312-0227
Mountain View, CA
(415) 390-3900
Newport Beach, CA
(714) 852-1980
Northern California
(510) 277-1940
Peninsula/Silicon Valley
(415) 390-3900
Phoenix, AZ
(602) 784-4747
Ridgecrest, CA
(619) 371-7760
Sacramento, CA
(916) 922-1980
San Diego, CA
(619) 546-0409
San Ramon, CA
(510) 277-1940

Subsidaries
Asia & Indochina Region
(65) 777.30.88
Australia
(61) 2-879.95.00
Austria
(43) 1-798.68.48
Belgium
(32) 2-679.00.50
Brazil
(55) 11-820.11.01
Czech Republic
(42) 5-432.125.42
Denmark
(45) 43-43.86.00
Finland
(358) 0-61.33.24.33
France
(33) 1-34.88.80.00
Germany
(49) 89-461.08.0
Holland
(31) 34-06.21.711
Hong Kong
(852) 2784.31.11
Hungary
(36) 1-20.90.830
India
(91) 11-621.1354/621.1355
Israel
(972) 3-49.21.91
Italy
(39) 2-57.56.11.00
Korea
(82) 2-514.81.11.16
Japan
(81) 3-54.88.18.00
Latin America Territory
(1) 305-938.83.88
Mexico
(52) 5-662.03.22
New Zealand
(64) 9-302.94.50
Norway
(47) 22-73.20.15
People's Republic of China
(86) 1-501.41.85-8
Russia
(49) 89-461.08.0
Spain
(34) 1-442.90.77
Sub-Sahran Africa Region
(27) 11-884.41.47
Sweden
(46) 8-601.2660
Switzerland
(41) 38.4335.35
Taiwan
(886) 2-560.56.68
United Kingdom
(44) 734-22.75.00

Distributors Country Group I
Saudi Arabia, Kuwait, Bahrain, UAE, Qatar, Oman, Jordan, Lebanon, Egypt, Syria
(973) 214.676

Distributors Country Group II
Poland, Estonia, Lithuania, Latvia, Slovakia, Belorussia, Ukraine
(972) 3-648.02.70/71

Distributors Country Group III
Slovenia, Croatia, Macedonia, Bulgaria, Romania, Yugloslavia, Albania
(41) 22-999.92.90

Distributors Country Group IV
Greece, Turkey, Portugal, Tunisia, Morocco, Algeria, Cyprus, Malta
(41) 22-999.92.90

Silicon Graphics, Inc.
Web address:
http://www.sgi.com
Silicon Studio, Inc.
Web address:
http://www.studio.sgi.com

From Content Creation to Digital Deployment, Silicon Studio™ Delivers a Complete Digital Production Environment for the Entertainment Industry.

A Digital Foundation to Build On

By Steve Geissen

The digital revolution is radically changing the way entertainment content is created, but no matter how far technology advances, an entertainment company's real asset is not the tools it uses to create content, but the content itself.

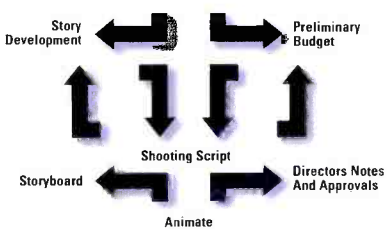
Several major entertainment companies have already begun the process of investigating and implementing comprehensive all-digital production environments that will enable them to reuse their content. By integrating digital technologies to create an environment in which all phases of the production are linked and based on real-world workflow analyses, these entertainment companies are creating "silicon studios" that allow their creative and technical professionals to intuitively and efficiently create, share, manage, repurpose, and distribute new media content.

Introducing the Silicon Studio Digital Blueprint

Over the past few years, Silicon Graphics and third-party vendors have laid the foundation for the creation of a digital studio for the entertainment industry. In 1994, Silicon Graphics formed Silicon Studio, Inc., a wholly owned subsidiary focused on the development and delivery of technology for the entertainment industry. Today, Silicon Studio introduces an architectural plan called the "Silicon Studio Digital Blueprint" that will make the concept of the digital studio a reality, integrating all functions of the production process.

After analyzing end-to-end solutions and gaining first-hand experience with the major entertainment companies, Silicon Studio has defined key technological challenges and opportunities that face this industry today. These include: streamlining the creative process, managing and reusing assets, network distribution, training, support, and service.

Production Workflow Complexity



Blueprint Components and Functions

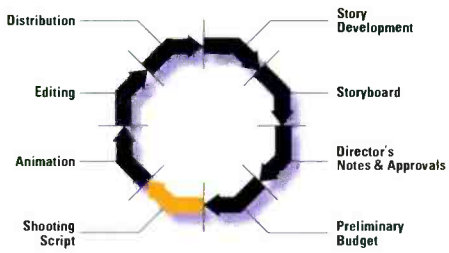
The Silicon Studio digital blueprint integrates renowned Silicon Graphics® visual computing systems and industry-leading content creation tools with foundation libraries, asset management products, and high-speed networking technologies. This digital blueprint has three critical functions: content creation, on-line archival storage, and real-time delivery. These functions enable Silicon Studio customers to exploit technology in every step of the content production process, including: story development, preproduction, production, post-production, distribution, reuse of assets, and merchandising.

The Silicon Studio digital blueprint is based on an open architecture that integrates multivendor platforms and supports over 30 industry-leading software applications and hardware peripherals from third-party developers. Silicon Studio continues to work with several industry-leading entertainment companies, such as DreamWorks-SKG, to continually develop innovative and powerful digital applications for production.

Integration—Not Islands

Current digital studio production systems are handcrafted and designed independently of each other resulting in inefficiencies and duplication of effort. Key functions such as story development, storyboarding, animation, production and in-process approvals, and budgeting are separate "island" applications at best, with manual integration causing delays and miscommunication.

Integrated Production Workflow



An integrated digital production environment delivers media "at speed" to every creative professional's desktop. This results in a dramatic reduction of the creation-to-visualization cycle, guaranteed frame rate media playback to each workstation, cost and time reduction because media is played before it is physically created, and on-demand daily (and hourly) tests with no editorial intervention.

Digital integration allows customers to leverage digitized film or video libraries for cross-promotional purposes. It offers the ability to author once and deploy in multiple distribution mediums. It also enables clients to integrate Silicon Graphics systems into their existing facilities and support a truly integrated production environment. Common APIs, libraries, data interchange, and file standards provide the benefits of a streamlined workflow.

Well-Positioned for the Future

The Silicon Studio digital blueprint is unleashing powerful creative and collaborative possibilities, while delivering dramatic gains in productivity. This digital blueprint enables companies to strategically evolve their digital infrastructures and modes of production so that they are well-positioned for the future. In the coming years, as the power of this digital architecture moves into the hands of the majority of entertainment professionals, this new production process will likely spark a creative renaissance, one that can forever change the way entertainment content is produced, managed, and distributed.

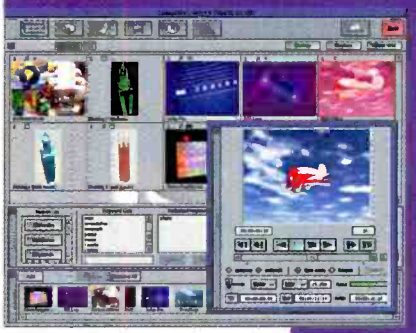
The Keystone Initiative: Streamline the Creative Process

Over 30 industry-leading software companies have joined Silicon Studio to define a more cohesive and integrated content development environment. The Keystone initiative provides the entertainment community with standards for creative applications used in production. These standards can be implemented by using provided programming guidelines and libraries from Silicon Studio. When a software company implements the Keystone standards, the application has a common look-and-feel, simplified data exchange, common data formats, consistent color, and plug-and-play capabilities. These benefits greatly streamline creative and production processes with minimal data administration.

Asset Management: Make It, Move It, Find It, Play It

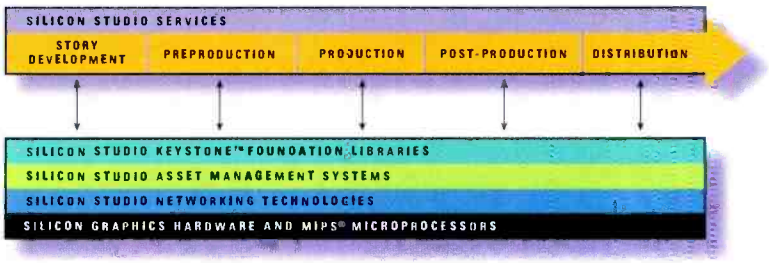
In the analog world, content assets may reside in videotape or film formats and are stored in archives not easily accessed by creative and technical professionals. Tracking, control, retrieval, and reuse of assets has been complicated, slow, and expensive.

An expanded Silicon Studio product line enables asset management capabilities such as cataloging, real-time browsing, version control, check-in, check-out, and data archiving on Silicon Graphics servers. Other Silicon Studio products in this offering will link the asset management toolkit and other creative application tools to existing data management systems such as Oracle, Informix, Illustra, and IBM's Digital Library, as well as the Silicon Graphics media-optimized XFS™ filesystem. (For more information on XFS, refer to the XFS sidebar on page 9.)



Managing assets with CineBase.

The Silicon Studio Digital Blueprint



Continued on the next page

When the asset management products are implemented, final versions of digital assets such as movies and games can be easily made available for distribution in a variety of formats over networks or on multiple media such as CD-ROM, film, or video.

StudioServices℠: Training, Support, On-Line Community

StudioServices gives entertainment customers the training, support, and information they need to make a smooth transition to an all digital environment. Clients receive help with the implementation and use of the Silicon Studio products and technologies.

StudioTraining℠ offers courseware and centers that entertainment professionals can use to keep their skills sharp. Hands-on training classes are led by industry experts and conducted at centers around the world, including Silicon Studio/LA℠, Silicon Studio/London℠, and more. This instruction gives clients knowledge and skills they can immediately apply in their facilities.

StudioSupport℠ provides an integration service that enables the world's best system integrators to provide complete system integration services for customers who want to install Silicon Studio products. Silicon Studio provides training, support, and expertise to a select group of integrators who can then supply customers with complete end-to-end solutions and service.

StudioLive™ gives clients access to on-line collaborative information and communication tools to support the content production process.

Using Silicon Graphics servers, StudioLive can interconnect any workstation or PC which is Netscape™ 2.0 ready. These tools and information sources are available via the Internet and/or private communication networks. Users can access comprehensive product and application information, and utilize chat rooms, industry directories, and media portfolios. For more information, visit the StudioLive Web site at: http://www.studio.sgi.com. ◆

rugged RELIABLE *Redundant* ReelTime™ RAID

Your high-performance Silicon Graphics computing environment deserves the fastest, most reliable storage system available - Falcon ReelTime RAID. In addition to providing an astonishing 16MB/sec of sustained system bandwidth per channel for real time data throughput, Falcon ReelTime RAID includes every feature on your wish list at a surprisingly affordable price. You get unrivaled expandability with PCB connectors in every drive bay for reliable plug-and-play connections. Redundant power supplies for both RAID and drive enclosures assures the safety of your data, and both the power supplies and drives are truly hot-swappable. Maintenance is made easy with LED indicators that numerically display the channel number and SCSI ID for every drive. This incredible disk array comes in a rugged 19-inch rack mountable cabinet. The individual drive units can also be placed in a Silicon Graphics Challenge or Onyx without modification for additional flexibility. Whatever your data storage needs, Falcon ReelTime RAID offers the ideal solution with the highest degree of performance and reliability at a price that won't break your budget. Why pay more when faster and better costs less? Prices start at $18,000.

Call your Falcon representative for additional information.

FALCON
SYSTEMS INCORPORATED

800 326 1002

tel 916.928.9255 http://www.falcons.com

You Won't Be Left Behind

By Grant Ellis

The digital revolution is radically changing production and distribution in broadcast television. And Silicon Graphics' unique combination of strengths in digital media servers, high-bandwidth filesystems, video I/O and compression technologies—and, of course graphics workstations—is enabling solutions for asset management, news editing, on-air 3D graphics, virtual sets, and digital distribution. Broadcasters will not be left behind in this digital revolution.

Silicon Graphics and its third-party solution developers are well positioned to help you lead in this revolution. Recently introduced Silicon Graphics® workstations, including IndyStudio™, the Indigo^2 IMPACT™ family, and the Onyx® InfiniteReality™ visualization supercomputer with its vastly increased graphics processing power, have created a performance gap that no other platform or solution provider can come close to in the foreseeable future.

No other platform supports software that compares with the world-class solutions of Silicon Graphics third-party developers.

No other platform can offer both compressed and non-compressed video editing, the world's fastest 3D graphics generation, and real-time video server power in a single compatible product line.

No other platform provides such powerful tools for digital media asset management. The Silicon Graphics CHALLENGE® server family, asset management API, guaranteed bandwidth filesystem (see sidebar), and high-speed networking integrated with third-party relational databases, will fuel the digital retooling of broadcast facilities.

News Editing: Speed, Quality, and Simultaneous Sessions

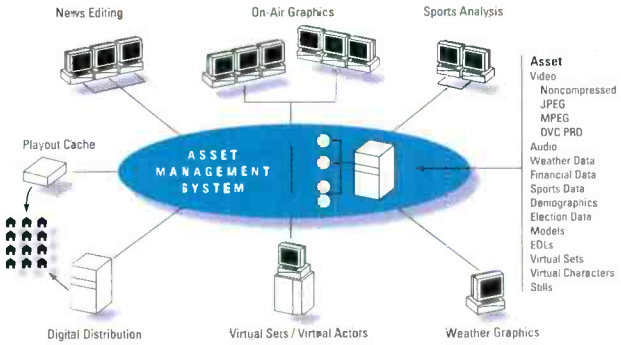
Silicon Graphics third-party developers have changed news editing dramatically by introducing digital client/server systems.

Once video material is captured on a Silicon Graphics CHALLENGE digital media server, it can be accessed simultaneously from many nonlinear digital workstations. Do you have video for a big story breaking late? Assign one editor to the 6 o'clock news. At the same time, another editor can be working on it for the 11 o'clock news, and the marketing department can be cutting promos and bumpers from the same footage simultaneously. You also improve image and programming quality; you can maintain generations, and editing is so easy you don't hesitate to add refinements or try different approaches.

3D On-Air Graphics: Animating Real-Time News

For on-air graphics, Silicon Graphics workstations are real-time, open-system, 3D animation generators: feed in data from anywhere on the planet, and you can automatically transform it into a live, three-dimensional, on-air animation. Data feeds from financial services, election computers, weather satellites, sports events, and other sources can be turned into 3D animations using off-the-shelf or customized software from innovative companies, creating an explosion of opportunities for broadcasters.

For sports graphics, Orad's Replay 2000™, now in use at NBC, can digitize the motion of a key play in seconds and replay it from any angle. Weather packages from companies such as WSI, Weather News, Kavouras, Weather Central, and Earth Watch now provide 3D animations from weather satellite data for hundreds of television networks and stations.



Asset Management and Digital Distribution: Digital Is No Longer an Island

The digital revolution promises broadcasters intelligent and efficient integration of the production and distribution processes.

In the not-too-distant future, digital media asset management systems like those provided by Silicon Studio and its third-party application developers will stand as an integral part of broadcast television operations. These large yet flexible systems will go far beyond today's "video server" offerings (which are little more than random access digital playout caches) to provide a leap forward in both production and distribution efficiencies. All production elements—graphics, titles, stills, clips, satellite data, EDLs, playlists, spots, and entire programs in compressed or noncompressed form will be stored on disk, moved across high-speed local-area and wide-area networks, sorted by powerful relational databases, and distributed digitally by satellite, cable, and the Internet—all by one integrated system.

The Amazing Numbers Behind XFS™

XFS from Silicon Graphics is a world first in digital media filesystems. It is designed to provide guaranteed bandwidth for multiple real-time video (and audio) channels. Its capabilities are compelling:

Bandwidth:	330MB/sec
File Opens:	Millions/sec
Maximum File Size:	Over 300GB
Maximum Filesystem Size:	Petabytes (1PB = 1 million GB)

Performance Animation: Live, On-Air Computer-Generated 3D Characters

Silicon Graphics hardware has made it possible to put another on-air spin on reality—performance animation. Sensors track the moves, the gestures, and even the facial expressions of off-camera actors. These signals, fed to a Silicon Graphics workstation, are used to animate an on-screen three-dimensional personality. The personality can stand alone (like Henry Koszlowsky, a virtual color commentator who appears on German soccer broadcasts) or interact in real time with on-screen talent.

Virtual Sets: A New On-Air World of Creative Freedom

Virtual set technology gives set designers far more creative freedom—not to mention greater freedom from budget and time limitations, and from the physical problems of building and storing sets. ACCOM, Brainstorm Multimedia, RT-SET, Discreet Logic, ELECTROGIG, and Orad offer elegant virtual set systems, and all of them use Silicon Graphics Onyx workstations—the technology that made the virtual set concept possible. The breathtaking performance of the new Onyx InfiniteReality visualization supercomputer produces even more intricate and compelling graphics in real time. Sets can be more realistic and elaborate. Designers can add more surfaces and textures. Lighting schemes can be more complex. Camera moves can be more realistic, adding depth of field and motion blur.

Solutions for Broadcast

ACCOM
ELSET™
Virtual Set Solution
Radiosity lighting technology, optimized animation features, precise calibration to ensure proper registration of real and virtual worlds, distance-key for virtual object mattes, interface to Alias|Wavefront or AutoCAD® models; uses Radamac or Ultimatte camera heads.

BRAINSTORM MULTIMEDIA
Brainstorm ESTudio
Virtual Set Solution
Superior realism; on-air, real-time visualization of graphics associated with an external data source.

DISCREET LOGIC
FROST™
On-Air Graphics
3D modeling and animation system for real-time rendering of financial, election or other external data.

DISCREET LOGIC
FROST, Vapour™, Glass™
Virtual Set Solutions
Complete 3D modeling and animation, real-time 3D rendering, external workstation control, realistic camera control, single-camera and multicamera operation.

ELECTROGIG
Reality Tracking
Virtual Set Solution
On-the-fly 3D rendering of virtual environments; set creation with GIG3DGO® or practically any other 3D software; integrated, fault-tolerant architecture; turnkey solutions; multicamera configurations.

EVOLVING VIDEO TECHNOLOGY
Antero™ Ascent
Open-System PostScript® Character Generator
Complete image format support; external data control and networking; real-time statistic updating for news, election, weather, sports, and financial; uniform interface to databases.

ORAD HI-TEC SYSTEMS, LTD.
Virtual Set
Virtual Set Solution
Real-time compositing of foreground video and graphical backgrounds based on real-time pattern recognition; hand-held cameras; no need for mechanical or other sensors.

RT-SET, LTD.
Laurus™ and Otus™
Virtual Set Solutions
Turnkey solution, installation, training, and system support.

Clear Vision for the Solid Future of 3D

ELECTROGIG's vision is very clear. Offering complete 3D digital production tools is what we do. It is all we do.

Our flagship product, GIG3DGO®, is an award-winning, full-featured 3D graphics and animation software system, with a solids-based modeler and our proprietary raytracing renderer, bringing you crystal clear photo-realism that is unachievable with polygonally-based modeling packages. And we believe that to truly provide the best offerings for our customers we must deliver complete solutions, so we also offer complementary products and graphics engineering services.

LIGHTSCAPE
Radiosity and raytracing rendering
Interactive 3D walk-throughs
Material library support and texture mapping
Physically based point, spot, area and linear lighting
Real time manipulation of virtual environments
Available for Silicon Graphics workstations

GIG3DGO
Complete 3D graphics and animation system
Solids-based modeling
Vector-based 3D particle animation
Kinematic/dynamic spline-based modeling/animation
5-7 day learning curve
Available for Silicon Graphics workstations

ANIMATOR BROADCAST
Complete Video Production Solution
Resolution independent up to 32,768x32,768 pixels
2D and 2-1/2D animation, editing and compositing
Paint, raster, titling and vector effects
3D DVE sphere mapping
Available for Silicon Graphics workstations

SiliconGraphics VAR AUTHORIZED VALUE ADDED RESELLER

Silicon Graphics Inc. is the leading manufacturer of high-performance visual computing systems.

From our hand to yours - a clear path to the future of 3D.
Call now - 800.596.2GIG

ELECTROGIG, Inc.
Corporate Headquarters 50 Osgood Place, San Francisco, CA 94133 phone: 415.956.8212 fax: 415.956.8213
European Sales Office Herengracht 214 1016 BS Amsterdam, The Netherlands phone: 31.20.521.7300 fax: 31.20.622.6801
Asia Pacific Sales Office 6th Floor Kam Chung Commercial Building 19-21 Hennessy Road Hong Kong phone: 852.2.528.6295 fax: 852.2.529.7835
web: http://www.electrogig.com/ *or* http://www.gig.nl/ *email:* Americas: gigsl@electrogig.com Europe: info@gig.nl Asia: gigap@electrogig.com

CG EDITORS' CHOICE AWARD

BEST OF BYTE COMDEX '95

ELECTRO® GIG

XAOS TOOLS® AND SILICON GRAPHICS®

The High End is Now Radically Affordable

THE XAOS TOOLS SGI PRODUCTION SUITE

LIGHTWAVE 3D™ 4.0

INCREDIBLY POWERFUL YET EASY-TO-USE 3D MODELING & ANIMATION SYSTEM

NTITLE® 2.2

STUNNING TEXT GENERATION, ANIMATED TITLES, MULTI-LAYER 2D ANIMATION, DIGITAL VIDEO EFFECTS

PANDEMONIUM® 2.7

AWARD-WINNING SPECIAL EFFECTS, IMAGE PROCESSING, ANIMATION, MULTI-LAYER COMPOSITING

TV PAINT™ 3.6

INTUITIVE MULTI-LAYER PAINT, DRAW, TOUCH-UP & COMPOSITING, PRESSURE-SENSITIVE BRUSHES

World Class Hardware & Software for the Digital Media Professional
Now Available at Remarkably Affordable Prices

Contact Us Now For More Information and Your Free Video

Voice: 1-800-833-9267 • Fax: 415-558-9886 • email: sgisales@xaostools.com

SiliconGraphics ISV AUTHORIZED INDEPENDENT SOFTWARE VENDOR PREMIER

NEWTEK INCORPORATED

TECSOFT

CIS

XAOS tools

http://www.xaostools.com

CIRCLE FREE PRODUCT INFO NO. 30

The Cast Just Keeps Getting Better

By Grant Ellis

In 1993, Silicon Graphics introduced a successful concept: combine the world's finest-performing visual computers with a family of hardware and software products from the best of the video/computer industry. The way creative professionals have put it to work has changed video and film production forever.

We knew this ensemble of production tools would keep getting bigger and better. But we weren't ready for the explosion of great ideas from our engineers, our customers, and our third-party solution developers. Feedback from users around the world—impatient, visionary, outrageous—kept us driving for innovative, high-performance visual computer designs that would let software developers build the applications of their dreams, and enhance the creativity of the people who use the systems.

This combination—the most powerful hardware, the most innovative software solution developers, and feedback from the entertainment industry's most creative minds—has become an engine for progress that keeps Silicon Graphics at the cutting edge of technology for entertainment.

CPU, Graphics, and Video I/O Performance: Nobody Else Gives You Power Like This

Silicon Graphics gives you more power to create. Awesome 3D animations, complex multilayered composites, and multiple-channel noncompressed editing distinguish solutions on Silicon Graphics® workstations. And this year, your power to create has taken a leap forward across all Silicon Graphics product families.

Software developers will build the world's most powerful creative solutions on the Onyx® InfiniteReality™ visualization supercomputer. The new R10000™ processor has set render marks that exceed any other CPU on the planet.

And the R5000™ processor makes the new IndyStudio™ line a 3D workstation price/performance standard.

Second-generation Silicon Graphics video hardware in the Indigo^2 IMPACT™ family means faster and more versatile video I/O. It gives production studios real-time 8- and 10-bit-per-channel CCIR 601 digital component video, variable JPEG compression up to Digital Betacam™ quality, and even built-in MPEG playback.

Compositing: This Decision Has Been Made

The high-end production community has clearly chosen the flexibility of general-purpose hardware for video and film compositing. High-end compositing suites are getting more power with Onyx InfiniteReality and R10000. Meanwhile, the desktop is going on line with the compositing speed of Indigo^2 IMPACT.

Video and Film Production

Welcome to Noncompressed, Nonlinear Editing

Until recently, no general-purpose computer has ever provided cost-effective, noncompressed, nonlinear editing. The new generation of Silicon Graphics products now offers this fast throughput capability. They easily move noncompressed video to and from off-the-shelf disk arrays or even standard disks striped in software. These products are about to change the world of on-line editing in the same way that the first compressed-video nonlinear editors changed off-line editing a few years ago.

3D Animation: Fact vs. Fiction

Workstation and personal computer competitors are targeting Silicon Graphics leadership in 3D animation with "we're-just-as-good-as-Silicon-Graphics" tag lines. But the fact remains that the Indigo^{2}™ family continues to provide the dominant workstation for every major 3D animation and special effects feature, as well as for the lion's share of 3D animation for successful television programs and video games. And the adoption of Silicon Graphics technology in entertainment continues at an astounding rate.

The reason is simple: the tight integration of unequaled graphics horsepower, CPU and system performance, and the world's best applications.

The Indisputable Conclusion

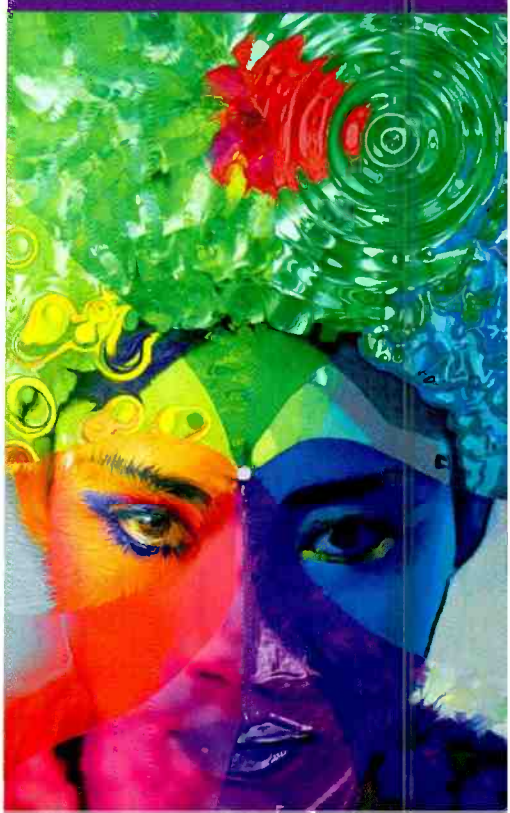
Silicon Graphics continues to succeed because of two unique, ongoing accomplishments: building the fastest visual supercomputers, and using that expertise to lead the world in visual computing price/performance, right down to the project studio level.

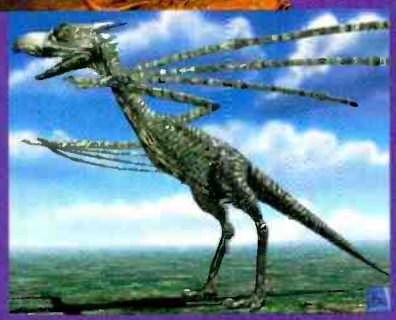
Solutions for Production

ALIAS|WAVEFRONT
Power Animator
3D Animating, Rendering, and Modeling Solution
Digital Opti F/X™ for lens flare, fog, and explosions; particle systems, CompuHair™ for lifelike hair; cinematographer-level camera control, NURBs, automatic polygon reduction, and Open Alias™ plug-in interface.

AVID TECHNOLOGY
Media Spectrum
On-Line Production System
(see sidebar, page 21)

AVID/PARALLAX
Advance
On-Line Compositing System
Resolution-independent, interactive compositing, 3D DVE effects process tree, integrated with Matador.





AVID/PARALLAX
Matador™
Paint and Animation System
Most popular Silicon Graphics-based high-end paint system, 2D animation, effects, sophisticated color correction tools, image stabilization, motion tracking, rotoscoping.

CAMBRIDGE ANIMATION
Animo
Cel Animation
Full-featured system for feature animation and cartoon serial production.

CHYRON
Liberty
2.5D Paint and Animation System
Resolution-independent, 32- and 64-bit versions, unlimited layers for animation and compositing, image tracking, and motion stabilization.

DISCREET LOGIC
FLAME
On-Line Digital Production System
Resolution-independent effects, compositing, painting and advanced image processing, match motion shots, go beyond conventional post-production.

DISCREET LOGIC
FLINT
Scalable Production Solution
Feature set identical to FLAME, can be used as a satellite or visualization station to a FLAME system or as a stand-alone finishing tool.

DISCREET LOGIC
FIRE
Noncompressed Nonlinear Edit System
(see sidebar, page 21)

DISCREET LOGIC
INFERNO
Film Compositing
Feature set identical to FLAME, greater bit depth and image resolution.

KODAK
Cineon
Image Compositing and Retouching Software
Advanced keying, restoration, grain management, color and tonescale manipulation, wire and rig removal, artifact removal, and image processing.

MICROSOFT/SOFTIMAGE
SOFTIMAGE® 3D and SOFTIMAGE 3D Extreme
3D Animation Solutions
The latest features for modeling, animation, and rendering.

MICROSOFT/SOFTIMAGE
SOFTIMAGE Toonz™
Cel Animation Software
Automates production steps without compromising animator's original drawing style.

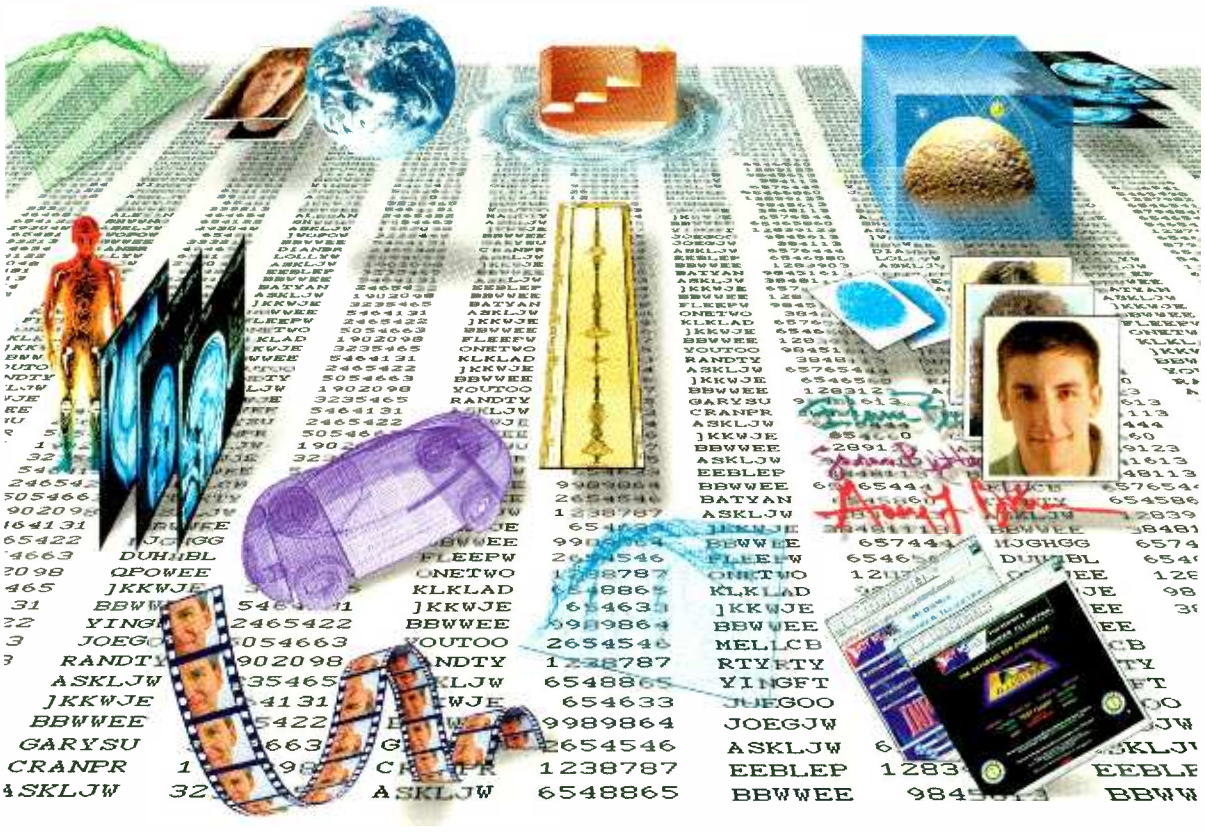
PIXIBOX
Pixiscan™
Cartoon Production System
Complete control of cost, planning, and final image, automatic scanning and painting, powerful camera and peg motions, special effects, real-time checking, mixing with 3D or live images.

SIDE EFFECTS SOFTWARE
Prisms
3D Animation and Image Manipulation System
Modeling, animation, lighting, raytracing, compositing, morphing, image processing, paint, natural forces, metaballs, deformations, motion capture, and character animation.

USANIMATION
Electronic Ink & Paint and Digital Compositing
Cel Animation
Production DBMS, resolution-independent, sophisticated camera moves, real-time playback, vector-based.

XAOS TOOLS
LightWave 3-D
3D Animation Solution
Tens of thousands of users worldwide, all-in-one photo-realistic animation, affordable power, and flexibility.

XAOS TOOLS
Pandemonium®
Special Effects Software
Unparalleled image processing engine, 48 modules, customizable pre-set styles, key frameable motion effects.



You've put a lot into developing your digital collection. Here's how to get a lot more out of it.

Until now, managing all those assets required paper and pencil, a photographic memory - or both. Not anymore.

With an intelligent content management system from Illustra™, you can store, find, retrieve, manipulate and re-purpose any kind of digital information—video, photos, drawings, sound, documents—all in one place. It's fast. It's efficient. And you don't even need key words to search.

To see the Illustra solution in action, drop by booth # M4265 at NAB '96. For more information call (510) 652-8000, or visit our Web site at http://www.illustra.com. You can also email us at info@illustra.com.

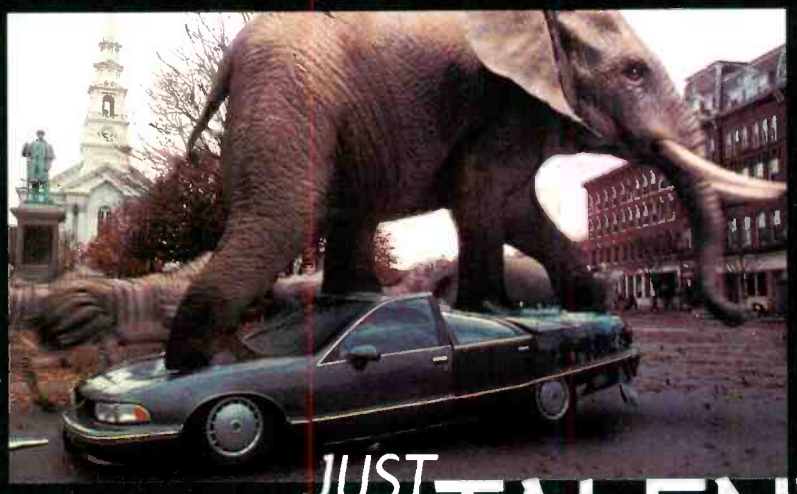
ILLUSTRA™

CIRCLE FREE PRODUCT INFO NO. 31

©1995
Warner Bros.
Image courtesy of
Metrolight Studios,

NOW YOU DON'T NEED A BIG BUDGET TO PRODUCE GREAT WORK.

©1995 Courtesy of Nintendo/RARE LTD.

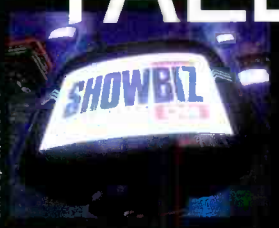


©1995 Tristar. All rights reserved Photo courtesy of Industrial Light & Magic.

JUST TALENT

CBS Sports' "National Championship" promotion, designed and produced by Talaxian Design/Animation (a division of National Video Center/NY). For client CBS Sports © CBS Sports

Courtesy of Menford Electronic Art.



CNN Graphics, Derald Hunt

If you've got a big idea, you need the best creative tools available.

Alias|Wavefront's PowerAnimator Version 7 – *the most advanced technology in the industry* – is engineered to unleash your creativity.

And it's now within everyone's reach – with the

DRAMATICALLY AFFORDABLE

high-performance IndyStudio™.

©1995 Courtesy of
Nintendo/RARE LTD.

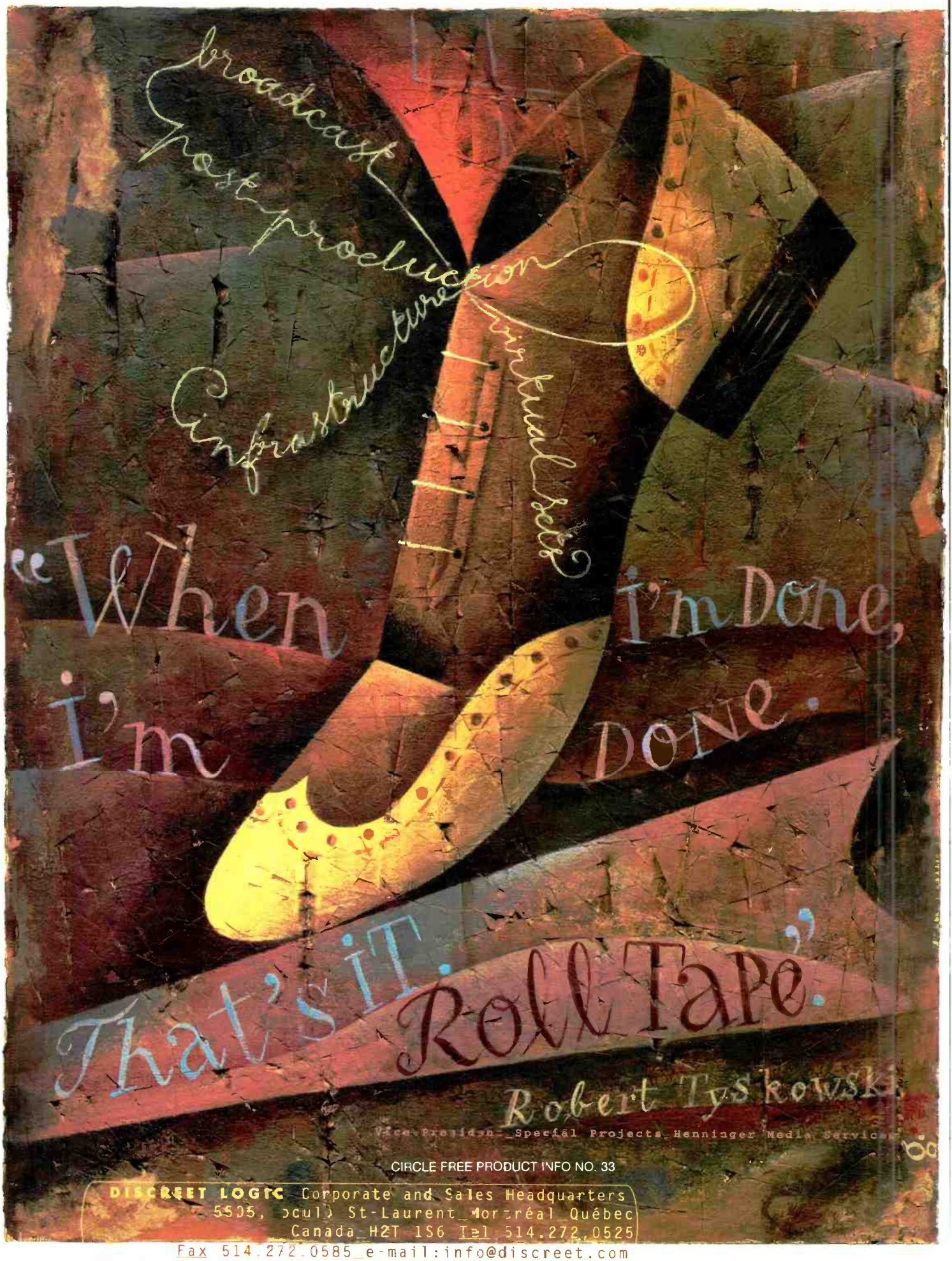
SEE US AT
NAB BOOTH 8249

For more information
CALL 1.800.447.2542
or visit our website at
www.aw.sgi.com

Alias | wavefront

CIRCLE FREE PRODUCT INFO NO. 17

A Silicon Graphics Company



By Don Levy

The Joy of On-Line Editing is Over DUE

Digital Uncompressed Editing

The power of Silicon Graphics® products has been heralded for the past several years in the post-production world. Avid Technology, Discreet Logic, and upstart Communicacion Integral (Jaleo) are delivering DUE (digital uncompressed editing, a.k.a. noncompressed editing), which will take the power of the Silicon Graphics Onyx® supercomputer and deliver it to editors.

Video obsolete? Video will not be the common denominator in an edit room anymore. This is the old paradigm, the edit suite dependent on video as the primary file type. Noncompressed editing will integrate the different media types needed to create a program. Input will be done regardless of pixel matrices or waveforms. With noncompressed editing, an editor could create a stunning visual, sandwiching a background captured at film resolution with an RCB 3D computer animated foreground and actors shot over a blue screen with Digital Betacam™, all in their native formats.

Export will depend on the choice of delivery; TV shows on D1, interactive games on CD-ROM, or theatrical releases recorded to film at 4,000 lines. Program production remains constant within the Onyx or Indigo^2 workstation while the distribution means are mixed and matched as needed.

Creative Adventures Lie Ahead

Noncompressed editing will enhance creative collaboration in ways heretofore impossible. As an editor, imagine having all of the tools that a project might require at your fingertips while collaborating with other creative souls by trading files in real time. Imagine having the ability to reinsert a final shot, juxtapose an effect, color correct someone's touch of envy, heighten a music score, remove wires, or handle some complex compositing, all while maintaining the history of decisions made, enabling you to undo any action anytime. You become more integral to the final product.

The power of noncompressed, nonlinear edit systems can be harnessed by a network of Silicon Graphics workstations, PCs, and Macintosh® systems. Divide the work and conquer the project in a parallel work environment paradigm. Utilizing HiPPI or Fibre Channel, multiple real-time video streams cease to be the bottleneck of open architecture software solutions, negating any advantage that closed architecture, proprietary solutions exploit. Inexpensive workstations like IndyStudio™ will allow assistants to concurrently execute a subset of the post-production process. Imagine the infinitely collaborative possibilities.

May You Live in Interesting Times

What is going on? Where are the traditional lines of demarcation of responsibility, of workflow, of creativity, of skill? Where does off-line end and on-line begin? Are the walls between compositing, editing, color-correction, and audio breaking down? Will talent no longer be constrained or pigeonholed into being just an editor?

Noncompressed editing will allow each editor's innate creative abilities to be tapped and utilized in the best way possible. This doesn't mean that they will do everything; machines multitask well, but humans do not. Creating an environment which forms itself to the natural talent and creativity of each individual in the post-production process has not been done before. This is revolutionary. Praise is DUE. ■

Don Levy is the vice president of new business development for RVI and was the founder of the first exclusively nonlinear editorial company, Digipix, in 1990.

We admit it.

Avid. Providers of the most powerful and complete suite of uncompressed editing, painting and effects tools for Silicon Graphics™ workstations.

