BROADCAST® ENGINEERING

An INTERTEC® Publication

March 1995/$5.00

NAB Preview:

- Complete exhibitor highlights
- Exhibit hall map
- Exclusive *BE* FASTtrack

Facilities Design Showcase

SEARCH NO MORE.

The Pioneer Rewritable VideoDisc Recorder puts an end to the endless search. With 0.3 seconds average access time and two playback heads, you can be cued and ready to move to the next segment long before the current one ends.

That's why just about anyone doing anything with video -- from the major broadcast and cable networks to sports arenas -- is doing it with Pioneer VideoDisc Recorders.

The search is over for scores of O&O's, affiliates, independents, PBS facilities, nationwide networks, production houses, and corporations. Discover why KRON, KESQ, KMEX, Prevue Networks, TNN: The Nashville Network, WSFP, WFMZ, KCOP, KCNC, KDFW, Videofonics, NIKE, and many others chose the Pioneer VDR-V1000.

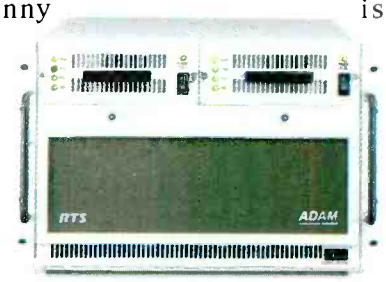
If you're searching for a quick return on investment, the Pioneer Rewritable VideoDisc Recorder is your ideal machine. Call today to find out why:

Northeast-Joe Wellman at (201) 236-4180; Midwest-Jim Burger at (201) 327-6400; South-John Leahy at (214) 580-0200; West-Craig Abrams at (310) 952-3021.

PIONEER
The Art of Entertainment

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 (4) on Reply Card

BROADCAST® engineering

March 1995 • Volume 37 • Number 3

NAB PREVIEW

32

THIS MONTH...

60

48

76

DEPARTMENTS:

16

COLUMNS:

ON THE COVER: Artist Craig Ridenour's rendering for station KDSU-TV.

BROADCAST ENGINEERING (ISSN 0007-1995) is published monthly (except semi-monthly in November) and mailed free to qualified persons within the United States and Canada. 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.

What's New At NAB95?

SUNDAY, APRIL 9–THURSDAY, APRIL 13, 1995
LAS VEGAS CONVENTION CENTER

It's no secret! Digital video equipment will be the key focus at NAB95.

You'll see new digital VTRs, new digital switchers, dazzling digital effect generators, cameras . . . and the latest in digital video test equipment – the state-of-the-art solutions from AAVS – providing test and measurement capabilities that assist the engineering and operations staff in determining the quality of the digital transmission and issuing a warning before a failure occurs. Preventative maintenance answers that ensure your digital video facility will stay up and running – helping you maintain and increase the quality of your final product - digital video quality that your customers expect and deserve.

The Principles Of Digital Video

The *"Principles Of Digital Video"* provides the basics of digital video, with an emphasis on digital video system troubleshooting and testing. This tutorial is ideal for system engineers in the process of converting to digital video and those who are presently considering the implementation of digital video in their facilities. **For more information on *"The Principles Of Digital Video"* tutorial call 1-800-769-AAVS(2287).**

Visit with us during **NAB95 at Booth #19623** to discover how AAVS can help with your digital video testing needs.

Don't Miss Out! **To Set Up A Private One-On-One Demonstration And Find Out About The Latest Techniques In Testing Digital Video Systems, Call 1-800-769-AAVS(2287).**

Circle (5) on Reply Card

See Us In Booth # 19623

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

NAB '95 Highlights

Digital TV transmission scheme to be demo'd

COFDM (coded orthogonal frequency division multiplexing), the digital TV transmission system broadcasters are examining as an alternative to the transmission approach backed by the Grand Alliance (GA), will be demonstrated during NAB '95.

This will be the first U.S. demonstration of COFDM technology applied to digital TV transmission. It's being considered for adoption in Europe and elsewhere as an alternative to the 8-VSB transmission technology.

HD-DIVINE, a consortium of five companies based in Stockholm, Sweden, will demonstrate its COFDM transmission "modem" in the special technology exhibit area at the Las Vegas Convention Center.

COFDM permits the use of several low-power transmitters or on-channel repeaters instead of a single, high-power transmitter. The technology also claims to provide greater multimedia flexibility. The equipment being demonstrated is designed for the European standard and features an 8MHz channel bandwidth. However, a later version will be modified to adapt to the North American 6MHz channel spacing.

Listen to CD-quality radio at NAB '95

For the first time broadcasters will be able to hear CD-quality or near CD-quality radio on the AM and FM band at NAB '95.

USA Digital Radio will sponsor the first over-the-air digital radio demo using an in-band, on-channel transmission scheme. The demo will allow broadcasters to hear digital audio broadcasting on the AM and FM bands. Listeners will be tuned in to the over-the-air demo while traveling around Las Vegas on specially equipped buses.

A similar demo is expected from digital radio developers at AT&T.

Futurist sessions to demo new services

TV broadcasting in a digital world and what broadcasters need to know now to plan for tomorrow will be explored during a TV futures summit on April 12.

Three-dimensional broadcast television, video-on-demand (VOD) and data broadcasting are some of the new services that will be demonstrated during a 2-hour session.

From 9 a.m. to 10 a.m., Dr. James E. Carnes, president and CEO of the David Sarnoff Research Center, will discuss digital technologies and their expected impact on TV broadcasting.

NAB and SMPTE present computer/film/video tutorial

An all-day seminar called "Pixels, Pictures, and Perception: The Difference and Similarities Between Computer Imagery, Film and Video" will be presented in Las Vegas on April 8, the day preceeding the NAB Convention. An international team of award-winning instructors will explain everything from the physiological process of vision to the electronic effect of monitor controls, as well as how that knowledge can be used to present better pictures. Topics will range from such basic issues as color, detail, and motion, to such specifics as digital filtering in data-rate compression and spot size in the recording of electronic images on film. The seminar is available at no additional cost to all NAB '95 full-program registrants. All participants will receive supporting print materials. For more information on NAB '95, including registration and housing, use Fax-on Demand at 301-216-1847.

NAB features a variety of speakers

FCC chairman Reed Hundt will address broadcasters on Tuesday, April 11, from 7:30 a.m. to 8:45 a.m. at the special chairman's breakfast. A regulatory dialogue also is scheduled Tuesday afternoon from 3:30 p.m. to 4:45 p.m. It will feature commissioners Andrew Barrett, Susan Ness and Rachelle Chong as well as NTIA chief and commerce department assistant secretary Larry Irving. James Quello will keynote the opening cermonies of the Broadcast Engineering Conference on Sunday, April 9.

Boutros Boutros-Ghali, secretary general of the United Nations, will keynote a special dinner for international broadcasters on April 12 at 7:30 p.m. at the Mirage Hotel. His address also marks the 50th anniversary of the United Nations Organization.

Dawson B. Nail, vice president/executive editor of *Television Digest and Communications Daily* will receive "The Spirit of Broadcasting" award April 10 at the NAB/TVB TV luncheon, which will be held from 12:00 p.m. to 2:30 p.m. The NAB award recognizes general excellence and is given to individuals who have a lifetime of contributions to the radio and TV industry.

Ian Diery, executive vice president and general manager, personal computer division, Apple Computer, Inc., will be a keynote speaker for NAB Multimedia World. He will share his views on the converging broadcast and computer worlds on April 11 at 9:00 a.m.

In other news

SMPTE Proceedings available

The Society of Motion Picture and Television Engineers (SMPTE) has published a *Proceedings* of selected papers from the SMPTE Advanced Television and Electronic Imaging Conference, which was held in San Francisco on Feb. 9-11.

Paid attendees who registered for the Advanced Television and Electronic Imaging Conference received a complementary copy of the *Proceedings*, courtesy of the SMPTE. Additional copies of the bound, 260-page paperback is available to SMPTE members for $20; the cost for non-members is $25.

The society also offers for sale a full line of test materials based on SMPTE standards and recommended practices to help engineers maintain their equipment at peak performance levels. Also for sale is a complete selection of SMPTE publications at reduced prices, including the established SMPTE Standard, 4:2:2 Digital Video, ITU/SMPTE Tutorial: Digital Terrestrial Television Broadcasting (DTTB) and A Television Continuum -- 1967 to 2017 (1991). A catalog and price list is available from SMPTE, 595 W. Hartsdale Avenue, White Plains, NY 10607 or call 914-761-1100. ■

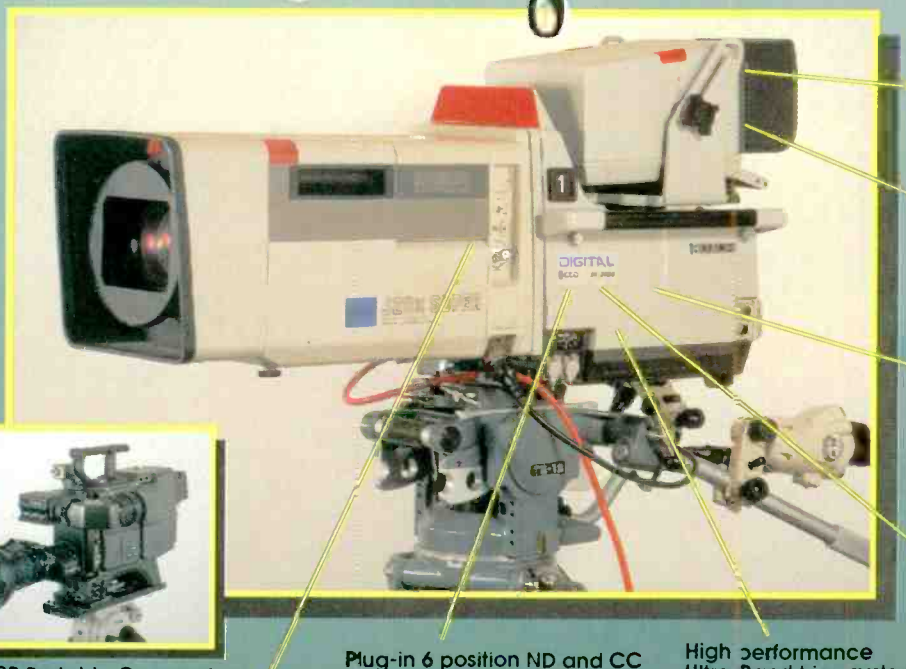
Buy a digital camera or else.....

Or else you may be stuck with a camera left behind by digital technology

As we all know, communications, video, information...everything is going digital. Isn't it time cameras did? Today's digital camera not only outperforms the best analog can offer but sets new bench marks in video quality, features, stability and reliability. The days of the analog camera are numbered because digital offers too many advantages to be ignored.

With DIGITAL advantages such as a new video transparency, flesh tone detail to soften facial blemishes, precision detail correction, precision transfer of setups between cameras, a plug-in memory card to recreate exact setups weeks or months later and serial digital outputs for D-1and D-2/D-3 VTR's, now is the time to consider what all cameras will be.....DIGITAL.

Introducing the Digital SK-2600

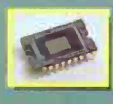


Unique PIP (Picture in Picture) Allows a second video source to be windowed with camera video in any of four quadrants or reversed with camera video

Separate H&V detail generator for viewfinder makes focus "pop" for camera operator

Exclusive single LSI device provides 13-bit (minimum) digital processing for RGB video including detail and masking.

The 600,000 pixel CCD provides 900 TV line resolution and dramatically reduces aliasing. An optional, 520K pixel CCD is available to provide switching between 4:3 and 16:9 aspect ratios at the push of a button.



SK-2600P Portable Companion

- "No Diascope" internal automatic camera setup
- "Thru-the-Lens" automatic setup with standard grey scale chart

Plug-in 6 position ND and CC filter wheels allow easy insertion of special effect filters with full remote control capability

High performance Ultra-Band triax system (12MHz Green) or Field triax system for long cable lengths or Digital optical fiber system

Network Users:
CBS TV City, Los Angeles
CBC Toronto, Canada

Call today for more information or a demonstration.

HITACHI

Hitachi Denshi, Ltd.
Hitachi Denshi America, Ltd.

New York	(516) 921-7200	Atlanta	(404) 242-3636
Los Angeles	(310) 328-6116	Dallas	(214) 891-6381
Chicago	(708) 250-8050	Canada	(416) 299-5900

Circle (10) on Reply Card

EDITORIAL

Hi ho, hi ho, it's off to Vegas we go.

Every year about this time my staff and I begin to feel the excitement of attending the industry's annual megaconvention. Preparing for the show is a monumental task in itself. Coordinating the editorial coverage for such an event with almost 50 staff members and reporters makes us tired before we ever get to the show floor. With NAB predicting 70,000 attendees and 1,000 exhibitors it'll be a tough job to cover all the bases, but after all, someone has to do it right!

In order to get a running start on our coverage, the crack *BE* editorial staff was allowed to peek into some manufacturers' back rooms for an advance look at new products. Here are a few of the hot new products you'll want to look out for at this year's show.

From *Sillican Graphics*, the Indigo-man-go, a 2,500MHz UNIX-based DTV graphics workstation, boasts 14 teragigaflops of floating point prowess. On-board thermal transfer coupling unit transfers dangerous heat out of unit and directly into your facility's HVAC system for efficient re-use.

Micro-microsoft (sometimes called *Picosoft*) introduces When95, a 32-bit virtual TV station software package. The company claims it can do everything from CG to automation control. Delivery date is unknown, but a company official assured me it would be available soon — whatever that means.

One of the most unique devices we located will be in the *Minor Flooded Heads* booth. Called the Spock rock tripod, it has no legs; the camera is supported in mid-air by levitation. Unfortunately, because the tripod is invisible, it's difficult to find in your trunk.

Panicsonic will release the latest in portable cameras, the super-dupercam. Able to record an entire year's worth of video on a single ½-inch cassette, the unit uses 2-bit processing to keep things simple.

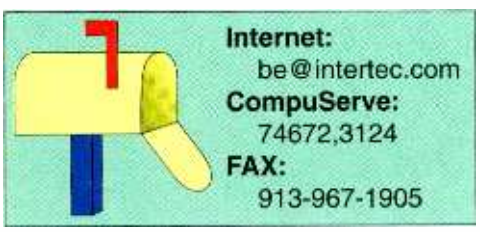
JVCC will be competing with its highly innovative camera. Using military stealth technology, the KY-why camera provides fully illuminated images in 100% darkness. It does so by remembering what it last saw in the light. The camera figures you, like the government, which funded the technology, won't know the difference.

Finally, don't forget to stop by the *So-me* booth. The company wouldn't release much about its surprise announcement, but it's expected to center on a new way to interconnect everything in your facility, from video server to the coffee machine. Sources tell me its Pentium-based, but then what's an error here or there?

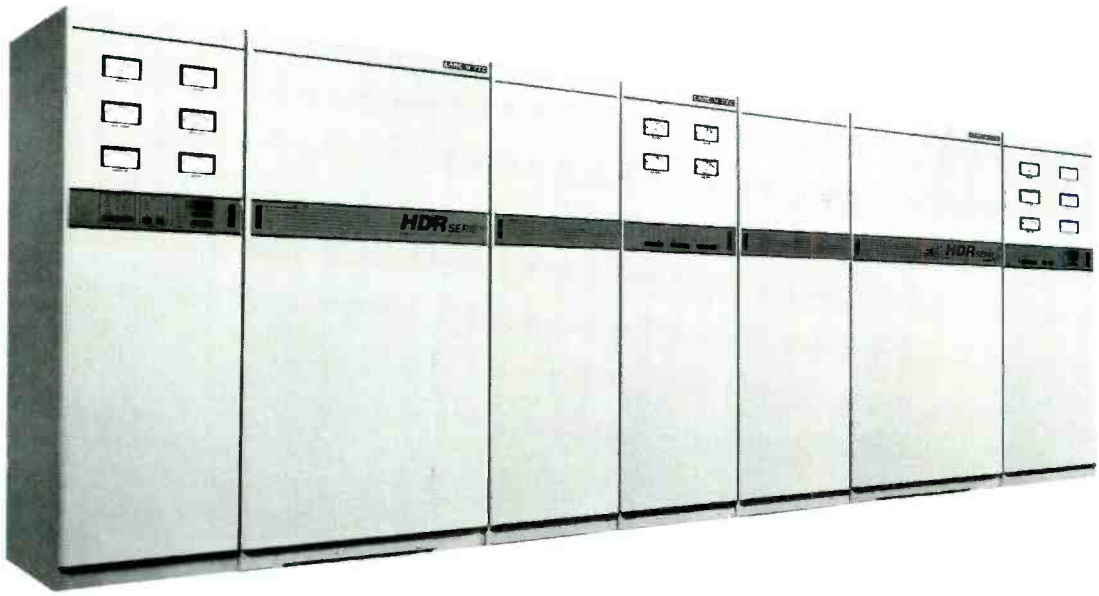
Keep your eyes open while on the show floor. If you find something really interesting during your visit, let us know. You can reach us on the Internet or CompuServe. We'll share the news with readers in our June wrap-up of this year's show.

Brad Dick

Brad Dick, editor



SUCCESS STORY.



Which company delivers maximum efficiency in high power IOT UHF transmitters?

80kW IOT High Definition Ready (HDR) Transmitter sold to KCSM, San Mateo/San Francisco, CA

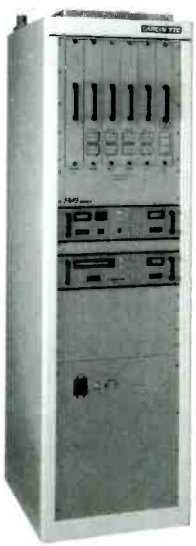
LARCAN-TTC is the answer. We're so successful in today's competitive transmitter market because everything we build is designed for simplicity, efficiency, reliability and long life. And everything we sell is backed by the resources of the LeBlanc Communications Group, one of the world's largest suppliers of RF transmission equipment and services.

Which company's low power UHF transmitters and translators are specified in FCC filings three times more often than all other competitors combined?

XLS Series LPTV Transmitters/translators: 1w-1kW. 100 watt shown

Who has sold more high power solid-state FM transmitters than anyone else?

FMS Series FM transmitters: 1 kW-8kW



Whether it's a 50 watt translator or a 240kW powerhouse, when you're ready to upgrade your UHF or FM facility, look to LARCAN-TTC. And for North America's most popular VHF transmitter, it's the legendary solid state LARCAN M Series. Let us help you write your own success story. Call LARCAN-TTC for the full story on our complete product line.

650 South Taylor Ave • Louisville, Colorado 80027 • Tel (303)665-8000 • Fax (303)673-9900

LARCAN TTC

LeBLANC

Please see us at NAB, Booth #12500.

Circle (11) on Reply Card

By Harry C. Martin and Andrew S. Kersting

FCC adopts NPRM in video dial-tone rulemaking

The FCC recently initiated proceedings to consider new rules governing telcos' provision of video programming to subscribers. The commission took this action in response to recent court decisions holding that the cross-ownership ban established by the 1994 Cable Act prohibits telcos from providing programming to subscribers in their service areas.

In its fourth Further Notice of Proposed Rulemaking (NPRM), the FCC seeks comment on whether telcos should be permitted to provide video programming over their own video dial-tone platforms. The proposed safeguards would protect consumers and video programmers. The FCC also seeks comment on whether it has authority to require telcos that want to provide video programming to do so over their own facilities, rather than over existing cable TV facilities. The FCC will consider the extent to which Title II and Title VI, which govern common carrier and cable services, should apply to telcos providing video programming to subscribers.

Because telcos may be able to become programmers on their own video dial-tone systems, the commission is considering whether to adopt additional safeguards against anti-competitive conduct or cross-subsidization. The commission also solicited comment on whether telcos should be limited to using a certain percentage of the capacity of their video dial-tone platforms for their own programming. Finally, the commission is considering whether to apply structural separation requirements and non-structural safeguards to telcos' programming. This would include cost allocation rules and customer proprietary network information requirements.

The FCC is seeking comment on whether telcos should provide video programming over their video dial-tone platforms.

FCC seeks comments on fee policy

In July 1994, the U.S. Court of Appeals for the D.C. Circuit invalidated the FCC's Forfeiture Policy Statement. The policy statement was improperly issued without notice and comment. Accordingly, the FCC has solicited comment on its fee policy. It also is proposing to amend Section 1.80 of its rules by incorporating the guidelines for assessing fines.

The commission is proposing fee guidelines that are virtually identical to those in effect prior to the D.C. Circuit's decision.

For the complete users' fee guideline, refer to the "FCC Update" in the October 1993 issue of *Broadcast Engineering*.

(See "FCC Update," October 1993 for the complete fee guideline.) The commission also is seeking comment on all aspects of its proposal, including whether the base fine amounts are appropriate. In addition, the FCC is questioning whether different base fines for similar violations in different services is proper in light of the different maximum fines for the different services. Those who are proposing alternatives should consider the distinctions between the services for purposes of maximum fines.

The fine policy provides general, non-binding guidance that the FCC may apply in appropriate cases. The commission emphasized, however, that it had the discretion to depart from the guidelines. Each decision will be based on the specific facts of the individual case. ■

Martin and Kersting are attorneys with Reddy, Begley, Martin & McCormick, Washington, DC. Resond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

DATELINE: APRIL 1

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

On or before April 10, all stations must place in their public files their first quarter listings of community issues and responsive programming.

PROPOSED NEW REGULATORY FEES FOR TELEVISION

VHF Stations

Markets 1-10	$21,450
Markets 11-25	$19,075
Markets 26-50	$14,300
Markets 51-100	$ 9,525
Remaining Markets	$ 5,950
Constr. Permits	$ 4,775

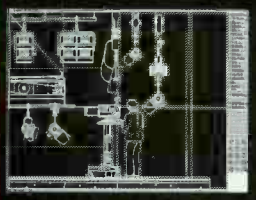
UHF Stations

Markets 1-10	$17,150
Markets 11-25	$15,250
Markets 26-50	$11,450
Markets 51-100	$ 7,625
Remaining Markets	$ 4,775
Constr. Permits	$ 3,825
Terrestrial Satellite TV +Stations (All Markets)	$ 595
Constr. Permits	$ 200
Low Power TV, TV Translators & Boosters	$ 160
Broadcast Auxiliary	$ 30
Multipoint Distribution Service (per call sign)	$ 120

Cable

Cable Antenna Relay	$ 305
Cable TV Systems (per subscriber)	$ .51

Table 1. The FCC has proposed the above 1995 regulatory fees for TV broadcast and cable services.



We design your **studio ceiling**, the complete **lighting equipment**, **suspension systems** (motor-driven or manual operation) as well as **positioning** and control systems – all with Sachtler products! Why don't you write us or give us a call? We are happy to provide you with detailed **information**.

Eastern Europe: Sachtler Vertriebsgesellschaft m.b.H., Germany, Segelflieger Damm 67, 12487 Berlin, Telephone (0 30) 6 36 43 11, Fax (0 30) 6 36 34 66

Headquarters: Sachtler AG, Germany, Gutenbergstraße 5, 85716 Unterschleißheim bei München, Telephone (089) 32158200, Fax (089) 32158227, Telex 5 215340 sac d

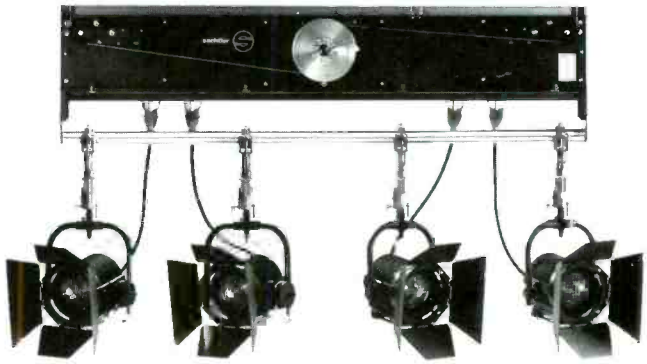
U.S.A.: sachtler® corporation of America, New York office: 55, North Main Street, Freeport, N.Y. 11520, Phone (516) 867-4900, Fax (516) 623-6844

アミック サハトラー株式会社

Japan: Amic Sachtler Corp.

東京都世田谷区三軒茶屋
1－2－21　〒154
電話 (03)3413－1212
Fax (03)3413-0888

Lighting and Studio Technology



sachtler

Support & Lighting

See us at NAB, Booth #19526.

Circle (12) on Reply Card

By Curtis Chan

Personal chemistry, part 1

Broadcasting has seen significant cost cutting in the last few years. You might be one of those who have been put out to pasture, suffered a demotion or seeking new opportunities. Maybe you've been promoted or are contemplating going off on your own. Whatever the reason, this 3-part series is for you.

Whether you are content with your present position or plan to move up the ladder, the importance of communicating correctly cannot be overlooked. It's vital to your personal and business success. Good communicators practice active listening, which involves listening for meaning, soliciting information, paraphrasing to check meaning, and paraphrasing again. Good communicators understand how different levels of management (operational, middle and senior) communicate.

Have a game plan

Let's assume that you're a TV chief engineer seeking a position at another network. In preparing for the interview, keep in mind that you can't plan precisely how things will go. You can, however, have a game plan.

Think of the interview as a selling situation. Anyone who's sold successfully will tell you that two things have to happen in this situation. One is the exchange of information. The second is building personal chemistry. It's not only what you say that is important, but how you say it. Let's look at some things you can do to build positive rapport, even before the interview begins.

The 10 Commandments of Building Personal Chemistry

1. Research the company
2. Build chemistry when you arrange interviews over the phone
3. Build chemistry with the secretary
4. Maintain a positive attitude
5. Project the right image
6. Pay sincere compliments
7. Build chemistry when you answer questions
8. Listen, find out what they want, and build chemistry as you do it
9. Let them know that you have what they want
10. Always follow up

Building personal chemistry

•***Research the company.*** Did you ever meet anyone for the first time who knew quite a bit about you? It takes you by surprise. It's a great way to make a positive first impression. Make it your business to know as much as you can about the company, the position and the person you're meeting.

•***Build chemistry when you arrange interviews over the phone.*** Most interviews are arranged over the phone and you can begin building good chemistry right there. Project confidence, friendliness and enthusiasm in your voice. Use the opportunity to gather more information about the company, job responsibilities and office environment.

Find out how much time the interview expects to take. If it's 15 minutes, you'll know it's only a screening interview. If they say "all day," plan accordingly.

Ask a theme question during the phone interview. This question is meant to stir conversation that could tip you off about what the interviewer considers important.

•***Build chemistry with the secretary.*** Most secretaries screen calls, in effect serving as "gatekeepers." Over the years a number of polls have focused on whether executives pay attention to their secretary's opinions about job applicants. About two-thirds of them did. What do you think?

The bottom line is to be attentive to the secretary. Strike up a conversation and learn more about the inside scoop. You may find that when you go out of your way to be kind and respectful to the secretary, he or she will often go out of their way for you.

•***Maintain a positive attitude.*** Build positive expectations. Visualize a successful outcome. If you think you can, you will. If not, you won't.

•***Project the right image.*** Most employers make up their minds in the first four minutes of any interview. Some things you can't control but image is one that you can. Ask your friends and peers to give you a frank commentary on what they think about you. Listen and learn.

•***Pay sincere compliments.*** During the first few minutes, let the interviewer know what you have heard about the company. This shows that you've researched the company. It also serves as a third-party compliment where you are passing on the good news you heard from others.

•***Build chemistry when you answer questions.*** There are many effective methods for doing this. A safe way out is to self-qualify your answer. When you do that, you give the interviewer the opportunity to respond and direct the conversation toward other areas if that isn't what they are interested in.

Your chemistry with the interviewer will be enhanced if you provide examples that demonstrate your grasp of an issue or familiarity with a process. This can be done with good, action-oriented stories.

Your chemistry will expand if you can handle the "insufficient information" question. Try the "polite turnaround" technique. This means that you don't give an answer, but you acknowledge the status of the interviewer and redirect the question.

> ***Most employers make up their minds in the first four minutes.***

•***Listen, find out what they want and build chemistry as you do it.*** The first step is to keep your mouth shut. Listen for a description of the job requirements. If you don't get anywhere, ask questions on areas in which you can help the company. The conversation should be a mix of positive comments, questions and effective listening.

•***Let them know that you have what they want.*** Consider the interviewer as a customer to whom you want to make a sale. You increase your chances for success by understanding the customer's needs and interpersonal style. First, ask a question; second, engage in a conversation so you can listen and learn; third, get across that you have the required strengths and skills. Finally, ask feedback questions. It's your best chance for determining if you've hit the mark and have what they want.

•***Always follow up.*** Before concluding the interview, get feedback, make a positive summary and get the names of "the players." Write follow-up letters as soon as possible. Relay your appreciation for the opportunity to learn about their organization, stressing again the ways in which you can contribute. Separate letters should be sent to everyone who met you.

If you follow these guidelines for building personal chemistry, you'll be halfway home. Remember the adage -- listen more than you talk -- and you will be successful. ■

Curtis Chan is president of Chan and Associates, a marketing consulting service for audio, broadcast and post-production, Fullerton, CA. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

By Les Brown

Serial digital video

Is the analog production switcher that seemed like a safe buy when the planning started last year looking like it may become prematurely obsolete? Instead, would a digital production switcher with analog inputs and outputs fit into the existing analog facility and provide better-looking pictures and more versatile operation? These are typical questions engineering management ask themselves in today's combination analog and digital environments.

This opportunity to begin the transition to an all-digital environment is made feasible by digital having become serial. The appeal of moving away from analog signal distribution has grown rapidly as serial digital equipment becomes easily available and economical. What kept it from happening sooner? Actually, it took even longer than we noticed!

Digital came to television more than 20 years ago with time base correctors and frame synchronizers. Inside they were digital, but the I/O was analog. The same thing happened as digital video effects (DVEs) came on the scene. They were still analog in and out so the surrounding systems didn't change. Because the digital portion was self-contained, it didn't matter that manufacturers all had their own processing methods, the analog I/O remained standard.

Digital recording forced standards

Digital tape recording offered the potential for better picture quality, especially over additional generations. They were the logical improvement over analog tape machines and were originally intended to replace the earlier generation VTRs nearing the end of their useful life. New machines demanded new standards, but this time not just for tape and what's on it, but also about the very nature of video.

The result was two sorts of standards: recording standards and interconnection standards. You can expect a tape recorded on one manufacturer's machine to play back on a machine made by someone else adhering to the same tape standard. However, what happens inside the machine is entirely up to the manufacturer; it's the end result that's standardized. If the world was going to be exclusively analog forever, that would be enough. There was clear vision, though, that digital held long-term advantages for interconnection and that demanded standards as well. Without them we'd be stuck in an analog interconnect world. Or, we would be forced to choose among proprietary systems that would lock each of us into using only the products of the single vendor whose system we originally purchased.

First, define digital

The need for improved record quality was most demanded by the production and post environments, which suffered badly from the artifacts of composite video. Those applications were already shifting to component analog video (CAV). Because this need was strongest and the value greatest, initial development efforts went into defining how CAV would be sampled for digital conversion.

The method chosen was originally called CCIR 601 (now called ITU-R BT.601-2). It's built on 8-bit or 10-bit quantizing of either a 525- or 625-line signal at 13.5MHz for luminance and 6.75MHz for each of two color-difference signals. Other common terms are 4:2:2 and D-1. The term "4:2:2" comes from an arbitrary "subcarrier" frequency which, multiplied by 2 or by 4 results in the 6.75MHz and 13.5MHz figures above. D-1 is a tape format and is properly used only in that context.

The parallel transmission standard that comes from the sampling standard is SMPTE 125M. It specifies cables with 11 twisted pairs terminated in 25-pin D connectors. The combined data rate on that cable (13.5 + 6.75 + 6.75) is 27MHz. Unfortunately, if cables and connectors aren't properly shielded, bad mathematical karma takes over and we get a powerful harmonic at 121.5MHz, which is an international aircraft distress frequency.

It's questionable whether anyone really believed there would be much use for those bulky and troublesome cables beyond occasional machine-to-machine copying. The idea was to get analog video and audio into a tape machine where they'd be digitally recorded.

Innovative post-production boutiques didn't let bulky cables stand in their way. It wasn't long before there were digital production switchers and parallel digital routing switchers of moderate size. Still, broadcaster interest was minimal. D-1 machines are component and broadcast is built on composite video. The cost of integrating an expensive component digital tape machine didn't make a lot of sense for most applications though some broadcasters bought into D-1, particularly for graphics applications.

Enter D-2 and D-3

The pressing need to replace aging analog composite tape machines brought us D-2 and later, D-3. They're digital composite machines intended to be plug compatible with the old analog VTRs they were replacing. Although the machines recorded in digital, the I/O was still analog.

Composite standardization took split paths. D-2 puts video and audio on tape in one way and D-3 puts video and audio on tape in another way. You can't play D-2 tapes in a D-3 machine or D-3 tapes in a D-2 machine. But, while there are two recording standards, there's only one interconnection format. You can connect the output of one type of machine to the input of the other and make copies.

As digital equipment finds its way into more facilities, engineers are faced with the task of managing hybrid analog/digital environments. (Photos courtesy of Tektronix, Beaverton, OR.)

Composite digital video was attractive to the NTSC world, but Europe saw no advantage. The PAL 8-field sequence makes composite editing difficult so Europe mostly edits in the component domain. A composite digital format doesn't

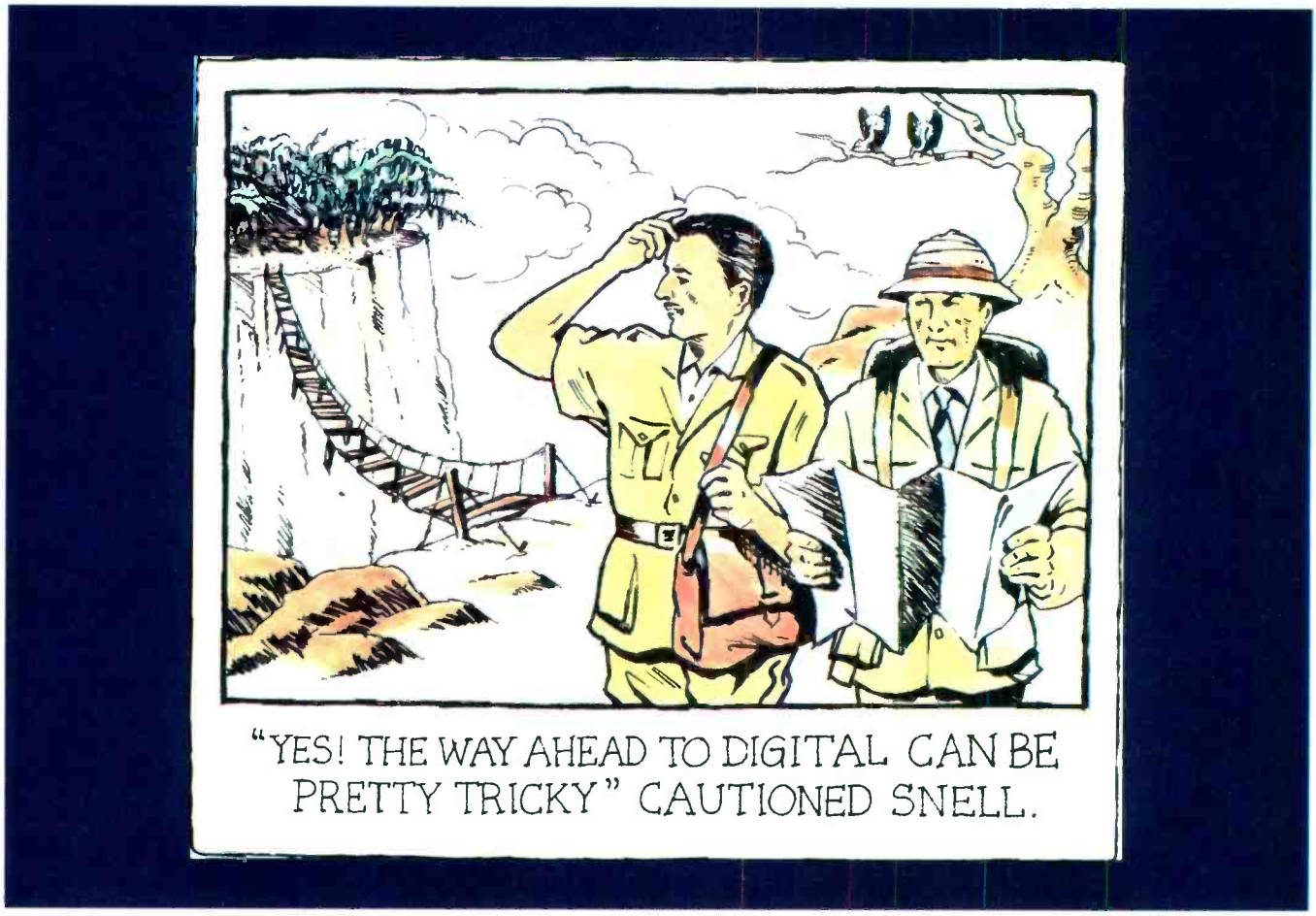
Production suites are often the first place engineers face the challenge of installing digital video equipment in an analog environment. (Photo courtesy of Tektronix.)

help with that, so digital in Europe kept to the component path. There was not, therefore, a lot of effort expended on defining a single uniform standard. It was decided to base composite sampling on four times subcarrier frequency. For NTSC, the sampling rate is 14.3MHz, for PAL it's 17.7MHz. Because there's no reason to directly connect the two standards, it isn't much of a handicap. Both the 14.3MHz and 17.7 MHz standards support 10-bit precision, so 8-bit and 10-bit quantizing are accommodated.

Moving to serial

Here we were with tidy standards for digital interconnection and no clamor to use them because they require replacement of our existing coaxial cabling with something downright difficult. Still, with digital video on tape and lots of digital production devices, it didn't make sense to keep converting A to D and D to A, taking at least a minor picture quality hit each time. Fortunately, development of serial standards hadn't been neglected and work was going forward on squeezing serialization and deserialization into chipsets.

To get all the data traveling on 11 twisted pairs onto the single signal path of a coaxial cable, the data has to travel faster. If simply transmitting the same data faster is all that's done, the result is poor recovery potential and extreme difficulty with



RF emissions. The first attempt at a component serial interface standard called for a 243Mb/s data rate that worked for 8-bit quantizing but not for 10-bit. It was later abandoned, but the 243Mb/s figure still generates occasional confusion. The final SMPTE 259M standard is based on a 270Mb/s data rate with scrambled NRZI (non-return to zero, inverse) coding that is more easily recoverable, less prone to generating RFI and allows insertion of ancillary data such as audio.

The 270Mb/s data rate is valid for both 4:3 and 16:9 aspect ratio pictures when the sampling rate is 13.5MHz. There are 720 available pixels per line regardless of line length. Pixels at 4:3 are essentially square while pixels at 16:9 are rectangular and vertical or horizontal resolution is lost. If you use 18MHz sampling at 16:9, then each of the 960 pixels are square, but the required data rate is now 360Mb/s. That leaves us guessing as to which scheme will prevail. Fortunately, equipment designed to pass 360Mb/s isn't significantly more expensive than equipment limited to 270Mb/s. The limitation is in the chipsets; early generations didn't address 360Mb/s because nobody had thought about it.

The SMPTE 259M standard also supports composite digital signals at data rates of 143Mb/s for NTSC and 177Mb/s for PAL. The process is a little more complex because the parallel composite standard does not include a timing reference and serial transmission demands one. It's necessary to insert a timing reference signal (TRS) into the parallel signal before it can be serialized. It's placed in the digital equivalent of the sync tip and is removed when the serial signal is reconverted to parallel. Fortunately, the 3-word TRS leaves plenty of room in the sync tip for insertion (multiplexing) of up to four channels of AES/EBU audio at the time of serialization. The same process that deletes TRS at deserialization also removes the audio, demanding that recovery of the audio (demultiplexing) be done before deserialization. The TRS/ancillary data removal is total. This ensures that the problems encountered in cleaning multiplexed audio from video in the analog world are not perpetuated.

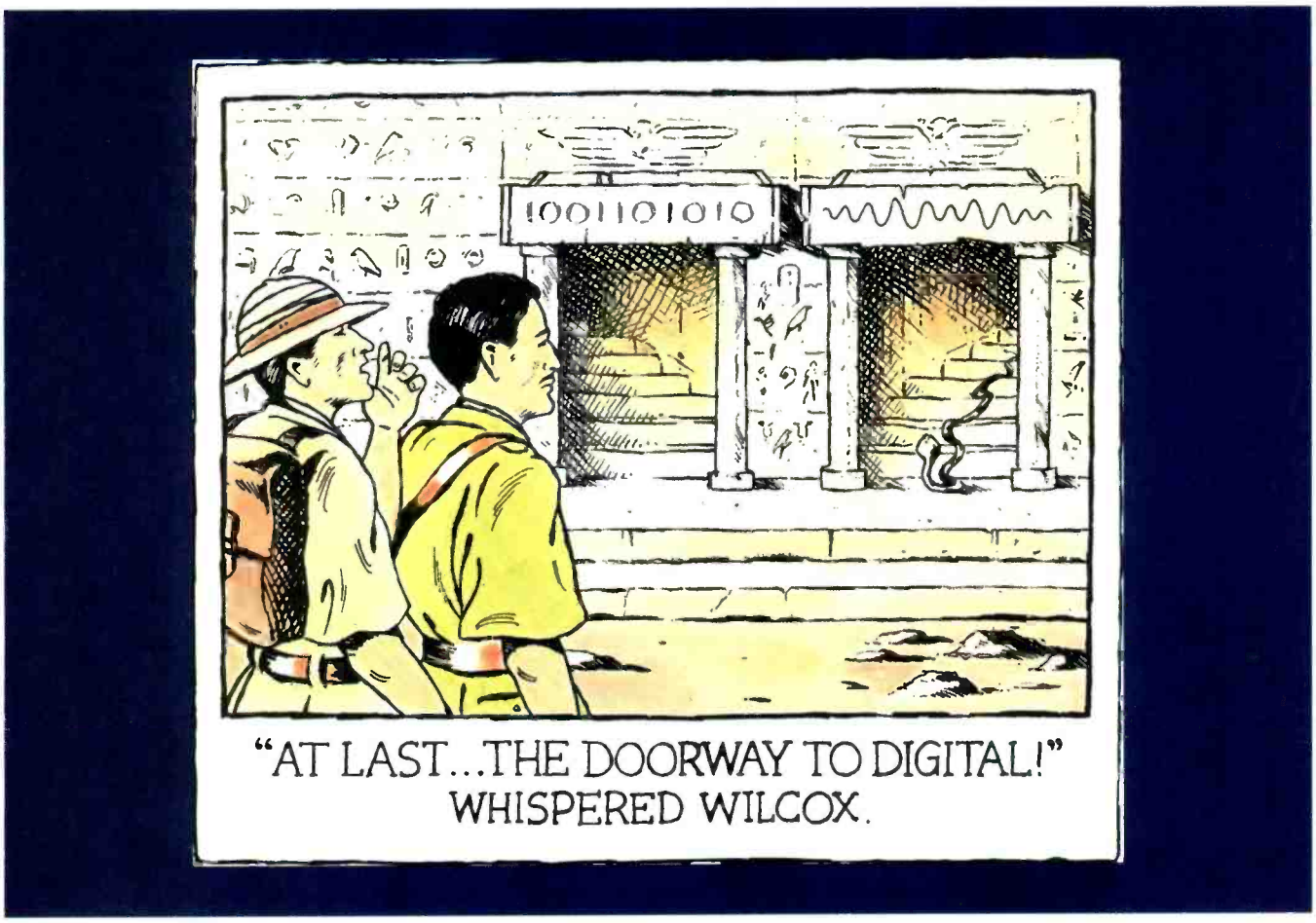
Logical options

Serial sets us free of the constraints of 25-pin connectors and bulky cables. The coaxial cable interconnect standard lets us directly re-use much existing cabling. In addition, distribution and routing techniques are familiar, though the equipment required is different. Timing is a little different but new tools make it relative easy to keep everything in time. A wealth of conversion products are now available that permit an orderly progression toward a serial digital core system.

There's just this one thing: Until now we thought only composite and now we don't have to. Analog component video offered higher picture quality but at tremendous additional cost and in system complexity. Digital component changes the equation and might just hedge against premature obsolescence.

Next month we'll compare component and composite in light of the new digital realities and look at ways to manage the transition to digital. ■

Les Brown is president of Les Brown Associates, Grass Valley, CA. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.



Snell & Wilcox.
"Your essential guide to digital."

"THIS MUST BE THE LEGENDARY ANALOG'S GRAVEYARD..." GUESSED SNELL.

Do you really need to dump your existing equipment to change to digital?

"THEY OBVIOUSLY WENT DIGITAL TOO ABRUPTLY" GASPED WILCOX.

Does changing to digital have to be so daunting?

"WHEN THE WORLD WENT DIGITAL THEY GOT LEFT BEHIND" SNELL EXPLAINED.

Don't get left behind! Come and explore the way ahead with Snell & Wilcox.

Buy "Your essential guide to digital" only at **NAB booth 19063.**

SNELL & WILCOX

Engineering with Vision

Circle (6) on Reply Card

Telephone: US (408) 734 1688. Fax: (408) 734 4760. UK +44 (0) 181 607 9455. Fax: +44 (0) 181 607 9466. Email: Info@Snell.co.UK

By Bennett Liles

Using digital links

When it comes to sending high-quality audio by land lines, the cost has never been lower, and the arrangements have never been more confusing.

The *Integrated Services Digital Network* (ISDN) is the up-and-coming tool for broadcasters' ground-based digital audio transmission jobs. ISDN's *Basic Rate Interface* (ISDN-BRI) won't be universally available in the United States until at least 1996, but it's already well established in some areas.

What ISDN-BRI provides is two bidirectional 64kb/s *bearer* (B) channels and one 16kb/s *delta* (D) channel for signaling or X.25 packet switching. With some data compression, known in the broadcast world as *bit-rate reduction* or *digital audio coding*, an ISDN B-channel can offer excellent audio fidelity.

The main pitfall in using ISDN involves knowing which terminal equipment can work, or be adapted to work, with the service and the equipment at the other end of the line.

SPIDs and TAs

Similar to tagging standard telephone lines, most ISDN circuits will be assigned a *service profile identifier* (SPID), which is created when the service order is made.

The terminal equipment on each end of these circuits is considered by telcos as *customer-premises equipment* (CPE). This means that it is the responsibility of the customer to select and use the proper hardware for the line.

The first of the CPE devices is the *network terminator* NT-1. It handles communicating with the digital circuit from the local telco office, which is supplied in one of two forms: the U-loop, a 2-wire interface, or the ST-loop, a 4-wire interface.

The next CPE item is the *terminal adapter* (TA) — the ISDN equivalent of the telephone instrument. The ISDN line's SPID must be configured into the TA to be used on that line. Failure to configure the TA to its corresponding SPID is a common source of trouble.

The final CPE piece for audio use of ISDN is the *codec*, short for coder/decoder. It is the device that applies the data compression algorithm to the original audio signal, allowing it to travel as a high-quality digital audio signal through the bandwidths offered by ISDN. Without data compression, a CD-quality stereo digital audio signal requires about 1.5Mb/s. With data compression, it can be reduced to as little as 128kb/s without excessive audio quality degradation.

ISDN's Basic Rate Interface is already well established in some areas.

A recent trend has consolidated some or all of the aforementioned components into a single box, simplifying things. Many units include an automatic redial/reset feature if any connections are interrupted.

Codecs

There are a number of different audio data compression algorithms in use. The most common is called G.722 (this terminology comes from CCITT, the international telephony standards organ), which provides reasonably quiet, 7.5kHz mono audio into 56kb/s or 64kb/s. More recently, ISO/MPEG Layer II (formerly called MUSICAM) and ISO/MPEG Layer III have been used, allowing higher fidelities at these low rates and more flexibility. But even these have difficulties. For example, due to Layer II's evolution over the years there is a degree of incompatibility among some manufacturers' Layer II codecs. Some of these problems can be corrected by simple retrofitting.

Layer II and Layer III codecs also are not interoperable, but current trends among codec manufacturers indicate that universal codecs incorporating G.722, Layer II and Layer III algorithms, with automatic detection on the receive end, are coming. A few current models offer G.722 and *either* Layer II or Layer III.

IMUX, BONDING and H.221

Although ISDN B-channels carry only 56kb/s or 64kb/s, the two B-channels of an ISDN-BRI circuit can be combined and used for a 112kb/s or 128kb/s path by a process known as *inverse multiplexing* (IMUX). The same process can be used to combine multiple ISDN-BRI circuits, adding all their B-channels together to provide 256kb/s, 384kb/s and so on.

This provides another user option — and another source of incompatibility. The IMUX can be performed either by the codec or the terminal adapter. For compatibility, it is more desirable to let the TA handle the IMUX. Most current TAs use a multiplexing method known as *BONDING* (Bandwidth-On-Demand INteroperability Group). Although widely used, BONDING is not perfect. If one B-channel of an IMUX'd path is interrupted and the IMUX synchronization is lost, BONDING won't restore it.

A newer IMUX method called H.221 is an *in-band* protocol. It runs constantly, checking synchronization and restoring it quickly if one line is interrupted. Unlike BONDING, H.221 steals a few bits from the B-channel in the TA to accomplish this. Although not yet widely deployed, the more reliable H.221 will likely supplant BONDING as the most common language of tomorrow's inverse multiplexing. Over the next year or so, the industry will begin hearing about J.52, which is the specification for implementing H.221 in audio codecs (rather than in the TA). Most codec manufacturers have announced that they will be using it. In the meanwhile, unless there are identical codecs at each end of the line, it's safer to rely on TAs using BONDING to handle IMUX.

Confusion still abounds on ISDN service and its terminal-gear maze. It's a "dot-rich" environment with many protocols, but it's getting simpler. The key for ISDN users is having a close working relationship with the manufacturer of their terminal equipment. Most offer 24-hour hotlines for support and some third-party companies can provide equipment and service setup. Until signals, service and equipment are truly standardized, ISDN may continue to stand for, "I Still Don't kNow." ■

Liles is an audio engineer for Georgia Public TV, Atlanta. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

Acknowledgments: Thanks to David Lin of CCS, Tom Hartnett at Comrex, Joel Quirt of DCI Communications, Jack Kelly of Intraplex and Steve Church at Telos Systems.

For more information on ISDN equipment, circle (300) on Reply Card. See also "Audio Coders & Decorders" and "Digital Terminal Equipment, Modems," pp. 49-50 of the Buyers Guide.
For more information on using digital telco links call:
•Bellcore's National ISDN Hotline: 800-992-ISDN
•Intel ISDN information: 800-538-3373

Pathway to digital future

(Please hold on to the rail)

Is it any accident that 'SUCCESS' is the root of 'SUCCESSIVE'? Not in this universe. Here, what succeeds is ADAPTATION, not abrupt change. BUILDING ON WHAT YOU HAVE, vs. gambling on what you don't. **EVOLUTION, NOT REVOLUTION.** It is a long term vision, and a much bigger idea. This is Sony's approach to the digital future. Good enough for THE UNIVERSE, we figured, good enough for broadcast.

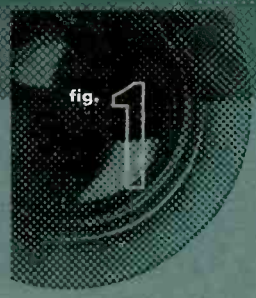
EVOLUTIO

CONT.

BUILD on what you have

MIGRATION PATH
Proceed at your own pace.

FIGURE C: reference chart



reference no. acquisition 1

ACQUISITION

The rhinoceros, biggest land animal next to the elephant, is a marvel of adaptation, for he is also one of the oldest. Living proof that despite his poor eyesight, he can see the horizon. Speaking of optics, the kind of vision and versatility suited to broadcast is embodied in our new system. Digitally acquired video will be fed, for example, via digital satellite modem or microwave link and will be streamed on to the server, logged on to the database and be instantly available for editing.

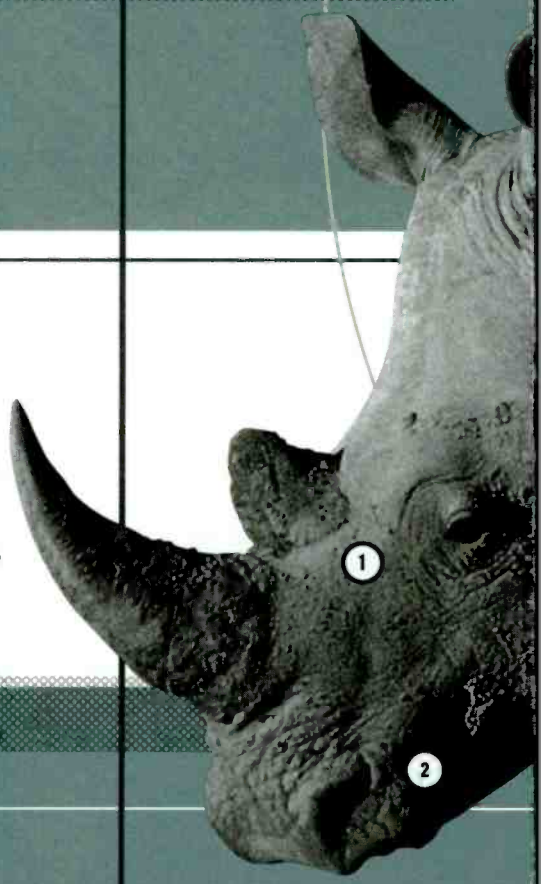
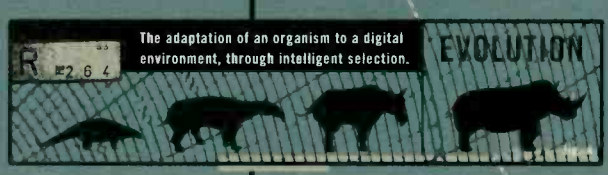


FIGURE D: evolution diagram



SONY

Defining the DIGITAL FUTURE.

FIGURE A/B: revolution vs. evolution

Fig. A

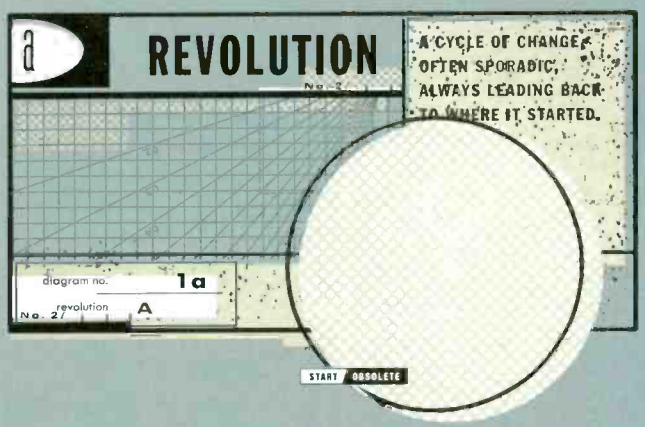
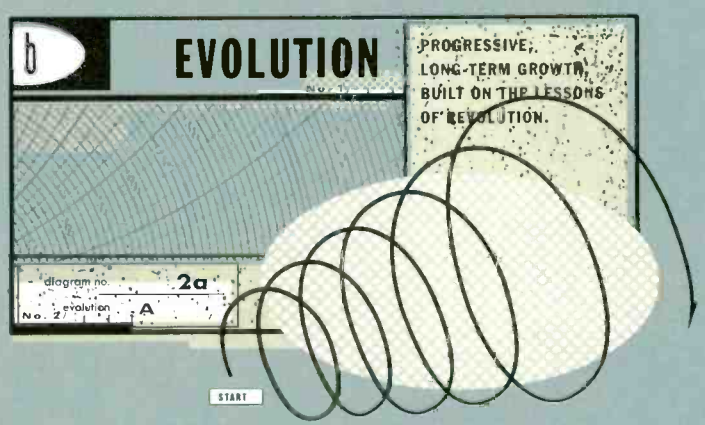
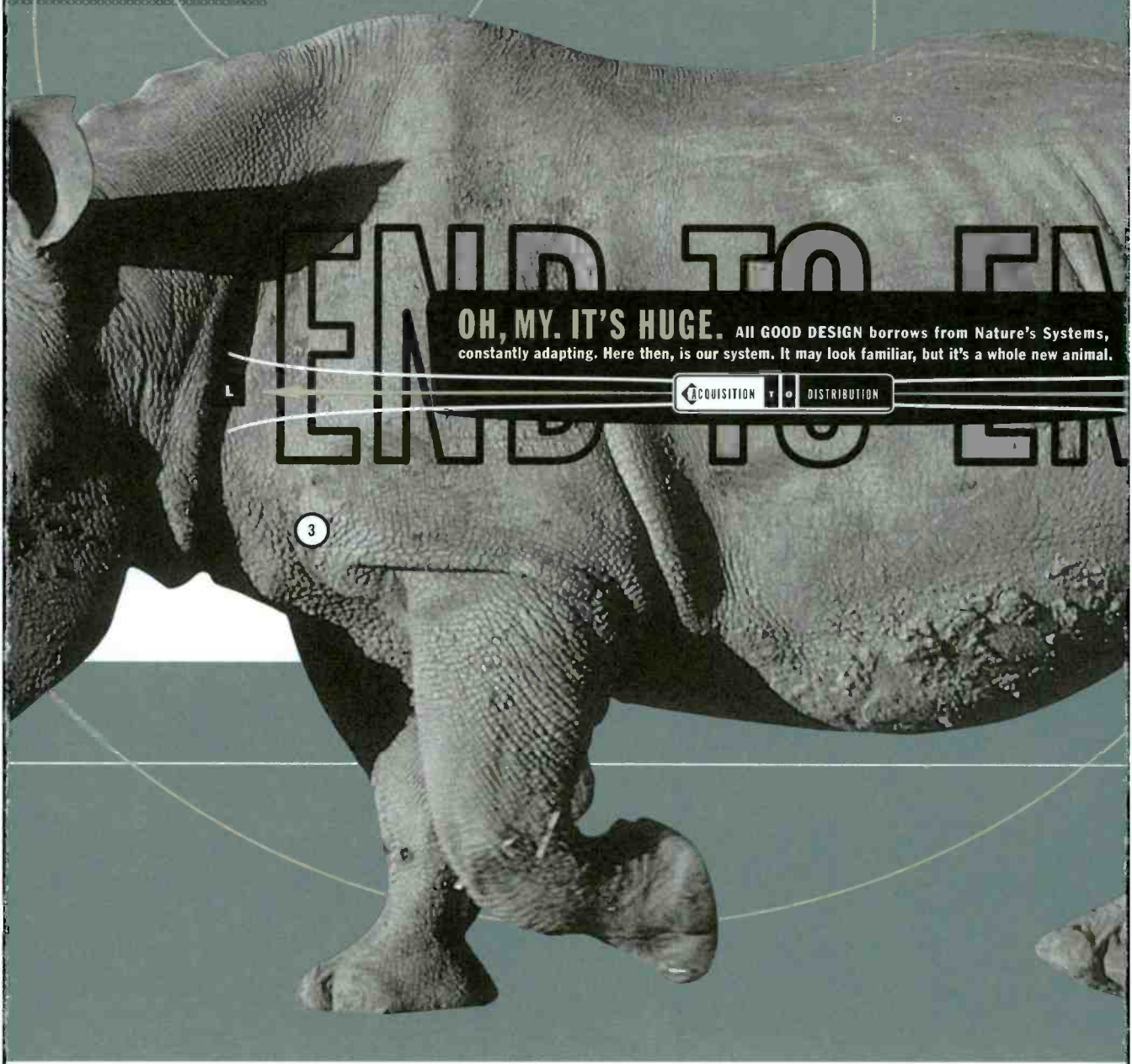
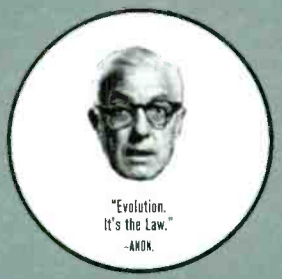


Fig. B



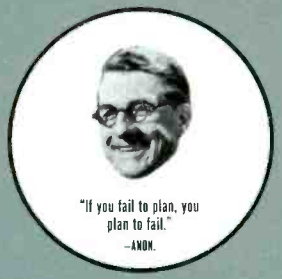
A single allele on a single gene can make the difference between survival and extinction.





Build on what you have

FIGURE E: hierarchy of fear



Pathways, not Products

revolution 1

obsolescence 2

death 3

irs 4

hair loss 5

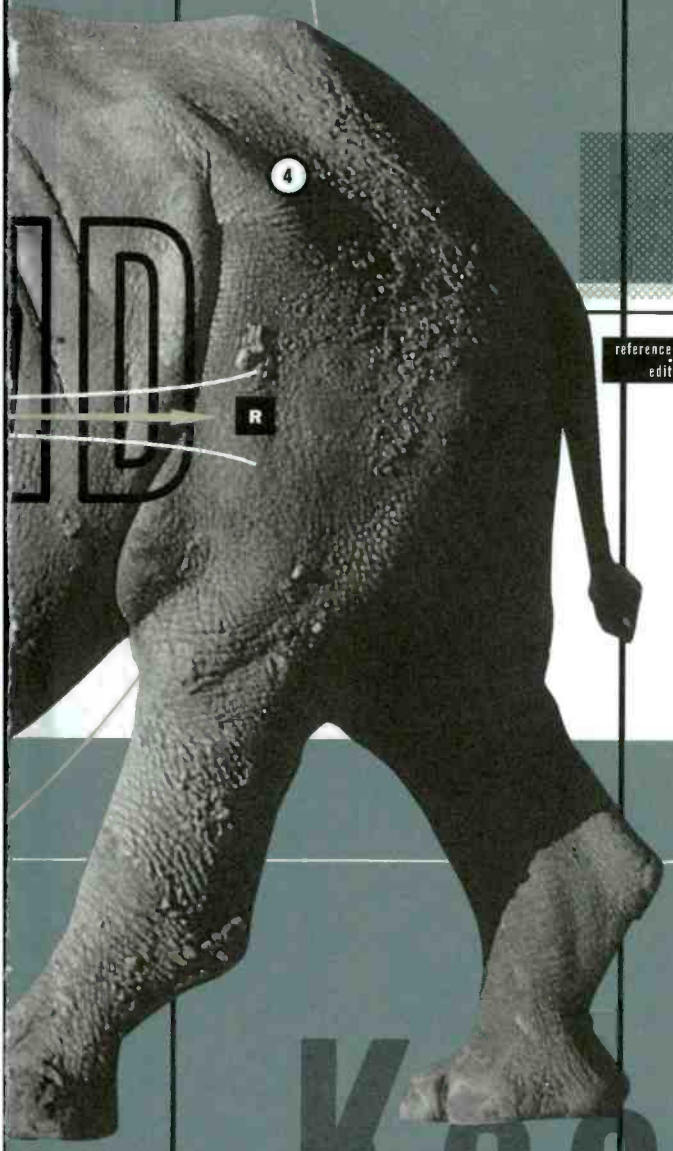
other people's breath 6

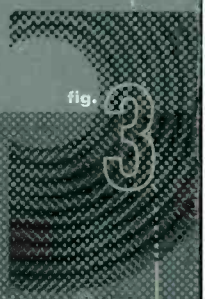
missing your flight 7

SONY

Sony Electronics Inc.
Business and Professional Products Group
3 Paragon Drive, Montvale, NJ 07645

FIGURE E: pathway continued





reference no editing 2

EDITING

The poor rhinoceros has no incisors to speak of. Leaves, leaves and more leaves, hundreds of pounds a day. If he could cut through steak he'd get his RDA of Protein in about 1/10 the time. If your editing system could cut both on line and off, how much more efficient would you be? Our new, non-linear digital editing workstation shares EDL file compatibility with existing dedicated systems. A hybrid system that edits from VTR's and hard drive simultaneously and with real time 3-D effects.

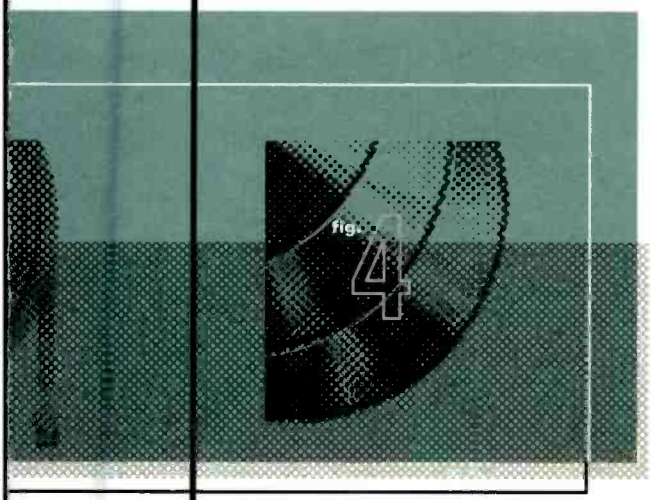
reference no distribution 3

DISTRIBUTION

Rhinoceroses are no
big-hearted. They ha
to pump the 40-plus
that circulate throug
bloodstream. Human
is 8 quarts. This give
rough idea of the exp
efficiencies possible
Sony's hierarchy of c
video compression le
and SDDI technology.
level is optimized for
appropriate applicat
easily moved through
network. SDDI, the e
of SDI, is the "pipelin
will carry BRR video
and multiplexed sign

evolution

television



reference no. storage 4

STORAGE

What does a rhinoceros look like under a microscope? (Ans.; muscle, bone, tissue, and fat). As with any efficient system, close inspection reveals not one single storage media but rather, a combination. Our hybrid storage delivers a perfect balance of access time, throughput, capacity and cost. It will employ RAM, hard drive, digital tape and MO disk, as the application requires.

toriously
ve to be,
gallons
h their
capacity
s you a
onential
through
igital
evels, SDI
Each
the
on and is
out the
tension
ne" and
signals
als.

VING

Ev

PATHWAYS, not products.

Keep EVOLVING.

BIT BY BIT, the future is being built. File servers, databases, workstations. All interfaced into one seamless broadcast system through a sophisticated digital communications network. EVOLUTION TELEVISION. Stay tuned.

evolution television

SONY

Luck is the
residue of DESIGN

evolution television

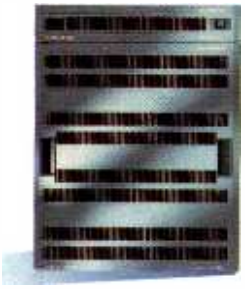
OUR SOLUTION disdains an ad hoc 'island' approach for integration. Our solution is a total **END-TO-END** digital network. A networked systems architecture under software control, component technology and file server based. From **ACQUISITION** to **TRANSMISSION**. The system management software efficiently operates in program creation, data base management, plant operations. The system also allows **EASY INTEGRATION** of current analog composite equipment as you layer in digital technology, while protecting your present and future product investments. In short, this is a natural progression toward a **DIGITAL FUTURE**.

Not another revolution. But Evolution.

There Are Two Kinds Of Engineers. Those Who Buy Utah Routing Systems. And Those Who Buy Something Else.

Introducing the UTAH-300. History Repeats Itself. Digitally.

If you're in the market for a routing switcher, you'll be happy to know Dynatech's new UTAH-300 is the ultimate achievement of four generations of router technology. In 1978, our AVS-1 proved that rugged, versatile routing switchers could also be affordable. Today the UTAH-300, with analog/digital capability, is the most sophisticated member of a full family of mature, reliable routing products. The UTAH-300 is built for growth. It goes from 32 x 32 to 256 x 256. And beyond. It's compatible with every control system we've ever built, so it integrates into any Utah installation. And not only does the UTAH-300 manage D1 (serial component) and D2 (serial composite) formats, it's ready for 360 Mb/sec. data rates of future ATV signals. Far more capability, yet it's priced competitively.



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

Experienced Support, Too.

Over time, we've also learned about what you need in the way of support. That's why we offer reliable 24-hour, 7-day Global Customer Service Support Center, training and on-site repair, and a 10-year warranty. Call your nearest Dynatech sales office for more information on the routing system everyone is smiling about.

Universal matrix frames allow easy upgrade to digital signals.

DYNATECH
VIDEO GROUP

Americas
Phone: 801-575-8801 Fax: 801-575-3299

Europe
Phone: 44-1635-521939 Fax: 44-1635-528387

Asia
Phone: 852-2868-1993 Fax: 852-2525-8297

Circle (19) on Reply Card

routing structure and tested the new router configuration and control software. During another long weekend, Post Perfect moved over to the new infrastructure and the character video router was brought up.

Although technological issues tend to be at the forefront of major projects such as this, Post Perfect was keenly aware that people are the heart of any facility. With the whole post-production process more interlinked than ever before, signal infrastructure impacts on every operator and every client every day. Post Perfect's clients often go from film transfer to edit to graphics to distribution within the facility. Tight deadlines mean clients need to get things done right away, so easy links to other departments during sessions is a high priority. There's not a minute to waste.

Post Perfect's new signal infrastructure helps clients achieve increasingly complex goals while providing operators with the powerful, ergonomic tools to do the job.

All our careful planning notwithstanding, Post Perfect's serial digital frame is expected to become 'stuffed' in the next 18 months, necessitating a review of what is absolutely necessary to have on the router and what has simply been convenient to have on it.

But a look at the big picture reveals a signal infrastructure with a lot of depth and breadth that will enable the facility to continue tailoring its services to clients' needs. It allows the company to add a new room by simply plugging it in to the existing architecture, growing the facility easily and efficiently for the rest of the decade and beyond. ■

Dean Winkler is executive vice president for Post Perfect, New York, NY. Christine Bunish is a broadcast and telecommunications consultant, Cedar Grove, NJ. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

THE DESIGN TEAM

Client: Post Perfect
Dean Winkler, executive vice president

Architect: Koszalka Design
Tom Koszalka

Broadcast systems designers: National TeleConsultants
Terry, Priesont, project coordinator

Implementers/systems installation management: National TeleConsultants
Don Phillips, director/implementation division

Post Perfect project team: Doug Butler, chief engineer; Audrey Block-Schnall, Chris Adams, Dave Best, Ed Walden, Greg Tassoni, Jerry Reneau, Ken Paehr, Steve Clark, Y. Tim Farrell

You're a news editor, it's 5 minutes to air and a big story breaks. The material's about to come down the line and the producer desperately wants it as the lead item.

What can you do?

Linear system.

Don't even think about it.

Ordinary non-linear system.

Oh well...start digitizing for the next newscast.

Newsbox.™

The whole job, no problem.

Begin your edit immediately - even as your feed comes in. Using Scene Select,™ grab the clips you want 'on-the-fly' and instantly link them into a rough-cut. That's it - you're ready to go on-air. Even so, nothing is committed - you can still re-arrange with Segment Replace and fine tune the edits as required - right up to the wire. The story is always available for instant playout.

With Newsbox's unique true random access operation it's as fast, flexible and simple as that. No dead time, no waiting, no panic.

Newsbox offers all this - and much more - at a very competitive price.

To catch up on all the very latest news, call Craig Sherter now at: (203) 656 3100.

NEWSBOX™

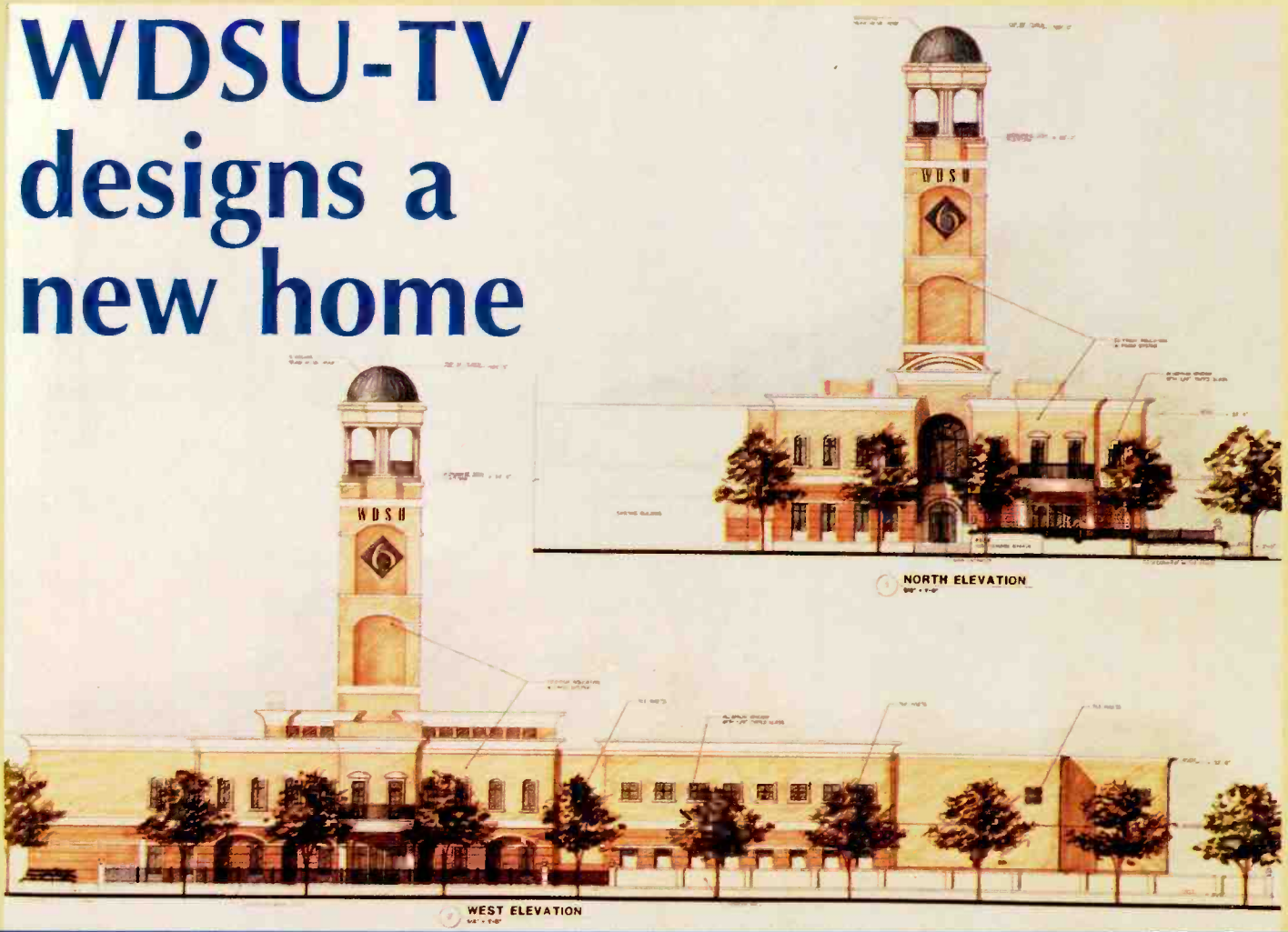
Dedicated to news, because you are.

QUANTEL

Quantel Inc. 85 Old Kings Highway North, Darien, CT 06820, Tel: (203) 656 3100, Fax: (203) 656 3459

Circle (30) on Reply Card

WDSU-TV designs a new home



Sometimes, it reaches the point where you simply have to start over.

The Bottom Line:

The TV business has been around for more than 40 years, and many stations are still in the original facility. The business has changed as have facility requirements. Depending on many factors, some stations have been able to adapt, while others have had to move to a new location to remain viable. WDSU-TV is among the latter, and faced numerous obstacles while designing a facility to take them into the future. $

By Shawn McBride

When WDSU-TV began planning for a new broadcast facility, management had more to consider than the industry's burgeoning technological requirements. For 45 years the station's staff and equipment have been packed into a quaint old building in New Orleans' famed French Quarter.

There were compelling reasons to seek a new home. Though the current location is prestigious and busy, it presents logistical challenges for the news staff. Parking is practically non-existent, and congestion renders ingress and egress for news vehicles difficult. Furthermore, the staff works through three interconnected buildings.

A modern facility specifically designed to accommodate the natural flow of fast-paced broadcast work was needed. Adequate parking, ready access to main thoroughfares and convenient ingress and egress were among the requirements. An additional requirement was flexibility to meet the technological challenges of today and tomorrow.

Beyond those necessities, WDSU-TV also sought to expand and enhance its community image. Perceiving that its involvement with downtown New Orleans was directly linked with profitability, the station wanted to fit in and assert its technological eminence, while retaining a uniquely "New Orleans" presence.

After much research, a site was chosen south of the New Orleans central business district and adjacent to the historic warehouse district. Bounded on the south by an elevated section of the Ponchartrain Expressway and fronting on Howard Avenue at Baronne Street, the site affords high visibility.

Although the Louisiana-shaped site was problematic, creative building design proved the space large enough for the 47,000-square feet of usable space needed. Ample space for parking and a garage for technical vehicles was also available.

By choosing a downtown location, it was inevitable that architectural implications would become a major factor. Aesthetic considerations became as important as technological function. The new facility had to be state-of-the-art to accommodate contemporary as well as future broadcast technology. However, the design would also have to be intricate and detailed, with a greater than usual proportion of the eight-million-dollar budget being spent on appearance.

Continued on page 42

Solid State
LPTV Transmitters and Translators

3dbm Offers:

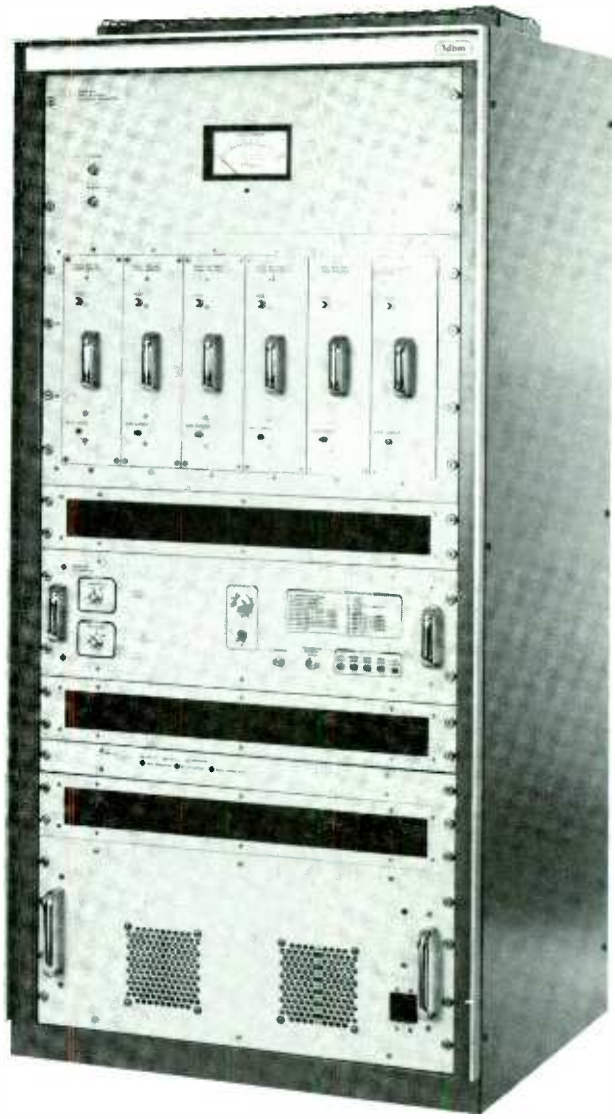
- ***Reliability -***
  100% Solid State Design with Redundancy
- ***Cost Effective Solutions -***
  No Tubes to Replace
- ***Warranty -***
  Full 24 Month Limited Warranty
- ***Service -***
  Complete Customer Service Organization
  Including Technical Assistance And
  Spare Parts Inventory

Standard Features:

- 100 to 2000 Watts Peak Sync
- Full 10% Aural Power
- 2 Video Inputs
- 3 Audio Inputs
- Automatic Sync Pre-correction
- Automatic Station Identifier is Standard
- Automatic VSWR Shutdown Protection
- Automatic Loss Sync Shutdown
- Individual Power Amplifier Protection Shutdown
- Individual Metering of Current fcr each Amplifier
- Individual Power Output Meter for each Power Amplifier
- Modular Plug-In Design
- RF Output Monitoring on Front Panel
- Output Monitoring of Modular Output Amplifier
- Remote Control Interface Built-In

Technical Specifications:

- Call 1-800-279-3dbm



(1KW Model Shown)

Please come by booth 15745 at the NAB show and see our new 2 KW Transmitter !!

Represented By:

UNITED STATES
Factory Direct Sales
17194 Preston Road
Suite 123-297
Dallas, TX 75248
Tel (800) 279-3dbm
Fax (214) 377-1625

EUROPE
MAFSA Management Finance, S.A.
Bernstrasse 15
CH-3280 Mursen/Morant
Switzerland
Tel +4137711303
Fax +4137711302

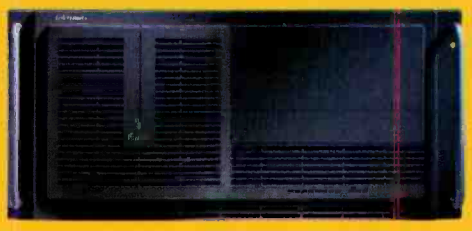
ASIA
3dBm, International Co., LTD
208-3, Yangsae-Dong,
Seocho-GU,
Seoul, Korea
Tel 822-579-8280
Fax 822-579-8281

3dbm
A DUCOMMUN COMPANY
975 Flynn Road, Camarillo, CA 93012

Circle (31) on Reply Card

You can spend millions on ads, public relations and big trade show productions convincing the world you've created the first truly practical pro video disk recorder.

Or, you can build it.

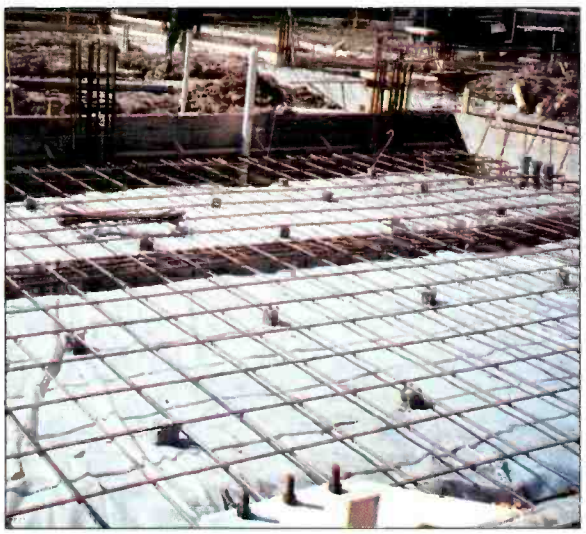


The **Pro*file*™** Professional
Video Disk Recorder from Tektronix.
Hundreds now playing worldwide.
See it at NAB '95 booth 16528.
Or call 800-998-3588 today.

Tektronix

Circle (32) on Reply Card

WDSU-TV continued from page 38



As of early February, when this photo was taken, much of the preliminary foundation work was complete and reinforcing bars were in place for the concrete slab flooring. (Photo courtesy of Rees Associates, Inc.)

Microwave tower or architectural landmark?

An on-site microwave tower was required for the station's eight mile STL. Despite the nearby presence of buildings and having to cross the Mississippi River twice, the city enforced a maximum height of 125 feet. This ensured the tower would not detract from a nearby statue of General Robert E. Lee. Nor could the tower be simply a functional steel structure; the city's representatives required that it blend aesthetically into the unique New Orleans cityscape.

Rees Associates, Inc., the firm of architects, planners and consultants retained to design the facility, elected to incorporate the microwave tower into the footprint of the building. The tower is enclosed in a New Orleans-style interior courtyard disguising its electronic function with a campanile-like facade. Through its location and orientation, the tower achieves line-of-sight with the transmitter site, as well as with the main ENG microwave site two blocks away.

Designing for technology and aesthetics

Fitting the building to the site and to the needs of the organization was not easy. Rees, with its long-term experience in design of broadcast facilities, first reviewed the existing facility and interviewed key station personnel. They explored anticipated equipment and staffing needs. Taking everything into consideration, the firm designed a building to take full advantage of the site.

Like the site, the building is roughly L-shaped. The main entrance gives way to a spacious interior courtyard — a significant design feature with multiple benefits. Functionally, the courtyard serves as a central circulation and communications corridor for staff and visitors. Through clerestory windows it also allows diffused natural light into the open offices and work spaces. Additionally, the courtyard allows visitors to look into master control and the tape operations area.

Offices are situated toward the front, with technical functions behind them. As the building extends back from the street, it spreads into the base of the "L." The news operations are housed at the heart of the facility in a 2-story-high space that visitors can view from a second-floor vantage.

Facilitating work through design

A primary objective was to co-locate departments that need to interface. The design calls for a newsroom of generous dimension, with access to the outside and easy ingress/egress for reporters and camera people. Along one wall is the news studio, with news edit booths on another wall. Also contiguous is a series of news-related offices. The assignment desk and photographer station are integrated into one unit to enable simultaneous communication of assignments to field crews.

Keeping options open for the future, a removable panel was specified on the wall separating the news studio from the newsroom. If removed, the panel exposes the newsroom as a backdrop during broadcasts from the news studio. There is also a large, second-floor expansion space that can be converted for additional news staff or other functions when needed.

Accommodating electronic evolution

Although the digital age is approaching rapidly, for WDSU-TV, it is not quite here. Most of the equipment is analog, but will be converted to digital in the not-too-distant future. The rack room must do double duty, accommodating analog equipment brought from the current facility and future digital equipment. Both must be accommodated during the inevitable conversion period. In the near term, the space allocated for electronic equipment may appear oversized, but every square foot will eventually be put to effective use.

Planning for the technical area took natural work flow and access needs into consideration. The rack room is positioned amid all the spaces that require connection to it: the studios, the control rooms, the post-production edit suite and the satellite dishes.

The master control area is large and designed for future change. It will comfortably contain all existing equipment as well as additional digital switchers, satellite controllers and increased staff, if needed.

Adjacent to master control is the tape room. In the near term, it will be filled with reel-to-reel and videocassette machines, along with the library management system. In the future, newer machines with smaller footprints will occupy the area. It is assumed that eventually the LMS will give way to a video file server connected to workstations dispersed throughout the facility. Experience indicates that smaller equipment usually means more individual components, greater flexibility, and more sophisticated staff. The generous space allotment will no doubt prove advantageous in the long term.

The station's maintenance shop, intended to serve as the center for all repairs, is in the middle of the technical operations, between tape operations and the rack room. This center will be a welcome improvement over the existing facility, which depends upon two separate maintenance shops — both inadequate. The new maintenance shop was deliberately made larger than necessary. The excess space will make it possible to expand tape operations or the electronic rack room, if needed.

Miles and miles of cable

Accomodating the miles of cabling required for a broadcast facility received plenty of attention during the planning stages. To en-

Another shot of the concrete work during construction. Note the expressway on-ramp in the background, a key issue during the site selection. (Photo courtesy of Rees Associates, Inc.)

WIDEST ANGLE

OUR LATEST BREAKTHROUGH IS ALSO OUR WIDEST.

See us at NAB Booth #18456.

Canon

The Number One Lens

Circle (33) on Reply Card

sure maximum flexibility and adaptability, efficient pathways connect all spaces, vertically as well as horizontally. Computer access flooring is used in master control, the studio control rooms, tape room, the rack room and the maintenance shop. Walker duct, overhead wireways and underfloor conduits allow convenient bundling and quick access. Plans call for stacking of telco rooms with chases between floors to permit efficient continuity of cable from story to story.

For the present, all internal cabling will be traditional. It will be coded in multiple colors to identify bundles by type of video (air program paths, reference, sync, monitoring, etc.). This should simplify wiring changes in the future.

For connecting to the outside world, the new facility is being equipped with service entrances for fiber optics from the cable companies as well as the capability to receive fiber from the telephone company and private vendors in the future. All entrances allow for quick access to the rack room.

Storage space that works hard

Another source of relief for WDSU-TV personnel will be well-conceived and adequate storage space. At the current facility, tapes are stored literally anywhere and everywhere, the space originally allocated has long been filled. The new facility will rely on high-density storage space, using movable shelving without fixed aisles.

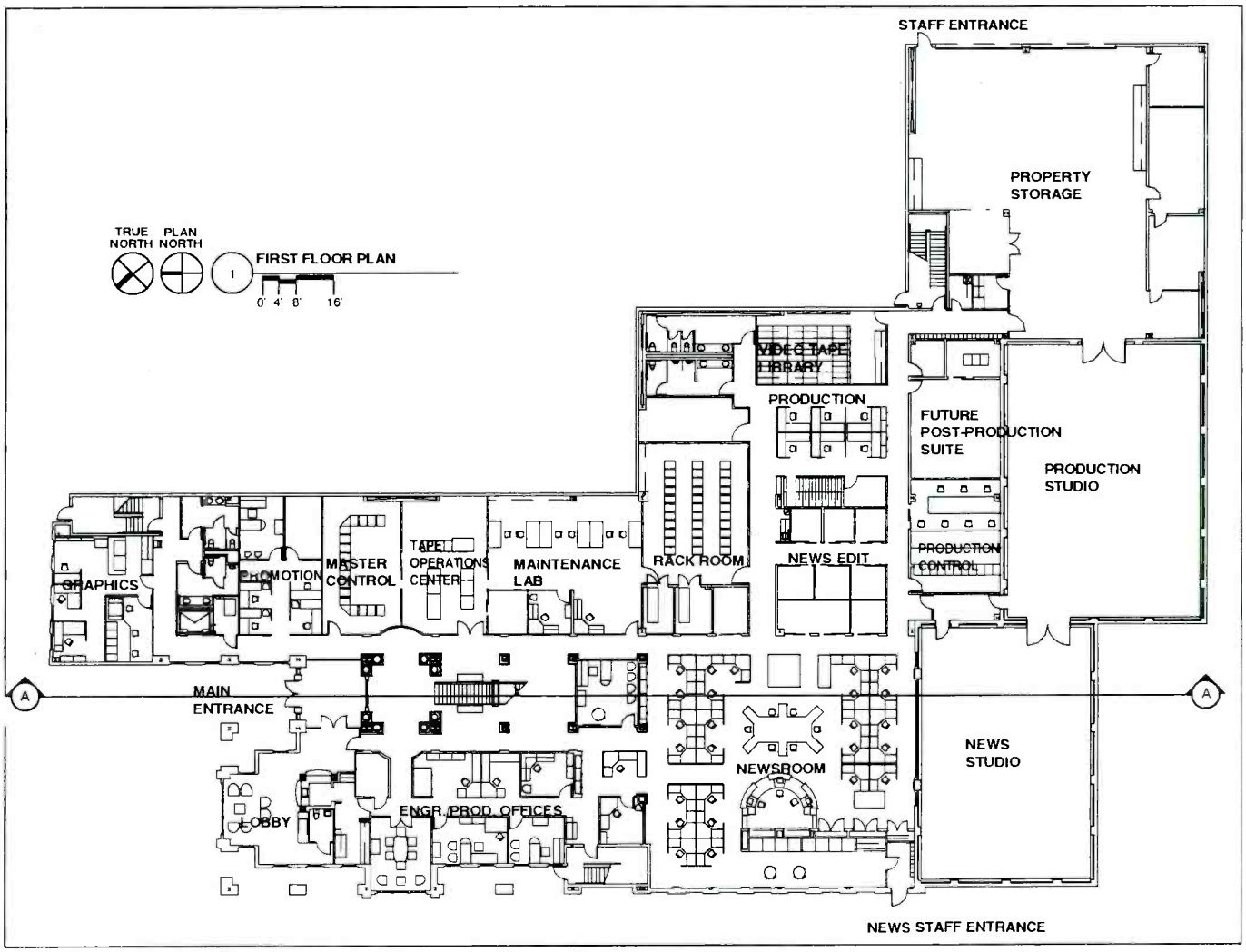
Next to the news edit booths there will be a space for news archives, while the station's main videotape library sits equidistant from the programming, tape and shipping areas, and adjacent to a stairway for access from the traffic, sales and program departments located on the second floor.

News-gathering vehicles will be garaged in a space that is large enough for both ENG and SNG trucks. The 20-foot ceiling allows the satellite antenna to be raised for indoor service and maintenance. The garage is located in the southeastern corner of the L-shaped structure.

Electrical and mechanical systems

The facility will be served by three distinct power distribution systems: one for sensitive technical equipment; one for noisy, high-power, mechanical motor loads; and one for normal usage. For emergency power, plans call for a large generator with automatic switchover capabilities to be installed in the future to furnish emergency power.

Because staying on the air is a basic requirement, the mechanical system has built-in redundancy to support operations during power outages. Two chillers ensure that vital areas remain cool. In addition, a free-standing system dedicated solely to electronic equipment will normally take chilled water from the central chiller. However, it is configured to draw on its own direct expansion system should the main system fail or be degraded. Such backup is especially vital in New Orleans, where extreme heat and humidity are commonplace. For acoustic reasons, the air-handling equipment serves each studio inde-



The first floor contains offices at the front with technical functions behind; news operations are tucked conveniently into the heart of the facility. Administrative offices are housed on the second floor.

DM-800 Digital Audio Workstation

The Power Studio From Roland

The new DM-800 provides power, speed, portability and reliability like no other system available.

Power Eight discrete tracks with 100 layers per track. 12 channel automated mixing and EQ. Time compression and pitch correction. Nondestructive, full featured editing. Sub-frame accurate SMPTE sync. Optional ADAT, DA-88 or RS-422 interface.

Speed The DM-800 is easy, fast and quick to learn, using powerful hardware controls with tape recorder style punch in and out. No computer required.

MIDI Support The DM-800 supports MMC, MTC and dynamic functions like tempo mapping, bar and beat editing, control of external sequencers and trigger mode for instant phrase playback.

Portability All the features and functions you need are contained in a single 12 pound unit. You can literally grab it and take it with you. Uses internal and external SCSI drives. View any level of information on the built-in LCD or plug the DM-800 directly into your video monitor.

Reliability The DM-800 is a completely dedicated piece of hardware with Roland's renowned reliability.

Price Incredible Power. Incredible Price. $5995.

Circle (21) on Reply Card

Call today for your free brochure and video.

Roland®

Roland Corporation U.S. 7200 Dominion Circle Los Angeles, CA 90040 (213) 685-5141 Ext. 756 Fax (213) 726-3267
Roland Canada Music Ltd. 5480 Parkwood Way Richmond, B.C. V6V 2M4 (604) 270-6626 Fax (604) 270-7174

See us at NAB, Booth #4713.

pendently with low velocity air flow to reduce ambient noise.

Accoustical considerations

Being located near a highway has advantages, but it also presents greater acoustical challenges. The studio and control room are designed to meet NC-20 criteria. The envelope design isolates spaces within the overall structure and suppresses sound conduction. The foundation is isolated from the floor, as is the ceiling from the roof; and the inner walls are isolated from the outer walls.

Site security

Security is a primary concern. Beyond a broadcast facility's vulnerability to acts of terrorism and revenge, stations must be concerned with acts of violence and vandalism. The higher visibility expected to enhance WDSU-TV's ratings may also increase the station's exposure to risk.

The property will be enclosed in wrought-iron fencing. All points of ingress will be equipped with electronic security, including camera monitors and eventually passive card readers. Although there was an effort to keep doors and windows to a minimum, the L-shape of the building demanded six entries. The building is set upon an elevated platform, which affords protection from potential flooding, and also prevents a direct line of sight through the windows from the street, dispelling the threat of drive-by shootings. The exterior courtyard functions as a security buffer, and, as a further precaution, staff parking is mostly on-site and secured.

Realizing the dream

Rees Associates and WDSU-TV are watching their plans take form. Ground was broken last November, and completion is scheduled for early 1996. There have been unique demands associated with the project: the ornamental tower, site complications, and the requirement to accommodate current technology while anticipating and planning for future transitions. The owner and architect have planned a facility that meets those demands and satisfies the station's priorities of community integration, architectural profile and contemporary TV work patterns. This has all been achieved at a price per square foot below average for New Orleans.

This project could only have been accomplished with careful, knowledgeable planning nurtured by working together and communicating continuously. Using interactive work sessions, modeling and gaming processes, (see the related article, "Facility Planning for Growth and Technological Change") the architects can identify and present options to those who will be using the space. By making maximum use of the technical expertise of the station's broadcast engineering staff, the architect can facilitate planning at every step and assure the end result will meet all the station's needs. ■

Shawn McBride is a freelance writer based in Oklahoma City, OK. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

THE DESIGN TEAM

Client: Pulitzer Broadcasting Company
WDSU-TV
Wayne Barnett, vice president and general manager
Fred Steurer, chief engineer

Architect: Rees Associates, Inc.
C. Leroy James, AIA, project director
Lisa Matthews, AIA, project designer
Kyle Lombardo, AIA, project architect

Broadcast systems integration: Pulitzer Broadcasting Company

Interiors: VarStavern Design Group, Inc.

Mechanical engineers: Davenport-Darr Associates, Inc.

Electrical engineers: EE Systems Engineering

Structural engineers: Comforth Associates

Civil engineers: Arnold R. Smythe Jr.

Contractor: Carl E. Woodward, Inc.

Acoustics: Russ Berger Design Group Inc.

Facility planning for growth and technological change

To get the most when building a new facility or expanding an existing facility, managers and architects must combine the best of their individual areas of expertise and experience. It's always advisable to deal with architects who understand the specialized needs of the broadcast industry. Every facility is unique and individual stations will always have some unique requirements and goals. Every effort must be made to identify all the issues up front. This permits early consideration of options and appropriate, timely decisions.

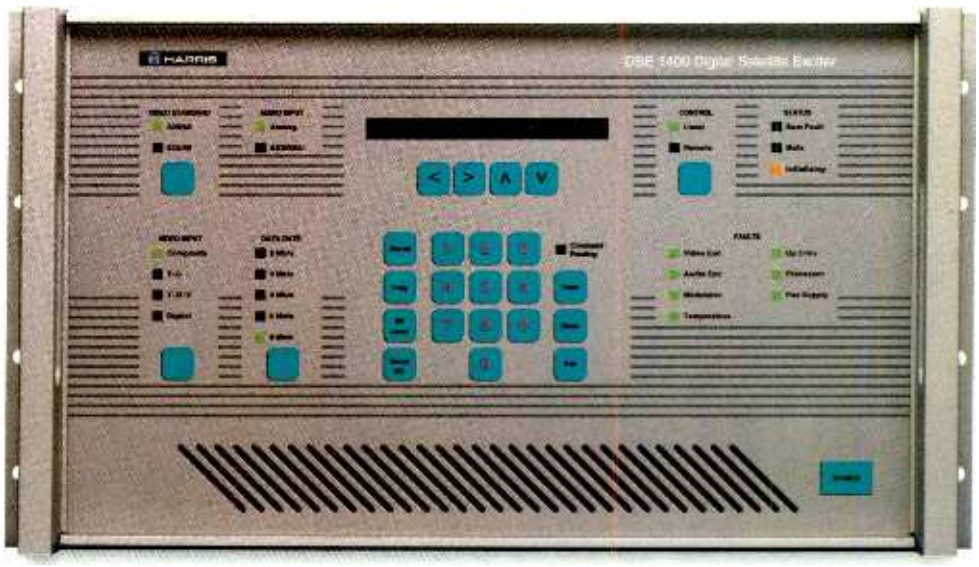
A structured method should be developed and refined to systematically elicit input from all those who understand present and future work flow, equipment requirements and the individual station's personality. The method should incorporate creative strategies for data collection and verification, program conceptualization, development and evaluation of alternatives and estimation and control of budget.

The planning phase should give the client all the information needed to make a "go" or "no go" decision and to plan for cash flow requirements. The resulting planning document should be completed in a matter of weeks and for a fraction of the cost of the full-blown project.

The critical steps of a successful planning phase include:

- Review existing facilities and equipment to determine a starting point for planning.
- Interview key station personnel to determine past and future trends and operational requirements.
- Assess the functional requirements of areas required for each operational department to determine gross space requirements.
- Prepare conceptual block diagrams to identify space requirements. (Rees Associates creates a gaming model with levels of Plexiglas supported by pedestals to represent each floor of the facility. Each level is overlaid with transparent sheets containing floor plans. Gaming pieces — paper cut-outs to scale — are then used to enable the client and the architect to explore dozens of options.)
- Develop a description of the construction method and the level of quality proposed for each portion of the facility.
- Prepare a project development schedule outlining the time and order of all actions required to achieve the facility's target on-air date.
- Develop a statement of probable budget and delineate a cash flow schedule, both month-by-month and total.

Other steps may be appropriate to specific situations. The bottom line during the planning phase is to identify all decision points and provide sufficient information for those decisions early in the project and at a relatively low level of investment. ■



Exciting Exciter.

SNG is going digital, and Harris leads the way.

For SNG and other SCPC TV links, upgrading to digital compression and transmission is essential for efficient, cost-effective operation. The Harris DSE 1400 Digital Satellite Exciter and DSR 1400 Studio Grade Receiver will give you a competitive advantage now, and into the 21st century.

With this integrated Digital Satellite News Gathering (DSNG) system, you can access a wider range of transponder channels, achieve lower transponder costs, use less transponder bandwidth and less HPA power, get improved signal quality, and have simpler, more reliable operation. You can also save space and money by using a smaller antenna. The innovative design of the DSE 1400 Satellite Exciter provides the latest MPEG-2 video and audio compression standards with advanced motion compensation and digital coding algorithms in a compact video encoder, combined with QPSK modulation and frequency conversion in a single, rugged, 6RU high unit. The DSR 1400 Integrated Receiver Decoder (IRD) provides L-band downconversion, demodulation and decoding. These single units require less space than separate 3-unit configurations, and are easily installed or retrofitted in SNG vehicles or fly-away terminals.

Each part of this Harris Digital Satellite TV System is designed for simple, error-free operation. All commands are entered from a single, user-friendly keypad, and are confirmed by colored LEDs. Routine set up requires no subsystem adjustment. The MPEG-2 encoder with I, P and B frames, modulator and frequency convertor automatically establishes, maintains, and displays the required operating status.

With this system, the cost of upgrading to digital technology is quickly offset by operational savings, which then continue, year after year.

Other features include variable data rates of 2, 3, 4, 6 or 8 Mbps, compatible with IDR standards; NTSC 525/60 and PAL 625/50 standards; analog composite video, S-VHS component, and Betacam* component inputs; CCIR 601 serial digital video input; standard 2-channel analog or AES/EBU digital audio; 64 kbps auxiliary channel; and 85-265 Vac, 47-63 Hz power supply for operation worldwide.

Contact Harris Allied to learn more about how this exciting digital satellite TV system can give you a competitive edge.

Harris Allied
7920 Kentucky Drive
Florence, KY 41042 USA
Phone: 606 282-4800
Fax: 606 283-2818

HARRIS ALLIED

*Betacam is a registered trademark of Sony Corp.

See us at NAB RADIO HALL BOOTH #3615 and TV HALL BOOTH #16001

Circle (22) on Reply Card

TCI builds new digital facility

Anticipation of the future has strong influence on new design.

The Bottom Line:

TCI took an empty building and created a full-service network origination and production facility from the ground up. In preparation for the changes in technology currently taking place, flexibility became the key design element for building this modern digital facility. The open design of the facility will allow it to adapt to the changing needs of its clients as they evolve. $

By Peter Douglas

Within the shell of a 1970's industrial building is rising the nation's premier service facility for the new explosion of cable networks. The mission of this new facility is to provide a myriad of services to new and existing networks. Housed in this 260,000-square-foot building are such services as uplink, downlink, post-production, studio production, master control, traffic and authorization services.

The primary design forces in building this facility are flexibility and speed of construction. Since the time line involved in this construction was such that the eventual occupants of the various parts of the facility were unknown at the time of design, much attention was given to a flexible and "clean" type of construction.

The first decision was to place raised flooring with an 18-inch rise throughout the entire facility. This allows all space to be technical space as the need dictates. All cabling and HVAC is via the floor. Again, this allows racks and equipment to be placed anywhere without worrying about routing of cooling and power. A large network of cable trays was installed below the floor to facilitate routing of video and audio cable without interfering with power or other under-floor utilities.

The second major design decision was the use of "demountable" walls. This type of construction involves the use of 3/4-inch duct-liner material (similar to Sheetrock with a much higher audio STC rating) precovered with a vinyl wallpaper. These panels are assembled above the computer floor with metal studs and plastic trim, creating an attractive look. The primary benefit is the ablility to relocate and/or remove these walls without problems such as dust and paint. We are using a local drywall contractor to build and assemble the components of the walls.

The basic floorplan is an open design with racks and demountable walls defining the individual areas. There are essentially two types of technical areas, master control rooms and post-production, and in each case the technical areas flow around mechanical electrical/IDF cores. Each core serves up to four master control rooms or up to six post-production facilities. Additionally, office space along the perimeters was also built on the raised floor to allow for conversion at a later date. By planning ahead, the facility will be ready for changes in technology that may dictate non-traditional use of office space,

and assigned via the routing switcher control system.

A digital sample rate converter allows digital audio signals to be converted between sample rates without having to be converted into analog (e.g., a 44.1kHz compact disc can feed the 48kHz digital audio input of a VTR). Two standards converters connected to the analog and digital video routing switchers convert between 525/60 (NTSC) and 625/50 (PAL) formats. Several digital audio delays connected to the analog and digital audio routing switchers correct for signal path delays introduced by conversion devices such as standards converters and decoders.

In addressing how and where cable corrections would be made, Post Perfect decided all signals would be level corrected and equalized so their signals were correct at all possible destinations. This is accomplished by GVG 8503 precision distribution amplifiers on every analog video routing switcher input and output. In addition, precision distribution amplifiers are used on all of the normalled signal paths.

Determining no router, all router or hybrid router approaches was another major issue. It was decided that analog signals take the hybrid approach, with most sources normalling into analog control rooms each of which have two routing switcher connections in addition to their normalled signal paths. Digital signals are distributed solely via the routing switchers. This eliminated the need for digital distribution amplifiers. However, it necessitated using large routing switcher frames.

In determining the specifications of the routing switcher, the primary question wasn't simply how large to make the new routing switcher, but rather how large could Post Perfect afford to make it? All manufacturers allow facilities to buy frames larger than they need, and the prospect of big amounts of headroom is tempting.

Post Perfect analyzed its current needs and planned for a reasonable amount of growth in various different signal points. The facility counted on a constant demand for filling the digital frame and a decreasing demand on the analog side. This resulted in the following specifications: 128 x 128 analog video, 64 x 64 analog video with characters burned in, 64 x 64 4-channel analog audio, 32 x 32 2-channel analog audio, 128 x 128 digital video, 128 x 128 AES/EBU digital audio (each signal is two channels) and 64 x 64 time code.

The routing switcher is controlled at individual destinations (e.g., at each VTR) by dedicated panels. In addition, a touchscreen control system has been installed in each control room, allowing operators to have personalized setup parameters for all of the routing switcher connections to and from each control room.

Post Perfect knew astute clients would appreciate the ability to instantly configure a room to meet their needs -- even at the last minute. With touchscreen control, editors can call up any machine in the house -- video, audio, time code and visual time code -- at the push of a button. Encoding and patching equipment that clients forgot to book is a thing of the past. The extra minutes gained in a session translate into more time for creative decisions, with the editor continuing to concentrate on the task at hand instead of on the mechanics of the technology.

Because the digital control rooms are so router intensive, each repeat monitor in these control rooms has an LED display showing what signal is being routed – a functional feature for operators and clients alike. These "under-monitor displays" are controlled by the central routing switcher controller.

Post Perfect considered custom under-monitor displays when the facility was built nine years ago. The per-room cost for under-monitor display at that time turned out to be the total amount Post Perfect invested on displays for the entire facility in 1994.

At Post Perfect, every input and output in the facility has a patch point for maintenance. The quality control area performs digital signal monitoring with Tektronics' 601i-scopes that permit the viewing of the analog characteristics of serial digital video signals. This means problems can be detected before they become significant enough to affect the picture.

In transforming any facility, a day a service area is closed means missed opportunities and lost revenue. So it was important for Post Perfect to engineer its massive infrastructure changeover with little or no downtime for the facility and its clients.

Glendale, California's National TeleConsultants (NTC) handled the design, installation and project management of a patchbay-based temporary routing system whose goal was to keep the facility open and at full capacity; NTC had the same responsibilities for Post Perfect's permanent router.

NTC worked with the facility's operations and engineering people to determine what needed to be available on the temporary system to ensure maintenance of day-to-day operations over a 5- or 6-week period. Because it is easy to overlook certain requirements for a temporary installation, as much care went into the patchbay-based system as into the permanent infrastructure.

Because Post Perfect had added cables on top of cables during the past eight years, a piecemeal switchover to the temporary system was not practical. The entire facility was taken down over a long weekend and transferred over to the patchbay-based system. NTC had prefabricated hundreds of cables in Glendale and shipped them to Post Perfect where it had personnel on site.

While the temporary system was on-line, NTC gutted and rewired the analog video

One of Post Perfect's all-digital color correction suites, Color A features a da Vinci Renaissance 8:8:8 color corrector (center console), digital and analog scopes, TLC keyboard, digital switcher and touchscreen routing switcher monitor (at far right).

Post Perfect required the highest level of signal quality physically possible. While reclocking is usually an option on routers, it was an absolute necessity for Post Perfect. The outputs of the serial digital router had to reclock the signals, rebuilding their time base. Without this capability, the facility would not face hard failures but intermittent, difficult-to-track problems.

Equally important was the ability to properly equalize both input and output sides of the analog video router. Post Perfect opted for a significant additional expenditure to have high-quality distribution amplifiers on every input so that all signals hit the router correctly without hum and on every output, establishing a correct level for the signal destination.

Resolving the question of dedicated vs. assignable signal paths involved not only Post Perfect's engineering staff but also its operations personnel. They decided on completely assignable signal paths for all devices in the machine rooms that have utility to more than one room (e.g., VTRs, digital disc recorders). Room-specific devices, such as title cameras, character generators and telecines, which offer no functional gains to the overall facility, have dedicated signal paths and do not use up routing switcher space.

All assignable signal paths have multipoint distribution, with the exception of machine control signals. Because the signals only go from one place to another at a time, control consistently seems to be the one thing worth patching in a post-production environment. With no signal-quality issues at stake, a control router didn't rank high in the cost/performance area.

Post Perfect decided to invest a significant sum in certain control panels and control heads for the consoles of edit and graphics rooms that shared these devices. This configuration eliminated the need to physically wheel a control panel or head from room to room in front of clients.

For the degree of flexibility required by the facility, all normal operations are performed without having to patch signals, however, every signal is available at patch points. Signals distributed and/or routed include analog composite video, analog composite video with visual time code burn in, digital composite video, digital component video, analog audio, digital audio and time code. Post Perfect decided analog component video signals would not be distributed due to quality problems; instead they are converted into component digital video at individual machines and distributed as digital component video. Also, machine control signals operate on normalled signal paths and must be patched to assign them.

At Post Perfect, all digital video is serial. There are absolutely no parallel video signal paths. Devices that have only parallel digital inputs or outputs have their signals converted into serial format at their connectors via Miranda serializers and deserializers.

Machine Room A features (left to right) D-2, Ampex DCT and D-1 machines and Innovision encoders for the D-1 decks (at extreme right).

It was determined to treat AES/EBU digital audio as an individual signal and to not embed it in digital video signal paths. At the time Post Perfect specked its router, there was a big push on the part of manufacturers to embed audio and video in one signal path. But Post Perfect felt it had nothing to gain by embedding audio, only to use multiplexers and demultiplexers to separate it out again. Although embedding audio saves a router frame, it seemed to be a process better suited to the broadcast environment or to facilities with multiple locations.

All AES/EBU digital audio signals are distributed 75Ω, unbalanced so standard video jackfields can be used. Devices that have only 110Ω balanced inputs or outputs have their signals converted into 75Ω unbalanced at their connectors, via Canarie transformers, enabling serial audio to be sent down a standard video cable.

All of Post Perfect's digital facilities (e.g., editing, telecine and graphics suites) work in both 525/60 (NTSC) and 625/50 (PAL) formats. Switching from 525/60 to 625/50 is accomplished with one master switch in each control room.

Signals are translated from one format to another in a number of different ways. Component digital VTRs and component digital control rooms have individual encoders (serial component digital in to analog composite video out) to feed analog video routing switchers. In addition, three encoders connected between the digital video routing switcher and the analog composite video routing switcher are assigned via the routing switcher control system.

Each component digital control room has several decoders (analog composite video in to digital component video out) so composite analog sources from the routing switcher or from individual machines can feed these control rooms. Two decoders connected between the analog composite video routing switcher and the digital video routing switcher are assigned via the routing switcher control system.

All digital VTRs are connected to and from the analog audio routing switcher in addition to being connected to and from the digital audio routing switcher. External analog-to-digital and digital-to-analog converters are installed on those VTRs without this built-in capability.

All digital control rooms feed both the digital audio routing switcher and the analog audio routing switcher. They have several analog-to-digital converters so analog audio sources from the routing switcher or from individual machines can feed these control rooms.

Four analog-to-digital and four digital-to-analog converters are connected between the analog and digital audio routing switchers

Post Perfect's digital solution

Upgrading signal infrastructure requires a balancing act.

The Bottom Line:

Post Perfect leaps forward and sets the standard for modern post-production houses by increasing its digital capabilities. In a major facility-wide upgrade, this leading post-production facility has balanced cost and performance to come up with the perfect design. $

By Dean Winkler

Facility signal infrastructure may not be as high-profile a topic as pioneering hardware or software or innovative facility layout and design, but as the driver of facility operations, it is critically important to every post-production house. Whether a new installation or an upgrade to an existing facility, as was the case last year for Post Perfect, signal infrastructure requires careful planning. Its design must balance cost, operational capabilities, signal quality, flexibility, maintainability and expandability.

One of New York City's leading high-end commercial post-production facilities, Post Perfect, was designed in 1986 when the industry was on the cusp of the coming digital revolution. Although we recognized the impact digital would have on video, audio and graphics and were determined to be among the first to take advantage of digital technology, there were few options for digital routing at that time, and the facility was built without it. But the recent advent of serial digital routing gave us the practical option we had been looking for.

Since opening its doors, Post Perfect has consistently increased its digital capabilities, offering digital component edit suites, film transfer and graphics. Based on the success of Edit 4, a fast, powerful NTSC/PAL compositing room that is fully-booked, we converted a second edit suite, Edit 1, from analog composite to digital component last year. In addition, we expanded with Edit 5, a high-quality interformat digital component environment that enables budget-conscious clients to maintain a high level of signal quality throughout the entire post process at accessible broadcast and longform prices.

As Post Perfect's digital offerings reached critical mass in 1994, we decided it was time to install a massive new signal infrastructure to better accommodate current needs and provide a pathway for future growth. In planning this major facility-wide upgrade, there was no single 'correct' answer for the facility. Like all engineering issues, it involved a series of trade-offs in which design criteria were weighed against cost and performance. Because the signal infrastructure affected the daily operation of the facility, decision-making required the representation of all of Post Perfect's departments and the consideration of ergonomic factors impacting the operators' day-to-day activities.

First and foremost, we determined that

The digital revolution.

With competition increasing and technology moving at an increasing pace, many facilities are finding that now is the time to upgrade. In any such project, the challenges are many. However, one effective key to success is to build on solutions developed by others. This month's facility showcase highlights how some leading-edge broadcast and production facilities have rebuilt their facilities with an all-digital tomorrow in mind.

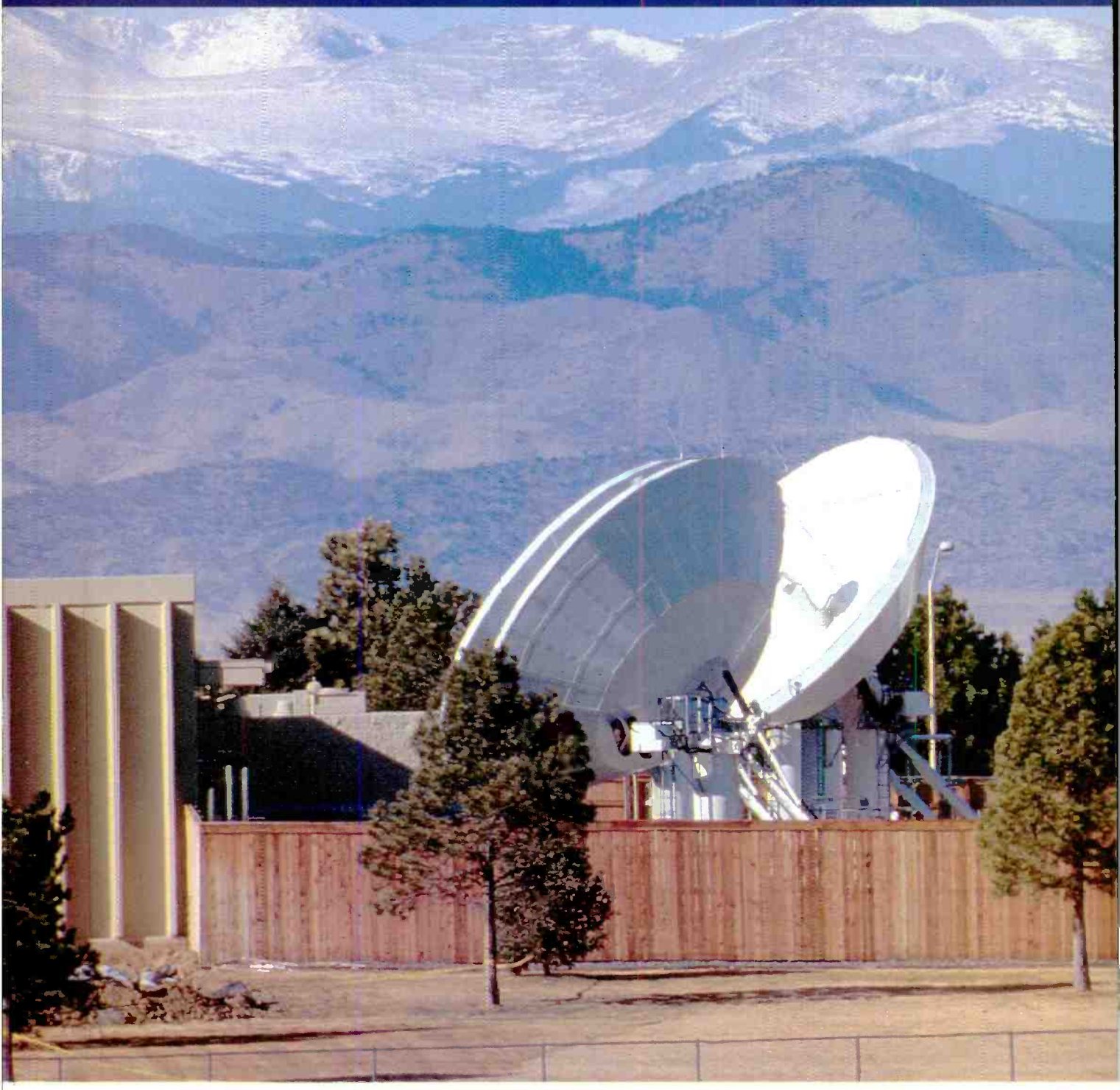
In addition to the traditional facilities, we'll also look at some cable, satellite and telco studios that address video and audio production (they call it content) in innovative ways. The solutions they have adopted to some traditional video/audio production problems may surprise you. It might be that we old dogs could learn a few things from these new pups.