There is something

Avid Media Spectrum.™ A comprehensive, all-digital online environment for editing uncompressed, CCIR-601 images, 48Khz audio and creating incredible special effects.

to match our

Avid Advance.™ Resolution-independent software for vertical editing and compositing.

editing know-how.

Avid Matador® For paint, rotoscoping and multi-layered 2D animation.

Our special

Avid Beyond Reality.® The ultimate special effects software for 2D & 3D hierarchical animation, warping and morphing.

effects know-how.

Avid Jester.™ Digital ink & paint software to accelerate cartoon production without compromising creativity.

1-800-949-AVID

CIRCLE FREE PRODUCT INFO NO. 34

Digital Noncompressed Editing

Media Spectrum™ Analysis: Avid Takes Steroids

So what is Avid Technology offering that will make you stand up and take notice?

According to Tom Ohanian, Avid's director of product design, Media Spectrum on Silicon Graphics® Onyx® benefits from the popular Media Composer's six generations of software development. There is virtually no learning curve for editors familiar with Avid.

Media Spectrum provides a comprehensive on-line environment for editing uncompressed, CCIR-601 images and 48KHz audio, creating incredible special effects and performing tasks such as painting, rotoscoping, animation, compositing, layering, keying, color correction, and image tracking and stabilization.

Media Spectrum operates interchangeably in three different color space environments. It starts with four channels of audio and can expand to 16 or more channels, along with audio equalization, time expansion, and time compression. Media Spectrum uses the Silicon Graphics standard XFS™ filesystem, enabling it to use all computer resources and disks; there are no proprietary disk formats. Spectrum starts with 38 minutes of uncompressed CCIR-601 disk capacity.

Media Spectrum is interchangeable between 29.97 fps (NTSC), 25 fps (PAL), and 24 fps (Film) and can convert 625 PAL to 525 NTSC and vice versa.

Editors on FIRE™: Discreet Lights the Fuse

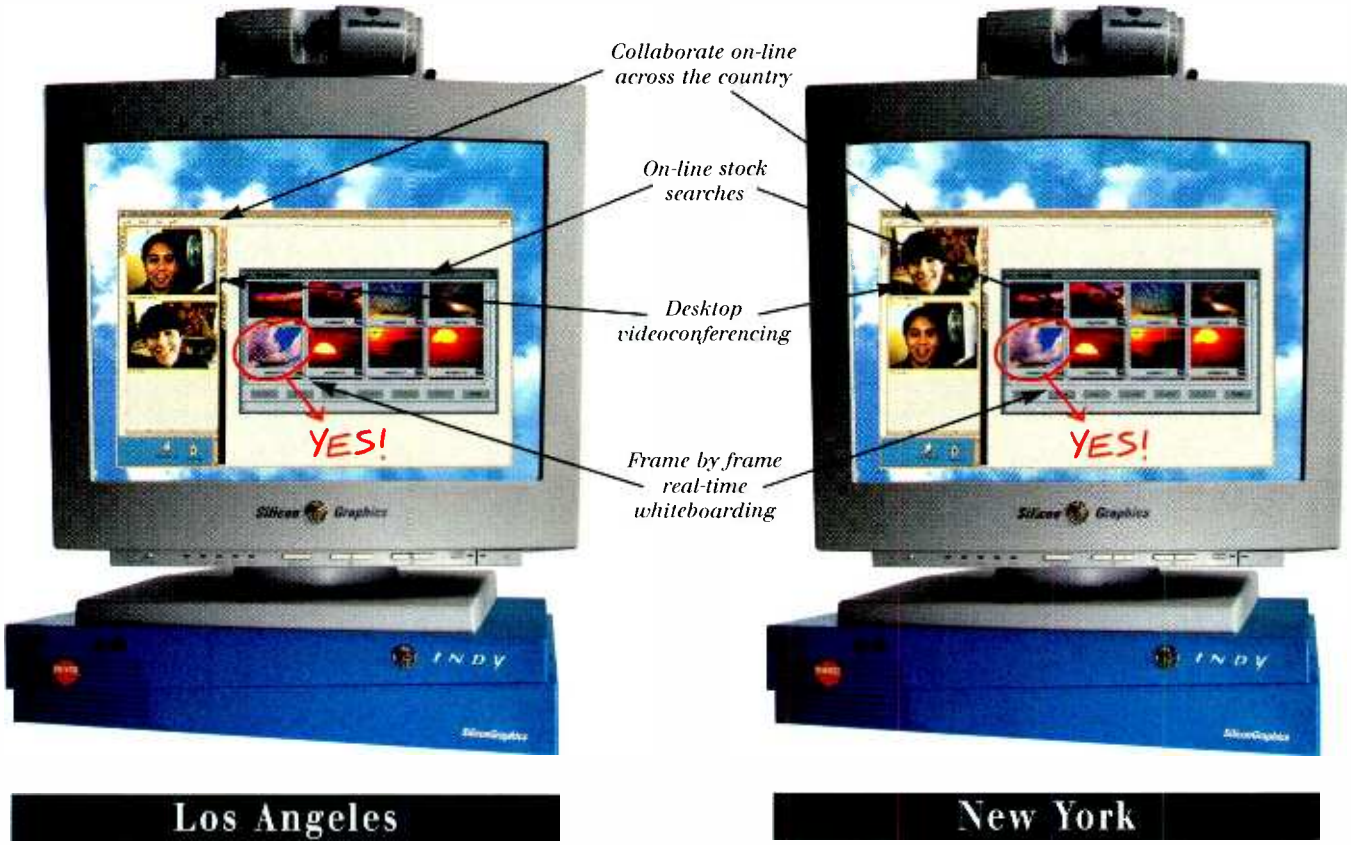
FIRE is Discreet Logic's answer to replace D1 linear editing systems, according to Steve Kreth, product marketing manager for FIRE. It is a resolution-independent system that offers a wide range of editing tools and a unique gestural editing style. FIRE is designed to enable the on-line editor to remain the ultimate master craftsmen of the finishing process.

FIRE benefits from Discreet's intimate knowledge of the Silicon Graphics Onyx platform via experience with FLAME™ and INFERNO™. It includes seamless integration with FLAME and can cohabitate with it on the same computer. Editors can animate three super layers of images over a background in a single color space, eliminating time and quality loss inherent in color space conversions.

FIRE's audio tools encompass Sonic Solutions digital audio technology. Widely used by the professional film and TV community, editors on FIRE can work with four, 16, or 32 audio tracks immediately.

Using Stone disk arrays, FIRE supports a minimum of 54 minutes of two real-time streams of uncompressed CCIR-601 resolution video that store a minimum of 54 minutes. By using the Wire infrastructure with standard network protocols, an entire post facility can transfer and track real-time noncompressed video within its applications from any platform.

Introducing Sprint Drums.℠ The production tool that does everything but schmooze the client.



With Sprint Drums you get a revolutionary on-line tool designed just for production professionals. Created with Silicon Studio,™ Drums connects you to a community of production leaders all over the country. It even gives you T-1 connectivity that puts you on the Net in a flash. In fact, with all the tools and resources Drums puts on your desktop, it can do almost everything. Except take the client to lunch. Find out more at http://www.sprint.com/drums or 1-800-931-3132.

Sprint. drums

CIRCLE FREE PRODUCT INFO NO. 36

Silicon Graphics® Product Family

IN THE SERVER: with the swift new XFS™ filesystem, CHALLENGE® servers (and Onyx® workstations) easily move multiple channels of noncompressed component digital video. The new R10000™ processor has set render marks that exceed any other CPU on the planet.

ON THE DESKTOP: there's more power here, too. The Silicon Graphics Indigo^2 IMPACT™ family allows noncompressed, nonlinear editing and true 3D real-time DVE capabilities. And the new IndyStudio™ line with its R5000™ processor sets a new performance standard for personal workstations in entertainment.

AT THE HIGH END: the new InfiniteReality™ graphics subsystem for the Onyx workstation has four-times the texture memory and 10-times the graphics performance of its industry-leading predecessor, RealityEngine^2™, plus the added bonus of real-time hardware filtering and the bandwidth to handle four channels of real-time 4:4:4:4 video. R10000 increases CPU performance by two to three times.

	IndyStudio	Indigo² IMPACT	Onyx InfiniteReality	CHALLENGE S, DM, L, XL
FEATURES/BENEFITS	World's Fastest Desktop Pixel Graphics Leading Price/Performance for Animation and Desktop Video	World's Fastest Desktop 3D Graphics Noncompressed Video	World's Fastest Graphics Multiple Processors Multi-Stream Video I/O Hours of Video Storage	Scalable Architecture Multiple Processors Huge On-Line Storage
3D ANIMATION	Fast Vector Preview | Fast Rendering	⊕ Interactive, Light-Sourced Gouraud-Shaded Preview Real-Time Video Texture Mapping	⊕ Real-Time, Anti-Aliased, Motion Video Texture Mapping Parallel Rendering	Asset Management Server Browse Server Parallel Rendering Network Processing Network Storage Batch Rendering
PAINT/SPECIAL EFFECTS	Resolution Independent Paint | Real-Time Airbrush and Cutouts | 2D Animation Image Processing | PostScript® Titling			
CEL ANIMATION	Scanning | Ink and Paint | Step Frame Compositing		⊕ Near Real-Time Compositing	
COMPOSITING	Frame-by-Frame Multilayering Color Correction | Chroma Key Real-Time Color Space Conversion	⊕ Real-Time Preview	Resolution Independent ⊕ Real-Time Batch Compositing Real-Time HDTV Preview	Video Clip Serving Batch Compositing
EDITING	On-Line Edit Control 1-Channel Nonlinear JPEG Editing	⊕ Noncompressed, Nonlinear Editing Real-Time 3D DVE 2-Channel Nonlinear JPEG Editing	Noncompressed, Nonlinear Editing Multiple Video Streams	Edit Server
AUDIO	Dat-Quality Stereo Digital AES/EBU I/O | 4-Channel Analog I/O		Same as Desktop System with Audio/Serial Option (ASO)	
LIVE PRODUCTION	On-Air Graphics | Character Generation	⊕ 3D Weather Graphics | Virtual Set Design Real-Time On-Air Graphics Performance Animation	⊕ Virtual Sets Real-Time On-Air Graphics Performance Animation	Commercial Insertion | Clip/Library Storage Video-On-Demand
VIDEO I/O OPTIONS	Indy Video™–Composite, S-Video Indy Video 601	Indigo² IMPACT Video 2 Channels CCIR601; 10-bit	Sirius Video™–YUV, Composite, CCIR 601 with Key; 8 or 10-bits per Channel	
VIDEO COMPRESSION	Movie Master – Software MPEG and Cinepak® Cosmo™ – 60/50 Field JPEG	⊕ Indigo² IMPACT Compressed 2:1 JPEG, 2 Channels Low Cost Composite I/O	Movie Master–Software MPEG and Cinepak	
VIDEO THROUGHPUT	5:1 JPEG Compressed	⊕ Real-Time Noncompressed	Real-Time, Multi-Channel Noncompressed	

⊕ Indicates that capabilities are cumulative, moving from left to right across the product line

Broadcast & Interactive Solutions

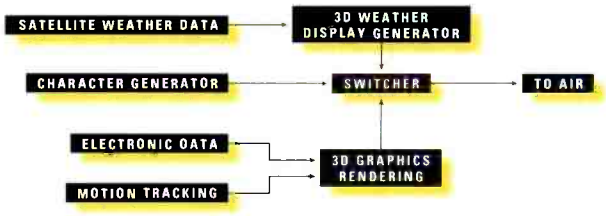
On-Air Graphics

On-Air Graphics
Avid/Parallax *Matador w/Atlas*
Chyron *Liberty*
Discreet Logic *Pure, Frost*

Weather Graphics
EarthWatch Communications *EarthWatch, StormWatch*
W.S.I.
Kavouras
Weather Central *Live Line Genesis*
Weather News *WeatherVision GS, WeatherVision VR, TerraVision, WorldView*

Character Generator
Chyron *CODI™*
Evolving Video Technology *Antero Ascent*
Parsec *Codi-X*

Motion Tracking
Orad *Replay 2000*

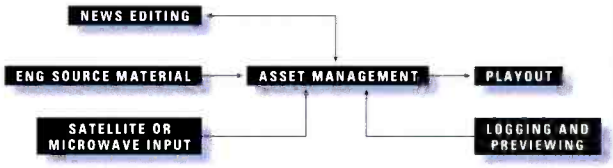


Distribution/Asset Management

News Editing
Avid *MediaServer, Netstation*
Discreet Logic *Slice*

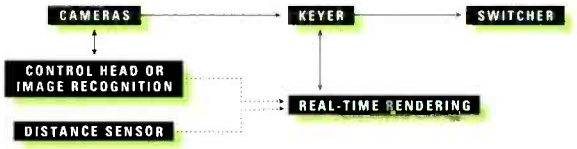
Playout
Antec *Digital Video*
Discreet Logic *Air*

Logging and Previewing
Illustra *Illustra*
Visual f/x *Cinebase*



Virtual Set Solutions

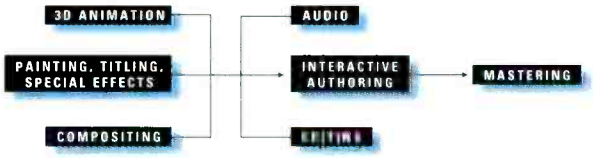
Virtual Set
Accom/VAP *Elset®*
Brainstorm Multimedia *ESTudio*
Discreet Logic *Vapour/Glass*
ELECTROGIG® *GIGTIME™*
Orad Hi-Tec Systems *Virtual Set*
RT SET *Laurus, Otus*



Interactive Authoring Solutions

3D Animation
AliasIWavefront *GameWare*
AliasIWavefront *PowerPlay™*
Microsoft *SOFTIMAGE IDEAS*
MultiGen *GameGen*
Nichimen Graphics *N-Dynamics*
Nichimen Graphics *N-Geometry*
Nichimen Graphics *Skeletal Animation System*
Side Effects *Prisms*

Authoring/Prototyping
AimTech *IconAuthor®*
Corypheaus *Activation*
Metacard *Metacard*
Paradigm Simulation *Vega*
RAD *RAD*
Sense8 *WorldUp*
Silicon Studio *FireWalker™*
SYBASE *GainMomentum*



Mastering
Electrosan *Gear*
Philips Media *MPEG-1 Encoding System*
Young Minds *CD Studio*

Paint
Avid/Parallax *Matador Sprite*
Nichimen Graphics *N-Paint*

Third-Party Peripherals/Utilities

Video Input/Output
Chyron *Cindy™ Video Adaptor*
CFE *DVES-3 Video Adaptor*
Miranda Technology *Espresso*
Photron *Oscon Box with RAM store*
Viewgraphics *Dataview SDA*

Audio Input/Output
Vigra *VigraSound*

Machine Control
Diaquest *ImageNode™, Animaq/UX, Series II™*
Lyon-Lamb® (VAS Group) *I-VAS™, ProVAS™*
Moonlight Computer Products *SoftVTR™*
Videomedia *ALIX™-SGI, EXPRESS™, V-LAN control system*

Digital Disk Recorders & Disk Arrays
Abekas *A65/A66, Diskus*
Accom *WSD, RTD, Introl SCSIFLEX*
Ciprico *Spectra 6000*
Nichimen Graphics *Action Editor*
Nichimen Graphics *Saturn Express*
Sierra Design Labs *QuickFrame*
Stone + Wire *Stone One*
Viewgraphics *Viewstore 6000*

Image Processing Acceleration
AtLightSpeed *Time Driver*

Color Correction
Photron *PRIMATE*
daVinci *Renaissance 8:8:8*

File Conversion Software
5D Solutions *5D Toolkit*
Avid *Open Media Framework*
Charybda *Diver*
Elastic Reality *Image Independence*
Equilibrium *deBabelizer UNIX®*

Compression/Decompression
Applied Vision *MPEG Expert*
Channelmatic *MPEG 1+ Decoder Set, MPEG 2 Decoder Set*
North Valley Research *MPEG codec*
Optivision *OptiVideo MPEG Encoder, Xing*
Performance Animation *(Proto)zoa MEDIALAB*

Film Recorders
Focus Graphics *ImageCorder, ImagePrinter*
GW Hannaway & Assoc. *Hannaway Recorders*
Management Graphics *Solitaire™ & Jet Stream™*
Pthalo Systems

Film Scanner/Software
Digital Video Art *OxScan*
Kodak *Genesis*

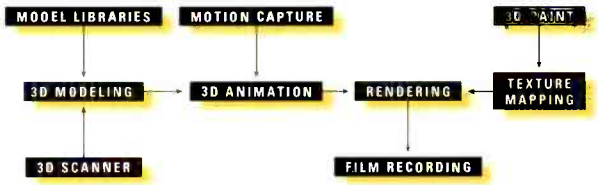
Tertiary Storage Management
Emass Systems *AMASS Direct Archiving*

CIRCLE FREE PRODUCT INFO NO. 41

CIRCLE FREE PRODUCT INFO NO. 42

Production Solutions

3D Animation Solutions



3D Animation and Rendering

AliasIWavefront *Advanced Visualizer, Animator™, Explore Visualizer, Explore Professional, PowerAnimator™*

Del Ray Graphics *ARKGeometry*

ELECTROGIG™ *GIG®, 3DGO®, GIG Sculptor™*

Hash Inc. *Animation Master*

Microsoft *SOFTIMAGE 3D™, 3D Extreme*

Side Effects Software *PRISMS*

Sumitronics *METAEDITOR®*

Vertigo *Power Vertigo, Psycho*

XAOS Tools *Lightwave 3D*

Separate Rendering Modules

AutoDesk *3D Studio Renderer*

Del Ray Graphics *ARK Renderer*

Electric Image *Electric Engine*

ELECTROGIG *GIG RaySketcher™*

Engineering Animation *VisLab™*

Lightscape *Visualization System*

Microsoft *SOFTIMAGE mental ray*

Nichimen Graphics *N-Render*

Pixar® *NetRenderMan™*

Torque Systems *RenderServer™*

Video Bits *Flash Tracer™*

3D Scanner

Cyberware *Cyberware*

3D Paint

AliasIWavefront *Studio Paint*

Discreet Logic *TAARNA*

Interactive Effects *3D Paint*

Nichimen Graphics *N-Paint 3D*

Motion Capture/Performance Animation

(Proto)zoa *ALIVE*

Polhemus *FASTRACK®, ISOTRAK®, INSIDETRAK™*

SuperFluo *Elite*

Vierte Art *X-IST*

MEDIALAB *Clovis/P.O.R.C.*

3D Models

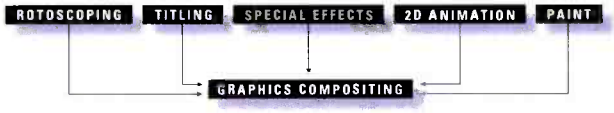
Acuris *ClipModel Libraries*

Engineering Animation *VisLab Model & Motion Libraries*

Kinetic Effects/KA World *Lifeforms*

Viewpoint Datalabs *3D Datasets™*

Paint Solutions



Paint & 2D Animation

Avid/Parallax *Matador*

Chyron *Liberty®, Eagle*

Vision Images *Animator Broadcast*

Titling

Evolving Video Technology *Antero*

XAOS Tools® *nTitle™*

Still Image Paint

Adobe *Adobe Photoshop™*

AliasIWavefront *Eclipse™, StudioPaint™, Visualizer Paint™*

Barco *Creator*

Chyron *Independence*

Del Ray Graphics *ARKImage*

Interactive Effects *Amazon Paint*

Special Effects

Beyond *Beyond Reality, Light FX, No Strings Attached*

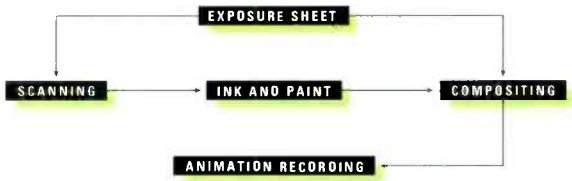
Chameleon Graphics Software *Caramba*

Microsoft *SOFTIMAGE Eddie Morph™*, Painterly Effects™

Side Effects Software *mojo/ice/tima*

XAOS Tools *Pandemonium™, Pan FX 1*

Cel Animation Solutions



Cel Animation

Avid/Parallax *Jester*

Cambridge Animation *Animo*

Microsoft *SOFTIMAGE Toonz*

Pixibox *PEGS*

Toon Boom *Tic Tac Toon*

US Animation *Electronic Ink-and-Paint, Digital Compositing*

Compositing Solutions

Compositing

AliasIWavefront *COMPOSER™*

Avid *ADVANCE, Media Spectrum*

Communicacion Integral *Jaleo Composite®, Jaleo Plus®*

Discreet Logic *FLAME™, FLINT™, INFERNO™*

Integrated Research™ *Harmony*

Kodak *Cineon™*

Microsoft *SOFTIMAGE Eddie™*

Ultimatte® *CineFusion™*

Vision Images *Animator Broadcast*

CIRCLE FREE PRODUCT INFO NO. 43

CIRCLE FREE PRODUCT INFO NO. 44

CIRCLE FREE PRODUCT INFO NO. 45

Production Solutions

Editing Solutions

Noncompressed Nonlinear Editing

Avid *Maestro*

Discreet Logic *FIRE*

Compressed Nonlinear Editing

Avid *Media Suite™ Pro*

Integrated Research *Harmony*

Vision Image *Animator Broadcast 3*

Character Generation

(see On-Air Graphics Solutions)

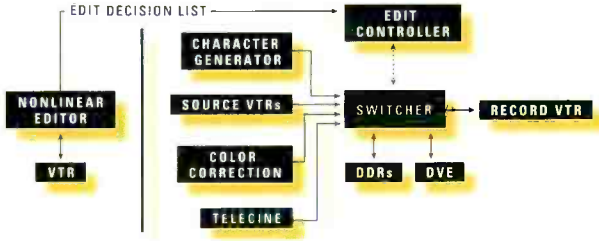
Edit Controller

Grass Valley Group *Sabre Edit*

SONY *9100+*

Color Corrector

DaVinci Systems *Artisan*



Audio Solutions

Audio

Sonic Solutions *Sonic Station, Media Net*

Timeline *Mediasound™*

Sound Effects

Aware *Speed of Sound SFX Library, AudioSuite Compression*

MIDI Sequence and Music

Blue Ribbon Soundworks *SuperJAM!™*

Steinberg Software *Cubase Audio*

COMPANY	VOICE	FAX
5D	+44.1.922.8814	+44.1.401.8621
Abekas	415.369.5111	415.369.4777
Accom	415.328.3818	415.327.2511
Acuris	415.329.1920	415.329.1928
Adobe	415.962.6604	415.961.3769
AIMTECH	603.883.0220	603.883.5582
AliasIWavefront	416.362.9181	416.362.0630
Applied Vision	415.573.8365	415.573.7913
AtLightSpeed	904.246.4184	904.246.4883
Autodesk	1.800.879.4233	415.507.6124
Avid Technology	508.640.6789	508.640.9769
Barco Graphics	404.454.1721	404.590.8042
Biovision	415.292.0333	415.292.0314
Blue Ribbon	404.315.0212	404.315.0213
BTS	805.584.4700	805.584.4710
Cambridge Animation	818.762.6466	818.762.6455
CFE	+33.1.69.41.27.27	+33.1.69.41.98.03
Chameleon	310.478.4871	310.445.5620
Channelmatic	619.445.2691	619.445.3293
Charybda	505.758.5514	505.758.5527
Chyron	516.845.2000	516.845.5210
Ciprico	612.551.4000	612.551.4002
Communicacion Integral	+34.1.413.7411	+34.1.416.9914
Cyberware	408.657.1450	408.657.1494
daVinci Systems	305.484.8100	305.486.7936
Del Rey Graphics	310.577.0500	310.577.0577
Diaquest	510.526.7167	510.526.7073
Digital Video Art	408.734.4977	408.734.5118
Discreet Logic	514.272.0525	514.272.0585
Dynatech Video Group	801.575.8801	801.328.3668
EarthWatch Communication	612.476.9005	612.476.9010
Elastic Reality	608.273.6585	608.271.1988
Electric Image	818.577.1627	818.577.2426
ELECTROGIG, USA	415.956.8212	415.956.8213
Emass Systems	214.205.6431	214.205.6144
Energy Productions	818.508.1444	818.508.1293
Engineering Animation	515.296.9908	515.296.7025
Equilibrium	415.332.4343	415.551.4000
Evolving Video	303.456.1450	303.456.1434
Falcon Systems Technology	916.928.9255	916.928.9355
Focus Graphics	415.377.0596	415.377.0598
Fore Systems	408.654.8844	408.654.8805
G. W. Hannaway	303.440.9631	303.440.4421
Grass Valley Group	916.478.3000	916.478.3286
Hash	360.750.0042	360.750.0451
Illustra	510.652.8000	510.869.6338
Integrated Research	513.321.8644	513.321.8722
Interactive Effects	714.551.1448	714.786.2527
Introl	612.631.7860	612.633.2353
Kavouras	612.890.0609	612.882.4500
Kinetic Effects	206.443.0209	206.443.0240
Kodak	716.726.2498	716.253.9467
Lightscape	408.342.1900	408.342.1910
Leich	804.548.2300	804.548.4088
Lyon Lamb (VAS Group)	818.843.4831	818.843.6544
Management Graphics	612.854.1220	612.854.6159
MEDIA LAB	+33.1.44.30.44.30	+33.1.44.30.44.60
Metacard	303.447.3936	303.499.9855
MetaTools	805.566.6200	805.566.6385
Microsoft/SOFTIMAGE	206.882.8080	206.936.7329
Miranda	514.333.1772	514.333.9828
Moonlight Products	619.625.0300	619.625.0199
New Tek/Lightwave 3D	913.228.8000	913.228.8001
Nichiman Graphics	310.577.0500	310.577.0577
North Valley Research	503.236.6121	503.236.7358
Optivision	916.757.4850	916.756.1309
Orad High Tech Systems	+972.9.45.2020	+972.9.42.7215
Avid/Parallax	+44.71.287.3626	+44.71.494.2822
Parsec	717.949.9010	717.948.4116
Peripheral Solutions	408.425.8280	408.425.5792
Pthalo Systems	604.872.5675	604.872.0144
Philips Media	+32.11.242.167	+32.11.242.168
Photron	408.261.3613	408.261.3628
Pixar	510.215.3480	510.236.0388
Pixel Control	+972.3.571.3065	+972.3.571.5167
PixiBox	+33.1.49.85.17.18	+33.1.49.85.16.96
Polhemus	802.655.3159	802.655.1439
Prisa Systems	619.677.0030	619.677.9099
Protolzoa	415.642.4121	415.824.0389
Rorke Data	800.328.8147	612.829.0988
RT-SET	415.775.9551	415.922.9633
Side Effects Software	416.504.9876	416.504.6648
Sierra Design Labs	702.831.7837	702.831.5710
Sonic Solutions	415.893.8000	415.893.8008
Sony	201.358.4262	201.930.6294
Sprint	408.894.6617	408.894.6673
Steinberg Software	818.993.4091	818.701.7452
Sumtronics	408.980.0811	408.980.1409
Sybase	415.813.8328	415.813.8333
Timeline Vista	619.727.3300	619.727.3620
Toon Boom	514.522.5142	514.522.5971
Torque Systems	415.424.1010	415.424.1096
USAnimation	213.465.2200	213.465.2800
Ultimatte Corporation	818.993.8007	818.993.3762
Vertigo	604.684.2113	604.684.2108
Video Bits	520.556.1483	520.556.1483
Videomedia	408.227.9977	408.227.6707
Viewgraphics	415.903.4900	415.969.6388
Viewpoint	801.224.2222	801.224.2272
Vigra	619.597.7080	619.597.7094
Vision Images	+45.75.45.3188	+45.75.45.3186
Visual f/x	310.475.4959	310.475.2878
Weather Central	608.274.5789	608.273.5854
Weather News	408.522.8350	408.481.0667
W.S.I.	508.670.5186	508.670.5100
XAOS Tools	415.487.7000	415.558.9886
Xing	805.473.0145	805.473.0140
Young Minds	909.335.1350	909.798.0488

Bold print denotes advertisers

IMAGE CREDITS

Page 5: CineBase, asset management product; image courtesy of Visual f/x.
Page 9: ***Africa*** courtesy of Discreet Logic FROST.
Virtual News Set courtesy of IMP and Virtual Studio Hamburg.
Page 13: Courtesy Silicon Graphics, Inc. Created by Bob Marcinka of Interprocess Service, Inc.
Page 14: ***Bombardier Sea Doo "Dream"*** courtesy of Pacific Ocean Post.
Balinese woman by Frances Dose, courtesy of XAOS Tools, Inc.
Page 15: ***Monster*** from Todd Rundgren's *Fascist Christ* video. ***Chicken raptor*** from *The Adventures of Hercules* TV show, courtesy of XAOS Tools, Inc.
Dancing fish: created using Amazon 3D Paint. Image courtesy Sinnott and Associates.
Page 19: ***Screen shot (Black Hole Sun)*** courtesy of 525 Post Production and Why Not Films.
Page 21: Avid's Media Spectrum System, courtesy of Avid Technology, Inc.,
Screen shot: EditDesk™, courtesy of Discreet Logic.
Page 24: ***Poppies*** courtesy of XAOS Tools, courtesy of Silicon Graphics, Inc.
Created by David Benton of SOFTIMAGE, photography courtesy of Stan Musilek.

One of today's top stars reveals secrets to looking good.

You may have noticed that Nintendo's Donkey Kong® is one monkey that just keeps getting better looking all the time.

What's his secret?

According to his creators at RARE. Ltd., Donkey Kong's beauty secrets come in a box.

It's called Indigo²™ and it's from Silicon Graphics.

The power of the Indigo² workstation allowed RARE to create more realistic 3D characters and achieve an unprecedented level of image quality.

In the process, they set a new standard for 16-bit video games. "The industry is saying we reinvented the game development process," says Simon Farmer, Production Manager at RARE. "We could never have done it without the Indigo² workstation—it's the key to our development."

The new Indigo² IMPACT™ 10000 workstation, in fact, is reinventing the entire range of digital content creation.

Feature films, broadcast television, TV commercials, web sites and print media are all benefiting from the Indigo² workstation's unequalled combination of the best chip (the new MIPS® R10000™ processor), the best graphics, and the most advanced 64-bit operating system.

So if you're in a field where good enough isn't, you can give us a call at 1-800-636-8184 Dept. LS0023, or you can access us on the World Wide Web at http://www.sgi.com/Froducts/Indigo2/IMPACT. And let us tell you more about the world's most powerful workstation. Indigo² IMPACT. We can help you look good, too.

Silicon Graphics
Computer Systems
See what's possible

CIRCLE FREE PRODUCT INFO NO. 46

Silicon Studio
TECHNOLOGY FOR ENTERTAINMENT

Introducing an entire school devoted to the art of manipulation.

At the Silicon Studio Training center, image truly is everything. We're a state-of-the-art facility that offers a wide range of classes on content creation for the entertainment community.

You'll get hands-on experience with the latest technology, taught by industry experts.

For more convincing, call 1.800.S.STUDIO or visit our World Wide Web site, http://www.studio.sgi.com

We just know you'll want to look through our course catalog.

Silicon Graphics
Computer Systems
See what's possible

CIRCLE FREE PRODUCT INFO NO. 47

Comm/Scope L7884
Cable and fiber-optic products.
Circle (564) on Action Card

CommSpec L 4842
Microwave radio repair services with specialization in M/A-Com and Microwave Associates products; replacement power supplies and accessories manufactured.
Circle (565) on Action Card

Communications Data Services R 3307
RFCAD; international terrain data; Fryers Site Guide/CDS on-line services; North American terrain data covers U.S., Mexico, Canada.
Circle (566) on Action Card

Communications & Power Industries L 7131
Ground-based satellite communication klystrons including extended frequency ranges and "Fast-Tune" versions; new range of external cavity UHF TV klystrons, 15kW to 60kW; 28GHz LMDS wireless cable amplifiers.
Circle (567) on Action Card

Communications Specialties, Inc. M 4745
Scan Do Ultra combination scan converter and downconverter; signal outputs for NTSC, PAL, S-Video, RGB, YUV and composite forms; dual computer inputs.
Circle (568) on Action Card

Compix Media M 5240
Video CGI PC-based broadcast-quality character generator.
Circle (569) on Action Card

Comprehensive Video Supply L10721
Video amplifiers, multimedia monitor cables, desktop video production accessories; PC/Mac-based Edit Master; Walter Brewer lighting systems integrations services.
Circle (570) on Action Card

Compression Labs L10175
Magnitude MPEG-2 system with statistical multiplexing (Statmux).
Circle (571) on Action Card

Comprompter L 8869
ScoreMaster automatic gathering and airing of sports scores; ENR for Windows 95 newsroom system; VoteMaster versatile election software; NetMaster produces HTML text from news scripts; school closings and automatic air-cancellation announcements; VideoMaster digital video control interface.
Circle (572) on Action Card

Computer Engineering Associates L 8280
Computerized newsroom equipment, the CEA Newsroom System on a PC network with Windows.
Circle (573) on Action Card

Computer Expressions S 5235
Die-cut custom-printed mousepads; CD clocks with your logo; MouseTrap computer mouse holder; miniwrist rest for mouse users.
Circle (574) on Action Card

Computer Prompting & Captioning Company L10949
SMPTE time code-based CPC-700 captioning, subtitling software with frame-precise caption/subtitle placement; CPC-600 software for novice or professional; both interface to Chyron Codi for multilanguage subtitles; CPC-800 for real-time captions; CPC-1000 prompting software with notebook compatibility, proportional fonts, spell check, scrolling from any word processor.
Circle (575) on Action Card

Comrex L 7009
Nexus digital audio codecs, designed for ISDN remote broadcast use with integral TA and NT1 employing ITU G.722 international standard.
Circle (576) on Action Card

Comsat Corporation L 6958
Satellite communications products, services.
Circle (577) on Action Card

ComSonics, Inc. L 10941
VideoWindow digital video multimeter for NTSC and PAL formats, hand-held and weighs 1.7 pounds, conducts as many as 40 separate tests including differential gain, differential phase and chrominance/luminance delay.
Circle (578) on Action Card

ComStream Corporation S 2027
Compressed digital video transmission system permitting on-the-fly bandwidth change; digital audio receiver (for NPR system); RCA DSS1 satellite receiver.
Circle (579) on Action Card

Comtech Antenna Systems **L 8350**
"Comtrack" software; 5M, 3.8M inclined orbit antennas; 1.8M fly-away antenna.
Circle (580) on Action Card

ComTek **L 9981**
Frequency-agile IFB systems with digitally synthesized base station transmitters with IFB controller and synthesized personal receivers for on-camera and on-stage talent cuing systems; Camera Companion on-camera wireless mic system (MRC-82), professional wireless system (MR-182).
Circle (581) on Action Card

Comwave/Communications Microwave **L10545**
Microwave transmitters.
Circle (582) on Action Card

Concept W Systems **S 2909**
Camplex VTU-320 camera timing unit for subcarrier, H-phase; accessories and additional features to be introduced.
Circle (583) on Action Card

Conifer Corporation **L 8670**
Wireless cable, ITFS, MMDS reception equipment; 5,000 and 4,000 series integrated receivers; receiving antennas for 1.7-2.7GHz range; products for interactive 2-way services.
Circle (584) on Action Card

Connectronics **L 8335**
Parabolic reflector with accessories, shoulder straps, transport cases, sport handles, wind muff.
Circle (585) on Action Card

Continental Electronics **R 2605**
Complete line of AM, FM, DAB and UHF TV transmitters. Information on new products not available at press deadline. Visit the Continental Electronics exhibit for data on our new products.
Circle (586) on Action Card

Continental Microwave **L10869**
DML-D series 2-piece portable microwave system for digital transmission to 45Mb/s; Ku-band satellite antennas for analog/digital transmission; VML-D series split portable microwave systems; dual-band dual-role satellite systems; digital modems/compressors.
Circle (587) on Action Card

Control Concepts/Leibert **L10946**
Isolatron Plus with complete monitoring facilities; IslaGuard, available with complete monitoring.
Circle (588) on Action Card

Cool-Lux **L 6055**
PanaCharge fast battery charger; NiCad belts for lights, cameras; ProPak lighting system with 7 amp battery; TriLight broadcast lights.
Circle (590) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

Cooper Sound Systems **R 1901**
CS-104 ENG/EFP 4-channel stereo audio mixer.
Circle (591) on Action Card

Countryman Associates **L 8471**
Microphone products.
Circle (592) on Action Card

CPI-Satcom Division (Varian MEP) **L 7131**
Solid-state power amplifiers; compact 300-400W medium-power amps; compact single-drawer 600-700W power amps; V-Star II 200W hub-mount amps.
Circle (593) on Action Card

CPI **L 7131**
Featuring K260W Klystrode IOT; CV-5000D cavity.
Circle (594) on Action Card

Crestron **M 4058**
VisionTouch, ColorTouch, VideoTouch, PCVision, VGAVision multimedia device control facilities.
Circle (595) on Action Card

Crouse-Kimzey Company **R 1719**
Audio distributors; Otari digital workstation; Denon CD player.
Circle (596) on Action Card

Crown International **R 2523**
Head-worn mic; full line of microphones, amplifier products.
Circle (597) on Action Card

CSI/Camera Support International **L 4641**
Camera support products including dollies, tripods, pan/tilt heads.
Circle (598) on Action Card

Cycle Sat **L10183**
Program distribution services, transmission security equipment.
Circle (599) on Action Card

H L Dalis **L 9583**
Distributor for Belden 8451 audio cable in 10 colors; Belden SVHS and data cables; Kings connectors; Sony headsets; Mickas audio, video cables; Switchcraft, Neutrik audio connectors.
Circle (600) on Action Card

Dan Dugan Sound Design **R 1901**
Model D-1 live microphone processor.
Circle (601) on Action Card

DCM-Data Center Management **L 7675**
DCM newsroom automation systems for Windows and Windows NT Server.
Circle (602) on Action Card

Data Check **S 2456**
Model 2021 (2000 series) vectorscope monitor system.
Circle (603) on Action Card

Data Security **L 5858**
Bulk tape degaussers, cleaners/evaluators, encryption equipment.
Circle (604) on Action Card

Data Translation **M 9772**
Media 100 xs, an on-line video product; offers superset of Media 100 features and functionality; Media 100 qx combines Media 100's Vincent digital video engine with Adobe Premiere 4.2 software for Mac users to create multimedia programs; Media 100 v. 2.6.
Circle (605) on Action Card

Datatek **L10324**
D-2600 series analog and digital video/audio routing switchers to 32x32; D-2800 series 8-character alphanumeric keypad control panels; D-2800 routers for systems from 32x32 to 1,024x1,024 for analog, digital video, audio, time code and data; D-2400 series control panels, alphanumeric and push-button-per-crosspoint; bi/tricolor undermonitor display units; virtual tally systems; analog/digital video/audio modules.
Circle (606) on Action Card

Dataworld **R 1608**
CD-ROM industry database software; detailed ethnic, demographic reporting via tabular and graphical/map formats; on-line database for instant access; Internet communications capability; ethnic/demographic shading overlays for any base map.
Circle (607) on Action Card

Davicom Technology **L 8657**
FM, TV antennas; low-power filters, circulators; monitoring units.
Circle (608) on Action Card

Dawn Satellite Inc. **S 2149**
Economical 3.1m satellite antenna; inclined orbit tracking satellite downlink; Coversat antenna snow cover; digital-ready C-, Ku-band LLNB amplifiers.
Circle (609) on Action Card

DB Elettronica **R 3126**
FM, TV transmitters, translators.
Circle (610) on Action Card

Dedotec USA **L 8331**
Innovative and versatile lighting equipment; AC- and DC-operated lights for location, studio, projection attachments, effects accessories.
Circle (611) on Action Card

Delco Wire & Cable **S 2155**
Wire, cable products.
Circle (612) on Action Card

DENON **R 1020**
MD cart recorders; cassette deck; CD jukebox.
Circle (613) on Action Card

DeSisti Lighting/DESMAR **L 9183**
Low-power and robotic studio lighting; studio grip, suspension equipment; special packages for studios, churches; ENG HMI, tungsten kits, lamps.
Circle (614) on Action Card

DGS Pro Audio **R 1423**
Channel Identification System for XLRs and 1/4" plugs by Deltron; halogen-free installation cable by Gotham.
Circle (615) on Action Card

DH Satellite **J 101**
3.7m horizon-to-horizon mount with power declination option; 3.7m Gibralter system for 90 degree elevation, 300 degrees of azimuth travel.
Circle (616) on Action Card

DIC Digital **S 2941**
Magnetic recording media, Betacam SP 60-, 90-minute cassettes.
Circle (617) on Action Card

Dielectric Communications **L 8016**
digiTLine broadband transmission line for NTSC, HDTV frequencies.
Circle (618) on Action Card

Digidesign **M 9338**
Digital audio recording systems.
Circle (619) on Action Card

Digimation **M 4658**
AnimaTek World Builder for computer-generated 3-D landscapes; Bones Pro animates unjointed meshes; LenZFX 2 with Inferno special effects;

Our Customers Love This Picture.

Whether you are in television broadcasting, program distribution, or corporate communications, video pirates cost you a bundle. Protect your video and your business with Macrovision's *VES and StarShaker scrambling systems.* For video transmission security in PAL or NTSC format, Macrovision has a product for you.

Macrovision Scrambling Systems:

- StarShaker: **NEW!** Fully addressable, low cost transmission system
- VES-TX: Fully addressable, professional transmission system
- VES-TP: Stand alone professional transmission system
- VES-TM: "Minicrypt" surveillance transmission system

For your total video security needs, call or fax Macrovision for details and distributor contacts.

Macrovision U.S.A.
Tel: +1 (408) 743-3462 Fax: +1 (408)743-8622

Macrovision UK, Ltd.
Tel: +44 1895 251602 Fax: +44 1895 256951

Macrovision Japan K.K.
Tel: 81-3-5378-7212 Fax: 81-3-5378-7213

See us at NAB Booth #8583

See us at Cable & Satellite London Stand #605

MACROVISION

Protecting your image

Circle (187) on Action Card

Fractal Flow fire, smoke, cloud image distortions; Aurora Mapping 3-D atmospheres, auras; Illustrate! converts 3-D images to 2-D line drawings; OrganiX Pro; Refraction Mapping; training tapes.

Circle (620) on Action Card

Digipath Video **L 8657**

Sahara routing switchers, -32X models up to 32x32; analog video in 2RU and serial digital -2RU systems with integral monitoring to view all 32 inputs and 32 outputs; -64X serial digital prototype with 64x64 matrix.

Circle (621) on Action Card

Digital Equipment Corporation **S 2612**

Computer networking equipment.

Circle (622) on Action Card

Digital Graphix **L10613**

NetDeko consolidated graphics suite; TypeDeko broadcast-quality CG; series 5XP allows effects to be created based on three live video inputs; Microtime DM-100 and FS-10 series capable of synchronizing external video signals; Composium II real-time videographic workstation; graphics systems; 3-D multichannel video effects system; frame synchronizers.

Circle (623) on Action Card

Digital Processing Systems **L 6754**

10-bit, 4-field video synchronizer; audio/video synchronizer; component transcoding TBC/synchronizer.

Circle (624) on Action Card

Digital Vision **S 2326 L8221**

BITPACK MPEG-2 authoring station produces MP@ML MPEG-2 files from video in real time; AAC advanced aperture corrector detail processor operating in field or frame modes with color corrections, coring, softening, high light/low light selection; HZOM horizontal zoom resizing processor.

Circle (625) on Action Card

Discreet Logic **L 9163**

Software-based graphics and desktop production equipment for various platforms.

Circle (626) on Action Card

Display Devices **M 4030**

SAM CL-2 cable lift stationary mount and cable maintenance service lift; AVPAC adaptable video projector adjustable cage.

Circle (627) on Action Card

Di-Tech Inc. **L 6348**

Model 5875 serial digital video router for D-1, D-2, HDTV with 64x64 frame capacity 64x64, expandable, selected reclocking, non-reclocking; model 5884/8.5 serial digital audio switchers with 64x64 and 128x160 frame capacities; models 5883/89 RS-232/422 port switchers with matrix sizes 64x64 and 128x160.

Circle (628) on Action Card

Divicom **M 5132**

MPEG-2 program encoders; remultiplexers; system controllers.

Circle (629) on Action Card

DNF Industries **L 8446**

ST300 slow-motion controller; 2-machine cuts-only editor; ST60, ST100, ST200, ST30 universal VTR controllers.

Circle (630) on Action Card

Dolby Labs **L10552**

DP503 digital audio encoder; model 740 spectral processor; Dolby Fax; Dolby Surround; DSTL digital studio-to-transmitter link sytem; digital and analog sound processing technology for film, video post-production, professional audio recording.

Circle (631) on Action Card

Dongseo Electronics **M 4752-3**

Portable audio mixer; audio DAs; AV switchers, monitors; commentator box; tally control; TVR remote control; on-air lamp; clock display.

Circle (632) on Action Card

Dorrough Electronics **L10953**

Big LED giant Dorrough audio meters for scoring, rerecording and concert or location situations; multiband processors, stereo generators, A/V T/M devices; peak, average loudness meters; AES/EBU digital reading audio meters; analog loudness meters.

Circle (633) on Action Card

Doty Moore Services **S 2832**

Broadcast consultants.

Circle (634) on Action Card

Dubner International **S 2820**

Video Alert low-cost video/audio signal level monitoring system, a single board and software for 286-based PC with 512k RAM; Scene Stealer auto scene detector and video logging/archiving tool; C.A.D.E.T features technology applied to MPEG product development in determining 3:2 pull-down phase cadence in film-to-tape transfers.

Circle (635) on Action Card

D-Vision Systems **L 8823**

Non-linear editing systems with Windows NT OS; turnkey solutions produce D-1 quality video, software supporting various compression methods; off-the-shelf hardware; open-architecture standards.

Circle (636) on Action Card

DVS Digital Video Systems **L11069**

MovieVideo multistandard RAM recorder for HD video, digital film processing with 4Gb 40s of HD video; ISP500 multistandard RAM recording for industrial, R&D applications.

Circle (637) on Action Card

Dwight Cavendish **L10733**

Compact Videocassette Duplicator for post-production, in-house corporate duplication.

Circle (638) on Action Card

DYNAIR Electronics **L 7113**

Series 36 stereo router for stand-alone or as slave to companion video router, ASIC to reduce size; System 2000 expansion for digital switching.

Circle (639) on Action Card

Dynatech Video Group **L10013**

AdWare software for automation and control of digital disk storage devices in spot playback applications; SC-3 routing switcher control system complements UTAH-300 analog/digital router family with Smart Architecture; Delta 6.0 graphic titler software upgrade with instant logo placement, resizing, multipoint color spreads, chroma mattes; EditStar LAN Browse/Archive Server maintains shadow copy of all video and audio clips and distributes them to LAN workstations; Capture newsroom tool monitors and captures up to four channels of closed-captioning simultaneously; Antero titler with broadcast automation interface allows data to be downloaded from computer and placed into predefined template pages; new control panels for daVinci Renaissance 8:8:8 color enhancement system and color enhancement module for Kodak Cineon imaging system; EditStar, NewStar for Windows, DigiStore, TAS, MC/MC-500, Super Glue digital converters.

Circle (640) on Action Card

Dynatech/Colorgraphics Systems **L10013**

Videographics workstations; also see Dynatech Video Group.

Circle (641) on Action Card

Dynatech Video Group/daVinci **L10013**

See Dynatech Video Group.

Circle (642) on Action Card

Dynatech NewStar **L10013**

See Dynatech Video Group.

Circle (643) on Action Card

Dynatech Video/Utah Scientific **L10013**

See Dynatech Video Group.

Circle (644) on Action Card

Eastman Kodak Company **L 8829**

Motion picture films; HDTV processing systems.

Circle (645) on Action Card

Echolab **L 6740-3**

20-input modular switcher with component format, full program/preset mixer, advanced multilayer keys, aux bus output, M/E key outputs, reentrant effects; MVS5, MVS6 analog switchers; MVS9 composite, Y/C and component switcher.

Circle (646) on Action Card

Econco Broadcast Service **R 3911**

High-quality rebuilt power tubes and klystrons for radio and TV transmitters.

Circle (647) on Action Card

Editing Technologies Corporation **L 9484**

Ensemble Gold, Multilinear editing combines nonlinear and linear features and power; Ensemble Pro, Stiletto series edit controllers.

Circle (648) on Action Card

EDX Engineering **R 1523**

Comprehensive RF system planning tool for Windows 95 with coverage and interference analysis, plotting of system planning maps showing terrain features, land use, roads, demographics; Signal software predicts signal propagation; MCS site-specific communication channel modeling; POP-90 performs population, demographic analysis; terrain elevation databases for North America and England.

Circle (649) on Action Card

See spot.

See spot run.

See spot run without
aggravating the entire audience because it's

too damn loud.

Who needs the aggravation? With the new OPTIMOD-TV DIGITAL you never have to worry about poorly mixed programs, complaints from irate viewers, or advertisers devising diabolical new ways to "punch" their sound. The 8282 handles it all quietly, digitally, and automatically. The OPTIMOD-TV is fully progammable to optimize audio processing of your programs. And with built-in presets, general programming, news, sports, film, fine arts and other broadcasts will always sound great at home. Never too loud, too soft, or too spotty.

orban®

H A Harman International Company

1525 Alvarado St., San Leandro, CA 94577 USA Phone 1•510•351•3500 Fax 1•510•351•0500.

Circle (117) on Action Card

EEG Enterprises **L 8449**
EN 470 Smart Encoder III broadcast encoder with two language captioning, extended data service encoding, multiple data and modem ports, PAL capability; component serial digital upgrade; EN 370 series origination encoders in desktop or PC versions; DE 241 2-field decoders with decoding and display of Line-21 data, XDS and PAL capability.
Circle (650) on Action Card

EEV **L10906**
Improved models of high-power UHF IOT systems, both air- and water-cooled; these improvements feature better linearity, easier handling, easier incorporation into transmitters.
Circle (651) on Action Card

Egripment **L10975**
Javelin Crane, Kaleidoscope systems; Skyking, Tulip, Skymote, Maxijib camera crane, Matador, Dinky, Canyon, Focus products; Hot-Head, Hot-Shot, MiniShot remote heads; Hi-Lo camera platform; sports dolly.
Circle (652) on Action Card

Elantec Semiconductor **S 2938**
Semiconductor products, including EL1501 differential line driver/receiver, EL2150/2157 single supply amp; EL4093 DC-restored video amp subsystem; EL2140/2141 low-power, differential twisted-pair drivers; DL4332 triple 2:1 mux amp.
Circle (653) on Action Card

Electric Image **S 2017**
Animation system V.2.5.2; Electric Image Scholastic Edition.
Circle (654) on Action Card

Electrohome **M 5157**
New Marquee series; retro rear projection unit; interfaces, decoders.
Circle (655) on Action Card

Electronic Associates **L10472**
RF-Host Windows 95/NT multisite transmitter control system; RF-Director small-scale transmitter control system; RF-Manager Ver. 5 software upgrade; RF-Manager expansion chassis for large-scale transmitter sites.
Circle (656) on Action Card

Electronic Visuals **S 2031**
Video, waveform, vector monitors.
Circle (657) on Action Card

Electronics Diversified Inc. **L11085**
Lighting control systems, dimmers.
Circle (658) on Action Card

Electronics Research/ERI **R 3000**
Lightning Dissipation Spur; low-power FM antenna; high-gain PCS antenna; towers, monopoles; combiners, filters; FM antennas.
Circle (659) on Action Card

Electrophysics Corporation **L10983**
AstroScope 9323B night vision modules for ENG cameras and selected camcorders, transforming dark, moonlit or starlit nights into bright, high-resolution scenes.
Circle (660) on Action Card

Electrosonic Systems **L 7677**
New ImageStar; 2XView display system; C-Through for Windows.
Circle (661) on Action Card

Electrorack Products **S 2930**
19" racks, consoles, computer furniture, EMI/RFI-shielded enclosures, seismic-tested cabinets, Nema-protected enclosures and custom sheet metal assemblies.
Circle (662) on Action Card

Elmo Manufacturing **M 4245**
DT-50, DT-100 desktop video systems; TRV-35V random-access telecine with 3-chip CCD sensor; EV-X medical video presenter; EV-400AF visual presenter; QN401E microcolor high-resolution camera.
Circle (663) on Action Card

EMC/Dynatech Video Group **L10013**
See Dynatech Video Group.
Circle (664) on Action Card

EMCEE Broadcast Products **L10313**
DigaCom series analog/digital wireless cable transmitters; Freedom series UHF transmitters; TTV1000 agile VHF transmitters for channels 2-13 using NTSC, PAL or SECAM standards.
Circle (665) on Action Card

EMCOR Products/Crenlo **L 9372**
Modular equipment enclosure systems, console configurations; air-movement devices; custom fabrication capabilities.
Circle (666) on Action Card

ENCO Systems **R 4105**
DAD486x Digital Audio Delivery system and satellite-based DADSAT store forward system.
Circle (667) on Action Card

ENG Mobile Systems **L 7143**
Products for remote production, camera transport cradle and NITEK battery maintenance products.
Circle (668) on Action Card

Ensemble Designs **S 3209**
Windows Digital Video I/O for computer graphics transfer to video for use with existing multibuffer DS-1 (also includes Mac or SGI I/O); SGI 601 video I/O for computer graphics use, also works with multibuffer DS-1; serial box converters; TBC control systems; digital proc amp; Catalyst digital keyer.
Circle (669) on Action Card

Enterprise Systems **S 1621**
Broadcasting business systems.
Circle (670) on Action Card

The Equipment Broker **L10582**
Broadcast, production equipment brokers.
Circle (671) on Action Card

ERGO 90/Ergo Industries **S 2813**
Monitor mounts; slides for JVC, Panasonic, Sony, Pioneer rack-mount equipment.
Circle (672) on Action Card

ESE **L 8434**
ES-160A master clock with 1s/month accuracy; ES-245 quad 1x6 audio DA with individual gain pots; 4-inch display clocks, timers, slaves; FS-220 gen-lockable blackburst generator; master clock systems; audio/video DA family.
Circle (673) on Action Card

ETC-Electronic Theatre Controls **L 9379**
Lighting control products, response series dimmers, microVisionFX control, effects consoles.
Circle (674) on Action Card

Euphonix **R 3123**
CS2000B on-air mixer with 12 mix-minus buses, stereo subgroups, clear display; V2.5 software; MX464 master expander module; Clear R display channel label electronic alphanumeric readouts.
Circle (675) on Action Card

Eventide **R 2020**
Featuring Harmonizer effects processors; obscenity delays; VR, VP series digital audio loggers.
Circle (676) on Action Card

Evertz Microsystems **L10181**
Model 8070 encodes captions on a variety of digital tape formats; model 8950 digital video D-VITC reader, character inserter; model 4025-RC remote-control unit for Evertz 4025 film footage encoder.
Circle (677) on Action Card

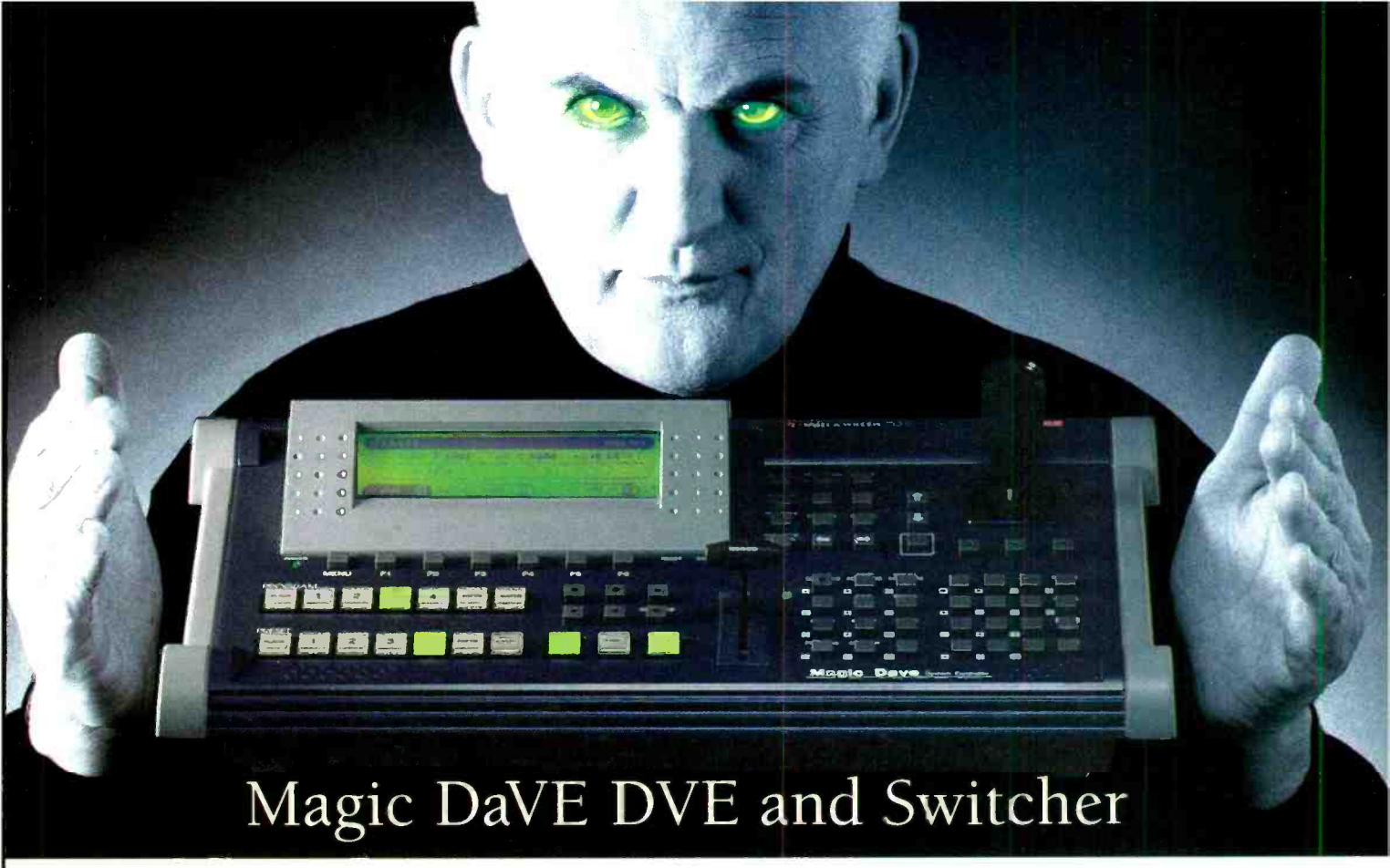
Evolving Video Technology **S 1455**
Antero release 12-title generator for Silicon Graphics Indigo2 Impact workstation, supports 601 video and key I/O, PostScript interface, drawing package; Antero Accent broadcast titler with template page design, networked system control, WWW support, extensible database interface.
Circle (678) on Action Card

EVS Broadcast **S 1224**
LSM4 channels slo-mo multicamera with simultaneous record and playback; Super LSM slo-mo disk recorder; Air Box stand-alone video server with 2-channel operation; Spot Box disk recorder with Odetics and Louth protocol; Sport Edit nonlinear on-line editing with simultaneous record, edit; Video Delay time shift delay; Air Edit multichannel commercial inserter; ADA A/D, D/A converters.
Circle (679) on Action Card

Extron Electronics **M 4532**
System 4LD projector control switcher with 4-input line doubler; Emotia Jr VGA-to-NTSC/PAL video converter; VTG 200 field-programmable video test generator; computer-video interfaces, switchers, DAs, scan converters, cable.
Circle (680) on Action Card

E-Z UP International **R 4014-5**
Eclipse, Encore E-Z UP Instant shelters for shade on remote locations, catch attention as a trade show booth with highly visible silk-screened call letters; setup time in less than 60 seconds; 5x5 feet, 10x20 feet; accessories, sideways, rail skirts.
Circle (681) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.



Magic DaVE DVE and Switcher

If you thought the power to create and manipulate fantastic images was way beyond your financial reach, meet Magic DaVE.

This is no ordinary low cost DVE switcher. Thanks to those wizards of technology, Snell & Wilcox, Magic DaVE packs high quality 8 bit 4:2:2 processing within its compact body and achieves full broadcast quality and transparency.

It's fully expandable and up to four channels of DVE can be controlled from a single control panel allowing it to grow with your needs.

But the real magic is that, in spite of its competitive price, it offers a combination of features and effects found only on much more expensive systems.

- Two channel effects for instance, like dual source, double sided page turns and push-on push-off effects are available from a single channel.
- Other powerful effects include 3D rotation with perspective, lighting, quad peels, fragmentation, flag waves and ripples, bursts and blinds, wipes, and many many more.

Options include an advanced wipe generator, downstream keyer, chroma keyer, trail and sparkle effects with drop shadow and image texturing.

Magic DaVE

How can he do it for the price?

Circle (197) on Action Card

SNELL & WILCOX

TO FIND OUT MORE ABOUT THE AMAZING POWERS OF MAGIC DaVE. TELEPHONE: UK– +44 (0) 181 607 9455. USA – +1 408 734 1688. FRANCE – +33 1 37 89 83 08. GERMANY – +49 611 99 08 40. JAPAN – +81 3 3446 3996. RUSSIA +7 095 1926992

Fairlight ESP Pty Ltd. **L 7668**
DaD digital audio dubber; F.A.M.E. Fairlight audio mixer editor; MFX3 disk recorder/editor software, including audio base, high-speed networking, OMF file compatibility.
Circle (682) on Action Card

Faraday Technology Ltd. **L11083-4**
Credit card-sized deserializer; wider range of active hybrid filters than previous product.
Circle (683) on Action Card

Faroudja Laboratories **L10903**
VP400 line quadrupler; LD100, LD200 line doublers; CTC-2 bi-directional transcoder; CFD-SN SuperNTSC decoder; DFD-U PAL/NTSC decoder.
Circle (684) on Action Card

FAST Electronics USA **L10475**
AV Master/AV Master Pro non-linear editing, video capture boards using Philips PCI chips to combine high-quality 60f/s Motion-JPEG capture, on-board CD-quality audio, Windows NT/95 compatibility; VM-Studio 3.0, 3.0 Plus software releases increase VideoMachine with enhanced tool set, edit control drivers for Sony, Panasonic DV VTRs, Wave Import direct file import and more.
Circle (685) on Action Card

Fast Forward Video **L 5158**
Digital video recorders for PC and SGI platforms; ISA digital video subsystems; digital video subsystem.
Circle (686) on Action Card

Fiber Options **L 8076**
Fiber-optic systems: series 177B Y/C component video; series 1240SB video, 18-bit audio single-mode long-haul broadcast-grade; 1121B/1121SB long-haul broadcast-grade video signals; 502R mini rack enclosure for fiber-optic links; Learning Link 1-way video/audio link for distribution in educational classrooms.
Circle (687) on Action Card

Fidelipac **R 2405**
Dynamax DCR1000 series digital cartridge machine with magneto optical option; Dynamax MXE series consoles including three new optional modules.
Circle (688) on Action Card

Film & Video Systems **S 1037**
Orion telecine, integrated dailies transfer system with color control, time code generator, Keykode reader, data capture; Excalibur logging, conforming system tracks relationship between film, video, audio; A&V time code generators, readers, inserters.
Circle (689) on Action Card

FirstCom/Music House **L 8276**
Music On-Line network service; MusiQuick search software; MusiQuick+Clipz search/audition CD-ROM.
Circle (690) on Action Card

J L Fisher **S 2858**
J L Fisher 11-camera dolly; 10-camera dolly with multiposition level head; microphone booms and bases.
Circle (691) on Action Card

5D **S 2153**
SparkPlugs software effects plug-ins for Discreet Logic Flint and Flame devices; aRTy stand-alone special-effects system for Silicon Graphics, combines particle system with motion tracking and more than 40 user-customiz-able effects.
Circle (692) on Action Card

Flash Technology **R 1408**
FTB205 and FTB224 dual and FTB225 dual high-intensity obstruction lighting; FTB-310 and FTB 312 dual medium-intensity obstruction lighting.
Circle (693) on Action Card

FloriCal Systems **L10383**
Digital video caches; hierarchical storage management; satellite dish, receiver control systems.
Circle (694) on Action Card

FM Systems **L 9285**
VM-972S S-video master automatic level control; VM-878 auto video level control, 8-output; VLM-473 video loss monitor with screen graphics; ACE automatic video cable equalizer.
Circle (695) on Action Card

Folsom Research **M 4032**
Model 9400JR, 98500SR auto sync video scan converters; 9600 VIP Video-InWindowing peripheral.
Circle (696) on Action Card

FOR.A Corporation **L 8513**
Audio mixers, recorders; video production switcher; TBCs, synchronizers, effects systems, still-stores; display, projection products; scan converters; edit controllers.
Circle (697) on Action Card

Force, Inc. **L 60534**
ExcelLinx 250-C short-haul FM video/digital audio fiber-optic link; No. 2762 short-haul FM video/digital stereo audio fiber-optic link; No. 1704/5 CATVLite VSB/AM link; No. 2764 InfoBiway videoconference transceiver; No. 2754 InfoXpressway multimedia retrieval system.
Circle (698) on Action Card

Fostex **R 3314, 5544**
DMT-8 V.2.0 software; 8-track hard-disk recorder with 8x4x2 analog mixer; D-80 rack-mount hard-disk recorder with remotable removable front panel; CX-8 ADAT-compatible digital multitrack recorder; studio time code DAT recorder (D-10/D-25/D-30); PD-4 portable time code DAT recorder.
Circle (699) on Action Card

Frezzolini Electronics **L 5217-8**
MiniArc with full range of connectors; Frezzi MFIC mini-fill with dimmer control, network-approved; NP bracket system for mini-fill light and NP bracket that attaches easily to existing NP bracket that comes standard with cameras, permitting powering of light and camera with NP batteries.
Circle (700) on Action Card

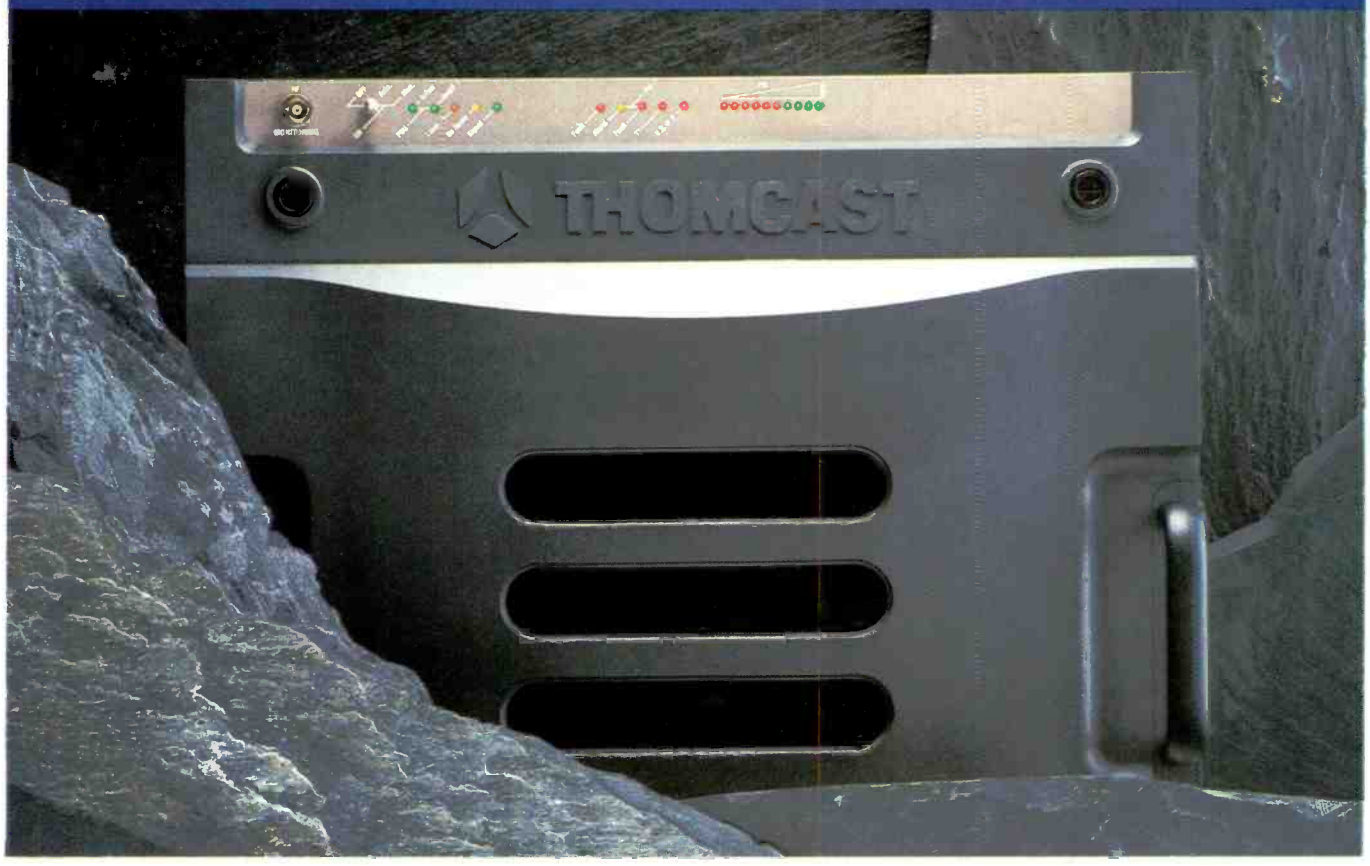
Frontline Communications **L 6761**
Broadcast vehicles for ENG microwave, satellite uplink/downlink and remote fiver production applications; on display, vehicles for KOIN, SkyWest, KDBC ENG van.
Circle (701) on Action Card

Fujinon **L 9724**
Video camera lenses, high magnification range; production lens with floating group lens assembly for 2/3" format; miniature pan/tilt system.
Circle (702) on Action Card

FutureTel **M 4841**
Combined composite, component board for MPEG Publisher products.
Circle (703) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

20-200W NEW GENERATION TV TRANSMITTER/TRANSPOSERS



THE NEW FACE OF HIGH PERFORMANCE.

Meet the new generation transmitter/transposers from Thomcast: an innovative family whose interior features and exterior design place it, and your operations, in an all new performance category. Sure, it looks great on the outside, but the real beauty is what you'll find inside: - modular construction - dual drive or passive reserve architecture - internal and external redundancy, including amplifiers, power sources and synthesizers - electromagnetic compatibility... Integrated autodiagnostics and hot-swappable modules also keep your operations running smoothly and cost-effectively. With a full range of options—and common modules across the entire family—these new-generation transmitter/transposers will meet your current needs, and provide low-cost, hassle-free evolution as your requirements change. A hand-held diagnostic device remotely measures broadcast parameters for effective preventative maintenance. Industry-leading advantages also include an exceptionally small footprint and low power consumption. The new face of high-performance from Thomcast: your broadcast business has never looked so good!

PEMA 2B

THOMCAST

THOMCAST AG / Bahnhofstrasse CH-5300 Turgi - SWITZERLAND / Tel : 41 (56) 79 44 44 - Fax : 41 (56) 28 11 25
THOMCAST GmbH / Ohmweg 11-15 D-68197 Mannheim - GERMANY / Tel : 49 (0621) 8101 270 - Fax : 49 (0621) 8101 290
COMARK / PO Box 506 - Rte 309 & Advance Lane - Colmar PA 18915 - USA / Tel : 1 (215) 822 0777 - Fax : 1 (215) 822 9129

1, rue de l'Hautil, 78702 Conflans Sainte Honorine Cedex - FRANCE
Tel : 33 (1) 34 90 31 00 - Fax : 33 (1) 34 92 30 00 - Telex : 696 833 F

Circle (199) on Action Card

FWB **S 3458**
UltraSCSI JackHammer dual-channel accelerator for transfer rates up to 80Mb/s; SledgeHammer Pro series high-performance disk arrays with 80Mb/s transfer rates and removable shuttles; RAID O JAZ arrays with 10Mb/s transfer rates; HammerDLT 100G autoloader tape backup system with 200GB capacity; HammerDisk 2.6GB 5.25-inch, 640MB 3.5-inch MO drives.
Circle (704) on Action Card

Garner Industries **L 6840**
Recording media degausser systems.
Circle (705) on Action Card

GE American Communications **L 7121**
Satellite news-gathering relay services.
Circle (706) on Action Card

GEC-Marconi Communications Systems **R 2002**
Eureka 147 DAB transmitter system; FM transmitters; high-power MF and HF transmitter systems; MF & HF antennas.
Circle (707) on Action Card

Genelec **S 1039**
Model 1039 active main monitoring system with two 320-liter enclosures, two 7U racks to house amplification system, active crossovers, protective circuitry.
Circle (708) on Action Card

General Instrument **L 8243**
HDTV Grand Alliance.
Circle (709) on Action Card

General Microwave Services **S 1736**
7GHz microwave equipment, including audio/video transmitter, receiver and antenna systems.
Circle (710) on Action Card

Genesis Microchip **M 3927**
Image resizing engines for projection systems, broadcast equipment, videographic workstations, teleconferencing, scan conversion.
Circle (711) on Action Card

Gennum/Video-Broadcast **S 2819**
GENLINX specialized IC devices; cable equalizers with improved jitter performance; receivers with improved noise performance; low-power digital filter; wideband video buffers; low-power 2-channel video mixer.
Circle (712) on Action Card

Gentner Communications **R 2016**
TS612 network interface connects multiple multiline talk show systems together; GSC Gentner remote transmitter control; PTX portable transmitter for assistive listening.
Circle (713) on Action card

GEPCO International **L 7884**
VSD2001 extended distance serial digital video cable; Gep-Flex audio cable, matte finish, extra flexible, CM-rated multipair audio cables.
Circle (714) on Action Card

Getris Images **L 7768**
Hurrican Suite multi-DVE layer graphics suite with non-linear editing option; Broadnews system for automatic news broadcasting; Digitoon software for scanning, paint and exposure sheet for animation production; upgrades for Eclipse and Venice, adding real morphing, multilayer autotracking.
Circle (715) on Action Card

Gorman-Redlich Manufacturing Company **R 3323**
EAS encoders, decoders; weather radios for NOAA weather alerts; digital antenna monitors for AM directional arrays.
Circle (716) on Action Card

Graham-Patten Systems **L10542**
D/ESAM 200 8-input, digital edit suite audio mixer, 4-channel 24-bit digital paths and integral sample-rate conversion; D/ESAM 400 audio mixer with redesigned user interface and operational software; enhanced D/ESAM 820 with master processor board, more than 700 storage registers, improved 20/24-bit resolution.
Circle (717) on Action Card

Grass Valley Group **L 9313**
(Also see Tektronix VND.) Top of the line Model 4000-B and 4000-T component digital production switchers for studio and mobile applications, Model 2200 and Model 1200 mid-range and compact component digital switchers for production and post; Krystal digital effects; Series 7000 Serial Digital Routing, Series 6000 compact digital routers, modular products, digital codecs; digital and fiber-based video transport products and systems; automated transmission system.
Circle (718) on Action Card

The Great American Market **L 5321**
GAMCOLOR color correction filters with 21 new colors and in junior roll size; Shadow Play 6 28-page catalog lists 56 new patterns.
Circle (719) on Action Card

Grey Matter Response **M 5045**
Mezzo Media Collaborator data-management software for digital media, project-based management of on-line data for multiroom facilities and networked studios; Mezzo Media Archiver project-based backup and archiving Ver. 2.5.
Circle (720) on Action Card

Halland Broadcast/Henry Engineering **R 4108**
HitDrive Service music libraries preloaded on a hard drive; HitPick software for quick, easy selection among more than 4,000 titles.
Circle (721) on Action Card

Hallikainen & Friends **L 7032**
Audio mixers, TVA series, programmable transmitter control systems.
Circle (722) on Action Card

Hamlet **L10363**
DigiScope 601 serial digital component in-vision analyzer, waveform, vectorscope with embedded, AES/EBU audio bar graph displays, dual standard

operation, analog composite/component inputs, component/601 output; DigiGen reference generator; Stereo Scope 503AES; Monitor Scope; Video Scope 301AF; PLM1 program level meter; PC Scope Plus.
Circle (723) on Action Card

Hardigg Industries **L10981**
Reusable, rugged shipping and storage cases; 19-inch EIA rack-mount cases.
Circle (724) on Action Card

Harris Broadcast Division **R 3517, 5809**
Sigma series IOT UHF HDTV transmitter; SigmaPlus 20-40kW IOT transmitters; S-23EXT mobile production and uplink system with full digital capability; S-15 compact SNG vehicle in Suburban or comparable 4-wheel drive van; digital networks, wireless cable systems; DAB 2000 transmitters with D-cast COFDM encoder from ITIS; SuperCiter analog exciter; Platinum and Ultravision TV transmitters; CD and Quest FM transmitters; Gates, DX AM transmitter series; 360 Systems Instant Replay hard-disk audio player; Sage Alerting ENDEC EAS system; DSE/DSR 1400 DVB satellite exciter; DIGIT FM exciter; DRC1000 digital audio console; Audion VoxPro sound-editing system; Audio-Metrics studio furniture.
Circle (725) on Action Card

Harrison by GLW **L 5318**
Fault-tolerant system non-functional host computer recognizes current status of console and updates automation computer accordingly; TV950 broadcast console for TV with six frame options, mix-minus and clean-feed IFB options; digital audio hardware and software to work with current Series Twelve and MPC control surfaces.
Circle (726) on Action Card

Henry Engineering **R 4108**
Stereomixer, 8-input stereo utility mixer for line sources.
Circle (727) on Action Card

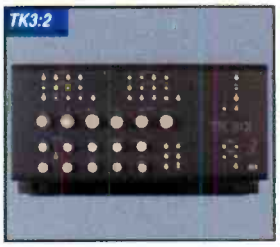
Herman Electronics **L 4845**
Distributors for Sony, Panasonic replacement parts; Neutrik patch panel connectors; Belden cable; Shure, Sony, Fluke, Kings, 3M, Ideal, Leader, Telex microphone products; Brady label systems.
Circle (728) on Action Card

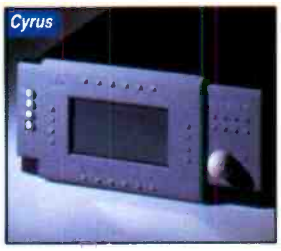
Hewlett-Packard **L 9177**
Next-generation, disk-based video server doubles channels and storage space or current HP platform; MPEG testing software; HP workstations with 2-D, 3-D animation software; various test and measurement products; VidJet Pro video print manager; MediaStream interactive products; demonstrations of complete on-air solutions.
Circle (729) on Action Card

HHB Communications Ltd. **R 1424**
PDR1000 PORTADAT portable DAT recorder; PDR1000TC PORTADAT with time code; accessories; advanced media products; Cedar audio restoration equipment; Pioneer D9601 DAT recorder; ATC loudspeakers; Coles microphones.
Circle (730) on Action Card

A Smooth Operator...

Tekniche is in the business of solving your standards conversion problems. We are the Company leading the development of the Art of Standards Conversion, supplying converters for a wide range of applications and budgets.





EOS is a cost-effective standards converter which does not compromise on conversion quality. The digital processing provides comprehensive picture enhancement facilities with full resolution four-field conversion.

Cyrus is the World's most flexible four-field standards converter. Designed to support all available digital and analog video tape formats and all world standards, the all-digital signal processing offers unrivaled facilities and signal integrity. Cyrus can be field upgraded to operate with Motion estimation.

Cyrus Prime leads the field in standards conversion. Utilizing advanced motion estimation techniques, it provides the smoothest portrayal of motion available today.

TK3:2 Our Emmy® award-winning TK3:2 Film Converter leads the field in specialized Film-to-Video applications. TK3:2 has been optimized to deliver seamless transfer of film-originated NTSC to PAL.

Tekniche - at the heart of standards conversion.

TEKNICHE

Circle (201) on Action Card

TEKNICHE INC.,
100 STONEHURST COURT
NORTHVALE, NJ 07647, USA
TEL: +1 201 784 2288 FAX: +1 201 784 3860

Hi-Tech Industries **L 6661**
Work area furnishings.
Circle (731) on Action Card

Hitachi Denshi America, Ltd. **S 6303**
CCD for SK-2600W, SK-2600PW portable companion cameras; CCD for SK-2000P portable companion camera; digital triax transmission system; multicore CCU for SK2020P camera; video file server; two video compression/transmission systems; high-definition DK-H2 industrial camera; TBD general-purpose color CCD cameras for low-light capability.
Circle (732) on Action Card

Hi-Tech Enterprises **S 1409**
New and used broadcast and industrial video equipment and related services.
Circle (733) on Action Card

Holaday Industries **L 5219**
Magnetic field, RF radiation hazard instruments; induced current meter; EMF instrumentation.
Circle (734) on Action Card

Hoodman Corporation **L 7967**
Hoods for glare-free viewing of monitors.
Circle (735) on Action Card

Horita **L 4956**
GPS-MTG GPS-based master time system for worldwide, unattended operation; SMPTE time code and position-logging products; bar, black, tone, NTSC test pattern, safe area, matte test signal generators; on-screen audio meter, time-date stamp and character generator; VITC/LTC readers, generators, inserters, LED displays, RS-422 inserter; TC Toolkit tape logging/auto EDL software.
Circle (736) on Action Card

Hotronic **L 8373-4**
AL86 10-bit video, 20-bit audio solid-state frame recorder with 6s A/V delay; AT61 8x2 asynchronized video router, audio follow; AP41 standalone broadcast, PC-TBC computer plug-in card TBC/frame/synchronizers; AU51 20-bit stereo audio delay to 10s; AP41-PAL PAL format TBC/frame synchronizer; AT61P PAL format 10-bit frame synchronizer.
Circle (737) on Action Card

Hughes Communications **L10525**
Broad range of satellite communications services for premium video, voice, data, mobile, business, educational and direct-to-home consumer entertainment service, a division of Hughes Electronics and subsidiary of General Motors.
Circle (738) on Action Card

Hughes JVC Technology **M 4541**
Model 200 single-lens ILA projector; Projection console system; series 300 ILA projectors.
Circle (739) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

Hughey & Phillips Inc. **R 3317**
FAA-approved obstruction lighting, controllers and remote monitoring for tall towers.
Circle (740) on Action Card

IBM Telecommunications & Media **L10338**
Computer equipment, software.
Circle (741) on Action Card

IDB Communications **S 2921**
Satellite communications systems, the Flyaway Phone satellite terminal in a suitcase; digital video compression services; Atlantic, Pacific and domestic cable distribution.
Circle (742) on Action Card

IDX Technology/IKON Video **L 6338**
Grafix Charger 4-channel sequential charger, discharger; KX-2 4-channel sequential field charger; Delta-4a upgraded design of established system for NP/BP batteries; AC-23 NP-battery-styled power supply for 100-240VAC input; DC-200 camera-mountable case for two NP-type batteries.
Circle (743) on Action Card

IHS Communications Products **M 5055**
CD-ROM databases of legal and regulatory information for communications industrial, engineering technical standards.
Circle (744) on Action Card

Ikegami Electronics **L 9829**
Introductions include HK-343A, HK-388 field/studio cameras; DNS-100, DNS-11 digital disk camcorders; HL-43A, HL-V77, HL-59/59W, HK-388P portable cameras; and featuring an established camera line; series 17, 18, 19, 20, 30 color monitors; PM-series BW monitors; PP-70 microwave link, PITA tracking antenna.
Circle (745) on Action Card

Illbruck **R 2223**
Acoustical material; Sonex Colortec, acoustical curtains.
Circle (746) on Action Card

Image Logic Corporation **L 5361**
VDAPT VTR interfaces with uniform command set for Windows, UNIX, DOS; EDUCAP low-cost closed-captioning; DYNACAP pay-as-you-go captioning system; Log Producer videotape logging; Word Wizards time-coded transcription service for A/V production; Autocaption closed-captioning and subtitling systems.
Circle (747) on Action Card

Image Video **L 8452**
Signal routing systems No. 9520/9521 to 320x320 with control panels; master control switchers; serial digital products, including: DLG-1000K logo generator/keyer; DCU-1040 safe area generator; DWU-1080 wipe generator; DCL-1090 clipper; ATD-1031 AES/EBU digital audio and time-code delay unit; DDA-1050 AES/EBU digital audio monitor.
Circle (748) on Action Card

Imagine Products **L 9584**
The Executive Producer editing software with ACT automatic capture technology, spell checking, storyboard printing; features deluxe logging for Mac and Windows.
Circle (749) on Action Card

IMC/AKAI Digital **R 4031**
S-series samplers; DR16 16-track recorder with VGA display.
Circle (750) on Action Card

Immersion Corporation **M 4451**
MicroScribe-3D "3D photocopier" digitizer for animation, graphics systems; captures dimensional description of physical objects and stores data in standard file formats to generate accurate computer models.
Circle (751) on Action Card

Industrial Acoustic/IAC **L10469**
Acoustic, sound control products.
Circle (752) on Action Card

Inline **M 5051**
IN1776 VGA/MAC to video scan converter; IN1224/IN1424 scan doublers; IN7200 ultrahigh-resolution coax cable; Pathfinders HR series 200MHz RGB matrix switchers.
Circle (753) on Action Card

Innovision Optics **L 8080**
Probe II camera lens system; shuttle motion-control monorail camera platform; Radcam miniature, remote-control camera car.
Circle (754) on Action Card

Inscriber/Mainframe Graphics **S 3326**
VMP Ver. 1.2 integrated titler, digital still-store, DVE editor, paint system for on-line, off-line modes with full TrueType and PostScript Type 1 fonts including international languages and optional Chinese, Korean, Japanese; CG Supreme low-cost titler operating under Windows NT/95 with dynamic character motion effects; VideoCarte Windows NT/95 digital still-store with motion playback capability.
Circle (755) on Action Card

Intelligent Resources **M 5238**
Fully integrated systems for media authoring, storage, delivery; systems development.
Circle (756) on Action Card

Intelvideo **L10972**
Video processor/noise reducer permits correction of Y/C delay errors, chroma level and phase, frequency response, gamma and random noise; Drop-out Corrector DP100 multidimensional correlation system detects tape dropouts and reinserts appropriate video; NTSC color decoders, encoders with adaptive comb filtering, digital linear color modulation, demodulation; impulse noise and random noise reducers; co-channel filter eliminates 10kHz or 20kHz co-channel beats.
Circle (757) on Action Card

NIKON'S NEW ENG LENSES ARE MAKING SMALL NEWS

Smaller Size Smaller MOD Smaller Price

S15X8.5B1-III

S9X5.5B1-II

Nikon's two new ENG lenses, the S15x8.5B1-III and the S9x5.5B1-II are lighter, smaller and incorporate an internal focus system for greater flexibility and ease of operation. Both boast aspheric lens technology for high performance with minimal chromatic aberration.