Brad Dick

Brad Dick, editor

Photo: Outside view of new TCI uplink and TV production center in Littleton, CO.

Facility Design Showc



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 #11832.

Circle (9) on Reply Card

According to David Elliot, vice president of engineering at the ABC Television Network, Index Plus and the XDS system offer two main benefits. "First, it is a service to our viewers. If someone wants to record *Home Improvement* and they have Index Plus, they can just tell their VCR to record that show without concern as to when it goes on. The machine gets the information from the schedule and updates it from the live program information that is transmitted in the XDS field."

The second advantage offered by XDS is that it helps cope with channel surfing: "People scan across channels and may hit in the middle of a network break or commercial. With this system, they will be able to know immediately what show they are watching. This is a service to us and our clients," presumably, their advertisers.

Commenting on the overall benefits of using XDS and Index Plus in light of the new realities of broadcasting, Elliot says, "It helps ABC by giving us a stronger network identity with the viewer. With the efforts everyone is making in stamping their video these days, branding and identifying is becoming more and more important in these days of multiple channels and channel surfers. "ABC is anticipating a second phase of its XDS implementation, but has not yet decided what other information it will be adding.

In testing and preparing for national launch of Index Plus, Gemstar is also leasing VBI lines at stations and cable networks. This way, the company can broadcast title data itself on a national basis to over 90% of the United States.

Support from broadcasters is a benefit to Index Plus users and to Gemstar because it enhances its product's features. "It's more content rich," explains company CEO, Dr. Henry Yuen, "if the broadcaster is involved." He also provides reasons why broadcasters would find it in their interest to support the system: "It gives the broadcaster a pre-emptive right to do last-minute program corrections and extend a recording beyond the normal time. Also, the broadcaster can provide live program information." Yuen predicts that the first VCRs incorporating Index Plus will probably reach consumers in the third quarter of 1995. Licensees include RCA/GE, Panasonic, Hitachi, JVC, Sanyo/Fisher, Mitsubishi and Sharp. Gemstar has either made or is negotiating agreements with other major broadcast and cable networks to support Index Plus. The company is also expected to license its Index Plus technology for TV sets in the future.

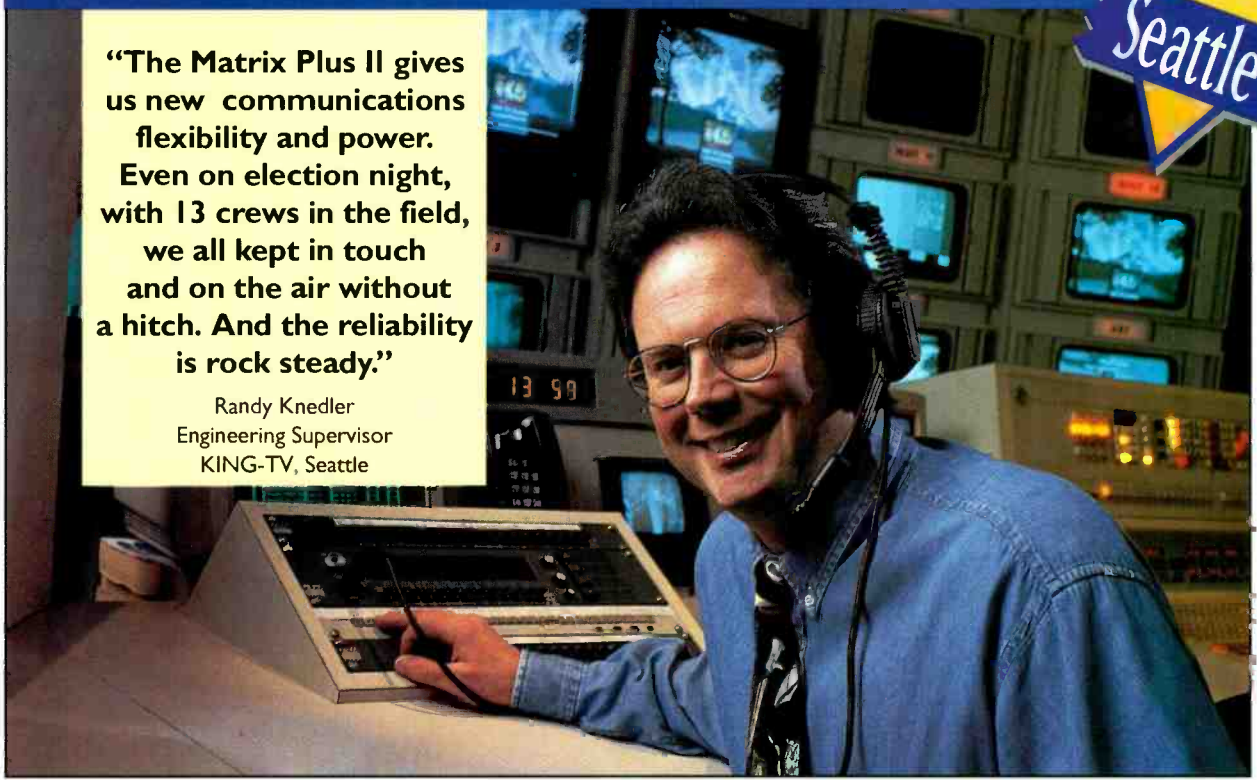
As the broadcast industry gathers in Las Vegas for NAB '95, we are likely to hear more about new ventures and announcements related to XDS and the VBI. Broadcasters are learning that you don't have to own a broadcast license to fill in the lines of the VBI but it always helps to make deals with someone who does. With its new high profile, the VBI is offering innovative ways for veteran broadcast operations to benefit from new products offered by start-up companies in other fields. Through these new offerings, broadcasters can provide a service to their viewers as they raise their own profile with viewers and advertisers. ■

Marjorie Costello is a broadcast and video industry consultant and *Broadcast Engineering* contributing editor based in New York. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

For more information on services using VBI, circle the following numbers on the Reply Card:
•Electronic Industries Association (302)
•Gemstar Development (303)
•StarSight Telecast (304)

THE TALK OF THE TOWN

Seattle



Everybody's Talking About the Power of the Matrix Plus II Intercom System.

KING-TV is the king of Seattle broadcasting; the market's news leader. A team of dedicated broadcast pros puts more than 4½ hours of live TV on the air everyday. At any given time, staffers are in the station, on the street, up in the chopper, or beaming in via microwave and satellite. While they rely on state-of -the-art equipment, they depend on one thing even more: each other. No matter what the situation, they have to stay in touch.

That's why Randy Knedler relies on the Matrix Plus II intercom system. Fully integrated, the system ties everybody together easily and neatly, whether they are on-site or calling in on the phone, the wireless, or via the bird. Many of the system's powerful intercom stations have bright electronically-labeled displays to let everybody know who's on-line and in-touch so that broadcasts go off without a hitch. And since there is no telling what the next broadcast will bring, the system reconfigures quickly to let anybody communicate with anybody...in just seconds.

"Station Identification" is easy with electronic or paper labels

No matter what news breaks in Seattle, Randy knows he can rely on the Matrix Plus II, just like broadcast engineers from San Francisco to Miami and from London to Tokyo. The Matrix Plus II. It's the talk of the town.

Matrix Plus™ II
DIGITAL INTERCOM

Domestic Sales: Clear-Com Intercom Systems
945 Camelia Street, Berkeley, CA 94710.
Tel: (510) 527-6666, Fax: (510) 527-6699

Clear-Com
Intercom Systems

Export Division: Clear-Com International
PO Box 302, Walnut Creek, CA 94597.
Tel: (510) 932-8134, Fax (510) 932-2171

Circle (17) on Reply Card

See us at NAB Booth #18936

upon that by opening up field 2 for captioning, which is not part of the requirements, but it has been documented in an EIA standard.

The next part of the progression, notes Szakolczay, was the design of a packetized data service within field 2, the XDS standard. XDS uses the same data format as closed-captioning but CC has priority at all times. XDS's data packets carry a range of information but the detail it can deliver is limited by its small bandwidth. The Mitsubishi VP continues to explain the hierarchy: "Then there is StarSight, which is a full-blown deluxe guide service that is not as bandwidth limited because it is using a chunk of three of four PBS VBI lines."

Despite its bandwidth limitation, XDS is capable of delivering valuable information and services to viewers. Unlike StarSight, XDS is free. (For both systems, of course, consumers have to purchase products that can capture and display each service's data.) Some of the information that can be provided via XDS includes the name of the show, its length and the time left in the program; captioning and audio services; the aspect ratio; and the network name and station call letters.

In 1994, PBS became the first broadcast operation to transmit some of this XDS information with nationally distributed data augmented locally, depending on the station. Current model TV sets that can display XDS information are recent models from Mitsubishi. Because XDS can also perform automatic VCR clock setting, in 1994 Sony added the feature to its SLV-770HF and SLV-920HF VCRs so the time is always correct and not blinking "12:00."

Gemstar and ABC join forces for XDS launch

XDS will receive a major push in 1995 through the joint efforts of a commercial TV network and a consumer electronics development company. In February 1995, the ABC Television Network and six of its owned and operated (O&O) stations began transmission of XDS information. The added service was launched in collaboration with Gemstar Development through its new Index Plus system, with the company providing broadcast insertion/encoder hardware to ABC.

Gemstar, based in Pasadena, CA, took the VCR industry by storm in the past few years with the introduction of its VCR Plus technology. The technology solved a major consumer problem by making it much easier to record with a VCR. It is now a common feature in all major VCR brands after its debut as a separate hand-held device in 1990. To record a program, consumers punch in the show's VCR Plus code number, printed next to a show in TV listing guides found in newspapers and *TV Guide*.

According to Gemstar's co-founder, and VCR Plus' co-inventor, Dr. Henry Yuen, his company now wants to simplify playing back tapes. Index Plus provides an on-screen directory of shows recorded on each videocassette and automatically fast-forwards or rewinds to selected programs. Index Plus VCRs use a proprietary computer chip to grab program titles and other information in the VBI.

Another important feature of Index Plus is its ability to access program information during live viewing. Program name and channel number can be displayed with the push of a button. An on-screen electronic guide covering the rest of the day for a specific channel being viewed can also be displayed instantly. Although this information is far from the detailed and week-long guide provided by StarSight, Index Plus does not require consumers to pay a subscription or other fees. Similar to StarSight, Index Plus also offers an easy point-and-record capability.

ABC and most of its O&O's are broadcasting show titles and other information via the XDS in phase one of its implementation. In addition to passing along their network's XDS information, the O&O's will be adding their own call letters, local program titles and running times.

and General Instrument/Jerrold converter boxes.

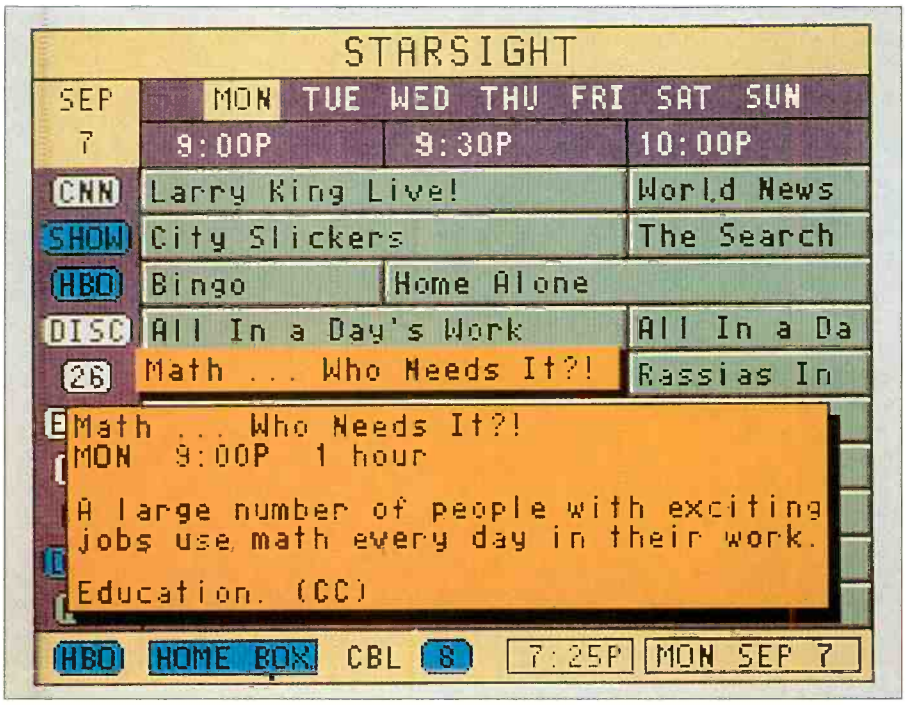
In addition to making TV viewing more manageable and convenient, Burns predicts StarSight will offer promotional opportunities to broadcasters and cablecasters in the future — presumably for a fee. Although StarSight products' president was not ready to reveal specifics, he did offer these possibilities: "One way is to highlight what is hot tonight." A viewer presses a button on the StarSight remote and, "Up pops some of the specials that are on tonight." Another way, suggests Burns, is for a station or network to put a marquee around a box at a certain time and the viewer can move to a bigger screen with more information. This could include tie-in possibilities with advertisers.

StarSight has also given indications that it plans to add weather, news and sports information in the future. We can assume that these services could be provided in partnership with broadcasters, cablecasters or their competitors at newspapers or wire services. The company is also exploring two-way communication with viewers through a phone or data jack.

One advantage of the XDS system, shown above, is that TV stations can make last-minute changes in their program schedule with the system tracking those changes to the viewer.

Index Plus and XDS

The EIA subcommittee that set the standard for closed-captioning and XDS was chaired by Julius Szakolczay, Mitsubishi Consumer's vice president of new technologies research. Because of his EIA committee work and his company's adoption of both StarSight and XDS, Szakolczay has a unique perspective on these new services. According to Szakolczay, "They should be viewed as hierarchical. It starts with closed-captioning, which uses field 1 of line 21 of the VBI." He goes on to explain that they improved



The StarSight interactive on-screen guide provides detailed information on current and upcoming programming as far as one week out. The signal is currently carried on PBS stations, MTV and Nickelodeon.

StarSight provides the name of the network, the channel number and the station's call letters. StarSight makes TV watching easier by displaying the name of a movie or show as you channel surf along with the time remaining in the program.

TV viewing also becomes more interesting as well as convenient because a viewer can easily obtain a program synopsis, actors' names and the year a movie was released.

According to John B. Burns III, president of StarSight Products Group, the benefit to broadcasters is that, "StarSight gives [consumers] up-to-date information about [a broadcaster's] programming in a format that is easy to access and understand for a consumer." As Burns, formerly with Showtime, goes on to explain, "The problem is that there is a lot of good TV on and people can't find where it is. This is a tool for accessing it. This is a home run for broadcasters."

Since all the major TV set manufacturers — including RCA, Sony, Panasonic and Magnavox in addition to Zenith and Mitsubishi — have also signed agreements to offer StarSight products, it's likely that the service will gain wide acceptance in the United States. Another introduction that is likely to hasten the spread of StarSight is its stand-alone box sold by Magnavox at retail for under $150. Companies will also be offering StarSight in VCRs with Samsung and GoldStar planning to be the first to make models available by summer. StarSight has also licensed its technology to other players in communications. Uniden is selling home satellite decoders incorporating StarSight, and Bell Atlantic Video Services (BAVS) will feature StarSight in its planned video dial tone service. StarSight is also available from cable operators in Zenith

ing guides so consumers know what's on television. Ironically, these new services amount to full-blown consumer-oriented versions of information until recently restricted to network VBI transmissions to their affiliates.

The first of these new on-screen viewing guides is StarSight, launched in 1994. As evidenced by the recent 1995 Winter CES in Las Vegas, StarSight is one of the hottest new features on televisions and VCRs. Along with XDS-related services like Index Plus, StarSight is likely to change the way people watch television and make their viewing selections.

StarSight: Navigating the future

StarSight is an interactive, electronic on-screen guide designed to help consumers navigate their TV information highway. It goes far beyond the information and capabilities provided by a cable system's preview channel and the print listings found in newspapers and *TV Guide*. StarSight, a Silicon Valley start-up founded in 1986, is leasing VBI lines from PBS to carry its information throughout the United States

StarSight's on-screen features, displayed on its grid guide, include instant program selection, 7-day program information, and schedules for dozens of channels. The Fremont, California-based company's system also offers direct tuning by program title or by themes — such as movies, sports, news — as well as one-touch VCR recording.

Designed to incorporate its patented technology in TV sets, VCRs, satellite decoders and other converter boxes, StarSight's first major appearance was in several Zenith TV models. These sets, which shipped in summer 1994, were joined by Mitsubishi models this past fall.

StarSight data is supplied by TV Data Technology (TVDT) in Glen Falls, NY, a corporate partner in StarSight and one of the major providers of TV program guide information to print media. The TVDT information, formatted to StarSight specifications, is sent by dedicated data lines to StarSight in California.

After StarSight formats the schedules and adds security algorithms, the information is again sent by dedicated data lines, this time to PBS in Alexandria, VA. In Virginia, the StarSight data is inserted into the PBS VBI and uplinked to the Telstar 401 satellite. The StarSight information is downlinked at 200 PBS member stations achieving coverage of virtually every household in the United States.

To ensure national coverage and provide redundancy back-up, StarSight is also transmitting on the VBI of two cable networks, MTV and Nickelodeon, owned by StarSight equity partner, Viacom. These cable networks are also uplinking the StarSight data on their VBIs to Satcom C3 and Satcom C4 from Viacom's Hauppauge, Long Island satellite facility. Incidentally, other StarSight equity partners include Cox Communications, The Tribune Company, Times Mirror Cable, The Providence Journal, Spelling Entertainment/Blockbuster and KBLCOM/Houston Industries.

To activate a StarSight-equipped product, a consumer calls an 800 number and provides cable system and home equipment information along with a credit card number. Then, in a matter of minutes, information specific to that consumer reaches the home setup, transmitted over the pathway described above. Consumers pay a one-time $15 activation fee, and a monthly subscription fee averaging under $4. After the entire initial download, which can take several hours, the consumer's StarSight information is refreshed daily when the consumer is not using the StarSight-equipped home hardware.

StarSight does offer a capability that on the surface might rattle broadcasters: The consumer can rearrange the order of channels on the StarSight grid and customize them for his/her viewing habits. As an example, a viewer could place channel 13 before channel 2, preceded by a frequently watched cable channel, like CNN.

StarSight: Home run for broadcasters

The overall effect of StarSight should make all broadcasters and cablecasters happy. Based on first-hand experience, StarSight leads to increased TV watching. The reason is that with the click of the StarSight remote, the viewer gets an excellent rundown of what's on now or in a few hours or days. And,

BROADCAST 2000

New consumer services fill in the VBI lines

A Look at StarSight, XDS and Index Plus

As broadcasters face a future of increased competition for viewers' attention and advertisers' dollars, keeping up with change is more important than ever. The purpose of this bi-monthly column is to address a growing range of new or announced technologies and services that will affect the world of broadcasting and cable. That way, your operation can keep current, competitive, and cash in on change.

Some of these developments will let your station develop new revenue sources, while others will have to be offered simply to stay competitive. And since what you don't know can kill you, we will also discuss a third area: services that may initially appear to be threats to your operation.

But before you pull out the patch cords and turn off the transmitter, we will also point out some interesting partnering opportunities for the savvy station. Even in a world filled with new competitors, broadcasters should always remember they have valuable and unique assets they can leverage. These include spectrum space with a license to broadcast and many years of real-world experience in producing professional-quality "content" — the term computer and telco people often use to describe TV programming.

The face for VBI space

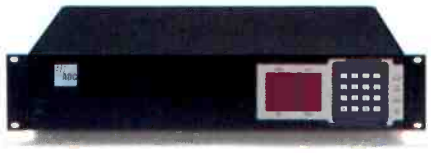
The subject of this debut column, new consumer-oriented services using the VBI, incorporates several aspects of the new media mix. The VBI is becoming one of the most sought-after parts of the spectrum because it provides an existing, cost-effective and dependable pathway for distributing data to consumers. New consumer data services and products tapping the VBI include StarSight, XDS and Index Plus.

Up until recently, the VBI's primary consumer use has been to transmit information for closed-captioning. As you may know, as of July 1, 1993, all TV sets 13 inches and larger manufactured for sale in the United States required built-in closed-captioning (CC) circuitry. Because of this federal mandate, TV-set makers have been exploring other ways to use this technology and circuitry to display additional text and information services.

This has led to a new standard called XDS, extended data services. Developed by the consumer electronics trade association, the Electronic Industries Association (EIA), you may have seen XDS demonstrated at recent NAB Conventions under its previous name, EDS.

Also moving consumer electronics (CE) manufacturers to offer new on-screen display features is the proliferation of channels available to TV viewers. VBI lines are being used to deliver new on-screen electronic view-

By Marjorie Costello



Constant Change.

Constant.

ADC's New LightSwitch™ – The "Future-proof" Digital Router.

As digital formats come and go, so does a lot of expensive equipment. But while changing formats often requires upgrading cameras, decks and other source equipment, it doesn't have to affect your switching system.

Introducing the new LightSwitch digital router from ADC. A switching system that literally doesn't care what format you use. By avoiding internal reclocking, the LightSwitch router is able to switch any true digital signal, regardless of format–even ones that don't exist yet! It can interface with either coax or fiber and features on-site matrix mapping, group takes, chop mode and RS232/RS485 control panel interfaces.

So, regardless of what digital format the future holds–from D1 to HDTV–turn on the LightSwitch router from ADC. For more information about LightSwitch or our digital video and audio fiber optic links and DAs, call us at **1-800-726-4266** or circle the reader service card below.

ADC Telecommunications®

See us at NAB, Booth #19935.

Circle (14) on Reply Card

By Brad Dick

SMPTE Winter Conference

This year's SMPTE Winter Conference was held in San Francisco in early February. The last three meetings centered on the converging of video and computers. This year's theme, "New Foundations for Video Technology," continued that development, but with a slightly different twist.

This year's meeting brought together some of the highest-regarded experts in both the computer and video industries. No longer satisfied to simply talk about the merging of these two worlds, the meeting provided a good overview of how general-purpose computers will become an even more important tool for the video professional.

The language barrier

Three year's ago the conference was called "Collision or Convergence: Digital Video/Audio, Computers and Telecommunications." I recall that the event resembled a meeting of foreign delegates, all speaking different languages. At times, attendees almost needed a real-time translator to understand what the other party was saying. For instance, resolution conjures up one definition to the computer type and something different for the video professional.

I chuckled when the computer-based presenters called the small, jerky pixelated pictures on the computer screen *video*. One computer-based presenter showed "real video" on a computer monitor. It was Quick Time. The video professionals shook their heads in amazement. Not that the technology was possible, but that anyone would call it video.

For the video old fogies, seminar chairman, Charles Poynton of Sun Microsystems, delivered a wake up call on the merging fields of computers and video.

He showed how the two industries are becoming closer in terminology and function. As future technology is developed, it will be a blend of consumer electronics technology and information industry technologies, he said. In many ways, the video industry is piggybacking on the developments of the computer industry. The economics of scale are critical when it comes to producing a cost-effective product. For one thing, it's far better to be able to amortize the cost of R&D over one million devices rather than 10,000, especially if the device was expensive to develop.

Look at video monitors. For every professional video monitor sold, perhaps thousands of computer monitors are sold. However the monitors cannot be identical because the applications are different. Fortunately for video applications, as manufacturers develop higher-quality (and less expensive) monitors for the computer market, the video products gain from that R&D, which is paid for by the computer products. The result is better products, more features and lower costs.

Another good example of the advantage of scale is the CD-ROM. It is now becoming standard equipment for computer users. However, were it not for the audio CD, the CD-ROM might still be a thousand dollar option reserved only for expensive computers.

Table 1 summarizes how the design parameters for video and computer products are fundamentally different. What makes the criteria different is the application, not the product. Understanding this premise, makes it easier to understand how hardware developed for one application may not prove effective in another.

Multimedia

Multimedia is something easy to say, but hard to describe accurately. The executive director of the Interactive Multimedia Association, Philip Dodds, addressed the group at the Thursday luncheon. While some video types were outspoken in their wonderment at his selection as featured speaker, he proved up to the task.

Dodds' theme centered on the current development of interactive products. He complained that interactive media was not well understood. He said that only the old systems where the video and control were kept separate produced a quality experience.

Originally, the systems were composed of a video disc player with the video and graphics combined in overlay cards. He complained that today, no commercial delivery systems, including CD-based systems, can produce the quality of video and degree of control as those "antiquated video disc systems" had. According to Dodds, the key was that the computer exerted only control. It did not handle video.

Dodds stated that the computer industry has declared "Analog is a scourge upon the earth and must be eliminated." In other words, "If you can't compute it, it is inherently bad."

He claimed that the video disc is dead because analog is a dirty word to the computer industry." "Like it or not," he said, "we all have begun the wholesale shift to compute-intensive, CPU-cycle-sucking digital multimedia." The video crowd loved it! The computer guys didn't see a problem.

Next year

The SMPTE Winter Conference has never been a large show, and probably wasn't intended to be. And, it's not designed to teach you how to repair your tape recorder or provide a hands-on practical experience. However, for what it lacks on the practical experience level, it gains measurably by providing attendees with an important look at their industry's technological future.

It is a major gathering of the video and computer industry's experts. If you want to know where video and computer technology is going, or what tomorrow's hardware might look like, consider attending next year's conference in Seattle. You won't be disappointed. ■

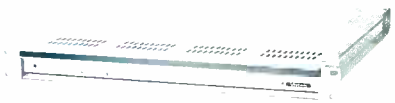
Design parameter	Industry	
	Video products	**Computer products**
Industry standards	Stable, monolithic. Detailed and layered. Standards are large	Small standards for little portions. Lets user plug and unplug parts of standards as desired.
User Access Patterns	Sequential. Ex. movies; run from beginning to end. One pass only	Statistical. Ex. caching, storing used data for future (repeated) use access and use.
System Topology	Open loop, ex. broadcast. no feedback from end user back to information source	Closed loop, ex. PC screen presents information, user responds via keyboard, and PC again responds.

Table 1. Because the basic application needs are different, the design parameters for video and computer products must be dissimilar. For example, computer monitors make lousy TV sets. They don't produce sufficient image brightness. Likewise, TV monitors are larger, designed for distance viewing and must have narrow cabinet depth. One cannot optimally replace the other.

Designed for Each Other

NAB Booth #13835

Peaches and cream, a mouthwatering combination. Now there's another. We've introduced the new V4238 Digital Encoder, the perfect partner to the already successful V4228 Digital Varicomb Decoder. Our Industry Standard *Varicomb*® technology has been refined and implemented digitally so your pictures will never look more appetizing. Ask to see the menu.



V4228 DIGITAL DECODER

- 2-D OR 3-D VARICOMB® ADAPTIVE DECODING
- AUTOMATIC MULTI-STANDARD OPERATION
- ANALOG AND DIGITAL INTERFACES
- ALL DIGITAL PROCESSING (10 BIT)
- ULTIMATE COMPONENT QUALITY FROM A COMPOSITE SOURCE

A peach of a decoder

V4238 DIGITAL ENCODER

- VARICOMB® PRE-PROCESSING FOR 'CLEAN' ENCODING
- AUTOMATIC MULTI-STANDARD OPERATION
- ANALOG AND DIGITAL INTERFACES
- ALL DIGITAL PROCESSING (10 BIT)
- THE CLEANEST COMPOSITE SIGNAL FROM A COMPONENT SOURCE

The cream of encoders

Vistek

Because the World is Watching

Circle (8) on Reply Card

Vistek Electronics Ltd, Unit C, Wessex Road, Bourne End, Bucks SL8 5DT. England. Tel (+44) 01628 531221 Fax (+44) 01628 530980

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

By Gene Koprowski

Networking

On-line services such as CompuServe, Prodigy, and the Internet often are misperceived by the public as electronic hideouts for software hackers or a collection of chat lines for struggling souls desperate for a computer date. In fact, these access points to the so-called information superhighway are primarily networking tools that people in a range of professions, including broadcasting, are using to make contacts, find new jobs, buy and sell equipment, and exchange industry information.

Useful resource

As a technology journalist, I log into CompuServe's Journalism Forum several times a day as part of my prospecting and networking strategy. There, I can discern the latest trends, or talk to editors seeking a specialist in a given subject area. I can even find press releases from universities and companies involved in the science and business fields. Having worked as a PBS-TV producer, I also use the Broadcast Professionals Forum to see if there are any documentaries looking for research assistance.

So, if your range of contacts in this business is limited, or if you want to investigate moving to a new locale, start by equipping your 486 PC or Macintosh to move in the fast lane with one of the commercial on-line services. Setting up your system for on-line access is relatively easy. The off-the-shelf software can be purchased almost anywhere for $20 to $150. You'll also need a modem that has at least 9,600bps capacity. That should cost about $150.

Having just hinted that the whole process is easy — I lied. Well, it is easy if you're talking about one of the major on-line services like CompuServe, America On-Line or Prodigy because they all provide customized software. However, getting your system configured for the Internet is akin to having to wire a 64 x 64 component routing switcher using a manual written in Swahili with one hand tied behind your back and being color-blind!

Once you have your system up and running, call the on-line service (some software packages do this automatically) and log in. The system will ask you a few questions — like your life history — no, really just some credit card stuff. Answer the questions and you'll be in. You now have an official e-mail address. Using a local access number will connect you to the service and you're now an official member of the I-way.

So what's on-line?

Now that you've gone to all this trouble, what's out there? The quick answer is about anything you can imagine. Let's take a quick tour of the Professional's Forum on CompuServe.

Forums consist of areas composed of like interests. Clicking on the Professional Forum brings up the following selections:

- Aviation
- Business Management
- Data Processing/MIS
- Media Services
- Engineering/Technology
- Entrepreneurial/Small Business
- Engineering/Technology
- Health Professions
- Legal Services
- Education
- Market Quotes/Highlights
- Other Interests

Forums are usually composed of several areas or *libraries*. The first library may be a general area where news and beginner guidance and rules are listed. This allows someone to cruise the net reading the intro areas and entering only those forums of interest.

Let's check into the Broadcast Professionals Forum. We call it BP Forum for short. It is reached by selecting the Media Forum, which yields another menu of choices.

- Help & Information
- TV
- CATV/MMDS
- Radio/TV Talent
- Strictly Audio
- Post-Production
- Radio
- Résumés/Jobs/Classified
- Manufacturer's Information

In addition there are several manufacturer-specific libraries where users can get technical assistance or download new drivers and information for their equipment.

Clicking on the Résumés/Jobs/Classifieds library, I saw this posting: "We are looking for two producers to work in Montreal full-time on contract. Five years of experience needed. ABC digital editing, French fluency, and editorial judgment needed." Now, if I spoke French with any degree of confidence, I might have replied. But I do not, so I dared not.

In another posting I saw a member looking for the address of a radio station in New York City. According to the log (in I-way language a "thread") of replies, he received three responses from people who not only gave him the needed telephone numbers, but also contact names. The on-line environment is usually friendly; rather like living in a small town. People are quite willing to help.

The on-line environment is usually friendly; rather like living in a small town.

There are ads from people looking for specific equipment. One guy was looking to buy a PAL Betacam. Others were seeking to sell equipment from an Edit Master, to an ATVista and two MII decks, to a Barco CVS monitor. Many forums provide such classified sections like this one and they are accessible 24 hours a day.

The personal touch

When operating on-line, keep in mind a couple of rules. Because you don't know what the other person looks like and you receive no social cues as to their status, you must deal with them on an equal level. Also, there are mores on-line. Generally, anyone who engages in vulgar language will be asked to leave by the system operator (SYSOP). Keep in mind that all your replies and messages are public (except your personal e-mail box). If you want privacy or want to send an individual message to someone, you have to log out of the forum and send them a direct e-mail message.

In the future as more people adopt this interactive technology, electronic networking will be a commonplace — not a cutting-edge — business practice. Until then, see you on-line. ■

Gene Koprowski is a technology journalist based in Chicago and a former PBS producer. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

Coming in April...

Cover Story: TV Station Builds Cable News Network

Broadcasters and cable systems have finally stopped beating each other up as economic realities force cooperation. Savvy TV stations now use cable systems to deliver programming to areas they can't normally reach. San Francisco station KRON-TV was looking to the future when it built an entire network of cable outlets through the use of ISDN and transmission equipment.

Using Fiber for Video:

One of the hottest in-studio technologies is fiber. The demands of high-speed data and video are often best-suited for fiber. We'll take a look at how fiber can solve many in- and out-of-studio problems.

Automation for multicasting:

As stations forge alliances with cable systems and develop their own mini-service areas, one key to success is localized commericals. We'll look at tape- and disk-based storage technology, which is crucial to the effective implementation of multicasting.

Building an RF ATV facility:

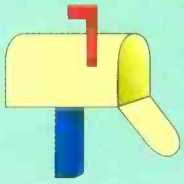
This "how to" is for engineers needing to plan for their station's ATV future. We'll discuss implementation costs for the RF portion of the system, including towers, transmitters, antennas, coaxial lines, filters and combiners.

Technical Glossary:

A humorous look at the acronyms that plague our everyday technical environments.

In addition to:

News
Editorial
FCC Update
Transition to Digital
Management
Production
Interactive
Transmission Technology
SBE Update
New Products



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

The inventors of the VideoCube® introduce

TURBO Cube

It's new.
It's hot.
It's from ImMIX!

(Who else?)

Experience the next generation of power at NAB - ImMIX booth #19779.

ImMIX®
A SCITEX COMPANY

Wearing this button could change your life.

TURBO Cube

ImMIX A SCITEX COMPANY

Last year's winner: Writer/producer Kimberly Cowden of ST Digital Productions in Fargo, North Dakota — shown here with ImMIX President Randy Hood — won a VideoCube workstation at last year's NAB Convention. This year, the smile might be on *your* face.

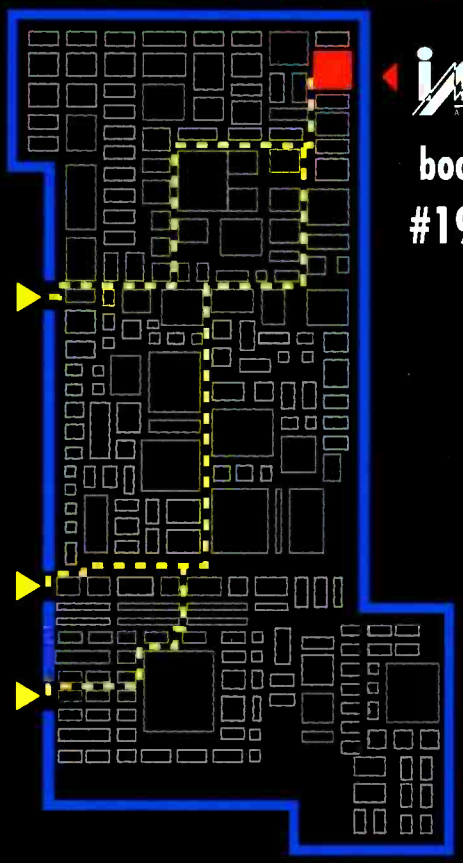
Just ask Kimberly Cowden. She wore a VideoCube button during last year's NAB Convention and won a complete VideoCube system worth more than $40,000.

Now it's your turn to win at NAB — and this year, the stakes are even higher. Pick up your ImMIX button at booth #19779, wear it during the NAB Convention, and you can win the most exciting new product at the show — the TurboCube.

Two years ago at NAB, ImMIX made history with the VideoCube — the industry's first nonlinear finishing system. This year at NAB, TurboCube will set the new standard for nonlinear finishing.

So wear your ImMIX button at NAB, for your chance to turbocharge your business by winning the TurboCube.

Las Vegas Convention Center



ImMIX A SCITEX COMPANY

booth #19779

ImMIX A SCITEX COMPANY

ImMIX
PO Box 2980
Grass Valley CA 95945
USA

Tel: 916/ 272-9800
Fax: 916/ 272-9801

such as non-linear workstations.

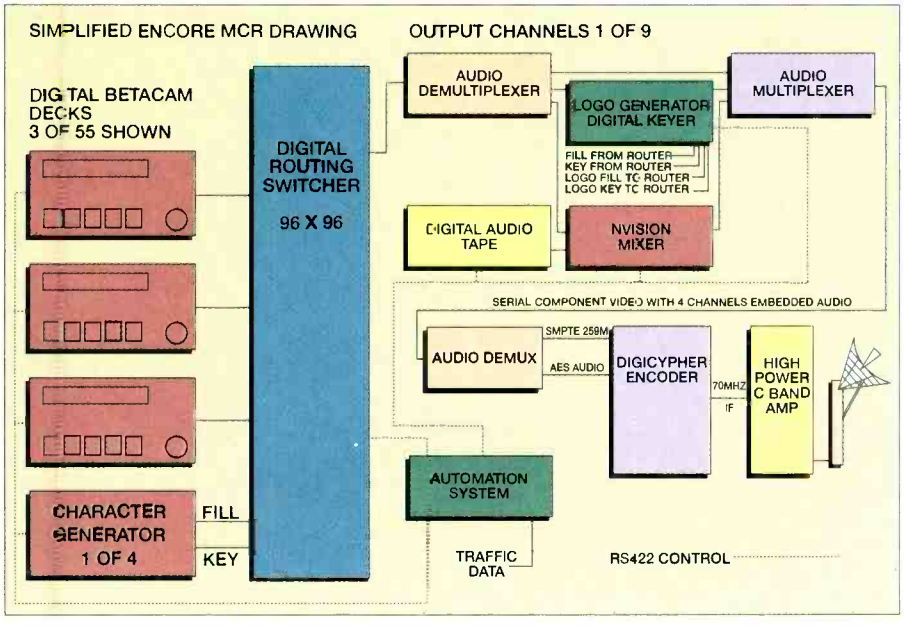
Functionality and ergonomics were important considerations in the design of the facility. The control room lighting is quite different from what most of us have seen in the past. A study has shown that the largest factor in eye fatigue among operators was not low light but the contrast between the typical direct lit work space (about 70 foot candles [fc] and the light emitted from a typical CRT (about 15-20fc). Another problem was the glare from the standard track light fixtures. To address this problem, we installed dimmable indirect fluorescent fixtures that maintain a constant 3,500°K color temperature. The result is a glare-free, evenly lit area with a constant illumination of about 20fc. An interesting facet of this is that when left to their own and without any suggestions, the operators consistently set the lights at this level. The cost of these fixtures is high, about $1,800 per 6-foot strip, but it has proven to be a good decision based on operator feedback. These same fixtures are used wherever possible, especially in common work areas, such as cubicles, where individuals have little control over their environment.

For the comfort of our employees and overall asthetics, we opted to install carpet tiles over the raised flooring. There were also advantages in cost because we were able to use some used tiles since they would be covered. A Milliken static-free overlay carpet was used for the entire facility. I have yet to experience any static discharge as a result of walking the floors. In the electronic shop, we used a grounding-type floor tile with a full bonded ground grid beneath the adhesive. A key factor in keeping static discharge to a minimum has been constant humidity and good maintenance of the carpeting. This requires a special cleaning treatment to maintain the static-free properties and Milliken factory people come in once a month to clean the carpet.

General wire and construction concepts

In a facility this size much emphasis is placed on neatness, documentation and serviceability of installation. All the areas with discrete audio are interconnected with the ADC ICON system. All routers, DAs and other high-density devices are connected to swingout punchdown panels installed in the backs of each rack so that repeat connections do not disturb or wear the high-density connections on the equipment. Testing is also facilitated with this installation technique. The racks are interconnected with 26-pair numbered and insulated snake cable with intermediate blocks mounted on the walls behind each technical area.

Because our wiring area under the floor is considered a plenum, it was necessary to use plenum-rated cabling. For video, we use Belden 1506A (a mini 8281 product). For long audio runs we use a specially made plenum-rated 12-pair snake cable. Because the plenum-rated audio snakes are difficult to strip, we opted to use 3-inch flexible conduit for the rack-to-wall and wall-to-rack connections. The snake cables were placed in the conduits prior to them being installed under the floor and this turned out to be a relatively easy process — much easier than



The design of this all-digital control room allows the Encore channel to originate nine separate program feeds from a single facility. The program source is a digital Betacam with a synchronized backup machine.

dealing with several thousand plenum-rated audio cables.

Power and HVAC systems

Each of the four master control pods and six post-production areas are served by a core mechanical/electrical room. The HVAC system consists of a pair of 300-ton water-cooled chillers backed up by a pair of 200-ton air-cooled chillers. In five years, the efficiencies of the water-cooled system will have paid for the extra cost involved in building a separate chiller building. To keep the demand load down and to load test the generators, the backup chillers are only run while the backup generators are running. This is an effective test and exercise of both systems. Within each M/E core are Liebert air handlers that pressurize the floor with cooled and humidified air. A temperature of 72° with 40% humidity is maintained throughout the facility and by distributing the air handlers and backing up the chillers, chances for HVAC failure are remote.

Because all air conditioning is via the floor and intended primarily for equipment, we had some concern with the ability to control areas occupied by non-equipment (people). To solve this problem we used a 2-step process. First, all racks were sealed up as much as possible allowing cool air to flow in the bottoms and out of the vented tops of the racks. Secondly, thermostatically controlled floor vents with quiet fans are being used to control the temperature of the operator areas. To protect the control rooms from mysterious circuit breaker trips, we installed floor-mounted non-UPS outlets in the floor beneath the operating consoles for the inevitable portable heaters (not encouraged, but always present).

Three 1,250kW diesel generator sets feeding three 750kVA rotary UPS systems keep the facility well-powered in the event of a commercial power failure. The gensets and UPS systems are all paralleled on their outputs to allow for future expansion and service. Within the system one genset and one UPS are considered backup units. Although rather expensive (about $160,000 each) the rotary UPS has proven to be extremely reliable while providing a spike-free clean AC waveform. The UPS feeds a series of power distribution units each located within an M/E core. The power distribution units are fed from 480VAC and transformer isolated, supplying each rack or outlet with isolated ground AC power. The circuit breakers are located on panels within the power distribution units.

In a facility covering this large of an area, much attention was paid to proper grounding. Beneath the computer floor, a 4' x 4' grid of 3-inch copper strap was placed. All connections are welded to the grid and all racks are grounded individually with No. 4 copper wire. The ground system is tied to a ground rod network installed within the base of five 9-meter satellite dishes outside the building.

Racks are interconnected with 26-pair cable to wiring blocks mounted on the wall behind each technical area. Computer flooring makes wiring changes a snap.

Voice and data

Scattered throughout the facility are more than 20 IDF closets. Each IDF is interconnected to the main telephone and data area with 200 pairs of traditional phone lines and eight fibers. The standard communication outlet for each office or other location is four 4-wire telephone jacks and two RJ45 data connectors. The data networks are interconnected using the fiber so there are no data lines in excess of 100 feet. In addition to the voice and data, a dual 750MHz house cable system was installed. We are currently using one of the LANs to carry e-mail/Internet, printer sharing, and two traffic systems.

All-digital master control

Early in the process we made the decision to use the digital formats where applicable to our clients' requirements. Not all clients wanted to go the digital route. The first full digital master control room is being used by Encore to originate all nine of its movie networks. If you watch Encore, Starz or any of the Encore "Multiplex" channels, such as Mystery or Western, the signals are coming from this digital master control room. All origination from this MCR is done using serial component digital with embedded audio.

Construction of this MCR was a challenge. While not a complete "turnkey" job, our partners in construction were Sony Systems Integration Division. We quickly discovered that there were many "digital holes" in the plan. Such things as digital downstream keyers and logo generators were not commonly available. In addition, we created a control system to use DAT for each network's audio voice-overs.

The basic system consists of 55 Sony DVW-A510 digital betacam tape machines, a GVG SMS7000 96 x 96 serial component router, primary and backup Alamar automation systems, Nvision digital audio mixing equipment, nine DAT playback machines, 18 Microvision digital downstream keyer/logo generators, four Chyron Max!> character generators with digital output options and a large assortment of Wohler digital audio VU/monitor amps, Sony digital conversion/demux boards and monitors/scopes.

All tape machines are fed into the router with four channels of embedded audio and the Alamar systems control the router and machines according to nine active playlists. The user bits are used to assure that the right tape gets to the right channel and all active tapes have a second tape synched to the original for backup purposes. The automation system monitors the RS-422 control lines for machine errors and will switch to the backup in the event of an error. Each channel has its own DAT machine that is used for voice-overs and is controlled by the Alamar system with time code. The advantage of the DAT system is twofold. First, we are able to keep all audio digital, and second, instead of the usual pile of analog carts we are all familiar with, we simply have one digital tape per channel per day. The program audio is dipped and voice-over audio is added with Nvision mixer components controlled by Alamar systems.

Downstream keys were added with the Microvision keyers (hot off the assembly line in Great Britain). On the Encore and Starz east/west networks there are three of these keyers. One is used for inserting the logo during the program and the other two are used for inserting live keys of upcoming events and other promotional material live in the MCR. The reasoning behind the stacked keyers is ease of controlling the key and fill video as well as being able to trigger the keys via the automation system.

Traditonal and non-traditional operations

Being client-driven, we are quite diverse in our operations. We operate several master

Continued on page 53

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.

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

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

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

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

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

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

sachtler
corporation of america

See us at NAB, Booth #19526.

Circle (24) on Reply Card

Flumbicon is a registered trademark for TV camera tubes.

Standing by.

You have confidence in the reliability of your tube cameras. You count on their high resolution, low lag and the exceptional picture producing quality. Shouldn't you count on the best replacement tube for your cameras? Philips wants you to know we are standing by with a complete line of the best replacement camera tubes in the industry.

By providing replacement tubes for the world's most popular cameras we have earned a reputation for uncompromising quality products and customer support. So when you are standing by ready for broadcast, have confidence in your equipment. Know that Philips is standing by with the camera tubes you need now and in the future.

Philips Components, 100 Providence Pike, Slatersville, Rhode Island 02876, USA. Tel: +1-401-762-3800, Fax: +1-401-767-4493.

Philips Components, Prof. Holstaan4 Postbox WAG-04 5656 AA Eindhoven, The Netherlands. Tel: +31 40 742191, Fax: +31 40 744090.

Philips Components

PHILIPS

PHILIPS

See us at NAB, Booth #17011.

Circle (25) on Reply Card

TCI continued from page 50

This master control room is capable of originating up to 10 channels of on-request pay-per-view programming with only one operator.

control rooms that would be considered traditional with LMS and MC switchers. We also operate a number of non-traditional control rooms. For our clients running longer-length program formats such as movies, we have combined as many as 10 channels out of one control room. All tape playback is fully redundant with backup copies synched to the original. These signals are switched to air with large routing switchers controlled by an automation system with keys put in downstream. Routing switchers are kept individualized between clients to prevent inadvertant airing of another client's material on the wrong channel. This heavy use of automation results in large savings on personnel costs and has proven to be effective and error free.

We are in the process of converting several networks to use disk-based commercial playback. Currently, we have three 3-channel AVID airplay systems installed and are using two single-channel systems to compile off-line. The 3-channel system grows out of the need for full redundancy in these network feeds. Two channels operate in a parallel mode with separate processors and disk buffers fed from a central 12-hour disk archive unit. These two channels provide a primary and backup feed to the air switcher and the third channel is used for inputing new spots.

One example of a busy master control operation is the control room for the new network "TV!" This is a sampler network now available in about six million homes and growing. The concept of the network is to allow basic cable subscribers to sample various upgraded service options at no cost. During the week, the schedule varies to include such premium services as Disney, Encore and Starz as well as many other services. The complicating factor is the need to switch into and out of up to 16 different networks each day and covering all spots with new ones in the process. Timing must be exact and automated operation is only possible about 50% of the time. Four 4.5 meter C/Ku dishes are used to feed eight frame syncs and audio mixers with source material for this control room. An AVID system supplies the commercial playback. Because of a special ID effect used by "TV!" a 2-channel Grass Valley DPM700 DVE is installed downstream of the air switcher to allow a special effect that keys two live video sources over an animated cube. This effect is done "on the fly" repeatedly throughout the day. A typical daily event schedule for this channel may contain up to 2,200 events.

Traffic for many channels is handled individually with a large Columbine system and our own traffic system, called Savant, was developed primarily for the multichannel pay-per-view movie channels. All of the traffic systems are networked together for maximum operator flexibility.

Studio and post-production

We currently operate five on-line edit suites with varying levels of complexity and tape formats. Most of these suites are used for promo production and formatting of program materials. The simplest suite is run by a Grass Valley DPE 241 editor with GVG 110 switcher and DPM 700 DVE, while the largest is a CMX Omni 1000E with Abekas A-83 switcher and three channels of Abekas A-57.

Continued on page 56

AVID® WAS THE MOST POWERFUL.
D/VISION® PRO WAS THE MOST

Introducing the NEW family of non-linear editors from D-Vision: OnLINE™ and FilmCUT™. They beat the competition. And with true broadcast quality, they eliminate online costs and are even MORE affordable than our D/Vision Pro. All for under $10,000*.

For starters, **D-Vision OnLINE** has full CCIR-601 resolution with serial D1 in and out. Avid® and Media 100® don't.** And with compression ratios under 2:1, D-Vision gives you beautiful D1 image quality.

What's more, **D-Vision FilmCUT** lets you edit at 24 frames-per-second, input and output four channels of 48 KHz audio, and mix and playback 24 audio tracks.

And when it comes to open architecture, D-Vision goes beyond merely beating the competition. Using the power of Windows NT™, D-Vision lets you edit from

MEDIA 100® HAD THE BEST PICTURE. AFFORDABLE. NOT ANYMORE.

up to 210 standard hard drives. This means instant access to over 130 hours of BetaSP quality video — 15 times more than Avid with the 14-drive Mac limitation.***

Now, D-Vision gives you a choice of many non-proprietary compression boards, seamless integration with third party tools and editing over a network. And our new software supports up to **8,000** lines of resolution. So you have a built-in upgrade path to HDTV, film quality and other technology that hasn't even been invented yet.

D-Vision OnLINE and FilmCUT. The same D-Vision affordability with a whole new image.

D-VISION SYSTEMS, INC. Making Digital Media Work For You™.

To find out more, call 1-800-8DVISION or +1-312-714-1400.

*For software and board kit. **All competitive comparisons are based on Avid and Media 100 products available on 3/1/95.
***Hard drive comparisons assume no specialized hardware such as RAIDs or servers are present.

Circle (35) on Reply Card

TCI continued from page 53

Dealing with multiple tape formats is a continuing challenge. We currently operate 89 D-3 decks, 72 Digital BetaCam, 43 Beta SP decks, more than 100 high-grade SVHS decks and the ever present 3/4- and 1-inch machines as well as a few D-2 machines. In the post rooms, format is matched to switcher as much as possible. For example a digital BetaCam format suite may contain an Abekas A-83 serial component switcher or a GVG 4000 switcher. A central tape room and dubbing facility allows for dubs from various analog and digital formats without loss of quality. The central facility also contains a large Sony still-store system and a variety of Chyron Infinit! and Abekas A-72 character generators available in all edit suites and studio control rooms.

In the interest of maintaining good functionality, we abandoned the concept of separate tape rooms in edit suites. With the advent of relatively quiet tape machines and the reality that most people do little truly qualitative audio monitoring, we feel that tape machines in the suite are a good idea. Tape machines are mounted in a rolling cabinet that can contain up to six machines. Triple B&W monitors are mounted above the machines in the cabinets, providing menu access to all machines. Our editors enjoy this feature, and it has proven to be a time saver in situations where a large number of tapes must be cycled through the machines in an edit session. In lieu of the usual producer desk located behind the editor, we have simply increased the counter space to the left and right of the primary editor position.

Currently under construction and due for completion in May of 1995 are four new production studios. The smallest is 65 x 40 and the largest is 100 x 80. All studios are built using a 12-inch filled concrete block inner shell with a ceiling consisting of four layers of Sheetrock hung with dampeners. Additionaly, to prevent the occasional jet noise overhead, we re-enforced the roof deck and placed a layer of 2-inch concrete pavers outside on the surface of the roofing material. This, along with generous acoustic treatments, resulted in an ANSI quietness spec of less than 25dB. Each studio contains a catwalk-type system to support the lighting and support equipment. A new type of semi-resiliant flooring is being installed over a leveled concrete surface. It is hoped that this material will solve the traditional problems of studio floors that are either too hard or too soft. The material was originally specified for automated warehouse operations, which are similar in many ways to studio applications.

Each studio is supported by its own control room and all the switchers are Grass Valley 4000-2A digital switchers. A 9-channel Grass Valley Kaleidoscope DVE system is shared between the studios and some edit suites. Cameras are either Sony BVP375 or Ikegami HK 377 and audio systems are automated Sony 3000 series boards. All mic pre-amps are placed in the studio connection boxes to reduce low-level runs of cables.

The smaller editing suites, like this one, provide clients with enough power to complete the desired tasks in a cost-effective manner. Note the roll-around tape cabinet on the right.

Transmission facilities

Although not considered a primary uplink facility, there are considerable uplink operations within this facility. The dish complement is five 9-meter dishes and six 4 1/2-meter dishes. The 9-meter dishes are used for uplinking several compressed and analog signals. Again redundancy is a key issue. All HPA and transmission systems are fully redundant. Diverse fiber routes interconnect this facility with other local facilities as well as the VYVX network.

Compression

One of the things that makes a facility like this work is the ability to compress video and audio signals to place multiple signals on transponders. The math on this is easy. For instance, let's say you own a C-band transponder on a prime satellite such as C-3 (F-3). A typical monthly cost for this transponder can run as high as $200,000. What if you wanted to expand your service or sell space to additional users? Compression is expensive. The Digicypher I equipment we currently use costs about $750,000 per 6-channel redundant unit. The additional five transponders would have cost you one million a month. As you can see, the hardware is paid for in less than one month.

We use the General Instrument Digicypher I units in both a 4:1 and 6:1 configuration. The units have provided satisfactory results for us and many high-quality premium movie services are aired using them. Digicypher I is a fully proprietary system not compatible with any known standard such as MPEG-1. When the Digicypher II MPEG-2 compatible systems are available, all units will be converted.

Eighty-four channels of video are compressed and uplinked from this facility. Of these, 72 are for PrimeStar DBS customers while the rest are for traditional cable network signals.

QC off-air monitoring

The last step in the process is an off-air monitoring facility. We use this area to provide a complete test of all systems from master control to downlink. This area is able to monitor up to 144 channels. Separate monitors with under monitor channel displays line the walls of this glass-enclosed room, but the real work is done within the four computer workstations. All 144 signals are received and the audio and video routed into four routing switchers (one for each workstation). Within each workstation are three powerful PCs with 17-inch touchscreen monitors as well as one analog high-resolution monitor with overlaid scope and audio monitoring equipment. Custom software scans the routing switchers to route every fourth frame of video of each channel into the PCs where they are analyzed for a change in average picture level within a window of both time and level. Audio signals are monitored by the PCs full time. The purpose of the system is to provide an operator with an alarm in the event of black, noise or loss of video on a particular channel. Each touchscreen contains 12 small pictures with

I didn't know Snell & Wilcox did that...

visual VU meters. In the event of an alarm, a tile lights below the affected picture. By touching the picture, the signal is routed to the analog monitoring system for manual evaluation by the operator. After determing if the alarm is real or just the way a particular program acts, the operator is prompted to various levels of activity to log, follow-up or dismiss an alarm. This software was developed for this facility by Procion, a division of Pro-Bel Corporation.

Authorization and "HITS"

One thing unique to facilities of this type is the need to provide authorization services for cable systems. Located within the facility is a large computer room that is capable of many thousands of transactions daily. Primarily, this is used to authorize individual cable converters in cable systems that do not have the computer resources to do this themselves. Usually these systems are small operators. The datastreams are transmitted on subcarriers of two satellite transponders that are received by virtually all cable systems. Modems are used to transmit the transaction requests and subsequent billing information back to the cable system.

A new product exclusive to this facility is Head-end In The Sky ("HITS"). This will be the source of the true 500-channel universe we have heard so much about. The basic premise is to transmit compressed video all the way into the consumer's home over existing bandwidth. This facility will begin testing this system this fall using new equipment compatible with MPEG-2. Compressed signals will be uplinked then downlinked at the cable system but, instead of being demodulated and remodulated, they will simply be transcoded and a local datastream added. The result is the ability to increase the number of video signals fed to the home by a large factor (average of 5:1). Therefore, your existing 36-channel system can carry as many as five times that number of channels without an expensive rebuild. In addition to expanded channel capacity, operators will have the benefit of fewer dish needs, since all signals will be available on a single satellite. This product will be available to all cable operators, telecommunications operators, wireless systems and SMATV operators.

Conclusion

As you can see, this is not what most people in broadcasting would consider to be a typical "cable" facility. Indeed, we do not consider ourselves anything but a full-service network origination and production facility. Remember, all those cable channels have to come from somewhere. ■

Peter Douglas is vice president operations and engineering at Tele-Communications, Inc., Littleton, CO. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

THE DESIGN TEAM

Client: TCI

Senior management: David Beddow, TCI

General project design and implementation: Peter A. Douglas, TCI

General contractor/architect: Cybercon Corporation

Acoustic and lighting consultant: David L. Adams & ASC

RF, voice & data design: WTCI Engineering (an engineering division of TCI)

Power systems design: Ben Summers, WTCI Engineering; Ron Dixon, Cybercon Corporation

Broadcast systems design: Bradley Martens, TCI

Integration partners: Sony Systems Integration Development, Burst Communications, Grass Valley Group

Two filters are better than one.

- **Frame-based recursive filtering**
- **Three dimensional median filtering**
- **Automatic noise threshold**
- **Low throughput delay**
- **Format interchange 4:2:2 synchroniser**
- **Wideband Gate decoder**
- **Special wide chrominance median filter mode**

KUDOS NRS30 MEDIAN & RECURSIVE NOISE REDUCER

No amount of filtering can help the smoker. But in noise reduction, a dual-filter system enables the Kudos NRS30 to eradicate different kinds of video noise whatever the cause. It is simply the most powerful noise reducer in its class.

Not only does it offer advanced recursive filtering to deal with random 'white' noise, but also the power of a 3-dimensional median filter in a sophisticated design ideally suited to removing impulse noise such as satellite 'sparklies'.

At this price nothing else comes remotely close.