The S15x8.5B1-III Standard ENG lens is the smallest, lightest and most compact in its class, and has a built-in 2.2x extender which gives you 280.5mm, the longest focal length in its class and a Nikon exclusive. Add to that a convenient zoom speed adjustment knob, Nikon's exclusive user adjustable zoom torque and the shortest MOD in its class, just 0.55m (22"), and you have one of the most versatile lenses available anywhere, at any price.

The S9x5.5B1-II also features internal focus, adjustable zoom speed and zoom torque. And the body and servo have been ergonomically redesigned for maximum comfort. With the highest zoom ratio (9x) and wide angle of 5.5mm (77.3°) this super wide angle lens meets today's new digital demands.

To learn more about the value of owning TV Nikkor lenses and our overnight loaner lens service, call 1-800-52-NIKON or (908) 758-0308 for our brochure. Or write to Nikon Electronic Imaging, 5775 Lindero Canyon Road, Westlake Village, CA 91362.

See us at NAB Booth #10881

Nikon
ELECTRONIC IMAGING

Circle (183) on Action Card

Interactive Images **M 5122**
Digital video-editing system using PCI design with CCIR-601 sampling and low JPEG compression.
Circle (758) on Action Card

Interlace Engineering Corporation **S 2825**
VMAXX broadcast-grade graphics boards; VBOXX audio/video routers, component linear keyer.
Circle (759) on Action Card

International Tapetronics/ITC **R 2005**
DigiCenter digital audio management system with tool box; expanded integrated mixer with virtual console; enhanced traffic, music interfaces; Virtual Scheduler; audio routing switchers.
Circle (760) on Action Card

Intertec Publishing Corporation **L 5207, R 901, M 1965**
Publishers of *Broadcast Engineering, Broadcast Engineering/Radio, Video Systems, World Broadcast News, Lighting Dimensions, Theatre Crafts International-TCI, Satellite Communications*and *RF Design*; stop by booth for copies of magazines and subscription information.
Circle (761) on Action Card

Intraplex **R 3900**
AES/EBU interface; demo of model 4464 series digital audio codec; ISDN adapter, multiconfiguration storage; for remote broadcast.
Circle (762) on Action Card

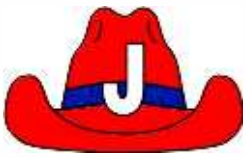
IPITEK Inc. **S 2936**
Fiber-optic transmission system products.
Circle (763) on Action Card

IRTE SpA **S 3064**
3.5-23GHz microwave links for TV, sound channels operating digitally 2.048Mb, S-4 PSK 6-channel sound system; parabolic antennas for microwave links; microwave accessories; UHF repeaters; radio cameras; GSM, broadcasting antennas; parabolic antennas for satellite reception; remote-controlled tracking system for portable microwave on-camera radio links.
Circle (764) on Action Card

ITELCO spa **L10724**
Featuring TVRO systems; 1kW, 5kW fully solid-state FM transmitters; 2kW all solid-state UHF TV transmitter.
Circle (765) on Action Card

ITS/Information Transmission **L 6760**
Introducing models ITS-820 100W and ITS-834 2kW solid-state transmitters; featuring ITS-830 1kW solid-state transmitter, UHF Exciter Plus and VHF Exciter Plus systems; MMDS transmitter system.
Circle (767) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.



James Grunder & Associates **L10363**
Feral QS-400 quad-split image-scaling device combines four inputs on one screen; Feral line doubler; Feral transcoder; Hamlet DigiScope all-digital waveform, vectorscope monitor.
Circle (768) on Action Card

Jampro Antennas **L 5308**
HDTV and dual-mode VHF/UHF antennas; transmission system components; FM combiner; aperture/simulcast antennas; UHF broadband panel antennas; hybrids, harmonic filters; transmission line, patch panels; bandpass and notch filters.
Circle (769) on Action Card

Jensen Tools **L 8344**
Numerous tools and tool kits for video, audio technicians, broadcast engineers; various metering, signal source products, JTK-5000 computer maintenance kit; Fluke model 87 DMM.
Circle (770) on Action Card

JK Audio **S 1026**
QuickTap for recording from a telephone handset or connect an amplifier for sales presentations; Pureformer stereo isolation transformer to reduce noise on PC audio cards.
Circle (771) on Action Card

J-Lab **L10938**
Video production utility products; CFS-1 field, portable video switcher; DA-1 with hum-bucking, EQ 6-output; DA-2 1x4 audio DA with tone source.
Circle (772) on Action Card

JMR Electronics **M 4757**
Vertical 19" racks, cabinets of 12-gauge steel for all environments; CD-ROM enclosures to accommodate 21 CD-ROM devices and 8-slot motherboard; Infinity RAID towers, compatible with current RAID controllers or software, N+! redundant hot swap power supplies; Array RAID rack-mountable disk array enclosures.
Circle (773) on Action Card

JVC Professional Products **L 8505**
Digital-S 4:2:2 component digital format; BR-D85 Digital-S 4:2:2 8-bit component digital VTR; BR-D80 Digital-S editing recorder; BR-D50 Digital-S player; BR-D40 Digital-S docking recorder; KY-D29 digital signal processing camera; GY-X3 S-VHS camcorder; LX-D300 LCD projector for video and multimedia applications; low-light cameras; C-mount computer-controlled camera; recorder VCRs; W-VHS/HDTV system.
Circle (774) on Action Card

KATABAND **S 1424**
Compact Camera Case contoured, padded soft case for camera with on-board battery; multi-long, multipurpose soft case; Tripobag for tripod with head and pan handle; Hexabag with six cylindrical pockets for light stands; Vestique videographer's vest; ABBA5 anti-bullet body armor; Audio Vest, Video Vest; MOMO monitor cover and transport bag.
Circle (775) on Action Card

Kathrein-Werke KG **L 8362**
Antennas and accessories for FM and TV broadcasting.
Circle (776) on Action Card

Kavouras **L 7880**
Pentium-Age for Triton i7 graphics and animation weather workstations, disk-based animation, 24-bit Photoshop and text editor, EFX special effects; Ver. 4.0 uses Windows NT, WxCad for 4-D fly-through look-down imagery; Triton Doppler Radar real-time street-level radar.
Circle (777) on Action Card

KD Kanopy **R 4005-6**
KD Majestic lightweight canopies for sporting or special events; fast setup; tops are water-resistant, fire-retardant, UV-guarded; customized graphics.
Circle (778) on Action Card

Keystone Communications **L 5324**
Production services.
Circle (779) on Action Card

K5600 **S 1446-7**
Joker Daylight HMI single-ended PAR fixtures for location lighting; Bug-Lite 200W MSR lamp fixtures for Chinese Lantern applications; Slimverter 200 operates Joker 200 and Bug-Lite on 30V batteries.
Circle (780) on Action Card

K&H Products **L 8472**
Equipment transport cases, camera support products.
Circle (781) on Action Card

Kings Electronics **L 8346-7**
Digital Tri-Loc connectors, Digital video jackfields; 75V BNC connectors; video patch plugs.
Circle (782) on Action Card

Kino Flo **S 1449**
Kino Flo gaffer kit for location lighting for film/video; Kino Flo 2F kit for ENG/EFP lighting; Kino Flo 3F EFP lighting kit.
Circle (783) on Action Card

Kintronic Laboratories **R 1220**
Single-pole, double-throw RF contactors.
Circle (784) on Action Card

Kline Towers **L 7877**
Design, fabrication and erection services of broadcast and special antenna support structures; prototype transmitter facility design by T G Crowder AIA of Architektur, featuring latest advances in ice protection, component-style construction.
Circle (785) on Action Card

Knox Video Products **L 8336**
Chameleon 64 modular routing switcher; 16x16, 8x8 and 12x2 full-matrix A/V routing switchers; Studio 40 character generator.
Circle (786) on Action Card

KUB Systems Inc. **S 1237**
Zydeco animatics, compositing, video production software combines two live video foregrounds with a video background with full chroma-key, machine control for Mac; Calypso instant access Pick & Place compositing to create keyframe-accurate layered, animated graphics with range of effects in 3-D space, spline-based motion control.
Circle (787) on Action Card

Larcan **R 3311**
30kW VHF, 10kW UHF all solid-state transmit-

WOULDN'T IT BE GREAT IF TASCAM MADE A PORTABLE DAT RECORDER WITH THE SAME DURABILITY AND SOUND QUALITY AS THEIR STUDIO DECKS?

It's here. The TASCAM DA-P1. The ideal portable DAT for field recording in broadcast applications.

You need a durable and high-quality DAT recorder for your team to take into the field. You'll get higher quality digital audio, plus be able to dump it to a digital audio workstation for quick and easy editing. That's why TASCAM makes the DA-P1. It has the features demanded by broadcast professionals. Things like XLR-type MIC/LINE inputs with phantom power so you can use a wide range of microphones and input devices. A 20dB pad, and a versatile, easy-to-read display. But field reporters and production personnel will love the DA-P1's extended life 2-hour battery that recharges in just 1½ hours.

If you can get the DA-P1 back from your field personnel, you'll find it performs outstanding in the studio, too.

With a built-in S/PDIF direct digital I/O, it integrates with DAWs, and other digital gear. Also, it supports multiple sample rates (*48, 44.1 and 32 kHz*) and utilizes next-generation A/D and D/A converters delivering studio-DAT quality sound.

DA-P1 PORTABLE DAT

Standard accessories include a shoulder belt, AC adapter and battery — carrying case optional.

So if you're torn between a new recorder for the field, or a DAT for the "B" suite, think no more. Pick up a DA-P1. You get the best of both worlds. In fact, once you get your hands on a DA-P1, you may want to buy two. So get to your dealer today and order your new portable DAT from TASCAM.

TASCAM FAX-BACK 1-800-827-2268 DOCUMENT #2150

TASCAM®

Take advantage of our experience.

Circle (186) on Action Card

MSRP $1,899. For complete specs and information via TASCAM FaxBack, call 800-827-2268 document #2150.

SURPRISE!

ters/ 30/60 UHF IOT transmitter.
Circle (788) on Action Card

Larcan-TTC — R 3311
Rocky Mountain series RMS UHF TV transmitters, 100W-1kW; HDR-80M2W 80kW UHF IOT or Klystrode transmitters for HDTV; FMS solid-state FM transmitters; 100W-12kW; XL100FM FM translator; model X 30W FM exciter.
Circle (789) on Action Card

LBA Technology — R 1524-5
Folded unipole antenna; antenna-tuning units; transmitter combiners; diplexers, triplexers; transportable antenna systems; RF components.
Circle (790) on Action Card

LDL Communications — L 9844
30kW VHF, 10kW UHF all solid-state transmitters; 30/60 UHF IOT transmitter; HDTV center-fed UHF panel and HDTV broadband panel antennas; InstaGas Nitrogen.
Circle (791) on Action Card

Leader Instruments — L 8369
LV 5100D digital/analog component waveform monitor with EDH facilities, analog monitoring capabilities including 525/60 and 625/50 operation, vector, picture and stereo audio displays; LT 425D digital component 525/60, 625/50 generator with EDH facilities, embedded and separate AES/EBU digital audio, test signals tailored for digital operations, variable-speed still-pattern switching evaluate the effects of concatenated compression; 4:2:2 system analyzer has coordinated 4:2:2 signal source and receiver/analyzer.
Circle (792) on Action Card

Lectrosonics — L 7865
UCR compact diversity receiver for ENG/EFP and film production; powered from 9VDC or 12VDC; Quadbox 4-channel VHF/UHF wireless receiver assembly for EFP, film production with RF, power distribution; Quad 195 4-channel UHF wireless receiver for UCR195 receivers; UDR 200B synthesized UHF receiver for studio or stage, frequency switchable over 25MHz range.
Circle (793) on Action Card

LegaSys International — M 4654
Peripherals for Silicon Graphics platform; quad speed CD-ROM, Vault-S, Vault-G, 9GB drives.
Circle (794) on Action Card

Leightronix — L11044
Time-event controller for automated playback, recording, switching; telephone remote equipment control; PC-based VHS/S-VHS commercial-insertion control software; interactive video equipment control; custom control engineering, design, development.
Circle (795) on Action Card

Leitch Inc. — M 9349
VIA32 AES/EBU digital audio router; SMART Panel; DigiBus adaptive comb filter; DAs and frames; XPlus analog video and audio routers; StillFile gateway object server; EDH mix box; XPRESS digital routers; RouterWorks; new LogoMotion features; routing scheduler; AES D/A converter; Media Port; EDHview software; audio signal monitor.
Circle (796) on Action Card

LEL Computer Systems — M 4953
The Video Pipeline, rack-mount, turnkey distribution of MPEG-1 datastreams via T1, E1, RS-422, V.35, Ethernet transmission; LEL/Stellar One set-top receiver/decoder; closed-captioning, serial device control for Video Pipeline.
Circle (797) on Action Card

LEMO USA — L 5560
High-quality circular connectors; fiber-optic hybrid connectors for video cameras.
Circle (798) on Action Card

LIGHTING DIMENSIONS

Lighting Dimensions magazine — L 5207, M 1965

Lightmaker Company — L11057
Manufacturers and marketers of AC ballasts for flicker-free HMI lighting instruments rated 200W to 12kW.
Circle (799) on Action Card

Lightning Eliminators & Consultants — L 8343
Dissipation Array System; SBT Spline Ball Terminal; Chem-Rods grounding; CLP coaxial line protector; advanced surge protectors.
Circle (800) on Action Card

Lightware — L 8582
Featuring 1623, 1629 Hotlight cases; other cases for cameras, monitors, Deluxe Soft Box case, Ticket Zip Wallet and File Wallet; Mongo Tab, Cinch Lock.
Circle (801) on Action Card

Lightwave Systems — L10938
DC(x) series analog video, audio routers; Fibox series data I/O modules, Fibox and IMS series fiber-optic transmission systems.
Circle (802) on Action Card

Lightworks — L11025
Featuring Heavyworks One non-linear editing systems able to play and edit multicamera material from one hard drive in real time; other products include Turbo, the Fader Box audio console, Digistation and Assistant.
Circle (803) on Action Card

Link Electronics — L 5342
Modular digital processing and distribution product family; digital closed-caption encoder, decoder and data recovery; analog video-processing amplifier; video/audio routers; audio/video analog products for the digital frame to mix analog and digital.
Circle (804) on Action Card

Linker Systems Inc. — M 4055
Animation Stand, Ink & Paint, Pencil Tester, Art Director and ScanLink for Macintosh, SGI and Windows NT.
Circle (805) on Action Card

Lipsner-Smith Company — L 7144
Motion picture film-cleaning systems for professional applications; CF3000-Mk VI solvent-based ultrasonic system; EXCEL non-immersion IPA cleaning system with enhanced cleaning power.
Circle (806) on Action Card

Listec Video — L 8635
A6000WIN Prompter software for Windows word processors, using True-Type scalable fonts, including international characters from related keyboards; prompter displays (9", 12", 15" with studio, location hardware; 220VAC, 50Hz available; NTSC, PAL composite converters.
Circle (807) on Action Card

LM Engineering — S 1932
Composite series cases, featuring 30% weight reduction, overall improvement in strength.
Circle (808) on Action Card

LNR Communications — R 3708
Safari digital video fly-away satellite system with mobile voice communications; LVE-14 low-profile Ku-band video exciter with enhanced front-panel capabilities; upgrades to LVM series exciters, designed to be used in fixed and mobile SNV uplink applications.
Circle (809) on Action Card

Logitek — R 1802
VU-Trax audio meter bridge; to 24 high-resolution audio bar graph meters on a 2RU box or self-contained overbridge enclosure; Super-VU audio meters available with combination analog and digital inputs.
Circle (810) on Action Card

Loral Microwave-Narda — SS 1034
Microwave products for ENG, STLs.
Circle (811) on Action Card

Louth Automation — S 2022
PC-based media management and automation products using PC-BUS design, object-oriented programming; ADC-100 software-based multichannel automation system; Turbomedia for automated recording, segmenting of program material; Autoshow/Autosat automated recording and timing of incoming material and previously recorded shows.
Circle (812) on Action Card

Lowel-Light — L 6822
Softcases; Fren-L 650 production lights and kits; Rifa-Lites and kits.
Circle (813) on Action Card

LSI Logic — M 5119
Encoder, decoder chipsets for DBS, cable markets; channel-decoding products; QAM, QSPK demodulation, 16VSB demodulation, Viterbi Reed-Solomon FEC; decoding products for MPEG-2, integrated audio/video, single-chip decoders, single-chip transport; encoder chipsets; JPEG compression chipsets.
Circle (814) on Action Card

LTM Corporation of America — L 6333
HMI lighting products, including Bonzai 200W, Cinepar 200W, Sungun 200W, Cinepar 2.5/4kW; Cinepar 6k.
Circle (815) on Action Card

Mackie Designs Ltd — S 1245
Broadcast and recording consoles; 8-bus series; consoles and production equipment.
Circle (816) on Action Card

3rd Radio MONTREUX

June 6-9, 1996

3rd Montreux International Radio Symposium and Technical Exhibition

In association with

European Broadcasting Union

Association of European Radios

National Association of Broadcasters

Radio Advertising Bureau

3rd International Symposium on DAB 4-5 June, 1996

DAB Digital Audio Broadcasting

Following the first two editions in Montreux in 1992 and Toronto in 1994, the **3rd International Symposium on DAB** will take place in Montreux on **June 4-5**, preceding Radio Montreux.
Organised and coordinated by the EBU, the Symposium will focus on the latest developments of this technology.

MONTREUX INTERACTIVE MEDIA SERVICES

The First Montreux Interactive Media Services Symposium and Technical Exhibition will be launched concurrently with the Radio event, from June 6-9, 1996, bringing together under one roof all the players of the broadcasters' world active in the field of multimedia and interactive services.

P.O. Box 1451, Rue du Théâtre 5,
1820 Montreux, Switzerland

For further details:
Fax +41 21 963 88 51
or call +41 21 963 32 20
E-Mail: r.crawford@tvsympo.mcnet.ch

NEW JUNE 6-9, 1996

June 6-8, 1996

DIGIMEDIA

DigiMedia, organised by the four founding institutions – International Telecommunication Union, the European Broadcasting Union, Audiovisual Eureka and the University of Geneva together with the Montreux Symposium Office is moving from Geneva to **Montreux in June 1996**.

Philippe Coeytaux
Tel. +41 22 320 90 33
Fax +41 22 320 90 75
E-mail:
100724.114@compuserve.com

Circle (186) on Action Card

Macrovision L 8583
Starshaker, a low-cost satellite scrambling system; VES-TX individually addressable video-scrambling system for broadcast; VES-TM "minicrypt" video-scrambling system for low-power consumption, high-quality surveillance.
Circle (817) on Action Card

Magic Teleprompting Inc. S 2815
Prompting systems.
Circle (818) on Action Card

Magni Systems L10877
VGAP 16 VGA card with video output and overlay.
Circle (819) on Action Card

Magnum Tower R 2923-4
Manufactured radio, TV and communications towers.
Circle (820) on Action Card

Management Graphics L 8384
Solitaire Cine III image film recorder for post-production, special effects, animation; Cine FLX camera module for pure vibrant colors, black blacks and white whites for continuous tone or computer-generated cine images.
Circle (821) on Action Card

Manhattan Production Music L 7977
Apple Trax cutting-edge music library of the '90s; Chesky Records Classical series; Manhattan production music 50-CD specialty library, Audiophile sound-effects series.
Circle (822) on Action Card

Marconi Communications Systems R 2002
Test, measurement equipment; radio/TV transmitters.
Circle (823) on Action Card

Mark IV Audio Group/Electro-Voice L 8026
Model 635L long-handled version of 635A mic; RE1000 condenser mic; RE200 probe condenser mic; C02 mini lavalier omnidirectional mic.
Circle (824) on Action Card

Mark IV Audio Group/Klark Teknik L 8026
300, 400 series equalizers; 500 series compressors, gates; 700 series digital delays; 800 series crossover; DN 3600 stereo programmable graphic equalizer; DN 3696 remote controller for DN3600; DN 6000 1/3- or 1/6-octave RTA with RT 60, LET or LEQ, printer port; DN 728 RM remote-control option for DN728.
Circle (825) on Action Card

Mark IV Audio Group/MIDAS L 8026
XL-200 console with 4-band parametric EQ, 8 aux, 8 mute, 8 VCA, 12x8 matrix; XL4 console with 4-band parametric EQ, 16 mono+ 4 stereo aux, 8 mute, 10 VCA, 24x8 matrix and SMPTE-based automation; XL-42 two channels for mic or line, 4-band parametric EQ, pan, level, stackable.
Circle (826) on Action Card

Mark IV Audio Group/Vega Wireless L 8026
Wireless microphone systems and intercom components.
Circle (827) on Action Card

Matco L10565
MA-2048, enhanced version of MA-204A with greater memory for improved machine control and commercial insertion system.
Circle (828) on Action Card

Matrox Electronic Systems M 4267, S 2630
DigiSuite PC-based digital video hardware, software; Digimix video mixer, 2 DVEs; DigiMotion JPEG codec, audio mixer, SCSI controller; DigiVid multichannel analog video I/O; QMPEG-2 decoder; Marvel Millennium controller; DigiSDK component Object Model for Windows NT/95; other components.
Circle (829) on Action Card

Matthews Studio Equipment L 6312
Matthews Magic, Just Grip.
Circle (830) on Action Card

MCL Inc. L10963-4
Maxxim series of high-power amplifiers and accessories: MX2000 125W TWT, MX3000 400W TWT, MX5000 700W TWT with integral linearizer, MX7000 2.2kW TWT; MXC universal redundancy controller.
Circle (831) on Action Card

McCurdy Radio Industries L 6612
DCS 3000 serial digital and Microcompact digital intercoms; M/2000 automation system; McCart digital audio storage, multichannel playback;

UMD-32 3-color 32-character undermonitor display; ATS-100 audio test set; AT2656 stereo audio monitor; UIO-80 serial/parallel machine control interface; series 9000 A/V DAs, accessories.
Circle (832) on Action Card

Media Concepts **L 5356**
Used broadcast TV production equipment.
Circle (833) on Action Card

Mega Drive Systems **M 3858**
Enterprise systems, Ultra CSI, 200MB/s full-duplex fiber channel for uncompressed video, multi-user environments; 9GB drive modules; 90GB MR/RAID disk array; Enterprise storage systems; MX/500 rack-mount RAID disk array; MR/RAID disk array with 5 to 10 drives for capacity to 90GB data storage.
Circle (834) on Action Card

Meret Optical Communications **L 7113**
System 2000, Series 36 routing switchers; fiber-optic transmitter and receiver, Smini Star controls; Windows control program.
Circle (835) on Action Card

Merging Technologies **S 1030**
Pyramix virtual studio; lossless real-time coding demonstrations.
Circle (836) on Action Card

Micro Communications **L 6801**
UHF high-power Mask filters; broadband transmission lines; HDTV/NTSC common antennas; low-power FM, resonant loop channel combiners; LPTV/wireless all-band UHF panel antennas and multichannel combiners; wireless cable diplexers and channel combiners; antenna coverage studies for HDTV.
Circle (837) on Action Card

Micro Computer Products **S4039**
Video DC20 digital video editing system for the PC; Motion DC20 for PCI Power Macs.
Circle (838) on Action Card

Micron Audio Products **L 8331**
Wireless microphone systems, TRAM lavalier microphones; SQN location mixers.
Circle (839) on Action Card

MicroNet Inc. **S 2638**
Domestic and international video transmission services.
Circle (840) on Action Card

Micropolis **M 4762**
RAID subsystems; AV-enhanced disk drives; video servers.
Circle (841) on Action Card

Microsoft Corporation **L10349**
PC computer software.
Circle (842) on Action Card

Microvideo Ltd. **S 2246**
Serial digital closed-caption generator with digital data inserter to add closed captions, time code and VITS signals; serial digital 10-bit linear keyer for captions, logos; logo generator with capture and download system; D-1 proc amp; serial digital test signal source with full-frame patterns, embedded audio and EDH checksum data; digital audio embedder, demux for component digital; 4:4:4:4 10-bit A/D and D/A converters.
Circle (843) on Action Card

Microwave Filter/Comband **L10970**
Interference, bandpass, bandstop filters for cable TV, microwave, earth station signal applications.
Circle (844) on Action Card

Microwave Radio **L 6308**
Featuring portable microwave transmitters for ENG; fixed radio systems for STLS, ICRs, backbones; antennas, controllers.
Circle (845) on Action Card

Milestek **S 2917**
Video and audio patch panels 2x24; BNC T adapter, 75V; BNC plugs for 1694A, 1695A, VFM809, 8218 cable, 75V.
Circle (846) on Action Card

Millennium II Digital Systems **S 2622**
Composium II real-time digital video workstation for high-end compositing, layering, editing.
Circle (847) on Action Card

Miller Fluid Heads **L 6138**
Introducing Miller System 25 ENG camera-support package, redesigned counterbalance, pan handle, above-ground spreader for 2-stage models, new rubber feet; accessories for Series II ENG/EFP tripods, ground spreaders, suction-grip rubber feet, carry strap, accessory hook; Pro-Jib arm with 6-foot extension, dual bubble level, stainless steel alloy construction, folds to 4 feet for transportation.
Circle (848) on Action Card

Minerva Systems, Inc. **S2416**
Compressionist 200 offers real-time MPEG-2 encoding, including real-time previewing of compression quality, supports a range of video resolutions for MPEG-1 and MPEG-2 applications; Minerva Publisher MPEG digital video publishing system.
Circle (849) on Action Card

Minolta **L 8065**
CA-100 color analyzer; XY-1, CL-100 hand-held colorimeter; CS-100 hand-held non-contact colorimeter.
Circle (850) on Action Card

Miralite Communications **L10966**
Specialized products for digital video compression for distribution of content by satellite, telco, CD-ROM; view.topia cross-platform, software-only compression, decompression digital video architecture and multimedia library; earth stations; Spaceline products for digital transmission.
Circle (851) on Action Card

Miranda Technologies **L10852**
VFC-123i 4:2:2 to 4fsc NTSC/PAL format converter; ADP-101i ancillary data processor; FDL-101i 4:2:2 frame delay module; FRS-101i 4:2:2 frame synchronizer; SEL-402i 4x2 serial video selector; SMD-110, SDM-110C 4:2:2 to RGBS/YUV D/A converter (C with composite output signal).
Circle (852) on Action Card

Mirror Image Teleprompting **S 1051**
TP-9000 9-inch color AC/DC teleprompter for the field; TP-170 17" VGA studio teleprompter; TP-180 17" black-and-white composite studio teleprompter; Autoprompter PL prompting software for IBM; Questar 16 Mac-based prompting software; SP-120 speech prompter system.
Circle (853) on Action Card

MMS Multi Media Systems **L11069**
Pronto Video D-1 digital disk recorder with 2.5-60 minute uncompressed recording time with fast/wide host computer interface; RGB/4:4:4 capability with Color Space Conversion; SCSI/video D-1/4:2:2 to SCSI interface, M-JPEG and digital audio option; Sphinx3D auto 3-D modeling software for Unix Os; VideoConnect serial D-1/4:2:2 monitoring D/A converter.
Circle (854) on Action Card

Modulation Sciences **R 1517-18**
PCG-11 Sidekick Pro Channel audio generator transmits IFB on Pro Channel and eliminates cellular phone charges; PRO-11 PROceiver with antenna diversity input for audio, data-selective calling, compatibility with Comrex, Clear-Com, et al.
Circle (855) on Action Card

Mohawk/CDT Broadcast Cables **L 6862**
Water-resistant triaxial cable with waterproof boot; serial digital D1, D-2, D-3 video coax; parallel digital D-1, D-2, D-3 data cable; digital audio cable; Ultraflex video cables; composite camera cables; fiber-optic video link; cables conform to SMPTE, NEC code.
Circle (856) on Action Card

Mole-Richardson **L 6831**
Lighting products, lamps, fixtures.
Circle (857) on Action Card

Montage Group **L 5241**
Non-linear videotape editing systems, Montage Picture Processors; Montage for the Video Toaster and Amiga AGA.
Circle (858) on Action Card

Moseley Associates **R 2316**
Digital STL for RF, T1/#1; remote pickup links; digital remote broadcast equipment; transmitter remote controls; digital encoder and decoder with ISO/MPEG audio.
Circle (859) on Action Card

Multidyne Electronics **L 4942**
FTX-95 fiber-optic video, digital audio transmission system; VAS-1000 10x1 video, 3-channel audio router; UTIL-200 video distribution tray compatible with Grass Valley DA modules.
Circle (860) on Action Card

Multimedia Accessories **M 4729**
Distributors of SVHS, VGA, RGB video and audio cables, connectors; adapters; test equipment; audio, video DAs; video processors; multimedia and desktop production video equipment; tools, cases, cable-management products.
Circle (861) on Action Card

MYAT **L 5301**
Rigid coaxial transmission line components and accessories; 7/8 to 93/16".
Circle (862) on Action Card

Nady Systems **L 6941**
Wireless mic systems using VHF and UHF frequencies.
Circle (863) on Action Card

Nagra Kudelski SA **L 6804**
ARES-C solid-state recorder with PCMCIA support in 3kg portable package, recording time to 40 minutes mono on 20MB card, editing features and G722, Musicam ISO/MPEG compression; Nagra-D 4-channel digital audio recorder with open-reel 1/4-inch tape, helical rotary heads, 24b/s sampling with headroom for 16-bit dynamics; LYSIS integrated system and broadcast architecture with hardware, software for sound/news editing, scheduling, broadcasting, statistics, administration.
Circle (864) on Action Card

Nalpak Sales **L 8675**
TuffPak Wheel Base; expanded line of TuffPaks, soft-sided production bags, MagLine accessories.
Circle (865) on Action Card

NBC News Archives **M 5232**
Contemporary, archival footage: personalities, politics, wildlife, scenes from around the world.
Circle (866) on Action Card

NDG Phoenix **L 6362**
Operations management software; LMS V1.6 upgrade to library management system.
Circle (867) on Action Card

L E Nelson Sales **L 5547**
Stage and studio lamps by Thorn, GE.
Circle (868) on Action Card

Neotek **R 1819**
Featuring the •lan, •lite and Esprit audio mixing consoles; Sytek microphone pre-amps.
Circle (869) on Action Card

Nemal Electronics International **L 7965**
Serial digital patch panels; CT3700 crimp tool for 75V BNC connectors; BC213PJ composite ENG cable.
Circle (870) on Action Card

Nesbit Systems Inc./NSI **S 1849**
Software systems for facilities, equipment tracking; business tracking, reporting; media library system.
Circle (871) on Action Card

Network Music **L 6031, M 4554**
Production music libraries.
Circle (872) on Action Card

Network Video Technologies **S 2837**
Model 203A passive video transceiver for real-time analog video on standard telephone wire to 1,000 feet; Coaxitron and other remote pan/tilt or zoom signals may be sent on the same wire pair.
Circle (873) on Action Card

Neutrik USA **R 1600**
Rapid Test RT-1M multitone audio analyzer for simultaneous measurement of frequency response, distortion and noise on with channels from single 1-second multitone burst.
Circle (874) on Action Card

NewsMaker Systems **L11038**
Newsroom automation interface products for titlers.
Circle (875) on Action Card

Newtek **S 1952**
Video production graphics, effects system.
Circle (876) on Action Card

Nigel B Furniture **S 2031**
Monitor suspension system; mobile workstations; free CAD software.
Circle (877) on Action Card

Nikon Electronic Imaging **L10881**
95mm polarizer filter; S15x8.5 BW 2/3" HD ENG lens; S20X8 telephoto general-purpose, ENG zoom lens with the short MOD, compact, lightweight; S9X5.5II 9x zoom ratio wide-angle ENG lens; S15X8.5III compact, lightweight internal focus ENG standard zoom.
Circle (878) on Action Card

Norpak **L 8175**
TES3 multistandard VBI encoding platform inserts digital data into the vertical blanking interval of any CCIR standard TV signal; TTX625+ PC card, TTX645+ external VBI receivers for data broadcasting include FEC firmware.
Circle (879) on Action Card

Norsat International **R 1417-8**
VM62 multistandard 300-800MHz agile modulator for private cable system head-ends; Windows-based GUI control software for multistandard COD private cable head-end; data-grade PLL LNB, available in a variety of frequencies, for digital audio/video applications.
Circle (880) on Action Card

Nortel/Northern Telecomm **S 3319**
Nortel video operations center; DV45 digital video codec, Nortel Video Trunking, Supertrunk.
Circle (881) on Action Card

Nova Systems **L 9377**
NovaBlox Studio series SD series serial digital converters; 10-bit frame synchronizer; NovaBlox Desktop series TBCs, frame syncs, video interface products; NovaScan computer-to-video scan converter.
Circle (882) on Action Card

NS Microwave **L 4756**
Continuous rotating pedestal for trucks, ENG towers; offset-fed antennas for trucks, ENG towers; camera-mounted microwave systems; ENG

CONNECT WITH THE BEST

Cablewave Systems ISO 9001 Certified.

- BOGNER high and low power UHF TV antennas
- BOGNER circular polarized UHF TV antennas
- BOGNER MMDS/ITFS/MDS antennas
- PTV4 panel HDTV antennas
- Low- & high-power circular polarized FM antennas
- STL microwave parabolic antennas
- FLEXWELL® coaxial cables, elliptical waveguides, and rigid transmission lines
- FLEXWELL® radiating cables
- Coaxial cable and elliptical waveguide R.F. connectors
- Installation accessories
- Pressurization equipment

RFS Radio Frequency Systems, Inc.
Cablewave Systems Division

Cablewave Systems
60 Dodge Ave.
North Haven, CT 06473
☎ (203) 239-3311
FAX (203) 234-7718

See us at NAB Booth #9468

Circle (84) on Action Card

microwave truck package.
Circle (883) on Action Card

N Systems/NSI **L10910**
MC5 Ver. 3 PC-based remote-control system controls, monitors central ENG receive systems, cameras on pan/tilt positioners, A/V switchers and other machine control needs; Silhouette LP low windload central ENG receive antenna system; Super Pod SP3 helicopter ENG system with GPS-controlled transmit antenna.
Circle (884) on Action Card

NTL **L10344**
Development and implementation of the infrastructure and services for digital broadcasting; joint service platform with Orion for digital distribution to Europe and the United States; News Technology Group, Digi-Media Vision News Digital Systems and News Datacom divisions.
Circle (885) on Action Card

Nucomm **L10366**
Microwave transmitters, receivers for ENG, STL, ICR; 1.99-2.11GHz, 2.45-2.5GHz spectra, programmable audio subcarriers, video presence detector; miniature microwave transmitter for wireless camera operation, 1.99-2.5GHz range with full remote control, two audio subcarriers, .25W to 2W.
Circle (886) on Action Card

NVision **L11021**
NV1221, NV1222 serial digital video DAs, 10-bit reclocking and simple 10-bit fanout types; NV1230, NV1231 video A/D converters for composite NTSC and PAL; NV1240, NV1241 video D/A converters, composite NTSC and PAL outputs; 9000 series networked control panels; low-power version of NV3512 synchronous router; synchronous versions of NV1308/3064 AES routers.
Circle (887) on Action Card

Nytone Electronics **L10957**
Film/slide transfer equipment, slide scanner with 3-chip camera, remote control, 750-line resolution, RGB/YC/NTSC.
Circle (888) on Action Card

O'Connor Engineering Labs **L 5556**
Carbon fiber lightweight 2-stage column tripods; fluid head with lighted level and counter-balance indicator.
Circle (889) on Action Card

Odetics Broadcast **L 8237**
Disk-based replay system for news, low-power television; comprehensive ABS disk-based automation systems with RAID 3 storage and control.
Circle (890) on Action Card

OMB America **R 2626**
Radio/TV transmitters.
Circle (891) on Action Card

Omicron Video **L 6847**
Signal distribution products, video/audio DAs; Audio Dubmaster; duplication QC switcher.
Circle (892) on Action Card

Omnimusic **L 6842**
Music production libraries.
Circle (893) on Action Card

Opamp Labs **L 8283**
Amplifiers (A/V, DA, mic, EQ, line, VCA, power); switchers (routing, assign, matrix); press boxes; audio transformers; oscillators, power supplies; custom subsystems.
Circle (894) on Action Card

Optibase Inc. **M 4722**
MPEG-1 encoders, MPEG-2 playback cards for PC under DOS, Windows 3.x or NT, OS/2; MPEG Lab Suite; MPEG Lab Pro; Gemini; MPEG Lab VCD.
Circle (895) on Action Card

Optical Disc Corporation **L 9784**
Recordable Laser Videodiscs (RLVs) compatible with standard LaserVision or laser disc formats, accepts composite video for single-copy or low-volume duplication.
Circle (896) on Action Card

OptImage Interactive Services **M 4732**
Desktop video equipment; multimedia products.
Circle (897) on Action Card

Optimum Productions **L 5962**
Versioning, dubbing of videos, films with translations from and into English from other languages; meets broadcast and feature-film specifications.
Circle (898) on Action Card

Options International **L 4761**
Turbo 2 telecine; DSE digital shading eliminator; Cirview; CRT faceplate restoration; 35mm slide adapter kit; Trans/EFX filter system; Hamlet Video Scope 305WV; ASTEC advanced system telecine edit controller; blanking generator; Accuglow; PEC bases/head amp combination; bi-phase capstan upgrade; vertical black generator; remote blanking controller; XYZoom upgrade; new voltage regulator for MkIII power supplies; Accom encoder remote control; Accom still-store upgrade; voltage regulator for MkIII power supplies; static removal kit.
Circle (899) on Action Card

Optivision **S 1430**
High-speed quad multichannel MPEG-2 decoder; MPEG-2 encoding workstation for real-time encoding and multiplexing; MPEG-1 and MPEG-2 video transmission systems.
Circle (900) on Action Card

Orban/Harmon Pro Audio **R 2011**
Optimod-FM 2200 low-cost FM digital audio processor with eight programmable presets, 2-band processing with HF enhancement, peak overmodulation prevention, digital stereo encoder/generator; analog I/O, digital AES/EBU IO option; DSE-7000 upgrade features new DSP hardware and Ver. 6.0 software for real-time, 24-bit internal effects with 4-band parametric EQ, Optimod compression, reverb by Lexicon.
Circle (901) on Action Card

Orion Atlantic **S 3464**
International digital video satellite transmission services through London and New York MCPC gateways; SCPC digital video transmission service using Drop & Shoot small ground stations for rapid service start.
Circle (902) on Action Card

Otari **L11029**
RADAR multitrack hard-disk recorder; MR10 minidisc recorder/player; CDC 600 dual-drive, 360-capacity CD changer; B10 broadcast production and on-air console; PicMix surround-sound monitoring and panning system; Status digitally controlled analog console with console-wide image recall; Concept 1 digitally controlled 24-bus analog console with fader and mute and snapshot automation; UFC24 universal digital audio format converter.
Circle (903) on Action Card

Ortel **5044**
Interfacility Links product series.
Circle (904) on Action Card

Oxberry **S 1535**
Animation equipment.
Circle (905) on Action Card

Pacific Bell **M 3854**
Multimedia CD publications.
Circle (906) on Action Card

Pacific Radio Electronics **L 5662**
Distributor for Belden, Gepco, Kings, Stanton, VAC, SDG, RDL product lines.
Circle (907) on Action Card

Pacific Research & Engineering **R 2301**
ADX Ensemble, ADX Eight digital audio workstations; BMX III; air console; AMX stereo production console; STX stereo TV mixer; RMX radiomixer air console; Productionmixer production multitrack console; custom cabinetry; sound design, installation; StereoMixer compact console.
Circle (908) on Action Card

Paco Electronics USA **L10481**
NiCad battery products; DP series.
Circle (909) on Action Card

PAG Ltd. **L 7680**
Instantaneous battery status recognition and run time information system; PP240 battery pack equivalent to AU-BP220, NB-G1U batteries; MC124 4-channel charger for 4.8-14.4V NiCad batteries; AR124NP fast charger, 4-channel microcomputer-controlled advanced charging system.
Circle (910) on Action Card

PanAm Sat **S 2241**
Global satellite program distribution services; ad hoc and special-events coverage.
Circle (911) on Action Card

Panasonic **L10000**
DVCPRO "Laptop" portable editing system; AJ-D700 DVCPRO ENG camcorder; AJ-D750 DVCPRO studio VTR; DVCPRO SMART-CART; POSTBOX Version 2.0 software upgrade; A6-EZ1U DV-Cam camcorder; AJ-D300 D-3 camcorder; AJ-D360 D-3 studio VTR; AQ-23W 16:9/4:3 portable digital camera; LQ-D5500 digital optical video recorder; AQ-235W 16:9/4:3 all-digital studio camera; AJ-D580 D-5 digital component VTR; AG-EZ1 DV ultra-compact camcorder; AG-DP800 SUPERCAM S-VHS camcorder; AG-DS550 S-VHS VCR; AQ-20D broadcast digital processing camera; WV-F565 3-CCD FIT camera; WV-E550 box-type 3-CCD camera; FASTEDIT S-VHS editing system; MDA-1 R-DAT recorder; SV-3800 DAT recorder; and SX-1 audio console.
Circle (912) on Action Card

Pandora International S 3343
Enhanced color processors; telecine control systems; tape-to-tape color processor systems; electronic cursor generators.
Circle (913) on Action Card

Parallax Graphics Systems L 9584
Videographics, paint, animation software including digital compositing, effects and sequence editing; digital ink and paint software system.
Circle (914) on Action Card

Parkervision, Inc. S1464
CameraMan camera product line features include 12x or 16x zoom lens option, gen-lock capability, high-resolution 1/2" 3-CCD with 720 TV lines, software inteface to control multiple cameras.
Circle (915) on Action Card

Peerless Sales Company L 8458
Monitor/TV wall and ceiling mounts; floor stands for TVs and VCRs; speaker stands.
Circle (916) on Action Card

Penny & Giles R 2323
Signal controls, faders, linear, rotary motorized series; T-bar controls; precision controllers.
Circle (917) on Action Card

Penta Laboratories S 2370
Electron transmission tubes for radio and TV broadcast.
Circle (918) on Action Card

PEP L 8000
Videotape editing products; digital recorder, player cart replacement.
Circle (919) on Action Card

PESA Switching Systems L10844
Jaguar A/V digital/analog router, 64x64 matrix in 6RU package, Win 3300 controller; Win 3300 model 3300 control system and user-interface software; updated version for full-feature control of all PESA routers; Novell network control software for switcher operation from computer connected to Novell network; PVC3000 telephone interface; RM4000, RM5000, Lynx series, Cougar series audio/video routing switchers; Bobcat A/V analog digital router; RCP control panels; DAs.
Circle (920) on Action Card

P E Photron S 2335
Digital disk array; video frame capture box; advanced chroma-key software.
Circle (921) on Action Card

Philips Components L9300
Plumbicon camera tubes; Vidicons; Newsvidicons; CCD sensors; CCD camera modules.
Circle (922) on Action Card

Philips TV Test Equipment L9300
PM 5639/01 color analyzer, PM 5639/02 auto color alignment; PM 5655M VITS generator and inserter; plus a wide range of analog and digital test equipment for broadcast, production applications.
Circle (923) on Action Card

Pinnacle Micro S 2012
Apex 4.6GB optical drive; FCD 5020 recordable CD media.
Circle (924) on Action Card

Pinnacle Systems L 9157
StudioPak for Alladin software upgrade adds effects and functions; other new desktop video tools will be announced.
Circle (925) on Action Card

Pioneer New Media Technologies L10457
MPEG-2 encoder; Digital LD hybrid video library system; Video Browse server; CAC-V5000 500 CD audio disk changer; commercial insertion system; fast file stills and clips presentation; DVD technology demo; RM-V4000V multiscan video cube wall system.
Circle (926) on Action Card

Pixel Instruments S 2624
DS4200 serial digital synchronizer, proc amp; AD3100 audio time compressor, expander, pitch shifter; TC3100 digital audio transcoder; AD3000, FD1900, FD2900 audio delay products; DA300 distribution amp for S/P digital video.
Circle (927) on Action Card

Pixel Power Ltd S 1618
Collage character generator combining high performance, CG, paint and still store capabilities.
Circle (928) on Action Card

Play S 2606
Trinity video production systems.
Circle (929) on Action Card

Potomac Instruments R 1917
Field-intensity meters; audio test equipment; antenna monitors; transmitter remote-control equipment.
Circle (930) on Action Card

Premier Wireless S 1961
BE-500 high-power wireless video system; BE-400 diversity receiver wireless system.
Circle (931) on Action Card

Prime Image L 5852
Audio/video delays with no data compression with independent delays to 30s; standards converters that reduce anomalies 2-to-1 and can pass the same standard in and out; TBCs, synchronizers; desktop video standards converters, TBC/synchronizer boards; Xpon component and C-Sync full-frame synchronizer/TBCs transcoder between YUV, YRB, T/C and composite signals.
Circle (932) on Action Card

Pro-Bel Ltd. L 8269
6664/6665 fiber-optic link using Eurocard transmitter receivers for serial digital video standards 143-360Mb/s on typical cables; 5015 digital audio compressor/limiter tailors signal characteristics to suite program material; TM32 series routers, analog and digital systems to 32x32; XD digital routers to 360Mb serial digital, synchronous AES/EBU digital audio; TX-220 digital master control switcher; Compass playout and SNAP multichannel playout automation systems; MAPP disk-server media manager system; Procion workbench PC control system.
Circle (933) on Action Card

Prodelin Corporation R 2326
RF transmission feedline products.
Circle (934) on Action Card

Production Garden Library L 6062
Production music libraries; Tune Ranch library; "In Your Face" tracks; new collection of rock and urban CDs; Manchester music library.
Circle (935) on Action Card

Professional Label Inc. L 6262
Label Producer for Windows; DAT labels; new label colors, D-1, D-2, D-3 labels; CD labeling; status label sheets.
Circle (936) on Action Card

Professional Sound Corporation R 1411-2
PSC Power Station reghargeable battery pack; phone hybrid, phone tap; Press Bridge; Press Train; RF multiradio mic antenna DA; M4A+ portable audio mixer; VDB carbon fiber boom poles.
Circle (937) on Action Card

Promax Technology M 5242
Jaz disk arrays for video editing, DTV 2 and 5GB; NT disk arrays for video editing, DTV 4 to 54GB.
Circle (938) on Action Card

Promusic S 2816-7
Music libraries, including Water, eMu; 150 new CD releases in various libraries; Abaco Music now available on TuneBuilder search program.
Circle (939) on Action Card

ProSource L 5345
Scriptboy II, wireless time-code system; Shade/FX lightweight matte box; D.O.F.I. raster screen, monitor enhancer; Formatt professional 4x4 filters; ENG/EFP broadcast cameras, monitors; lenses; tripods; batteries; transport cases; lighting/grip, related location/field supplies.
Circle (940) on Action Card

Proxima Corporation M 4573
LCD panels, desktop projectors.
Circle (941) on Action Card

Pulizzi Engineering L 8067
IPC 3200 series power control and conditioning system with local or remote control via RS-232 port; triple noise protection, EMI/RFI filtering, spike and surge protection.
Circle (942) on Action Card

QSI Systems L 8352
Model 908 multiple image inserter; 908TMP multiple inserter with time and temperature display; 808 single-image inserter.
Circle (943) on Action Card

Q-TV L 5556
Line of ComputerPrompter software and on-camera teleprompter cuing equipment; Software: QCP LT, QCP Mark I, QCP Mark II IBM/PC-compatible; CueMac software for Macintosh; custom software for news and production; closed-captioning, international fonts, other features; FDP-9 flat panel 9", 12" to 17" models for studio, remote locations; Executive Speech Prompter for public speaking.
Circle (944) on Action Card

Quanta/Dynatech Video Group L10013
See Dynatech Video Group.
Circle (945) on Action Card

Quantegy S 3313
New digital video (DV) tape for DCT systems; Digital Betacam (DBC) tape; comprehensive line of video media; audio for video options in media; data media for workstation back-up.
Circle (946) on Action Card

Quantel L 9329
New features and facilities for many Quantel products will be introduced; Editbox true non-linear, non-compressed, on-line editing system; Henry complete visual effects editor; Domino digital film-editing system; Paintbox Express, Graphic Painbox 2 graphics systems; Hal Express complete video graphic suite; Clipbox video server networks multiple Newbox news editors with interface to newsroom automation computer and Picturebox Express still-store.
Circle (947) on Action Card

Quickset L 6815
Low-profile electromechanical pan/tilt QPT90; miniature electromechanical pan/tilt QPT15; Jupiter fluid head and tripod system.
Circle (948) on Action Card

QuVIS S 3323
QuB itintelligent video recorder (IVR) high-quality digital video recorder for the broadcast and computer graphics industries.
Circle (949) on Action Card

Radamec Broadcast Systems L 7147
TCP touch control panel with shot storage, recall from touchscreen monitor, displays montage of frame-grabbed shots for 8 cameras; RP4 pedestal drive unit for full XY control; RP2 robotic studio provides full remote control of floor position, height, pan, tilt, zoom and focus; Virtual Scenario Studio system, true VR without a supercomputer has full-bandwidth virtual backgrounds processed in real time for greater realism; pan/tilt heads.
Circle (950) on Action Card

Radio Design Labs R 3423
Stick-On additions: ST-CX1S subwoofer, ST-CX1S woofer, ST-CX1F full-range crossovers; ST-NG1 noise generator; ST-STM2X switched mic pre-amp; Rack-Up additions; RU-OSC4A sequencing oscillator; RU-SX4 balanced audio switch; RU-SC1 serial converter; RCS4 remote channel selector; RU-VCA1, RU-VCA1D digitally controlled attenuators; RLC2 remote level control; RU-SQ6 power up/down sequencer; TX-1W music-on-hold amplifier.
Circle (951) on Action Card

Radio Systems R 3008
Audio mixers; telephone interfaces; digital and analog clocks; audio DAs; digital delivery system.
Circle (952) on Action Card

Radius L 9777
Video monitors, presentation products; graphics software.
Circle (953) on Action Card

RAM Broadcast R 3514
Audio consoles, including SS9500 series and SS9320XL series.
Circle (954) on Action Card

Ramsa Audio/Panasonic L10000
Professional audio mixers, monitors; R-DAT systems with RS-422 control.
Circle (955) on Action Card

Rank Cintel L 6344
Analog flying spot, all-digital and HDTV telecine systems.
Circle (956) on Action Card

Rapid Technology S 3161
MultiMedia Xpress (MMX) dual-stream PCI-based Motion-JPEG board combines full broadcast video and audio to 10Mb/s and 48kHz with compression rates below 3:1; Vistor 4:2:2 component digital disk recorder; StudioXpress EISA plug-in card for real-time Motion-JPEG optimized for 50/60 field compression.
Circle (957) on Action Card

Raytheon/Semiconductors S 1641
TMC 22x5y family of digital video decoders; TMC2360 VGA to video encoder; TMC2490 set-top video encoder.
Circle (958) on Action Card

RCI Systems Inc. S 2823
A/V wall plates, panels; active/passive audio mult. boxes; cable tester; video mult. box and custom silk-screening services.
Circle (959) on Action Card

R-Columbia Products L 6844
World Class intercom/talkback system, expandable from 4-400 stations; telephone coupler interface ties any intercom system to telco lines; boom mic intercom headphones with single or double ear types; ultralight boom mic headset; 2-channel beltpack remote intercom station; wireless intercom headphone with 1-mile range.
Circle (960) on Action Card

RE America S 1627
PALPlus, SDH/SONET options for RE3400/4500 video codecs; RE660 series MPEG Layer II audio codecs; RE8930 linear PCM audio/data/voice codec; RE532/RE533 RDS/RBDS encoders for FM broadcast, paging.
Circle (961) on Action Card

Rees Associates L 8340
Facility business plan for broadcasting and production facilities.
Circle (962) on Action Card

Research Technology Int'l./RTI L 7144
Pro Line videotape evaluators, recyclers for Betacam SP, Digital Betacam, D-3, MII, U-matic, S-VHS cassettes and instrumentation or data tape systems; magnetic media degaussers.
Circle (963) on Action Card

RFdesign

RF Design magazine L 5207, M 1965

RF Plante Ind Com R 1626
AM, FM transmitter systems.
Circle (964) on Action Card

RF Technology L10869
ACL series heterodyne links 1.2-16GHz; UPL series transmitters 1.2-16GHz; ACR series ENG central receive systems; SNG-60/140DT C-/Ku-band analog/digital satellite system; D-series portable transmitters, receivers; SVX series analog/digital satellite modulators, exciters, upconverters; Central Receive remote-control system.
Circle (965) on Action Card

RGB Computer & Video M 5048
Desktop video editing system.
Circle (966) on Action Card

RGB Spectrum S 2249
Superview 100, video windowing system; RGB/Videolink 1700 D-1 video scan converter.
Circle (967) on Action Card

Richardson Electronics L 7004
Power transmitting tubes, UHF power devices, power tetrodes.
Circle (968) on Action Card

The Rip-Tie Company S 1933
Rip-Tie Velcro CableWrap, Velcro CableCatch, Lite and WrapStrap cable management products.
Circle (969) on Action Card

Mark Roberts Motion Control S 2276
Flair motion control computer; Milo portable motion control system, a multi-axis rig, rigid for live-action shooting, with CGI interface for easy input of coordinate data.
Circle (970) on Action Card

Rohn L10310
Antenna-mounting spine for HDTV; turnkey installation worldwide service; steel ISO container shelters completely outfitted.
Circle (971) on Action Card

Roland Corporation R 1215
Audio workstations; audio announcement recorder; antifeedback processor; 3-D sound processor.
Circle (972) on Action Card

Rorke Data S 2322
Max-Array 16 and 32GB PCI storage arrays; V-Mod 100 stand-alone digital VTR; rack-array rack-mounted PCI arrays; recordable-CD for SGI, MAC, Windows.
Circle (973) on Action Card

Rosco Labs L 5731
Lighting modification and control materials; chroma-key paint, material.
Circle (974) on Action Card

Ross Video L11013
CDK 104 component digital keyer, 4-input 10-bit CCIR-601 keyer; VPA-7020 video proc amp; RSA-7806 remote gain stereo correction amp; SCA-7556 stereo correction amp; CMA-8012 composite monitoring amp; RVS series production switchers, including enhanced border generator option; video, audio and digital video distribution products.
Circle (975) on Action Card

RT-SET/United Studios of Israel L 10700
Will be exhibiting in Chryon booth; Developer, marketer, integrator of 3-D computerized Virtual Studio Systems for broadcasting market; turnkey solutions include hardware, software, installation,

training, system support; Larus system enables real-time integration of live actors with 3-D virtual sets during live-to-air program shooting; Otus system for live-to-tape and remote operation.
Circle (976) on Action Card

Rules Service Company R 4000
FCC rules, regulations published monthly in loose-leaf and computer formats; copyright, patent, trademark rules.
Circle (977) on Action Card

Rycote Mic Windshields R 1818
Wind-attenuation devices over foam windscreens; system consists of windshield, suspension, high wind cover and windjammer for 10dB greater protection; Softies slip-on covers.
Circle (978) on Action Card

Sachtler L11016
Camera support, pan/tilt and tripod products; lighting equipment.
Circle (979) on Action Card

SADiE R 1223
Octavia modular digital editor; SADiE mobile field recorder; Sascia ATM networking; SADiE 3 workstation software; Timesynch software for syncing dailies; SADiE portable digital editor.
Circle (980) on Action Card

Sandar Electronics R 3324
Video router with 64x64 6RU or 32x32 3RU configurations; audio router 32x32 3RU; 16x16 and 32x32 140 and 270Mb/s routers; systems to 300MHz bandwidth; audio conference system; software for PC router control.
Circle (981) on Action Card

Sanders Media Adventures/C MAC M 3937
Active video filters for multichannel set-top and workstations; expanded line of NTSC/PAL CCIR-601, broadcast and low-cost filters; also Y, C, Y/C and composite outputs for RF VTRs.
Circle (982) on Action Card

Sanix Corporation L 7144
Bulk tape eraser using capacitive discharge concept; models 3800, 4800, 6000.
Circle (983) on Action Card

Sanken/Developing Technologies L 9383-4
CSS-5 shotgun stereo microphone; COS-11 lavalier microphone.
Circle (984) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

SATELLITE COMMUNICATIONS

Satellite Communications magazine L 5207, M 1965

Scala Electronic L 8362
Antennas and accessories for FM and TV broadcasting.
Circle (985) on Action Card

ScheduALL by Visual Inc. L11071
ScheduALL facility management for Windows with facility scheduling, personnel management, project management, bidding, library/labeling, invoicing and production reporting modules.
Circle (986) on Action Card

Scientific-Atlanta L 5812
Satellite communications equipment, earth station antennas, video receivers, antenna controllers; MPEG-based digital video compression system.
Circle (987) on Action Card

Scitex Digital Video (Abekas) L 6058
Titler with multiple attributes per character, Postscript Level II, imports TIFFs; scalable server; real-time, 10-bit disk recorder; multichannel, multi-user recorder; component digital switcher; effects system.
Circle (988) on Action Card

Scitex Digital Video (ImMix) L10163
Non-linear on-line editing, production.
Circle (989) on Action Card

Sennheiser Electric L 6948
Headphone, microphone and wireless RF products; large diaphragm cardioid condenser mic.
Circle (990) on Action Card

Shereff Systems L 8177
TV graphics composer.
Circle (991) on Action Card

Shively Labs L 5304
MMDS antennas in slot and waveguide styles; LP UHF TV antennas; model 6832 LP broadband antenna; low- to high-power FM antennas.
Circle (992) on Action Card

Shook Electronics O H 101
Model A-48T EXP expanding side production trailer engineered using Ikegami HK-377 cameras; GVG 3000 switcher; model A16-EXP ENG/EFP expanding side production truck on GMC TopKick chassis, fully functional, all composite system supporting 6 cameras; A-48T production trailer; A-11 ENG/ENG/microwave van.
Circle (993) on Action Card

Shotmaker Dollies/Camera Platforms L11049
Camera support equipment, camera dollies, remote head crane, mini crane; portable motion control system.
Circle (994) on Action Card

Shure Brothers L 5312
SCM 810 automatic mixer; SCM 800 manual mixer; LX wireless microphone systems; Beta series wired microphones.
Circle (995) on Action Card

Siemens Audio Inc. L 6819
Neve audio mixing systems; Mitsubishi digital audio recorders; AMS mics, automated mixers, workstations; Siemens analog, digital routers.
Circle (996) on Action Card

Sierra Automated Systems R 4026
SAS 64000 audio routing switcher, high-performance microprocessor-based audio switching system from broadcast installations, uses LSI technology for extreme high-density of 256x256 cross-points per frame.
Circle (997) on Action Card

Sierra Design Labs S 2606
Open architecture QuickFrame family of component digital video disk recorders, combining SCSI disk arrays with DDR interface for economical uncompressed video storage solutions; 2-48 minutes storage times; SCSI-framer departmental workstation server; NFS-compliant network file server; introducing large-scale server solutions for complete production/broadcast facilities.
Circle (998) on Action Card

Sierra Video Systems L10549
Mirage serial digital 4:2:2 10-bit image compositing system, wireless mouse control plus motion tracking; BetaKey analog component video keyer; Ponderosa series 64x64 or 144x144 analog audio and video router; Shasta series serial digital video and audio routers, 8x8 to 32x32; Manzanita, Sierra, Tahoe familes of small, medium routers.
Circle (999) on Action Card

Sigma Designs M 4766
REALmagic Producer MPEG authoring system for multimedia CD-ROM titles, includes all necessities to turn a PC into a full-featured multimedia authoring workstation; includes frame-accurate VTR control, real-time video previewer; drivers for Windows 95.
Circle (1000) on Action Card

Sigma Electronics L 9768
Series 9600 large routing systems; series 2100 digital video routing, distribution and test; modem control software (MCP) for routing switchers.
Circle (1001) on Action Card

Silicon Graphics L 9170
Graphics supercomputer platforms; on-line support, training, industry information service; network servers.
Circle (1002) on Action Card

Sira Sistemi Radio srl L 8362
Antennas and accessories for TV and FM broadcasting.
Circle (1003) on Action Card

SMPTE L 8440
Professional organization.
Circle (1004) on Action Card

Snell & Wilcox L 8849
MPEG-2 test, measurement products; compression pre- and post-processing devices; modular solutions for digital interfacing; compact, low-cost HDTV upconverter; digital aspect ratio conversion; Magic DaVE DVE; five new standards converters with digital output; three new noise reducers.
Circle (1005) on Action Card

SoftTouch S 1870
Test tape; closed-caption display and recovery product, closed-caption encoder.
Circle (1006) on Action Card

Solid State Logic R 2311
Axiom digital production system can be specified to fit a facility's working needs, with integral multitrack hard-disk DiskTrack recorder/editor; Axiom Preparation Station for simple, efficient recording and playback of audio to DiskTrack before mixing on Axiom digital console; Omni-Mix Surround Sound A/V system for optimum levels of creative control and audio imaging in surround sound; Scenaria A/V production system for efficient working with Cycle-based automation, fader trim, autoglide; SL 8000 GB on-air production and multitrack mixing console; Audio Preparation Station.
Circle (1007) on Action Card

Solidyne R 2825
Distributor, audio products.
Circle (1008) on Action Card

Sonic Solutions M 3830
Digital video disk solution includes MPEG-2 encoding and AC3 multichannel audio encoding in networked authoring environment; MediaNet 1.5 includes family of PCI-based client and server nodes that address NFS and IP encapsulation for audio, video and multimedia networking; SS-105 premastering system; audio utility NN-100 NoNoise sound restoration system.
Circle (1009) on Action Card

Sony Electronics/Business & Professional L 5828
DVW-250 portable VTR; BVP-500 studio, BVP-550 portable cameras; DLE-100 clipper; DNE-300 non-linear news editor; BZA-8100 transmission management software; LMS cache; DME-7000 multichannel digital multi-effects; DMK-7000 stand-alone multichannel digital DSK; FXE-120 effects editing system; UVW-100BL Becacam SP camcoder; DXC-3727B 3-chip dockable camera system; UVW-100B 3-chip camcorder; BVM-14E1E 14" evergreen display evaluation monitor; BVM-14E5U 14" evergreen stand-alone evaluation monitor; DSC-1024 digital scan converter; SMS-10P monitor speaker with integral amplifier; VideoStore new features include WAN capability, increase channels the system can playout, playout commercials at two resolutions, provide increased video quality through an expansion board, embedded clip identification; dedicated RS-232 port and vertical interval closed-caption board.
Circle (1010) on Action Card

Sony Recording Media L 5828
DARS-MP metal particle audiotape for DTRS format.
Circle (1011) on Action Card

Sound Ideas L 5847, S 2937
Production music, effects libraries; Turner Entertainment SFX library; Hanna-Barbara Lost Treasures SFX CD.
Circle (1012) on Action Card

Sound Technology L 8431
Audio system analyzers.
Circle (1013) on Action Card

Soundscape Digital Technology M 4760
Hard-disk recording systems with all standard DAW functions.
Circle (1014) on Action Card

Spencer Technologies S 1024
SS-2000 still-store video server for NTSC/PAL including database, linear and chroma-keyer, logo generation, DVE, graphics generator, LAN networkable; Dynastore digital disk-based video clip-store for random access to video bumpers, commercials, IDs, promos, NTSC/PAL.
Circle (1015) on Action Card

Sprague Magnetics R 1721
Tape head, DAT head reconditioning; hard, floppy and optical drive repairs; computer/audio DAT drive repair; computer and audio accessories.
Circle (1016) on Action Card

Sprocket Digital L 6660
VTR audio interface; multistandard digital serial transceiver; reticle generator.
Circle (1017) on Action Card

Staco Energy Products R 2325
Voltage regulators, power conditioners, UPS systems; SVR series 1-í voltage regulators rated 2.5-15kVA, single-knob voltage setting with microprocessor control; redesigned AVR, MVR regulators, PLC, MLC power conditioners; UPS series True-On-Line 10kVA 1-í, 12-75kVA 3-í.
Circle (1018) on Action Card

Stainless L 5212
Complete tower design, fabrication, erection, modification and maintenance; inspections and structural analysis of existing towers, full-service field operations for antenna installations, repairs, regular tower maintenance.
Circle (1019) on Action Card

Standard Communication L 9983
Control access module, complete on-site, off-side control of all satellite receiver functions; international satellite receiver; SMATV/CATV, special network receiver; VSB AM TV modulator.
Circle (1020) on Action Card

Stanton-Video Services Unltd. L 9283-4
Camera support products including Jimmy Jib III and accessories.
Circle (1021) on Action Card

Steenbeck S 1875
Instant acccess digital video recorder using removable magneto-optical disks; studio-quality film-to-video transfer, 24-side holoscope, shipping case.
Circle (1022) on Action Card

Ste-Man L 7680
Distributor, U.S. source for PAG batteries.
Circle (1023) on Action Card

Storage Concepts S 2558
New family of digital video storage systems using new Fibre Channel and Ultra-SCSI standards; 40MB/s transfer rates in the post-production marketplace; Videoplex, video-on-demand servers for real-time output with record and playback times from 6 hours to 160 hours at 1.6Mb/s transfer rate.
Circle (1024) on Action Card

Storeel L10303
Room Stretcher tape storage line for maximum-density storage for small formats; Rail Rider system provides single-entry access in narrow depths; Stor-Max system for double-entry access in lengths from 3'-18' without raised flooring or motors.
Circle (1025) on Action Card

Strand Lighting L 5552
Lighting fixtures, control products.
Circle (1026) on Action Card

Studer International 7116
DigiMedia '95 compact broadcast system with modular system expansion for CD-Jukeboxes, hard disk and other devices.
Circle (1027) on Action Card

Studio Technologies R 3308
StudioComm central controller, control console, accessories; model 750 audio mixer; Studio Tools DAW accessories. DAs, IFB Plus series cuing systems.
Circle (1028) on Action Card

Sumitomo Electric L 7978
Multichannel video displays.
Circle (1029) on Action Card

Sundance Digital S 2925-6
FASTBREAK digital spot playback system for use with Tektronix Profile, ASC VR, Drastic Technologies VVCR; StationMaster broadcast automation software.
Circle (1030) on Action Card

Superior Electric R 3912
Electronic, electrical control equipment; power-protection equipment; uninterruptible power supplies, power conditioners, transient suppressors, RFI filters; voltage regulators; AC disturbance monitors.
Circle (1031) on Action Card

Superscope Technologies/Marantz R 2927
CDR620 CD recorder; IS5022, IS5021 digital sound processors; VPS 200 video presentation system; PMD 350 combination CD player/tape deck; portable audio presentation products.
Circle (1032) on Action Card

Sure Shot Teleproductions L10471
Ku-, C-band transportable earth stations; production facilities and transportable equipment.
Circle (1033) on Action Card

Svetlana Electron Devices R 1123
Quality power tubes manufactured in Russia's largest power tube factory; numerous 3CX, 4CX, 5CX series products and a growing list of other devices.
Circle (1034) on Action Card

Swintek Enterprises L 5228
Intercom products; full-duplex transceiver; base, 20-channel full-duplex remote systems.
Circle (1035) on Action Card

Switchcraft R 3320
Audio patch panels; TTPP96 jack panel; MT52 patch panel.
Circle (1036) on Action Card

SWR Inc. L 5328
RF feedline products; broadband TV, FM antennas; field engineering service; MMDS antennas.
Circle (1037) on Action Card

Symetrix R 1511
610 broadcast audio delay designed for live or taped talk shows, elminates comments with 7.5s delay stored in memory, Dump Profanity button drops unwanted audio from the memory.
Circle (1038) on Action Card

Synclavier R 3417
Digital audio production equipment.
Circle (1039) on Action Card

SyntheSys Research S 1267
DVA184 digital video analyzers with jitter insertion and measurement, event log, auto print; BA400 bit-error analysis system, digital interfacing for bit-accurate evaluation at rates to 400Mb/s.
Circle (1040) on Action Card

Systems Wireless L 7983
Representatives for Clear-Com, Premier, Lectrosonics; Wireless mics, headsets, IFB, video and Clear-Com intercom systems; Letrosonics UHF synthe-

sized wireless mic; triversity system by Premier.
Circle (1041) on Action Card

Tally Display Corporation **L11078, S 1615**
FLD-6 video detector; BCD encoder; up/down timer/counter; Slim Line LED displays; L-bracket for Slim Line displays; face plate for rack-mount LED displays.
Circle (1042) on Action Card

TAO Media Systems **S 1964**
Editizer 3.1; Internet information management software.
Circle (1043) on Action Card

Target Technology **S 1027**
2x16 video reference switcher; 16x1 video/stereo audio monitoring switcher in 1RU with integral power amplifier; high-density modular audio DA with 16 outputs.
Circle (1044) on Action Card

Target Vision **M 4045**
Introducing TVI desktop messaging systems, multimedia networks; TVI subscription services; TVI VCR interface.
Circle (1045) on Action Card

TASCAM **L 8226**
M-2600 Mk II and M-5000 audio consoles; DA-88 digital multitrack, DA-30 Mk II DAT, DA-P1 portable DAT recorders.
Circle (1046) on Action Card

Taurus Communications Inc. **L 8284, S 1612**
Full-service telecommunications services.
Circle (1047) on Action Card

Techflex **L10564**
FLEXO expandable sleeving products for bundling and protecting camera cabling, lighting wiring and other harness applications.
Circle (1048) on Action Card

Techni-Tool **L 7870-1**
Source for Tektronix, Fluke products; also fiber optics, field service, rework, connect, interconnect equipment; service chemicals, service control.
Circle (1049) on Action Card

TECNEC/Technical Necessities **L 6162**
Patch panels for S-VHS, composite video, balanced and unbalanced audio; camera to CCU and VTR cables for Sony, Panasonic, JVC, Ikegami, Hitachi; video/audio DAs and routers; blackburst and time-code generators, test equipment; PC-based CG; TecNec Power CG; 1996 catalog.
Circle (1050) on Action Card

Technosystem SpA **L 4645**
Mod TTU44-UC 40kW IOT, Mod STU-35 5kW solid-state UHF TV transmitters; Mod STV-41 10kW solid-state VHF TV transmitter.
Circle (1051) on Action Card

Tekniche Ltd. **L 8221**
Enhancements for linear and motion-compensated Cyrus Prime standards converters; additions to Genesis 6000 modular interface, digital multiplexers, demultiplexers, fiber-optic drivers, receivers, digital encoders, decoders, frame synchronizers; TACS technical assessment and control monitoring, control system conforming to SMPTE 273 SMDP.
Circle (1052) on Action Card

Tekskil Industries **L10463**
EasyView Pro; View Mate; QuickView 9" prompter; View Manager; Prompt Wizard; ClearView 12" prompter.
Circle (1053) on Action Card

Tektronix **L 9313**
WFM601M serial component monitor; VM101 PAL video measurement set; AM700 audio measurement set with color display; 2715 cable TV spectrum analyzer.
Circle (1054) on Action Card

Telecast Fiber Systems **L 5856**
Adder digital fiber-optic audio/comm/control snake; TX/RX 259 fiber-optic digital video module set.
Circle (1055) on Action Card

Telemetrics **L10372**
Camera remote-control systems; triax, coax and FO camera control systems; high-performance pan/tilt systems; weatherproof robotic camera systems; motorized linear horizontal and vertical positioning systems; teleconferencing (TC) equipment, distance learning; permanent on-site installations; transportable, self-contained TC systems; classroom TC design and integration.
Circle (1056) on Action Card

Telepak San Diego **L 8680**
Line of carrying cases and bags; tripod bags, multipurpose, utility bags and others.
Circle (1057) on Action Card

Telescript **L10838**
Monitor prompting systems with 9-17" monitors, flat-panel display with mounting systems for camera or public speaking; PC desktop, laptop and stand-alone or remote; closed-captioning systems.
Circle (1058) on Action Card

Television Engineering **L 6331**
Design and assembly of ENG mobile units; IFB system; mast-mounted camera control unit.
Circle (1059) on Action Card

Television Equipment Associates **L 7030-1**
Matthey Electronics digital interface, distribution products; ADC-3011, DAC-3021 10-bit A/D, D/A converters; SER-3031 parallel-to-serial, DES-3041 serial-to-parallel converters; SDA-3052 reclocking, SDA-3051 non-clocking digital distribution amps; DEM-3071 embedder, DEX-3072 extractor for digital audio.
Circle (1060) on Action Card

Telex Communications **L10863**
RTS 803 master station; Windows Keypanel; ENG500/UT 500; KP-12; line monitor speakers; beltpacks; wireless mic systems; antenna splitters; RTS ADAM CS digital matrix frame for small facilities, mobile vans, new member of ADAM family.
Circle (1061) on Action Card

Telos Systems **R 4023**
Enhancements to Zephyr ISDN codecs.
Circle (1062) on Action Card

Tel-test **L 6033**
Automation products, master control switchers; air channel control automation.
Circle (1063) on Action Card

TEM/Tecnologie Eletronniche Milano **R 3419**
Introducing solid-state UHF/VHF amplifiers rated 30W-1kW; SlimLine analog microwave links for all frequency bands; portable links for all microwave bands; solid-state FM transmitters rated 20W-1kW.
Circle (1064) on Action Card

Tennaplex Systems **L 8362**
Broadcast antenna products for FM, TV, HDTV offering omnidirectional and custom patterns.
Circle (1065) on Action Card

Tentel Corporation **L 5220**
Betacam Maintenance Package with instrument test set to perform various critical mechanical setups for DVW, BVW, PVW and UVW Sony transports; PVW training program.
Circle (1066) on Action Card

Texscan MSI **S 1644**
Video titling generator; digital commercial insertion system.
Circle (1067) on Action Card

TFT Inc. **R 3002**
EAS 911 emergency alert system encoder/decoder with 2 audio inputs, RS-232 digital I/O; EAS 941 remote-control/status board for multiple studio control of EAS 911; EAS 940 program/transmitter interrupt unit; EAS 930 multimodule receiver with chassis, power supply AM/FM/7-channel NOAA weather radio receiver modules; model 8900 reciter STL receiver exciter.
Circle (1068) on Action Card

Theatre Crafts International-TCI magazine **L 5207, M 1965**

Theatre Service & Supply **L 5846**
New fabrics for studio cyclorama curtains; Porza velour with flame-proof treatment, improved dynamic stability; Empire velour of flame-resistant polyester; both recommended for areas experiencing high humidity; available in black and several colors.
Circle (1069) on Action Card

Thermodyne International **L 6631**
Equipment transport cases.
Circle (1070) on Action Card

Thomcast France **L 7109**
Tube or solid-state technology radio, TV transmission equipment; 10W-240kW VHF and UHF TV; 30W-10kW FM radio; 5kW-2MW AM radio; DAB transmitters and systems; radio, TV antennas; worldwide design, installation, maintenance program.
Circle (1071) on Action Card

Thomson Broadcast **L 7109**
Sportcam configuration transforms the 1657 into

a "multifunction" camera; No. 1657 split-head camera compact ENG/EFP system; Extended 9000 series vision mixers; 9200 1 M/E post-production; 9250 1 M/E digital production mixer with 24 inputs; 9300 2 M/E digital mixer; 9500 2.5 M/E digital production mixer with 42 inputs; Evolution interface; DBI 2000 audio/video analog to digital standards conversion; Pixtore graphics system shown with Getris Images; Pro-Cart automated playout/record cart system; DBE 2110 MPEG-2 TV service encoder; DBX 2200 MPEG-2 remultiplexer; DBS 2910 MPEG channel controller; DBT 2600 telecom network adapter; DBM 2310 QPSK satellite modulator; DigiThom family TER8522 single TV codec, TER 8523 for compressed, single TV program transmission.

Circle (1072) on Action Card

Thomson Tubes Electroniques — L 5331

RF power devices for all broadcast applications; introducing TH610 Diacrode; air-cooled tube for UHF amplification in 10kW combined configuration.

Circle (1073) on Action Card

3dbm — R 2826

Lower-power TV transmitters.

Circle (1074) on Action Card

360 Systems — R 1605

ShortCut is a stand-alone digital audio call-in editor; Instant Replay instant access audio player; DigiCart/II random-access digital audio recorder.

Circle (1075) on Action Card

Tiernan Comm — S 2453

MPEG-2 encoders, decoders for DVB-compliant digital video transmission with single video, four audio and two data channels to 15Mb/s; TDR7 IRD adapts for access control and advanced VBI processing at variable rates from 1 to 60Mb/s.

Circle (1076) on Action Card

Tiffen Manufacturing — L 8835

Matte boxes; warm polarizing filters; light modification filters.

Circle (1077) on Action Card

TimeLine — R 1226

MMR-8 modular multitrack recorder replaces current magnetic dubbers with magneto-optical or hard-disk storage; Studioframe Ver. 6.20 digital audio workstation software upgrade; MicroLynx MC-1.34 software upgrade for SMPTE, MIDI time code synchronizer to lock recording multiple audio/video transports, workstations, MIDI devices; Lynx-2 V700-11 software upgrade for post-production machine synchronizer control over unlimited audio, video and film transports.

Circle (1078) on Action Card

Toko America — L 4653

VAST-p transportable communication system with live, store-and-forward full-motion video, audio transmission over Inmarsat A/B, ISDN/Accunet/T1, telephone, cellular, Ku/C/X-band communication channels.

Circle (1079) on Action Card

Torpey Controls & Engineering — L10952

All-digital display operating from SMPTE, ESE, DQS, Leitch codes; 1", 4" LED digital displays; master clock drivers, impulse clocks, count up/down timers.

Circle (1080) on Action Card

Toshiba Corporation — L 5744

Digital SNG/LINK systems; HDTV products, CCD cameras, VCRs, picture computers, FO transmission equipment; NTSC/PAL CCD cameras; Hi-8 cameras, camcorders; desktop video production equipment.

Circle (1081) on Action Card

Transvideo USA — L 7680

LCOM06, LCM06 monitors using flat-panel displays available for all standards and formats; 10" monitor with composite NTSC, PAL, digital serial 270Mb/s, VGA inputs with 640H/480V resolution.

Circle (1082) on Action Card

TreeTop Systems — S3340

TreeTop camera elevating tower and robotics system is a remote-controlled lift-and-shoot rig consists of three modular parts: telescoping tower, robotic pan/tilt head and command control center, reaches max. elevation of 21 feet in 30 seconds.

Circle (1083) on Action Card

TRF Production Music Libraries — L 6462

Production music libraries.

Circle (1084) on Action Card

Troll Technology

Products will be displayed at Microwave Radio and Wescam booths; TouchStar's TS-1705 17" rack-mounted touchscreen controller displays four sites simultaneously; TS-1480 6U rack height controller with built-in CPU, features MapConTroll software; portable Troll Track receive antenna system.

Circle (1085) on Action Card

Trompeter Electronics — L 7007

BNC connectors; patching, distribution products.

Circle (1086) on Action Card

Tron-Tek — M 3954

Cost-effective remotely controlled TowerCam for broadcast use, traffic monitoring, weather watch, disaster reporting, repeater.

Circle (1087) on Action Card

Truevision — M 4650

Targa 2000 Pro integrated digital video production engine for PCI-based Apple Power Macintosh computers; Targa 1000 desktop multimedia editing system for Windows NT.

Circle (1088) on Action Card

27th Dimension Inc. — L 5546

Production music libraries.

Circle (1089) on Action Card

TWR Lighting — R 3903

Tower lighting products.

Circle (1090) on Action Card

Ultech — S 1974

Analog, digital VBI data encoders for closed-captioning, XDS, teletext, custom data including foreign language subtitles, open captions; ghost-canceling reference generator for microwave/ENG, cable; TV/video trigger for oscilloscopes.

Circle (1091) on Action Card

Ultimatte Corporation — L 8365

Plug-ins for Adobe After Effects, Discreet Logic Flame; Ultimatte-8 digital 4:4:4 image compositing system with Smart Fill screen correction frame selection.

Circle (1092) on Action Card

Union Connector — L 6360

2P+G 3-pin studio lighting connectors; DistroBox portable power distribution box for studios, locations; RackBox EIA rack-size power distribution units with digital metering and line protection for audio use.

Circle (1093) on Action Card

UniSet Corporation — L 5225

Studio furnishings, sets.

Circle (1094) on Action Card

United Ad Label — L 7975

Betacart labels; Ink jet printer-compatible labels; audiocassette and CD packaging; Videocassette packaging.

Circle (1095) on Action Card

United Media — L10321

On-Line Express non-linear production system integrated post-production random-access digital editing system; MVS duo editor Windows-based A/B roll editor with total software control for Pinnacle Alladin.

Circle (1096) on Action Card

United States Broadcast — L10715

Used equipment source; batteries.

Circle (1097) on Action Card

U S Tape & Label — R 1717

Labels, promotional products.

Circle (1098) on Action Card

Utility Tower — R 1900

Tower products and services for AM, FM, TV, microwave and other communications.

Circle (1099) on Action Card

Valentino Production Music — L 6832

Additions to music and sound effects audio CD libraries; debut of CD-ROM music and effects libraries.

Circle (1100) on Action Card

VEAM — L 7872

Electrical connectors, multipin products; A/V FO products.

Circle (1101) on Action Card

Veetronix Inc./Reach — L 6744

Push-button and panel switches, illuminated, non-illuminated types; hermetically sealed; keycaps in various styles and colors.

Circle (1102) on Action Card

Vela Research — M 3835

Centaur third-generation encoder compresses raw video to MPEG-1 or MPEG-2 datastreams; EISA-2, PCI bus decoder boards for NTSC/PAL studio-quality MPEG-2 decoding capability with closed-captioning support to extract user data fields; SCSI-2 single-board audio/video decoder; Pyxis encoder supports MPEG-1 enhanced SIF, MPEG-2 1/2 D-1 environments.

Circle (1103) on Action Card

Vertex Communications — S 2038

Design, engineering, earth station antennas and components; tracking control systems; turnkey installations, site testing, maintenance services.

Circle (1104) on Action Card

Victory Battery Company **L 6846**
Battery products.
Circle (1105) on Action Card

VidCAD Documentation Programs **L 8476**
Demonstrating VidCAD Ver. 7.0 design and documentation software for communications engineers.
Circle (1106) on Action Card

Video Accessory **L 5227**
Small video and audio routing switchers in the VAC Brick package; manual switches are 4x1 while automatic signal-sensing switches are 2x1, they can be configured for audio-follow-video and larger numbers of inputs.
Circle (1107) on Action Card

Video Associates Labs **S 4026**
Video keying, capture devices.
Circle (1108) on Action Card

Video Data Systems **S 2030**
Automated text/message systems emergency alert CG; closed-caption CG.
Circle (1109) on Action Card

Videoquip Research **R 3823**
Signal routing switchers, distribution products.
Circle (1110) on Action Card

Videc Int'l. Development **L 8672**
MNR 320 median filter/video noise reducer; ADS 601 analog-to-digital serial 601 converter; DTC 4600MV motion vector standards converter.
Circle (1111) on Action Card

VideoLab Para Technologies **L10572**
Time code processors, generators, readers for LTC, VITC code; VTR retrofits allows address track time code capability.
Circle (1112) on Action Card

Videomagnetics Inc. **L10307**
Refurbished video/audio heads for 1" C format Ampex, Sony, Hitachi; 2" heads for quad machines; manual, belt degaussers for high-density metal tape; refurbished lower scanner for 1" Sony BVH VTR; refurbished upper drum assemblies for Sony BVM-60, -65, -70, -75.
Circle (1113) on Action Card

Videomedia **L10538**
OZ-PCE digital ver. 4.0, EQ-digital video production systems with hybrid non-linear video editing tools; ver 3.1 with VDI-virtual device interface control for Alladin, EDL management, Pro-III keyboard; EdiQit EQ-300 multisource CMX/GVG-style editing; Express CX universal signal device controller, Super "T" transmitter for 32-bit applications; V-LAN CM remote-control software; V-lan control network for remote assignment, control of devices from multiple workstations; Strassner editing controllers.
Circle (1114) on Action Card

Videonics **M 3839**
Powerscript character generator with postscript capabilities, comprehensive feature mix; available as standalone or network.
Circle (1115) on Action Card

Video Systems magazine
L 5207, M 1965

Videotek **L 8231**
SDC-101 digital color corrector; RCU-102 remote-control unit for SDC-101; VTM-100 TV signal monitor; DM-145 154-channel, agile cable-ready demodulator; DM-154 154-channel, agile cable-ready demodulator; VSG-204D digital sync and test generator; combo waveform/vector monitors; video production switchers; synchronizers; sync, timing equipment; signal generators; stereo audio DA; audio program monitors.
Circle (1116) on Action Card

Videssence **L 5459**
Upgrades to Studio 2000 series SRGB lighting; modular lighting series; Vid-Lite studio and location products.
Circle (1117) on Action Card

Viewgraphics **L 4643**
Dataview SDA model 50, 51; analog input modules for Viewstore 6000; View Manager graphical I/O software utilities; programmable video to/from RGB conversion module model SDA-RGB.
Circle (1118) on Action Card

Vinten Broadcast/TSM **L10329**
Autocam camera automation system featuring SP-2000/X-Y servo pedestal and HS-2010 MH servo pan/tilt head; camera support equipment featuring Quartz 2-stage and single-stage studio pedestals; Esprey Elite Studio/OB 2-stage pedestal and Vector 70 pan/tilt head.
Circle (1119) on Action Card

Vistek Electronics **L 8500**
VEGA V4701 standards converter; MV-630 and MV-310 single-channel codecs; MV-660, MV-330 MPEG-2 transmission encoders, decoders; TV345 ETSI codecs, 45Mb/s version, compatible with T3 circuits, also 8Mb/s for digital SNG; V4238, V4228 digital composite encoders, decoders; V1600 digital interface products with frame synchronizer module; third-generation digital router in 32x32 or 64x64 frames with SDDI serial digital data interface; SX164 16x4 compact digital router; Vector VMC standards converter, Autotran automation system; D8001 4:4:4 digital production switcher; D2401P digital master control switcher;
Circle (1120) on Action Card

VYVX National Video Network **L10157**
Switched fiber-optic TV transmission services.
Circle (1121) on Action Card

Ward-Beck Systems **L10300**
Renaissance series radio consoles; M405P portable extended range VU meter; D8212 audio DAs.
Circle (1122) on Action Card

Weather Central **S 3330**
Liveline Genesis; MetLine with satellite-delivered data.
Circle (1123) on Action Card

Wegener Communications **L11033**
Digital video compression products, including MPEG-2 decoder, MPEG-1 IRD, MPEG-1 encoder, MPEG-2 audio workstation; digital video file server.
Circle (1124) on Action Card

Wescam Systems International **L 5041, S 2035**
Helicopter, aircraft camera support systems; installation on all types of moving vehicles and cranes.
Circle (1125) on Action Card

West Penn Wire/CDT **S 2824**
RGB sync coax 3-4-5, RGB sync coax plenum-type connectors for RGB cables; miniature 75V coax, PVC, plenum types in colors; Tri-shield coax; Aquaseal moisture-resistant coax.
Circle (1126) on Action Card

The F J Westcott Company **L10984**
Westcott Box with accessory kits, attaches to

lights with speed rings; collapsible Illuminator Plus backgrounds 6'x7' with 7' apron; 52" Illuminator reflectors in three metallic finishes; 48"x72" Illuminator reflector with sunlight/white finish; muslin diagonal background series in earth, light gray, sky blue, aurora.