Circle (38) on Reply Card

Snell & Wilcox offices: UK Tel: +44 (0)181 607 9455 Fax: +44 (0)181 607 9466 E-Mail: Info@Snell.co.UK
USA Tel: +1 408 734 1688 **Germany** Tel: +49 611 99 0840 **Japan** Tel: +81 3 3446 3996
Italy Tel: +39 6 66 38 594 **France** Tel: +33 1 47 89 83 08 **Russia** Tel: +7 095 4125016

KUDOS by SNELL & WILCOX

WARNING
NOISE CAN SERIOUSLY HARM THE QUALITY OF YOUR PICTURES.

Bell Atlantic's digital production studio

This is not your father's post house.

The Bottom Line:

Nearly all of today's post houses take advantage of the new digital equipment. However, most are installing it within the confines of an old design model. At the new Bell Atlantic facility, analog and digital audio and video exist, but most interconnection is a combination of component serial digital video, digital audio and digital datastreams using computer networks. $

By Steve Epstein, technical editor

Above photo: Some of the computer horse power behind Bell Atlantic's Digital Production Studio. (Photo courtesy of CEI.)

Not far from the nation's capital, what may be the post facility of the future is evolving. The walls are up, and the gear is in, but everyday the process of getting the job done changes. It's not that those involved don't know what they are doing, on the contrary, most are professionals with many years of experience. The process changes, or more appropriately — evolves — because the tools and procedures used are being refined constantly. The facility is the Digital Production Studio, and it is a crucial piece of Bell Atlantic's Video Services Company.

Bell Atlantic is the Regional Bell Operating Company (RBOC) that serves the Northeast. The Video Services Company, located in Reston, VA, was set up by Bell Atlantic to deliver interactive and broadband services to area customers on a trial basis. Unlike many of the video-on-demand (VOD) and video dial-tone (VDT) experiments, the Bell Atlantic system is commercially viable today. The system is designed to deliver interactive video data at 1.5Mb/s over asymmetrical digital subscriber line (ADSL). Because the system is designed to be viable today, it may not offer the flash of other trials. The set-top decoders cost several hundred rather than several thousand dollars. The basic system is also scalable and extensible. As the inevitable economies of scale bring more horsepower to set-top boxes, the system's throughput can be easily increased, bringing additional services to customers.

Within Bell Atlantic's Video Services Company, there are four main divisions. One, the Digital Service Bureau (DSB) prepares video for interactive delivery. A second division is the Digital Production Studio (DPS), whose mission is to provide interactive video production services. The third, the Operations Center, houses servers and video databases used to provide video and audio information to subscribers. The fourth division markets the service and provides customer service and support. According to plans in place at this writing, the divisions will be split into separate companies by April.

The high-tech facility was designed and built as a turnkey installation by Communications Engineering Inc. (CEI), Newington, VA. The systems are built around extensive computer hardware and software including large-scale file server technology. CEI was responsible for technical design, planning

'The whole truth and nothing but the truth'.

- **Every broadcast standard**
- **All digital and analogue formats**
- **8 and 10-bit digital outputs**
- **More than 500 resident patterns**
- **Ultra-precise outputs**
- **Special moving test images**
- **Serial digital pathological test patterns**
- **16:9 downloadable patterns available**
- **Custom pattern generation software available**

KUDOS TPG20 TEST PATTERN GENERATOR

Test patterns are judged by their absolute precision so here's a clear cut case for the Kudos TPG20.

Full-frame, line repetitive and moving test images in every broadcast standard and format, with more than 500 resident patterns and an unlimited number downloadable from a PC. The TPG20 is supremely versatile yet outstandingly easy to use.

Patterns are computer synthesised for absolute mathematical accuracy. Moving test images reveal system defects that would otherwise remain undetected. Special downloadable patterns, including real images, can be made to your requirements, and the optional Pattern Master software enables the user to generate customised line based test patterns via their own PC. It's the only test generator you'll ever need.

Snell & Wilcox offices: UK Tel: +44 (0)181 607 9455 Fax: +44 (0)181 607 9466 E-Mail: Info@Snell.co.UK
USA Tel: +1 408 734 1688 **Germany** Tel: +49 611 99 0840 **Japan** Tel: +81 3 3446 3996
Italy Tel: +39 6 66 38 594 **France** Tel: +33 1 47 39 83 08 **Russia** Tel: +7 095 4125016

Circle (26) on Reply Card

KUDOS by SNELL & WILCOX

One of the production suites within the DPS used to build interactive productions.

and documentation as well as installation, testing and operator training on the equipment.

The Digital Services Bureau

The DSB takes standard video programming, movies and syndicated shows and prepares them for delivery. Programs are quality checked and then MPEG encoded. Currently, it takes three hours to encode each hour of original material. Four encoding rooms have been built, and up to seven more can be added when necessary. The current capacity of the rooms is 20,000 minutes per month. With all 11 on-line, it will increase to 50,000. Once encoded, programs are stored on 8mm Exabyte tapes. Later, depending on the air schedule, the encoded versions are downloaded onto the video server for playback to subscribers. Currently, the facility is using MPEG-1 encoding. MPEG-2 will be used in the future as new encoding equipment becomes available.

At present, the equipment complement of the DSB is anything but impressive to anyone familiar with the equipment requirements of a typical network video facility. Less than a dozen tape machines, both analog and digital, a router and four Silicon Graphics towers (see photo on opening page) along with test equipment make up the common equipment area. The encoding suites use off-the-shelf hardware configured in a proprietary manner. What *is* impressive is how much is being done with this small complement of equipment. The key to this facility's capability is how this small amount of dedicated equipment is combined with high-speed computer systems. The result is nothing short of amazing. Whenever possible, dedicated equipment has been replaced by specialized software running on powerful computers.

It is also interesting to note that the compression process is accepted as part of the package. Comparisons are not done before and after encoding. Instead, the final compressed product is viewed by a group of regular viewers — not video professionals — to determine its acceptability. For the most part, the comparison is made relative to a cable TV signal in the home. After viewing video delivered over ADSL, I was surprised at the quality. Yes, there were some artifacts, but for the most part, they were negligible and did not affect the viewing experience. Professional video people will discern the artifacts, but the average viewer will not. Rather than being touted as high quality, it was realistically portrayed as being good enough.

The prevailing philosophy is different from the typical broadcast mentality. For one thing, the majority of what takes place happens through software. For example, there are no DVEs in the DPS, but there is DVE software. Because so much of the system is software-based, it can be modified. Having serious programmers on staff doesn't hurt either. As the job parameters change, so can the software. Another difference is the issue of quality. On one hand because the delivery method is ADSL, "good enough" is sufficient. On the other hand, because it is all digital, the signal will not degrade. Artifacts that exist today will still be there tomorrow, but they won't get any worse, and new ones will not suddenly appear.

Comparing this facility to the DirecTv facility featured last year, the contrast is striking. At DirecTv, there are more than 300 Digital Betacam decks. At the Bell Atlantic facility there are just a handful. DirecTv compresses everything on the fly prior to uplinking. Because of this, compression ratios may vary based on the content of other channels. At Bell Atlantic, everything is compressed once for a 1.5Mb/s datastream. Picture quality will not vary from one showing to the next as it might with DirecTv. In a sense, DirecTv is built on a parallel model whereas the Bell Atlantic facility is closer to a serial model.

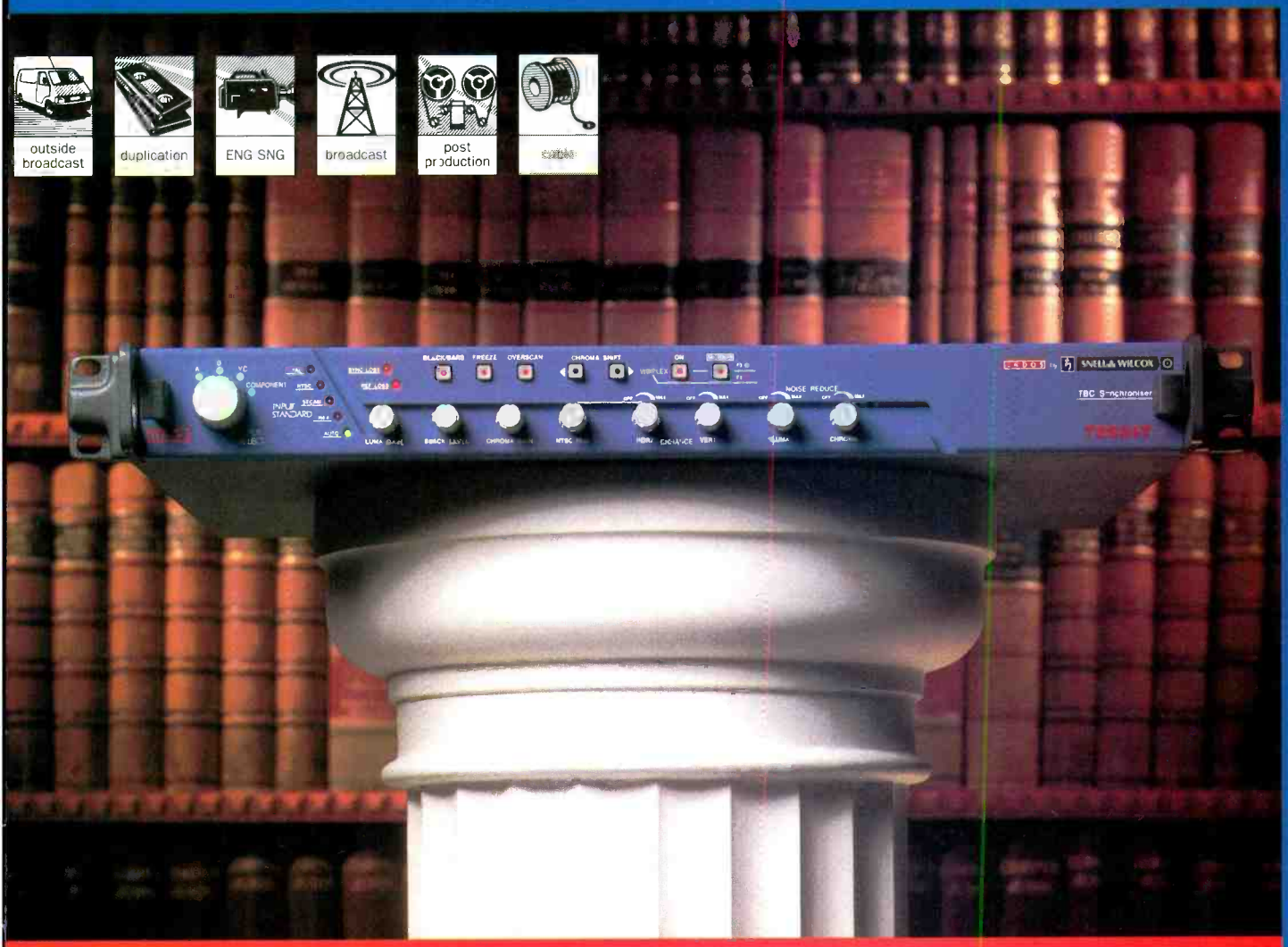
Digital Production Studio

Like the DSB, dedicated hardware exists in the DPS, but for the most part, it's workstations running specialized software. One of the major issues considered when the equipment was specified was related to connectivity. In a real sense, everything is connected to everything else. This has been accomplished by keeping everything in either the serial digital component domain or simply as digital data.

Another key aspect of the DPS is the interactive nature of everything produced. Almost everything is short form, 15 seconds or less. Much of it is background and icons for menus, other items include still and moving video for interactive shopping. Because of this, few of the standard editing tools are needed. Rendering and compositing packages tend to be the production tool of choice. In addition, authoring software is used to develop the code (programs) needed to navigate through the various on-screen menus required for an interactive service. A significant portion of the work is done using low-tech tools — white boards. Menu hierarchy and decision points necessary to navigate through the system are all first carefully laid out. Once the planning stages are finished, the results are tested. Only after testing

The key to this facility's capability is how this small amount of dedicated equipment is combined with high-speed computer systems.

'I sync, therefore I am'.



- **Full bandwidth 4:2:2 processing**
- **Wideband Gate decoder**
- **Powerful noise reduction**
- **Component and composite inputs and outputs**
- **Digital horizontal and vertical enhancement**
- **Ideal for format interchange**
- **Multistandard operation and transcoding**

KUDOS TBS24T WIDEBAND SYNCHRONISER

If your philosophy is to have superb quality output from practically any imput source then the logical choice is the mult standard TBS24T. It is the classic stand alone Syncroniser and Timebase Corrector.

Broadcast quality 4:2:2 processing, composite and component inputs and outputs, plus a rugged, wideband decoder using proprietary Gate technology, give the TBS24T the power you need.

Full user adjustments are provided, including digital horizontal and vertical enhancement and a powerful adaptive noise reducer.

Circle (27) on Reply Card

Snell & Wilcox offices: UK Tel: +44 (0)181 607 9455 Fax: +44 (0)181 607 9463 E-Mail: Info@Snell.co.UK
USA Tel: +1 408 734 1688 **Germany** Tel: +49 611 99 0840 **Japan** Tel: +81 3 3446 3996
Italy Tel: +39 6 66 38 594 **France** Tel: +33 1 47 89 83 08 **Russia** Tel: +7 095 4125016

KUDOS by SNELL & WILCOX

The central control room provides full support for the compression suites. The room is equipped with a serial digital router, digital and analog videotape machines for master tape playback, and full machine control capability.

successfully is asset production started.

One of the significant problems the facility deals with is *asset management*. In this context, assets are the elements used to build the product, for example, backgrounds, icons and product shots for interactive shopping. As productions are assembled, the individual assets are cataloged and stored. Because of the large number, storage requirements are significant, as is the task of managing the information. Six months from now a producer may need a single element of a production. Rather than having to recreate it, the original can be pulled from an archive. Being able to locate the original quickly and efficiently is a major task. Development is still under way to find new tools to manage these assets effectively.

Because of the interactive requirements of the final product, the

By the simple addition of an ATM card tied to the outside world, the DBS can become part of a virtual production community that operates over long distances using data links to transfer information from one location to another.

DPS is staffed with TV and multimedia producers, interactive and graphic designers, and audio and video engineers. Needless to say, getting them all to work together can be difficult at times. Each has a different background and, therefore, a different perspective of how the product should look. In addition to navigation tools, the DPS provides advertisers with the expertise needed to make their message work within an interactive environment.

Within the facility, computer systems are tied together by an array of networks. The networks operate on various standards including primarily Ethernet and ATM. By the simple addition of an ATM card tied to the outside world, the DPS can become part of a virtual production community that operates over long distances using data

- **TVSTOR!** allows iNFiNiT! to function as a full-color, high resolution still store device with video and full linear key signal in analog or digital CCIR 601 domain. TVSTOR! features powerful database search functions, flexible playlists and extremely rapid recall of stills and an optional TVSTOR! recall panel. Also available for Chyron MAX!> and MAXINE!
- **THIRD OUTPUT CHANNEL** allows for full resolution program video output from any iNFiNiT!. Assign the available three channels to any combination of still store or graphics functions. Air all three program outputs simultaneously or select two for program and the third as preview.
- **EXTENDED EFFECTS FRAME BUFFERS** provide three times the number of display frames as the standard buffers. This offers digital layering, dissolves, mix effects, and sub-scanline rolls in a single channel.

For more information on:

- ❑ **TVSTOR! for iNFiNiT!**
- ❑ **THIRD OUTPUT CHANNEL for iNFiNiT!**
- ❑ **EXTENDED EFFECTS FRAME BUFFERS**

Return this card or fax to 516-845-3895

PRIME +2% FINANCING AVAILABLE

Name _____ Title _____

Company _____

Address _____

City/St/Zip _____

Phone _____ Fax _____

BC-ENG 395

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS PERMIT NO. 72 MELVILLE, NY 11747

POSTAGE WILL BE PAID BY ADDRESSEE

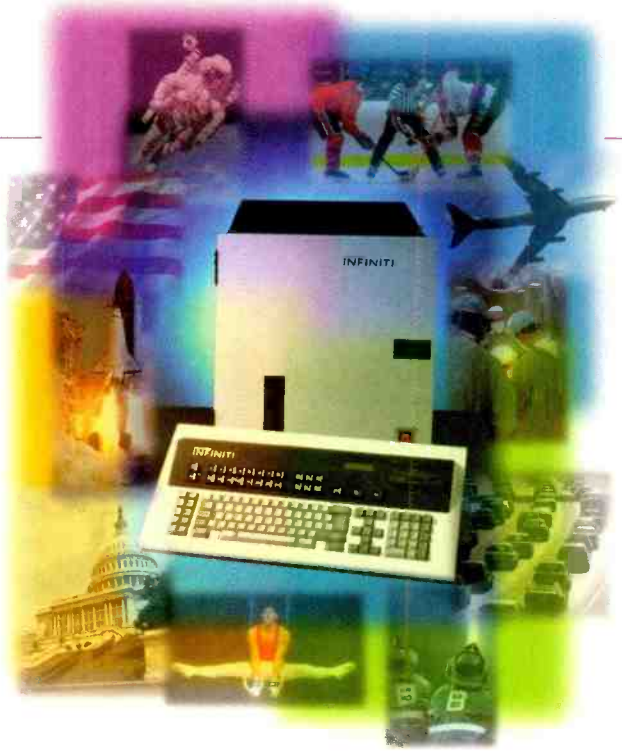
Isaac Hersly, Exec. VP
5 Hub Drive
PO Box 1901
Melville, NY 11747-9686

CHYRON

Up to the minute with the CHYRON

iNFiNiT!®

Chryon's iNFiNiT! provides the highest quality graphics for live and post production applications.



Chyron's iNFiNiT! displays full color graphics, stills, 2D and 3D animations. With the brand new TVSTOR! option, iNFiNiT! becomes a full function still store as well!

Information may be entered manually or automatically down-loaded from computer newsroom and election systems via iNFiNiT!'s Intelligent Interface.

Dual Channel and dual user capability provide the flexibility to instantly display quality images in analog or 601 digital format.

BRAND NEW!
Third channel output!

You can count on iNFiNiT!

See the new options available for iNFiNiT!, MAX!> and MAXINE! at NAB Booth # 19401

CHYRON
THE COMPANY THE WHOLE WORLD WATCHES
5 HUB DRIVE
MELVILLE, NY 11747

Tel: **(516) 845-2026**
Fax: **(516) 845-3895**

links to transfer information from one location to another.

GUI, NUI and LUI

Finally, there is the operations center, which houses several video servers. Current storage capacity for the on-line servers is 42,000 minutes for programming plus an additional 10,500 minutes that is used to instantly update the system with new programming. This is typically done at the end of the month when old programs are dropped and new ones added. A second server is used for testing new software. Another system for business and operations is used to provide the required interface between the subscriber's set-top box, the video server and the telephone switching network.

When describing the inner workings of the interactive video service, three levels of interfacing software get the job done. The GUI (graphical user interface) is what the customer sees, including the on-screen menus and icons that allow users to navigate through the system.

NUI is the navigational user interface that comprises the necessary code to get users from one area of the interactive system to another area. By design, navigation is simple; point and click. The idea being that your grandmother can sit down with a remote, and if she can't get where she wants quickly and easily, more work is needed.

The LUI (linking user interface) is how subscriber commands are translated through the system. When a subscriber points and clicks, the relevant information, along with a user profile, goes through the business and operations system where it can be stored and tabulated if desired. Billing information is recorded, and the necessary verifications are made. These verifications ensure that subscribers do not get shows they don't want to see. The upcoming trial period will help resolve the numerous privacy issues that still need to be addressed. Finally, the LUI generates the necessary commands to initiate playback of the request.

Where to go from here?

Recently, Bell Atlantic received regulatory approval to market its interactive services to area residents. In addition to the interactive services, broadband services are to be delivered over standard technologies (coax or fiber). With the combination of broadband and interactive services, Bell Atlantic hopes to attract 50% of current cable subscribers away from cable to these new services. Time will tell whether the project is a success or failure, however, there is little doubt that the current facility is on the cutting edge of technology, both in terms of equipment and innovation. ■

THE DESIGN TEAM

Client: Bell Atlantic
Rich Schmeltz, chief engineer

Mike Lasky, director,
Digital Production Studio

Architect: CEI
Lawrence Brody, project manager

José Colchao, design engineer

Felix Peña, console designer & head acoustician

Soundwave: digital audio in perfection

What's worse — outgrowing your old facility or moving to a new one?

The Bottom Line:

Moving into new quarters without shutting down the operation is a frequently encountered obstacle to any production facility's growth. Unexpected delays always come up, and these can disrupt the best-laid plans. Creative solutions allowed this busy audio-post house to make its move with minimal problems. $

By Jim Bloch

At its start more than 15 years ago, Soundwave was a typical rock-and-roll studio in Washington, DC. The facility had been retrofitted into a pre-World War II-era apartment building-turned-office space. In 1983, Soundwave began to offer audio post-production services. By 1987, the music recording portion of the business was nearly phased-out — a familiar story. The next and natural step was to add yet more services in the allied disciplines of graphics and video. Soundwave was putting new and extraordinary demands upon the capabilities of the building — old electrical systems and poor air conditioning, to name just a few. The Soundwave staff found itself conducting a growing business in an ergonomic nightmare. By 1993, the company's business goals became too much for the old building. The only alternative involved the M-word: *move*.

After extensive searching, an appropriate space was found in the nearby suburb of Arlington, VA, and a project team was assembled. Several ground plans for the facility were roughed out, with each examined to see if it met the facility's needs technically and ergonomically. The plans were based on the same basic number of audio, video and graphics rooms in the old space, plus room for expansion. Flexibility was one of the tests applied to the design: Could it be an office today and an off-line or graphics suite tomorrow? Eventually, an agreeable plan was attained.

Next up was examination of the building's mechanical core. This primarily involved air conditioning and power. The project's acoustic and mechanical consultants specified an air unit that would meet the HVAC needs and the noise constraints required. An additional air-conditioning unit would be required for the master control area to cool and humidify the machine core separately.

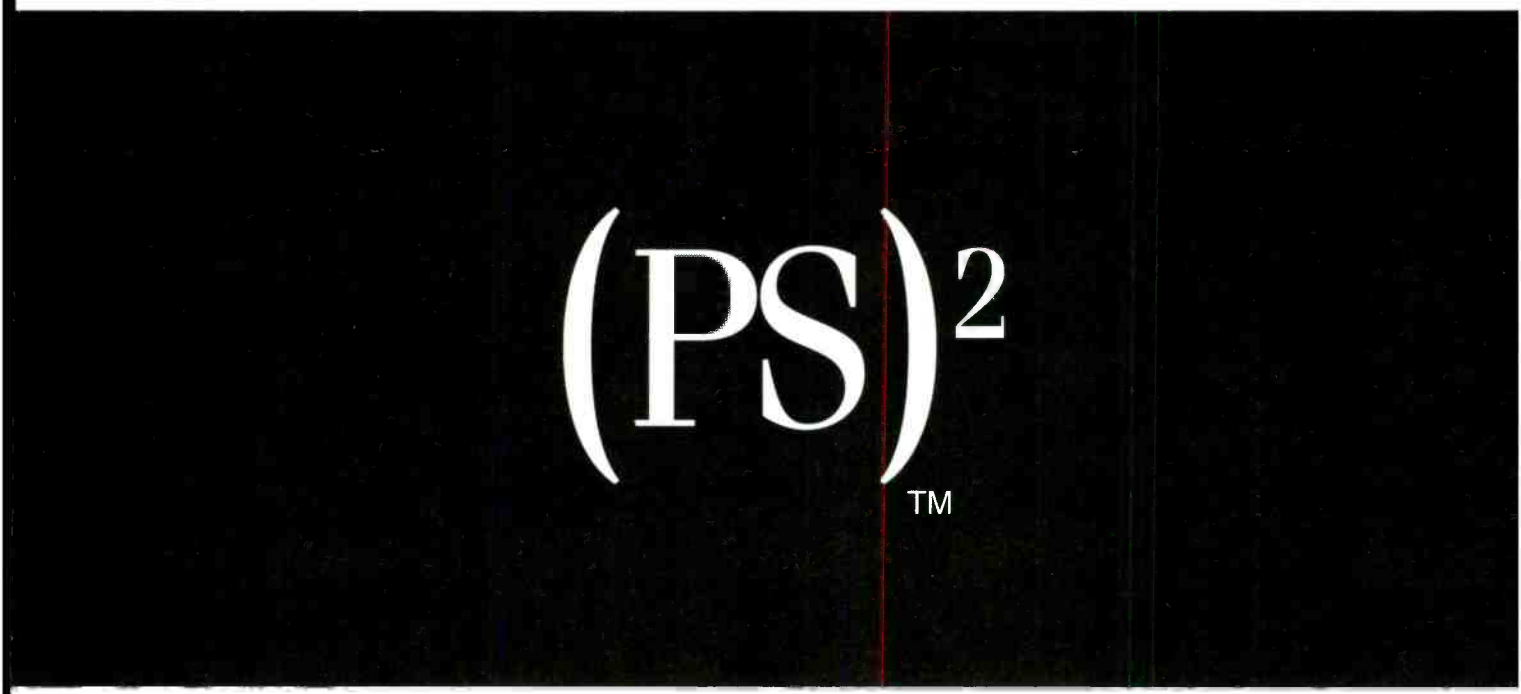
Power requirements were divided into three classes: 1) general use, 2) office computers (with an isolated ground) and 3) technical power (with full transformer isolation plus spike- and surge-suppression).

Making the move

The design was broken down into major categories: audio, video, graphics, music composition, office space and miscellaneous.

Continued on page 72

At NAB, Comark will launch...



And once again UHF transmitters will never be the same.

Come see this exciting new technology at COMARK'S NAB booth # 16117

COMARK

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

THOMCAST

1990 Emmy Award for Engineering Excellence

Circle (87) on Reply Card


Professional Digital Audio Tape Recor
Panasonic
NO, I AM NOT
AN SV-3700.
POWER
OFF ON
HEADPHONES
LEVEL
MIN
HEADPHONES
EXT SYNC
MODE
0-Fs OFF (INTERNAL)
1-25 VIDEO 25
1-29 VIDEO 29.97
1-30 VIDEO 30
2-Fs WORD SYNC
3-Fs DIGITAL DATA

The SV-4100 Pro DAT Recorder from Panasonic. Think of it as an SV-3700 with Instant Start, External Sync, improved sonic performance, and a whole lot of attitude. If you would like detailed information, call 800-777-1146, code 02.

Panasonic

Broadcast & Television Systems Company

Circle (50) on Reply Card

Soundwave continued from page 68

The interformat D-2 video suite would make the move to the new space essentially intact. The design team made sure that the distances between the main equipment racks in the new master control would be the same as in the old facility. This avoided extensive retiming issues and allowed the existing wiring harness to be reused. Equipment relationships within the edit suite were also kept as close as possible to the old space. Moving this room became mostly a re-installation issue. It needed to be back up in 10 days, and it was. This was one of the few pleasant surprises encountered.

The facility's Avid on-line and graphics rooms were fairly self-contained so they presented few problems in relocating. They both moved with the same furniture and internal room wiring intact, although their harnesses to the master control had to be redone.

The staff composer's MIDI-based room also moved to the new facility with its existing harness and some slight modification to its cabinetry. This room was back up in about a day.

The bulk of the design and installation work occurred in the facility's four audio rooms. These had to be designed and built with all new equipment because the existing facility's rooms had to remain operational throughout the move to satisfy client needs.

The new plan called for three identical digital workstation rooms and one analog room with an existing NED Post Pro in it. After extensive budget/feature/performance analysis, AMS/Neve Logic 3 consoles with Audiofile Spectra workstations were selected for the DAW rooms. Near-field monitoring (Genelec 1031A) would also be used in all of the control rooms, allowing simplified acoustic design and acceptable performance for the majority of projects. (The focus of the new facility's design and budget considered the type of work that was done 90% of the time. The additional cost for the other 10% of projects was simply deemed not worthwhile.)

Making the three DAW rooms identical allowed additional design economies, because once choices were made for one room, a simple copy and paste finished out the other two. (Unfortunately, this also applied to any errors or changes required.)

The lobby at Soundwave, with reception area at rear.

Interconnection

System interconnection design included audio (digital and analog), video (component and composite), sync reference (blackburst and subcarrier), time code, control, grounding and data.

Operationally, minimal to no patching was desired for normal operation in the audio rooms. This implied the use of extensive normaling. The budget could not accommodate an audio routing system, so standard bantam patchbays were used. All audio paths were normaled first through the master control patchbays and then into the audio control rooms.

Custom panels were fabricated in each recording booth for plugging in microphones and headphones. These included built-in microphone pre-amps and headphone amplifiers (by Benchmark Media Systems), which minimized the amount of mic-level and power-level audio lines required. All audio runs were therefore at analog line level or AES/EBU. A custom-built central DC supply was used to power all pre-amps and headphone amps throughout the facility.

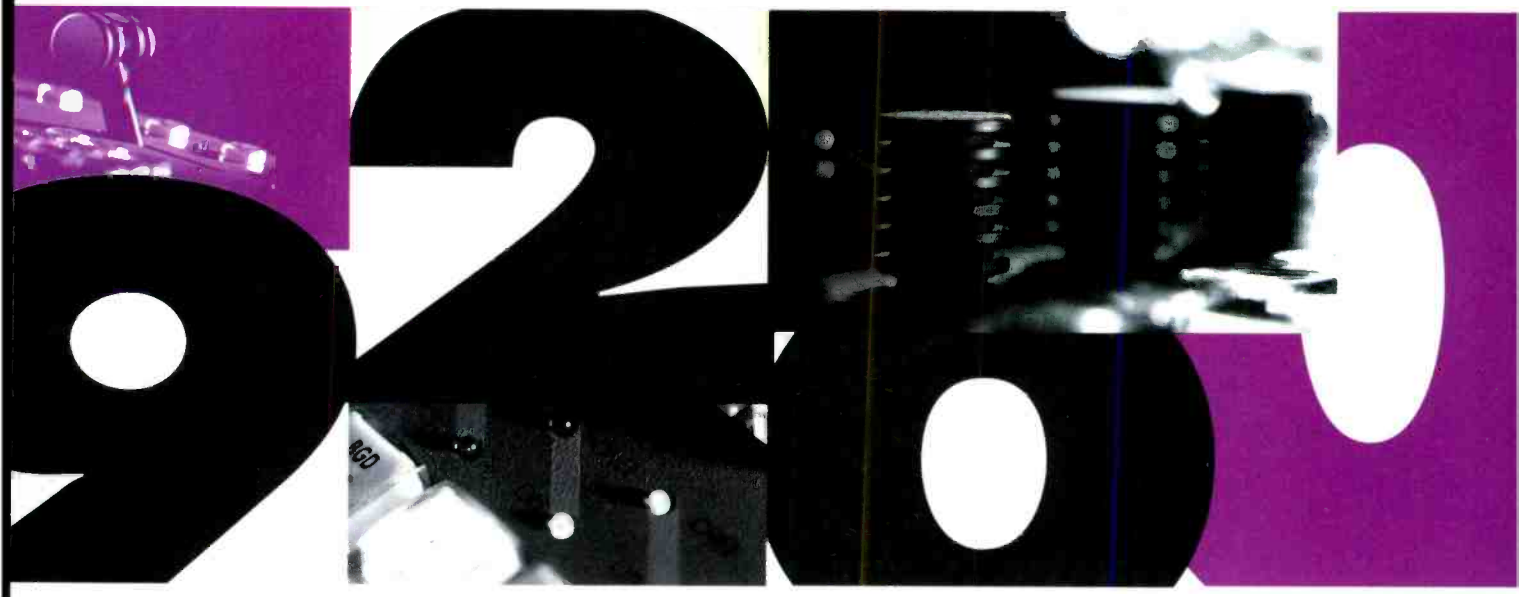
AES/EBU paths were carried on Apogee 110V AES/EBU cable. Patching of digital audio was done via XLR patchbays in master control and in each control room.

All video was run on Belden 8281. Most video decks are housed in master control. Formats include D-2, Betacam, 1-inch Type C, U-matic, VHS and ASC virtual recorders.

Serial 9-pin was the control standard adopted for the facility. All machine control centralized to an ADC serial patchbay in master control, which provides cost-effective flexibility and expandability via its modular and user-configurable design. Grounding was approached conventionally using a star plan to a central earth point. Telescoping shields were used for the audio runs. All grounding was done with low-gauge copper bus wire for the main star feeds and 1/2-inch braided shield for the equipment chassis runs.

Data and telephone systems are located in a corner of master control. This provides easy access to ISDN circuits used for the

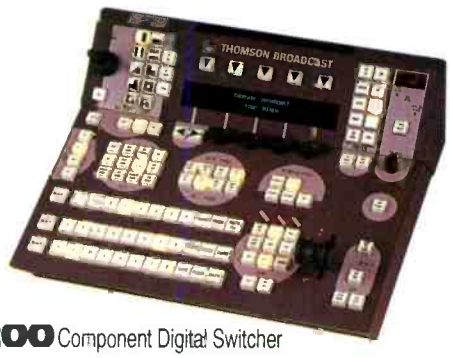
As the manufacturer which performed the world's first installation of a full digital studio back in 1985, THOMSON BROADCAST is proud to introduce the 9200, the newest member of its digital switcher family. This unit is the crowning achievement of a design team that boasts almost a



decade of experience in conceiving, manufacturing and delivering only component digital switchers. **The 9200** is a compact 1M/E + DSK with functional innovations that blow away the standard limitations of switchers of this size : M/E or multilayer, video or key freeze, fluorescent display, double transition, input level correction, source memory Mem Box with keyframes and sequences, timeline control, 6 auxiliary busses, and more. Besides being feature-rich, the 9200 switcher is ergonomically designed and interfaces easily with existing equipment. THOMSON has funneled its years of experience to produce a powerful, innovative component digital switcher within an affordable package. We used our expertise to do the hard work, so you won't have to.

THOMSON BROADCAST

State of the digital art



9200 Component Digital Switcher

Circle (51) on Reply Card

THOMSON BROADCAST - 17, rue du Petit-Albi - B.P. 8244 - 95801 Cergy-Pontoise Cedex FRANCE - ☎ (1) 34.20.70.00 - Fax : (1) 34.20.70.47. - Telex : 616 780 F
USA - THOMSON BROADCAST, Inc - 49, Smith Street - P.O. Box 5266 - ENGLEWOOD NJ 07631 - USA - ☎ (1 - 201) 569 1650 - Fax : (1 - 201) 569 1511
UNITED KINGDOM - THOMSON BROADCAST, Ltd - 18, Horton Road - DATCHET - BERKSHIRE SL3 9ES - ENGLAND - ☎ (44 - 753) 581 122 - Fax : (44 - 753) 581 196

Soundwave's IDB and EDNET interconnections. The entire facility is wired for level 3 10Base-T LAN. Modem and data lines also star from master control to all control rooms, primarily for clients' use.

Construction and installation

The construction went as well as could be expected for such detail-demanding work. There had to be someone on site every day checking the progress and details. Because this project was on such a fast track (aren't they all?), the different tradespeople were on top of each other through most of the construction. Permits and inspections created some uncontrollable delays.

To simplify installation and avoid exposing new patchbays to the drywall dust, the audio room racks were prewired off site. These rack systems held patchbays and the majority of ancillary equipment. Everything was wired with connectors and all runs were punched down to the bays. When the new rooms were deemed dust-free, cabinetry was brought in, racks were installed and the main rack harnesses were dressed into the troughing system, back to master control. This saved weeks of on-site installation time.

The final construction hurdle was presented by the sophisticated HVAC system. Prior to its installation, no occupancy permit could be issued, and no equipment could be operated. Naturally, it was late in arriving, caused in part by a tropical storm that stranded the unit on its manufacturer's loading dock in Georgia. It took a pontoon truck to get it on its way. When it arrived, the mechanical installers had to demolish several walls to get it into place. Finally, the process of moving in staff and equipment could begin.

Each Soundwave division — audio, video, graphics and music composition — came up against its own set of unique challenges during the facility move. In most cases, each group had an adequate amount of time to shut down operations in the old downtown location and power-up in the new suburban facility. The exception to this was the audio division, which was in the unenviable position of trying to keep fully operational through the move. This was necessary to accommodate the weekly network-broadcast schedule of a long-standing client.

The original, over-the-weekend shutdown/start-up plan was scuttled by combination of late county inspections and last-minute client demands, forcing the two facilities to be operated in parallel for more than two weeks. Despite the staff's best efforts to prevent it, some producers became understandably skittish as pieces of equipment and acoustical treatment began to disappear from the old facility. Ultimately, the programs made it to air on time, and the facility transition was completed.

Before and during the move, comments from the clients ranged from, "I can't wait to work in your new place," to "I'll never leave the city to work in Arlington." But the latter group of clients were curious about the new facility, nevertheless. Their curiosity generally led to "trial" sessions, and then to positive reactions. Clients who had sworn off Soundwave before the move began to come back. As a result, virtually the entire client base has moved with the facility to its new and improved home. ■

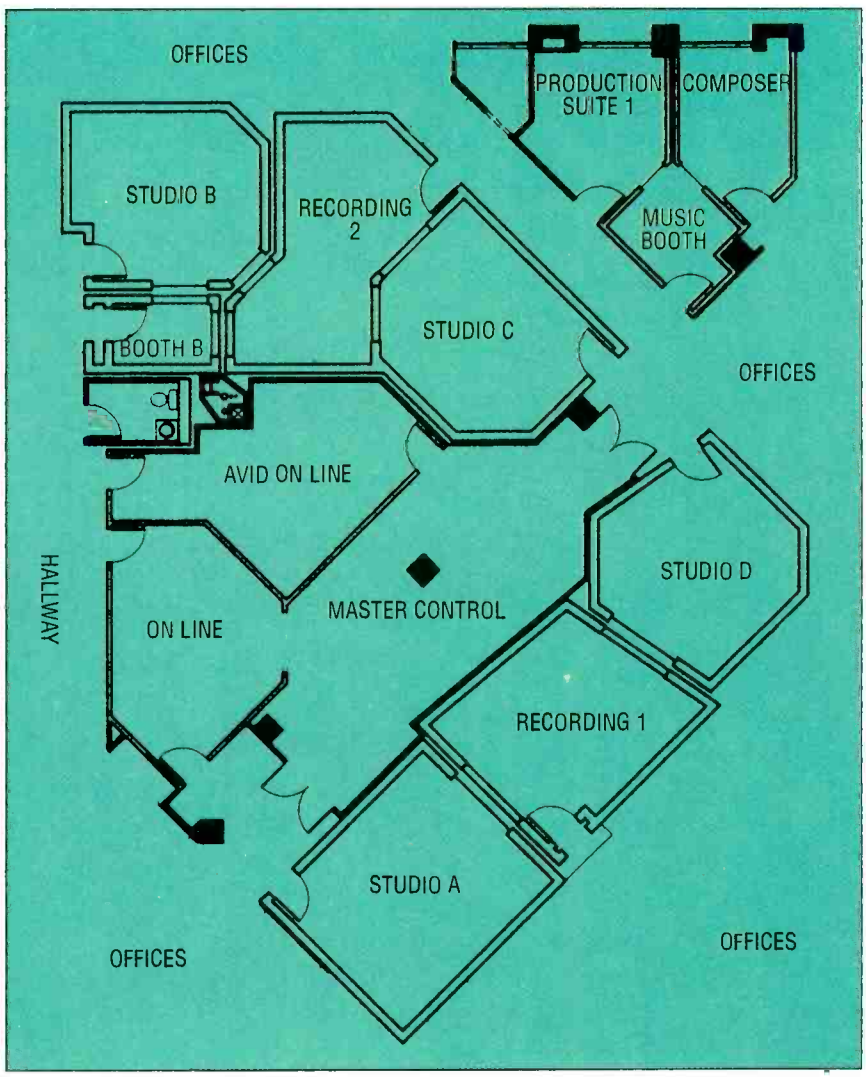


Figure 1. Floor plan of the new Soundwave facility in Arlington, VA.

Jim Bloch is vice president of operations/technical and a partner at Soundwave, Arlington, VA. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

THE DESIGN TEAM

Architect/interior design: Brennen Beer Gorman MonkKevin McCobb, chief architect: Jennifer Kyner

Acoustic consultant: Shen Milsom & Wilke
Francis Daniels

Mechanical/electrical engineering: GHT Limited

General contractor: Structure Tone

Technical Design: Soundwave
Jim Bloch, vice president
Tom Perrell, systems engineer

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 on 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.

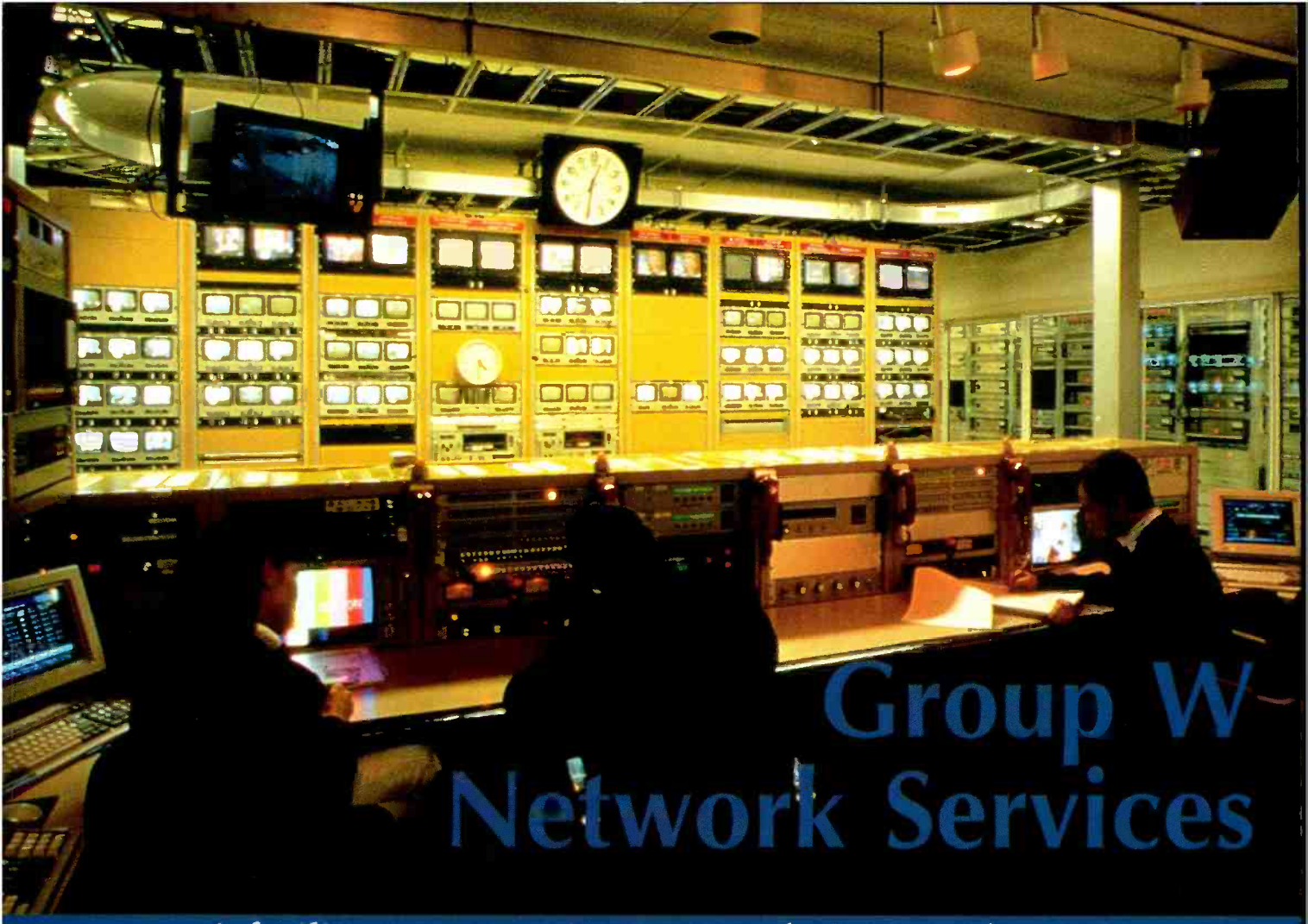
The Right Technology for Right Now.

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)

Canadian Address: 41 Industrial Pkwy S., Units 5 & 6
Aurora, Ontario Canada L4G-3Y5
905/841-7557 Main • Fax: 905/841-3693
Sales: 800/638-4741

Knows all. Tells all.



Group W Network Services

A facility grows to serve increased customer demands.

The Bottom Line:

One of the first providers of video program-origination and distribution services was a well-known name in broadcast circles: Group W. The company's Network Services division has been in operation for more than 13 years, during which it has undergone frequent redesigns to cope with growth and changing customer demands. Today, these demands come from customers that didn't even exist when the facility was first built. $

By Altan Stalker

High-quality standards, technical excellence and customer satisfaction have made Group W Network Services (GWNS) a leading independent outsourcer of TV facilities and services. GWNS provides a variety of customized production, post-production and transmission services tailored to the needs of its customers, which include all major commercial broadcast networks, leading cable programmers, special-events producers and business networks.

The potential market for independent distribution of video signals and associated technical services didn't really exist until the mid-1980s, when broadcasters and fledgling cable networks began to use satellite transmission. The 1990s have experienced the growth of cable channels and broadcast services, the convergence of video and the computer and the Fortune 100's interest in private television for real-time domestic and international communication. This has provided many new growth opportunities for distribution companies. To keep up with growing demand, GWNS has had to redesign its facilities on an almost continuous basis. One of its largest and most sophisticated renovations occurred in 1994.

Serving new customer demands

GWNS has had a long history in this business. When CBS became the first commercial broadcast network to change from AT&T landlines to satellite transmission in 1984, it chose Group W to handle the task. Since then, the company has helped launch many of today's leading cable programmers including *The Discovery Channel*, *A&E*, *Lifetime*, *The Travel Channel*, *Home Premiere Network* (which became *Viewer's Choice*), *Request TV* and most recently, *The History Channel*.

Each of the company's clients has unique requirements, but they all benefit from full-service operations housed in two Stamford, CT, locations: the Harbor Plaza Complex, which has two floors of playback, traffic, studio production, post-production, graphics and administrative facilities and, just three miles away, the Glenbrook Earth Station, which is the center for all transmission operations.

The Harbor Plaza Complex was expanded recently to accommodate a special-

Who says it's lonely at the top...

For 25 years we've helped set industry standards. Thanks to you, we're the driving force behind EAS!

A Long History of Leadership

25 years ago, TFT developed the first practical, off-air modulation monitors. When TV stereo was born, we developed the first BTSC aural modulation monitor. We pioneered the FM synchronized booster system. We introduced the only digital STL that accommodates additional subcarriers.

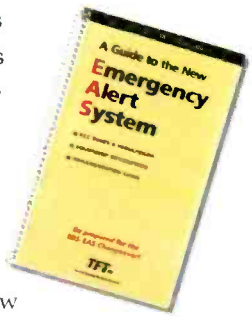
For 25 years we've listened to our loyal customers, and together we've helped set the standards for an industry. Now we're at it again. This time we've got a jump on EAS, the new Emergency Alert System.

Low cost, easy EAS

As one of the originators of the EBS standards back in '75, TFT has been the major force behind EAS. We've put our new low cost, easy EAS encoders and decoders through the FCC field tests in Denver and Baltimore, worked with government agencies and customers, and now we're ready for broadcasters and cablecasters. And we're here to help you with a low cost, easy transition!

We're ready to supply the broadcast & cable industries with low cost, easy-to-use, encoders & decoders.

Call TFT Today for Your FREE Primer on EAS



For years folks have relied on us for direction into the future. And again we're here to help. We've put together a comprehensive Primer on the new Emergency Alert System. You'll learn about FCC rules & regulations, equipment descriptions, implementation, and application diagrams. It's all yours *FREE* for the asking. Call or fax TFT now, and we'll send the info you need on the new EAS. **1-800-347-3383**

TFT INC

Sound Quality for Over 25 Years!

3090 Oakmead Village Drive, Santa Clara, CA 95051-0862
Phone: (800) 347-3383 (408) 727-7272 Fax: (408) 727-5942

Circle (42) on Reply Card

events master control center, which includes nine 9x9 foot master control rooms. This facility is capable of collecting and disseminating up to eight events (sports matches, concerts and the like) simultaneously. (The ninth room serves as a spare.)

The company's work on special events for pay-per-view channels *Request TV* and *Viewers' Choice* has provided valuable experience in the growing special-events business. In 1994, when the National Football League (NFL) decided to create a special package of events for the direct-to-home subscription market, it chose GWNS as its turnkey provider. As many as 12 regional NFL games are collected each Sunday during the season via downlinks and terrestrial circuits, then promotional and commercial video elements are inserted, and the program (called *NFL Sunday Ticket*) is encrypted and uplinked to the C-band TVRO market. On Saturdays, GWNS provides a similar service for college football to ESPN Enterprises.

Control room for the pay-per-view service, "Viewer's Choice," one of several cable channels that originates at the GWNS facility.

The output from each master control is sent to the Glenbrook Earth Station on a Com/Lux fiber-optic transmission system where the signals are encrypted by individual VideoCipher II Plus scrambling systems. The scrambled signals are then uplinked to the appropriate satellites for distribution. Backup links and hardware are always standing by.

All feeds are received on consumer-grade equipment and displayed in a central monitoring area at Harbor Plaza. This area is equipped with TV monitors for all downlinked feeds, descrambling status monitors and phones. An intercom system allows the central monitoring center to be in communication with the technician in each of the master control rooms.

Helping customers grow

An example of the company's commitment to its clients occurred when *Arts & Entertainment*, which has been a client since 1984, approached GWNS about providing similar services for *The History Channel*, its new 24-hour service that launched on Jan. 1, 1995.

A&E and *The History Channel* needed separate but integrated control rooms so that they could be managed from a common location yet operate independently. Two contiguous master control rooms — one for *A&E* and one for *The History Channel* — were constructed in addition to four shared rooms: an audio mixing room, a quality-control room, a common tape room and a tape library.

Each of the master control rooms uses a Bosch MCS 2000 master control switcher, a Digicart digital audio cart machine, a Microtime Genesis Act 3 digital video effects unit and one Leitch Still File. Various playback signals are monitored on 14 JVC TM900SU color monitors and one Ikegami 20-inch downlink monitor in each of the rooms.

This room monitors the downlink returns from each GWNS control room feed.

The common tape area is equipped with six tape machines: four Sony BVH 2000 1-inch machines with S-VHS and 3/4-inch tape machine backup and two Sony BVW 75 1/2-inch tape machines. One-inch machines were chosen because virtually all of the *A&E* and *The History Channel* programs are archival tapes in the 1-inch format. Twelve monitors in the common tape area are used to display the various playback signals, and an aircheck tape is made of the downlinked signal to check any discrepancies.

Two Odetics TCS 90 cart machines, each with six Sony Beta decks automate the tape loading and playback process, which involves the insertion of approximately 960 commercials and promotional spots each day for each channel. The backs of the Odetics cart machines are built into a passageway outside of the room. A maintenance technician can open doors on the passageway to gain easy access to the Odetics and its components.

The quality control room, where tapes are checked for quality as well as time and then dubbed, is outfitted with two 1/2-inch tape machines and two 1-inch machines. A Sony PVE500 editor and a Quanta Delta character generator in an adjacent console allow the technician to add titles and make minor edits in the tapes.

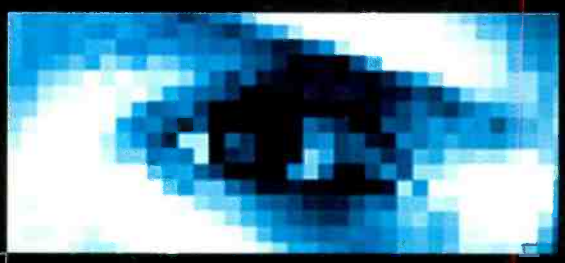
The audio mixing room includes a recording booth for creating voice-overs. The area is equipped with a Ramsa audio mixer, a SADiE digital audio workstation and two Digicart cart machines, as well as cassette and CD players.

Tucked in a rack room alongside the complex are a BTS TVS/TAS 2000 router, two Orban Optimod-TV audio limiters and all the electronic frames for the various equipment used throughout

The future of TV.

Montreux

How do you see it?



TELEVISION IN TRANSITION
Symposium and Technical Exhibition 8-13 June 1995

Your theme, your debate, your opinion, your future. If you want to keep pace with the changing face of television, you can't afford to miss Montreux. To register please call now on: + 41 21 963 3220 or fax: + 41 21 963 8851.

the *A&E* and *The History Channel* rooms.

One-stop video shopping

Included in the Harbor Plaza facility are production and editing facilities: a 3-camera production studio, a full-capability on-line post-production edit suite and a graphics suite. A second on-line edit suite is currently under construction. Digital audio and multimedia tape dubbing are also offered at the facility. The facility is aimed toward commercial/entertainment and business/non-entertainment video users.

The two edit suites and the studio can operate independently or as an integrated system. The edit suites and studio share three Philips LDK 9RS cameras and an Abekas A-53D dual-channel digital video system with WARP effects and key channels. Tapes in either D-2, 1-inch, 3/4-inch or 1/2-inch formats can all be accommodated.

The 40 x 45 foot studio is equipped with a 15-foot grid and floor lights, controlled by Strand Century 24-channel, 2-scene, 4-submaster dimmer board and a CD-80 66-circuit dimmer. A QVT teleprompter system is used in production.

The studio control room is outfitted with a GVG-220-2 video production switcher, Sony MPX 3036 audio console, Leitch dual-channel Still File system, Chyron infinit! dual-channel character generator with Transform and five Sony BVW-75SP Betacam recorders.

The edit room is an on-line suite with dedicated D-2, 1-inch and 1/2-inch Beta decks for interformat editing. It includes a Sony BVE-9100 editing system, GVG200-2N production switcher with streamline effects and fully expanded wipe system. Also included is a Quanta Delta SX dual-channel digital character generator. A Graham Patten D/ESAM 800 digital audio console with 48 inputs, 16 channels of digital equalization and full automation is interfaced with the rest of the suite's digital equipment to handle audio sources completely in the digital domain. A Leitch Still File DSF 3100 still-store and a Studer Dyaxis II digital audio workstation complete the suite.

A recent addition to the facility is a non-linear editing suite, featuring an Avid MC-1000 with AVR-27 digitizing software. The system includes multicamera editing software, four channels of audio and 27GB of hard drive storage.

The two edit suites and the studio can operate independently or as an integrated system.

Transmission control center expansion

To provide transmission services to the growing number of special-events producers as well as increased broadcast and cable traffic, GWNS recently doubled the size of its transmission control center at its Glenbrook Earth Station.

Two separate transmission control areas have been established. One for broadcast, cable and special-events transmission was expanded to allow for two additional operators and more efficient handling of special events and international traffic. A new independent transmission control and customer service desk was constructed to service the growing business TV segment.

The business TV transmission control was designed with a variety of corporate communications uses in mind. Video signals originate from the Harbor Plaza studio or from the client location and are sent to the earth station via terrestrial fiber-optic link or portable satellite uplink at the client location. One client placed fiber throughout its manufacturing facility and put cameras on the factory floor so that its equipment can be demonstrated via its training video network.

One client placed fiber throughout its manufacturing facility so that equipment can be demonstrated via its training video network.

Two new high-power amplifier (HPA) rooms are capable of handling 14 additional HPAs, bringing the total on hand to 38. To serve this expansion, the electrical system for the earth station was also doubled in capacity. It is powered by two 675kVA generators and two 300kVA uninterruptible power supplies.

The combined Harbor Plaza and Glenbrook Earth Station facility is the largest video earth station complex in the United States. It includes 15 satellite antennas: 11 C-band and four Ku-band. Nine antennas are equipped for full uplink and downlink and six are downlink only. The Ku-band system has full international capability, including INTELSAT E-3 certification for the Atlantic Ocean Region.

All critical path equipment is redundant, or can be bypassed, and all facility support systems are backed up. GWNS provides 24-hour, 7-day maintenance staffing and support to all program services and transmission clients. This reliability and the facility's overall flexibility combine with GWNS's dedication to customer satisfaction and its expertise to create a true "video services supermarket" for the TV industry. ■

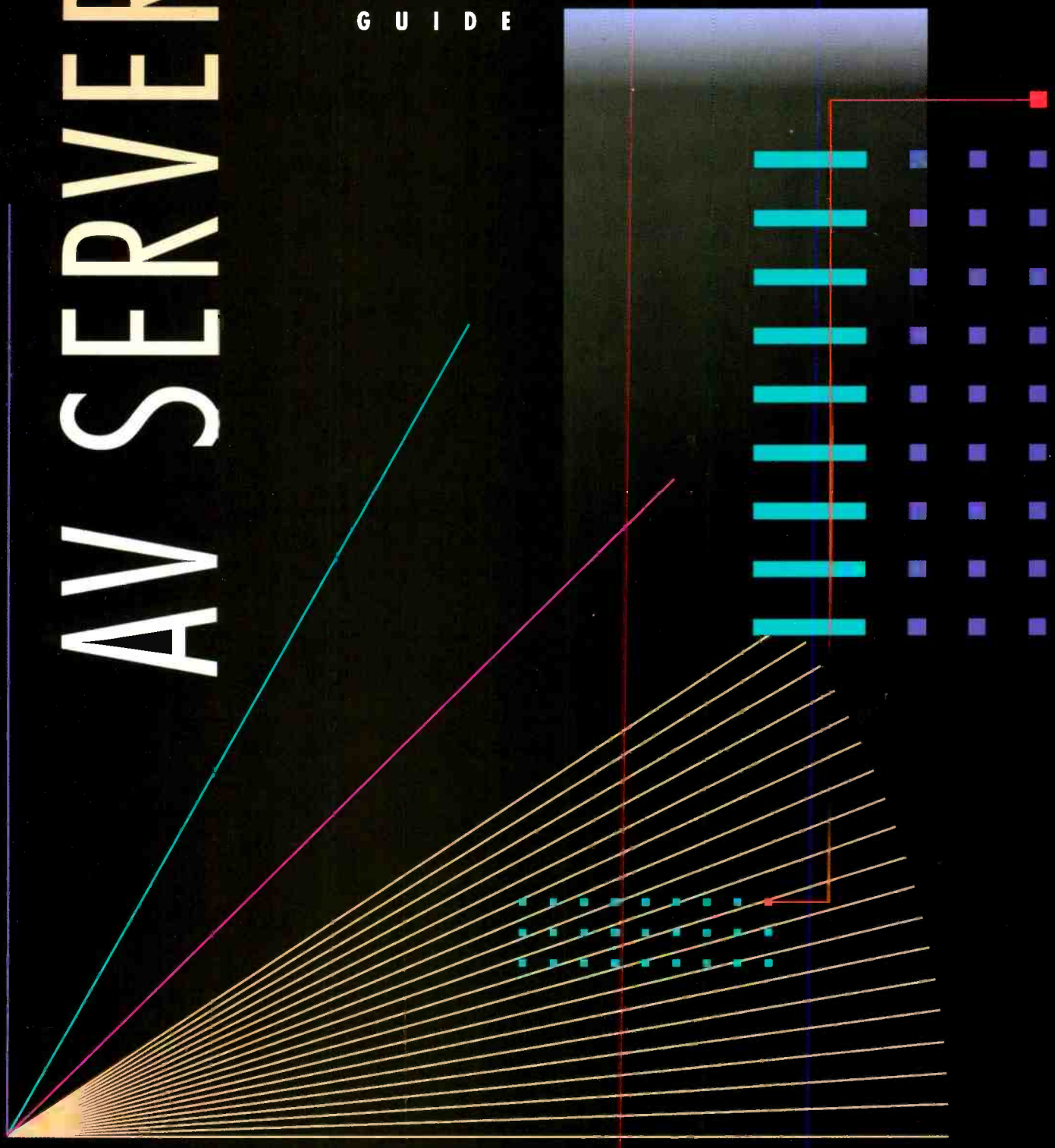
The recently expanded GWNS Glenbrook Earth Station in Stamford, CT.

Altan Stalker is senior vice president and general manager of GWNS, Stamford, CT. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

MICROPOLIS

AV SERVERS

APPLICATION GUIDE



Features/Functions

- 1 to 64 Channels per server
- Unlimited scalability—any number of servers can be connected to meet your needs
- MPEG-1 and 2 compatible
- PAL and NTSC compatible output
- Genlock
- Stereo audio output
- Up to 15Mb/sec per channel
- Store up to 240 hours per server at 1.5Mb/sec
- Fault tolerant—Video RAID
- VCR/VTR-like control protocol
- Standard 19" rack mounting

What is an AV Server?
Think of it like a VCR that can jump to any image or scene in a movie instantly, without queuing; a VCR that lets you view anything in the video library without having to change a tape; a VCR that permits use by up to 64 of your friends, at the same time (or at anytime), viewing the same movie (or different ones, for that matter!)—all the time!

SERVER

APPLICATIONS

HOTELS
In-room entertainment. Watch movies, sports, and look for places to go or shows to see; order room service; or go shopping and skip those lines with video-check-out when you're ready to leave. *Increase your occupancy and room revenue!*

KIOSKS
Information at your finger tips. Talking yellow pages and shop in virtual reality; multimedia guides are the future. *It's the new advertising medium!*

CRUISE SHIPS
View ports of call, preview activities and schedules, or learn how to gamble—if you can stay away from the video games. *Keep your passengers from threatening a mutiny!*

AIRCRAFT
On-line entertainment. Tired of looking at someone's head? Out of batteries? Seen the movie three times? Got a credit card? Access on-line entertainment. *Get your first- and business-class seats filled!*

BROADCAST TV
Wondering where you're going to put the next LMS? This is the video "Cache" for on-air programming, ad-insertion, and net-delays. And it's a lot less expensive—even if you buy another for a spare. *Flexibility and economy!*

CABLE HEADENDS
500 channel ad-insertion with VTRs? Not likely! How about any channel, any ad, any time, one copy. Thinking about Pay-Per-View? How about PPV in the same system. *Two systems for the price of one!*

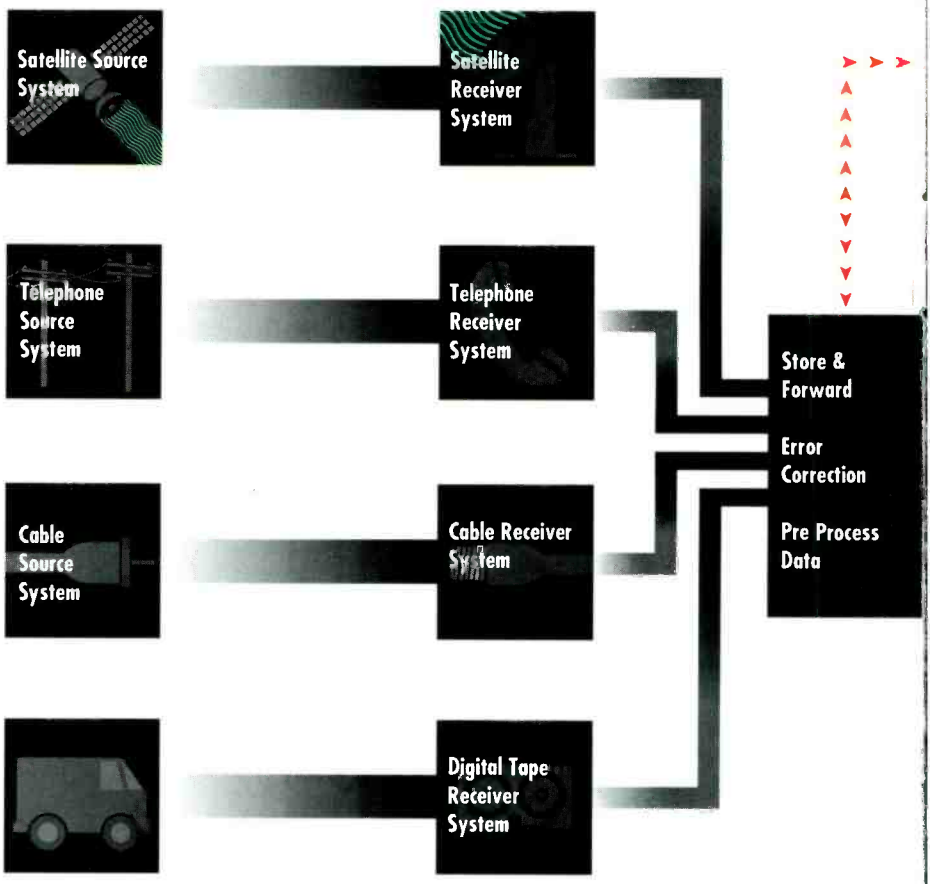
TRAINING AND EDUCATION
Interactive education—Multimedia enhanced
A teacher with patience. No more boring text books. Get results. *Interactive learning on-line!*

DESKTOP VIDEO
Turn your desktop PC into multi-media client. All you need is a TV tuner-card and video overlay card to turn your desktop PC into a multimedia client capable of handling any video database. From stock listings to weather reports and in between, get it all. *Welcome to the future!*

KARAOKE
Over thousands of video titles available at your finger tips. Any music video, any user, any time, all the time. Skip this, play that, and order a beer without getting up from your seat. Keep your customers and your accountant singing!

AV Server Implementation

IMPLEMENTATION

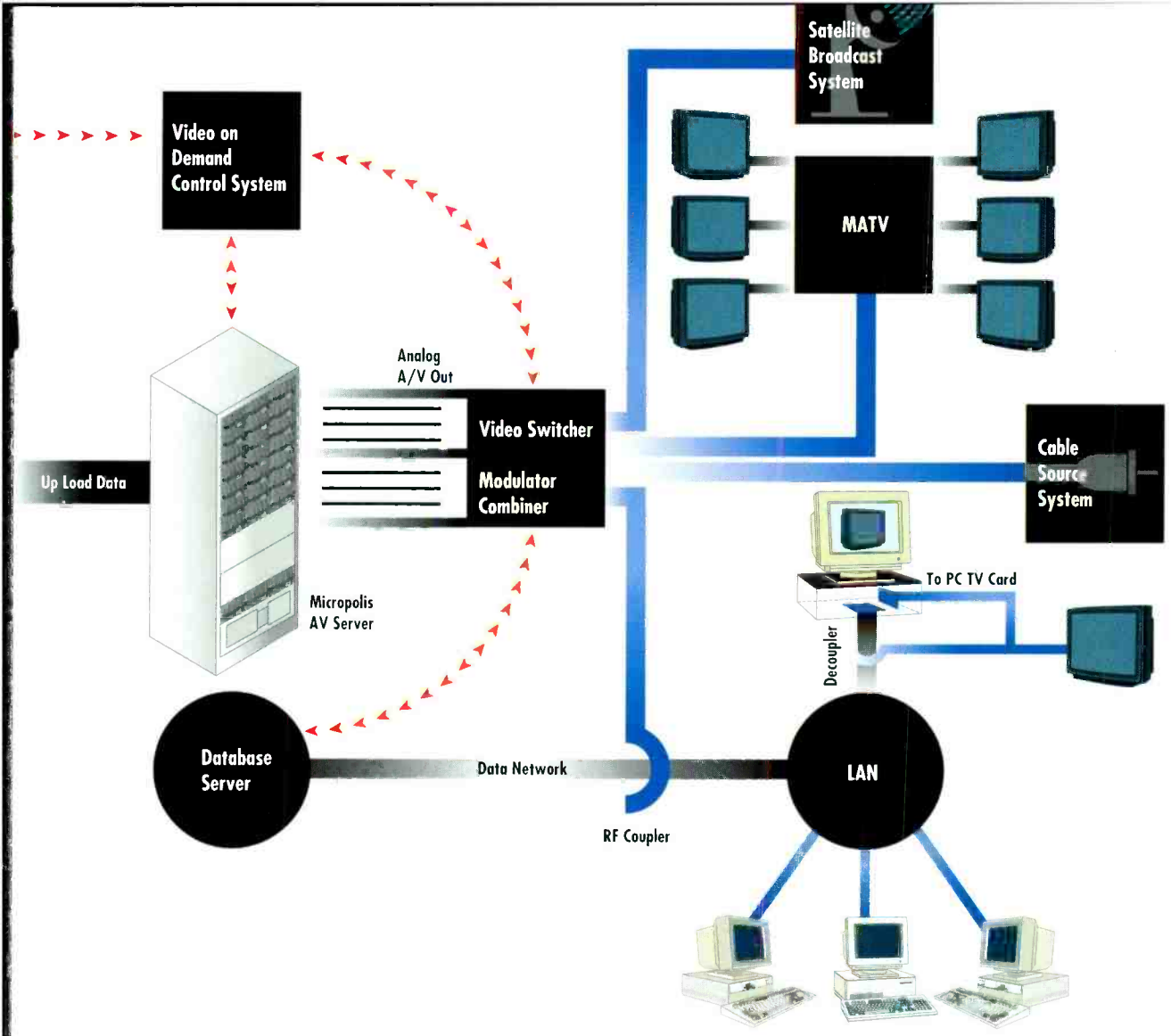


Content Preparation

Post-Production: Video material is edited for video server playback.
Content Preparation: Video and audio can be indexed and logged for contextual retrieval.
MPEG Encoding: Audio and video is encoded in real-time and a MPEG stream is produced.
Video File Formatting: A MPEG stream is required to be interleaved and formatted in the AV Server File Format for playback.

Transmission/Communication

Satellite: Provides single point to multipoint transmission. Allows everyone to be updated with a single transmission.
Telephone: Allows communication and control of VOD system remotely with limited point to point transmission of data.
Cable: Provides single point to multipoint transmission on multiple channels. Allows selective receives.
Store and Forward: Provides a holding tank of incoming data which allows reconstruction of data before loading.
Error Correction: Provides verification and error correction of incoming data to ensure data integrity
Upload: AV Server dynamic load balancing allows fastest possible uploading by using all excess bandwidth.



Operation & Control Methods

VOD Control System: The AV Server responds to high level - VTR/VCR like commands. The Micropolis proprietary communication protocol can be used on RS-232 or TCP/IP over existing LAN.
AV Server: The Micropolis AV Server is the heart of the VOD system. It is the video storage and playback engine delivering up to 64 simultaneous user with full random access capabilities.
Analog AV Out: The AV Server provides up to 64 of composite video and 64 48KHz stereo audio channel per system.
Database Server: A traditional database server can be used to provide contextual information for each video file over existing LAN.

Distribution Methods

Video Switcher: A Crossbar switch can provide mapping of N video sources onto M video output ports.
Frequency Modulator: Provides modulation of video signals into VHF or UHF band for use with TVs.
Combiner: Aggregates all modulated channels for distribution on a single coax cable.
MATV: Transmission system for standard cable RF distribution.
LAN: Data network.
RF Coupler/Decoupler: Couples and decouples RF from data signals.
PC TV: PC-TV Tuner and overlay card provides an RF video feed to a video in a window.

Introducing the Micropolis AV Server

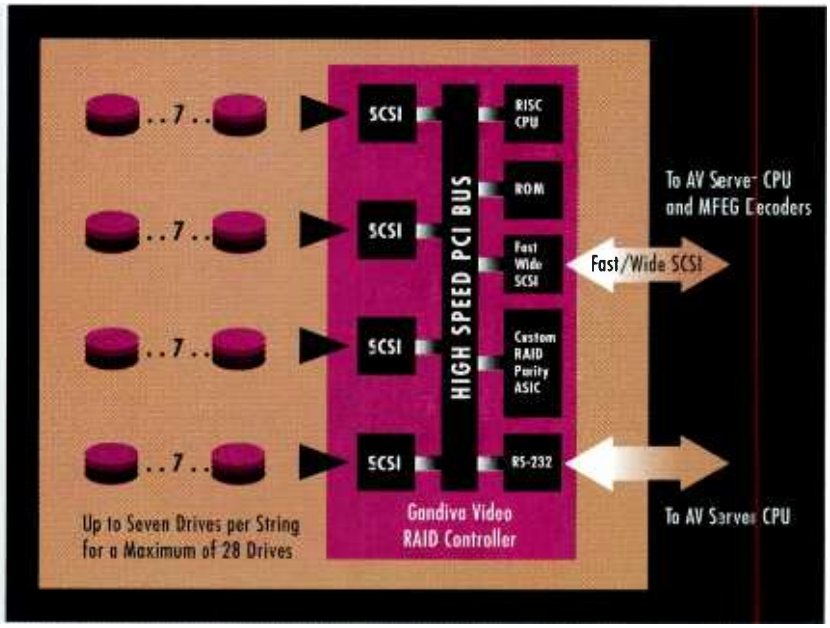
- It's digital.
- It's random access.
- It's based on Micropolis' patented Video RAID technology.
- It's got MPEG.

AV SERVER

Software Architecture

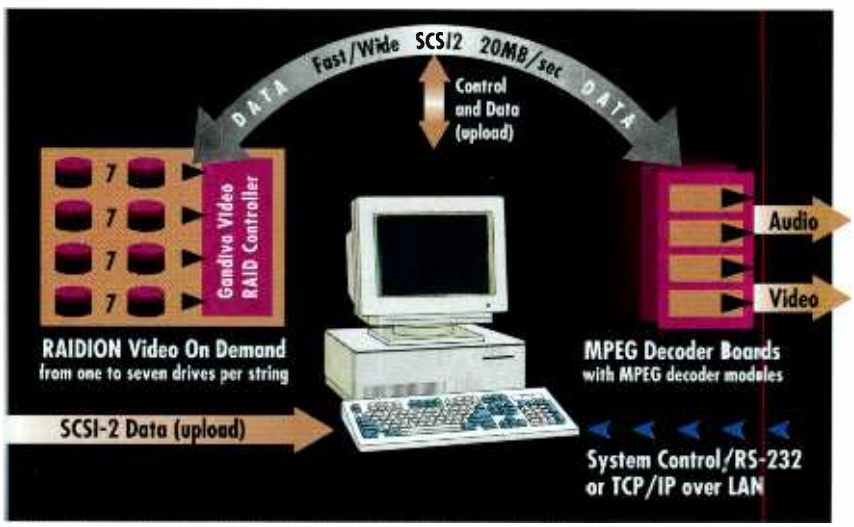
AV Server Architecture

The Micropolis AV Server is based on a "Disk Centric" Architecture. The Server uses the CPU only as a file manager, and traffic controller over the Fast-Wide SCSI Data Bus. The data is delivered directly from the RAIDION VOD video RAID storage subsystem to the SCSI based Multi-Channel MPEG Video Decoders. No data is passed through the CPU while playing. The AV Server is designed with fault-tolerance in mind. It is capable of sustaining single drive failures without degradation in performance. Each drive and video decoder board is designed to be easily hot-plug replaceable while the system remains running. Communication with AV Server is provided through RS-232 or with TCP/IP over LAN. Using Micropolis VTR/VCR-like high level communication protocols, controlling the AV Server is as easy as selecting a channel, and a video file for play.



RAIDION VOD System Diagram

The Gandiva™ RAID controller provides parallel transfer of data through four 10 MB/s SCSI buses. The custom parity chip on the controller generates parity "concurrently" guaranteeing video playback on all channels, even with a drive failure.



AV Server Diagram

RAIDION VOD

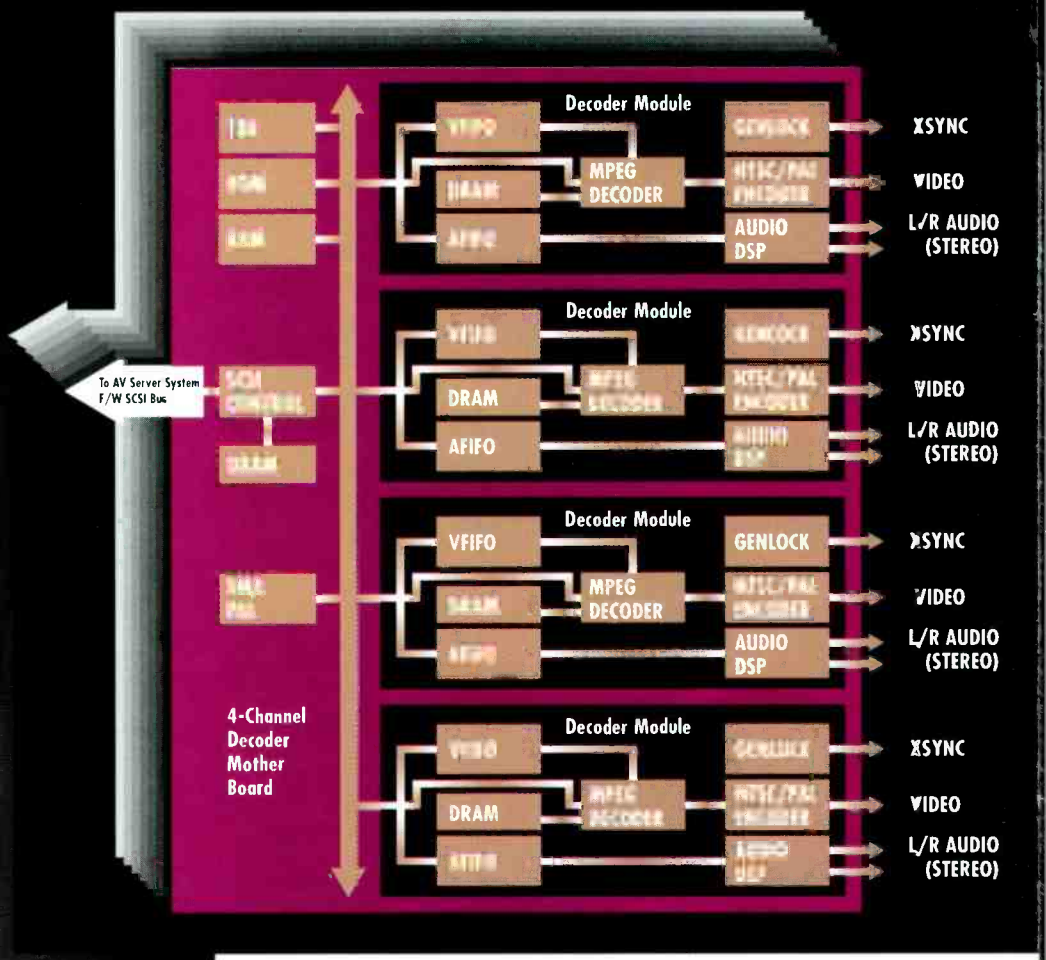
The RAIDION VOD is based on the Gandiva Video RAID Controller. It is designed around a 33MHz R3000 RISC processor with one Fast Wide host SCSI bus and four Fast SCSI-2 drive bus on a PCI architecture. At the heart of Gandiva is the Micropolis custom Parity ASIC. The Gandiva is tasked to provide simultaneous random access for all users while maintaining video data rates. Each of the four drive SCSI bus can deliver up to 10MBytes per second with a combined parallel data throughput of 40MBytes. The Gandiva can sustain an aggregate throughput of 17MBytes per second to the Video Decoders while allowing full random access. The RAIDION VOD is capable of connecting up to 28 drives with a maximum of 8 drive arrays; holding a total of 252GB or approximately 240 hours of MPEG-1 video. A patented feature of the RAIDION VOD is "concurrent parity". Provided through the custom ASIC, the RAIDION VOD can sustain a drive failure and still guarantee video playback on all channels.

AV Server CPU

The AV Server CPU is an Intel based 486 PC workstation. It is the heart of the AV Server. Its primary function is to direct user requests to each video decoder board and to manage the data flow over the Fast-Wide SCSI data bus. The AV Server OS/App is written on top of DOS to take advantage of hardware compatibility, however, all I/O and file management functions are unique to Micropolis. All MPEG data is formatted in the AV Server File Format by the Server CPU before it is stored on the RAIDION VOD.

The Micropolis MPEG Decoder

MPEG DECODER



Multi-Channel MPEG Video Decoders

Each Micropolis MPEG Video Decoder provides up to four composite and four stereo audio channels. On each Video Decoder Board resides the Micropolis Video Stream Manager running on the onboard 186 CPU. The stream manager controls each of the four video decoder modules on board, and is responsible for real-time delivery of video data to each of the four MPEG decoders. The AV Server CPU provides each Decoder Board video file location on the RAIDION VOD system (for each channel) and Video Stream Manager is then responsible for fetching the data.

Decoder Specifications

Decoder Module

Resolutions:	SIFF, 1/2 D1, Full 601
Compatibility:	Support MPEG-1, 1.5 (CL-950), and 2 (CL-9100) bit streams
Data Rate:	15Mbits/s

Decoder Motherboard

Data Rate:	6Mbits/s per channel with 4 channels active (higher if fewer channels are active)
Data Rate:	3.5MB/s per motherboard
Features:	Trigger Accuracy: ±360ms

Video Specifications

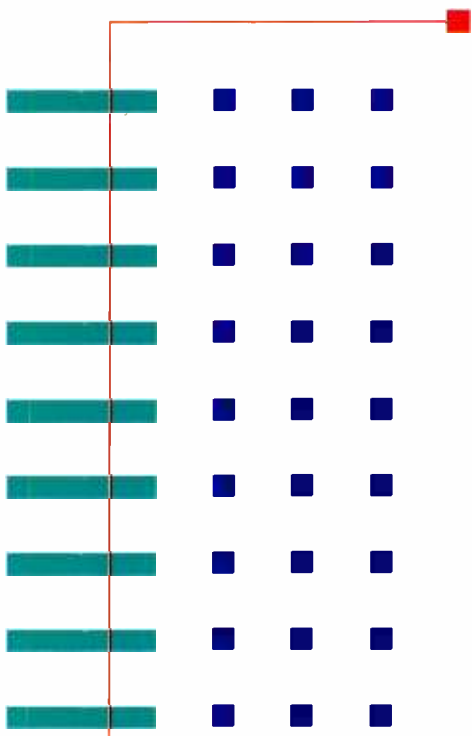
Output:	RS170A Composite
Format:	NTSC and PAL software selectable
Features:	Full Chroma Genlock with host and reference sync. Jitter Margin: 50 ppm

Audio Specifications

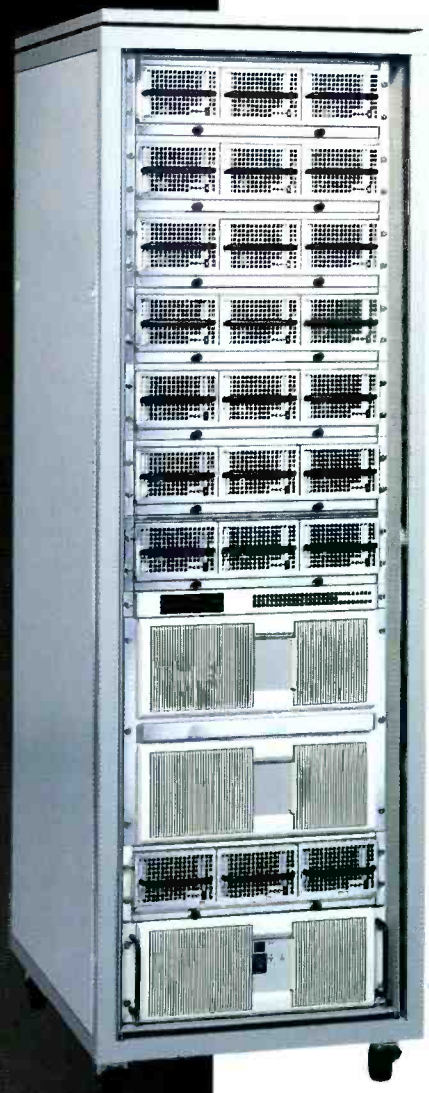
Output:	Stereo Audio up to 48 KHz @ 16-bit per channel
Format:	MPEG Layer I

Connector Mechanical Specifications

Video Output:	BNC
Audio Output:	BNC, Left and Right
Genlock:	SNB



MODULAR



AV Server 100/200

AV Server 50

AV Server 200

- Up to 64 Channels
- Up to 252 GB storage
- Video RAID
- 19" Rack format
- AV Server CPU
- Redundant Power

AV Server 100

- Up to 32 Channels
- Up to 252 GB storage
- Video RAID
- 19" Rack format
- AV Server CPU
- Redundant Power

AV Server 50

- Up to 16 Channels
- Up to 252 GB storage
- Video RAID
- 19" Sub-rack format
- AV Server CPU
- Redundant Power

System Specifications

Data	Fast SCSI-2	10 MB/s
Control	RS 232; TCP/IP	9600 baud; Token ring, Ethernet
Video		
Output:	RS170A Composite	
Format:	NTSC and PAL s/w selectable	
Features:	Full Chroma Genlock with host and reference sync.	
Audio		
Output:	Stereo audio @ 48KHz per channel	

Electrical Specifications

Input Voltage	120v at 20 amps 240v at 10 amps

Components	Description
AV SERVER CPU 	Av Server 50 16 channels AV Server 100 32 channels AV Server 200 64 channels
VDEC MODULE 	MPEG decoder module; resolutions: SIFF, 1/2 D1, CCIR-601, support MPEG-1, 1.5 (CL-950) and 2 bit streams; data rate 1.5 Mb/s to 8 Mb/s sustained
GANDIVA VOD 	19-inch rackmount module contains GANDIVA array controller, power supply and cooling fan
VDISK 2/4 MODULES 	VDISK drive modules; 3 modules per 19" rackmount tray, capacity (per module): 2 or 4 GB, power supply and cooling fan
VDISK 9 	VDISK 9 drive module with one 9 GB 5.25" disk drive, power supply and cooling fan
DISKRACK 3 	19-inch rackmount tray; holds up to eight VDISK 2 or VDISK 4 drive modules
DISKRACK 9 	19-inch rackmount tray; holds up to three RS drive modules
PCX 486 	Optional Intel 486 For satellite link and error correction

Power

Today,

Growth

for

Tomorrow

MICROPOLIS®

Corporate Headquarters
21211 Nordhoff Street
Chatsworth, CA 91311
Phone: (818)709-3300
FAX: (818)718-5312

U.S. Sales Offices
- San Jose, CA (408)441-0333
- Salem, NH (603)898-3550
- Dallas, TX (214)985-5535

European Offices
- Massy, France 33/1-6920-15-18
- Munich, Germany 49/89-859-5091
- Stockholm, Sweden 46/8580-32095

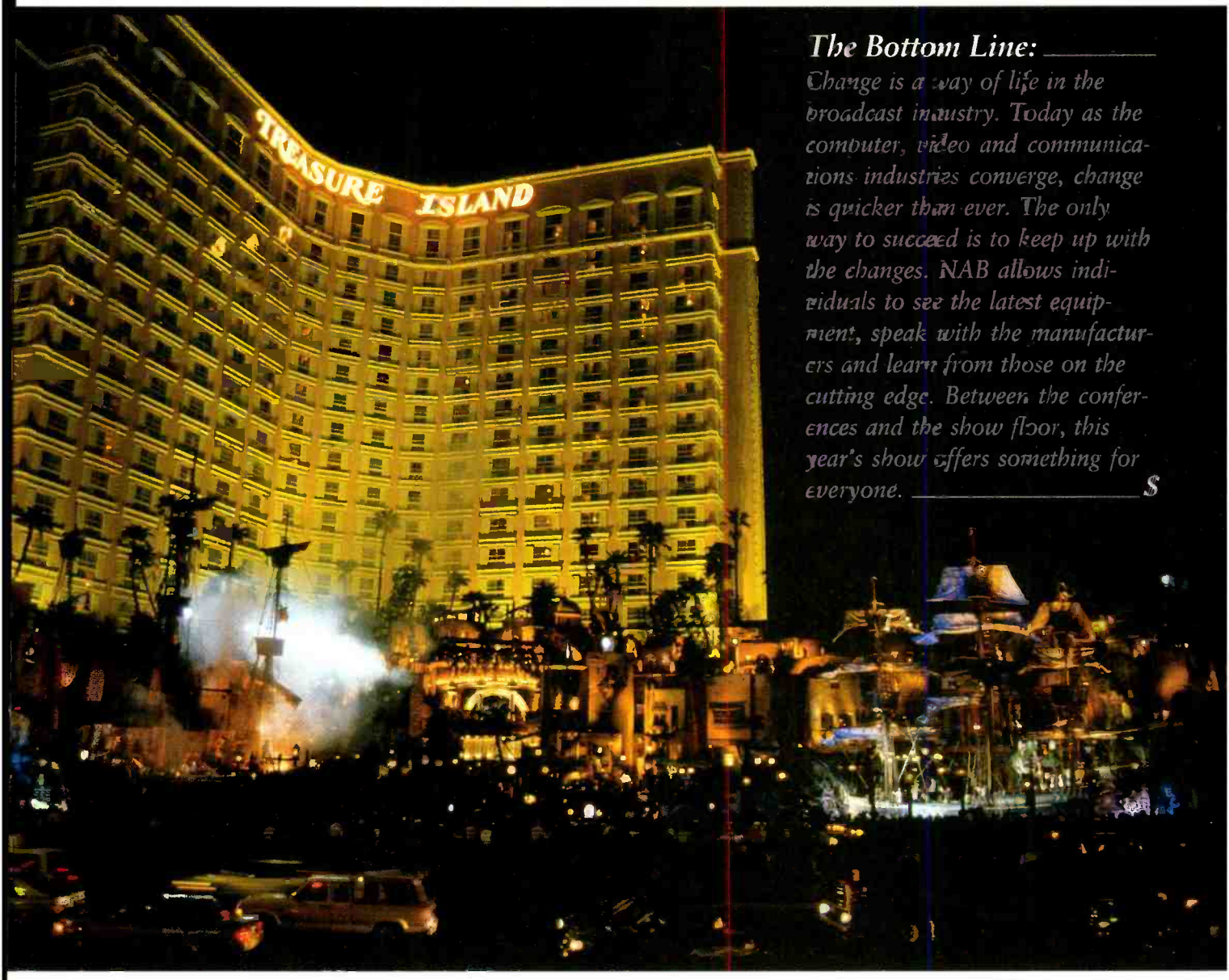
Asia/Pacific Offices
- Singapore 65/482-4191
- Taiwan 886/2-7222842
- Tokyo, Japan 81/3-323 404 26
- Sydney, Australia 61/2-959-2326

Printed in U.S.A. 2/95
Publication No. 103,774

NAB conference preview

By Steve Epstein, technical editor

A help to planning your time carefully.



The Bottom Line:

Change is a way of life in the broadcast industry. Today as the computer, video and communications industries converge, change is quicker than ever. The only way to succeed is to keep up with the changes. NAB allows individuals to see the latest equipment, speak with the manufacturers and learn from those on the cutting edge. Between the conferences and the show floor, this year's show offers something for everyone.

Broadcasters, video professionals, and those involved with multimedia will all converge the second week of April in Las Vegas.

The reason is the annual NAB convention, the largest show of its type in the world. This year's show will bring together more than 1,000 exhibitors and more than 70,000 attendees. For the third year, multimedia exhibits and conferences, co-sponsored by the Interactive Multimedia Association will be in the Hilton. New this year and expanding on the HDTV Production Conference will be the Digital TV Production Conference.

This year's exhibits will be spread throughout more than half a million square feet of exhibit space. Also included this year will be the convention center's south hall. The hall was opened to make room for more than 150 exhibitors on the NAB waiting list. Unlike the other areas, where specific technologies are displayed, the new hall offers technology of all types. Numerous treasures surely await the adventurous who take the time to explore this area.

Three technical seminars are scheduled to start on Saturday April 8. An all-day seminar, "Pixel, Pictures and Perception," will examine similarities and differences between the various imaging technologies. In addition, a morning tutorial on digital video will be offered as will an afternoon session on digital radio.

Broadcast Engineering Conference

Las Vegas Convention Center, Las Vegas, Nevada

Saturday, April 8 - Thursday, April 13

Gain an insider's perspective on the newest technologies, systems and products for radio and TV in the most comprehensive broadcast engineering conference in the world. You'll explore advances in digital technology, data broadcasting, satellite and auxiliary systems, post-production and more.

	Sat. 4/8	Sun. 4/9	Mon. 4/10	Tues. 4/11	Wed. 4/12	Thurs. 4/13
MORNING	**Special Technical Seminars** **9:00 am-** Digital Video Made Easy Pixel, Pictures & Perception: The Differences and Similarities Between Computer Imagery, Film & Video -- Part I	**9:00 am-** Keynote: FCC Commissioner James H. Quello **9:30 am-** Advanced TV Technology -- Part I	---------- NAB '95 Exhibits Open ---------- **10:30 am-** TV Data Broadcasting: Technology Development	**9:30 am-** Tapeless Video Production: The Evolution Digital Audio Encoding: Concepts and Realities	**9:00 am-** Audio and Video Testing: New Technologies Technical Regulatory Issues: Radio & TV -- Part I	**9:00 am-** Television RF Workshop: Maintaining the Signal
AFTERNOON	**Special Technical Seminars** **1:00 pm-** Pixel, Pictures & Perception: The Differences and Similarities Between Computer Imagery, Film & Video -- Part II	**1:00 pm-** Advanced Television Technology -- Part II	**1:00 pm-** Television On-Line: Interactivity and the New Media Computer Technology for Broadcast Support: BBSs, LANs, WANs and the Internet	**1:00 pm-** Designing the All-Digital Video Facility: Broadcast and Production	**12:30 pm-** Engineering Awards Luncheon **2:00 pm-** Digital Video: Maintaining the Image Technical Regulatory Issues: Radio & TV -- Part II **6:00 pm-** Ham Operators Reception	

Broadcast engineering conference highlights

Starting at 9:00 on Sunday morning, FCC commissioner James H. Quello will give the keynote address. Following that will be two technical sessions on advanced television technology. The first is scheduled to start at 9:30, the other at noon. These sessions will cover the current status of HDTV, the regulatory issues surrounding it and numerous technical issues involved with the transition from NTSC to HDTV.

Also included this year will be the convention center's south hall.

Monday morning starts off with a look at TV data broadcasting, followed by sessions addressing on-line interactivity for networks and local stations. Another afternoon session will look at how computer technology such as BBSs, LANs and even the Internet can be used to interact with viewers and streamline station operations.

On Tuesday, the morning starts out with a pair of sessions; one on tapeless video production, the other on encoding (compressing) digital audio. In the afternoon, attendees can delve into designing all-digital broadcast and post-production facilities.

The morning sessions that will be held Wednesday look into the realities of testing audio and video equipment and the technical regulatory issues facing broadcasters. The Engineering Awards Luncheon follows at 12:30 with Lewis Platt, chairman/CEO of Hewlett Packard as the featured speaker. The afternoon sessions will focus on digital video and regulatory issues. The traditional Ham Operators Reception will round off the evening at 6:00.

On the last day of the conference, sessions will take place only in the morning. For television engineers, a workshop will focus on RF. Throughout the convention, sessions will also be taking place on management and multimedia. For those wishing to expand their horizons, these sessions are an excellent way of becoming familiar with new areas of responsibility. Just like conventions of the past, there is far more to do and see than there is time. Plan your time carefully to get the most out NAB '95! ■

See page 84 for the *BE* FASTtrack, your personal guide to NAB products and services.

The Legend Continues.

The Old Standard.

Our M267 Mixer is more than the best selling mixer of the last ten years. It's the most versatile, the most durable, and the best performing. You trust it in your rack – you trust it on the road. And while production environments have changed, your mixer remained the same. Until now.

The New Standard.

Our new M367 Portable Mixer gives you all the reliability and durability of the M267, plus a list of new features and improvements. We made it over 25 dB quieter with a low noise circuit — ideal for digital formats. We added two more mic line inputs, bringing the total to six. We added peak LEDs. And we gave it 12 and 48-volt phantom power for your condenser mics.

What we didn't change was its toughness. It's still made with a rugged all-metal chassis and manufactured in the USA with legendary Shure durability.

The New Features.

Without increasing the size, we were able to pack in dozens of new features and improvements. The M367 has all the features of the M267, plus:

- Input peak LEDs
- Detachable power cord
- Two XLR outputs
- Easy-access side battery compartment
- Headphone monitor circuit
- Output peak/limiter LED
- Balanced, 2-position mix bus
- Adjustable limiter threshold
- Battery/AC VU meter illumination
- Monitor input sensitivity selector
- Program/monitor input selector

With the Shure M367 mixer, we've just raised the standards. It's time you raised yours.

For The Shure Dealer Nearest You, Call 1-800-25-SHURE.

See us at NAB, Booth #11800.

THE SOUND OF THE PROFESSIONALS®...WORLDWIDE. SHURE®

Circle (44) on Reply Card

BE FASTtrack

The shortest distance between two booths is the *BE* FASTtrack.

Finding the products you need at a convention as large as NAB is difficult at best. First, the companies are not arranged by product type, but by a seniority and size process. Second, because many companies offer a variety of products and services, it would be impossible to group them by product category.

Finally, most of us don't have time to visit all the booths just to find that perfect piece of equipment, even if we knew what products every company was exhibiting.

Recognizing this, the *BE* editors devised a better plan. The result is the *BE FASTtrack*.

Shortcut

The *BE FASTtrack* provides you with a shortcut to locating the companies that provide the products and services you are looking for. Instead of arranging companies by name in alphabetical order, the *BE FASTtrack* groups companies first by product type, then by booth number.

The result is a list of all companies providing products and services in any of 40 categories, broken down by booth number. This allows you to select the type of product needed and immediately know what companies provide that type of product.

Then, using the *BE FASTtrack* listing, you can take the shortest path between booths. The result should be a more efficient use of your time. The time saved can be used to see more equipment or, if no one is looking, relax and enjoy the other attractions Las Vegas has to offer.

BE FASTtrack *Table of Contents*

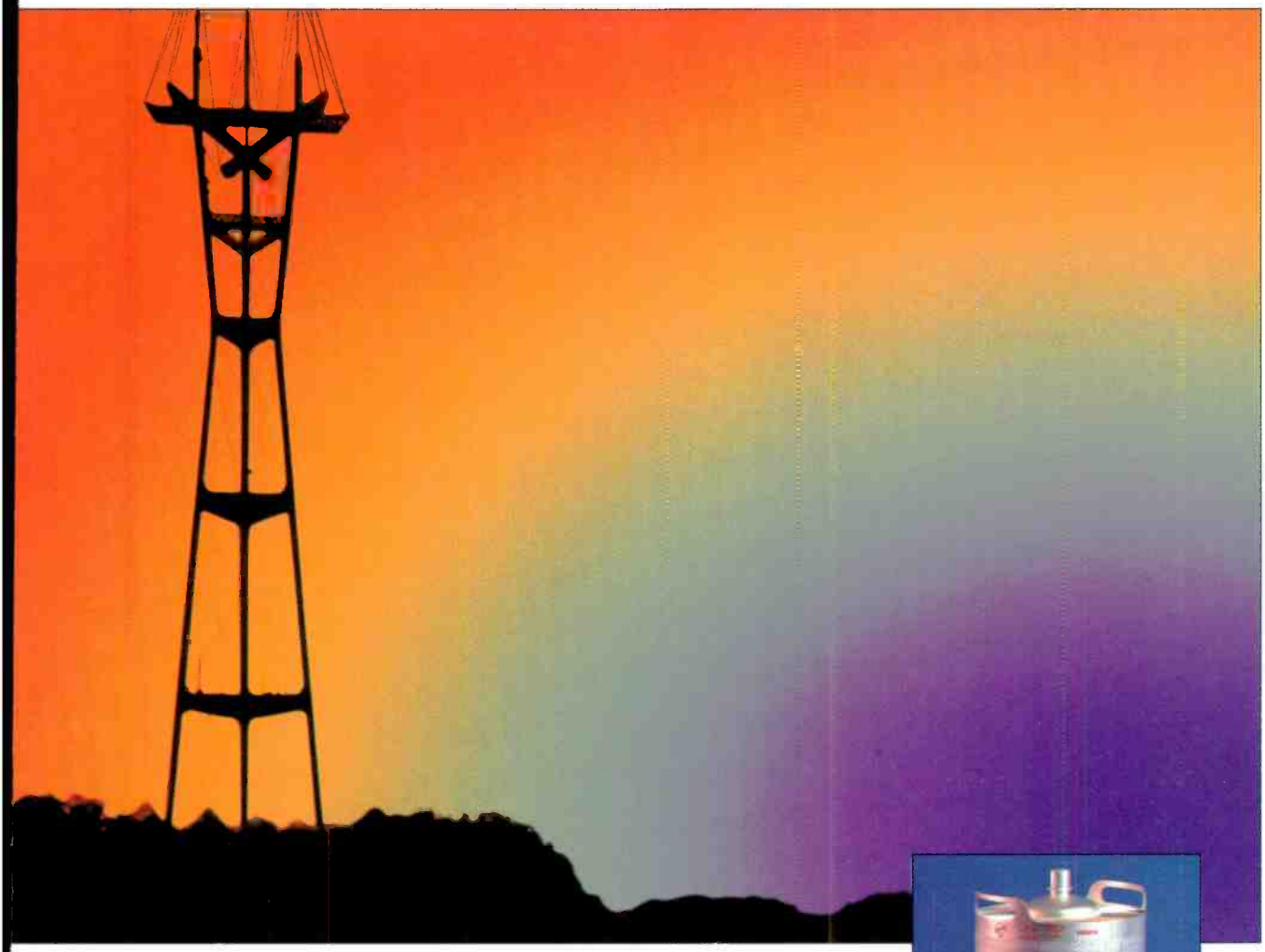
Audio Mixers - Portable

Audioarts Engineering	2211
Yamaha Music	2425
Logitek	2725
Euphonix	3603
Audio Services Corporation	3607
Audio Developments	3910-11
RAM Broadcast	4413
Seem Audio A/S	4604
Wheatstone Broadcast Group	4709
Henry Engineering	5625
Fostex	10952
Audio Technica US	11206
Shure Brothers	11800
SESCOM	13600
Micron Audio Products	16448-51
ATI Audio Technologies	16602-702
TASCAM	17167
AMEK Consoles	19348

Audio Mixers - Studio, On-air, Recording

Otari	1414
Trident Audio USA	1507
Bradley Broadcast Sales	1903
Neotek	1907-9
Audioarts Engineering	2211
Yamaha Music	2425
Auditronics	2721
Logitek	2725
LPB	2727
Pacific Recorders & Engineering	3025
Fidelipac	3122
Euphonix	3603
Hallikainen & Friends	4223
RAM Broadcast	4413
Seem Audio A/S	4604
Wheatstone Broadcast Group	4709
Autogram Corporation	4719-21
Fostex	10952
Graham-Patten Systems	11454
Harrison by GLW	12110
Whirlwind/US Audio	12507
Dan Dugan Sound Design	13619
Siemens Audio Inc.	13813
Ward-Beck Systems	15704
Mark IV Audio Group	15717
Dorrough Electronics	16443-4
ATI Audio Technologies	16602-702

Spanning the Spectrum



with Leadership in Broadcast Tubes

From UHF to VHF to HF, Varian has offered a full spectrum of EIMAC power tubes to the broadcast market for more than 60 years.

EIMAC has delivered generation after generation of leadership products. Tubes from watts to megawatts. Cavities from megahertz to gigahertz. And a wide range of accessories. A full spectrum of solutions. Supporting a broad selection of radio and television products.

We deliver quality and dependability. Not only is every EIMAC tube subject to the strictest manufacturing standards, it's also warrantied 100% free of defects. The result: dramatically reduced transmitter downtime and operating overhead. We also provide rapid, expert customer service and support to assure success in your efforts.

From design to final product, we're there for you. EIMAC is flexible enough to handle special orders. And big enough to handle large requirements. Whatever you need, we can provide it now and – we guarantee – for years to come.

Perhaps the best proof of this promise is our past – more than 60 years of keeping you on the air, around the world, across the spectrum.

See us at NAB, Booth #13805.

Power you can trust...

Varian Power Grid
Tube Products
301 Industrial Way
San Carlos, CA 94070 USA
(415) 592-1221 or 1-(800) 414-8823

varian

Circle (53) on Reply Card

BE FASTtrack

Solid State Logic	16621
TASCAM	17167
ADM Systems	17836
Ramsa Audio/Panasonic	18101
AMEK Consoles	19348
FOR-A Corporation	M1529

Audio Processing; Telco-Related Products

Apogee Electronics	1601-2
HHB Communications Ltd.	1604-5
Inovonics	1625-8
Bradley Broadcast Sales	1903
Symetrix	1911
Gorman-Redlich Mfg. Company	1913
Aphex Systems	2125
Eventide	2707
Logitek	2725
Orban/Harmon Pro Audio	2910
AKG Acoustics/Harman Pro Audio	2910
Studio Technologies	3003
Penny & Giles	3004-5
Corporate Computer Systems/CCS	3813
Intraplex	3904-5
Audio Developments	3910-11
Audio Processing Technology Ltd.	4007-9
Telos Systems	4203
Group One Ltd.	4601-3
Wheatstone Broadcast Group	4709
Roland Corporation	4713
Gentner Communications	5621
Modulation Sciences	11113-5
Sony Electronics/Business & Prof.	11514
Comrex	12105
Yamashita Engineering Mfgr./YEM	12810
SESCOM	13600
Hotronic	13611-2
Manhattan Production Music	13633
Siemens Audio Inc.	13813
Mark IV Audio Group	15717
NVISION	15884
Dorrough Electronics	16443-4
Dolby Labs	16567
Solid State Logic	16621
TASCAM	17167
Alesis	18372
Pixel Instruments	18638
FM Systems	19051
ASC Audio Video Corporation	19784
Harris Allied Broadcast Division	4416/16001

Audio Recording & Playback Equipment

Digidesign	1203, 1515
International Tapetronics/ITC	1410
Otari	1414
HHB Communications Ltd.	1604-5
Bradley Broadcast Sales	1903
Crouse-Kimzey Company	1914-15
360 Systems	2116
Yamaha Music	2425
Broadcasters General Store	3007
Pacific Recorders & Engineering	3025
Fidelipac	3122
Audio Services Corporation	3607
DENON	4004-5
Audi-Cord	4416
Roland Corporation	4713
Sprague Magnetics	5015
AKAI Digital	5021
Henry Engineering	5625
Fostex	10952
Barco-EMT	11450
Sony Electronics/Business & Prof.	11514
Nagra Kudelski SA	11805
Sonic Solutions	12046
Multidyne Electronics	12262
McCurdy Radio Industries	13110
Siemens Audio Inc.	13813
PEP	16601-701
Solid State Logic	16621
TASCAM	17167
ASACA ShibaSoku	17406
Ramsa Audio/Panasonic	18101
Alesis	18372
ASC Audio Video Corporation	19784
Harris Allied Broadcast Div.	4416/16001
Optical Disc Corporation	M1024-1026
FOR-A Corporation	M1529

Audio Routing & Distribution

International Tapetronics/ITC	1410
360 Systems	2116
Sierra Automated Systems	2710
Auditronics	2721
Studio Technologies	3003
RAM Broadcast	4413
Videoquip Research	5315-17
Benchmark Media Systems	10052
Image Video	11216
Barco-EMT	11450
IRIS Technologies	11529
Multidyne Electronics	12262
Lighthouse Digital Systems	12337
Beck Associates	12350
Yamashita Engineering Mfgr./YEM	12810
Avitel Electronics	12942-4
Omicron Video	13040-2
Di-Tech	13106
McCurdy Radio Industries	13110
Television Equipment Associates	13410-411
SESCOM	13600
ESE	13606-8
Adrienne Electronics	13640-740
Audio Accessories	13642-742
DYNAIR Electronics	13800
Siemens Audio Inc.	13813
Datatek	13824
Vistek Electronics	13835
Nova Systems	13842-14042
Sandar Electronics	15661
NVISION	15884
Broadcast Video Systems/BVS	16348-50
Burst Electronics	16351
ATI Audio Technologies	16602-702
OpAmp Labs	16674
Broadcast Electronic Services	16771
BTS Broadcast Television Systems	17011
Utah Scientific/Dynatech Video	17124
Dynatech Video Group	17124
ASACA ShibaSoku	17406
Grass Valley Group	18117
Videotek	18132
Wohler Technologies	18369-569
Ross Video	18632
Pixel Instruments	18638
Link Electronics	18676-778
Pesa Switching Systems	19401
Digipath	19929
ADC Telecommunications	19935

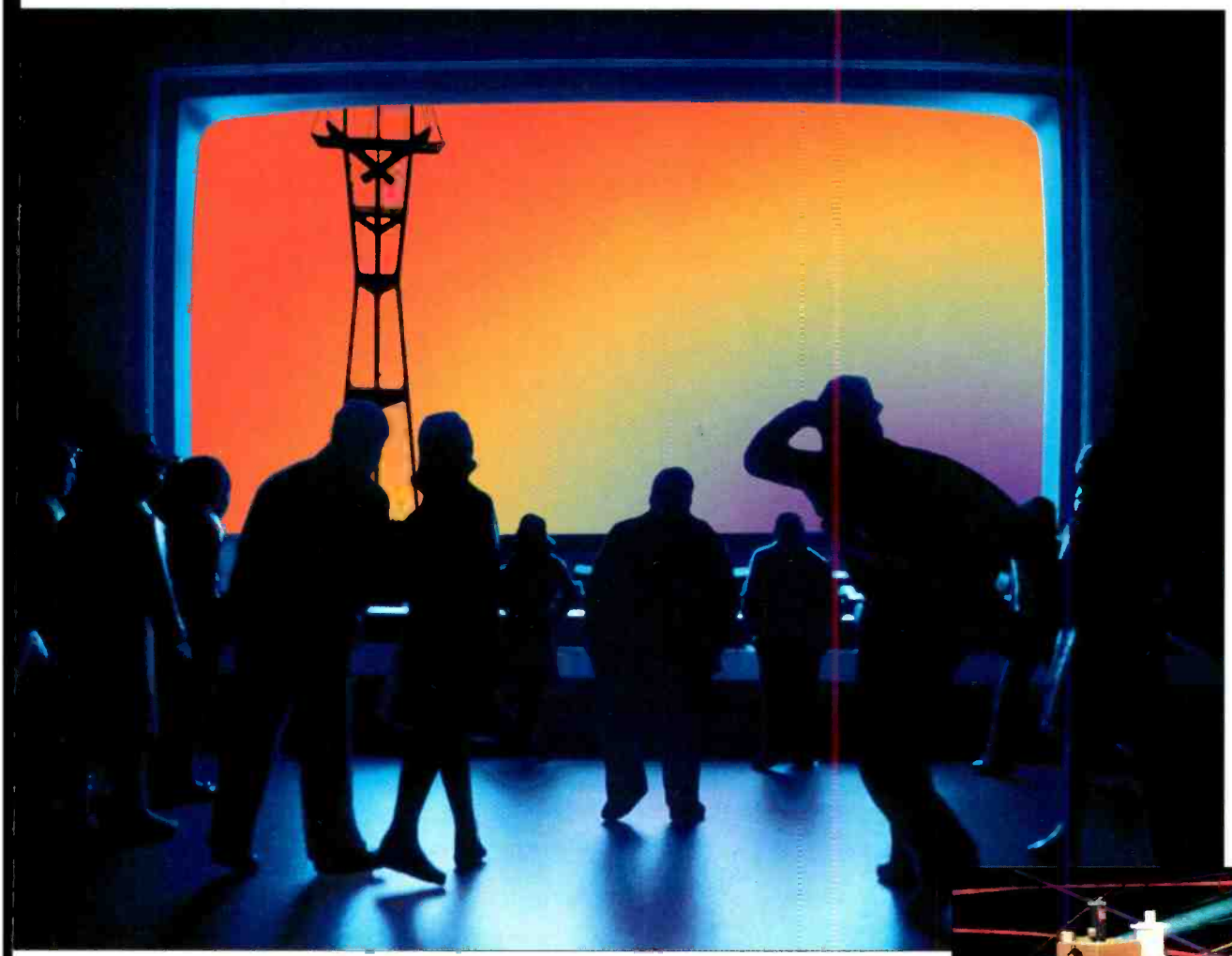
Digital Audio Workstations

Digidesign	1203, 1515
SADiE	1207
Otari	1414
TimeLine	1821
Crouse-Kimzey Company	1914-15
360 Systems	2116
Gefen Systems	2304-5
Yamaha Music	2425
Eventide	2707
Orban/Harmon Pro Audio	2910
AKG Acoustics/Harman Pro Audio	2910
Broadcasters General Store	3007
Pacific Recorders & Engineering	3025
Adams-Smith	3613
Augan Instruments	3613
Synclavier	3901-2
Roland Corporation	4713
AKAI Digital	5021
ComStream Corporation	5615
Gentner Communications	5621
Henry Engineering	5625
ABC Digital/Australian Broadcasting	5627
Nagra Kudelski SA	11805
Siemens Audio Inc.	13813
Solid State Logic	16621
AVID Technology	19539, M1515
AAVS/Sencore	19623
Fairlight ESP Pty. Ltd.	19920
Harris Allied Broadcast Division	4416/16001

Microphones, Speakers, Headphones

Neotek	1907-9
Audio Intervisual Design	2203
Murry Rosenblum Sound Associates	2428
AKG Acoustics/Harman Pro Audio	2910
Crown International	3203
Audio Services Corporation	3607
Bryston	3907-8
Group One Ltd.	4601-3
Professional Sound Corporation	5116-7
Audio Technica US	11206
beyerdynamic	11214
Nady Systems	11226
Lectrosonics	11232
Sony Electronics/Business & Prof.	11514
Countryman Associates	11607
Shure Brothers	11800
Sennheiser Electric	12035
Sanken/Developing Technologies	12802
Samson Technologies	12829
R-Columbia Products	13044
SESCOM	13600
Wireworks	13602-3
Connectronics	13627
Systems Wireless	13634-5

A New Generation



Varian's Klystrode® IOT Tubes for HDTV

The Klystrode IOT designed by EIMAC – a new generation solution for demanding new UHF-TV broadcast requirements.

- Keeps energy costs in check
- Simple and easy tuning
- User friendly tube replacement
- Improved linear dynamic range
- Enhanced reliability
- Covers complete UHF-TV band

The new generation Klystrode IOT combines the latest technology and reliability enhancements with new input and output circuits in a completely redesigned package. Made in the USA, the resulting amplifier offers outstanding performance across the entire UHF-TV band and is very easy to operate and maintain. Input cavity tuning is accomplished with only two adjustments, and all four cavity adjustments are readily accessible. Tube replacement is simple and easy to perform.

So, bridge the generation gap. Take a look at the Klystrode IOT. And see what a difference it can make as you move up to HDTV... and into a new generation broadcast future.

Power you can trust...