Circle (1127) on Action Card

Wheatstone Corporation **R 1211**

TV-600 series of TV audio consoles; D-500 digital audio console; SP-4 production console; SP-8 TV audio console; MR-40 production console; 8400 stereo DA.

Circle (1128) on Action Card

Will-Burt **L 8580**

Electromechanical telescoping masts with height to 38 feet; NightScan Chief elevated lighting system for nighttime ENG operation.

Circle (1129) on Action Card

Winsted Corporation **M 6825, M 4027**

Digital Desks for linear, non-linear editing systems, with corner consoles, low-boy racks under the work surface; Plexiglas doors; 22" wide system/85 rack bays; fabric side panels and tops.

Circle (1130) on Action Card

Wireworks **L 8443**

Introducing TE-3+ combination audio and video cable tester; X series cable assemblies.

Circle (1131) on Action Card

Whirlwind/US Audio **L 5541**

Audio mixers, MIX5-SB 4-channel mixer; audio, video cabling, distribution products; transformers.

Circle (1132) on Action Card

Wohler Technologies **L 8566**

In-rack self-powered 1RU speaker system; alarm system identifying error condition and location; analog and AES digital level meters; analog and digital audio router.

Circle (1133) on Action Card

Wolf Coach **L10617**

The Power Truck satellite uplink; Wolf Pac compact self-contained ENG system; The Super Power Truck for SNG or production; a new ENG product will be introduced.

Circle (1134) on Action Card

WORLD BROADCAST News

World Broadcast News magazine **L 5207, M 1965**

WSI **L10883**

Featuring WEATHERspectrum 9000 workstation, merging color art and animation with advanced feature forecasting; introducing WORLDscape, 3-D weather graphics, animation; operating on Silicon Graphics for fly-through view of weather.

Circle (1135) on Action Card

Yale Electronics **L 8683**

Distributors; components; racks; panel, cable connectors.

Circle (1136) on Action Card

Yamaha Music **R 1805**

Audio mixers; DMC 1000 digital automated recording console; YPDR 601 compact disc recorder.

Circle (1137) on Action Card

Yamashita Engineering Mfgr./YEM **M 4023**

EDC-3000 line doubler; EDC-4000 line quadrupler; EDTV, HDTV products.

Circle (1138) on Action Card

Zack Electronics **M 4551**

Distributor for Amphenol, Erem, Neutrik, Ideal Industries, Tektronix, Cooper Tools, Switchcraft.

Circle (1139) on Action Card

Zaxcom **L 8482**

ARRIA; DMX1000 digital audio consoles; full line of TBC controls, machine control systems.

Circle (1140) on Action Card

ZERO Stantron **L 6336**

Design Consoles engineered for durability and to make the user's life easy, in two sizes that include a monitor bridge with tabletop, cable raceway, angular positioning and other accessories; CAB/Cad design software bay-by-bay design methodology with auto selection of doors, panels, sides, integral logic, accessories.

Circle (1141) on Action Card

Colored listings indicate issue advertisers. See page 306 for the page location of their ad.

The GALLERY

The GALLERY

By Anthony Cuomo

Telemetrics' TM-CPS control system

Camera robotics systems are continuing to gain in popularity throughout the broadcast industry. As engineers and producers continue to look for creative ways to enhance camera coverage, camera robotics systems are being employed in a greater number of venues. Just flip through the line-up of morning news/talk programs and you'll see robotic cameras providing feeds from the tops of skyscrapers and on major highways and bridges being controlled from remote studios using IR links, telephone modems, etc.

In addition to providing camera shots from obscure locations, camera robotics systems provide a high level of efficiency inside studios. Multiple camera systems can be operated by a single person and effectively reduce overhead; and they can be programmed to save camera angles and setup adjustments for frequently used programming sequences. What's more, they have proven to be highly reliable. When considering the attributes, it's easy to see why more broadcasters are complementing their traditional camera configurations with the addition of remote-controlled robotic cameras.

The system

Today's robotic pan/tilt and trolley systems offer an increased range of movement with smaller, quieter components and increased camera payloads. The increased levels of physical camera movement have resulted in the need for extended camera robotics control capabilities — an area where there has been significant developments over the past few years at Telemetrics for two specific reasons: the use of serial control (RS-232) and the increased processing power of PCs for multitasking operations.

The company has developed a new camera robotics software system called Telemetrics Control Panel Software (TM-CPS), which is plug-compatible with the company's line of camera robotics systems.

TM-CPS delivers fully integrated programmable camera control, robotics control and video switching capabilities from a single PC. By employing a touchscreen graphical user interface (GUI), the software provides simple control of all camera preset shots, robotic positional control via joysticks, video switching and peripheral operation. To maximize ease of use, all system functions can be operated through the company's TM-LCDP color liquid crystal display panel or with a mouse on a standard PC.

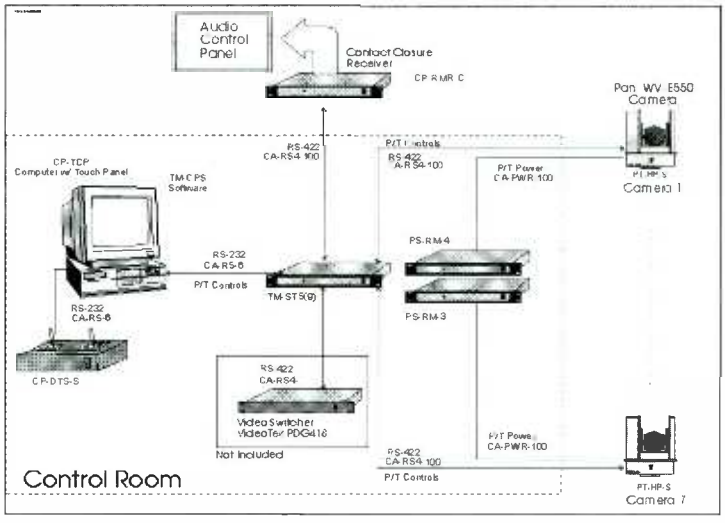


Figure 1. Telemetrics' TM-CPS and camera robotics systems have been successfully deployed to simplify live coverage of state and local government proceedings.

The operator can view real-time camera program and preview images. The live images can be processed from NTSC or PAL sources in composite, component or RGB formats. Still video preset images can be captured for each camera in the system and displayed using the software's integral video frame grabber. For completely centralized operations, all of the real-time and still video images can be simultaneously viewed on a single PC display. By consolidating robotics and switching controls, TM-CPS reduces the need for costly and redundant control room monitors.

The software also provides extensive camera setup capabilities with the ability to store an unlimited number of different camera settings for instant recall. Camera positions and shot assignments can also be preprogrammed and stored in memory, virtually eliminating camera setup time when shooting regularly scheduled productions, such as the news.

TM-CPS is comprised of four application modules, including robotics control display, set/preset display, camera control display and video display. The modular configuration allows customization of the software to meet specific applications.

Display functions

The software features a proportional "video joystick" that controls pan/tilt, zoom (in/out) and focus (near/far) for simple remote operation. In addition, robotics motion control and environmental housing functions (washer, wiper, heater) can also be controlled with the software. The camera presets and shot-angle positions can be stored and instantly recalled with the touch of a button or the click of a mouse.

An unlimited number of camera preset positions can be programmed into memory for instant recall and setup. The number of presets is limited only by the memory capacity of the host computer.

The software also includes a "Wait List" indicator that lets the system operator know when someone is ready to speak so that the appropriate camera can be selected for viewing in the preview or program mode. The set/preset display incorporates a room layout module to assist in camera setup and robotics control programming, enabling the system operator to precisely plot robotic camera movements for specific set layouts.

A camera control window provides a visual display of the selected camera's remote-control panel. It displays camera setup functions, including menu, shutter speed, gain, detail, audio white balance, gain, iris, pedestal and more. CCU functions for specific manufacturers' cameras can be emulated by the software to deliver a high degree of control and functionality.

Both program and preview windows feature real-time video displays. Twelve camera preset positions can be simultaneously displayed on the screen as still video images with the maximum number of images limited only by the host computer's storage capacity. The status of the preset screens is annotated by a 2-color border that clearly indicates when a shot has been stored (red border) and when a shot has been selected (green border). A "Quad" display mode also allows four real-time video images to be displayed simultaneously.

Application versatility

Telemetric's camera robotics systems have been successfully employed for numerous applications, including multicamera studios, the broadcast of government proceedings, teleconferencing, interactive learning (distance learning), court TV and traffic-monitoring systems.

For studio applications, the robotics systems allow a single operator to control multiple cameras and switch video sources from a single PC. Up to 40 cameras can be accommodated in a system with an unlimited number of camera presets. This allows camera operators to store camera angles, focal ranges and camera setup information for frequently used production formats.

The camera robotics systems are also used to record and broadcast state- and local-level public proceedings. A TM-CPS system has been designed to broadcast state and local level public proceedings (See Figure 1). The 6-camera system has been customized with an optional room layout control module that provides control over camera position, camera paint controls and video switching.

With 20 prewired microphone speaking platforms, TM-CPS has been configured to automatically highlight activated microphones with a red circle, allowing the operator to easily identify and select the appropriate camera presets and video sources.

In this system, two methods are provided for camera selection. The first method allows the system operator to select the camera source by simply selecting the highlighted microphone, automatically activating the preset camera. With the second method, the operator selects the camera and then the microphone location for that camera to shoot. In either case, all camera shots can be preset and tied directly to specific microphone locations for ease of operation.

Court TV has become one of the fastest-growing phenomenon in the United States. Telemetrics' robotics systems have been at the core of two of the most highly publicized trials in U.S. history: the Menendez brothers and O.J. Simpson. In both instances, the robotics systems were employed to provide the video feeds for the myriad of international broadcast carriers covering the trial.

On a more practical level, Telemetrics has camera robotics systems designed specifically for outdoor applications, such as traffic and weather monitoring (See Figure 2). In addition, these weatherproof systems have also been used by major broadcasters to provide perspective shots, such as the system that's mounted above New York City's Rockefeller Center Ice Skating Rink used by NBC's "Today" show.

Telemetrics' camera robotics and software control capabilities provide broadcasters with a new level of system functionality and efficiency. The increased level of system programmability greatly simplifies operation, minimizes setup time, requires a minimal amount of studio space and offers a high degree of efficiency. ■

Anthony Cuomo is general manager for Telemetrics, Mahwah, NJ.

For more information on submitting an Applied Technology article, contact Carrie Poland, technology reports editor: phone: 913-967-1740; fax: 913-967-1905; E-mail: be@intertec.com.

For more information on Telemetrics' TM-CPS control system, circle (330) on Action Card.

See Telemetrics at NAB Booth L 10372

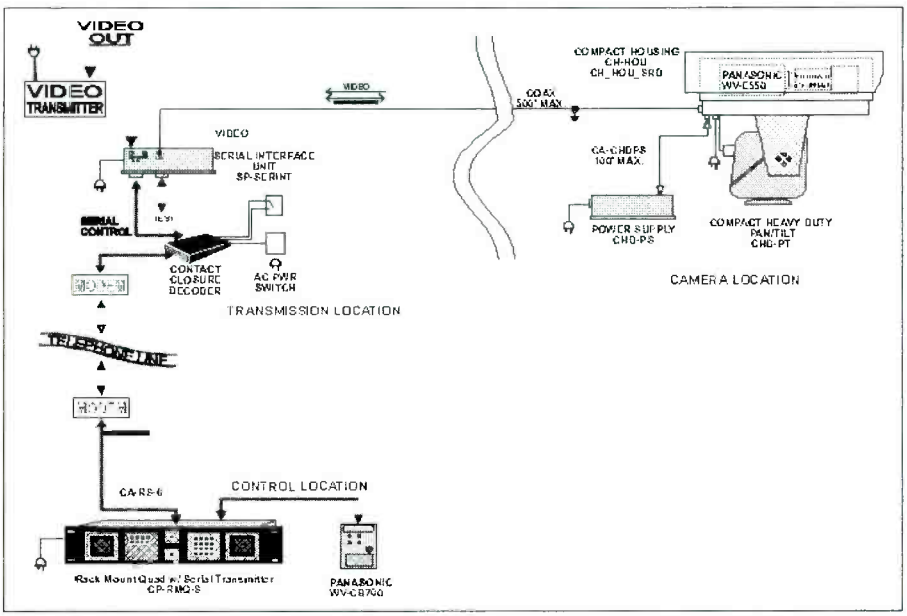


Figure 2. Telemetrics offers a series of camera robotics systems designed specifically for outdoor applications, such as monitoring traffic.

By Jeff Comer

ETC's Ensemble Gold

The best way to fully understand the term multilinear is to review non-linear and traditional linear editing's roles in the evolution of the multilinear concept. Non-linear editing generally includes the following capabilities:

- Random access to video clips;
- A time-line on which you can arrange segments and events; and
- The ability to arrange these clips and then rearrange them in a timely (near immediate) basis.

Most systems also include some type of video transition generator (some real-time, some not).

Non-linear systems often are primarily picture-based for making clip or segment selection and are generally self-contained packages; some using proprietary video cards, others using off-the-shelf cards.

Traditional linear editing techniques, interestingly enough, share many of the same capabilities of non-linear systems. Unfortunately, many of these features have only been available on a handful of upper-end edit controllers. Editing Technologies Corporation's (ETC) new technology offers these high-performance features on a PC platform, thus reducing the cost dramatically.

Where does multilinear fit into this equation, and how is it different from any other non-linear system? The first goal was to eliminate the disadvantages inherent in non-linear systems. These included having to record and predigitize all source footage, being locked into one type of digital recording that might not be up to the quality standards necessary for on-line, not being able to do real-time effects and having to use only those effects available as built-ins in the system, not being able to use external switchers, not being able to "roll in" other devices (DDRs, VTRs, DVEs, etc.) and access to only one source at a time.

As a response to these non-linear deficiencies, ETC has developed a multilinear editing system, Ensemble Gold. After almost two years in development, the first systems were shipped during the fall of 1995. These systems are currently on-line and are successfully producing daily news and information programs.

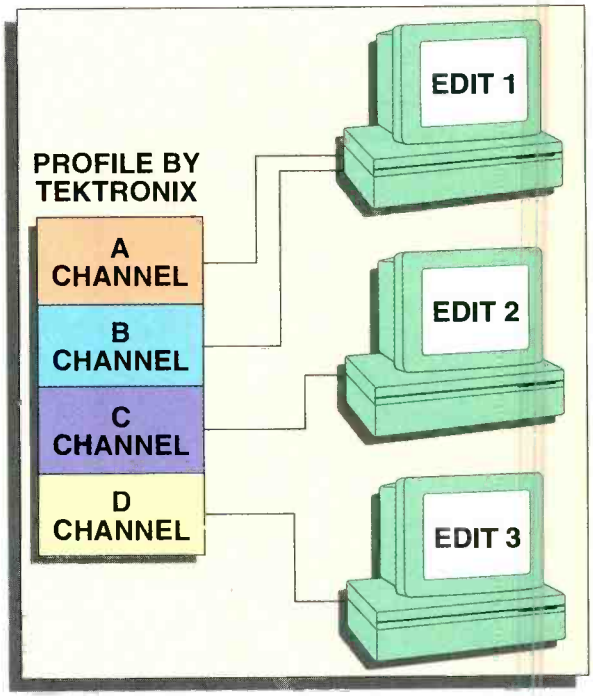


Figure 2. Depicted here is a non-linear editing network by Editing Technologies Corporation using Profile by Tektronix and the Ensemble Gold. It has two channels for A B on-line and two channels, one each, for two cuts-only suites. All three suites can work independently and access material as needed. Each system is configured to use specific channels as needed.

System configuration

The basic system includes a custom keyboard laid out in the traditional manner; a jog/shuttle control panel with function keys and slide faders, two ETC control cards for the control of external devices, a breakout box for use with the control cards and all of the necessary software (See Figure 1). To this configuration is added an industrial-grade rack-mount computer and a digital disk recorder (DDR) system to complete the non-linear editing system.

The first systems shipped were configured for use with the Tektronix Profile DDR (See Figure 2). Over the next several months, additional external and internal DDR solutions will be added. The system uses either internal or external effects units (video switcher, DVE, CG) for transitions or effects. Some DDRs, such as the Tektronix Profile, have an available built-in effects card, and there are PC-card video switchers that can provide various effects as a built-in device. Drivers for most of the popular effects devices are included in the system.

The Ensemble Gold software package includes all of the built-in software necessary to drive advanced features of current production/post-production switchers. Supported features include all effects, as well as effects memory functions and level settings for color generators, key clip levels and pattern positions. Four general-purpose in-

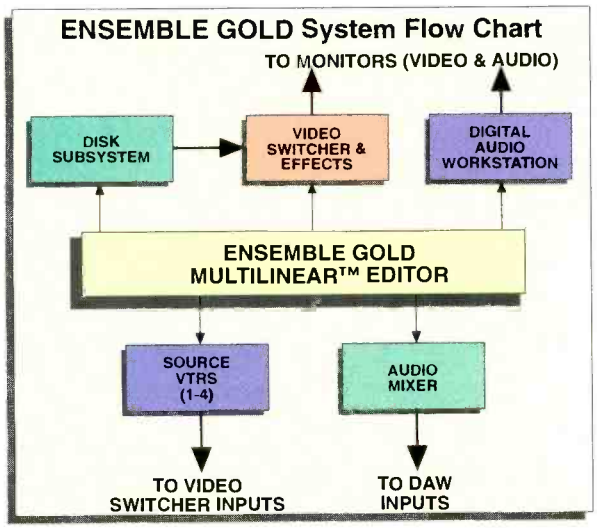


Figure 1. Basic system layout of a typical Ensemble Gold system.

Traditional linear editing techniques, interestingly enough, share many of the same capabilities of non-linear systems.

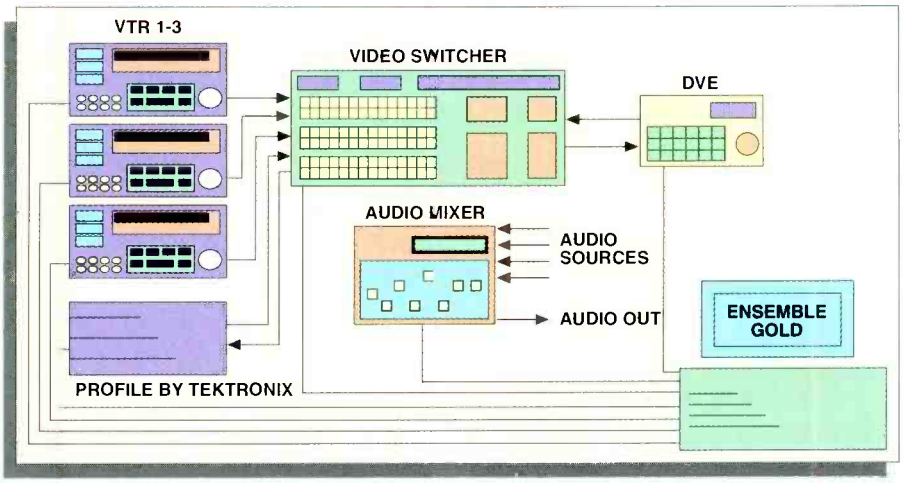


Figure 3. By incorporating the Ensemble Gold, this linear system has been expanded to include non-linear along with linear in one complete package. This system is using all external devices for DVE switching and audio, while the Tektronix Profile is providing digital betacam quality.

terfaces (GPIs), which can be used in conjunction with most video switchers, are included. The product also supports Pinnacle's Aladdin and the Newtek Toaster.

Since one of the unique features of the multilinear approach to non-linear editing is the ability to roll-in additional source footage, all of the current software needed for multiple machine control is included. A serial port for control of TBC/proc-amp setting is provided, as well as the protocol to control settings directly in many digital VTRs. Serial control of an external audio mixer is also included as a standard feature.

System operations

With the software included in the package, the operator has the ability to edit in a non-linear, hybrid or linear mode (See Figure 3). In a non-linear or predigitized system, the operator relies on source footage that was previously "loaded" into the system's HD storage. Ensemble Gold's multilinear system allows for this batch-type loading easily. However, an editor often needs additional footage or he or she may not have the additional time needed to preload and digitize. To accommodate this need, the system was implemented with the ability to roll source footage directly into the non-linear environment. Footage does not have to be prerecorded on the hard drive for the operator to preview an event. Footage committed to the hard drive is easily accessed randomly as a clip, all of which is done automatically as the operator moves through the editing process.

Once the source footage is on the hard drive, either by roll-ins, predigitization or any combination, the operator is free to add effects, move clips or groups of clips from place to place and generally continue in a non-linear mode until the project is completed.

While working in a non-linear mode, operators should be aware that changes in transitions, special effects and character generation are all done in a real-time "as needed" mode. Multilinear allows control of external switchers, DVEs or other devices in a completely non-linear environment.

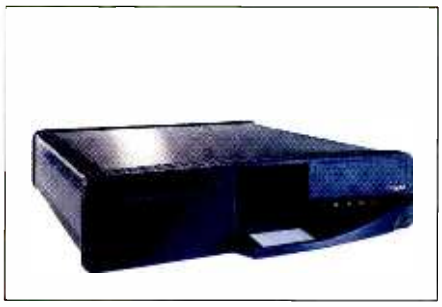
Editors do not have to compromise on effects just to gain the advantages of non-linear editing. They can use their existing high-quality switcher or effects system as a real-time device while still in a non-linear mode.

After the completion of a project on the system, it can be easily downloaded to another medium or a complete EDL can be exported for auto assembly of a master reel in a linear mode. All of this can be done with the software and hardware included with the system. ■

Jeff Comer is vice president, sales and marketing for Editing Technologies Corporation, Moorpark, CA.

By Gary Krohe and James M. Hébert

QuVIS's QuBit intelligent video recorder



The broadcast industry's digital revolution is now in its third decade. The promise of high-speed processors and creative software applications that are easy-to-use and lower in cost has spawned a dozen industries within the TV industry. The companies leading this new wave of innovative technology are not the ones that enjoyed success in the days of all-analog video. In their places are new companies creating exciting products for 2-D and 3-D animation, nonlinear editing, digital video effects and advanced audio editing — all designed for the next generation of broadcast professionals.

These new products require that we develop a more intelligent way of thinking about video recording and storage. The term intelligent video recorder (IVR) is a new approach from QuVIS. The IVR is QuBit, a high-quality digital video recorder for the broadcast and computer graphics industries. It records, plays and archives video data for broadcast professionals and computer animators, as well as medical imaging specialists, multimedia producers, industrial designers, architectural firms and MIS operators.

High-quality video recording

Cameras and computer graphics equipment can produce video signals that have greater bandwidth and less noise than current video decks are able to record. QuBit's specs can outperform today's studio cameras. It has the ability to cleanly and accurately record what the camera sees and to maintain this quality during playback, editing or processing. It also moves high-quality audio and video information easily between the analog and digital domains.

The D-1 VTR is a standard in the broadcast industry today and its digital video quality is regarded as lossless. The term 4:2:2 is used to describe the sampling rate of a D-1 VTR. The video signal contains luminance, which provides detail, and chrominance, which provides color. Because the human visual system is more responsive to the former, luminance is often sampled at a higher rate than chrominance. In D-1, the luminance channel of the signal is sampled at four times 3.375MHz (13.5MHz), while the chrominance is separated into two channels sampled at two times 3.375MHz (6.75MHz). Hence, 4:2:2.

We can improve on the 4:2:2 standard by specifying that the QuBit has greater sampling capability. The chief benefit of this is that the tape deck and media now become even more transparent in the video signal chain. Each generation is a clone of the original. By raising the sampling rate for all three signals to 20.25MHz, we can improve the accuracy and color fidelity of the recorded data, resulting in a 6:6:6 digital signal.

Of course, not all users need to record a 6:6:6 signal. You may only want to match the resolution of the other formats in use at your facility or that your client specifies, for compatibility. The QuBit can vary its channel sampling in steps of 2.25MHz and accept extended bandwidth input from 6.75MHz to 20.25MHz (8- to 12-bit resolution). In fact, you can mix and match the sampling rate of each channel independently, resulting in such combinations as 4:1:1, 4:2:2, 4:4:4, 6:3:3, 6:6:6 and others. A 6:6:6 signal retains more data during subsequent playback, editing or processing. With 4:2:2 considered lossless, 6:6:6 is much more lossless.

Above photo: The sweeping front panel shows QuVIS' straightforward design philosophy of simple elegance: basic VTR transport controls on the right, advanced control via the touchpad and LCD monitor in the center and easy tape access on the left.

Don't forget the alpha channel

A video switcher uses an electronically created key channel to cut a hole out of one video source and mix it with imagery from another. Three inputs are needed for this visual effect: the main video source, the inserted video source and the keyhole source (essentially a linear key signal, which computer animators call an alpha channel). In the studio, producers who do not have the flexibility of using real-time animation tools use another tape source to develop a synchronous linear key signal with which to composite. The QuBit is designed to record and play back the alpha channel as an integral part of the video signal. For video work, this feature alone will add a whole new bag of tricks to real-time on-line compositing.

Computer graphics artists work with the same three sources when they composite animated material with live-action footage. The primary difference is that the computer must work with one frame at a time rather than all of them in real-time. The computer artist uses the three input sources as if they were three separate sequences of individual images. Using 3-D software, the artist can merge these image sequences together, resulting in a seamless combination of live-action and computer-generated imagery. Examples of this include scenes of a live-action astronaut piloting a computer-animated starship or a live-action hero battling a computer-animated mythical creature. In order to achieve this union of the real and surreal, the animator needs an alpha channel.

QuBit can record a 4:4:4:4 signal, where the fourth "4" is the alpha channel. Channel configurations, such as 4:2:2:4, 4:4:4:4 and even 6:6:6:6, are possible (each channel is independently configurable), permitting maximum quality when retrieving imagery from the system. Images can be composited in the animation package and written to the system in one pass for playback as soon as the rendering is completed. The time savings alone can allow an animator to experiment or correct rendering errors. If the animator and production facility employ the system for video capture, transfer and render, then the resulting footage will be of much higher quality than can be achieved using conventional methods. This makes chroma-keying simpler because of the greater versatility video producers have in the recorded signal itself.

The system offers computer users frame grabbing, clip grabbing, frame buffering and single-frame control capabilities. The dual nature of it means that any video recorded by QuBit is already an image sequence when accessed via computer. Graphic artists can bypass the sequential-image capture process and immediately begin working with video. The system can also serve as a standard tape-based computer network file backup.

Data reduction

The sheer amount of data that the QuBit has to handle in processing a signal sampled as high as 6:6:6:6 is a technical challenge in digital video processing. Techniques for data reduction achieve compression ratios of about 3:1 by employing data truncation, which can generate objectionable patterned artifacts, visible loss of detail, aliasing and other undesirable side effects, making current compression schemes less than ideal for video production. The 8x8 blocks that DCT-based systems employ handle high-information content images poorly; fast-moving video imagery, such as fire, explosions, waterfalls and waves, are a challenge.

The system, however, makes use of a proprietary video compression technique based

on statistical transform coding (we call it STORM coding) that provides numerous advantages to the video user over DCT-based compression systems. STORM is not based on block-type reduction. It treats video data not as a series of samples, but as continuous information, enabling the system to surpass conventional compression techniques in the following ways:

- Typically achieves higher lossless compression ratios;
- Achieves higher lossy compression ratios at a given S/N ratio;
- Provides a broader range of acceptable lossy compression with less-objectionable artifacts and produces much less objectionable artifacts in lossy compression modes than do DCT-based methods;
- Can support intrafield and interfield modes of operation;
- Allows manipulation of video signal characteristics; and
- Can operate at high data/pixel rates.

accommodate several hours of recorded material. Also, they can use the tape drive for material that will be archived for future projects or delivered out of house and record up to two hours of broadcast-quality video on a single removable cartridge.

With the system's capacity, you can record full-bandwidth video directly from the camera. For video professionals who have had to resort to live camera shoots in order to maintain clean edges on chroma-keys, this means razor-sharp chroma-keying — from tape. It also has noise reduction and frequency-dependent non-linear contrast and color correction capabilities built-in.

The system records either NTSC or PAL video along with four channels of audio at either CD or DAT sampling rates. Complex setup operations can be performed simply from an on-screen menu system (visible on the built-in monitor screen and on a monitor output). The unit supports variable speed bidirectional playback for motion effects and a high-speed search mode to make the job of locating edit points faster and easier. There are industry-standard connections for the broadcast industry (composite, Y/C, component BNC, Betacam, serial digital, XLR audio, XLR time code) and the computer graphics community (Ethernet 100-base-T, SCSI II, serial port), as well as the company's new connector for 4-channel video and audio signals. A modular internal design allows for expansion and upgrades. ■

QuBit's rear panel allows a user to hook up to a variety of broadcast equipment, as well as to computer workstations.

QuBit's S/N ratio and bandwidth can be set to be higher than today's commercially available studio cameras.

Real-time to disk or tape

To support high-quality recording, an alpha channel and superior compression, the system requires a more flexible and open architecture than other digital VTRs. Onboard, you'll find a video DSP, an audio DSP and a high-performance general-purpose computer. These provide third parties with the ability to use the system to convert between standards, generate audio or video effects, pull frames into a 3-D package for compositing or test and evaluate other equipment in your facility.

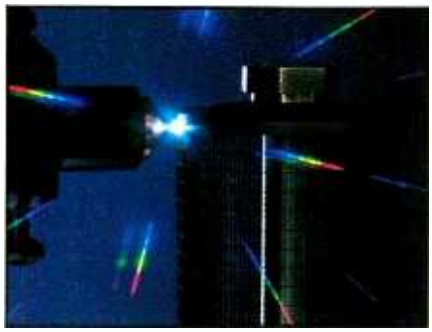
QuBit employs a built-in tape drive and an internal hard disk. Each can record video in real-time (depending on the quality setting you select, higher sampling rates may require use of the hard drive). Users are able to store about an hour of on-line, random-access video on the internal disk drive or increase the number of internal drives to

Gary Krohe is chief engineer at KMCI-TV, and James M. Hébert is a columnist for VTU magazine.

For more information on submitting an Applied Technology article, contact Carrie Poland, technology reports editor: phone: 913-967-1740; fax: 913-967-1905; E-mail: be@intertec.com.

By Robert Hunter

Genesis Microchip's DICE video line doubler



The noise was colossal, yet my hearing was unaffected. That's how I felt while watching a recent hockey game on the tube. The referees' shirts "moiréd" into circular, squiggly lines competing across his chest; stair-step "jaggies" climbed down hockey sticks. All of this was happening while the ice blinked and flickered at me throughout the game. In sum, the *visual noise* I witnessed began as simply irritating...and it soon became deafening.

Some of this irritation is caused by video *interlacing*, and viewers don't have to put up with these visual artifacts any longer. Technological innovation now provides an improved method of painting a better video picture.

The art of noise

First, some background. Interlacing is the process of separating one video frame into two fields for display on a TV screen. An NTSC television has 525 horizontal lines and displays all of the odd-numbered lines (a field) in one pass, then all of the even-numbered lines (another field) in a second run. This swapping back and forth is occurring 60 times per second and your eyes notice it as *flickering*. It also happens in the PAL world, where half of 625 interlaced lines are exchanged on screen 50 times per second.

As two fields of video information are screaming for your attention, the fallout from this struggle can be some of the noise just described. Mind you, interlacing is not necessarily the criminal here, just an accomplice.

Interlacing was created as a means of limiting TV bandwidth and cost, while providing a higher apparent resolution (suitable for the environment 50 years ago). Today's electronic circuitry moves a lot faster, and display technologies have evolved to the point of handling more information content than the NTSC/PAL system can provide. Remember your blurry vision from spending hours in front of the first PC monitors? The early Commodores, Amigas and CGA displays were all interlaced displays.

Today, generating high-quality video images is the work of *progressive scan* display devices. A *non-interlaced* computer monitor is the perfect example of this technology, where all of the lines of video information are presented in one pass. Typical SVGA monitors display 600 to 768 lines. Additional lines, plus a higher *vertical refresh rate* (the rate at which the screen image is redrawn, typically 70Hz-80Hz), adds up to an increase in video information being presented — while crisper, more stable images with hardly any visible flicker are produced.

Benefits of de-interlacing

The world is full of interlaced video images that can benefit from being presented in a progressive scan environment. Equipment using this method includes large-screen televisions, video walls, projection systems, video-in-a-window workstations, as well as some consumer-level products. The non-interlaced list is growing quickly because people are learning that images can look sharper and more stable — if they are first *de-interlaced*.

De-interlacing is the means of converting an interlaced video image into a progressive scan picture. Because an interlaced field is missing half of the image content (an interlaced field shows only odd or even lines at a time), absent lines are invented by plugging in video information from neighboring lines and fields. De-interlacing gets its nickname "line doubling" from this process. Interlacing artifacts can be produced when image processing occurs, so de-interlacing is critical when high-quality video is desired.

Several de-interlacing methods exist, including field merging (see Figure 1); line replication (see Figure 2); temporal and vertical filtering (see Figure 3); and motion adaptation. I'll stay away from the details of each method — that's beyond the scope of this article — but I will say that the first two processes typically produce artifacts on screen. The more sophisticated de-interlacing methods apply filtering, with the third method, temporal and vertical filtering, producing the best value. Motion adaptation, which uses vertical and temporal processing, is the most expensive method and is prone to failure at times.

It should be noted that the quality of all video is only as good as its source. Distorted images processed by any method won't always look better. The old adage "garbage in, garbage out" applies.

Genesis Microchip (Toronto, Ontario and Mountain View, CA) is about to introduce "DICE," a series of Video Line Doubling (VLD) chips that bridge the gap between interlaced and progressive scan displays by performing textbook temporal and vertical filtering. Genesis has taken complex and expensive circuitry and rolled it all into one chip in the digital domain.

Some digital applications are already reaping another benefit of de-interlaced video, with smoother motion between fields. The TV-computer relationship is developing quickly and deeply — just look at desktop video editing equipment, teleconferencing systems, set-top box technology and today's hottest video games.

And so a message to all "video referees:" halt offensive video, defend your vision, and when it comes to de-interlacing, the puck stops here. ■

Figure 1. The field merging process involves slapping together two fields to produce a video frame. Notice the "squiggly" motion artifacts on the calendar numbers. This would look bad running at 30fps.

Figure 2. Line replication involves doubling field 1's lines, then repeating field 2's lines, etc. Note the "blockiness" created on the numbers and the "jaggies" present on the train's yellow semicircle.

Figure 3. Vertical and temporal filtering — images are cleaned up substantially. This is the method Genesis Microchip uses, and motion video will appear cleaner and more stable.

Robert Hunter handles marketing communications for Genesis Microchip, Markham, Ontario, Canada. He can be reached at 905-470-2742.

. . . FOR PHOTO & VIDEO"

VISA MasterCard DISCOVER

TO INQUIRE ABOUT YOUR ORDER:

800 221-5743 • 212 807-7479

Circle (209) on Action Card

OR FAX 24 HOURS: 212 366-3738

119 WEST 17TH STREET, NEW YORK, N.Y. 10011

Store & Mail Order Hours:

Sun 10-4:45 • Mon & Tues 9-6 • Wed & Thurs 9-7:15 • Fri 9-1 • Sat Closed

EQUIPMENT LEASING AVAILABLE

B&H PHOTO - VIDEO - PRO AUDIO

DIGITAL PROCESSING SYSTEMS INC.

PVR-2500 Digital Video Recorder

The PVR-2500 offers powerful features for awesome animation, morphing and rotoscoping capabilities. With features like 720 x 480 resolution, 10-bit 2x oversampled video encoding, better than D1 scaling, component and S-Video outputs, multi-processor support and integrated FAST SCSI-2 controller, it empowers your computer to rival the finest professional production studios.

- The PVR-2500 is a full-length PCI card with a SCSI-2 interface that connects up to seven dedicated hard drives. Because the SCSI controller is integrated with the PVR-2500, video data never has to move over the PCI bus during playback. This avoids the bottlenecks found in systems which use the computer's hard drive for video storage.
- Designed to run under Windows NT 3.51 on computers employing Pentium, DEC ALPHA or MIPS processors. Perception's software utilizes NT 3.51's native support for multitasking and multiple processors, allowing use with-in the most powerful computers.
- Perception's multi-format virtual file system ensures complete integration with your existing Windows NT applications. Any acquired video or computer generated Perception video clips appear simultaneously in many different file formats including TARGA, SGI, BMP and TIFF. Also compatible with new NT versions of Lightwave 3D, 3D Studio, TOPAS 5.1, SoftImage and Elastic Reality.
- Video output section utilizes 10-bit 2x oversampled encoding and provides broadcast quality CCIR-601 (720 x480) resolution. Its dynamic range is in excess of D1 scaling so that images are brighter, have more color and greater spatial resolution. Outputs component, composite and S-Video via the included breakout cables.
- Use with any compatible sound card while synchronization of audio and video is maintained by the PVR software. Captured audio is stored on the computer's system hard drive, not on the dedicated drives. This approach provides maximum flexibility for manipulating audio and video during editing.
- Can perform real-time interpolation of 30 fps video to 24 fps film rates or vica versa.
- VCR-like controls on the Perception's GUI simplifies the task of batch digitizing and recording. In this mode, it reads SMPTE time code from the source deck.
- Drivers for Windows 3.1 are supplied as well, so third party editing software like Adobe Premier can be used. In fact, the PVR-2500 bundled with the AD-2500 capture card, a sound card, editing software and one or more SCSI hard drives becomes a non-linear editor of unparalled performance at an unbeatable price.

AD-2500 CAPTURE CARD

- The optional AD-2500 is a video capture daughtercard, that transforms the Perception into a digital video recorder. It has component, composite and S-Video inputs for real-time recording, and storage capacity is limited only by the size and number of your hard drives. Captured video can also be exported as sequential RGB files for rotoscoping and other compositing applications.
- The AD-2500 incorporates a sophisticated automatic entropy prediction circuit that analyzes the content of incoming video and dynamically calculates the optimum amount of compression on a field-by-field basis—even during real-time recording. You also have complete manual control over compression level/quality settings.

TRUEVISION TARGA 1000/2000

PCI-based Digital Video Capture Boards for Windows

The TARGA 1000 and 2000 is an easy and affordable way to transform your computer into a powerful digital editing system. Along with their high-speed PCI interface, both the TARGA 1000/2000 incorporate all the functions you need to create spectacular multimedia content. They support NTSC and PAL video standards and let you capture, edit and playback full-motion, full-resolution digital video with fully sychronized CD or DAT quality audio. Designed for high performance IBM compatibles, their advanced architecture provides incredible processing speed for video and audio effects, titling and compositing capabilities.

- Allows recording and playback of video directly to/from hard drive at full motion, full frame rates (50 fields/sec - PAL, 60 fields/sec-NTSC). Video is stored and played back at the highest resolution for each format (768 x 576 x 24 bit - PAL, 640 x 480 x 24 bit - NTSC). Compression can be adjusted on the fly to optimize for image quality and/or minimum storage space.
- Genlock using separate sync input for working in professional video suites.
- Equipped with composite and S-video inputs and outputs. Also available with component input/output (TARGA 1000 PRO).
- The audio is digitized at 16-bit resolution (at 44.1KHz or 48KHz sampling rates), yielding professional quality stereo sound. Since all audio and video processing is done by on-board DSPs, you are assured of perfectly synchronized sound and images.
- Optimized to work with Winsows NT-based software (Adobe Premiere 4.2, in:sync Speed-Razor MACH III).

TARGA 2000 Additional Features:

- Equipped with composite and S-video inputs/outputs. Also available with component input/output (TARGA 2000 PRO).
- Accelerated Windows 3.11 and Windows NT display drivers offer integrated, true-color (24-bit), non-interlaced desktop up to 1152 x 870 pixels.
- Provides a large work area for displaying video, as well as editing application controls. Any part of the display (or even the whole image) can be recorded to tape (video-out-of-a-window).
- View your desktop and video-in-a-window on your non-interlaced high resolution desktop display while the processed video is output at NTSC or PAL resolutions to a video monitor and/or a VCR.

Turnkey TARGA 1000/2000 and PVR-2500 Perception Systems:

- Video capture board (specify) • 220-watt, 6-bay midtower case
- PCI motherboard with 256K pipelined burst cache • Pentium 133 MHz processor • Diamond Stealth64 Video 2MB VRAM PCI display card
- 32MB of EDO (Extended Data Out) RAM • Quantum 1.28GB IDE system drive • Seagate (Barracuda) 4.2GB SCSI-2 FAST/Wide hard drive
- Adaptec AHA-2940UW FAST/Wide SCSI-2 controller card
- 3.5" floppy drive • Teac CD-56e 6X EIDE internal CD-ROM drive
- Altec-Lansing 300.1 three-piece deluxe speaker system
- Princeton Ultra 17+high resolution 17-inch multiscan monitor
- Focus 2001A keyboard • Microsoft MS mouse • MS-DOS 6.22 and Windows 3.11 or Windows NT 3.51 operating system software.

*PVR-2500/AD-2500 Windows System with Adobe Premiere 4.0a	$7295
*PVR-2500/AD-2500 Windows NT System with in:sync Speed-Razor MACH III	$8495
TARGA 1000 Windows System with Adobe Premiere 4.0a	$7795
TARGA 1000 PRO Windows System with Adobe Premiere 4.0a	$8295
TARGA 1000 Windows NT System with in:sync Speed-Razor MACH III	$8795
TARGA 1000 PRO Windows NT System with in:sync Speed-Razor MACH III	$9150
TARGA 2000 Windows NT System with AVID Real Impact	$11,250
TARGA 2000 Windows NT System with in:sync Speed-Razor MACH III	$11,250
TARGA 2000 PRO Windows NT System with in:sync Speed-Razor MACH III	$12,000

*PVR-2500 System Notes: 1) Does not include Adaptec SCSI-2 controller card (has built-in SCSI-2 port)
2) Includes Seagate Barracuda 4.2GB Narrow hard drive (doesn't accept Wide drives)
3) Includes Stealth64 Video 2MB DRAM PCI display card (Add $100 for 2MB VRAM card)
4) Requires sound card (DSP-equipped card preferably)-see "Expansions and Upgrades"

Expansions and Upgrades for all Systems:

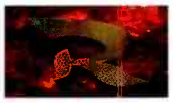
Substitutions

Full Tower Case (10-bay)	add 100.00	Super Tower Case (12-bay)	add 200.00
Pentium 150 MHz processor	add 150.00	166 MHz processor	add 400.00
Seagate Elite 9.1GB Narrow drive (for PVR-2500)	add 1000.00	Seagate Elite 9.1GB Wide drive	add 1000.00
Matrox Millenium 4MB VRAM PCI Display Card	add 250.00	Matrox Mrlenium 8MB VRAM PCI Display Card	add 400.00
MAG Innovision MXP-17F 17" multiscan monitor	add 225.00	MAG MXP-21F 21-inch multiscan monitor	add 1100.00
Altec Lansing ACS-500 three-piece surround sound stereo system			add 140.00

Add-Ons

APC Smart Ups 650 power backup	349.00	Conner 4GB QIC/ Wide tape backup IDE/SCSI	439.00
Ensoniq SoundScape Elite DSP-equipped 16-bit audio card (for PVR-2500 systems only)			199.00
MediaTrix Audio Trix Pro DSP-equipped 16-bit audio card (for PVR-2500 systems only)			279.00
Elastic Reality for Windows/Windows NT (includes Transjammer-30 transitions)			349.00
Transjammer Vol 1 (with 100 transitions)			89.00

in:sync SPEED RAZOR MACH III



Digital Video Editor for Windows NT

The ultimate digital video editing software, Speed-Razor MACH III allows you to edit full screen, 60 fields per second, CCIR 601 broadcast-quality video. Designed for the DPS PAR DR-2100/ Perception PVR-2500 and Truevision's TARGA 1000/2000 video capture cards, Speed-Razor MACH III is the fastest and most powerful tool for editing and compositing video clips, animations, stills, music and sound effects. Experience straight cut editing in real time and effects which fly on the fastest machines out there. Alpha,Intel, MIPs-based and PowerPC-based workstations, making this the fastest, most flexible software you've ever seen. Running under Windows NT, it offers three times faster than Windows 3.1 on the same machine and up to ten faster when used on Alpha-based systems.