See us at NAB Booth #13805

Varian Power Grid
Tube Products
301 Industrial Way
San Carlos, CA 94070 USA
(415) 592-1221 or 1-(800) 414-8823

See us at NAB, Booth #13805.

varian

Circle (54) on Reply Card

BE FASTtrack

Siemens Audio Inc. 13813
Electro-Voice 15717
Mark IV Audio Group 15717
Vega/Mark IV Audio 15717
Micron Audio Products 16448-51
ATI Audio Technologies 16602-702
ComTek 17521-721
Ramsa Audio/Panasonic 18101
Wohler Technologies 18369-569
Alesis 18372
Telex Communications 18827
Harris Allied Broadcast Division 4416/16001

Automation Systems - Radio

International Tapetronics/ITC 1410
CBSI Custom Business Systems 2113
Gefen Systems 2304-5
Louth Automation 10158
Alamar Electronics USA 11829
McCurdy Radio Industries 13110
Adtec Productions 13262
Videomedia 15724
AAVS/Sencore 19623

Automation Systems - Video, TV, Newsrooms

CBSI Custom Business Systems 2113
Louth Automation 10158
Media Computing 11105-7
Sony Electronics/Business & Prof. 11514
Alamar Electronics USA 11829
Tel-test 12107
FloriCal Systems 13102
Enterprise Systems 13253
Adtec Productions 13262
Jefferson Pilot Data/JDS 13810
Videomedia 15724
American Broadcast Systems 15729-829
Columbine Systems 15731
Odetics Broadcast 15734
IBM Power Visualization Systems 15773
Unique Business Systems 16558
BTS Broadcast Television Systems 17011
Utah Scientific/Dynatech Video 17124
Dynatech NewStar 17124
Dynatech Video Group 17124
ASACA ShibaSoku 17406
Panasonic 18101
Leightronix 18577-777
NewsMaker Systems 18585
Matco Mfg. & Test 18937-19137
Channelmatic 18977
AVID Technology 19539, M1515
AAVS/Sencore 19623
DCM-Data Center Management 19768
Pioneer New Media Technologies 19771
ASC Audio Video Corporation 19784

Cameras, Lens Systems, & Accessories

Sony Electronics/Business & Prof. 11514
Toshiba Corporation 11740
BURLE INDUSTRIES 12100-1
Fujinon 15959
Thomson Broadcast 16117
TECNEC/Technical Necessities 16711
BTS Broadcast Television Systems 17011
EEV 17136
Arriflex 17152
JVC Professional Products 17359
Innovision Optics 17569-769
CAMPLEX/Concept W Systems 17784
Panasonic 18101
Hitachi Denshi 18127
Band Pro Film/Video 18370-870
Canon USA/Broadcast Optics 18456
Century Precision Optics 18972
Ikegami Electronics 19214
NAC Visual Systems/Angenieux 19226
Angenieux SA 19226
Nikon Electronic Imaging 19536
AVID Technology 19539, M1515
FOR-A Corporation M1529

Camera Support Products, Robotic Equipment & Controls

Chapman/Leonard Studio Equipment 10252
Chapman/Leonard Studio & Prod. Ctr. 10252
Shotmaker Dollies/Camera Platforms 10949
Quickset 11527
Cinema Products 11810
M S Russin Group 16112-3
AF Associates 16338
Radamec EPO Ltd. 16338
K&H Products 16343-5
Stanton-Video Services Unltd. 16373-473
Italiana Ponti Radio SRL 16677-777
CSI/Camera Support International 16855
Miller Fluid Heads 16967
O'Connor Engineering Labs 17148
Arriflex 17152
Micron Tool & Mfg./Cammate 17570-670
Band Pro Film/Video 18370-870
Telemetrics 18932
Vinten Broadcast/TSM 18939
Egripment 18975
Bogen Photo 19372
Sachtler 19526
Cinekinetic 19563-5

Character Generators, Prompters, Captioning Equipment

Dubner International 10861
Abekas Video Systems 11853
Horita 12650
Questar Systems (Farpoint Systems) 12862
Brek Conner Group 13832
Video Data Systems 15578
QSI Systems 15828-16028
Knox Video Products 16346
Shereff Systems 16374-474
Magic Teleprompting Inc. 16559
Microtime - See Digital Graphix 16624
Digital Graphix 16624
Telescript 16735
Image Logic Corporation 16774
BTS Broadcast Television Systems 17011
Quanta/Dynatech Video Group 17124
Dynatech Video Group 17124
Q-TV 17148
ASACA ShibaSoku 17406
Hamlet 17436
Cheetah Systems 17969-18069
Comprompter 18148
Computer Prompting & Captioning Co. 18630
Listec Video 18748
Tekskil Industries 19048
Norpak 19209-10
Chyron Group 19401
Texscan MSI 20068

Desktop Video Equipment

Gefen Systems 2304-5
D/Vision Systems (TouchVision) 10549
Toshiba Corporation 11740
Nova Systems 13842-14042
Elastic Reality 15168, M1220
Advanced Digital Imaging 15169-369
Newtek 15171
Silicon Graphics 15779
Knox Video Products 16346
BTS Broadcast Television Systems 17011
Discreet Logic 17772
Comprehensive Video Supply 17848
Grass Valley Group 18117
Pinnacle Systems 18380
United Media 18914
Chyron Group 19401
Hewlett-Packard 19656
ImMIX 19779
ASC Audio Video Corporation 19784
Intelligent Resources 20048
Desktop Images M 117-136
OptImage Interactive Services M 512
RGB Computer & Video M1321
FOR-A Corporation M1529
Divicom M1603
Adobe Systems M1609
Y/C Plus M1806

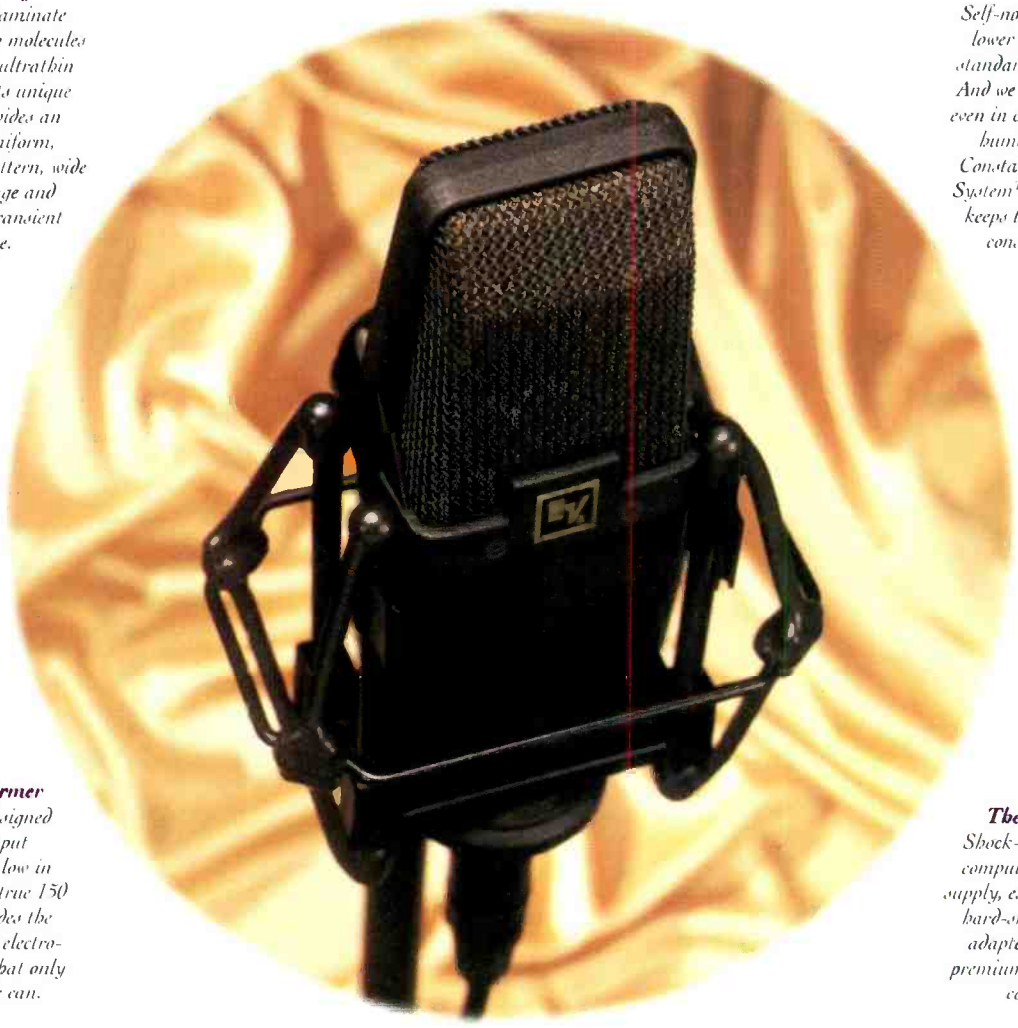
Graphics & Animation Systems

Toshiba Corporation 11740
Kavouras 12332
Alden Electronics 12901
Advanced Designs 12905-6
WSI 12956
Microvideo Ltd 13626
Bencher 13632
Alias Research 15179
Autodesk 15184
Silicon Graphics 15779
Getris Images 15985
Shereff Systems 16374-474
Wavefront Technologies 16379
Digital Graphix 16624
Microtime - See Digital Graphix 16624
Softimage 16972
Dynatech Video Group 17124
ColorGraphics Systems/Dynatech 17124
Discreet Logic 17772
Comprehensive Video Supply 17848
Quantel 18151
Pinnacle Systems 18380
Accu-Weather 19205-8
Aurora Systems/Chyron Group 19401
Chyron Group 19401

RE2000

The Diaphragm
We vacuum-laminate gold—just a few molecules thick—to our ultrathin diaphragm. Its unique diameter provides an extremely uniform, supercardioid pattern, wide dynamic range and exceptional transient response.

The Performance
Self-noise is 5 to 10 dB lower than "industry standard" microphones. And we keep it that way even in conditions of high humidity with our Constant Environment System™ (CES), which keeps the element at a constant 125 °F.



The Transformer
Our custom-designed Jensen® output transformer is low in distortion and a true 150 ohms. It provides the high rejection of electromagnetic noise that only a transformer can.

The Amenities
Shock-mount system, computer-grade power supply, external pop filter, hard-shell case, stand adapter and 20 ft. of premium cable with gold connectors.

The Awe-Inspiring, Uncompromising Studio Condenser Microphone

Even before its introduction, the RE2000 had earned an amazing reputation and an enthusiastic following. Its exacting performance elicited accolades from professionals who thought they had heard it all.

"The RE2000 has a richness of sound I have experienced only along the lines of a tube mic"— David Esch, Eschicago

"The perfect mic for recording any acoustic string instrument."—
John Beland, Flying Burrito Brothers

"The RE2000 has the warmth of a tube mic—extremely quiet and sensitive, allowing me to pickup low-level material without adding noise."—
Scott Weber, Buena Vista Sound, Walt Disney Studios

"The RE2000 has a crisp, clean and quiet response. I used less EQ to achieve what I look for. What goes in...comes out! It's also extremely versatile...from vocals to acoustic guitars to trumpets and violins."—
Tom Cusic, TM Century, Dallas, TX

"I think it's one of the most versatile I've ever used."— Roy Thomas Baker, Producer

In fact, all of these professionals asked one remarkably familiar question:

"When can I get one of my own?"

It's available now! And once you've heard it, we expect you'll be inspired to send us an accolade or two as well.

Electro-Voice, Inc. a MARK IV company 600 Cecil Street Buchanan, Michigan 49107 616/695-6831 **800/234-6831** In Canada: 613/382-2141

Circle (49) on Reply Card

Progressive Image Technology	19926
Rasterops	19952, M1309
Intelligent Resources	20048
Oxberry	20077-177
Hash Inc	M 308
Extron Electronics	M 319
Caligari	M 801
Linker Systems Inc	M 813
5D	M 821
Microsoft Corporation	M 913
Xaos Tools	M1114
Parallax Graphics Systems	M1720-1
Evans & Sutherland-Design Software	M1727-8

High-Definition TV Equipment

Sony Electronics/Business & Prof	11514
Toshiba Corporation	11740
Faroudja Laboratories	12827
BTS Broadcast Television Systems	17011
ASACA ShibaSoku	17406
Eastman Kodak Company	17552
Snell & Wilcox	19063
Ikegami Electronics	19214

Intercom/IFB Products

RAM Broadcast	4413
Wheatstone Broadcast Group	4709
Swintek Enterprises	11064
Anchor Audio/ROH	11504-6
McCurdy Radio Industries	13110
Ward-Beck Systems	15704
Vega/Mark IV Audio	15717
Telex Communications	18827
Clear-Com Intercom Systems	18936-19336

Lighting Equipment

VIDESSENCE	10059-61
Anton/Bauer	11210
GE Lighting	12807-8
Great American Market	13120
Frezzolini Electronics	13421-22
L E Nelson Sales	13615-6
Theatre Service & Supply	13637
Strand Lighting	13817
K5600	15368
The F J Westcott Company	15469-569
Mole-Richardson	16355
American Studio Equipment	16361
Tiffen Manufacturing	16365-565
Dedotec USA	16448-51
Cinemills	16555
LTM Corp of America	16561
Electronics Diversified Inc	16577
Matthews Studio Equipment	16648
PROSOURCE/Broadcast Marketing	16658
Lightmaker Company	16665-765
Sinar Bron	16773
DeSisti Lighting/DESMAR	16984
Colortran	17039
Lowel-Light	17155
Balcar	17164
ETC-Electronic Theatre Controls	18348
Chimera	19469-569

Multimedia Products

Advanced Digital Imaging	15169-369
Autodesk	15184
Videomedia	15724
Chyron Group	19401
Intelligent Resources	20048
Pacific Bell	M 109
Target Vision	M 202-4
Adda Technologies	M 315
OptImage Interactive Services	M 512
Micropolis	M 518
Caligari	M 801
Proxima Corporation	M 807-906
Crestron	M 901
Engineering Animation	M 907
LegaSys International	M1028-30
Celect Multimedia Products	M1034
Multimedia Accessories/TTL	M1120
Optibase Inc.	M1214
Communications Specialties Inc.	M1228
Apple Computer Company	M1403
Crystal Graphics	M1415
AMX Corporation	M1421
Divicom	M1603
Adobe Systems	M1609
AmPro	M1627

Production & Master Control Switchers

Image Video	11216
Sony Electronics/Business & Prof.	11514
Abekas Video Systems	11853
Tel-test	12107
J-Lab	12337
Echolab	13423-26
Vistek Electronics	13835
Thomson Broadcast	16117
BTS Broadcast Television Systems	17011
Dynatech Video Group	17124
Alpha Image/Dynatech Video Group	17124
Utah Scientific/Dynatech Video	17124
Ampex Corporation	17401
Panasonic	18101
Grass Valley Group	18117
Videotek	18132
Ross Video	18632
Snell & Wilcox	19063
FOR-A Corporation	M1529

Routing & Distribution Switchers, Video Processing Equipment

Sierra Automated Systems	2710
Videoquip Research	5315-17
Video Accessory	11126
Image Video	11216
IRIS Technologies	11529
Sierra Video Systems	11650
Multidyne Electronics	12262
Lighthouse Digital Systems	12337
Yamashita Engineering Mfgr./YEM	12810
Avitel Electronics	12942-4
Omicron Video	13040-2
Di-Tech	13106
Television Equipment Associates	13410-411
ESE	13606-8
Adrienne Electronics	13640-740
DYNAIR Electronics	13800
Datatek	13824
Vistek Electronics	13835
Nova Systems	13842-14042
Sandar Electronics	15661
Knox Video Products	16346
Broadcast Video Systems/BVS	16348-50
Burst Electronics	16351
OpAmp Labs	16674
TECNEC/Technical Necessities	16711
Broadcast Electronic Services	16771
BTS Broadcast Television Systems	17011
Utah Scientific/Dynatech Video	17124
Dynatech Video Group	17124
Alpha Image/Dynatech Video Group	17124
ASACA ShibaSoku	17406
Kings Electronics	17821-921
Grass Valley Group	18117
Videotek	18132
Ross Video	18632
Pixel Instruments	18638
Link Electronics	18676-778
Sigma Electronics	19059
Pesa Switching Systems	19401
AAVS/Sencore	19623
Digipath	19929
ADC Telecommunications	19935
Extron Electronics	M 319
Communications Specialties Inc.	M1228

Standards Converters

Video Int'l. Development	11200
VAS Group	11447-8
Yamashita Engineering Mfgr./YEM	12810
Faroudja Laboratories	12827
Quality Video Supply	13246-8
Interlace Engineering Corporation	13601
Microvideo Ltd.	13626
Intelvideo	13628-9
Vistek Electronics	13835
Accom	15766
Wegener Communications	16335
Magni Systems	17284
James Grunder & Associates	17436
Link Electronics	18676-778
Snell & Wilcox	19063
Miranda Technologies	19648
Progressive Image Technology	19926
Digipath	19929
Prime Image	19984
RGB Spectrum	M 310-2
Extron Electronics	M 319
Communications Specialties Inc.	M1228
FOR-A Corporation	M1529

Time-Base Correctors, Frame Synchronizers

Digital Processing Systems	11832
Ikon Video	12335
Ensemble Designs	12646-746-7
Hotronic	13611-2
Nova Systems	13842-14042
Digital Graphix	16624

Twenty five years ago Neil Armstrong made history by stepping on to the moon. Now Leitch has made history with technological achievements placing the company at the forefront of digital systems equipment. If we can't fly you to the moon, we *can* guarantee you out of this world performance from all our Digital Glue™ products.

Digital to Analog Encoders

Leitch pioneered monitoring encoders with the introduction of the VSM-6800. Its superior performance and features remain unsurpassed, giving four PAL/NTSC outputs as well as four reclocked serial outputs from a serial 4:2:2 input. It is also zero SCH locked and can pass vertical interval signals such as VITC, teletext and closed captioning.

This is the proven industry leader for monitoring encoders.

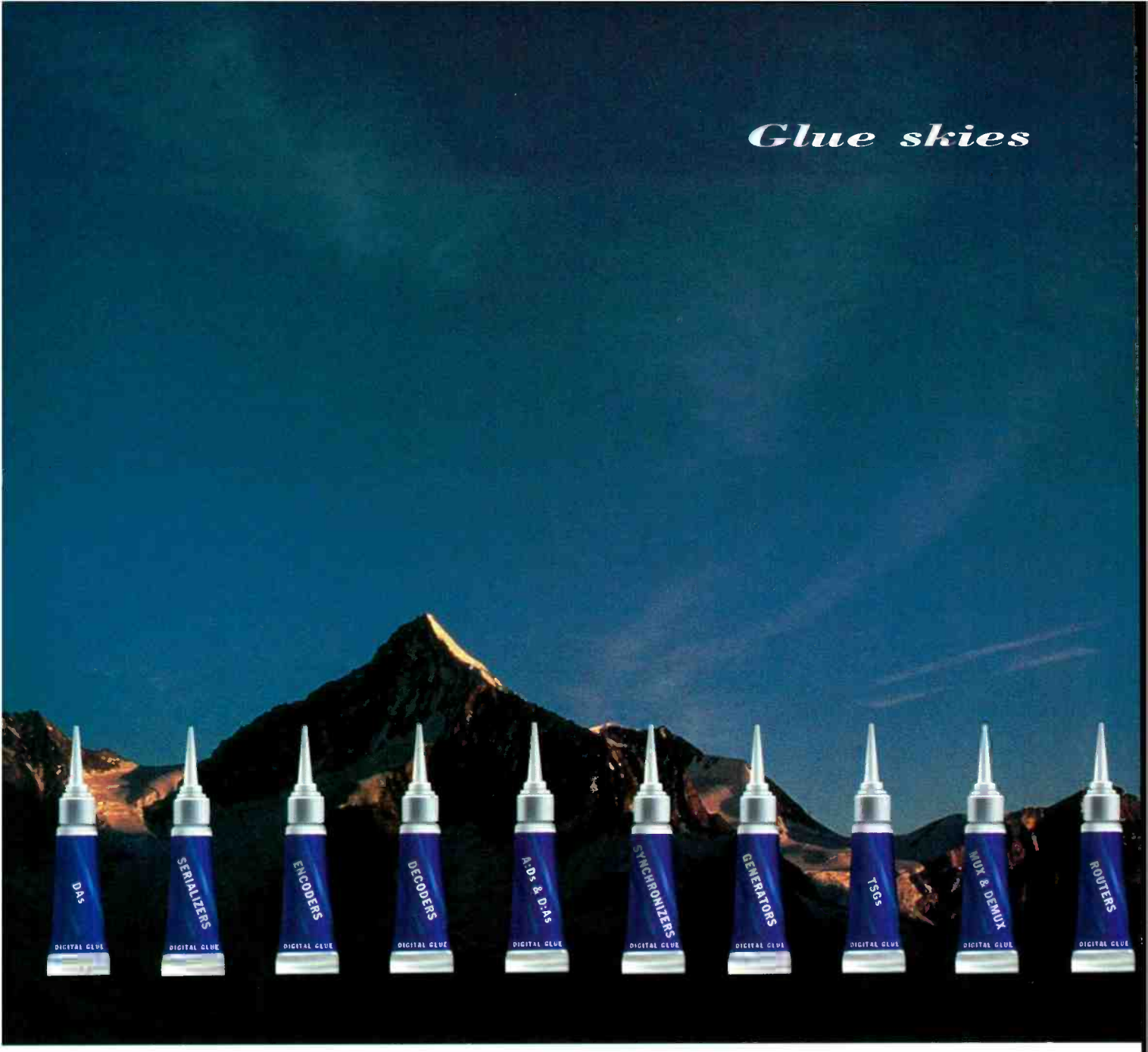
The CES-3500 is a 'next generation' precision quality encoder. It uses 12 bit signal processing and unique filter circuitry to provide exceptionally high resolution PAL or NTSC outputs from a component digital source. It has many matchless features such as automatic timing to an external reference, low frequency digital jitter removal and advanced sync outputs all of which are setting new standards for composite encoders. This is an exceptional product at a surprisingly low price, and, it's available now!

When it comes to talking digital you should be talking with Leitch, the industry's No.1 choice. For more information on these and associated digital products call us today.

LEITCH

Leitch Incorporated, 920 Corporate Lane, Chesapeake, VA 23320-3641, USA. Tel. 1 800 231 9673 Fax 1 804 548 4088
Leitch Technology International Inc., 25 Don Mills Road, North York, Ontario, Canada M3B 1V7. Tel. 1 416 445 9640 Fax 1 416 445 0595
Leitch Europe Ltd., 24 Campbell Court, Bramley, Basingstoke, Hampshire RG26 5EG, UK. Tel. +44 (0) 1256 880088 Fax +44 (0) 1256 880428

Circle (56) on Reply Card

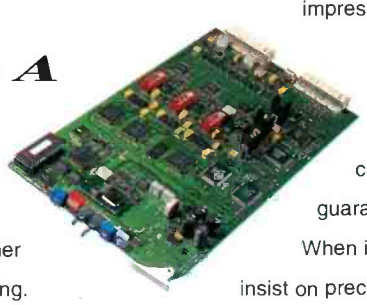


At the top of the world you have the bluest skies and the clearest vision.

With that vision and a reputation for innovation, Leitch delivers high performance serial digital technology through an advanced range of Digital Glue™ products.

A to D and D to A converters

Any conversion process from analog to digital or digital to analog requires accuracy and stability. With this in mind, Leitch has taken yet another leap forward by launching an A to D with digital filtering.



The new 3511AD component analog to serial converter sets the highest standards of conversion by using custom designed digital filter ASICs and innovative **oversampling** techniques. There is also an impressive range of practical features such as switchable looping YUV/RGB inputs, timing calibration markers, variable picture blanking and embedded EDH check words on the outputs. The Leitch range of modular 8 bit and 10 bit converters offers you the most choice and guaranteed performance.

When it comes to A to Ds or D to As, insist on precision, insist on Leitch.

EQUIPPED WITH EDH ERROR DETECTION & HANDLING

2X OVER SAMPLING

Circle (57) on Reply Card

LEITCH®

Leitch Incorporated, 920 Corporate Lane, Chesapeake, VA 23320-3641, USA. Tel. +1 800 231 9673 Fax +1 804 548 4088
Leitch Technology International Inc., 220 Duncan Mill Road, Suite 301, North York, Ontario, Canada M3B 3J5. Tel. +1 416 445 9640 Fax +1 416 445 0595
Leitch Europe Ltd., 24 Campbell Court, Bramley, Basingstoke, Hampshire RG26 5EG, UK. Tel. +44 (0) 1256 880088 Fax +44 (0) 1256 880428

Making Right Choices

The benefits of component digital technology are now well established, more and more broadcasters, cablecasters, post houses and facilities are moving over to serial. Sound advice on what to use and implementation comes from experience and technical expertise. Dealing with a 270Mb/s signal is quite different to a 5 MHz carrier. One of the foremost innovators in this area is Leitch, who has been designing and manufacturing serial products since the beginning of serial technology. Close working relationships with users have enabled the company to develop products and arrive at solutions geared to a wide range of applications.

Broadly grouped under the title *Digital Glue,* Leitch offers an enormous range of interfaces, converters, synchronizers, routing and signal distribution products, typically everything found at the core of technical installation. The DigiBus product line epitomizes the approach taken by the company to centralized functionality, as a single system can accommodate decoders, synchronizers, encoders, format converters and audio processing functions all operating together under an integrated control system.This is the industry's first achievement in 'open architecture' hardware where groups of modules replace traditional racks of equipment, saving space and power and simplifying installation. An interesting application of this is at WTTG-TV in Washington DC.

Analog or Digital?

WTTG is believed to be the first Fox affiliate to 'go digital'. Weighing up the balance between a new analog installation and digital was initially a risky thing. It became apparent as time went on that serial digital technology was becoming more available and affordable.

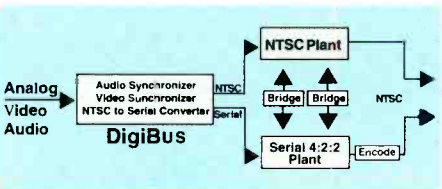
Discussions with various manufacturers revealed that the future of signal distribution is serial 4:2:2. With this in mind, when the 'go' button was pressed, WTTG confidently stepped forward into the digital world. The tough decisions were not which choice of switcher or CG, but how to equip the technical infrastructure, particularly as they would need to transition to digital over a period of time. It was important to choose suppliers who could cover the bases, minimize any potential interfacing and signal conversion issues.

Leitch was selected because they met the criteria and, amongst their products, the DigiBus system provided an efficient way to 'bridge' between analog and digital. Their particular problem was to take NTSC feeds, together with analog audio, into and out of a serial island.

"Digital bridges were the key..."

The DigiBus system provided an integrated platform where multiple decoders, video synchronizers and audio synchronizers all operate together and under a common control system. As the facility gradually replaces its old analog equipment then the DigiBus system can be equipped with additional modular products and so the technical infrastructure migrates effortlessly to its serial future.

WTTG's confidence in Leitch was backed up across the board with digital encoders, distribution amplifiers, monitoring encoders, totaling over $400,000.



WTTG-TV facility in Washington, DC

Earlier this year, Arnold Palmer opened the new Golf Channel with all the razzmatazz of a new station. Broadcasting 24 hours a day, means that golf lovers will now have to decide whether to watch TV or go out and shoot birdies. This channel has made a few good scores of its own. It's one of America's first all digital stations and was on the air in record time. Leitch tied it all together as a main supplier of terminal equipment, at the core of the station.

"Leitch was chosen because of its reputation for quality equipment and commitment to customer service."

Typical of the switch to digital is ABC in New York, who built a new component digital graphics suite using *Digital Glue* to interface with its existing NTSC plant. This was one of the first U.S. installations of Leitch's NTSC to 4:2:2 decoder, which ABC is using to convert NTSC signals between their plant router and the 4:2:2 suite. ABC, like many other users, such as Editel, Turner Broadcasting, and The Family Channel have turned to Leitch for solutions to their digital installations.

...serial "was surprisingly easy to install..." - HGTV

On March 30, 1995, the ribbon will be cut on Home and Garden's new facility. HGTV is making its mark not just by its popular programming, but by setting new standards for program production.

By choosing a serial digital infrastructure, HGTV made a significant decision to take advantage of the very latest technology. Although editing, graphics, and network origination are serial components, HGTV still receives and transmits analog NTSC signals. Leitch was chosen as a major equipment supplier because of its "very solid reputation for reliability" as well as its capability to deliver key core equipment. For the short term the cablecaster will be mixed format, analog and digital. Commenting on their experiences, HGTV said that serial was, "surprisingly easy to install and maintain, it even simplified our production process." HGTV is very much a leader in its decision and Leitch was delighted to be associated with this successful project.

With so many installations complete, the issue amongst users is how to analyze and verify digital signals in service. The preferred methods with engineers is EDH techniques (Error Detection and Handling). Once again, Leitch is playing a major part in the implementation of this new technology and is working with users on in-field testing. We will be talking about this subject in more detail in the future. Meanwhile, for more information on serial digital technology, *Digital Glue* products, EDH, or would just like to talk to Leitch about installing serial digital systems, call any of the numbers below:

Leitch Regional Contacts

U.S. Headquarters:	800-231-9673 or 804-548-2300
Western Region:	800-380-1676 or 714-458-2952
Central Region:	800-861-9440 or 317-861-9440
South Central Region:	800-401-3770 or 214-401-3770
Northeastern Region:	800-653-4824 or 201-226-4933
Eastern Region:	800-231-9673 or 802-548-2300
Southeastern Region:	800-641-1277 or 404-640-6707
Canada:	800-387-0233 or 416-445-9640

Just as a lagoon is separated from the ocean by reefs and sandbars, so your digital facility is separated from a sea of analog signals.

Audio and Video Synchronizers

Synchronizing signals with Leitch equipment brings a tranquility and peace of mind that we call 'Glue lagoon.' Performance is guaranteed by using innovative and proven technology to perform video retiming functions or to stabilize the most turbulent audio and video feeds.

Therefore, should you require multiple synchronizers operated under a single powerful control system, synchronization of audio to video or simple line synchronizer functions, Leitch offers the complete solutions.

With experience and understanding Leitch applies advanced technology to your applications, bringing the most effective solutions to modern broadcasting.

Call Leitch or your nearest dealer today.

Circle (46) on Reply Card

LEITCH®

Leitch Incorporated, 920 Corporate Lane, Chesapeake, VA 23320-3641, USA. Tel. +1 800 231 9673 Fax +1 804 548 4088
Leitch Technology International Inc., 220 Duncan Mill Road, Suite 301, North York, Ontario, Canada M3B 3J5. Tel. +1 416 445 9640 Fax +1 416 445 0595
Leitch Europe Ltd., 24 Campbell Court, Bramley, Basingstoke, Hampshire RG26 5EG, UK. Tel. +44 (0) 1256 880088 Fax +44 (0) 1256 880428

BE FASTtrack

Microtime - See Digital Graphix	16624
Broadcast Electronic Services	16771
James Grunder & Associates	17436
Videotek	18132
Pixel Instruments	18638
Zaxcom	19069-269
Prime Image	19984
FOR-A Corporation	M1529

Video Accessories

Pandora International	11440
Sierra Video Systems	11650
Digital Processing Systems	11832
J-Lab	12337
Rank Cintel	12340
Ensemble Designs	12646-746-7
Faroudja Laboratories	12827
Sprocket Digital	12962-13062
Quality Video Supply	13246-8
Options International	13256
ESE	13606-8
Intelvideo	13628-9
Vistek Electronics	13835
Lipsner-Smith Company	13845
Research Technology Int'l./RTI	13845-14054
Folsom Research	15177-255
Accom	15766
Evertz Microsystems	16045
Thomson Broadcast	16117
Broadcast Video Systems/BVS	16348-50
Milestek	16445
Macrovision	16576-776
EEG Enterprises	16801-901
Dynatech Video Group	17124
Alpha Image/Dynatech Video Group	17124
da Vinci/Dynatech Video Group	17124
ASACA ShibaSoku	17406
Comprehensive Video Supply	17848
Videotek	18132
Snell & Wilcox	19063
Nytone Electronics	19201-2
Allen Avionics	19211-2
Miranda Technologies	19648
Hewlett-Packard	19656
Video Associates Labs	M 815
Genesis Microchip	M 817
LSI Logic	M1205-7
Sanders Media Adventures/C MAC	M1709

Video Editing Control Systems; Time-Code Equipment

TimeLine	1821
DNF Industries	3007
Broadcasters General Store	3007
D/Vision Systems (TouchVision)	10549
Imagine Products	10761
Dubner International	10861
Sony Electronics/Business & Prof.	11514
Fast Forward Video	11848
Ensemble Designs	12646-746-7
Horita	12650
Adrienne Electronics	13640-740
Editing Technologies Corporation	13839-939
TAO/Technical Aesthetics Operations	15662-3
Technical Aesthetics Operation/TAO	15662-3
Videomedia	15724
Accom	15766
Steenbeck	15811-12
Evertz Microsystems	16045
PEP	16601-701
PROSOURCE/Broadcast Marketing	16658
Broadcast Electronic Services	16771
Amtel Systems	16804
ADCOM	16804
Montage Group	16980
BTS Broadcast Television Systems	17011
EMC/Dynatech Video Group	17124
VideoLab Para Technologies	17322-422
JVC Professional Products	17359
Ampex Corporation	17401

BE FASTtrack

Comprehensive Video Supply	17848
Panasonic	18101
Hitachi Denshi	18127
United Media	18914
Lightworks	19054
CMX/Chyron Group	19401
AVID Technology	19539, M1515
Strassner Editing Systems	19633
ImMIX	19779
ASC Audio Video Corporation	19784
Interactive Images	M1128
RGB Computer & Video	M1321
FOR-A Corporation	M1529

Video Presentation Equipment;

BARCO Industries	11450
Sony Electronics/Business & Prof.	11514
Toshiba Corporation	11740
SAIC-Information Display Systems	13405
DYNAIR Electronics	13800
Vistek Electronics	13835
Folsom Research	15177-255
Display Devices	15268
Electrosonic Systems	15365
Management Graphics	15477-577
Hoodman Corporation	16376
BTS Broadcast Television Systems	17011
Viewgraphics	17321-421
JVC Professional Products	17359
ASACA ShibaSoku	17406
Videotek	18132
Ikegami Electronics	19214
AAVS/Sencore	19623
Proxima Corporation	M 807-906
Synelec	M 825
Electrohome	M1134
FOR-A Corporation	M1529

Video Recorders & Video Servers

DNF Industries	3007
DVS Digital Video Systems	10658-758
CMC Technology	11507-8
Sony Electronics/Business & Prof.	11514
Toshiba Corporation	11740
Fast Forward Video	11848
Abekas Video Systems	11853
Samson Technologies	12829
Advanced Digital Imaging	15169-369
Video Data Systems	15578
Accom	15766
Steenbeck	15811-12
Thomson Broadcast	16117
Wegener Communications	16335
AF Associates	16338
Knox Video Products	16346
Tektronix	16528
Sierra Design Labs	16585
Recognition Concepts	16712-3
BTS Broadcast Television Systems	17011
JVC Professional Products	17359
Ampex Corporation	17401
ASACA ShibaSoku	17406
Videomagnetics Inc.	17722-922
Panasonic	18101
Hitachi Denshi	18127
Quantel	18151
Pinnacle Systems	18380
AVID Technology	19539, M1515
Hewlett-Packard	19656
Pioneer New Media Technologies	19771
ASC Audio Video Corporation	19784
Optical Disc Corporation	M1024-1026
P E Photron	M1329
FOR-A Corporation	M1529

Video Duplicators

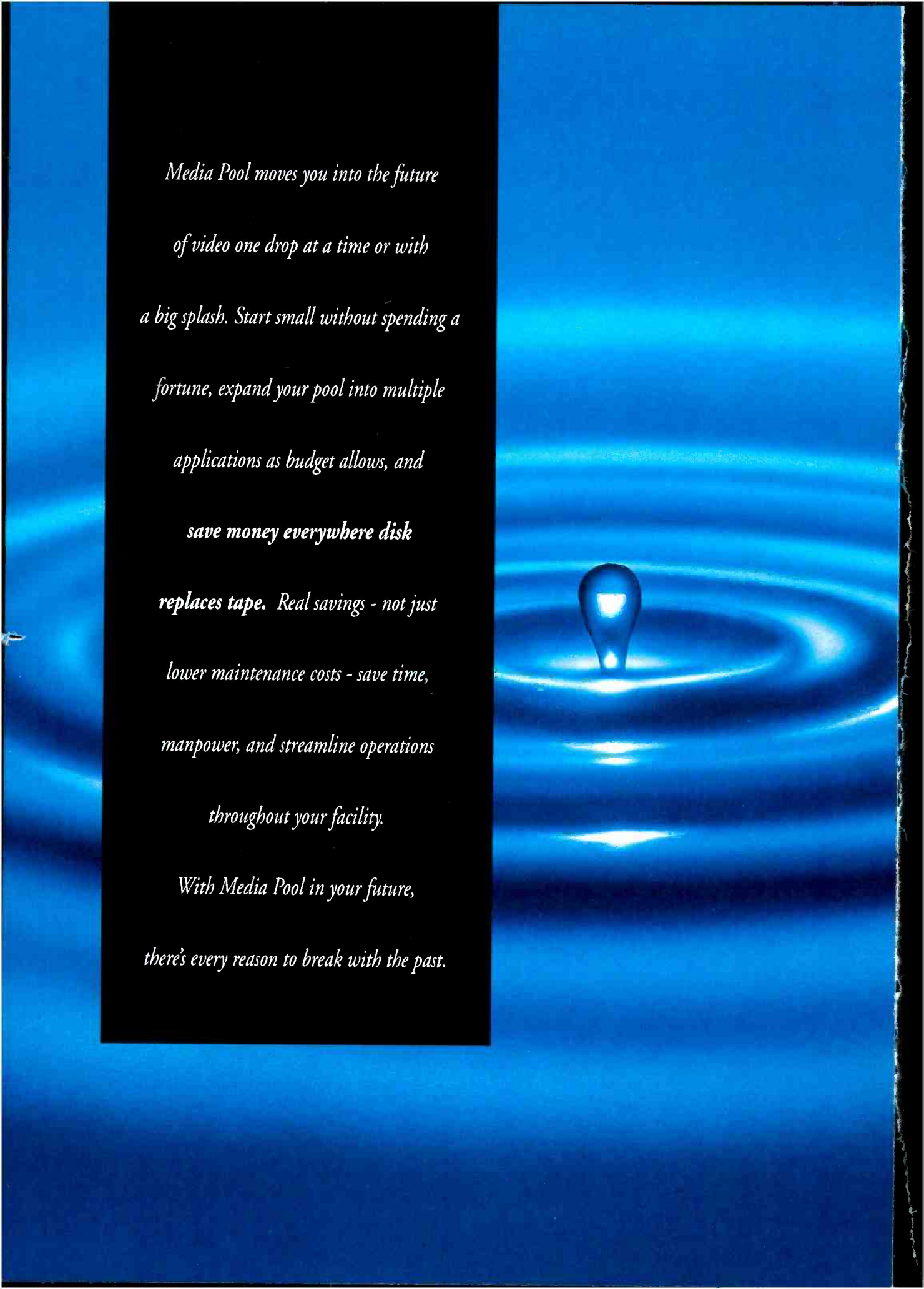
Dwight Cavendish	19233

Video Special Effects

Sony Electronics/Business & Prof.	11514
Abekas Video Systems	11853
Newtek	15171

Circle (58) on Reply Card →

Almost anywhere you go,
you can find reminders
of the past.



Media Pool moves you into the future of video one drop at a time or with a big splash. Start small without spending a fortune, expand your pool into multiple applications as budget allows, and ***save money everywhere disk replaces tape.*** *Real savings - not just lower maintenance costs - save time, manpower, and streamline operations throughout your facility.*

With Media Pool in your future, there's every reason to break with the past.

Most important of all, Media Pool represents video technology from a company who understands the video world. Real 601, real genlocking, real timecode, industry standard protocols, GPIs, GPOs – it's in there. And we didn't forget audio either. Record one to 16 simultaneous AES/EBU digital audio tracks with each file. We understand computer technology too – Ethernet TCP/IP for control and file transfers and Fast Wide SCSI 2 connections to other computers or data storage archives. It's all from the same company that has been bringing you the latest developments in television technology since the beginning of television.

Go ahead, make Media Pool your choice for that first step into the future of television.

HERE ARE A FEW OF THE NUMBERS ON MEDIA POOL:

Storage Time	40 minutes to 80 hours uncompressed 3 hours to 480 hours at 6:1 compression All media available to all channels at any time
Compression	Selectable constant bit rate or constant quality Discrete Cosine Transform (DCT) 2:1 to 40:1 or none, variable at *any* time on any optioned channel
Number of Channels	One to Sixteen Video/4 Audio Channels, field expandable
Video I/O	Serial Component Digital Video CCIR 656 8 or 10 Bit
Video Standards	Software configurable to 625/50 or 525/60 on a channel by channel and file by file basis
Time Code	XLR LTC input & output and/or VITC
Audio I/O	AES 48 kHz 24 bit, optional 4 channels per I/O
Video Reference	Serial Component Digital CCIR 656 or Analog Reference- Independent reference per I/O
Audio Reference	AES sync reference or Video reference
Control	Ethernet LAN, RS-422, and/or GPI
Storage Medium	Redundant Arrays of Independent Drives (RAID) level 3 with 10 GB standard computer SCSI hard drives

BTS

Call toll-free (800) 962-4BTS
Outside the U.S. and Canada,
call (805) 584-4700

A PHILIPS COMPANY

February, 1995

PUT THE PAST BEHIND YOU - PUT MEDIA POOL IN YOUR FUTURE

You know the problems of living in the past–high operating cost, growing maintenance problems, worries about equipment reliability.

There's a new alternative that offers you the chance to break away and take a step into the future of television–the Media Pool video server system from BTS.

Leave those tape-based worries behind and move into a whole new world of instant access, absolute reliability, and easy system expansion.

Go ahead, imagine the possibilities for your operation. Broadcast, Post, Satellite–whatever part of the video universe you work in–Media Pool can liberate you and give your operation the competitive edge you're looking for.

Give BTS a call. Let us show you how Media Pool can give you the freedom to move into the future, today.

Media Pool offers the most future proof technology available - full bandwidth capability at every I/O, instant variable compression and unlimited expandability. In Media Pool, we've built a video server that combines the best features of VTRs, Disk Recorders, and the newest high speed data technology.

Expandable drive array modules allow this system to start with minutes and grow to hundreds of hours using cost- effective unmodified computer hard drives. A pool of audio and video information is available in one stream, two streams, up to 16 *simultaneous* record or playback streams.

Expandable Bandwidth gives you compressed or full 10 bit CCIR 601 streams or any combination to fit your needs.

Compressionist™ Quality Composer lets you choose *any* level of space saving DCT compression every time you go into record. You can even preview the relative quality in E-E.

Impressive software turns a Media Pool channel into a full featured VTR, an automated spot player, or a wide variety of other products through a universe of third party applications. Our open platform philosophy lets this video server link to a growing list of video products from the world of professional video. Powerful system management tools make delegation of hardware resources easy and flexible. All housekeeping functions like adding users, protecting files, monitoring usage, and troubleshooting are done with SPLASH, the Software Program for Logical Administration of System Hardware.

Our advanced RAID architecture gives Media Pool unmatched reliability – parity drives protect from *any* drive failure with *no* impact to operation! *Hot Swappable* hard drive sleds let you replace that failure without missing a beat. Rock solid mechanical design insures reliability against physical assault. Redundant fans and a full failure alarm system are standard in every system. Redundant power supplies, controller cards, hot spare hard drives, even redundant data pathways can be added to any system to create a snug security blanket.

BTS

You really don't need to work in one.

BE FASTtrack

Broadcast Video Systems/BVS	16348-50
Wavefront Technologies	16379
Digital Graphix	16624
Microtime - See Digital Graphix	16624
Ultimatte Corporation	17280
Ampex Corporation	17401
Quantel	18151
Pinnacle Systems	18380
Snell & Wilcox	19063
Chyron Group	19401
Xaos Tools	M1114
FOR-A Corporation	M1529

Microwave Equipment

JNS Electronics Pty.	1627-8
TEM spa	1813-4
Utility Tower	2528
Intraplex	3904-5
Loral Microwave-Narda	5425
COMWAVE/Communications Microwave	11202
NUCOMM	11220
AVCOM of VA	11502
Toshiba Corporation	11740
Conifer Corporation	11807
Broadcast Microwave Services	12200-3
Microwave Radio	12327
ITS/Information Transmission	12950
RF Technology	13128
N Systems/NSI	13132
Varian Canada Microwave Products	13805
Varian Microwave Equipment	13805
Scala Electronic	15707
Dolby Labs	16567
Cablewave Systems/RF Systems	16643
Italiana Ponti Radio SRL	16677-777
EMCEE Broadcast Products	17106
Technosystem SpA	17770-18170
Alcatel Network Systems	18084
Ikegami Electronics	19214
Andrew Corporation	19914

Satellite Equipment & Services

Norsat Int'l./NII	1704-5
LNR Communications	2416
Bird Electronic Corporation	2901-2
Sports Network	5104-5
ComStream Corporation	5615
Panamsat	10049
Orion Atlantic	10155
Vertex Communications	10955
COMSAT Corporation	11458
Conifer Corporation	11807
Cycle Sat	12346
DH Satellite	12902
Comtech Antenna Systems	13402-3
Antenna Technology Corp./ATCi	13643-14043
Varian Traveling Wave Tube Division	13805
Varian Microwave Equipment	13805
Scientific Atlanta	13828
Aydin West	15176-376
Sure Shot Teleproductions	16029
Thomson Broadcast	16117
Miralite Communications	16377-477
EEV	17136
Hughes Communications	17548
GE American Communications	17706
ITELCO spa	18514
Advent Communications	19377
MCL/Inc.	19582-3
BAF Communication	19652
Andrew Corporation	19914
Standard Communication	19923

Radio, TV Transmitters

Penta Laboratories	1525
TEM spa Tecnologie Elettroniche	1813-4
Milano/TEM	1813-4
Flash Technology	1819
Kintronic Laboratories	2119

Central Tower	2411
Utility Tower	2528
LPB	2727
CTE International	3201
Magnum Tower	4010-11
Hallikainen & Friends	4223
TWR Lighting	4323
Shively Labs	4425
Hughey & Phillips Inc.	4722-3
Econco Broadcast Service	4823
Axcess Global Communications	5115
Svetlana Electron Devices	5313-4
Phasetek Inc.	5427-8
Gentner Communications	5621
Advanced Broadcast Systems	10161-261
California Amplifier	10456-556
Modulation Sciences	11113-5
BURLE INDUSTRIES	12100-1
Larcan-TTC	12500
Thomson Tubes Electroniques	12505
Lightning Eliminators & Consultants	12900
ITS/Information Transmission	12950
Richardson Electronics	13100
Varian Canada Microwave Products	13805
Varian Power Grid Tube Products	13805
Varian Microwave Power Tubes	13805
Acrodyne Industries	13821
SWR Inc.	14845, 15745
Aydin West	15176-376
Tennaplex Systems	15707
Scala Electronic	15707
MYAT	15714
Dielectric Communications	15720
3dbm	15745
LDL Communications/Larcan	15855
Will-Burt	16114-5
Comark Communications/A Thomcast Co.	16117
Thomcast France	16117
Kline Towers	16367
Doty Moore Services	16371-471
Electronics Research - ERI	16604
Stainless	16608-908
Jampro Antennas	16617
Cablewave Systems/RF Systems	16643
Italiana Ponti Radio SRL	16677-777
GEC-Marconi Communications Systems	17101
EMCEE Broadcast Products	17106
EEV	17136
Technosystem SpA	17770-18170
ITELCO spa	18514
Sira Sistemi Radio srl	19359
Antenna Concepts	19375
Micro Communications	19401
MCL/Inc.	19582-3
Allen Osborne Associates	19877-977
Andrew Corporation	19914
Broadcast Int'l. Group	19976-20176
Harris Allied Broadcast Division	4416/16001

Power Products - Batteries, Chargers, UPS

Staco Energy Products	2427
Kay Industries	2507
Cortana Corporation	3909
Superior Electric	5113-4
Professional Sound Corporation	5116-7
Alexander Batteries	11116
Anton/Bauer	11210
Christie Electric	11608
Ikon Video	12335
Lightning Eliminators & Consultants	12900
United States Broadcast	13412-6
Frezzolini Electronics	13421-22
Victory Battery Company	13630
K5600	15368
Control Concepts/Leibert	16014-5
Cine 60	16253-453
Paco Electronics USA	16764
ENG Mobile Systems	17043
Band Pro Film/Video	18370-870
Pro Battery	19151-251

Engineering Consultants & System Integration

Rules Service Company	1528
Communications Data Services	1811
Gefen Systems	2304-5
Dataworld	2419
EDX Engineering	4325
Communication Graphics	5016-7
NDG Phoenix	13043
Television Engineering	13116
Wadsworth/ITP	15656-7
AF Associates	16338
Doty Moore Services	16371-471
Rees Associates	17122-222
BAF Communication	19652

Dealers, Distributors

HHB Communications Ltd.	1604-5
Broadcast Supply Worldwide/BSW	1825
Bradley Broadcast Sales	1903
Crouse-Kimzey Company	1914-15
Broadcasters General Store	3007
RAM Broadcast	4413
Solidyne	5107-8
Professional Sound Corporation	5116-7
Balboa Capital	10459-559
Media Concepts	11442
BCS Broadcast Store	13242
GEPCO International	13251
United States Broadcast	13412-6
H L Dalis	13430
System Associates	13431
Systems Wireless	13634-5
Antenna Technology Corp./ATCi	13643-14043
Yale Electronics	15929
Photomart Cine-Video	17121-221
Comprehensive Video Supply	17848
The Equipment Broker	19070-370
BAF Communication	19652
ASC Audio Video Corporation	19784
Broadcast Int'l. Group	19976-20176
Harris Allied Broadcast Division	4416/16001
Multimedia Accessories/TTL	M1120

Fiber-Optic Equipment

Lightwave Systems	1807-8
Telecast Fiber Systems	10458-558
C-COR/Comlux	11510
Meret Optical	12748
Mohawk/CDT Broadcast Cables	13404
Fiber Options	16573-673
IRT Electronics Pty. Ltd.	18169
Ortel	18377-477
Canon USA/Broadcast Optics	18456
VYVX National Video Network	19763
ADC Telecommunications	19935

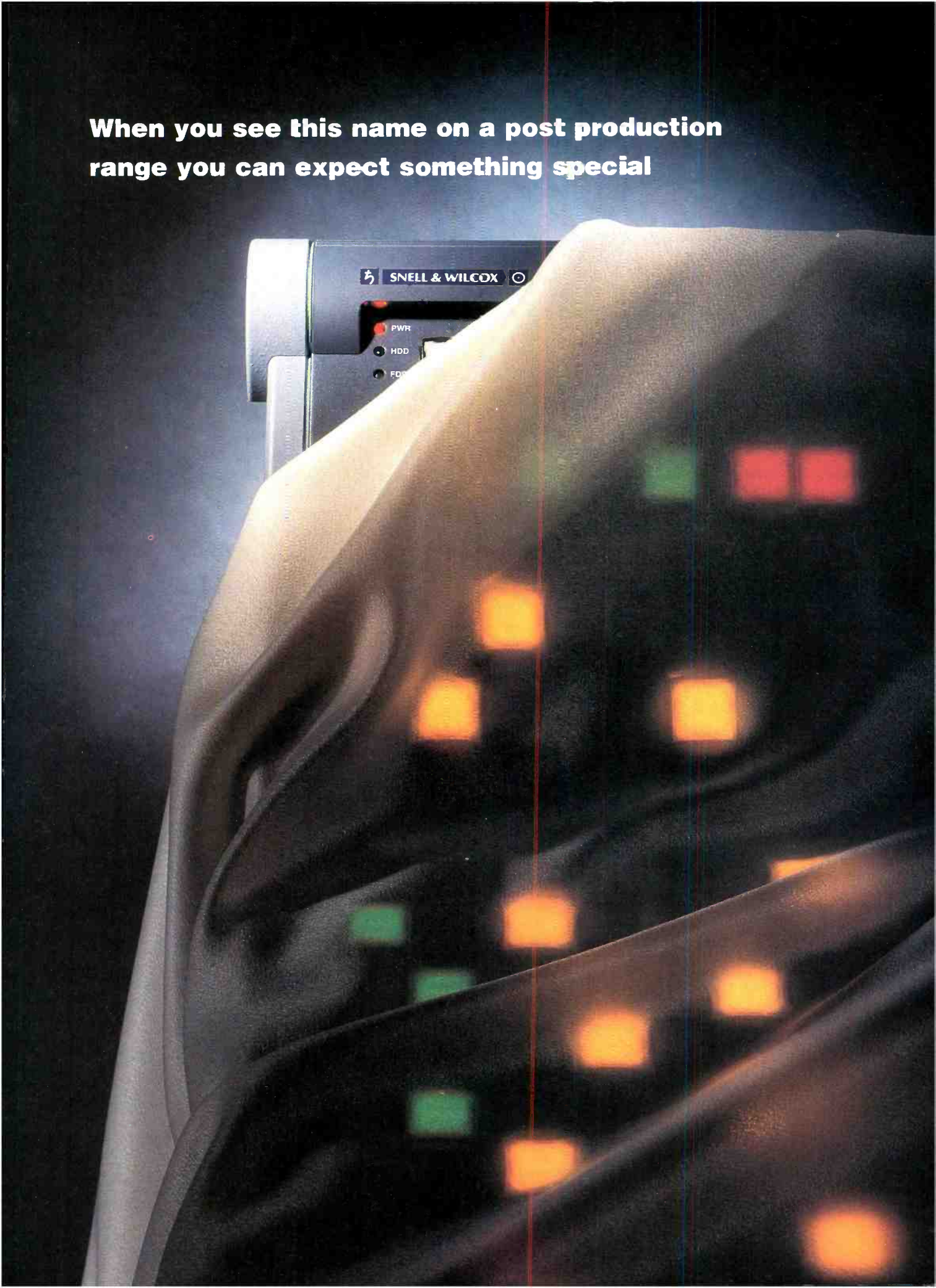
Studio Support Products & Accessories

Bradley Broadcast Sales	1903
Illbruck	2904-5
Pacific Recorders & Engineering	3025
Wheatstone Broadcast Group	4709
Tripp Communications	10656-756
EMCOR Products/Crenlo	11532
Clipper Products	11546
UniSet Corporation	11600
Winsted Corporation	11827, M1718
Beck Associates	12350
AMCO Engineering	12510
Stantron	12832
Hi-Tech Industries	12940
Pacific Radio Electronics	12946-8
Acoustic Systems	13417
Torpey Controls & Engineering	13418
Acoustical Solutions	13419
ESE	13606-8
Theatre Service & Supply	13637
Industrial Acoustic/IAC	14039
Display Devices	15268
The F J Westcott Company	15469-569
Peerless Sales Company	16012-3
Nigel B Furniture	16228
American Studio Equipment	16361
Bretford Manufacturing	16364
Hoodman Corporation	16376
Cinemills	16555
Matthews Studio Equipment	16648
DeSisti Lighting/DESMAR	16984
ERGO 90/Ergo Industries	19052
Forecast Consoles	19237
Electrorack Products	19566-67
Marco Inc.	19584-6
AMX Corporation	M1421
Anthro Technology	M1714-16

Tape, Optical Recording Media & Accessories

Apogee Electronics	1601-2
Fresh/The Music Library	2201
Gefen Systems	2304-5
U S Tape & Label	2508-9
Branson Country Music Network	2712
Fidelipac	3122
audiopak	4219
Halland Broadcast Services	5625
Killer Tracks Music	10455-755
Tripp Communications	10656-756
Audio Action	11127-8

When you see this name on a post production range you can expect something special



Digital Switcher - Analog Price

DVS1000

Component Digital Switcher & Router

A unique, compact, cost effective switcher - the DVS1000 is designed for telecine bays and other applications such as graphics, animation or presentation bays outside broadcast vehicles, small edit bays and training organisations.

It provides transparent, component digital quality, without the complexity, expense and space requirement of a conventional digital switcher.

The DVS1000 accepts 8 SDI component inputs and has 4:2:2, 10-bit processing throughout. As the unit is entirely digital, it allows maximum performance to be obtained from today's 10-bit DVTRs.

It offers an optional downstream keyer, with external key and fill, and is also available in 16:9 aspect ratio.

This is a serious switcher in a small box.

Dual Channel Effects - Single Channel Price

Magus
Digital Video Effects

Magus is a high quality 3D digital effects system, whose unique architecture enables the cost-effective single-channel production of many popular effects previously only available on dual channel DVEs (see overleaf)

The system is modular in concept, going from a 3D digital effects frame-store up to a multi-channel system, with the option of digital component layering mixer, with wipe and transparency.

All processing is done in the industry standard digital 4:2:2:4 domain, using 12 bit internal processing. Superb filtering quality and Dynamic Rounding™* ensure transparent processing quality.

SNELL & WILCOX
Engineering with Vision

Circle (63) on Reply Card

Applications

DVS1000

Component Digital Switcher & Router

- Digital quality without the price penalty
- Designed for telecine, 3D animation, graphics, special projects and simple edit applications in broadcast and post-production
- Eight channel switcher, providing 8x4 serial digital routing matrix
- Downstream keyer option with external key and fill
- Maintains 4:2:2 signal path
- Eight serial inputs of 4:2:2 video processed to full 10-bit resolution
- Multiple wipes with variable edge softness. Auto transitions, internal black and background generators
- Six integral switching busses, four output busses. External control from editor
- 525/625 Switchable
- Available in 4:3 or 16:9 aspect ratio

telecine

post-production

broadcast

satellite

editing

graphics

16:9

Applications

Magus

Digital Video Effects

- 3D effects with perspective
- Dual image effects on single channel
- Warp effects as standard
- Live, still or matte backgrounds
- High quality filtering and interpolation
- Dynamic Rounding™*
- Still store capability
- False color, quantization, pixelation and defocus which can all be manipulated within the picture
- Linear keying throughout
- Sophisticated trails and sparkles
- Extensive ripple controls
- Lighting and shading effects
- Corner positioning
- Variable strobe with motion blur effect
- GPI and serial protocol interfaces
- Selectable 4:3 or 16:9

broadcast

post-production

corporate

educational

newsroom

16:9

Examples of Magus single channel effects**

Dual source, double-sided pageturn

Push on / push off with widescreen

True 3D with intersecting planes

Warp with drop shadow over internally generated background

Circular ripples with lighting

Snell & Wilcox offices:

USA Tel: +1 408 734 1688 Fax: +1 408 734 4760 **UK** Tel: +44 (0)81 607 9455 **Germany** Tel: +49 611 99 0840

Japan Tel: +81 3 3446 3996 **Italy** Tel: +39 6 66 38 594 **France** Tel: +33 1 47 89 83 08 **Russia** Tel: +7 095 1926992

* Dynamic Rounding™ is used under license from Quantel Limited

** Off screen shots

SNELL & WILCOX

BE FASTtrack

Data Security	11155
Video Matic Group	11446
Sony Recording Media	11514
Sound Ideas	11602-3
27th Dimension Inc.	11846
Valentino Production Music	12102-3
Capitol Production Music	12904
MSE Video Tape Services	13046
Promusic	13047-8
Network Music	13122
Production Garden Library	13346-7
TRF Production Music Libraries	13427-8
Optimum Productions	13429
H L Dalis	13430
Garner Industries	13621-2
FirstCom/Jim Long Companies	13623-25
Manhattan Production Music	13633
United Ad Label	13639-739
Vistek Electronics	13835
Research Technology Int'l./RTI	13845-14054
Professional Label Inc.	15728
Carpel Video	16232-332
3M Pro A/V Products	16312
Omnimusic	16802-902
Ampex Corporation	17401
Videomagnetics Inc.	17722-922
Storeel	18114
Maxell Corporation of America	18136
DIC Digital	18385
Aircraft Production Music Libraries	19203-4
CBS News Archives	M1705
Sonic Science	M2209

Test and Measurement Equipment

Schmid Telecommunication	1815-17
Boonton Electronics Corporation	2107
Kintronic Laboratories	2119
Neutrik USA	2127
Neutrik Instrumentation	2127
Potomac Instruments	2510-11
Logitek	2725
Bird Electronic Corporation	2901-2
Broadcasters General Store	3007
Belar Electronics Lab	3119
Crown International	3203
Audio Precision	4113
Selco Products	4121
Coaxial Dynamics	5013-14
RCI Systems Inc	10361
Telecast Fiber Systems	10458-558
Video Accessory	11126
Techflex	11261
AVCOM of VA	11502
Techni-Tool	11547-8
Minolta	11605-6
Multidyne Electronics	12262
Beck Associates	12350
Horita	12650
Faraday Technology Ltd.	12762
Leader Instruments	12803-6
Holaday Industries	12908
McCurdy Radio Industries	13110
Microwave Filter/Comband	13240
Tally Display Corporation	13259
Tentel	13407-408
Television Equipment Associates	13410-411
H L Dalis	13430
Clark Wire & Cable	13604-5
Microvideo Ltd.	13626
Antenna Technology Corp./ATCi	13643-14043
VDP/Video Design Pro	13840-040
Altronics Research	15800-2
LDL Communications/Larcan	15855
Computer Assisted Technologies	16337-339
ScheduALL by Visual Inc.	16340-41
Gennum/Video-Broadcast	16385
Dorrough Electronics	16443-4
Milestek	16445
Tektronix	16528
Elantec Inc.	16574

BE FASTtrack

Jensen Tools	16609
Philips TV Test Equipment A/S	16811-5
Veetronix Inc./Reach	16909
Marconi Communications Systems	17101
Magni Systems	17284
ASACA ShibaSoku	17406
James Grunder & Associates	17436
Hamlet	17436
ComTek	17521-721
CAMPLEX/Concept W Systems	17784
Videotek	18132
Wohler Technologies	18369-569
RE Electronics	18378-478
AAVS/Sencore	19623
Hewlett-Packard	19656

Vehicles & Remote Support Equipment

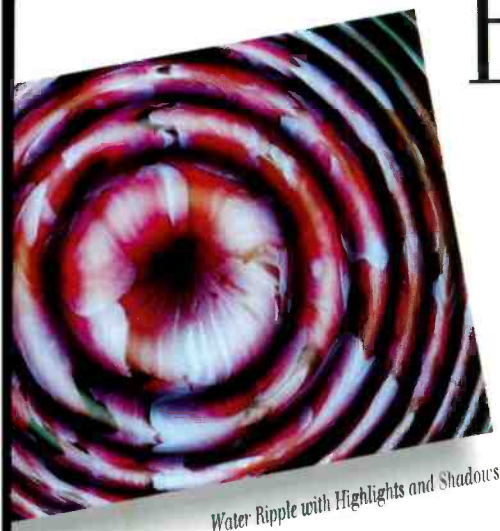
Shook Electronics	A1
E-Z UP International	4821-2
KD Kanopy	5204-5
Telepak San Diego	11102-3
Keystone Communications	11228
Clipper Products	11546
Thermodyne International	13114
Television Engineering	13116
Anvil Cases	13126
Wescam Systems International	15470-570
Professional Label Inc.	15728
Wolf Coach	15862
Will-Burt	16114-5
AF Associates	16338
Calzone Case	16758
Nalpak Sales	16964
ENG Mobile Systems	17043
Hardigg Industries	19351-451
Advent Communications	19377
BAF Communication	19652

Wire, Cable, Connectors

Neutrik USA	2127
Delco Wire & Cable	2204-5
DGS Pro Audio	4605
Switchcraft	5010-11
Professional Sound Corporation	5116-7
RCI Systems Inc.	10361
Canare Cable	11118-22
LEMO USA	11222
Whirlwind/US Audio	12507
Trompeter Electronics	12800-1
GEPCO International	13251
Mohawk/CDT Broadcast Cables	13404
H L Dalis	13430
Wireworks	13602-3
Clark Wire & Cable	13604-5
Connectronics	13627
Nemal Electronics International	13636
United Ad Label	13639-739
Audio Accessories	13642-742
Union Connector	16358-9-459
Milestek	16445
Insulated Wire	16571
VEAM	16659-759
TECNEC/Technical Necessities	16711
Kings Electronics	17821-921
Belden Wire and Cable	19223
West Penn Wire/CDT	19570
ADC Telecommunications	19935
Extron Electronics	M 319

What's a Page Turn Without Different Video Front and Back...or a Ripple Without Shading...or a Four-Corner Page Peel That Takes More Than One Pass?

Single-Pass, Double Page Turn



Water Ripple with Highlights and Shadows

Single-Pass, Four Corner Page Peel

Clearly it's not a Refractor curvilinear effect from Pinnacle. While others in our price range can only make waves we do it all. Harness the power of the Prizm Video WorkStation with Refractor.

See us at NAB, Booth #18380.

PINNACLE

870 West Maude Avenue, Sunnyvale, CA 94086 Phone: (408) 720-9669 Sales Offices: Midwestern U.S. & Canada: Phone: (513) 446-3168 Northeastern U.S. & Canada: Phone (203) 870-8051 Southeastern U.S. :Phone: (904) 769-4061 Western U.S., Canada & Mexico: Phone: (408) 720-9669 Northern & Eastern Europe: Phone: +44-932-848806 (United Kingdom) Southern Europe, Africa & Middle East: Phone: +32-2-6462122 (Belgium)

Circle (173) on Reply Card

The Aphex Air Chain has given stations throughout the world more listeners by increasing fringe area coverage and reducing multipath distortion. After installing the Air Chain, WDRE-FM, a suburban New York City station, is reaching over *one million* more people! And their listeners are staying tuned in longer. Why? Because the Aphex Air Chain is the cleanest, most natural sounding processing available–regardless of music format–while still maintaining competitive loudness.

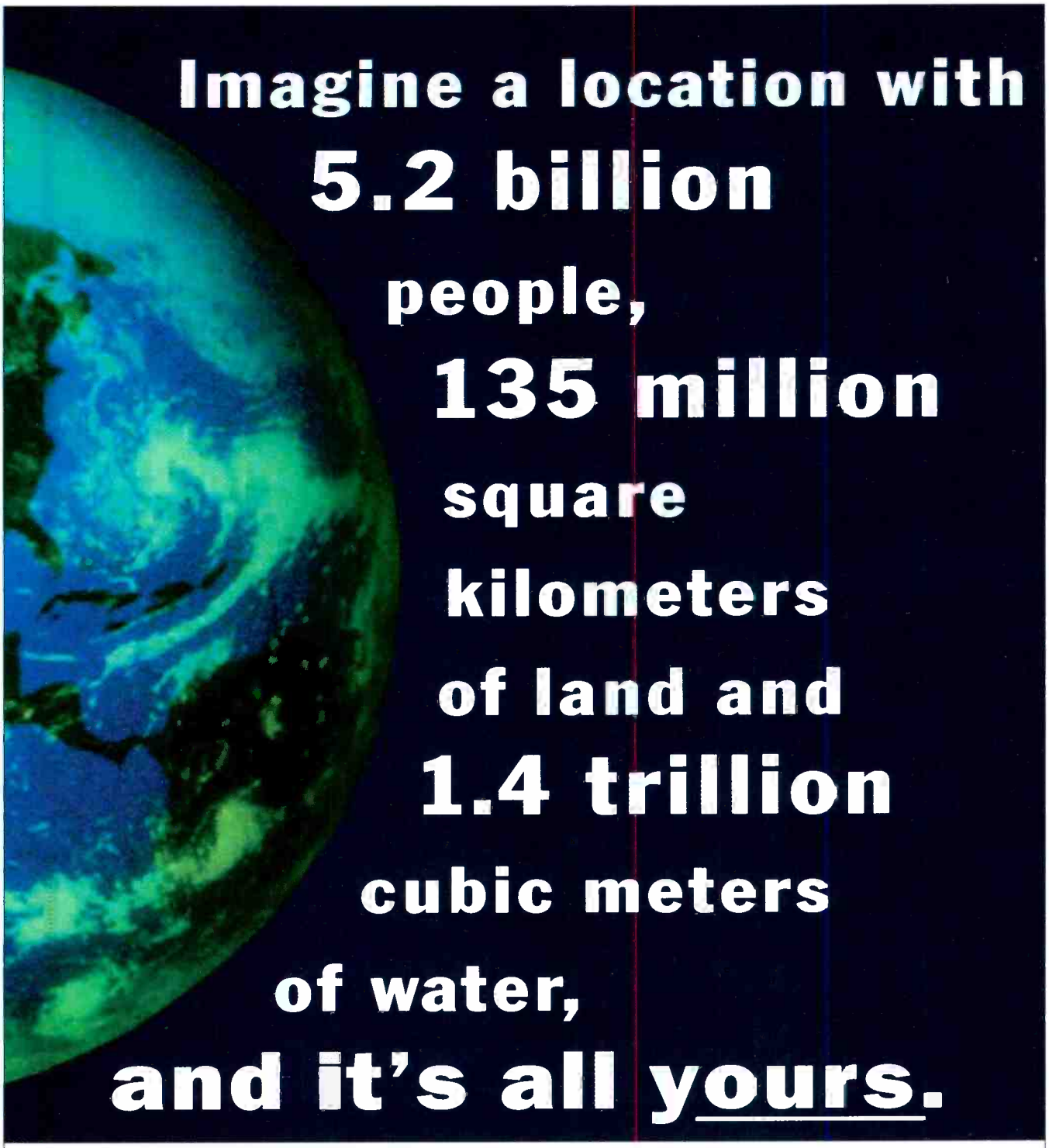
If you want to reach more listeners and keep them tuned in longer, call us today for your "Pick Up Listeners Anywhere" package.

APHEX SYSTEMS

Improving the way the world sounds[SM]

11068 Randall Street, Sun Valley, CA 91352 • Tel: 818-767-2929, Fax: 818-767-2641

Circle (174) on Reply Card



France Telecom proves it at NAB '95.

We'll be sending broadcasters' NAB coverage around the world via our ad-hoc digital video services. Come and take advantage of our transmission facilities and see how the world can be yours in the **NAB Broadcasters' Executive Lounge** sponsored by France Telecom, **Room N243, LVCC.**

France Telecom

KEYSTONE COMMUNICATIONS

MAXAT

Circle (67) on Reply Card

Exhibitor Highlights

A comprehensive listing by company of product introductions for the 1995 NAB Convention.

Once again, Las Vegas calls us for the annual NAB Convention. It's time to get ready for the daily exhibit floor walkabout. There's nothing more thrilling than exploring hundreds of exhibits demonstrating the latest technology. It can also be overwhelming and exhausting wandering around in that massive exhibit hall trying to locate the booths you want to see.

Well, ***BE's** Exhibitor Highlights* is your tour guide. Use it to pinpoint the companies you want to explore. The *Exhibitor Highlights* is a preview of products and services to be shown on the convention floor.

Booth numbers are based on information provided by NAB as of Feb. 1, 1995. An M in front of a booth number indicates that the company is exhibiting in the multimedia exhibit.

FASTtrack

If you are looking for a specific type of product, use the ***BE** FASTtrack* listing, which begins on p. 84. It provides you with a list of companies and booth numbers, based on booth location. Following the route in the *FASTtrack* will shorten your trek to finding the products you need.

New exhibit area

S-6 is a newly opened exhibit hall. Any late additions for the main and multimedia hall will be listed in the S-6 Hall listings that begin on p. 182. See the map on p. 184 and 185.

A

AAVS/Sencore 19623
Introducing DSA309 digital video studio analyzer.
Circle (301) on Reply Card

ABC Digital/Australian Broadcasting 5627
Digital audio recording products.
Circle (302) on Reply Card

Abekas Video Systems 11853
Introducing Texus character generator provides, six attributes per character, Postscript Level II interpreter, imports TIFF graphics; Clipstore scalable server for stills, full-motion audio/video clips; Diskus real-time, 10-bit disk recorder, 30s or 60s of CCIR-601 recording capacity; Hexus multichannel, multi-user recorder with six record/playback channels available to four users; ASWR8100 component digital switcher; A57/51 digital special effects system; A83 component digital switcher.
Circle (303) on Reply Card

Accom 15766
Introducing ELSET virtual 3-D environment, allows cameras to zoom, pan, enabling presenters to walk around computer-generated 3-D backgrounds; WSD/XL 62s digital video disk recorder; Brontostore video server; Axial 2010 on-line editor; RAVE Random Access Visual Editing; RTD disk recorder.
Circle (304) on Reply Card

Accu-Weather 19205-8
UltraGraphix-32 weather system with Virtual Weather Flythrough using Pentium PC; Front Door 7000 for high-speed, dial-up, real-time satellite and NEXRAD images, maps, features; NEXRAD Storm Tracker severe weather forecast graphics; FirstWarn automatically generates crawls and graphics from NOAA weather line; Meteorology School educational program; Ray-Ban UV Index.
Circle (305) on Reply Card

Acoustic Systems 13417
Announcer facilities, voice-over booth.
Circle (306) on Reply Card

Acoustical Solutions 13419
Acoustic treatments including AlphaSorb wall panels and hanging baffles; Audio Seal sound barrier; modular recording booth, 4'x3'4"x6'6."
Circle (307) on Reply Card

Acrodyne Industries 13821
Introducing TRU/60KD Diacrode-equipped 40-60KW UHF transmitter; TLU/100E 100W, TLU/1KE 1kW, TLU/1KE 2kW solid-state LPTV UHF transmitters; TRU/1K 1kW, TRU/2K 2kW, TRU/5K, TRU/10K solid-state UHF transmitters.
Circle (308) on Reply Card

Adams-Smith 3613
Augan digital audio workstations.
Circle (309) on Reply Card

ADC Telecommunications 19935
Signal distribution products, LightSwitch fiber/coax digital routers and video converters; "true 75Ω" BNC connector family; S-8 RS-422 patchbay.
Circle (310) on Reply Card

ADCOM 16804
NIGHT Suite D-1 non-linear video production system.
Circle (311) on Reply Card

Adda Technologies M 315
Circle (960) on Reply Card

ADM Systems 17836
Audio mixing consoles.
Circle (312) on Reply Card

Adobe Systems M1609
Adobe Premiere 4.0 for Macintosh and Windows.
Circle (313) on Reply Card

Adrienne Electronics 13640-740
Introducing AEC-Box 30G serial LTC data inserter with LTC generator; AEC-Box-60 video sync monitor, RS-232/422 output; Windows interface for existing PC-based time-code boards.
Circle (314) on Reply Card

ADT 12107
Circle (961) on Reply Card

Adtec Productions 13262
Introducing Ad Maestro low-cost network commercial inserter; Lite-Ning automated playback controller (V 2.0); Active Broadcasting System automation system; Operator, on-demand remote-control device.
Circle (315) on Reply Card

Advanced Broadcast Systems 10161-261
CST computer supervised IOT UHF TV transmitters with integrated remote control, autologging; HEPS BCD pulser to cut power costs with klystron-based transmitters.
Circle (316) on Reply Card

Advanced Designs 12905-6
Introducing enhanced 32-bit radar graphics display with street-level mapping, Storm Path Analyzer; 32-bit time lapsing; 32-bit NEXRAD display with street-level mapping.
Circle (317) on Reply Card

Advanced Digital Imaging 15169-369
Digital Magic non-linear editing, compositing, special effects and rotoscoping; direct QuickTime control; Adobe Premiere editing interface; CoSA special effects; Photoshop frame-by-frame editing.
Circle (318) on Reply Card

Advanced Imaging M 413
Circle (962) on Reply Card

Advent Communications 19377
D-SNG NewSwift motorized/vehicular and NewSwift Flyaway, world's smallest systems; D-SNG C-band Mantis Flyaway; digital and analog products; communications packages; test, monitoring system; remote-control systems; exciters, converters, receivers, modulators; VSAT, DAMA.
Circle (319) on Reply Card

VIDEO EXPLORER®

Providing the highest quality digital video for desktop video solutions.

Fox Television, NBC, BBC, ITN, Editel, Post Perfect, the 1994 Winter Olympics, and the Academy Awards – broadcast, post production, design, and multimedia companies worldwide depend on the quality and creative flexibility of the Video Explorer system to provide quantifiable broadcast quality video from a personal computer. The core of complete modular video systems, Video Explorer is transforming the professional video industry with advanced solutions for compositing, animation, graphics, character generation and much more.

Animation & Graphics

The broad range of available software such as Electric Image™, Linker Systems Animation Stand™, Fractal Designs Painter™, Crystal Graphics Crystal Topaz™, and Adobe Photoshop™, plus the highest quality video input/output, makes Video Explorer the platform of choice for both animators and designers alike. Employ multiple high-end graphics and animation stations for less than the cost of a single dedicated electronic paint system.

Character Generation and Video Tools

Put a Video Explorer and a Macintosh personal computer in your on-line suite to keep edit sessions moving smoothly:

- Directly import/export computer graphics and logos to your switcher or paint system in real time.

- Perform touch-ups on shots and create complex mattes, right in the edit suite, for a fraction of the cost of traditional methods.
- Make thousands of fonts, textures, filters and more available to your electronic paint system.
- Eliminates slow ethernet and Exabyte file transfers.

Compositing & Rotoscoping

Create high-quality, low-cost multi-layer compositing, special effects and graphics over video by integrating Video Explorer with ADI's Digital Magic™ and QuickTime™ compatible software such as Adobe After Effects™ and Adobe Premiere™.

Computer Images

Effects

Video Clips

Composite

Scrolled Type

System Features

- The Video Explorer system provides uncompromised image quality in:
  - **Component Digital** (CCIR 601),
  - **Multi-Component** (including MII, Betacam, SMPTE YUV, & RGB),
  - **RGB**, and
  - **YC/Composite Modules.**
- Achieve **uncompressed digital video** for multiple video inputs and outputs as well as integration with third-party products such as digital disk recorders. All this is possible through VideoBahn®, Intelligent Resources' industry standard real-time video bus.
- Video Explorer configurations support **NTSC, PAL, SECAM,** and Macintosh video rates.
- Requires a Macintosh personal computer with 12 inch NuBus slots.

Systems start as low as **$3995.**

Contact Intelligent Resources at **708-670-9388** for more information and the name of your nearest dealer.

INTELLIGENT RESOURCES

I N T E G R A T E D S Y S T E M S

3030 Salt Creek Lane, Suite 100, Arlington Heights, IL U.S.A. 60005-5000
Phone: (708) 670-9388 Fax: (708) 670-0585

Visit us at Booth 20048

NAB95

SUNDAY, APRIL 9 – THURSDAY, APRIL 13, 1995
LAS VEGAS CONVENTION CENTER

Circle (68) on Reply Card

AF Associates 16338
Tapeless digital technology; digital server systems; advanced post-production digital technology; turnkey systems design, engineering and fabrication; consulting engineering services; Radamec-EPO camera robotics; digital computer and disk-based solutions for broadcast and post- production.
Circle (320) on Reply Card

AfterGlow Inc. 16585
Circle (963) on Reply Card

Aircraft Production Music Libraries 19203-4
Music libraries on more than 70 CDs; introducing "Jazzvertising" jazz-based rhythm tracks; "Co-pilot" split tracks for customizing.
Circle (321) on Reply Card

AKAI Digital 5021
Digital recorders, including the DR8 hard-disk recorder; MT8 Mix tab, DD1500 digital audio workstation.
Circle (322) on Reply Card

AKG Acoustics/Harman Pro Audio 2910
Circle (964) on Reply Card

Alamar Electronics USA 11829
Automation control products and software including MC-series station automation systems, Media Manager library database and satellite resource management.
Circle (323) on Reply Card

Alcatel Network Systems 18084
Microwave link products; TM 400 series for audio, video.
Circle (324) on Reply Card

Alden Electronics 12901
Weather graphics systems; NEXRAD data demonstrations.
Circle (325) on Reply Card

Alesis 18372
Digital audio products, ADAT multitrack recorder, remote-control equipment.
Circle (326) on Reply Card

Alexander Batteries 11116
Batteries and battery maintenance equipment, tri-analyzers, smart chargers.
Circle (327) on Reply Card

Algo Rhythmic Technology 1916-7
Circle (965) on Reply Card

Alias Research 15179
Graphics software, Animator, PowerAnimator 3-D modeling, rendering, animation.
Circle (328) on Reply Card

Allen Avionics 19211-2
HEC-2000H, HEC-3000 hum eliminators; mini low-pass, CCIR 60 and HDTV filters; VNE-75-3 3-channel video noise reducer; VTE-75-3 3-channel isolation transformer.
Circle (329) on Reply Card

Allen Osborne Associates 19877-977
Featuring Hilomasts, telescopic pneumatic-operation masts for remote ENG, field testing, surveillance applications.
Circle (330) on Reply Card

Alpha Image/Dynatech Video Group 17124
See Dynatech Video Group.
Circle (331) on Reply Card

Alpha Lyracom/Panamsat 10049
Program distribution, global satellite services; syndication services; ad hoc and special events coverage; satellite news gathering.
Circle (332) on Reply Card

Altronics Research 15800-2
Model 3500 digital calorimeter for air-cooled dummy loads; featuring standard line of air- and water-cooled dummy loads.
Circle (333) on Reply Card

AMCO Engineering 12510
Equipment enclosures; introducing an extended line of enclosures for monitoring applications.
Circle (334) on Reply Card

AMEK Consoles 19348
A new console will be shown with 2-input paths, 4-band EQ per input module, routing to 24 buses, 16 aux sends, Supertrue fader/mute automation, Recall, Virtual Dynamics; 9080 console, designed by Rupert Neve; Big by Langley console; 501 and Recall by Langley.
Circle (335) on Reply Card

American Broadcast Systems 15729-829
Automation systems.
Circle (336) on Reply Card

American Studio Equipment 16361
Motion picture equipment; grip products; rental programs.
Circle (337) on Reply Card

pro-bel

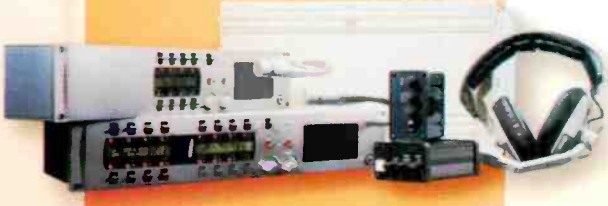
At the Heart of your System

Digital Test Equipment

Control Panels

Signal Processing & Distribution

HD Series Routers



Trilogy Commander Intercom

NAB: Introducing TX-220 Digital Master Control
COMPASS Broadcast Automation
MENTOR SPG
BOOTH S203, DISPLAYING BOOTH 11216

Procion Control Systems

The **pro-bel** Group of companies – Pro-Bel, Procion Innovative Control Systems and Trilogy Broadcast combine their resources to bring you complete systems capability.

- ANALOG A/V ROUTERS
- DIGITAL A/V ROUTERS
- INTERCOM SYSTEMS
- TOUCH SCREEN APPLICATIONS
- MODULAR TERMINAL EQUIPMENT
- PROTOCOL CONVERTERS
- SYNC PULSE GENERATORS
- USER FRIENDLY CONTROLLERS

AND MUCH MORE

pro-bel INC

4480 North Shallowford Rd.
Dunwoody, GA 30338-6410

Telephone: (404) 396-1971
Fax: (404) 396-0595

Atlanta • San Francisco • Boston • Orlando *and growing!*

Circle (85) on Reply Card

Ampex Corporation **17401**
Featuring the DCT line including DCT 1700d tape drive, DCT 700s switcher, DCT 500a digital effects, DCT 700e editor.
Circle (338) on Reply Card

AmPro **M1627**
Multimedia video projection systems.
Circle (339) on Reply Card

Amtel Systems **16804**
Editing controllers, E-Trax workstations and E-Pix interface products.
Circle (340) on Reply Card

AMX Corporation **M1421**
Teleconferencing, multimedia products.
Circle (341) on Reply Card

Anacapa Micro Products **M 819**
Circle (966) on Reply Card

Anchor Audio/ROH **11504-6**
Intercom systems, introducing the 2-channel wired PORTACOM; sound systems, including Voyager PB-3000.
Circle (342) on Reply Card

Andrew Corporation **19914**
Introducing vertically polarized Shadowmaster antenna; 6-foot STL grid antennas; 3⅛" HRLine rigid line; EW20 elliptical waveguide wideband connectors; top-mount ALP antennas; Digital ValuLink; 4.5M dual-reflector earth station antenna; MT 050 low-volume automatic membrane, MRS 052 Slim Line manual regenerative dehydrators.
Circle (343) on Reply Card

Angenieux SA **19226**
Video camera lens systems.
Circle (344) on Reply Card

NAC Visual Systems/Angenieux **19226**
Video camera lens systems including the ⅔" 15x8.3 AIF (assisted internal focus) lightweight lens for ENG; the 62x9.5 AIF ⅔" OB lens.
Circle (345) on Reply Card

Antenna Concepts **19375**
UHF and VHF antennas from low to high power, in slot, panel and corner reflector designs; high gain CP Blaster for LPTV directional patterns; introducing CP FM panel transmit antennas covering the entire FM band; transportable omnidirectional VHF antennas.
Circle (346) on Reply Card

Antenna Technology Corp./ATCi **13643-14043**
Featuring Vanguarde spectrum analyzer, satellite receiver, monitor; SimulSat multibeam antennas; PROFLine electronics; voice and data systems; satellite videoconferencing equipment.
Circle (347) on Reply Card

Anthro Technology **M1714-16**
Facilities furnishings; introducing Anthro editing stations, a modular, mobile and adjustable work unit; holds monitors, rack equipment, digitizers, printers, large keyboards.
Circle (348) on Reply Card

Anton/Bauer **11210**
Introducing Digital Trimpac, capacity of more than two times OEM slide-in batteries, onboard "fuel computer;" Lifesaver Dual and Q2 2-position chargers; Ultralight Satellight includes Ultralight2 mated with Gold Mount bracket; featuring Logic Series InterActive batteries, Microprocessor chargers.
Circle (349) on Reply Card

Anvil Cases **13126**
Transport cases for delicate equipment, A.I.R. isolated rack types.
Circle (350) on Reply Card

Aphex Systems **2125**
Model 107 Tubessence tube type 2-channel mic pre-amp; model 722 Dominator includes defeatable pre-, de-emphasis.
Circle (351) on Reply Card

Apogee Electronics **1601-2**
Model AD-1000 digital conversion system; Wyde-Eye digital audio cable; Master Digital audiotape; UV1000 super CD encoder; Master Tools mastering software for Digidesign.
Circle (352) on Reply Card

Apple Computer Company **M1403**
Personal computers, multimedia equipment.
Circle (353) on Reply Card

Array Microsystems **M1434**
Circle (967) on Reply Card

Arriflex **17152**
Motion picture cameras, Arriflex 535; support products; ARRI geared head; lighting products.
Circle (354) on Reply Card

BEAMING-UP EASY AS...

(Watch out for changing frequencies!)

1

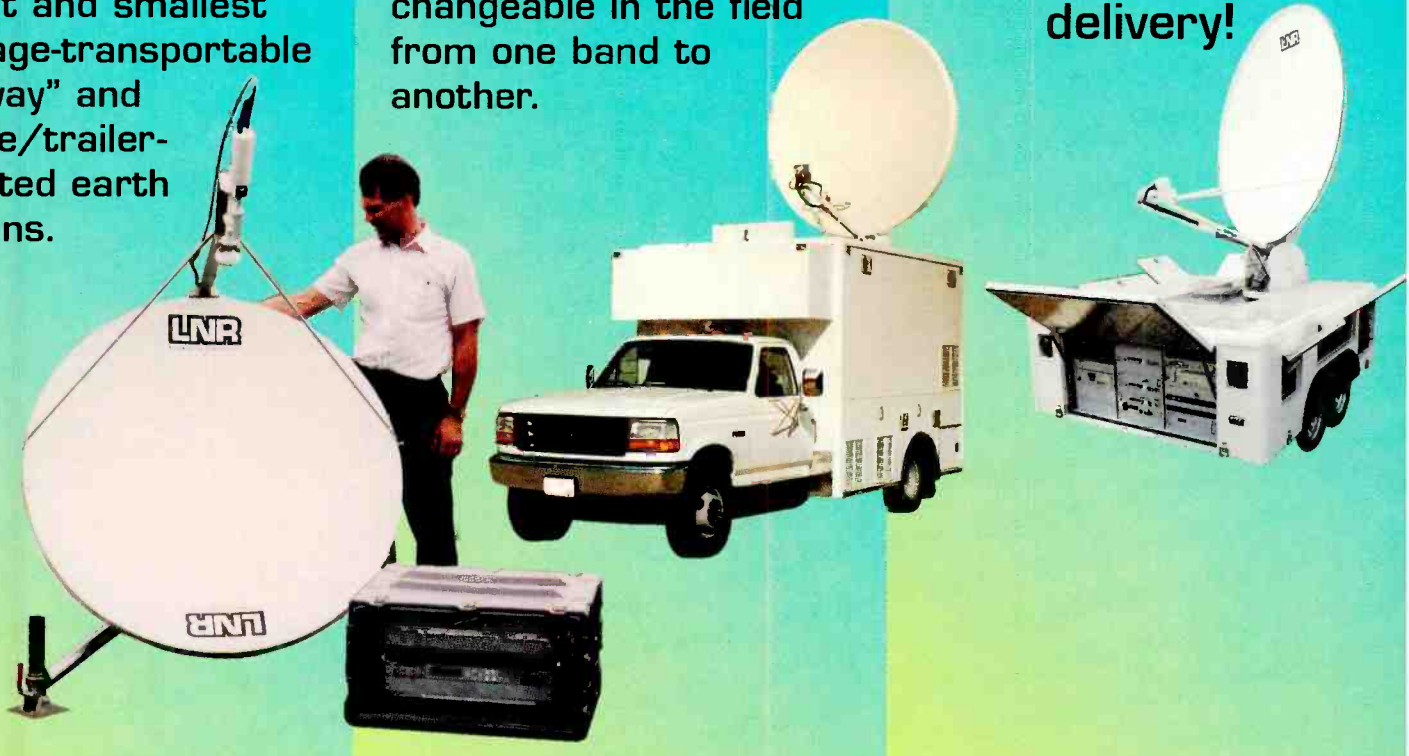
LNR offers lightest weight and smallest baggage-transportable "flyaway" and vehicle/trailer-mounted earth stations.

2

Cost-effective and easily changeable in the field from one band to another.

3

Available on short delivery!



Sample of available systems configurations from the pioneers of the digital broadcast quality and audio distribution systems via satellite...

Model	Service	Format	Antenna Size	Band*	Space Segment	Satellite Example
DVF-C	Video	Digital	1.9 / 2.4	C	8 MHz	Intelsat
DVF-K	Video	Digital	1.2	Ku	8 MHz	Intelsat
AVF-C	Video	Analog	2.4	C	22 to 36 MHz	Regional
AVF-K	Video	Analog	1.9	Ku	22 to 36 MHz	All
TRILITE™	Data/Voice/Fax	Digital	1.2 / 1.9 / 2.4	C, X, and/or Ku		All
X-LITE™	Data/Voice/Fax	Digital	2.4	X		DSCS/NATO
DVF-CI	Disaster Recovery	2.Mb Duplex	2.4	C	5 MHz	Intelsat
MVC-10	Data/Voice/Fax Order Wire	128Kb Duplex		C, X, and/or Ku		All

**Note: All Systems Can be Configured for One Band or Multibands*

For your mobile terminal requirements take advantage of LNR's in-depth capability. Contact our Marketing Department for more information.

YOUR DIGITAL AND ANALOG COMMUNICATIONS CONNECTION

LNR COMMUNICATIONS INC. 180 MARCUS BLVD. • HAUPPAUGE, NY 11788-3795 • TEL: (516) 273-7111 • FAX: (516) 273-7119

See us at NAB Booth #2416 Radio Hall.

Circle (55) on Reply Card

ASACA ShibaSoku **17406**
Audio analyzers; audio, video routers; multiformat, digital control and auto setup monitors; closed-captioning equipment; decoders, encoders; DAs; envelope delay measuring sets; erasable rewritable MO disk audio files; still-tores; dropout counters; GCR, HDTV motion picture memory; digital IF demod; HR color monitors; test signal, sync generators.
Circle (355) on Reply Card

ASC Audio Video Corporation **19784**
Expanded Virtual Recorder (VR) line; VR playlist; VR NLE on-line, non-linear editor; VR Sports slow-motion controller; VR Delay 2-VR switcherless system for simultaneous, variably delayed record/playback; VR Cache 2 VR system combining VR Delay, Playlist; VR MediaNet enables shared storage, multiple VR systems access same media.
Circle (356) on Reply Card

AT&T **15740**
Telephone, program transmission services.
Circle (358) on Reply Card

ATI Audio Technologies **16602-702**
Small format audio mixers; mic, headphone, line, monitor, turntable, interface, utility amps, audio DAs; metering systems.
Circle (359) on Reply Card

Audi-Cord **4416**
Audio cart recorders/players, DL series and S series.
Circle (360) on Reply Card

Audio Accessories **13642-742**
Introducing Project Patch reconfigurable interface system for easy, fast studio wiring through pre-terminated patchbays and cables.
Circle (361) on Reply Card

Audio Action **11127-8**
Production music library on CD format.
Circle (362) on Reply Card

Audio Developments **3910-11**
Introducing AD006 compact meter bridge for AD116, AD118; AD146 stereo mic module, T powering options; AD148 4-output MS-compatible edit mixer; Portaflex series, ENG mixers, Location mixers; Flexilink system; Flex EQ, Constant Q, Parametric Q.
Circle (363) on Reply Card

Audio Intervisual Design **2203**
Microphones.
Circle (364) on Reply Card

Audio Precision **4113**
Introducing System Two audio analyzer; APWIN Windows-based audio test software for Systems One and Two; GAT-1 GPIB interface translator for System One; PCMCIA interface for Systems One, Two.
Circle (365) on Reply Card

Audio Processing Technology Ltd. **4007-9**
Digital audio processing units using data compression, apt-X 100 system.
Circle (366) on Reply Card

Audio Services Corporation **3607**
Distributor: Audio mixers, speakers; wireless boompole; Stellavox, Fostex DAT recorders; Microtec-Gefell microphones.
Circle (367) on Reply Card

Audio Technica US **11206**
AT4050/CM5 capacitor mic for studio; MX341a SmartMixer automatic mic mixer; ATH-M40, ATH-D40 precision headphones; ATM75 headworn condenser, AT873R handheld condenser, ATM10a condenser, MT858 gooseneck mics; AT851b, AT835b line cardioid shotgun mics; COM1, COM2 headsets.
Circle (368) on Reply Card

Audioarts Engineering **2211**
Audio mixing consoles.
Circle (369) on Reply Card

audiopak **4219**
Tape cartridges A-2, AA-3, AA-4; lubricated audiotape formulas 605, 613, 614.
Circle (370) on Reply Card

Auditronics **2721**
Audio mixers, 210 series radio on-air, 900 series TV news/production; 1900 series IFB/mix-minus system; Destiny 2000 program management systems with control console, control software and 200MB computer.
Circle (371) on Reply Card

Augan Instruments **3613**
Digital audio workstations.
Circle (372) on Reply Card

Aurora Systems/Chyron Group **19401**
Freedom series graphic software for SGI platforms, including the Eagle 64-bit 4:4:4 package; Independence paint-only graphics package with paint, rotoscope tools; Liberty paint, animation, compositing tools.
Circle (373) on Reply Card

Autodesk **15184**
Graphics software, 3-D Studio animation tools.
Circle (374) on Reply Card

Autogram Corporation **4719-21**
Introducing Autogram CYA-3; featuring the AC-8, R/TV-20, Pacemaker and Minimix audio consoles; Autoclock time and temperature device, Autocount counter.
Circle (375) on Reply Card

AVCOM of VA **11502**
Portable spectrum analyzers (PSA-65A, -37D); network/spectrum analyzers; SCS, SCBC, video satellite receivers; microwave transmission equipment; portable test receivers PTR-25A; microwave sweep generators; MSG-5, -1000D, -1750A).
Circle (376) on Reply Card

Avid Media Group **M 117**
Circle (969) on Reply Card

AVID Technology **19539, M1515**
Introducing Avid/Ikegami dockable, disk-based video camera; AvidNews newsroom computer system; featuring Media Composer series; NewsCutter non-linear editor; Airplay playback system; Media Suite desktop video production system; AvidNet ATM; MediaServer production server/library solutions.
Circle (377) on Reply Card

Avitel Electronics **12942-4**
DSC 1100 signal corrector; under monitor displays; serial digital terminal equipment with DAs, D/As, serializers, deserializers.
Circle (378) on Reply Card

Axcess Global Communications **5115**
Communications products using subcarriers.
Circle (379) on Reply Card

Aydin West **15176-376**
High-power amplifiers for satellite uplink; TWT, klystron power amplifiers for S, C, X, Ku bands; magnetic assemblies for broadcast applications; turnkey TV transmitter upgrade service with high-efficiency UHF klystrons.
Circle (380) on Reply Card

B

BAF Communication **19652**
SNV, ENG and remote production vehicles, including SNV FE-42d 7-rack system, SNV-19 E-350 Ford with 1.5M ES antenna and ENG-19 E-350 Ford Van.
Circle (381) on Reply Card

Balboa Capital **10459-559**
Financial institution.
Circle (382) on Reply Card

Balcar **17164**
TWINLITE modular lighting fixtures in Fluxlite fluorescent line, 2 one-lamp lightheads operated with remote ballast.
Circle (383) on Reply Card

Band Pro Film/Video **18370-870**
Introducing Elmo Pen camera UN-411E 1/3" diameter color camera; DuoPod compact camera support; featuring CAMS remote-control system, Goblin folding dolly, Genio wireless remote lens control; Crosziiel lans mount bracket, idler gears; Microshot remote pan/tilt head; Sony XC-999 miniature camera.
Circle (384) on Reply Card

BARCO Industries **11450**
Introducing CVM 3237 14-inch 900-line, CVM 3670 26-inch, CVM 3051iH 20-inch 900-line monitors from CVM 3000 series; 10-bit digital input for CVM 3000 series monitors; digital video link fiber-optic monitor interface.
Circle (385) on Reply Card

Barco-EMT **11450**
Digital cartridge recorders, players EMT-460, 461; EMT-710 audio router.
Circle (386) on Reply Card

BCS Broadcast Store **13242**
Broadcast equipment sales, brokerage.
Circle (387) on Reply Card

Beck Associates **12350**
Introducing flexible, durable knock-down console, rack series; combination VU and phase meter; serial control patch panel; audio level matching unit.
Circle (388) on Reply Card

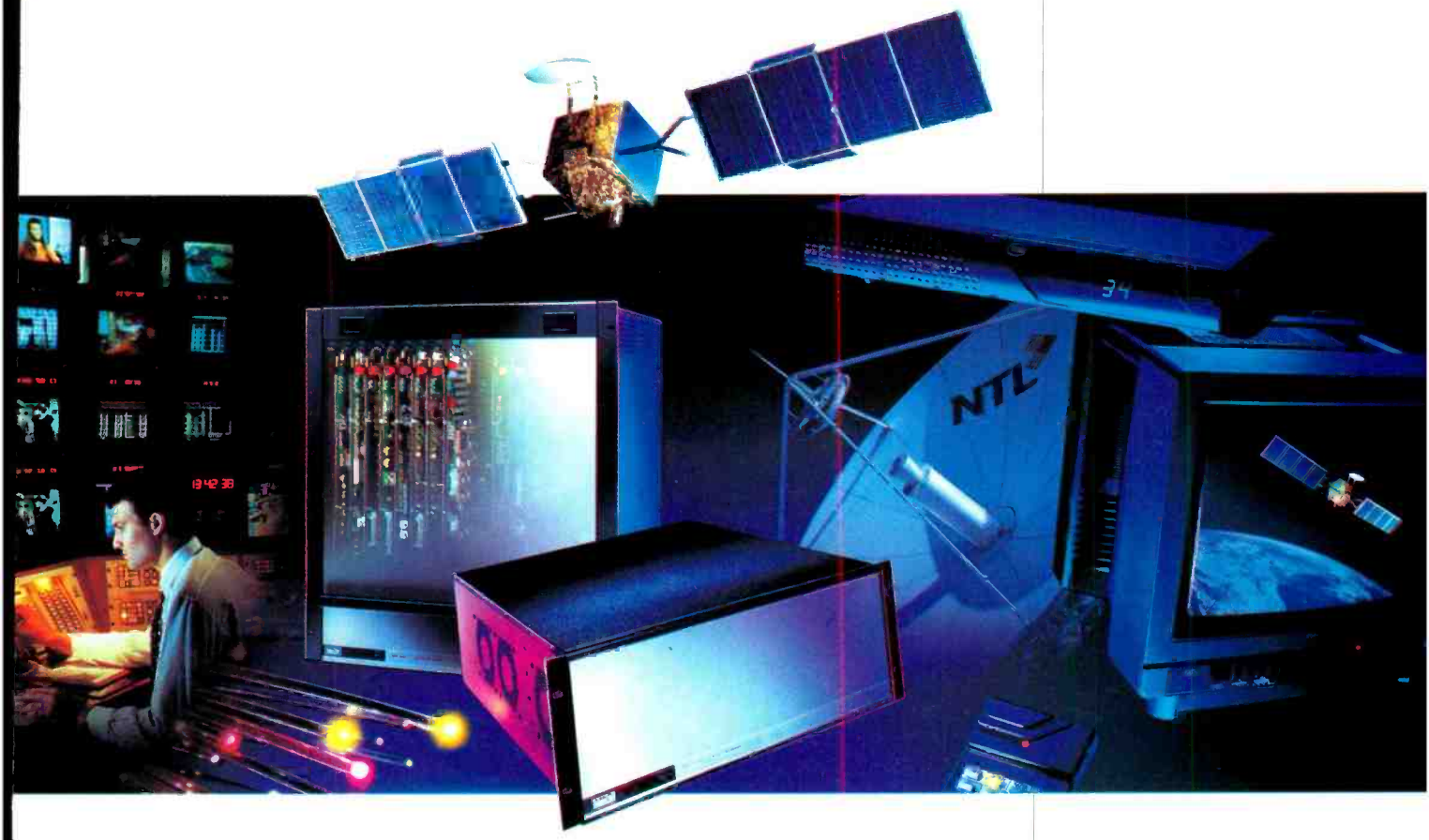
Belar Electronics Lab **3119**
Modulation monitors for radio, TV/FM/AM; The Wizard digital FM analyzer; RFA-4 agile FM amp; digital FM stereo monitor/analyzer.
Circle (389) on Reply Card

Belden Wire and Cable **19223**
Introducing #1694A serial digital video cable; #1696 high-flex AES/EBU digital audio interconnect cable; #1800 series NEC-rated single-, double-pair digital audio interconnect cable; NEC CM-rated digital audio snakes.
Circle (390) on Reply Card

Bencher **13632**
Graphics camera support products, Copymate II, M2, VP200 and VP300 copy stands.
Circle (391) on Reply Card

NTL MPEG-2 Video Compression

Tried, Tested and Trusted



Two years ago NTL set the pace for digital broadcasting with the launch of System 2000, the world's first video compression system based on the MPEG standard.

NTL MPEG systems are now widely in use by television broadcasting operators all around the world giving substantial operational benefits in applications that include broadcast contribution links, distribution to cable headends, satellite news gathering networks, business television and even distribution to terrestrial television antennas.

Now, NTL has launched System 3000, based on the tried and tested technology of System 2000 but enhanced to be compliant with the European DVB standard and the MPEG-2 (Main Profile at Main Level) performance specification.

System 3000 also gives broadcasters additional capabilities including the ability to broadcast up to 18 video channels within a single satellite transponder, statistical multiplexing and various telecom networking capabilities.

This diversity of applications using NTL's established technology means that fully compliant MPEG-2 systems are now being shipped to solve broadcasters' networking problems without the uncertainty of how the system will perform.

When you can't afford to take risks, don't settle for anything less.

Contact Barry Crompton for more information. Telephone +44 1703-498042.

See us at Booth S504/S6 NAB '95

NTL Advanced Products Division 34 A-C Parham Drive Boyatt Wood Ind. Est. Eastleigh Hampshire SO50 4NU United Kingdom Tel: +44 1703-498000 Fax: +44 1703-498043

NTL

Circle (88) on Reply Card

Benchmark Media Systems 10052
Audio equipment including card-based DAs, mic-pre-DA, remote gain cards; router/switcher; MicroFrame Series 1RU chassis for 16-mp modules, two power supplies; program meter systems; interface amplifiers.
Circle (392) on Reply Card

beyerdynamic 11214
Wireless equipment, microphones, headsets; S170H hand-held and S170P pocket microphones and NE170 diversity receivers; headphones.
Circle (393) on Reply Card

Bird Electronic Corporation 2901-2
RF measurement instruments, accessories.
Circle (394) on Reply Card

Bogen Photo 19372
Gitzo Mountaineer carbon fiber tripod; model 510 fluid video head; collapsible frames and fabrics.
Circle (395) on Reply Card

Boonton Electronics Corporation 2107
RF test, measurement equipment.
Circle (396) on Reply Card

Bradley Broadcast Sales 1903
Introducing Panascheme studio furniture, racks; Audioarts R-60 audio mixer; Telos 1x6 phone talk system; Tascam portable DAT; Gentner TS-612 phone talk system.
Circle (397) on Reply Card

Branson Country Music Network. 2712
Music programming service.
Circle (398) on Reply Card

Brek Conner Group 13832
Production titling systems.
Circle (399) on Reply Card

Bretford Manufacturing 16364
Expanded line of TV equipment-mounting products for wall and ceiling mounting applications.
Circle (400) on Reply Card

Broadcast Electronic Services 16771
Video signal distribution, format conversion products, GPI Network router; Betabox interformat editing unit; TBC remote controllers.
Circle (401) on Reply Card

Broadcast International Group 19976-20176
Dealer/distributor serving Latin America.
Circle (402) on Reply Card

PROSOURCE/Broadcast Marketing 16658
Presenting Scriptboy wireless time-code system; Kobold EFP 400 HMI lights; Ikegami HL-V55 ENG camcorder; Red Wing light boom; Coherent wireless A/V and time-code system.
Circle (403) on Reply Card

Broadcast Microwave Services 12200-3
Microwave radio equipment, BMT125 portable transmitter, BMR120 portable receiver; BMT75 3/12W, BMT55 0.75/3W ENG MW transmitters; Videocam transmitter.
Circle (404) on Reply Card

Broadcast Supply Worldwide/BSW 1825
Distributors of professional audio, RF/radio products, including Telos Zephyr, Arrakis Digilink, Vox Pro digital editor (Audion Labs) and Roland DM-800.
Circle (405) on Reply Card

Broadcast Video Systems/BVS 16348-50
Introducing BUGTRAP, a self-contained logo store, inserter; MASTERKEY 6D serial digital downstream linear keyer; featuring VM400 video switcher, video proc-amp, safe area generators; EN350 multiformat encoder; D100/101 NTSC decoders; interformat video converters; closed-caption equipment; passive A/V switcher; video delay lines, filters, hum coils.
Circle (406) on Reply Card

Broadcasters General Store 3007
Distributor for DNF Industries VTR remote controllers; IQS SAW digital audio editing software; Sine Systems RFC-1/Bj Thermal Sentry, Message Board Controller; American Recoder Technology recorder cleaning products.
Circle (407) on Reply Card

Bryston 3907-8
Audio monitors, model 7B-PRO.
Circle (408) on Reply Card

BTS Broadcast Television Systems 17011
Featuring Media Pool video server; FDL Quadra CCD telecine; MN R11 Median Noise Reducer; Bravo VE Windows-based A/B/C-roll

Command Performance.

Ikegami's HK-366 Wideband Studio/Field CCD Camera System

The HK-366P Portable Camera employs the same 450,000-pixel CCDs as the HK-356, and can be operated through the same Base Station and contral panels as the HK-366. When the HK-366P is docked to a VCR, it becomes a high-image quality ENG camera.

Our HK-366 camera incorporates many new features demanded by video professionals. For superior studio performance that draws encores, the HK-366 offers a newly-developed Snap-Shot Memory-Card, VF DTL and Picture-In-Picture, Skin Detail including Auto Skin Hue Set-Up, and Six Vector Color Correction.

During the development of the HK-366, every identifiable operating nuance came under close scrutiny. Exceptional image quality was achieved with 450,000 pixel CCDs. Cable runs up to 2400 meters are handled with the new long-range triax transmission system.

Commitment to essential functions plus production features, combined with exceptional picture quality, results in the HK-366's superb performance.

The HK-366 achieves a horizontal resolution of 800 lines (Y-ch), a S/N ratio of 62db, and a high sensitivity of f8, while offering startling picture quality typical of the HK-Series Cameras.

When an optional Digital I/F unit is added, the base station can provide a composite serial digital signal (143Mb/s) or a component serial digital signal (270Mb/s). This allows the HK-366 to be interfaced with a variety of digital systems.

The HK-366 and its portable companion are readily upgradeable to a 16:9 aspect ratio.

Take command and lead. To learn more, call the nearest Ikegami Regional Office.

The HK-366/366P cameras have the Skin Tone Detail feature which received the Engineering Emmy Award for technical achievement.

THE PROFESSIONAL'S CHOICE

Ikegami Electronics (U.S.A.), Inc. 37 Brook Avenue, Maywood, NJ 07607 East Coast: (201) 368-9171
West Coast: (310) 534-0050 Southeast: (305) 735-2203 Southwest: (214) 869-2363 Midwest: (708) 834-9774

Ikegami®

Circle (90) on Reply Card

editing system; LDK 10/10P CCD camera with 16:9 frame transfer chip and DPM dynamic pixel management; Diamond production, Saturn master control switchers; Venus, Mars routers; DCR 6000 HDTV recorder.
Circle (409) on Reply Card

BURLE INDUSTRIES 12100-1
Power devices for RF transmission; camera tubes.
Circle (410) on Reply Card

Burst Electronics 16351
Featured products include AS4X1 4X1 audio switcher; ADA-4 4-output audio DA; AS8X8 8x8 audio switcher.
Circle (411) on Reply Card

C

Cablewave Systems/RF Systems 16643
Antenna products, Bogner wideband and MMDS, ITFS, FM and STL antennas; high-power FlexWell transmission line.
Circle (412) on Reply Card

Circle (91) on Reply Card

California Amplifier 10456-556
RF amplifier products.
Circle (413) on Reply Card

Caligari M 801
Multimedia, graphics software.
Circle (414) on Reply Card

Calzone Case 16758
EZ-Haul transport case; ESCORT broadcast camera, mobile computer cases; ESCORT Avid System rack tower; floating/shock-mount rack case; NEC-MT transport case; LD-ATA DVR-20, Convoy Lightweight, LD cases; Ultima LCD panel transport case; Executive lap-top attache case.
Circle (415) on Reply Card

Canare Cable 11118-22
Cable and connectors, including L-5CFB serial digital 75Ω coax; RF-BCJRU RCA-to-BNC recessed panel-mount 75Ω adapter; IMPX AES/EBU digital audio adapters; PF-C 75Ω crimp-on F connectors.
Circle (416) on Reply Card

Canon USA/Broadcast Optics 18456
Broadcast lenses: J14ax17B KRS V with vari-angle prism optical stabilization system; standard, internal focus lenses; LX-200 Hi8 prosumer camera; laser transmission systems.
Circle (417) on Reply Card

Capitol Production Music 12904
Music libraries, including Archives line.
Circle (418) on Reply Card

Carpel Video 16232-332
Evaluated blank Betacam SP cassettes; blank cassettes of all formats available wholesale.
Circle (419) on Reply Card

CBS News Archives M1705
Video libraries.
Circle (420) on Reply Card

CBSI Custom Business Systems 2113
Station automation software for broadcasters; Classic traffic and billing software, DOS or Windows, Elite for budget-minded; InterAcct complete interactive accounting system; Digital Universe digital audio storage and management system using Windows NT.
Circle (421) on Reply Card

C-COR/Comlux 11510
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 (422) on Reply Card

CCS Audio Prod./Corp. Computer 3813
See Corporate Computer Systems.
Circle (423) on Reply Card

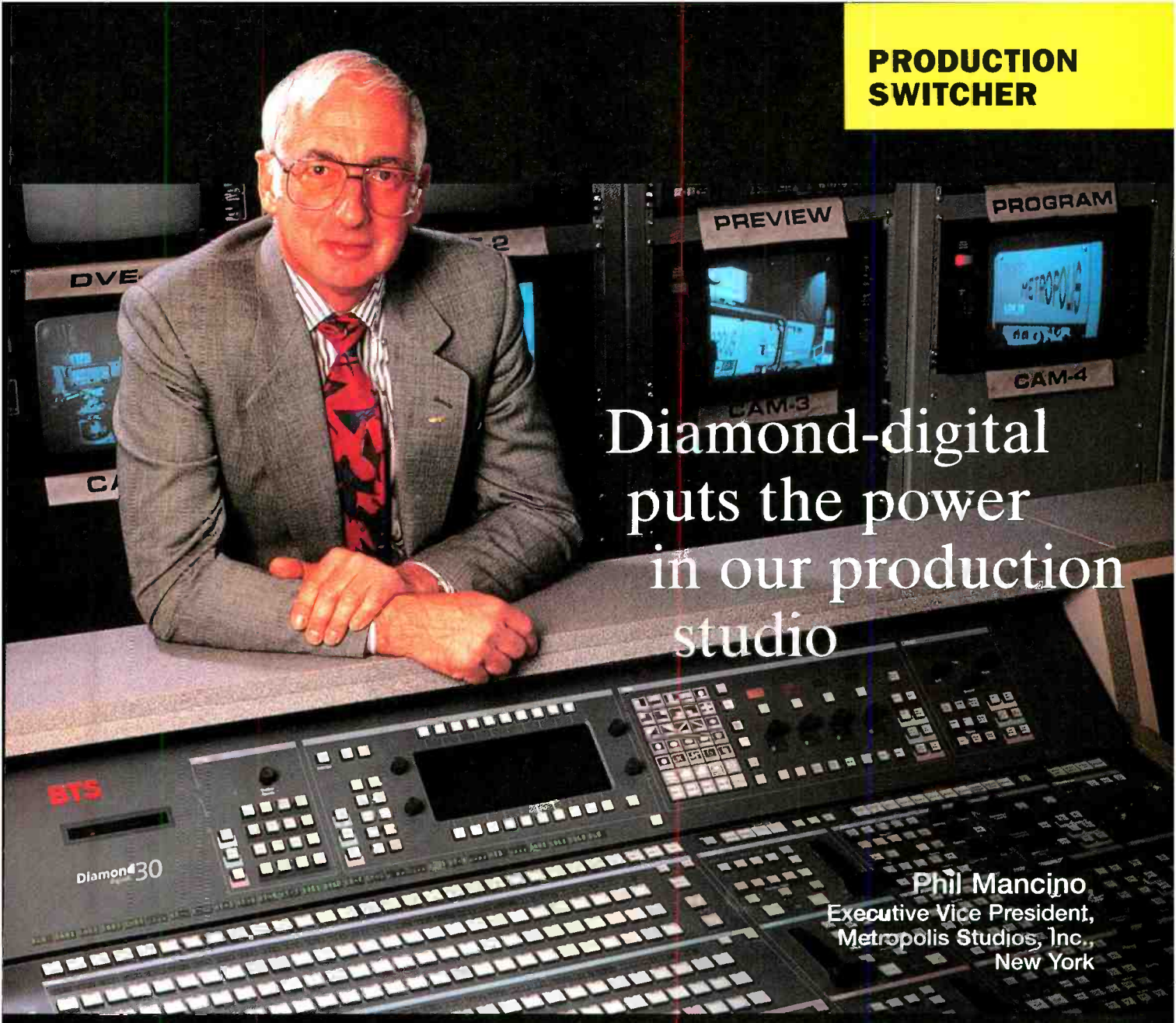
C-Cube Microsystems M 712
Circle (970) on Reply Card

Celect Multimedia Products M1034
Circle (971) on Reply Card

Central Tower 2411
Towers and monopoles for all broadcast applications; structural engineering analysis; complete construction services, antenna and line installation; turnkey projects; new line of self-supporting towers.
Circle (424) on Reply Card

Century Precision Optics 18972
Introducing Super Fisheye adapters for internal focus zoom and industrial zoom systems; filter holder and sunshade for .6x aspheric wide angle adapter; .8x wide angle zoom-through

PRODUCTION SWITCHER



Diamond-digital puts the power in our production studio

Phil Mancino
Executive Vice President,
Metropolis Studios, Inc.,
New York

"We built Metropolis Studios from scratch as an all-digital video production studio. Our operation 'talks' digital, from cameras to VTRs. It takes a special switcher to give us the flexibility to handle the demands of this unique operation.

"That's why I'm so delighted with our Diamond-digital switcher.

"Architecturally, it's the most competent switcher we've found. For example, it has a user interface that can emulate the operating characteristics of other popular switchers.

"Since free lance operators use our facility every day, they can set up the Diamond the way they want it, and go to work almost immediately. Saving those setups is a snap, via Diamond's setup card feature.

"The keying is fabulous. In the past, we needed a separate special effects keyer. With the Diamond's built-in Chromakey, it works as well or better than a stand-alone system. It also offers an auto-setup feature which makes it a 'no-brainer' to operate.

"I'm also impressed with its ability to switch instantly between 4:3 and 16:9 aspect ratios. Because our facility is set up to produce shows daily in both standard and wide-screen formats, we needed a switcher that could change modes as quickly as our projects dictate. The Diamond was the only switcher we found that could do it well.

"To say we're pleased with our Diamond-digital is an understatement. Thanks, BTS, for this terrific switcher."

BTS

A PHILIPS COMPANY

For more information or literature, call toll-free (800) 962-4BTS
Outside the U.S. and Canada, call (805) 584-4700

Shown: The BTS Diamond-digital DD 30. Photographed at Metropolis Studios, New York N.Y. an all-digital video production facility.