Speed-Razor features infinite video, audio, transition and effects tracks and comes with Razor Blades—transitions and effects to enhance your production. There are preset tumbles, fades and wipes which you can easily customize and save as new presets. In addition, there are special image effects which are unquestionably the highest quality of any system—analog or digital. Speed-Razor sports anti-aliased 3D DVEs, an infinite channel chroma keyer and an excellent character generator. Use the effects or transitions which come with the package, layer them to create new ones, make your own grayscale bitmaps to use as transitions, or use third party plug-in effects—the flexibility is yours.

EDITING FEATURES:

- Real-time straight cut editing (this does NOT require a new file to be made and requires less space on the hard drive to edit)
- The only video editor with the ability to cut to the field
- Work in Thumbnail or Final Output resolution mode (you set the resolution for each)

COMPOSITING:

- Infinite number of layers of video clips, still and animations can be composited together
- Handles any resolution from Betacam (720 X 480) up to Omnimax film (4000 X 4000)
- Video clips can be combined using an alpha channel, key color transparency, still or traviling mattes

FILE FORMATS:

- Reads and writes ANI files (created by DPS' PAR), PVD files (Perception), DVM files (TARGA 1000 and 2000) and sequences of TARGA files
- Convert files between any of the following formats: ANI, PVD, DVM, AVI, BMP, TGA, FLC, FLI, WAV
- Project-based Library for organizing your work

There are two user definable resolution modes (thumbnail and final) to facilitate editing. The thumbnail mode allows you to use Speed Razor in the field on a laptop computer then transfer the project file back at the edit suite and automatically recapture and re-render the entire project at final resolution. Speed-Razor also features RS-422 control and even does batch capture (new batch capture module allows you to automate video capture via SMPTE time code), so digitizing video and audio is simple and painless. In fact, with the innovative "Virtual Editing" function you can actually edit your project, complete with effects and transitions—before you've digitized a single frame of video.

AUDIO:

- Handles audio up to DAT (48 kHz) quality
- Infinite number of audio tracks for multi-layer audio mixing

EFFECTS:

- Blur (circular, gaussian, fast), tint, brightness adjustment, chroma key, crop, displacement, emboss, freeze frame, glass texture, greyscale, invert, loop, matte, pixelate, repeat fields, scale, transparency, strobe, turn red/green/blue
- 3D DVE (translates and/or rotates an image in three dimensions on the X, Y and Z axis)
- Sets a color channel to an assignable value)
- Titles (full blown CG using any Windows font in any color with automatic drop shadow)
- Sub-pixel rendering for incredibly smooth motion
- Effects can be applied to infinite sources

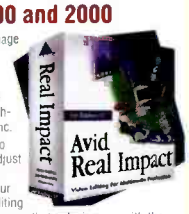
TRANSITIONS:

- Includes over 100 grayscale image transitions, crossfades, luminance fades, fade to/from black, fade to/from white, push, twirl, twist in/out tumbles, flip, turn, scale (zoom)
- Transitions can be applied between infinite inputs

Real Impact

Windows NT-based Video Editor for TARGA 1000 and 2000

With the introduction of Real Impact, Avid provides Windows users with the same professional image quality, intuitive cut/copy/paste editing, and instant random access capabilities that have won 2 Emmy awards—for thousands of dollars less than outsourcing an average video. Designed exclusively for Truevision's TARGA 2000, Real Impact lets you create professional-quality video with audio, graphics, animations, special effects and titles—with the speed, flexibility and creative freedom you need. Create sales, training and product videos right on your PC, quickly and easily—without compromising quality. Produce video in 24-bit color, with CD-quality sound and perfect lip sync.



Easy to Use: A true 32-bit application (Windows NT 3.51), Real Impact's intuitive interface and extensive on-line help get you productive right away. It's powerful editing features let you work with video, audio, graphics, animations and titles with the simplicity of cut, copy and paste.

Video Capture: Digitize video and audio—without dropping a frame. Your video is full-screen, full-motion, 60 fields-per-second and your audio in sync. With its Dial-a-Quality image feature, Real Impact allows you to adjust image quality for differing system, storage and delivery requirements.

Create a Storyboard: Extensive media management with built-in media library and database let you easily find the video and audio clips that you want. Instant access makes previewing edits simple and immediate. And, with timeline editing, you just click and drag to experiment with different cuts, rearrange clips and assemble your story. There are 32 levels of undo/redo.

Add Graphics, Titles and Special Effects: Create and seamlessly incorporate audio, graphics and animations into your video using popular Windows-based applications. Real Impact supports AVI video files, WAV audio files, FLC animation files as well as BMP, JPEG, PCX, TGA and TIFF graphics files.

Add Audio: Polish your audio with music and narration. Adjust pan and volume in real time. Simultaneous playback of four audio tracks makes audio editing quick and easy. View your four audio tracks in sync with the video immediately, no waiting for tracks to compile.

Digital Media Interchange: Compatible with the Open Media Framework (OMF) interchange, a file format for the seamless integration of digital data among applications and across platforms. Through OMF, you can import video and audio files from other OMF-compatible applications like Avid's Media Composer.

Output to Tape, CD-ROM or Over a Network Gives complete control over video distribution. There's no long rendering process, creating professional quality tape is a snap. Embedding video in multimedia presentations for distribution on disk or CD-ROM is as simple as the click of a mouse. Supports third-party MPEG tools to create MPEG files for network distribution.

Avid's Support Advantage: Real Impact is backed by Avid's world-class customer service. Toll-free telephone support and bulletin board service are just some of the benefits.

FEATURES:

Video

- Real-time JPEG compression / decompression and playback at 60 fields per second
- Supports RS-422 control protocol and SMPTE time code.
- Edit two tracks of video for layered effects.

Audio

- Edit up to four tracks of 44.1 KHz, 16-bit CD-quality audio.
- Real-time pan and volume adjustments, digital audio scrub.
- Waveform for precise audio editing.

Import/Export

- AVI video files, WAV audio files, FLC animation files.
- OMF Interchange files.
- BMP, JPEG, PCX, TGA and TIFF graphics files.

Special Effects

- Filter effects with previews and adjustable parameters.
- Transition effects include wipes, dissolves, zooms, pushes and squeezes.
- Layered effects include picture-in-picture, luminance and chroma key.

Integrated Title Generator

- 32-bit processing (24-bit color and 8-bit alpha channel)
- Support for TrueType fonts and international character sets.
- Drop shadows, transparency and color blends.
- NTSC and PAL-safe color palettes.

Media Management

- Media library for organizing digital clips.
- Database with search capabilities.
- Customized views for easy clip access and retrieval.

A note about our turnkey systems:

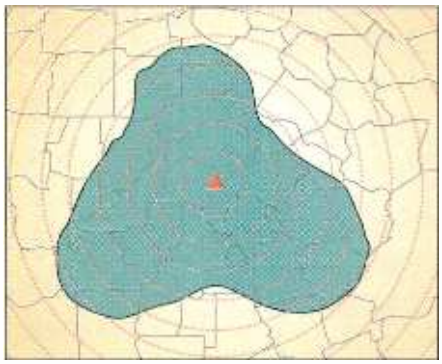
In addition to the systems listed on this page, we can further customize any system to fit particular needs. We carry a large variety of 2X and 4X CD-ROM recorders (HP SureStore 4020i, Sony Spressa, FWB Hammer CD-Rs), RAID subsystems (ATTO, FWB) and portable storage devices (Iomega, Syquest) to name a few. Tell us what you need and our salespeople will custom design a system for you. And if you happen to be in NewYork, please come and . . .

Visit our newly expanded Video Store & Digital Video Showroom

Minimum shipping USA (Except AK & HI) $7.00 up to 3lbs. Add 60¢ for each additional lb. For ins. add 40¢ per $100. Prices valid subject to supplier prices.

By Oded Bendov

Predicting HDTV coverage



This article looks at the differences that exist in predicting coverage patterns for NTSC vs. HDTV systems. HDTV is used rather than ATV to signify the Grand Alliance's transmission format. For NTSC, the conventional predictor for coverage is the field strength in decibels above 1 microvolt/meter (dBu). The prediction of the 64dBu contour (UHF Grade B) is based on the computation of the available effective radiated power (peak of sync ERP) emitted by the antenna.

For NTSC, field strength is a measurable predictor, and the computation of the coverage contour based on the available ERP is valid, because multipath and other signal distortions over the 6MHz channel translates into degraded picture and not into loss of coverage.

In contrast, multipath co-channel interference and other distortions of the digital HDTV signal that can be observed on a spectrum analyzer translate into loss of coverage, not picture degradation. The loss of coverage due to signal distortion must, therefore, be accounted for as a penalty against the available power if a realistic coverage prediction is desired. Furthermore, the field strength of HDTV is not measurable and cannot serve as a service predictor. (See sidebar on p. 297.)

HDTV signal distortion

The spectra of undistorted NTSC and HDTV channels are shown in Figure 1. The undistorted spectra are a good representation of the NTSC and HDTV signals delivered to the transmitting antenna. What may come out of the transmitting antenna and is finally delivered to the receiver is shown in Figure 2. It is apparent from these figures that NTSC is essentially a narrowband 3-carrier transmission in which only the integrity of the area around the carriers is important for picture and sound quality.

In contrast, HDTV is a wideband transmission in which the integrity of every portion of the channel is equally critical for coverage. In fact, the distorted HDTV signal, with a deep notch just below the color subcarrier of the overlaid NTSC spectrum, will provide zero coverage regardless of the power level at the receive antenna. The same distortion applied to the NTSC signal would hardly affect the picture and will have no effect on the sound.

Several sources may cause multipath distortion at the transmission facility. For example, it occurs when the transmitting antenna is near the support tower (side-mounted) or is part of an antenna farm. Figure 3 shows what happens to a perfectly omnidirectional Channel 38 antenna once it is installed next to (8-foot separation) a typical tower with a 10-foot face. The antenna pattern is distorted, and in each azimuthal angle, the distortion varies with frequency.

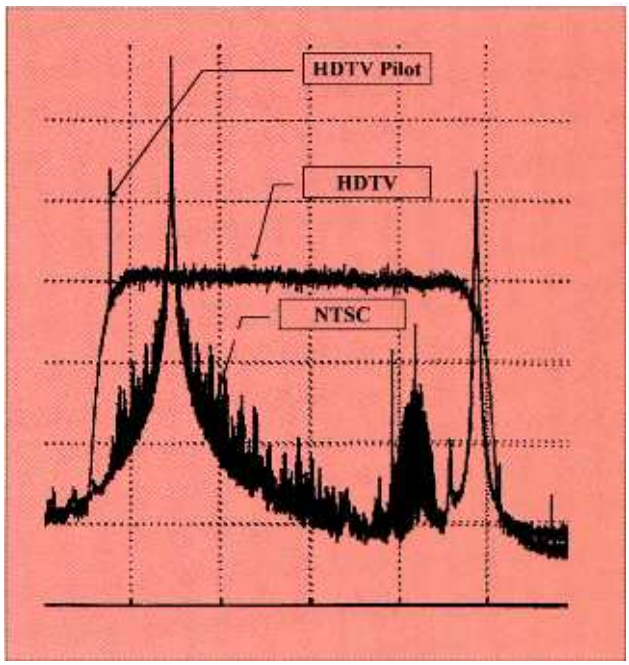


Figure 1. The spectra of undistorted NTSC and HDTV channels.

Coverage penalty due to distortion

Any distortion of the HDTV signal results in a loss of coverage. The loss of coverage is best expressed as a power penalty, in decibels, against the available power at the input to the transmitting antenna. The concept of the power penalty is unique to HDTV. It is central to the observation that the net useful power, rather than available power (used in NTSC), is the key to realistic coverage prediction. The computation of the penalty due to linear distortions, such as multipath, is detailed elsewhere. (See "A New Approach to the Analysis of Adjacent Structure Effects on HDTV Antenna Performance," 1995 NAB Engineering Proceedings.)

The power penalty is a sum of two components: one component represents the actual loss of total power in 6MHz; the second component represents the effective loss of power due to the channel equalization process at the receiver. The equalizer attempts to reshape the distorted spectra shown in Figure 2 to that of the undistorted spectra shown in Figure 1 by increasing the gain at selected frequencies. As a result, the noise level increases and the carrier-to-noise ratio (CNR) decreases, which is effectively a loss of carrier power. It should be mentioned that, in HDTV the carrier power is the average of total signal power over 6MHz, whereas in NTSC, the carrier power is the rms power at the carrier frequency during sync pulses.

The total penalty due to the antenna patterns of Figure 3 is shown in Figure 4. In two directions, southeast and northwest, the multipath was substantial and the penalty was high. In those directions, coverage would be totally lost for HDTV, while the penalty for NTSC would be some loss of coverage and minor picture degradation.

HDTV contours

HDTV coverage contours cannot be defined by the equivalent NTSC contours (City, A and B grades) because HDTV does not degrade gracefully — picture and sound are either available and perfect or absent altogether. This is known as the cliff effect, and it takes less than 1dB loss of CNR to lose service at the fringe.

HDTV coverage contours can be defined and measured in terms of power or CNR with sufficient margin for the desired percentage of time availability. As an example, consider the antenna of Figure 3 with the penalty against the available power of Figure 4. The 15dB CNR (threshold HDTV) contours over a flat terrain are shown in Figure 5. The two contours are shown for two different percentages of time availability. A comparison of figures 3 and 5 illustrates the significance of the penalty. For NTSC, coverage would be predicted every-

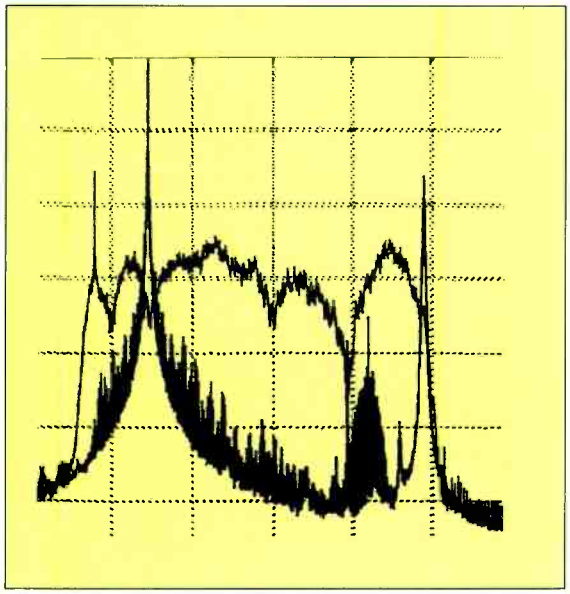


Figure 2. The NTSC and HDTV spectra as they might appear at the receiver.

where, whereas for HDTV, coverage would not be available everywhere. Just what is the "right" percentage of time availability for HDTV service is still an open question. Suffice it to say that, because of the cliff effect, the percentage required for reliable HDTV service will be higher than the 90% used for UHF-NTSC.

While HDTV field strength cannot be measured (and even if it could be measured, it could not serve as a reliable coverage predictor), the concept of "equivalent field strength" could be useful for contour planning. (See "The Effect of Channel Assignment on Transmitter and Receiver Requirements for Equivalent HDTV/NTSC Coverage," 1994 NAB Engineering Conference Proceedings.) The assumption underlying the concept of "equivalent field strength" is that there are no linear or non-linear distortions by the transmitter/antenna system; then the penalties to spectrum distortion do not apply, and contour planning at a single frequency is valid. In most cases, this assumption is optimistic. Even the transmitter's in-band intermodulation products may contribute a penalty of 0.5dB against the available power. The concept of "equivalent field strength" is also useful because most of the available software is based on field strength. Following are the equivalent field strengths that, together with the FCC (50, 50) curves, would yield the HDTV 15dB CNR contours with enough margin for the stated

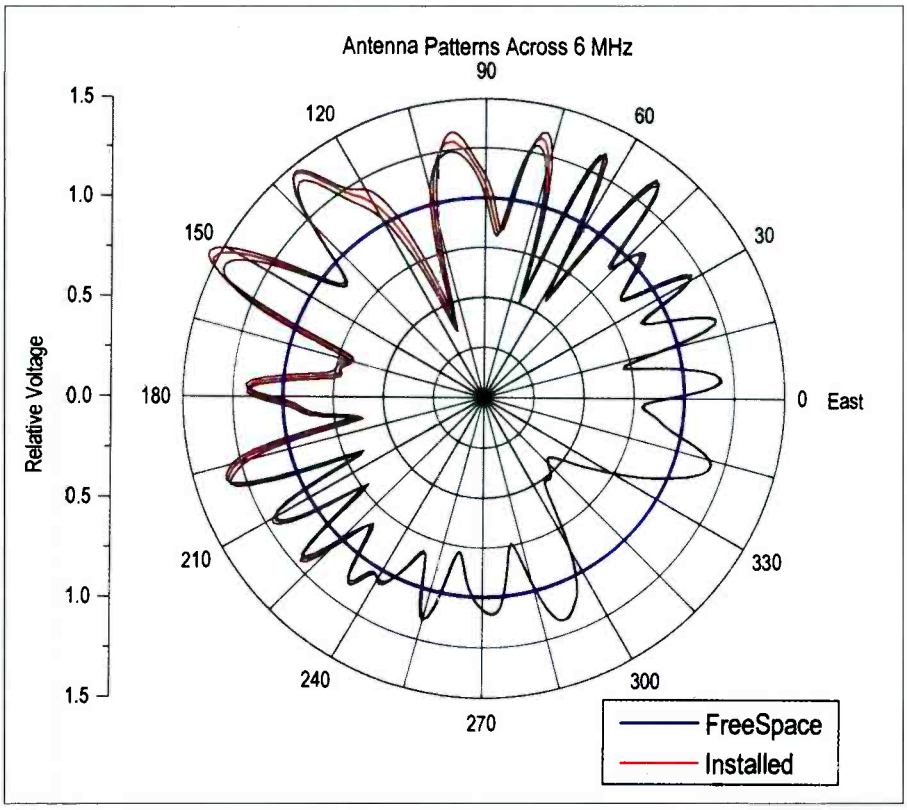


Figure 3. The radiation pattern of an omnidirectional antenna (Channel 38) after it is installed next to (8-foot separation) a tower with a 10-foot face.

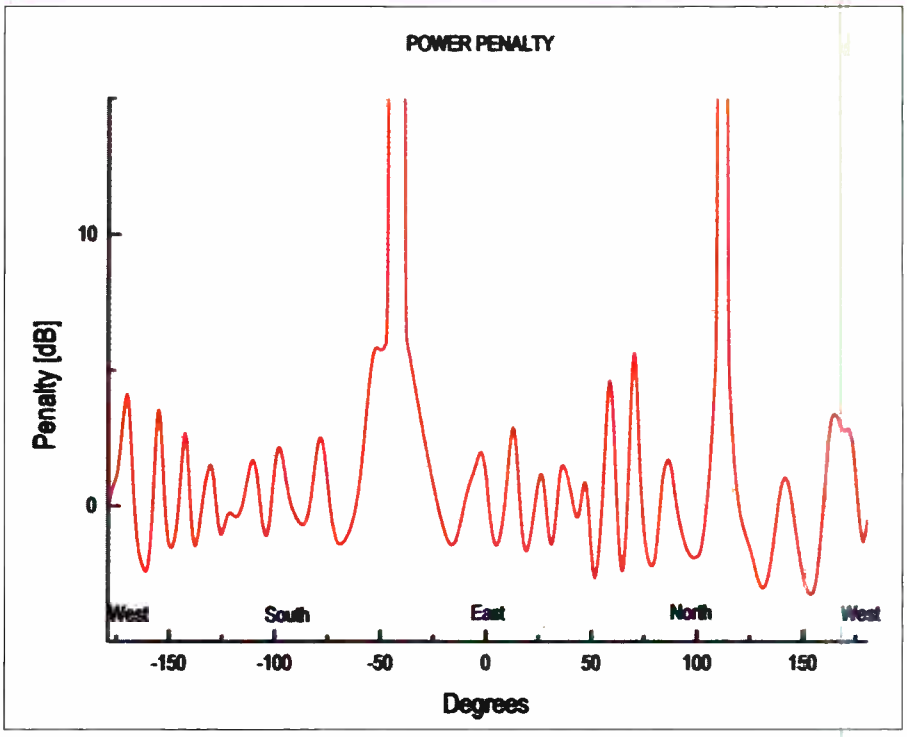


Figure 4. Power penalty that results from the pattern shown in Figure 3.

percentage of time availability, assuming a receiver noise figure of 10dB and an outdoor antenna with a gain of 10dB:

	Channel 15	Channel 39	Channel 61
50-foot Downlead attenuation	4dB	4.5dB	5dB
90% Availability	51dBu	53dBu	55dBu
99% Availability	58dBu	60dBu	62dBu

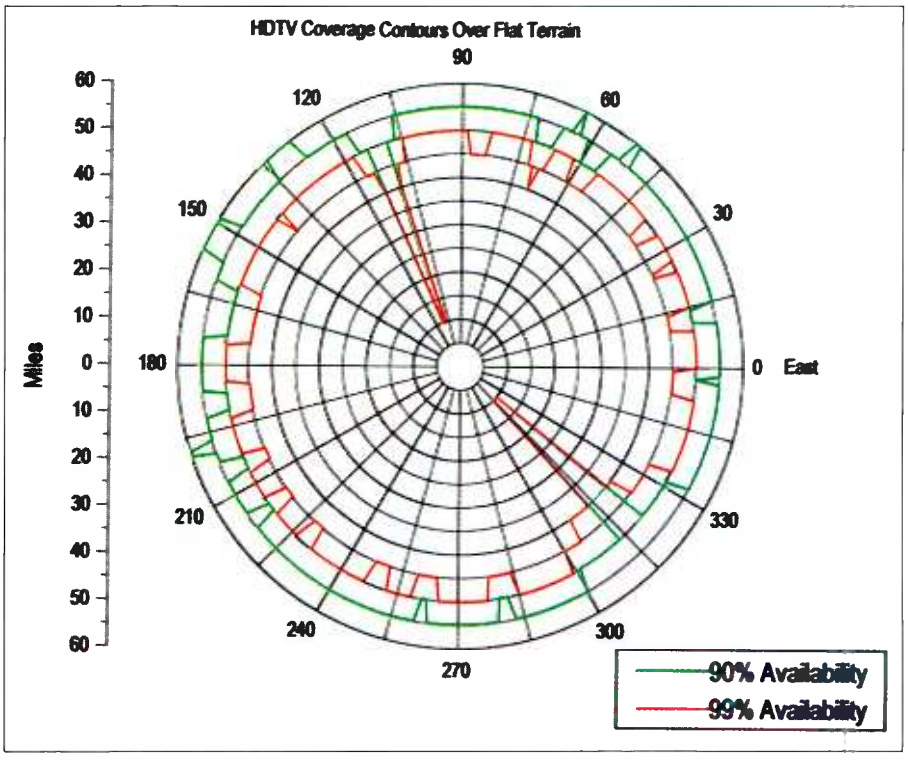


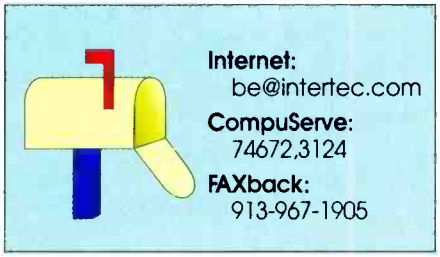
Figure 5. Antenna contours that would result when the installation of Figure 3 is combined with the power penalty of Figure 4.

Conclusions

- Conventional field-strength meters cannot be tuned to the carrier frequency of an HDTV signal.
- Neither the field strength of the pilot nor the average power of the HDTV signal can serve as reliable coverage predictors because signal distortion, such as a notch in the spectrum, must be factored as a penalty against the available power.
- Transmission equipment of two different vendors that would provide identical NTSC coverage contours may provide different HDTV coverage contours because the spectral distortion of HDTV is translated into loss of coverage. It should be remembered that, in HDTV, a 1dB penalty is typically translated into a loss of one mile at the fringe.
- Unless the FCC sets standards for HDTV receivers, the penalty due to the equalizer may vary from one receiver brand to another, thereby affecting actual coverage. ■

Acknowledgment: Figures 1 and 2 of the NTSC and HDTV spectra courtesy of C. Scarpa, Hitachi America.

Oded Bendov is vice president, antenna engineering and advanced technologies, for Dielectric Communications, Cherry Hill, NJ.



Can field strength serve as a predictor of HDTV coverage?

The Final Technical Report submitted to the FCC by ACATS states that "An objective measurement that should permit reliable prediction of satisfactory HDTV service at UHF is field strength." In fact:

- HDTV field strength is not measurable.
- The field strength of the NTSC signal was measured during the Grand Alliance field test in Charlotte using the Potomac Instruments' FIM-72 field-strength meter. This measurement failed when applied to the HDTV signal.
- The conversion process, from the measured total signal power in 6MHz to incident field strength at the receive antenna as used in the field test report (not documented in the report), is not applicable to HDTV.

Unlike NTSC, the 6MHz spectrum of HDTV shows no distinct carrier, only a signal acquisition pilot. RF field strength is measurable by a narrowband tunable receiver at a single frequency provided the field stays constant during measurement. The field strength of the HDTV signal is random and fast-changing because it depends on the picture content, and the data rate is high.

How, then, did the field test report come up with the field-strength data even though it could not be measured? It began with the averaged measured total signal power in 6MHz. That power is represented by the area under the power spectrum curve as seen on the spectrum analyzer. Next, the conventional NTSC formula that relates the measurable received power to the incident field strength was invoked:

$$P = \frac{E^2}{120\pi} \cdot \frac{G\lambda^2}{4\pi}$$

G = Gain of Rx antenna relative to isotrope
E = Field strength
λ = Wavelength

To determine the field strength for HDTV using the conventional formula, a wrong assumption had to be made — that all of the HDTV power is concentrated at a single frequency (carrier was chosen) rather than being spread, generally not uniformly, across the channel. In any case, the value obtained is a derived quantity, not a measurable field strength of the HDTV carrier. The derived field strength using the conventional formula can play a role in service planning as explained in the HDTV contours section on p. 290.

Measurement of the HDTV pilot carrier's field strength might be possible, but the pilot's field strength alone cannot be used as a coverage predictor because the shape of the spectrum must also be accounted for in the prediction of realistic coverage. ■

INDUSTRY BRIEFS

BUSINESS

Blaine Lentz Lighting Associates, Woodland Hills, CA, announced sales of its pro lens shades to CBS Studio Center, Studio City, CA; Bexel Corporation, Burbank, CA; and NBC, New York.

On the international scene, the company also delivered 20 pro mic bracket dual lock bases to WDR, Cologne, Germany.

Tektronix, Grass Valley, CA, merged its subsidiary, The Grass Valley Group, Grass Valley, CA, into Tektronix. Grass Valley will continue to develop and manufacture switchers, routers, effects and video communications products under the Grass Valley name.

Quantel, Darien, CT, filed a patent infringement suit against Adobe Systems in relation to the Photoshop software produced by Adobe. The suit cites five U.S. patents held by Quantel and seeks permanent injunction and damages.

The Hollywood-based headquarters of Quantel relocated to 8501 Wilshire Blvd., Suite 340, Beverly Hills, CA 90212; telephone 310-652-9227.

The Florida-based design shop, VDO Images, bought Quantel's HAL, and Viewpoint Computer Animation, Needham, MA, installed HAL Express in its Boston satellite office. Also, DC Post, Washington, DC, has acquired Quantel's Paintbox Express.

Genelec Oy, Finland, has activated a subsidiary in Wayland, MA, that will be responsible for the marketing and distribution of the Genelec product line in the United States. The Genelec office is located at 42 Peck Ave, Wayland, MA 01778; telephone 508-647-4780; fax 508-647-4789. The authorized service operators of all Genelec products in the United States will continue to be handled by Florida Electronics Services.

Dielectric Communications, Raymond, ME, was awarded a contract for two antenna system designs to be installed on the World Trade Center. Kline Towers, Columbia, SC, will perform the structural analysis of the present mast on World Trade Center 2 and the design of the new mast for the World Trade Center 1 Building.

Dynatech Corporation, Burlington, MA, plans to divest its broadcast video equipment and selected data transmission operations to enhance growth and profit. Communications Test, Industrial and Scientific Communications Systems and Video Technologies are not included in the divestiture.

Following the announcement made by its parent company, the Dynatech Video Group divided its Salt Lake City operations into two units: a routing and distribution company operating under its original name, Utah Scientific; and a separate unit combining all other Dynatech Video Group product lines.

Sennheiser Electronic Corporation and Neumann USA, both of Old Lyme, CT, have new World Wide Web sites located at http://www.sennheiserusa.com and http://www.neumannusa.com respectively. The sites provide product information, specifications and photos, as well as frequency response curves and polar patterns.

Panasonic, Secaucus, NJ, sold three D-3 composite digital AJ-D351 studio VTRs to PBS-station KUED located at the University of Utah, Salt Lake City.

In addition, a Panasonic D-5 AJ-D580 digital component VTR was purchased by IVL, Minneapolis.

Harris Corporation, Quincy, IL, formed a joint-venture agreement with Anshan Broadcast Television Equipment Group Corporation (ABEGC), People's Republic of China. The agreement creates Anshan Harris Broadcast Equipment Company, Ltd. (Anshan Harris), based at Anshan City, People's Republic of China, which will offer high-quality TV transmitters, as well as customer service and support. Harris will provide technology, equipment and services to Anshan Harris.

Quantegy moved to interim headquarters in Mountain View, CA, until a permanent worldwide headquarters location is selected. As part of its contract with the Ampex Corporation, Quantegy agreed to move from the Ampex campus in Redwood City. The current address for Quantegy is 1025A Terra Bella Ave., Mountain View, CA 94043-1829; telephone 415-903-1100; fax 415-903-1141.

Stainless, North Wales, PA, was awarded a multimillion dollar contract by Lin Television for the construction of two TV towers. The towers will serve Lin stations in New Haven, CT, and Portsmouth, VA.

DiviCom, Milpitas, CA, delivered a volume shipment of set-top decoders to Bell Atlantic for use over the first commercial video dialtone (VDT) network. The company is also supplying the MPEG-2 program decoders being used by FutureVision of America Corporation, one of the seven video information providers who have reserved channels on Bell Atlantic's Dover Township VDT system.

DMV, England, and the Mitsubishi Electric Corporation, Japan, formed a partnership to develop digital set-top receivers. The companies will use DMV's MPEG-2/DVB-compliant technology and Mitsubishi's semiconductor/receiver manufacturing technology to develop a new generation of digital receivers.

Westinghouse Electric Corporation, Pittsburgh, PA, was awarded a $4.5-million government contract to develop a more rugged and versatile semiconductor electronic material. The material, silicon carbide, will allow electronic devices to operate reliably at higher temperatures and power levels than materials presently used.

Wegener Corporation, Duluth, GA, received an order for its MPEG-2 satellite news gathering equipment from AKS Televizyon Reklamcilik ve Filimcilik A.S., Istanbul, Turkey.

TV/COM International, San Diego, CA, a wholly owned subsidiary of Hyundai Electronics America, installed its Compression NetWORKS digital video compression system at the Hyundai Electronics Industries Company, Ltd. in the People's Republic of China. The system is part of an overall technology agreement with China's Academy of Broadcasting Science.

Avid Technology, England, shipped NetStation version 14.0 to NRK, Norway, and YLE, Finland. Also, NorthWest Cable News (NWCN), a 24-hour regional news network for Oregon, Washington and Idaho, is using Avid's digital news gathering (DNG) system.

A new company called Acker/Jacoby Technology has been established by David Acker and Tedd Jacoby. The company designs, manufactures and markets advanced video processing equipment with an emphasis on the broadcast, post-production, cable TV, presentation, multimedia and other professional video markets. For more information, contact: AJ Technology, 265 Otis St., West Newton, MA 02165; telephone 617-969-0547; fax 617-969-3889.

Scitex Digital Video, Sellersburg, IN, named the Digital Production Academy located in Louisville, KY, as the official training center for SDV ImMIX workstations. For more information, contact the Digital Production Academy at 110 North Indiana Ave., Sellersburg, IN 47172; telephone 812-246-1075; fax 812-246-6456; web site http://www.ictnet.com/-ictnet/dpa/dpa.html.

AT&T and DirecTV formed a partnership in which AT&T will market and distribute the DirecTV high-power direct broadcast satellite (DBS) service and digital satellite system (DSS) equipment.

D-Vision Systems' PC-based Pro 2.2 was selected by BMC Software, Houston, for its first non-linear editor.

Accu-Weather, State College, PA, and Sintef signed an agreement under which Accu-Weather will be the integrator and sales and marketing agent for NIMBUS.

Technical Industries, Atlanta, GA, was selected by Panasonic/MEI to perform all detailed engineering and installation of the International Broadcast Center for the 1996 Summer Olympics.

Waterfront Communications Corporation relocated to larger facilities at 545 Fifth Ave., New York, NY 10017; telephone 212-599-1011; fax 212-599-4172.

Graham-Patten, Grass Valley, CA, has been awarded a contract to supply Matsushita with 51 D/ESAM series digital edit suite mixers for use during the 1996 Summer Olympics.

PEOPLE

Brian VanHerp was appointed as OEM and partners business manager for Pinnacle, Sunnyvale, CA.

Dick Crippa was selected as executive vice president, worldwide marketing, sales and service division (MSS) of BTS Broadcast Television Systems GmbH, Griesheim, Germany. He will be located at the new MSS headquarters in London.

Also, Jeff Rosica was named vice president and general manager of marketing, sales and service operations of the Americas region for BTS, Simi Valley, CA.

Colin Ritchie has become the business development manager for Quantel, England.

Robert A. Luff was named president and chief executive officer of TV/COM, San Diego, CA, a wholly owned subsidiary of Hyundai Electronics America.

Michael Levy joined Matchframe, Burbank, CA, as director of post-production services.

Gabriel Sidhom has been appointed vice president marketing and business planning for Keystone Communications, Washington, DC.

By Jerry Whitaker

Broadcast Engineering Conference for NAB '96

All is ready for the Broadcast Engineering Conference (BEC) at the spring NAB Convention in Las Vegas. The annual event is being organized by a committee of SBE- and NAB-appointed members. Work on the BEC began last summer when the first call-for-papers announcements were mailed.

This year, the BEC is observing its 50th anniversary. To commemorate the event, special presentations and exhibits are planned. Sessions each day will open with a historical introductory videotape that chronicles the advancements in technology over the past half century. Exhibits of classic broadcast equipment are also planned for the areas adjoining the BEC session rooms.

The BEC this year, continuing its tradition of excellence, offers a comprehensive examination of new technologies, systems and products for television and radio. The conference begins on Sunday, April 14, and concludes on Thursday, April 18. The conference will follow the same schedule used in years past, with split TV/radio sessions running from Sunday through Thursday morning. The exhibition runs Monday through Thursday afternoon. Table 1 provides a grid of session times and topics.

The NAB Convention provides an unequaled educational opportunity for audio/video professionals. Furthermore, the exhibition floor — featuring a record number of booths — affords attendees a superb opportunity to check out new technologies and products. This year, the Sands Convention Center will be used in addition to the Las Vegas Convention Center to house exhibitors. Shuttle buses will run on a regular basis between the two venues.

As in the past, NAB '96 also provides unlimited networking opportunities in the technical sessions, during the exhibit hours and at any of the many social gatherings scheduled during the show. One such gathering, the Ham Radio Reception — a longtime favorite of attendees — is scheduled for Wednesday evening.

Through an arrangement between the SBE and the NAB, SBE members can register at the NAB member rate, a savings of $300. Because time is short, register as soon as possible, and arrange for lodging and air travel immediately.

NAB '96 contact list

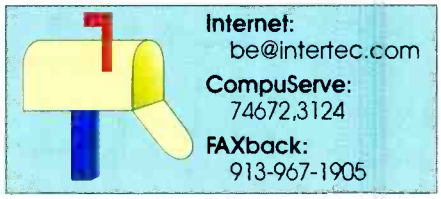
- NAB '96 Fax-On-Demand: 301-216-1847
- General registration information: 800-342-2460 or 202-775-4970
- General registration information via the Internet: http://www.nab.org
- Fax your completed registration forms to: 301-694-5124
- Mail your completed registration forms to: NAB '96, P.O. Box 3370, Frederick, MD 21705, USA

The must-attend event

Change is accelerating in the broadcast industry. Digital radio, advanced television and interactive program offerings will profoundly affect how broadcast professionals will do business in the years to come. Indeed, these technologies and others may well redefine broadcasting as we know it. Staying on top of leading-edge developments has never been more important, and the best place to accomplish this task is to attend the NAB Convention.

The joint NAB/SBE Broadcast Engineering Conference Committee has worked hard to provide attendees with a wide range of topics and speakers. We hope that you can take advantage of this opportunity and attend the show. ■

Jerry Whitaker is a contributing editor to *Broadcast Engineering* magazine and chairman of the NAB/SBE Engineering Conference Committee.



TIME	SUNDAY APRIL14		MONDAY APRIL15		TUESDAY APRIL16		WEDNESDAY APRIL17			THURSDAY APRIL18	
9:00 am	*BEC Opening Remarks 9:30 am*		*NAB '96 Opening Ceremonies 10:30 am*		*Historical Intro*	*Historical Intro*	*Historical Intro*	*Historical Intro*	*Historical Intro*	*Historical Intro*	*Historical Intro*
	Advanced TV, Part 1	DAB: US and Worldwide Planning, Part 1	Datacasting Technologies for TV	Digital Audio Storage: Technologies/ Implementations	Transitioning from Analog to Digital	Radio RF	TV RF	EBU: Digital Video in Europe	Regulatory Issues, RFR Panel	Implementing Video Datacasting	Radio On-Line: Internet Applications
12:00 pm	Break	Break	Break	Break	Break	Break	Engineering Luncheon			Close	Close
1:00 pm	Advanced TV, Part 2	DAB: US and Worldwide Planning, Part 2	Video Servers: Technologies/ Implementations	Datacasting Technologies for Radio	Facilities: The Newsroom Talks to the File Server	Facilities: Radio's Missing Digital Link	Keynote speaker: Bruce Crocket COMSAT 2:00 pm				
							Mobile TV: ENG, DSNG, Remote Vehicle	Improving and Controlling TV Signal Quality			
5:00 pm	Close	Close	Close	Close	Close	Close	Close	Close			

Table 1. Schedule for the 1996 NAB Broadcast Engineering Conference.

PROFESSIONAL SERVICES

CLASSIFIED

FOR SALE

CLASSIFIED

FOR SALE

CLASSIFIED

FOR SALE

SATELLITE COMPRESSION EQUIPMENT FOR SALE General Instrument Digicipher Compression Encryption System for sale by authorized reseller. Encoders and Consumer IRDs. Also for sale, C-band and Ku Band uplink trucks and C-band satellite time. Call Kevin Mulhare, 212-753-6024.

SATELLITE EQUIPMENT FOR SALE Scientific Atlanta B-Mac Encryption System for sale. Decoders and Encoders (MBE and Level 1). Good Condition. Price Negotiable. Call: Kevin Mulhare, (212) 753-6024.

PANASONIC-MACKIE-RAMSA-TASCAM-Technics-Sharp-Bogen-Dalite-Eiki-Maxell-Shure. Professional/Industrial Video & Audio Equipment. Wholesale Prices! Factory Sealed New! Sales = 800-233-2430, Support = 607-687-0545.

FIX RF ON HEADSETS, HANDSETS & PHONES. Filters Tuned for AM, FM & CB. Modular, for Handset or Base Cords. Even if you've tried others...Ours WILL Work! 30 Day Moneyback Guarantee. Call for 4 Page RFI Tech Bulletin & Catalog, or on the web at http://www.sandman.com. Mike Sandman...Chicago's Telecom Expert. 708-980-7710.

BUSINESS OPPORTUNITIES

MAKE MONEY WITH YOUR OWN Digital Satellite System Business. Sell systems in all 50 states with customer financing. System uses the new AT&T 402R Satellite. Ground floor opportunity. Call 24 hours for free information packet 803-750-3540.

EQUIPMENT WANTED

WANTED: USED VIDEO EQUIPMENT Systems or components. PRO VIDEO & FILM EQUIPMENT GROUP: the largest USED equipment dealer in the U.S.A. (214)869-0011.

FOR LEASE

TOWER SPACE AVAILABLE, Oklahoma City market. Construction begins April, 1996. Call Brad Ferguson at KCSC. (405) 460-5272. FAX (405) 330-3844. E-mail KCSCFM@aol.com.

HELP WANTED

ELECTRONIC TECHNICIAN

Leading manufacturer of wireless cable and broadcast transmission equipment seeking qualified indivduals for production test and field service positions. Responsibilities will include testing, installation and troubleshooting of equipment at field and factory level. Minimum qualifications include:

1. Formal technical training and experience in RF systems and troubleshooting.

2. Good working knowledge of RF test instruments. Production test requires minimal travel. Field service requires extensive travel. Salary commensurate with experience. 40 hour work week plus liberal benefits package. Submit resume in confidence to:

Personnel Department
EMCEE BROADCAST PRODUCTS
P.O. Box 68
White Haven, PA 18661
E.O.E.

HELP WANTED

MAINTENANCE ENGINEERS

NBC-6 is looking for highly qualified television maintenance engineers. Positions are available with emphasis on high power UHF transmitters, microwave and satellite systems; as well as studio equipment maintenance such as switchers, video recorders and computerized television equipment. 3-5 years of television maintenance experience and FCC general class license required. Candidates must have at least 2 years of technical school or military training in Electrical Engineering. NBC-6, home of the NBC news channel, located in Charlotte, North Carolina, is a leader in television technological advancements in support of its news operations. We have a congenial working environment with excellent benefits. If qualified, please forward your resume to: Zina Jemison, Human Resources, NBC-6, 1001 Wood Ridge Center Drive, Charlotte, NC 28217-1901. EOE/M/F/V/H

WE PLACE PROFESSIONALS

(Placement Limited to Technical Engineers, Post Production Editors, Colorists, Graphics & Animators)

Employer Paid Fees • Guaranteed Confidential
17 Years of Coast to Coast Service

Before calling please FAX or Mail your Resume to Mark Kelly

KEYSTONE INT'L, INC.
16 Laflin Road, Suite 900
Pittston, PA 18640

Fax 717-654-5765 • Phone 717-655-7143
E-Mail:keyjobs@keystone.microserve.com

CNN

TELEVISION ENGINEERS

Turner Broadcasting System, the leading News, Sports, and Entertainment system in satellite communications, has career opportunities for engineers with **broadcast maintenance** experience. These positions demand an extensive background in television engineering and at least two years of training in electronics technology. Turner Broadcasting System offers an excellent benefit and compensation program.

Send resumes to:
Mr. Jim Brown, Corp. Engineering
Turner Broadcasting System, Inc.
One CNN Center
P.O. Box 105366
Atlanta, GA 30348-5366
(404) 827-1638 office
(404) 827-1835 fax

TBS is an equal opportunity employer

Maintenance Engineer

Swiderski Electronics, Inc., a leader in the Audio/Video/Telecommunications field, has an immediate opening for a qualified Audio/Video Component Level Maintenance Engineer. 2 yrs. exp. Position works with Broadcast/Industrial 1/2", 3/4" and 1" VTRs & related equipment.

Send resume & salary history to:
H/R Dept., 1200 Greenleaf Ave.
Elk Grove Village, IL 60007
Fax resume (847) 364-5019

NETWORK DESIGN ENGINEER

Interlink Network Corp., the leader in network operations management, is seeking a design engineer for various projects domestically and abroad. Interested candidates must have a working knowledge of "state of the art" broadcast equipment for design and installation around the world. Travel required. BSEE a plus, but not mandatory. If you are deadline driven, interested in "pushing the envelope" and a team player, this job is for you.

Fax your resume immediately to:

INTERLINK
Attention: Ms. Jane Magida
914-244-3463

All correspondence will be kept confidential.

ENGINEERING - KSTW, Seattle's CBS affiliate is seeking a Maintenance Engineer for our Seattle Office. Associates Degree in Electronics or equivalent courses in a related technical field. Two to five years services broadcast equipment required. FCC General Class License preferred. Send your resumes to: KSTW - Channel 11, 2320 S. 19th Street, Tacoma, WA 98405, Human Resource Department. Women and minorities are encouraged to apply. EOE.

MAINTENANCE ENGINEER: Immediate opening for a Maintenance Engineer. Associate Degree in Electronics and 4-6 years experience in TV Maintenance. FCC General Class license required-SBE certification desirable. Individual must be energetic, self-starter with experience in component level troubleshooting and maintenance of a wide variety of audio, video and RF equipment. U-Matic maintenance experience required. Beta experience a plus. Must also share in driving/operating KU band SNG truck (Missouri chauffeurs license required). Some weekends and nights may be required. Minorities and women encouraged to apply. Send resume listing references, salary requirements and any manufactures technical schools to: Chief Engineer, KOMU-TV, 5550 Hwy. 63 South, Columbia, MO 65201. An EEO Affirmative Action Employer.

MAINTENANCE ENGINEER Black Entertainment Television Inc. Ability to troubleshoot to the component level production switchers, digital video effects systems, routing switchers, vtr's character generators, cameras, editing systems and audio equipment. This will include system interfacing to computers and compatible components, equipment installation for studio and remote productions. Must be knowledgeable of system timing theory, broadcast specifications, and electronics course study. Ability to perform fiber switches and satellite downlink. Must have 3 years experience. BET, Corporate Human Resources, 1905-E 9th Street, N.E., Washington, D.C. 20018.

SONY

Projects Department Manager

Within the Systems Integration Division, you will orchestrate the management of resources to execute complex, fully integrated broadcast systems. The ideal candidate will bring thorough project management experience and will be expected to further enhance project management techniques and new quality assurance programs. Your major responsibility will be to ensure project completion, both within schedule and budget. You will work in concert with our marketing and sales groups for future project budgeting. You will also prepare and update budgets and capital expenditures.

Requires 10+ years' experience in broadcast or production systems, as well as project management with 6 years' supervisory experience. Job Code: CCY-PDM

Proposal Manager

Utilize your sales and marketing expertise to oversee the development, coordination and preparation of sales proposals. This will include specifying strategy formulation and plan generation, as well as designing proposal formats and ensuring that guidelines meet customer and company needs. Requires 4+ years' broadcast or television production experience emphasizing operations. Excellent writing skills a must; familiarity with value-added sales processes desirable. Job Code: CCY-PM

Sr. Video Systems Design Engineers

Regular Full-time and Contract/Temporary

We're looking for very seasoned Engineers to work on designing large scale digital audio and video facilities. Candidates must be strong in system level engineering design, technical problem solving, team building and communications. Responsibilities will include the design of floor plans, equipment rack elevation layouts, and detailed signal flow construction diagrams. Fluency in Microsoft Excel for Windows is required; AutoCAD, MS Word and MS Access software knowledge a plus.

Requires 5+ years' experience in the design, operation, maintenance and testing of large scale state-of-the-art analog and serial digital audio and video production, as well as broadcast facilities. Job Code: CCY-VSD

Send responses to: **Sony Electronics Inc., 3300 Zanker Road, MS: SJ-2C2, San Jose, CA 95134; FAX (408) 955-5166. Or e-mail youngc@ccmail.nhq.sony.com.** EOE.

CLASSIFIED

HELP WANTED

SENIOR MIXER DESIGN ENGINEER-design engineering department: Minimum bachelor of science in electrical engineering plus 5 years experience in similar position required. Duties include the engineering analysis, design and development of recording, broadcast and reinforcement professional audio mixing consoles, signal processors, amplifiers and similar audio equipment; providing advisory assistance and guidance to Junior Engineers and introduction into production of new products. Company is located in Meridian, Mississippi. U.S. Proof of legal right to permanently work in the U.S. will be required. Salary: $52,500 per year. Work week: Monday-Friday, 8:00 a.m. to 5:00 p.m. Total work hours: 40 per week, no overtime. Interested applicants should contact the Mississippi State Employment Service, P.O. Box 750, 1100-17th Ave., Meridian, Mississippi 39302-0705. Job order #MS2746097.

MEDIA ENGINEERING / MAINTENANCE MANAGER B: Bellevue Community College, Bellevue, WA has immediate opening. Position supervises technical staff who are responsible for installation, maintenance and repair of electronic media equipment (except computers); provides leadership in planning, designing, testing, and installing of electronic media systems and electronic classrooms and in developing and reviewing bid specifications for the purchase of electronic media equipment; manages operating budget; documents all services provided by department. Requires four years of college or technical school training in radio, television, electrical, electronics, or related engineering field AND four years of responsible experience in electronics work including two years of closed-circuit television experience and two years of lead or supervisory experience. Additional applicable work experience may be substituted, year-for-year, for the college or technical school training. Salary: $3,131 to $4,006/mo. For job description and application materials, contact the BCC Jobline at 206-643-2082 or write BCC Human Resources, 3000 Landerholm Circle S.E., Bellevue, WA 98007. Closes 4/5/96.

MAINTENANCE TECHNICIAN - Immediate opening for experienced technician. Must have a minium of 5 years experience in TV broadcast maintenance, including systems troubleshooting and repair of studio video and audio equipment, digital equipment, computer systems, Electronic News Gathering equipment, video and audio recording equipment. FCC General Class License or SBE Certification desirable. Send resume to KOMO Television, Human Resource Dept., 100 Fourth Ave. N., Seattle, WA 98109. EOE M/F.

CHIEF ENGINEER needed for NBC-affiliate, group-owned station in Reno, Nevada. Applicants must possess strong skills in repairing Sony 1" and Betacam VTR's; Ability to analyze microwave and satellite equipment; Electronic and broadcast experience preferred; Able to lift and carry heavy equipment; and possess a commercial driver's license with clean record. Send resume/salary history to John Finkbohner, Operations Manager, KRNV-TV, Sierra Broadcasting Company, 1790 Vassar Street, Reno, Nevada 89510, or fax to (702) 785-1208. EOE.

KDVR/FOX-31 DENVER has immediate openings for two qualified engineers. **Maintenance Engineer** position requires 2-5 years current studio experience. One-inch, Betacam, switcher, computer and terminal gear experience required; 2-inch, microwave and transmitter experience a plus. Requires FCC General Class and valid driver's license. **Transmitter Engineer** will be responsible for operation and maintenance of two full-power UHF transmitter sites and expanding low power systems. Must be able to evaluate systems and carry through necessary planning and repairs. Requires 2-5 years experience with high-power UHF transmitters and related equipment, FCC General Class and valid driver's license. For either position, send current resume to Dept. XE, KDVR/Fox-31, 501 Wazee, Denver, CO 80204 Fax 303-595-8312. No phone calls, please. EOE.

MAINTENANCE ENGINEER: Position requires at least five years experience maintaining Studio, Control Room, and Transmission equipment in a Broadcast Television environment. Expertise is required in component-level repair of video, audio, and digital equipment and installation of broadcast systems. A Degree in Electronics or equivalent training is necessary. Please send resume to: Bill Beam, WABC-TV, 7 Lincoln Square, New York, NY 10023. No telephone calls or faxes please. We are an equal opportunity employer.

TRANSMITTER MAINTENANCE ENGINEER On-site transmitter engineer with experience to maintain two VHF RCA transmitters and all related equipment including microwave. FCC general class license required. Excellent opportunity that includes housing in rural North Dakota setting for energetic, self-starter. Send resume with references to: Chief Engineer, WDAZ-TV, P.O. Box 12639, Grand Forks, ND 58208-2639 or fax 701-746-4507. Equal Opportunity Employer.

CHIEF ENGINEERS WANTED METRO MEGA T.V. STATION Looking for a Chief Engineer. Experience in VHF/UHF transmission equipment. An in depth understanding of studio systems, including Analog and Digital Technology. The ability to negotiate with vendors and set specifications for new equipment purchases. Good managerial skills including Departmental organization, budgeting, and labor negotiations. SBE Certification or an FCC General Class License a plus. Candidates should be willing to relocate. Good salary and all benefits, send resume to LTS A/C 10300 North Central Expressway, Suite 469, Dallas, TX 75231.

ASSISTANT CHIEF ENGINEER FULL TIME Assistant Chief Engineer is needed to lead engineering maintenance department into the digital future. Must have 7-years minimum television studio maintenance and UHF transmitter experience. SBE certification is desirable. Skills needed include: leadership, communications, organization, motivation, computer, electronics, and mathematics. Please send resume to: WAFF-TV, Human Resources, P.O. Box 2116, Huntsville, AL 35804. WAFF is an Equal Opportunity Employer and encourages applications from women and minorities. ABSOLUTELY NO PHONE CALLS.

CLASSIFIED

HELP WANTED

CHRISTIAN TELEVISION NETWORK seeking qualified Chief Broadcast Engineer with experience in Transmitter and RF system. Production and Transmitting video systems, and Component level repair of all electronic equipment involved in TV production and broadcasting. The Network is seeking individuals who are goal oriented, quality minded and self-motivated. If you meet our criteria and share our vision and purpose, send your resume to: Tri-State Christian TV-Employment, P.O. Box 1010, Marion, IL 62959. An Equal Opportunity Employer.

NEW SPANISH LANGUAGE International Cable Television network seeks qualified applicants for the position of Director of Engineering. This is a start-up opportunity. Your chance to design and install technical systems from the ground up. The successful candidate will have ten or more years of engineering experience in broadcast and/or cable television with demonstrated ability in television production and transmission facility design systems integration/installation and maintenance. A thorough working knowledge of satellite communications is necessary as is a complete understanding of studio production and engineering principles. All candidates must have professional management qualifications. Fax resume to 404-364-1625.

ELECTRONICS TECHNICIAN. Experienced and entry level positions available. AA in electronics required. Work on broadcast MII video tape machines and camera. Some transmitter work. Drug screen required. WHAG-TV is a small market NBC affiliate. We offer a comprehensive benefit package, including 401(k) and section 125 plans. Send resume to Personnel, WHAG-TV, Dept. Z, 13 East Washington Street, Hagerstown, MD 21740. No phone calls. EOE.

TRANSMITTER/STUDIO MAINTENANCE ENGINEER needed for VHF independent in Top 20 Market. Majority of work will be at studio, buy solid VHF RF experience is essential. This growing station need a highly qualified technician to help us continue the conversion to digital production/transmission. Excellent pay and benefits. EEO Employer. Send resume to Classified Ad Coordinator, Broadcast Engineering, Dept. 775, 9800 Metcalf, Overland Park, KS 66212-2215

WESH-TV, a Pulitzer Broadcasting Company Station, and NBC affiliate serving Central Florida, is seeking an Engineering Wizard to join our team of pros and to take charge of our in-house computer systems. This job is not for empire builders or 5-O'clockers. Ideal applicant will be a goal oriented self-starter who works well in a strong news environment. Working knowledge of PC based networks is a must. Novell experience preferred. Background in TV studio maintenance required. Team player a must!! If you are a can-do person who fits the bill, we want to hear from you. Mail us your resume to John Demshock, Director of Operations and Engineering, WESH-TV, P.O. Box 547697, Orlando, FL 32854 or via E-Mail: 72620.3206@Compuserve.com. NO PHONE CALLS OR FAXES. WESH-TV is an Equal Opportunity Employer.

CHIEF ENGINEER KFMB-TV, San Diego, is seeking a Chief Engineer to be responsible for all technical operations and maintenance. Strong computer skills and up-to-date technical knowledge necessary. Three to five years of management experience preferred. Team building a definite plus. College degree preferable. Send confidential resume with references to Anna Swearingen, Director of Human Resources, KFMB-TV, P.O. Box 85888, San Diego, CA 92186. EOE. No phone calls please.

CHIEF ENGINEER. Looking for CE with hands on experience, qualified in all areas of broadcast engineering, responsible for overseeing/maintaining transmitter and studio equipment. SBE certification, FCC general license required. Send resume w/salary requirement to Classified Ad Coordinator, Broadcast Engineering, Dept. 774, 9800 Metcalf, Overland Park, KS 66212-2215. EOE.

TELEVISION TRANSMITTER SALES Acrodyne Industries has an immediate opening for a salesman for the Western United States. Transmitter sales experience desirable but not essential. Extensive knowledge of television systems necessary. Call Mitch Montgomery at 800-523-2596 X-115 or send resume to 516 Township Line Road, Blue Bell, PA 19422.

TELEVISION MAINTENANCE ENGINEER Must have exp. in repairing & maintaining TV equip. of all kinds. Reg. 3-5 yrs. extensive equip. maint. at TV station or brdcst. equip. mfr. High school diploma, or equiv., & training in electronics required. Qualified candidates should send resume to Business Office, KCTV, P.O. Box 5555, K.C., MO 64109. KCTV IS AN EQUAL OPPORTUNITY EMPLOYER, M/F/H.

CHIEF ENGINEER: WFXV-TV is seeking a technical competent leader for a hands on situation at a growing Fox station. Send resume to Don Gragg, WFXV-TV, Greenfield Road, Rome, NY 13440. No phone calls please. EOE.

TRANSMITTER MAINTENANCE ENGINEER KCRA/KQCA Television stations need a qualified person with a strong background in RF equipment, especially UHF transmitters. Position requires 3-5 years recent experience with microwave and UHF transmitters. Studio maintenance experience and computer literacy would be highly advantageous. A valid driver's license and FCC permit are required. SBE certification desired. This is an IBEW union position. Send resume to Director of Engineering, Kelly Broadcasting Co., 3 Television Circle, Sacramento, CA 95814. Fax (916) 325-3309. No phone calls please. EOE; M/F/ADA. A pre-employment drug screen is required.

SERVICES

SERVICE COMPUTER AND BROADCAST picture monitors vcrs cameras switchers and much more. Installation and design of entire broadcast studios. You buy the equipment we install. Call Pathway Electronics (216) 654-3392.

PROMOTE YOUR SERVICES

Call Matt at 800-896-9939 and increase business for as low as $106 per insertion

FULL-TIME TRANSPONDER SPACE AVAILABLE ON SATCOM C3

Full-time transponder space available on SatCom C3 Transponder 20. Located at 131W using General Instruments Digicipher I Video Compression System. Will be converted to MPEG2 Video compression Digicipher II in the second quarter of calendar 1996. In addition to transponder space, uplinking and playback services are also available from an uplink facility located in Englewood, CO.

Call Doug Greene @ 303-784-8809

Monitor Service Center

Varitek specializes in high resolution broadcast video monitors.
Digital/Analog
NTSC, PAL, SECAM.

We at Varitek have been providing quality service to our clients throughout the United States since 1982.

IKEGAMI, SONY, HITACHI, MITSUBISHI JVC, PANASONIC, CONRAC, NEC BARCO, TEKTRONIX

(800) 400-7972

VARITEK INC.

415 W. Taft Ave., Orange, CA 92665

Circle (323) on Action Card

AD INDEX

Page Number	Reader Service Number	Advertiser Hotline
AAVS/Div. of Sencore ... 3	5	800-769-AAVS
Acrodyne Communications Inc. ... 129	119	800-523-2596
ADC Telecommunications ... 266-267	215	800-726-4266
Advanced Broadcast Systems ... MAP, 174	165	606-282-7580
AJA Video ... 56	198	916-274-2048
Alamar Electronics ... MAP		408-866-9373
Anton/Bauer ... 139	133	800-422-3474
Architektur ... 184	144	919-664-8500
ASACA/Shibasoku Corporation ... 106	112	310-827-7144
ASC Audio Video Corporation ... 167	145	818-843-7004
Audio Precision ... 7	14	800-231-7350
Avid Technology ... 9	15	800-949-2843
Avitel Corporation ... 180	176	801-977-9553
Beck Associates ... 210	178	512-388-9777
Beck Associates ... 302	320	512-388-9777
Belden Wire & Cable ... 68	80	800-235-3364
B & H Photo - Video ... 287-289	208, 209	800-947-9928
Bird Electronic Corp. ... 208	160	216-248-1200
Broadcast Microwave Services ... 96	88	619-560-8601
Broadcast Video Systems Ltd. ... 214	158	905-764-1584
BTI Computer Systems ... 152	127	408-524-9224
Burle Industries ... 118	116	717-295-6123
Cablewave Systems ... 269	84	203-239-3311
Canare Cable, Inc. ... 249	181	818-365-2446
Canare Cable, Inc. ... 277	74	818-365-2446
Canon USA Broadcast Lens ... 19, 169	8, 148	201-816-2900
Chyron Graphics ... 11	17	516-845-2000
Cipher Digital, Inc. ... 279	190	800-331-9066
Clear-Com Intercom Systems ... 27	20	510-527-6666
Comark Communications, Inc. ... 53, 257	72, 199	215-822-0777
Comm/Scope Inc. ... 201	155	800-982-1708
ComSonics Inc. ... MAP, 10	16	703-434-5965
Concept W Systems ... 158	138	316-342-7743
Conex Electro Systems ... 256	200	360-734-4323
CPI ... 93, 95	86, 87	415-424-4515
Datatek, Inc. ... 143	182	800-882-9100
Dielectric ... 292	204	207-655-4555
Digipath Video Inc. ... 166	132	514-697-0810
Di-Tech Inc. ... MAP		516-667-6300
DPS ... MAP, 37	68	606-371-5533
Discreet Logic ... 205	129	514-948-0660
Divi Com ... 183	143	408-944-6700
DNF Industries ... 279	192	213-650-5256
Drastic Technologies ... 97	97	416-636-4444
Duracell USA ... 104-105	110	800-548-5489
D/Vision Systems Inc. ... 61, 63	67	800-D-VISION
Dynatech Video Group ... 21	18	800-453-8782
EEV, Inc. ... 179	151	800-DIAL-EEV
Electro-Voice ... 36	202	616-695-6831
Emcee Broadcast Products ... 211	179	717-443-9575
Ergo Industries Inc. ... 168	147	800-635-9297
http://members.gnn.com/eii/index.htm		
ESE ... 128	106	310-322-2136
Faraday Technology ... 156	137	+178-266-1501
Faroudja Laboratories ... 33	22	408-735-1492
Fiber Options ... 204	156	800-342-3748
Florical Systems Inc. ... 50	64	352-372-8326
Force, Inc. ... 176	170	540-382-0462
Fujinon, Inc. ... 109, 111	99, 100	201-633-5600
Full Compass Systems ... 285	207	800-356-5844
Garner Industries ... 301	322	800-228-0275
Gray Engineering Laboratories ... 146	180	714-997-4151
Harris Corp./Broadcast Div. ... MAP, 1	4	606-282-4800
Henry Engineering ... 176	169	818-355-3656
Herman Electronics ... 174	166	305-477-0063
Hewlett Packard ... MAP, 46-47	61	800-452-4844
Hipotronics, Inc. ... 170	149	914-279-8091
Hitachi Denshi America ... 145	135	516-921-7200
Hotronic Inc. ... 164	130	408-378-3883
Hughes Communications Inc. ... 113	101	213-607-4377
IDX Technologies ... 80	83	619-560-9779
Ikegami Electronics Inc. ... 163	173	201-368-9171
ITS Corp. ... 173	196	412-941-1500
International TV Symposium ... 265	188	+219-633-220
Intraplex, Inc. ... 28	21	508-692-9000
Itelco S.P.A. ... 207	174	+39-763-316231
Jampro Antennas, Inc. ... 78	81	916-383-1177
Jelmax Co., Ltd. ... 52	65	+3-3436-4568
Jem-Fab Corp. ... 302	321	919-435-6179
JVC Professional Products Co. ... 32 A-H	12	800-JVC-5825
Leader Instruments Corp. ... 181	153, 154	800-645-5104
Leader Instruments Corp. ... 293	212	800-645-5104
Leightronix Inc. ... 278	194	517-694-5589
Leitch Incorporated ... BC	3	800-231-9673
Lighthouse Digital ... 168	146	800-577-9562
Link Electronics ... 170	150	314-334-4433
LNR Communications Inc. ... 209	177	516-273-7111
Louth Automation ... 38-39	69	415-843-3665
Macrovision ... 251	187	408-743-8600
Mark IV Pag ... 175	167	+01562-741515
Matrox Electronic Systems ... 122-123	118	800-361-4903
Maxell Corp. of America ... 115	102	800-533-2836
Miller Fluid Heads ... MAP, 17	7	201-473-9592
Miranda Technologies Inc. ... 76	92	514-333-1772
MIT Inc. ... 281	23	310-390-6608
Mountaingate Data Systems ... 117	114	800-556-0222
Multidyne Electronics ... 279	195	800-4TV-TEST
Musimatic ... 278	189	770-484-8434
MYAT ... 279	191	201-767-5380
Nikon Electronic Imaging ... 261	183	800-52-NIKON
Nova Systems Inc. ... 154	128	203-693-0238
Nucomm Inc. ... 144	152	908-852-3700
NVision Inc. ... 51	63	916-265-1000
Odetics, Inc. ... MAP, 103	109	800-243-2001
Opamp Labs, Inc. ... 216	185	213-934-3566
Orban ... 253	117	510-297-2774
Ortel Corporation ... 135	121	818-281-3636
Allen Osborne Assoc. ... 206	175	805-495-8420
Pag Ltd. ... 147	125	+081-543-3131
Panasonic Broadcast & TV. MAP, 130-133		800-524-0864
Panatek Inc. ... 128	107	805-482-4820
Parkervision ... 107	111	800-532-8034
Patchbay Designation Co. ... 278	193	818-241-5585
PESA Switching Systems ... 23	19	800-328-1008
Philips Components ... 213	157	800-447-3762
Philips TV Test Equipment ... 116	104	201-529-2188
Pirod, Inc. ... 99	98	219-936-4221
Pixel Instruments Corp. ... 114	103	408-354-9122
Pixel Power Limited ... 32	11	+1223-423-399
Probel ... 81	213	770-396-1971
Quantegy ... 77	79	415-903-1134
Quantel ... 171	161	203-656-3100
QuVis ... MAP		415-457-3005
Remarcable Co. ... 178	172	315-461-8161
Rosco Laboratories Inc. ... 126-127	134	914-937-1300
Ross Video Ltd. ... 297, 299	205, 210	613-652-4886
Sachtler Corp. of America ... 79	82	516-867-4900
Sanix Corporation ... 283	206	708-677-3000
Schneider Corporation of AM ... 172	163	516-496-8500
Scitex Digital Video, Inc. ... 177	168	415-369-5111
Sennheiser Electronics Corp. ... 137	123	203-434-9190
http://www.sennheiserusa.com		
Sierra Design Labs ... 45	24	702-831-7837
Silicon Graphics Inc. ... 217-248	25-60	415-390-5287
Skycell Satellite Telephone Service ... 54-55	73	800-867-8777
Snell & Wilcox Ltd. ... 13-15	6	+730-821-1188
Snell & Wilcox Ltd. ... 41-43	71	+730-821-1188
Snell & Wilcox Ltd. ... 85-87	94	+730-821-1188
Snell & Wilcox Ltd. ... 88-89	95	+730-821-1188
Snell & Wilcox Ltd. ... 90-91	96	+730-821-1188

AD INDEX

	Page Number	Reader Service Number	Advertiser Hotline
Snell & Wilcox Ltd.	255	197	+730-821-1188
Sony Business & Professional	34-35		800-635-SONY
Sony Business & Professional	74-75		800-635-SONY
Sony Business & Professional	MAP, 150 A-J		800-635-SONY
Sony Business & Professional	151		800-635-SONY
Sony Business & Professional	153		800-635-SONY
Sony Business & Professional	155		800-635-SONY
Standard Communications	157	136	310-532-5300
Synthesys Research Inc.	159	139	415-364-1853
Tascam/TEAC America, Inc.	263	186	213-726-0303
TDK Electronics Corp.	121	164	800-TDK-TAPE
Tekniche	259	201	201-784-2288
Tektronix Inc. Vnd.	65	77	800-998-3588
Tektronix Inc. Vnd.	67	78	800-998-3588
Tektronix Inc. Vnd.	69	89	800-998-3588
Tektronix Inc. Vnd.	71	90	800-998-3588
Tektronix Inc. - Measurement Bus	101	108	503-627-2830
Telemetrics, Inc.	136	122	201-848-9818
Telex Communications, Inc.	57	75	800-392-3497
Telex Communications, Inc.	119	115	800-392-3497
TFT	165	131	800-347-3383
Austin Company	138	124	216-691-6625
Thomson Broadcast Systems	125	105	800-882-1824
Thomson Tubes Electroniques	58-59	76	201-812-9000
Thomson Tubes Electroniques	73	91	201-812-9000
Trade Commission of Spain	108	113	213-627-5284
Trompeter Electronics	162	142, 126	818-707-2020
Varitek	305	323	714-283-8980
VDP Inc.	216	184	800-VID-CAD6
Vela Research Inc.	83	85	813-572-1230
Video Gainesville	172	162	904-372-0270
Videotek, Inc.	IBC	2	800-800-5719
Vinten TSM	215	159	914-268-0100
Vistek Electronics Limited	31	10	+162-853-1221
Viz Technology	178	171	718-714-9873
Wegener Communications	161	141	404-623-0096
Wheatstone Corporation	IFC	1	315-452-5000
Will Burt Company	160	140	216-682-7015
Winsted Corporation	49	62	800-447-2257
Wohler Technologies, Inc.	291	203	415-589-5676
3M Pro Audio/Video Products	29	9	612-733-1959
360 Systems	5	13	818-991-0360

SALES OFFICES

NEW YORK, NY
Gordon & Associates
Josh Gordon
335 Court Street, Suite #9
Brooklyn, NY 11231
Telephone: (718) 802-0488
FAX: (718) 522-4751

Joanne Melton
1775 Broadway, Suite 730
New York, NY 10019
Telephone: (212) 641-5270
FAX: (212) 459-0395

OXFORD, ENGLAND
Richard Woolley
Kerr Duffy
Intertec Publishing Corporation
Unit 3, Farm Business Centre,
Clifton Road, Deddington,
Oxford OX15 4TP England
Telephone: +44 (0) 1869 338794
FAX: +44 (0) 1869 338040
Telex: 837-469 BES G

AGOURA HILLS, CA
Duane Hefner
Lianne Fairchild
5236 Colodny Ave., Suite 108
Agoura Hills, CA 91301
Telephone: (818) 707-6476
FAX: (818) 707-2313
E-Mail address: dnhefner@aol.com

SANTA MONICA, CA
MC² Magazine Communications Marketing Corporation
Jason Perlman: (310) 458-9987
Sue Horwitz: (310) 458-8080
501 Santa Monica Blvd., Ste. 401
Santa Monica, CA 90401
FAX: (310) 393-2381

CHICAGO, IL
Bill Wendling
55 East Jackson, Suite 1100
Chicago, IL 60604
Telephone: (312) 435-2361
FAX: (312) 922-1408

TOKYO, JAPAN
Orient Echo, Inc.
Mashy Yoshikawa
1101 Grand Maison
Shimomiyabi-Cho 2-18
Shinjuku-ku, Tokyo 162, Japan
Telephone: (3) 3235-5961
FAX: (3) 3235-5852
Telex: J-33376 MYORIENT

CLASSIFIED ADVERTISING
OVERLAND PARK, KS
Matt Tusken
P.O. Box 12901
Overland Park, KS 66282
(913) 967-1732 Fax: (913) 967-1735

LIST RENTAL SERVICES REPRESENTATIVE
Lori Christie
9800 Metcalf
Overland Park, KS 66212-2215
Phone: 913-967-1875
FAX: 913-967-1872

BROADCAST ENGINEERING

EDITORIAL
Brad Dick, *Editor*
Skip Pizzi, *Technical Editor*
Steve Epstein, *Technical Editor*
Dawn Hightower, *Senior Associate Editor*
Deanna Rood, *Associate Editor*
Carrie Poland, *Associate Editor*
Tom Cook, *Senior Managing Editor*
Carl Bentz, *Directories Manager*

ART
Stephanie L. Masterson, *Associate Art Director*

BUSINESS
Raymond E. Maloney, *President*
Cameron Bishop, *Senior Vice President*
Dennis Triola, *Publisher*
Judson Alford, *Marketing Director*
Stephanie Hanaway, *Group Director, Special Projects*
Dee Unger, *Director Advertising Services*
Nancy Hupp, *Advertising Production Manager*
Annette Hulsey, *Classified Advertising Coordinator*
Pat Eisenman, *Senior Ad Production Coordinator*
Susan Jones, *Advertising Coordinator*
Doug Coonrod, *Corporate Art Director*
Barbara Kummer, *Circulation Director*
Meghan Wright, *Circulation Manager*
Customer Service: 913-967-1711 or 800-441-0294

TECHNICAL CONSULTANTS
Jerry Whitaker, *Contributing Editor*
Richard Dean, *European Correspondent*
Eric Neil Angevine, *Broadcast Acoustics*
John H. Battison, *Antennas/Radiation*
Dennis Ciapura, *Radio Technology*
Dane E. Ericksen, P.E., *Systems Design*
John Kean, *Subcarrier Technology*
Donald L. Markley, *Transmission Facilities*
Harry C. Martin, *Legal*
Curtis Chan, *Audio/Video Technology*

MEMBER ORGANIZATIONS
Sustaining Members of:
- Acoustical Society of America
- Society of Broadcast Engineers
- Society of Motion Picture and TV Engineers
- Society of Cable & Telecommunications Engineers

Member, American Business Press
Member, BPA International
Affiliate Member, International Teleproduction Society

BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other management personnel at commercial and public TV stations, post-production and recording studios, broadcast networks, cable, telephone and satellite production centers and networks. Qualified persons include consulting engineers and dealer/distributors of broadcast equipment.

SUBSCRIPTIONS: Non-qualified persons may subscribe at the following rates: United States and Canada; one year, $55.00. Qualified and non-qualified persons in all other countries; one year, $70.00 (surface mail); $130.00 (air mail). Subscription information: P.O. Box 12937, Overland Park, KS 66282-2937.

INTERTEC PUBLISHING

By Paul McGoldrick

D-1, component digital

This month, we will take a more detailed look at the component digital signal. To the annoyance of some readers, I am going to continue to call the stream D-1. Unlike D-2, where the recording machine is definitely the standard, different D-1 recorders from different manufacturers have existed with no compatibility between tapes (resulting in at least one legal action). It has simply become "convenient" to use the D-1 tag for the signal itself; it is not 100% accurate, but it has stuck.

There are different levels of component digital, but there are also some common basics. In all systems there is no sampling of blanking intervals; instead, data words showing Start of Active Video (SAV) and End of Active Video (EAV) indicate timing positions. The periods between EAV and SAV are available for ancillary data, such as digital audio, time code, etc.

The standard 4:2:2 signal in current use is sampled at 13.5MHz in the luminance, and as the ratio implies, the color-difference signals are sampled at 6.75MHz. (The numbers are based on 13.5MHz being four times some imaginary subcarrier frequency that "works" for both 525 and 625.) Sampling is coincident for the common sample point (see Figure 1), and the January article was misleading on this point. The total sampling frequency is 13.5 + 6.75 + 6.75 = 27MHz. The 4:2:2 standard allows for 10 bits, but eight bits are also permitted. Users should make sure that any reduction to eight bits, where 10 bits has been used for processing, uses a method of "rounding," rather than by simple "truncation" of the least-significant bits.

An alpha or key channel added to the basic signal sampled at 13.5MHz is expressed as 4:2:2:4 with a total sampling frequency of 40.5MHz. (More accurately, the key signal is a monochrome signal in the form of 4:0:0, but the initial '4' is used by itself for simplicity.)

There is, however, nothing to prevent other forms of D-1 signal, and some have been used, while others have been produced as test signals or used as internal processing in equipment. If the color-difference signals were sampled at 13.5MHz, we would have 4:4:4 or 4:4:4:4 with an alpha channel. In the same manner, it is possible to increase the sampling to 27MHz to produce up to 8:8:8:8 (108MHz total sampling frequency). Strictly speaking, we should stop using the separating colon because the multiplex system is no longer possible above 4:2:2 on a single DB-25 connector.

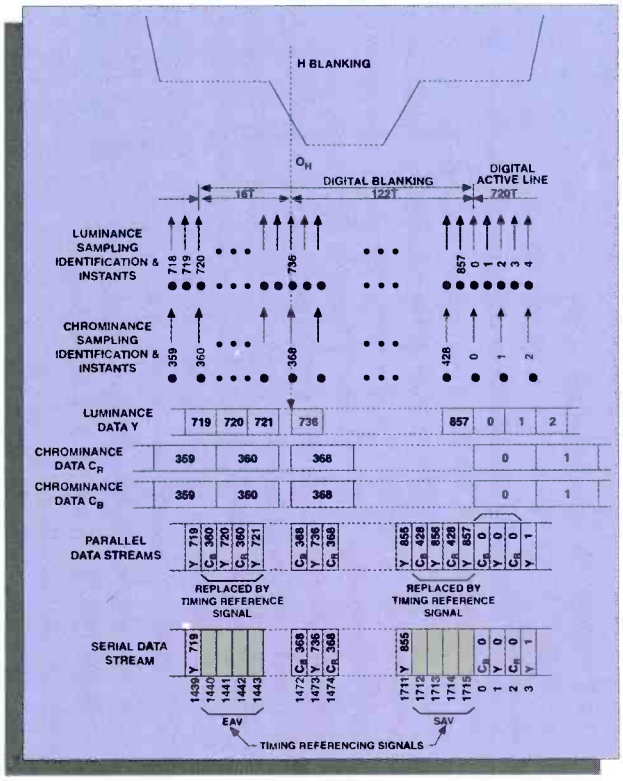


Figure 1. Structure of 4:2:2 digital sampling as per SMPTE 125M. (For more information, see "Transition to Digital," August 1995.)

The original D-1 recorders were 8-bit and used 19mm tape. They were expensive, but they became the absolute standard of the industry, particularly for high-end post-production. Still, the push for component digital has been heavier outside North America. Apart from the apparent disdain for D-2 (noted last month), there is also a large market where equipment is not available in composite (analog or digital) and that, of course, is in the countries using SECAM. Those territories were early converts to component analog and then component digital. Following the D-1 recorders, we have had lower cost entries in the form of:

- *DCT* from Ampex — a 19mm standard with 4:2:2 (eight bits) stored in a compressed format.
- *D-5* from Panasonic — a 13mm standard that stores uncompressed 4:2:2 (10 bits).
- *Digital Betacam* — a 13mm standard storing 4:2:2 (10 bits) in a compressed format.

Parallel component digital signals, as described here, are extremely inconvenient mechanically. The multiplexed 4:2:2 signal on a DB-25 connector (which was designed as a computer connector, not video), is bulky and heavy. Some of the earlier D-1 equipment required additional mechanical support for the cables and we went through periods with slide locks and/or screw locks.

The actual cable runs permitted are also quite short with standard conductors. The normal off-the-shelf printer cable (if it has all of the conductors) tends to have the conductor pairs twisted with the result that mistimings occur; also, the different spectral content of the pairs results in skewing of clock/data relationships.

The normal rule of thumb is that a stock cable should not be trusted over about 50 feet. A specially manufactured cable may be good up to double that length or more. Dressing of cable ends and terminations is important to prevent harmonic radiation at 108MHz: an international aeronautical distress frequency.

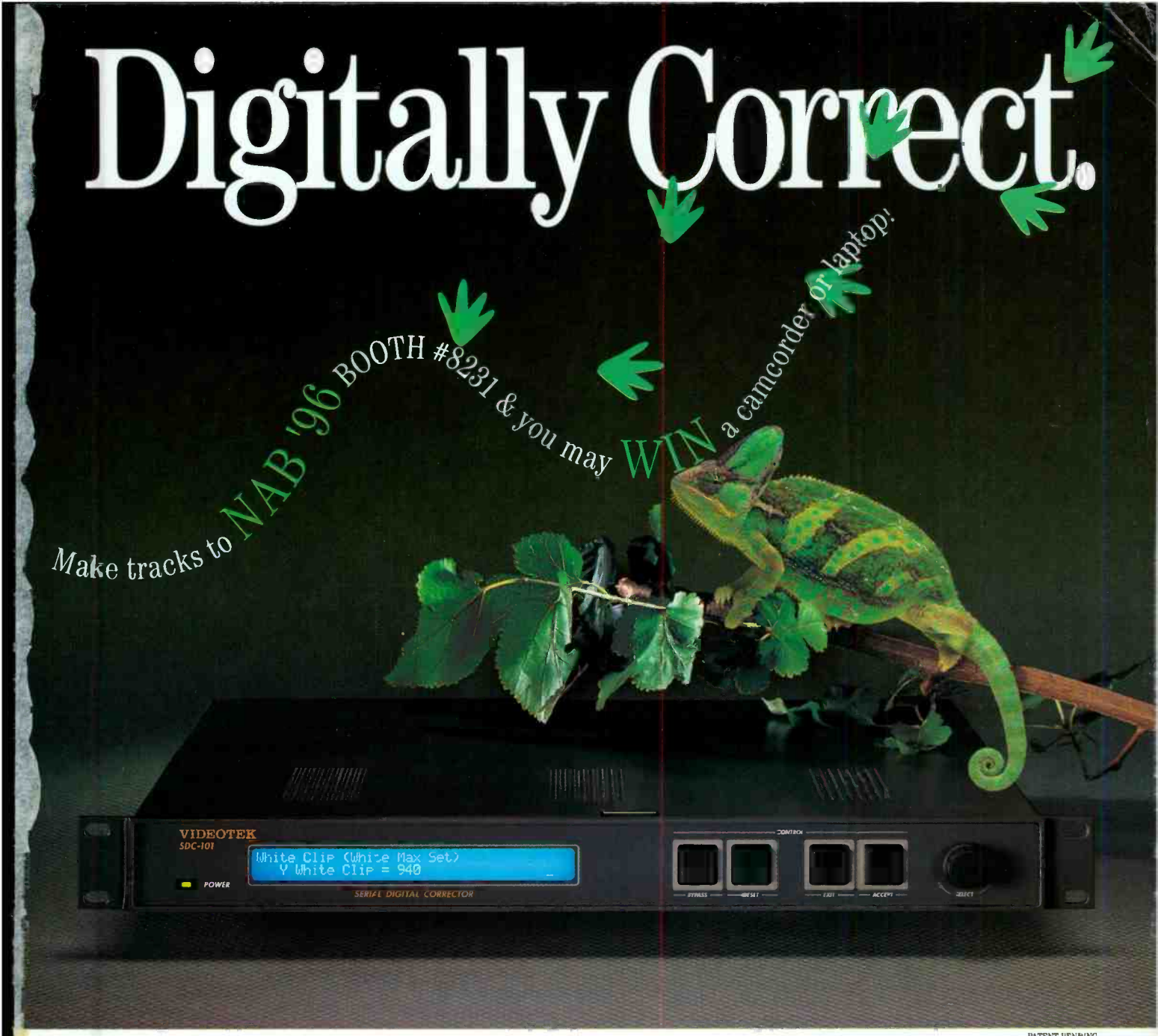
Fortunately, the technology for converting the parallel signal into a serial one came quite rapidly, and in the coming months, we will be looking at the serial interface and various detailed aspects of component digital, as well as the ATSC standard. ■

Paul McGoldrick is a free-lance writer and consultant based on the West Coast.

Editor's note: The table that appeared in the January column incorrectly listed the number of vertical lines in NTSC as 626, it should read 525. Also, D-1 is a tape format, not a video standard, but Paul makes a good point; inaccurate or not, it has stuck.

Digitally Correct.

Make tracks to NAB '96 BOOTH #8231 & you may WIN a camcorder or laptop!



PATENT PENDING

The unique Videotek digital corrector can even fool Mother Nature.

Quick, easy, and with total control. Videotek's new SDC-101 defeats any threat to your video images. It lets you correct picture errors and alter video levels in serial component digital video inexpensively, with controls and functions familiar in the analog world. 10-bit digital processing guarantees optimum signal quality. And, it does it all without relying on expensive outside services.

Unsuspecting picture variations fall prey to frame by frame correction. Changes in light and shadows are transformed before your very eyes.

A Digital System Integration Product

The more you work with the SDC-101, the more of its many faces you'll see. Its versatility and ease of operation means cost-effective and timely performance. That's what Videotek's products are all about.

Call us today. The SDC-101 will make your video creations digitally correct.

VIDEOTEK™
A Zero Defects Company

CERTIFIED ISO 9001

243 Shoemaker Road, Pottstown, PA 19464 1 800-800-5719 (610) 327-2292 Fax: (610) 327-9295

Circle (2) on Action Card

LOGOMOTION

Makes Every Frame Count.

LogoMotion™ is the first logo generator to store and playback animated logos, opening up a new world of creative options for on-screen presentation.

LogoMotion combines a comprehensive range of features in a simple, easy-to-use package. New Flash technology allows static and animated logos to be instantly recorded from video.

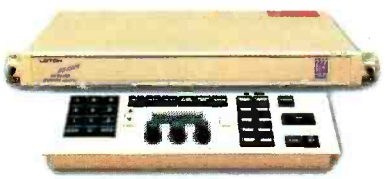
LogoMotion can store dozens of logos, which can be positioned anywhere on screen, looped to other logo sequences, and automated to create stunning effects. LogoMotion's integral keyer allows transparency and fade rates to be controlled separately, giving you the flexibility to tailor the 'look' of your logo to the program material. The possibilities are endless!

LogoMotion is loaded with sophisticated features that can add life to any program.

Call Leitch today and find out how LogoMotion can make every frame count.

LEITCH®

(800) 231-9673



Leitch Incorporated, 920 Corporate Lane, Chesapeake, VA 23320, U.S.A. - Tel: (800) 231-9673 or (804) 548-2300 Fax: (804) 548-4088
Leitch Technology International Inc., 25 Dyas Rd., North York, Ontario, M3B 1V7, Canada - Tel: (800) 387-0233 or (416) 445-9640 Fax: (416) 445-0595
Leitch Europe Limited, 24 Campbell Court, Bramley, Basingstoke, Hants, U.K. RG26 5EG - Tel: + 44 (0) 1256 880088 Fax: + 44 (0) 1256 880428

Circle (3) on Action Card