Circle (70) on Reply Card

converter; Nikon to 1/2" adapter; 25mm prime lens; achromatic diopter; Duplicins.
Circle (425) on Reply Card

Channelmatic 18977
Automation control systems for cable, TV.
Circle (426) on Reply Card

Chapman/Leonard Studio & Prod. Ctr. 10252
Sound stage with 9,000 square feet area.
Circle (427) on Reply Card

Chapman/Leonard Studio Equipment 10252
Lighting, camera support products; Pedolly, pedestal, Super PeeWee III; STB All Terrain Base; Lenny Arm III, Hybrid II, Hustler II.
Circle (428) on Reply Card

Cheetah Systems 17969-18069
Closed-captioning solutions.
Circle (429) on Reply Card

Chimera 19469-569
Featuring Lightbanks and light control accessories adaptable to more than 300 different production fixtures, from DC on-board lights to 20kW; compact, portable, controllable soft source lights.
Circle (430) on Reply Card

China International 5202
Circle (972) on Reply Card

Christie Electric 11608
Battery chargers/analyzers, CASP series.
Circle (431) on Reply Card

Chyron Group 19401
Introducing 3rd internal channel, extended effects buffers for InFiNiT!; Codi/Videofax high-resolution messaging, communications system for multimedia broadcasting; Jaleo Composite, Jaleo Plus digital post-production systems for SGI workstations; TVSTORE! still-store with recall panel for iNFiNiT!, MAX!>, MAXINE!; Freedom Series graphics software products, including Eagle paint, animation, compositing; Independence paint-only.
Circle (432) on Reply Card

Cine 60 16253-453
Lighting products, batteries, chargers.
Circle (433) on Reply Card

Cinekinetic 19563-5
Portable grip, camera support gear; McJib jib arm to mount on standard tripod; Microjib Pro SX, Sawed Board dollD, Pocket Dolly, Saddlecam, Jib Stix, One Man Grip Kit.
Circle (434) on Reply Card

Cinema Products 11810
Camera support products, SteadiCam video SK; Master Series Video, Master Series Film and Professional Video camera control systems.
Circle (435) on Reply Card

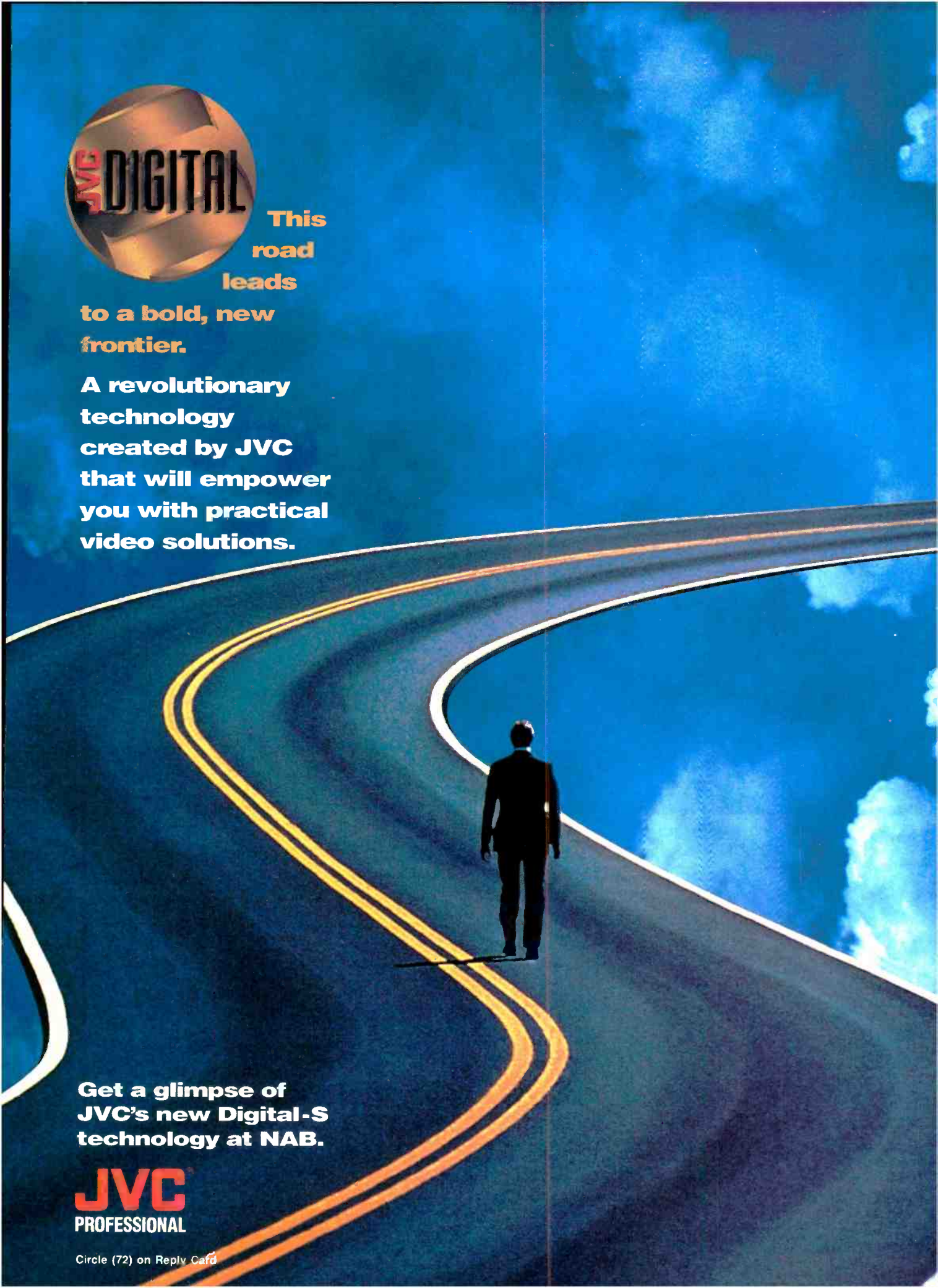
Cinemills 16555
Lighting products and systems; studio furnishings.
Circle (436) on Reply Card

Clark Wire & Cable 13604-5
Introducing RG6SD coax for serial digital signals; 800 series AES/EBU digital audio cable/snakes; Clark Ergonomic Crimp tools; Hannay reels; service mult cables, remote composite cables.
Circle (437) on Reply Card

Clear-Com Intercom Systems 18936-19336
PL-Pro party-line intercoms, 2- to 12-channel stations with linking feature for communication flexibility; ICS-92 9-key programmable intercom station, dedicated answer-back key for Matrix Plus II system; XPL-12, -22 expansion panels with electronic LED labels add 60 keys to Matrix Plus II system; AB-100 On-Air Announcer's Console.
Circle (438) on Reply Card

Clipper Products 11546
Rolling equipment cases, luggage carts, tubes, wheel sets; soft-side, padded and hard-shell cases; shipping cases.
Circle (439) on Reply Card

CMC Technology 11507-8
Replacement video head assemblies for VPR 1-inch C; upper drum refurbishing for BVH 1-inch C.
Circle (440) on Reply Card


JVC DIGITAL
This road leads to a bold, new frontier.
A revolutionary technology created by JVC that will empower you with practical video solutions.
Get a glimpse of JVC's new Digital-S technology at NAB.
JVC
PROFESSIONAL
Circle (72) on Reply Card

CMX/Chyron Group **19401**
Videotape editing systems, featuring the OMNI family, including AEGIS, OMNI 1000E, OMNI 850, OMNI 500, OMNI 500 Combo.
Circle (441) on Reply Card

Coaxial Dynamics **5013-14**
Introducing model 81070 Wattchman series; transmitter protection products, RF wattmeters, loads.
Circle (442) on Reply Card

ColorGraphics Systems/Dynatech **17124**
Videographics workstations; also see Dynatech Video Group.
Circle (443) on Reply Card

Colortran **17039**
Lighting products, control systems; compact Elite controllers, ENR series dimmers; lamps; studio fresnels; Encore lighting control software.
Circle (444) on Reply Card

Columbine Systems **15731**
Master control automation with multistation, multiregional capabilities; video server automation control; Program Scheduler; Asset Management; software for traffic, sales analysis, accounting, finance; Oasis cable advertising sales management.
Circle (445) on Reply Card

Comark Commun./A Thomcast Co. **16117**
UHF TV transmitting equipment; introducing a technology to implement high-power UHF IOT transmitters; featuring The IOX Line advanced UHF TV transmitters with modularized class A drivers, full-band linearity correction; IEC 215 compliance, internal AC distribution.
Circle (446) on Reply Card

Communication Graphics **5016-7**
Promotional products and professional logo design.
Circle (447) on Reply Card

Communications Data Services **1811**
RFCAD; international terrain data; Fryers Site Guide/CDS on-line services; North American Terrain Data (U.S., Mexico, Canada).
Circle (448) on Reply Card

Communications Specialties Inc. **M1228**
Computer-to-video scan converters; VGA, S-video, video DAs.
Circle (449) on Reply Card

Comprehensive Video Supply **17848**
Video amplifiers, multimedia monitor cables, desktop video production accessories; PC-/Mac-based Edit Master; Walter Brewer lighting systems integrations services.
Circle (450) on Reply Card

Comprompter **18148**
Introducing ScoreMaster ENR module for automatic update of sports scripts and scoreboards; VoteMaster election reporting software with automatic result updating; VideoMaster digital non-linear editing and video playback with D-1 quality; ENR Electronic NewsRoom software version 3.2, pull-down icon windows, keyboard or mouse control, spellchecker.
Circle (451) on Reply Card

Computer Assisted Technologies **16337-339**
Introducing CATest automated test measurement software, with full-status monitoring to display machine's operating status; PAMS Prop Asset Management Systems; WIS Wardrobe Inventory System; BCAM V5 maintenance management software.
Circle (452) on Reply Card

Computer Expressions **M1712**
Circle (973) on Reply Card

Computer Prompting & Captioning Co. **18630**
Introducing CPC-800 real-type Caption Maker; upgrade introduction for CPC-1000 Smart Prompter.
Circle (453) on Reply Card

Comrex **12105**
Introducing DX200 ISO/MPEG Layer II digital audio codec; DXR.1 and DXP.1 G.722 codecs capable up to 15kHz.
Circle (454) on Reply Card

COMSAT Corporation **11458**
Satellite communications products, services.
Circle (455) on Reply Card

ComStream Corporation **5615**
Introducing a new compressed digital video

Circle (126) on Reply Card →

transmission system permitting on-the-fly bandwidth change; ABR700 digital audio receiver (for NPR system); RCA DSS1 satellite receiver.

Circle (456) on Reply Card

Comtech Antenna Systems **13402-3**
Introducing EC8 microprocessor control system with optional IBM-compatible software, 3½" floppy drive, controls Comtech antenna with local or remote control; stationary and motorized satellite antennas from 35" to 7.3 meters; transportable, flyaway systems.
Circle (457) on Reply Card

ComTek **17521-721**
Wireless microphone equipment, MRC-82 Camera Companion receiver; IFB-72 cuing and talent feedback system; BST-25 base station transmiters and PR-25 personal receivers.
Circle (458) on Reply Card

COMWAVE/Commun. Microwave **11202**
20W transmitter model SB020B; 10W transmitter model SB010B.
Circle (459) on Reply Card

CAMPLEX/Concept W Systems **17784**
Introducing TU-320 camera timing unit (subcarrier, H-phase); Plus Port PP-150 camera control data interface; A2X 2nd program audio channel module; featuring Camplex CP-301A system.
Circle (461) on Reply Card

Concept W Systems/CAMPLEX **17784**
See Camplex/Concept W Sytems.
Circle (460) on Reply Card

Conifer Corporation **11807**
Wireless cable, ITFS, MMDS reception products including models 18T-, 25T-5412 31-channel, filtered, high-gain, low-noise with 50, 56dB gain; models 18T-, 25T-5420 33-channel systems; and models 18T-, 25T-5409 31-channel, non-filtered high-gain, low-noise, 50, 56dB gain systems.
Circle (462) on Reply Card

Connectronics **13627**
Introducing Big Ears parabolic reflector with accessories, shoulder straps, transport cases, sport handles, wind muff.
Circle (463) on Reply Card

Control Concepts/Leibert **16014-5**
Introducing Isolatron Plus, AccuVar power line protection for broadcast and communications; featuring patented Islatrol, Islatran active Tracking Filters.
Circle (464) on Reply Card

Corporate Computer Systems/CCS **3813**
CCS Audio Products: audio transmission codecs, Micro 56+ 7.5kHz and Micro 66i 7.5kHz dual rate units.
Circle (465) on Reply Card

Cortana Corporation **3909**
Featuring Stati-Cal lightning prevention systems for tower protection through charge dissipation.
Circle (466) on Reply Card

Countryman Associates **11607**
Microphone products, the EMW series.
Circle (467) on Reply Card

Crestron **M 901**
Introducing VisionTouch, ColorTouch, VideoTouch, PCVision, VGAVision remote multimedia device control facilities.
Circle (468) on Reply Card

Crouse-Kimzey Company **1914-15**
Audio distributors; Otari Prodisk 464 digital workstation; Denon DN970FA CD player; "Come to our Convention Oasis!"
Circle (469) on Reply Card

Crown International **3203**
CM-312 head-worn mic; full line of microphones, amplifier products.
Circle (470) on Reply Card

Crystal Graphics **M1415**
Circle (974) on Reply Card

CSI/Camera Support International **16855**
Camera support products including dollies, tripods, pan/tilt heads; System 40 for EFP/studio.
Circle (471) on Reply Card

CTE International **3201**
FM broadcast transmitter products, exciters, power amplifiers.
Circle (472) on Reply Card

Cycle Sat **12346**
Program distribution services, transmission security equipment, Cyclecypher.
Circle (473) on Reply Card

D

H L Dalis 13430
Distributor for Belden Wire & Cable, Neutrik and SwitchCraft connectors, Fluke meters; distributors for Sony, JVC and Denon DAT and S-VHS videotape.
Circle (474) on Reply Card

Dan Dugan Sound Design 13619
Featuring model D automatic mic mixing system.
Circle (475) on Reply Card

Daniels Publishing Group 13610
Publications listing broadcast equipment technical data, applications information; equipment buyers guide.
Circle (476) on Reply Card

DCM-Data Center Management 19768
Supplier of newsroom automation systems; introducing a distributed system using client-server environment; support for MS Windows, character terminals, X terminals, UNIX workstations, DOS, Mac systems.
Circle (477) on Reply Card

Data Security 11155
Bulk tape degaussers, cleaners/evaluators, encryption equipment.
Circle (478) on Reply Card

Datacount 5419-20
Circle (975) on Reply Card

Datatek 13824
Signal routing and distribution products; D-2800 series digital and analog audio/video routing switcher, with data, time-code capability; enhanced control system; 10x1 digital video switcher module; digital video DAs, serializers, deserializers.
Circle (479) on Reply Card

Dataworld 2419
Broadcast industry database, introducing detailed ethnic, demographic reporting in tabular and graphical map formats; large on-line database with instant access; Internet capability; ethnic/demographic shading overlays.
Circle (480) on Reply Card

da Vinci/Dynatech Video Group 17124
See Dynatech Video Group.
Circle (481) on Reply Card

dbx/Harman Pro Audio 2910
See Harman Professional Audio Group.
Circle (482) on Reply Card

Dedotec USA 16448-51
Dedolight lighting instruments, kits and accessories; precision optical lighting fixtures, projection attachments.
Circle (483) on Reply Card

Delco Wire & Cable 2204-5
Wire, cable products.
Circle (484) on Reply Card

DENON 4004-5
DN995R MD card recorder with DN80R portable MD cart recorder; DN790R cassette deck; DN1400F CD jukebox.
Circle (485) on Reply Card

DeSisti Lighting/DESMAR 16984
Low-power and robotic studio lighting; Blue Pinch lighting; studio grip, suspension equipment; special packages for studios, churches; ENG HMI, Tungsten kits; HMI lamps 125W-15kW; tungsten lamps 800W, 20kW.
Circle (486) on Reply Card

Desktop Images M 117-136
Introducing Startup for Video Toaster 4000; Studio 16-Professional Audio for Video Technology; Video Toaster screens; Pro Flying logo techniques.
Circle (487) on Reply Card

DGS Pro Audio 4605
Various connectors, cables, including universal XLR, Midi connnectors; $^1/_4$" phone plugs, $^1/_4$"-to-$^1/_4$" cable leads; digital multipair, speaker, GAC-2 low noise cables; adapters, attenuators.
Circle (488) on Reply Card

Fujinon's 70X Lens.

There's just no substitute for experience.

Fujinon's new Ah70X9.5ESM has the highest zoom ratio of any TV production lens. And with a focal length of 9.5 to 665 mm (1330 mm with 2X extender), the Ah70X is also one of the most versatile. All of this with the optical performance you expect from Fujinon.

Admittedly, an achievement like this would be a big stretch for other lens manufacturers, but it's the next logical step for Fujinon. Our popular Ah66X has become the standard in long focal length production lenses. Now the Ah70X continues this tradition of leadership.

So when your reputation is on the line, choose the company with the most experience...Fujinon.
For more information, contact Fujinon at 1-800-553-6611.

The Incredible 70X NAB Booth # 15959

FUJINON

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 048-663-2152. FAX 048 651-8517. TELEX: J22685

FOCUSED ON THE FUTURE

Circle (77) on Reply Card

DH Satellite 12902
Satellite program service.
Circle (489) on Reply Card

DIC Digital 18385
Magnetic recording media, MQ digital audio tape, Microfinity 8mm videotape, 4mm width data-grade cartridge tape, rewritable magneto-optical disks; HQ series professional DAT cassettes.
Circle (490) on Reply Card

Dielectric Communications 15720
Featuring digiTLine broadband transmission line for today's NTSC channels, tomorrow's HDTV frequencies.
Circle (491) on Reply Card

Digidesign 1203, 1515
Digital audio recording systems.
Circle (492) on Reply Card

Digipath 19929
Routing systems, including Sahara 16x series (audio, video, digital) 16x16 modularity; software-based control system with groups, sequences, salvos, virtual matrix mapping; Navagus 1500 D-1 to NTSC/PAL encoder and 4:2:2 serial reclocking; video serializer, deserializer.
Circle (493) on Reply Card

Digital Broadcast Associates 1701-2
Circle (976) on Reply Card

Digital Courier/MPR Teltech 1227
Circle (977) on Reply Card

Digital Graphix 16624
Introducing TYPEDEKO CG; composium II compositor & video graphic workstation; HALO Graphics Factory; Impact 3D multichannel effects.
Circle (1045) on Reply Card

Digital Processing Systems (DPS) 11832
Introducing MicroSYNC 10-bit, 4-field video synchronizer; MicroSYNC-AVX audio/video synchronizer; DPS-290 component transcoding TBC/synchronizer; VX upgrade for DPS Personal Animation Recorder.
Circle (494) on Reply Card

Discreet Logic 17772
Software-based graphics and desktop production equipment for various platforms, including Flame, Flint, Tsarna 3-D Paint.
Circle (495) on Reply Card

Display Devices 15268
Introducing Digital motor control for all Datalift series units; AVPAC adaptable video projector adjustable case system to protect, mount and adjust video projectors.
Circle (496) on Reply Card

Di-Tech 13106
Model 5886 analog video and D1-/D-2 digital router with matrices to 64x64; digital inputs equalized, outputs reclocked.
Circle (497) on Reply Card

Divicom M1603
Featuring real-time MPEG-2 program encoders; remultiplexers; system controllers.
Circle (498) on Reply Card

DNF Industries 3007
Introducing Slow-Motion Controller with 100 cue point memory, varispeed play; SW1X8 RS-422 switcher, controls up to eight VTRS from RS-422 control source; featuring ST30, 60, 200 universal VTR controllers.
Circle (499) on Reply Card

Dolby Labs 16567
DP524 AC-3 digital audio decoder companion to DP523 2-channel encoder; ABVS advanced broadcast video service using DS3 lines with Pacific Bell; Dolby Fax; enhancements to DSTL digital studio-transmitter link.
Circle (500) on Reply Card

Doremi Labs 2302-3
Circle (978) on Reply Card

Dorrough Electronics 16443-4
Signal measurement products including #280-D AES/EBU digital audio level meter; #40-N video level meters; standard line of analog audio meters.
Circle (501) on Reply Card

ENGINEERED FOR ALL THE RIGHT MOVES.

Vinten TSM's New Robotic Camera System.

The SP-2000/X-Y is a freely navigating servo pedestal designed to operate with the HS-2010M pan/tilt head. Utilizing many of the features found in our industry standard SP-300/X-Y servo pedestal and HS-310P pan/tilt head, the SP-2000/X-Y also features a lower profile, sleeker design and new brushless servo motor technology. It is designed to support new lighter weight CCD studio or portable cameras with any combination of lens or teleprompter.

The HS-2010M 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 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.

NAB Booth #18939

Vinten TSM Inc.
709 Executive Blvd.
Valley Cottage, NY 10989
Phone: 914-268-0100 Fax: 914-268-0113

Vinten TSM™
AutoCam Vision Classic

Circle (92) on Reply Card

Doty Moore Services 16371-471
Broadcast consultants.
Circle (502) on Reply Card

Dubner International 10861
pcCG character generator for broadcasting; Scene Stealer auto scene detector, video logger for archiving, transcription, rough-cut editing.
Circle (503) on Reply Card

D/Vision Systems(TouchVision) 10549
Introducing non-linear editing systems running under Windows NT/95; turnkey solutions featuring D-1 quality video, Motion-JPEG compression; off-the-shelf hardware, open architecture standards; supports editing over networks.
Circle (892) on Reply Card

DVS Digital Video Systems 10658-758
Introducing ProntoVideo D-1/4:2:2 digital video disk recorder, 6-minute plus capacity; SCSI/video D-1/4:2:2-to-computer interface with MJPEG; ISP500 HDTV multichannel RAM recorder; VideoConnect cost-effective monitoring D/A converter for D-1/4:2:2 signals; PC/Video D-1/4:2:2 digital video interface for PC/Windows.
Circle (504) on Reply Card

Dwight Cavendish 19233
Introducing the Compact Videocassette Duplicator for post-production, in-house corporate duplication; expands to 20 slaves; may operate unattended with industrial slaves and autoloaders.
Circle (505) on Reply Card

DYNAIR Electronics 13800
Introducing Series 36, a stereo router for use by itself or as a slave to a companion video router, using ASIC circuitry for reduced size; System 2000 expansion for digital switching, sizes to 144x144, 288x72.
Circle (506) on Reply Card

Dynatech Video Group 17124
Introducing EditStar script-based non-linear editor for news automation with NewStar and other newsroom systems; NewStar for Windows, automation running under Windows 95, Windows NT; daVinci Renaissance 8:8:8 color corrector with ARTISAN graphic interface on SGI platform; UTAH-300 router with "Smart Architecture;" DigiStore digital video storage system; Alpha Image Alphie, Elite digital production switchers; Colorgraphics DP/MAX graphic workstation; EMC Primetime on-line editor; Quanta Delta Concorde text, graphics.
Circle (507) on Reply Card

Dynatech NewStar 17124
See NewStar for Windows, *Dynatech Video Group. (Above)*
Circle (508) on Reply Card

E

EarthWatch Communications 10958
Eastman Kodak Company 17552

Motion picture films; HDTV processing systems.
Circle (509) on Reply Card

Echolab 13423-26
Introducing a 20-input modular switcher using composite, Y/C, component formats, advanced multilayer keys, aux bus outputs, M/E key outputs, re-entrant effects; featuring MVS5, MVS6 modular analog switchers with key matrix.
Circle (510) on Reply Card

Econco Broadcast Service 4823
Rebuilt power transmitting tubes, klystrons.
Circle (511) on Reply Card

Edac Inc. 1703
Circle (979) on Reply Card

Editing Technologies Corporation 13839-939
Featuring Ensemble Gold, multilinear editing with non-linear functions and linear quality; Stiletto PC-based editing control, graphic GUI, multilinear-compatible, non-linear option; Jazzman turnkey edit controller with rack-mount professional chassis.
Circle (512) on Reply Card

EDX Engineering 4325
Engineering software, MCS v1.2, SIGNAL v2.0/v2.5 International; MSITE v2.0/v2.5 International; SHDMAP v6.0/v6.5 International; TPATH V2.0/v2.5 International; RPATH v7.0/v7.5 International; U.S., international terrain data; U.S. land use/land cover data
Circle (513) on Reply Card

EEG Enterprises 16801-901
VBI data products, VDR-2 data receiver, TVCD100 line-21 encoder.
Circle (514) on Reply Card

EEV 17136
Introducing low-power, air-cooled IOT (type IOT7320R) for 20kW common amplification TV transmitters; STELLAR lightweight range of Ku-band TWT amplifiers for satellite uplink systems.
Circle (515) on Reply Card

Egripment 18975
Introducing the Javelin Crane, Kaleidoscope Microshot Plus and Cam-Cam systems; featuring Skyking, Tulip, Skymote, Maxijib, Matador, Dinky, Canyon, Focus products.
Circle (516) on Reply Card

Elantec Inc. 16574
Low-power amplifiers with outstanding video performance; video instrumentation amplifiers; faders; precision current-mode feedback amplifiers.
Circle (517) on Reply Card

Elastic Reality 15168, M1220
Elastic Reality software, version 1.01 for Windows and Windows NT on Power PC, MIPS or DEC Alpha; version 22 for SGI; version 1.2 for Mac native Power Mac; TransJammer 1.0 for Mac/native Power Mac.
Circle (357) on Reply Card

Electric Works Corporation M1808
Circle (980) on Reply Card

Electro-Voice 15717
Microphone products, including RE27N/D, TE36N/D dynamic cardioids; S-40 compact monitor system.
Circle (518) on Reply Card

ElectroGig USA Inc. M1731
Circle (981) on Reply Card

Electrohome M1134
Video projection systems, including ECP series with ACON 3-minute auto convergence, input module; ShowStar projectors and Stereographics 3-D visualization systems.
Circle (519) on Reply Card

Electronic Associates 13613-4
Circle (982) on Reply Card

Electronics Diversified Inc. 16577
Lighting control systems, dimmers.
Circle (520) on Reply Card

Electronics Research - ERI 16604
FM transmission antennas; introducing ARS-1003 auto transmitter recycler; RFSS-3125 Safety Switch for worker protection; SKIP Site Keeper Integrated Pager monitors and reports status of 16 site conditions.
Circle (521) on Reply Card

Electrorack Products 19566-67
Equipment rack systems.
Circle (522) on Reply Card

Electrosonic Systems 15365
Featuring large screen video displays with ProCube AC41" projection cube, PICBLOC multisource control system; options for HDTV, computer, workstation graphics; ImageMag (monitors), ImageStar (monitors or cubes) controllers.
Circle (523) on Reply Card

EMC/Dynatech Video Group 17124
See Dynatech Video Group.
Circle (524) on Reply Card

EMCEE Broadcast Products 17106
Solid-state transmitters for UHF and VHF-rated 100W and 1kW; wireless cable transmitters; Signal Bender, Site Controller for PC; Direct Digital synthesizer.
Circle (525) on Reply Card

EMCOR Products/Crenlo 11532
Featuring modular electronic enclosure systems, modular console configurations; air movement devices; custom fabrication capabilities.
Circle (526) on Reply Card

ENG Mobile Systems 17043
Products for remote production, camera transport cradle and NITEK NiCad battery maintenance products.
Circle (527) on Reply Card

Engineering Animation M 907
Circle (983) on Reply Card

Ensemble Designs 12646-746-7
MultiBuffer DS1 (component), DS2 (composite) framestores for Mac to Video; TC400D TBC control; Catalyst - digital composite keyer; Serial Box I, II, III A/D, D/A converters.
Circle (528) on Reply Card

Enterprise Systems 13253
Broadcasting business systems.
Circle (529) on Reply Card

The Equipment Broker 19070-370
Broadcast, production equipment brokers.
Circle (530) on Reply Card

Equi-Tech Corporation 4503
Circle (984) on Reply Card

ERGO 90/Ergo Industries 19052
Monitor mounts; slides for JVC; ballbearing slides for Panasonic; rack-mount kits for Sony, Pioneer, Panasonic, JVC.
Circle (531) on Reply Card

ESE 13606-8
Introducing ES-181 modem-based master clock, time-code generator; ES-126/-127 time/date displays with .55," 1" display heights; ES-996 2," 6-digit time or date display; ES-217

1x4 audio DA, XLR connectors; ES-150 auto switch-over for primary and secondary master clock systems.
Circle (532) on Reply Card

ETC-Electronic Theatre Controls **18348**
Lighting control products, response series dimmers, microVision^FX control, effects consoles.
Circle (533) on Reply Card

Euphonix **3603**
Introducing World Premiere, a digital-controlled audio mixer for on-air, audio post with instant reset of every control, optional surround sound; CS2000B broadcast mixer.
Circle (534) on Reply Card

Evans & Sutherland-Design Software **M1727**
Computer graphics equipment, software.
Circle (535) on Reply Card

Eventide **2707**
Featuring DSP400B, H3500B, H3000B+Ultra-Harmonizer effects processors with broadcast, post-production software; obscenity delays; VR, VP series digital audio loggers.
Circle (536) on Reply Card

Evertz Microsystems **16045**
Introducing LGR-16, LGR-35 keycode bench loggers; KFB-16, KFB-35 keycode reader heads; model 8025-CAP closed-caption video inserter; 8110 digital audio encoder; 8150, 8160 digital audio deocders; 5010-VTC LTC/VITC generator, reader, character inserter; 5950 LTC reader, character inserter.
Circle (537) on Reply Card

Extron Electronics **M 319**
System 4LD switcher with line doubler; SHR superhigh-resolution cable; RGB 300 universal analog interface including digital control; Inertia workstation to VGA scan converter; SuperEmotia SVGA, XGA, HiRes Mac scan converter.
Circle (538) on Reply Card

E-Z UP International **4821-2**
Quick setup shelters, requires minimal time, tools.
Circle (539) on Reply Card

F

Fairlight ESP Pty. Ltd. **19920**
Digital audio workstation.
Circle (540) on Reply Card

Falcon Systems **M1222-4**
Faraday Technology Ltd. **12762**
Remote-operated, rack-mounted cable clones for testing the integrity of serial digit datastreams.
Circle (541) on Reply Card

Faroudja Laboratories **12827**
Introducing VP400 video processor, scan converter, increases horizontal scan lines by factor of 4; DFD-U PAL, NTSC, Y/C decoders, produces RGB, component, D-1 serial, D-1 parallel outputs.
Circle (542) on Reply Card

Fast Forward Video **11848**
Featuring Bandit, Bandit SG digital video recorders for PC and SGI platforms; Outlaw ISA digital video subsystem; Outlaw 20/20, Bandit 20/20 audio versions; Recon 11 portable digital video subsystem.
Circle (543) on Reply Card

Fiber Options **16573-673**
Fiber-optic products: Series 177B Y/C component video, series 315B AES/EBU digital audio; series 1240SB video, digitally processed stereo audio for single-mode fiber; series 1121B long-haul broadcast-grade video.
Circle (544) on Reply Card

Fidelipac **3122**
Featuring Dynamax DCR 1000MO digital recorder, reproducer using magneto optical drive; Dynamax MXE series audio console modules, studio talkback monitor, telephone interface, 5-band EQ and panpot.
Circle (545) on Reply Card

FirstCom/Jim Long Companies **13623-25**
Featuring FirstCom Music On-Line network service; MusiQuick search software; MusiQuick+Clipz search/audition CD-ROM.
Circle (546) on Reply Card

5D **M 821**
Introducing aRTy image processing animation and effects; TMorph3 v1.2 technical morphing for movies and television.
Circle (547) on Reply Card

Flash Technology **1819**
Introducing ElectroFlash FTB 312 medium-intensity dual beacon, ElectroFlash FTB 224, FTB 225 high-intensity dual beacons, ElectroFlash AOL 302D dual antenna obstruction light; SMART obstruction lighting hardware, EAGLE obstruction lighting software.
Circle (548) on Reply Card

FloriCal Systems **13102**
SpotLinker commercial library management; DishTuner satellite receiver control; NewsRepeater auto replay of news until updated; TimeShifter Disk multinet delay; ShowTimer pre-air automation, timing; CartDirector robotic cart machine database and control; AirBoss on-air automation; Validator signal level and interval detector.
Circle (549) on Reply Card

FM Systems **19051**
Audio level controllers; digital video sync meters; ATIS Eater ID signal filter.
Circle (550) on Reply Card

Focal Press **13617-8**
Professional, educational and reference material for broadcast and other electronic media; backlist of more than 150 books, includes items on technology, management and production.
Circle (551) on Reply Card

Folsom Research **15177-255**
Introducing VIP Video In Product, displaying four real-time live video windows on a standard workstation monitor in 24-bit color with zoom features; models 9400PC, 9400JR, 9500SR scan conversion products.
Circle (552) on Reply Card

FOR-A Corporation **M1529**
Audio mixers, recorders; video production switcher; TBCs, synchronizers, effects systems, still-stores; display, projection products; scan converters; edit controllers.
Circle (553) on Reply Card

Video Gainesville **18142**
Circle (985) on Reply Card

Forecast Consoles **19237**
Image Master consoles, predefined workstations for specific desktop applications; Modular Component Consoles; integrated broadcast for post- production facilities.
Circle (554) on Reply Card

Fostex **10952**
Audio recorders, analog, R-DAT, multitrack;

audio mixing systems.
Circle (555) on Reply Card

Fresh/The Music Library **2201**
Introducing three production music CDs: Americana - patriotic, march, victory and Western music; Soundtrack Scores - numerous presentations; Lifestyles - Contemporary, light industrial, melodic themes.
Circle (556) on Reply Card

Frezzolini Electronics **13421-22**
MFNP-1 HC mini-fill lite, NP-1 battery holder, ML universal mounting clip; model FSP Frezzi Solar Panel; AR304 auto-ranging microcomputer-controlled fast charger; MFIC mini-fill light with integral dimmer control.
Circle (557) on Reply Card

Fujinon **15959**
Video camera lenses, introducing Ah70x9.5ESM highest magnification zoom lens; Ah24x7ESM studio production lens with floating group lens assembly for $^{2}/_{3}$" format; CPT-1A-10D miniature pan/tilt system.
Circle (558) on Reply Card

Full Sail Center for Recording Arts **M1603**
Education in film, video, audio production; 1," $^{3}/_{4}$" and Beta SP formats; Montage Picture Processor Suite, CMX editor, Sony cameras, Chyron titling and more.
Circle (559) on Reply Card

Future Network Inc. **11129**
Circle (986) on Reply Card

Futuretel **M1633**
Circle (987) on Reply Card

FWB **M1713-5**
Circle (988) on Reply Card

G

Garner Industries **13621-2**
Featuring model 4000, 682A, 1400, CF750 recording media degausser systems.
Circle (560) on Reply Card

GE American Communications **17706**
Featuring GE-2 satellite news gathering.
Circle (561) on Reply Card

GE Lighting **12807-8**
Lamps for studio lighting.
Circle (562) on Reply Card

GEC-Marconi Communications Systems **17101**
Test, measurement equipment; radio/TV transmitters.
Circle (563) on Reply Card

Gefen Systems **2304-5**
M&E Pro SFX locator and control for Mac and large-capacity CD changers; M&E Windows SFX locator; #100AGC auto gain control, #100CF crossfader, #100DS digital switcher, #TSE100 keyboard and monitor ex-

tender; CD changers from NSM, Denon, Sony, Pioneer; SFX libraries from Digiffects, The Hollywood Edge, Canford, etc.
Circle (564) on Reply Card

General Instrument M 600
HDTV Grand Alliance.
Circle (565) on Reply Card

Genesis Microchip M 817
Acuity series image resizing engines for projection systems, broadcast equipment, videographic workstations, teleconferencing, scan conversion; gm2242B half-band filter with (sin x)/x.
Circle (566) on Reply Card

Gennum/Video-Broadcast 16385
Featuring GENLINX specialized IC devices; GS9004B cable equalizer with improved jitter performance; GS9010A receiver with improved noise performance; GS9102A low-power digital filter; GM4570, GM4571 wideband video buffers; GT4123 low-power 2-channel video mixer.
Circle (567) on Reply Card

Gentner Communications 5621
Introducing enhancements for TS612 multiline telephone talk show system; enhanced ET100 portable teleconferencer; featuring digital hybrids, teleconference interfaces, acoustic echo cancelers, VRC-2000 transmitter remote control.
Circle (568) on Reply Card

GEPCO International 13251
Introducing VSD2001 video serial digital coax cable; VA-1/3 video/audio composite cable; multi-pair digital audio cable; packaged cable assemblies; video snake cable; flexible stranded cables of triax video.
Circle (569) on Reply Card

Getris Images 15985
Introducing Broadnews computer system for automatic news broadcasting; Digitoon PC software for scanning, painting and exposure sheet for animation production; upgrade software releases for Eclipse, Venice and Hurricane, adding real morphing, multilayer autotracking.
Circle (570) on Reply Card

Gorman-Redlich Mfg Company 1913
EBS and weather service equipment, model CEB EBS encoder and decoder, model CRW weather radio.
Circle (571) on Reply Card

Graham-Patten Systems 11454
Featuring D/ESAM 820 digital edit suite audio mixer, new master processor board, audio output module, digital input card, version 4.0 software; D/ESAM 400 digital edit suite mixer.
Circle (572) on Reply Card

Grass Valley Group 18117
Introducing VideoDesktop-personal production suite; series 6000 compact router; model 2200 component digital switcher; model 3000T composite digital switcher; J-series multichannel DS3 codec.
Circle (573) on Reply Card

Great American Market 13120
Lighting products, including GamSpin/FX variable speed effects wheels; GamTube, F12 correction gels; GamLitt soft box; GamFusion - 10 degrees of diffusion materials; new Micro patterns.
Circle (574) on Reply Card

Grey Matter Response M1335
Circle (989) on Reply Card

Group One Ltd. 4601-3
KRK K-ROK shielded audio monitors; Focusrite RED 6 Mic Pre/EQ; EXA DP100 audio delay (DSP).
Circle (575) on Reply Card

H

Habitech/Smith System M1802-1821
Circle (990) on Reply Card

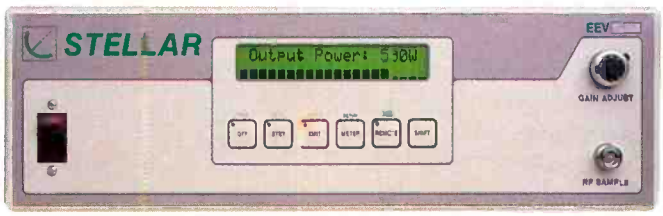
Hafler Professional 3903
Circle (991) on Reply Card

Halland Broadcast Services 5625
Music libraries on CD, including "Country Gold" country classics; "Best of 94" updates for A/C and country CD libraries.
Circle (576) on Reply Card

Here, There & Everywhere

with EEV's *STELLAR* Compact Digital Satcom Amplifiers

EEV's Satcom Amplifiers have always provided leading edge technology. Our new range of rugged Stellar lightweight Ku band amplifiers incorporate the latest TWT, power electronics and cooling technologies to create the highest performance. Compact 3u high units weighing only 50 lbs, having flange powers of 350W or 500W, are available NOW.
Stellar is exceptionally user friendly and provides auto diagnostics, remote interfaces, EMC compliance and automatic power factor correction as standard features.
And Stellar is digital satcom proven too!



SMALLER, LIGHTER *Plus* REAL POWER

Contact us today to find out how Stellar can fit into your plans.

EEV SATCOM AMPLIFIERS

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., Tel: (416) 745 9494 Fax: (416) 745 0618
UK: EEV Ltd., Tel: (01245) 493493 Fax: (01245) 492492

Subsidiary of the General Electric Company plc of England G&C

Circle (95) on Reply Card

See us at NAB, Booth #17136.

Hallikainen & Friends 4223
Audio mixers, TVA series, programmable transmitter control systems, DRC190.
Circle (577) on Reply Card

Hamlet 17436
Featuring waveform, vector, stereo audio measurement and monitoring devices including 301WVA and 302WVR videoscopes; 503AR stereoscope; PLM1 program level meter; AFM2000 PVM/UVM AFM kit.
Circle (578) on Reply Card

Hardigg Industries 19351-451
Equipment transport cases; ProRack 19" EIA enclosure.
Circle (579) on Reply Card

Harris Allied Broadcast Division 4416/16001
Introducing Platinum series HT EL5HS, EL10HS 5kW, 10kW VHF transmitters; Platinum III VHF modules; 1kW FET hot-pluggable units; DX series EPAC high-power digital solid-state medium- wave transmitters; DSE 1400 digital satellite exciter, DSR 1400 studio grade receiver; Audio-Metric CD-10E CD cartridge machine; OKTAVA microphones with Russian heritage.
Circle (580) on Reply Card

Harrison by GLW 12110
Featuring SeriesTwelve, K-Series, AP-100, Pro-790, MPC audio mixing consoles.
Circle (581) on Reply Card

Hash Inc. M 308
Featuring Animation MASTER 3D motion picture studio with spline-based modeling, animation, designed for classic character animation.
Circle (582) on Reply Card

Henry Engineering 5625
TELESTOR digital actuality recorder for automatic recording of news stories, weather updates and other material via dial-up phone line; Fast Trac II voice-over audio workstation; Stereoswitch audio switcher.
Circle (583) on Reply Card

Hewlett-Packard 19656
Introducing HP VidJet Pro - with new software capabilities and enhanced resolution; HP broadcast video server; 4:2:2 video disk recorder; HP workstations; various test and measurement products.
Circle (584) on Reply Card

HHB Communications Ltd. 1604-5
Accessories for PORTADAT portable DAT recorders; MCA 1000 AC/DC-powered 4-bay fast charger; Cedar DH1 DeHisser from Cedar Audio.
Circle (585) on Reply Card

Hi-Tech Industries 12940
Work area furnishings.
Circle (586) on Reply Card

Hitachi Denshi 18127
Introducing digital triax, optical fiber, studio robotics for SK-2600 digital camera; studio adapter, camera adapter with D-1 output for SK-2600P portable digital camera; SK-2020, SK-2020P digital camera systems with 400,000-pixel CCDs; RU-Z2 control, studio adapter for Z-2000 portable camera; Shot-Finder with PC to show image and time code of scenes on videotape.
Circle (587) on Reply Card

Hi-Tech Enterprises 10561
Circle (992) on Reply Card

Holaday Industries 12908
Magnetic field, RF radiation hazard instruments; HI-3702 induced current meter; EMF instrumentation.
Circle (588) on Reply Card

Hoodman Corporation 16376
Sunshades, monitor hoods for glare-free viewing of monitors; Video Chariot video cart.
Circle (589) on Reply Card

Horita 12650
Introducing BG-50 gen-locked multi-output blackburst generator; AM-50 on-screen audio meter; CSG-50, TSG-50 color bar, subcarrier generators; PGS-MTG time-code system.
Circle (590) on Reply Card

Hotronic 13611-2
Introducing AT61 10-bit frame synchronizer with 20-bit audio delay; AR71 dual-channel TBC/frame synchronizer; AU51 20-bit stereo audio delay; AQ-21 TBC, switcher, effects; AL82 video/audio delay; AP41 8-bit TBC synchronizer; AP41 PAL TBC, synchronizer, effects system.
Circle (591) on Reply Card

NAB Booth 18101

DIGITAL LEADERS.

TCI SEES 6,000 PLUS HOURS OF HEAD LIFE WITH PANASONIC D-3.

"At TCI's National Digital Television Center, we have adopted D-3 as our primary format for on-air playback. Sixty Panasonic AJ-D340 D-3 recorder/players are used for our Pay-Per-View services—PrimeStar and Request TV—that the Center distributes.

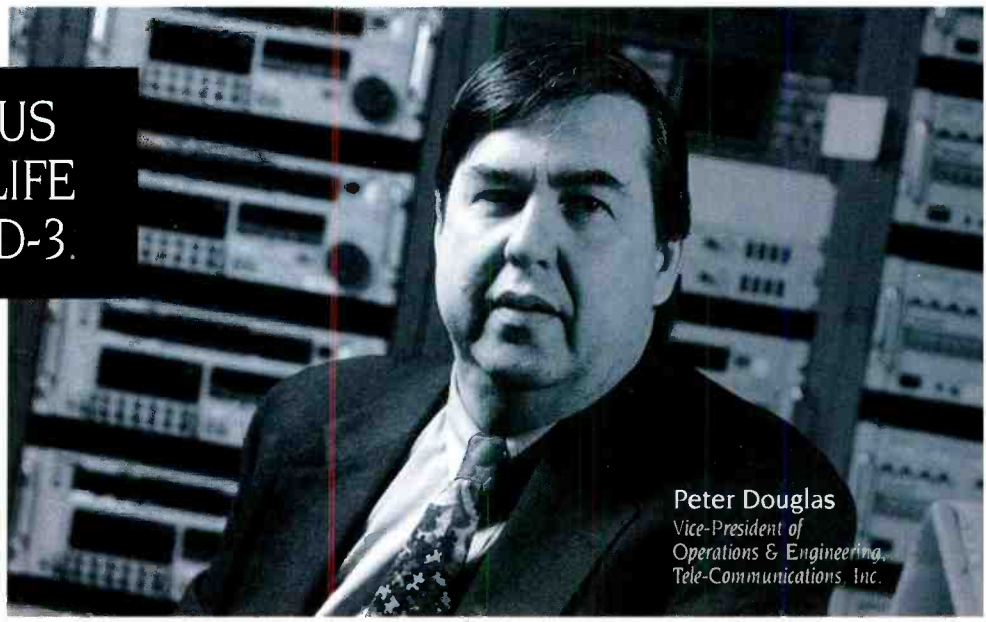
Twenty-one AJ-D350 D-3 studio VTRs are used for editing and mastering all promotional/interstitial programming for Request TV.

"TCI purchased the D-3 VTRs for their digital video quality, serial digital interface and four-hour tape recording time to record movies more than three hours in length.

What we had not anticipated was the dramatic cost-savings we are realizing with the 3000-6000 hours of head life the AJ-D340s are averaging.

"Many of the AJ-D340 VTRs are in use 15 hours a day, seven days a week. No AJ-D340 video heads have worn out since putting them into service more than 18 months ago. Several AJ-D340s have more than 6,000 hours of head life. One machine has more than 8,500 hours on its original head! While the AJ-D350s are not as forgiving as the -340s because of the different application, we're seeing terrific longevity with their heads as well.

"We had budgeted 2,000 hours of head life on the Panasonic equipment; clearly it has performed well beyond that. Our head wear and general maintenance requirements with D-3 are virtually nil.



Peter Douglas
Vice-President of Operations & Engineering, Tele-Communications, Inc.

"The AJ-D340 is simply a great movie-playing machine."

Panasonic engineered the D-3 format with a low tension tape path to enhance head life, a specification that is more than delivering on its promise at TCI. Just the sort of performance in critical applications that you can expect from Panasonic.

First in Digital Video.

Panasonic
Broadcast & Television Systems Company

For more information call: 1-800-528-8601 (Upon request enter product code 04) One Panasonic Way, Secaucus, NJ 07094.

Hughes Communications 17548
Broadcast satellite services, program distribution.
Circle (592) on Reply Card

Hughes JVC Technology M1301
Circle (993) on Reply Card

Hughey & Phillips Inc. 4722-3
FAA-approved obstruction lighting, controllers and remote monitoring for tall towers.
Circle (593) on Reply Card

I

IBM Power Visualization Systems 15773
Computer equipment, software
Circle (594) on Reply Card

Ikegami Electronics 19214
Introducing DNG digital disk cameras with and without detachable disk recorders; HC-390 2/3" IT portable camera; HL-55AW and HK-366P 3-FIT, HK-377P 4-FIT 2/3" format portable cameras with 16:9/4:3 switching; TM-10-17R 10," TM-24-17 24," TM-32-17 32" color monitors; featuring miniature microwave link and tracking antenna, Ultriminature camera and HK-343, HK-366, HK-377 field, studio cameras.
Circle (595) on Reply Card

Ikon Video (IDX) 12335
Introducing NP-23dx NiCad batteries for Sony cameras, accessories, LED charge status indicator; IXT-7 Super Seven single, dual-channel full-frame, infinite-window time base corrector.
Circle (596) on Reply Card

Image Design Film 10461
Circle (994) on Reply Card

Image Logic Corporation 16774
Featuring Log Producer, Auto Caption, Vidi Caption, Studio Caption.
Circle (597) on Reply Card

Image Video 11216
Signal routing, distribution equipment; 9501 20x30 video, dual/mono audio router; 9520/21 20x10 video, dual/mono audio router; model 8010 master control switcher.
Circle (598) on Reply Card

Imagine Products 10761
Editing and related products for DOS, MAC, Windows and laptop PCs.
Circle (599) on Reply Card

Immersion Corporation M1818
Circle (995) on Reply Card

ImMIX 19779
Introducing TurboCube and VideoCube version both available in NTSC and PAL for non-linear on-line finishing; also featured, Media File Exchange software.
Circle (600) on Reply Card

Industrial Acoustic/IAC 14039
Acoustic, sound control products.
Circle (601) on Reply Card

Innovision Optics 17569-769
Introducing Probe II camera lens system; Mini Mover Motion Control Lift and Linear/Curve Track; fiber-optic lighting systems; high-definition camera lenses.
Circle (602) on Reply Card

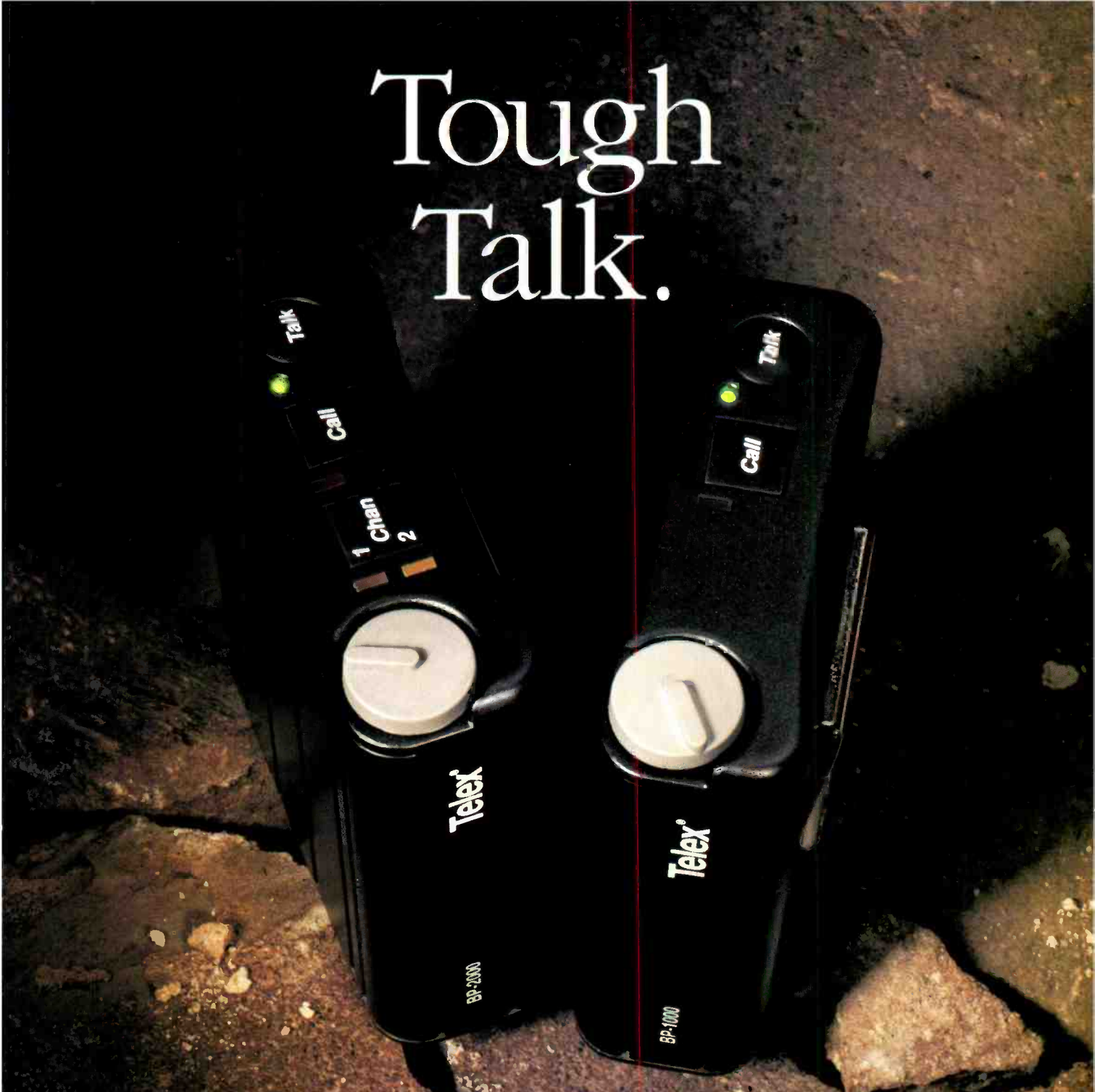
Inovonics 1625-8
Featuring #716 David-II second generation FM processor, generator; #708 digital synthesis FM stereo generator; #540 AM modulation monitor; RBDS encoder, decoder with full computer interface.
Circle (603) on Reply Card

Insulated Wire 16571
Various types of cable products including composite, triax, low-loss microwave, twisted pair, shielded twisted pair, Tuff-Flex (internally ruggedized), Re-Flex (semi-rigid).
Circle (604) on Reply Card

Intelligent Resources 20048
Fully integrated systems for media authoring, storage, delivery; systems development using advanced technology, MPEG authoring and playback, digital disk recorders, compositing and rotoscoping, animation and graphics, video tools for on-line editing.
Circle (605) on Reply Card

Intelvideo 13628-9
NTSC color encoder #ENC7A; enhanced impulse noise reducer # INR-ES; Ghost Buster model GB.
Circle (606) on Reply Card

Tough Talk.



When it comes to toughness, these new lightweight belt packs from Telex walk the talk.

When you need your voice to come through loud and clear, Telex® Audiocom® BP-1000 and BP-2000 Belt Packs deliver rock-solid performance. Their high-impact, extruded metal cases ensure long-lasting reliability.

They're built to be sturdy. And smart too. Microprocessor-controlled and compatible for either balanced or unbalanced lines, the BP-1000 and BP-2000 Belt Packs feature exclusive Telex innovations. Like the convenient volume control with 30 distinct positions. The attention-getting, audible call alert. And the remote microphone kill feature that shuts off microphones inadvertently left on.

The message is clear: The single-channel BP-1000 and dual-channel BP-2000 have the options, flexibility and toughness to meet your needs. For more information on the new Telex Audiocom Belt Packs, call **1-800-392-3497**. You'll like what you hear.

Telex

THE COMMUNICATION INNOVATOR.

Circle (79) on Reply Card

Interactive Effects M1226
Circle (996) on Reply Card

Interactive Images M1128
Digital video editing system using PCI design with CCIR 601 sampling and low JPEG compression.
Circle (607) on Reply Card

Interactive Multimedia Association M 101
Circle (997) on Reply Card

Interlace Engineering Corporation 13601
VMAXX frame buffers; E10 digital composite encoders; M10 memory expansion board.
Circle (608) on Reply Card

International Datacasting Corporation 4122-23
Reception equipment for satellite data transmission, SR250 and IDC FM/FM receivers.
Circle (609) on Reply Card

International Tapetronics/ITC 1410
DigiCenter digital audio management system with audio database management toolbox, WAV file support; multitasking operations; multivolume HDD backup with DAT cartridges; expanded integrated mixer with virtual console, event-driven input switching; enhanced traffic, music interfaces; virtual scheduler; audio routing switchers.
Circle (610) on Reply Card

Intertec Publishing 4322, 15659-60
Broadcast Engineering-TV, Broadcast Engineering-Radio, Video Systems, WBN.

Intraplex 3904-5
Series 4400 ISO/MPEG audio codec integrating ISO/MPEG II and G.7222 encoding/decoding, ISDN adapter, multiconfiguration storage; for remote broadcast.
Circle (611) on Reply Card

IPC Technologies M1122-4
Circle (998) on Reply Card

IRIS Technologies 11529
Introducing PX6400 series Video Commander graphical routing system with 64x64 audio/video capability; PX128 series 128x128 router; ideal for cable headends.
Circle (612) on Reply Card

IRT Electronics Pty. Ltd. 18169
"L" band fiber-optic (FO) link; analog audio/video FO link; modular FO products, portable FO link; 270Mb serial digital video FO link; multichannel analog video/audio FO link; VISCAS vertical interval audio system.
Circle (613) on Reply Card

Italiana Ponti Radio SRL 16677-777
VHF/UHF transmitters; microwave links; remote-controlled camera support products; antenna systems; HF equipment.
Circle (614) on Reply Card

ITC M 809
Circle (999) on Reply Card

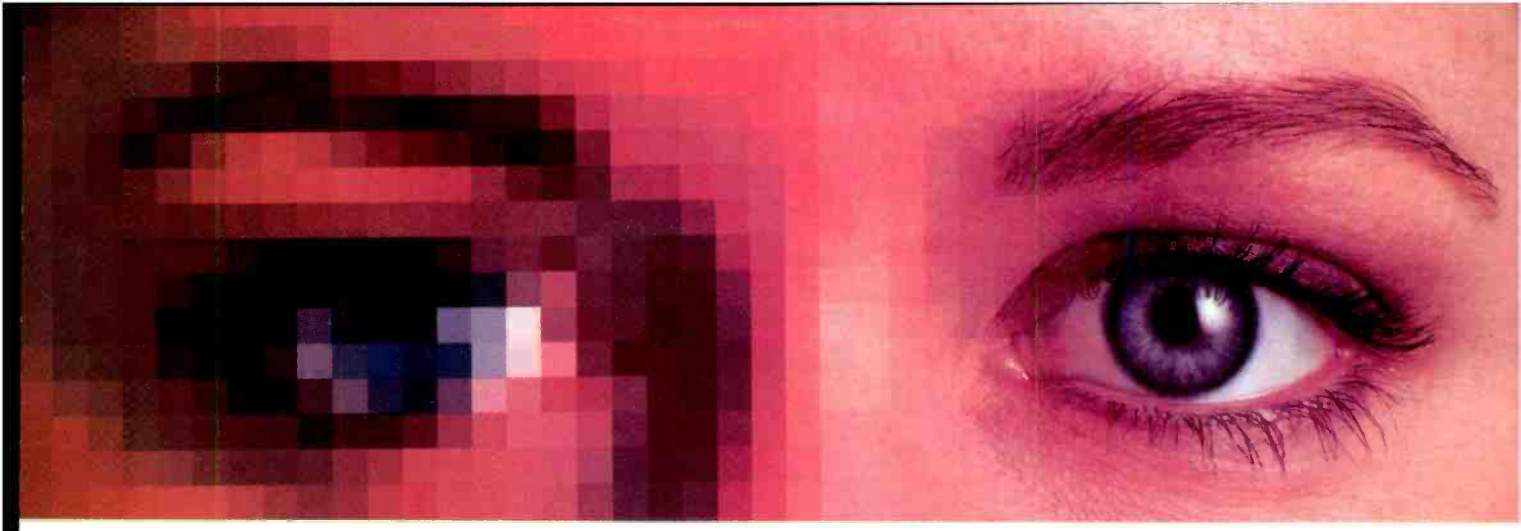
ITELCO spa 18514
Featuring TVRO systems; 1kW, 5kW fully solid-state FM transmitters; 2kW all solid-state UHF TV transmitter.
Circle (615) on Reply Card

ITS/Information Transmission 12950
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 (616) on Reply Card

J

James Grunder & Associates 17436
Extensions to FERAL EFFECT, including new software and digital video compression features; Compact LC 4:2:2 low-cost TBC/synchronizer for studio or portable use; The Advantage standards converter; HFT timing, higher-definition graticules, external reference, audio measurement enhancements for Hamlet signal monitors; 302WVR microscope with enhanced input facilities; 503AR stereoscope.
Circle (617) on Reply Card

Jampro Antennas 16617
Rigid coaxial transmission line and components; JIDC low-power FM combiner; common aperture/simulcast antennas; UHF broadband panel antennas; hybrids, harmonic filters; channel combiners, rigid transmission line, patch panels; directional couplers; UHF/VHF bandpass and notch filters.
Circle (618) on Reply Card

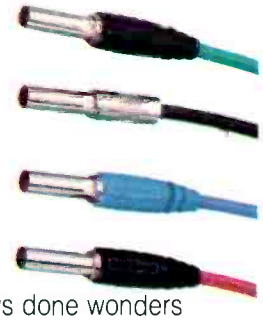


Look who's going to improve your image.

You've heard a lot about Switchcraft, a leading manufacturer of quality audio components for more than 40 years. Now, see what we can do. Because Switchcraft can supply you with video components, too.

Look to us for standard video broadcast equipment, all made with the reliability and high quality you expect from Switchcraft. When it comes to our video insulated patch panels, you'll find our eye for detail is second to none. Each one can accommodate up to 26 jacks for a variety of requirements. Dual jacks provide a normal-through signal path without the use of looping plugs or patch cords. And, each panel comes with large designation strips for your own labeling.

Our video patch cords are available in popular lengths and colors – all built for efficient video signal transmission. Our patch cords come with rugged metal handles and optional rubber "boots" for a better grip. The "boots" offer enhanced flex relief and are available in your choice of colors – red, black, green or blue. Switchcraft is dedicated to making your studio time as productive as it can be.



So whether you're thinking video or audio components, think Switchcraft. We've always done wonders with sound. Now we can improve your image, too.

For more detailed information, phone or FAX our Marketing Communications Department and ask for New Product Bulletins 426 and 427.

Switchcraft
A **Raytheon** Company

See us at NAB, Booth #5010-5011.

Circle (82) on Reply Card

Switchcraft, Inc.
5555 N. Elston Avenue
Chicago, Il 60630
(312) 792-2700
(312) 792-2129 (FAX)

Jefferson Pilot Data/JDS 13810
Broadcast business systems, software.
Circle (619) on Reply Card

Jensen Tools 16609
Numerous tools and toolkits for video, audio technicians, broadcast engineers; various metering, signal source products, JTK-5000 computer maintenance kit; Fluke model 87 DMM.
Circle (620) on Reply Card

J-Lab 12337
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 (621) on Reply Card

JNS Electronics Pty. 1627-8
Featuring microwave links DRFL 700 with 1.5-2.5GHz range; RFM 8323 FM broadcast receiver module for 8000 system.
Circle (622) on Reply Card

JVC Professional Products 17359
Introducing KY-27C low-light camera; KY-F55 small C-mount computer-controlled camera; 22B series editor, player, recorder VCRs; X2B upgrade of 3-CCD S-VHS camcorder; W-VHS/HDTV system with SR-W320U HDTV VTR, HV-M260U monitor, KH-100U camera for U.S. use.
Circle (623) on Reply Card

K

K5600 15368
Daylight-balanced location lighting kits including Joker 200, 400, 1200 instruments; 12V 800W-1500W Slimverters; 30V 200W Slimverter.
Circle (624) on Reply Card

Kavouras 12332
Weather radar products, displays, RADAC 2100 color radar accessing system and TRITON Doppler radar; Dramatic Triton surround weather graphics, version 3.0 software; WxAdvisor storm tracking sofware; TDR series radars.
Circle (625) on Reply Card

Kay Industries 2507
Power conversion products.
Circle (626) on Reply Card

KD Kanopy 5204-5
Shelter products for outdoor radio productions.
Circle (627) on Reply Card

Keystone Communications 11228
Production services.
Circle (628) on Reply Card

K&H Products 16343-5
Introducing Polar Bear camera case; Nagra case for Nagra 4ST, 4.2; The Hiker camcorder transport backpack; monitor case for Sony PVM-8044; recorder case for Fostex digital system; Shoulder, Carry-On, Quick Draw cases, Rain Slickers.
Circle (629) on Reply Card

Killer Tracks Music 10455-755
Production music libraries.
Circle (630) on Reply Card

Kings Electronics 17821-921
Connectors, including fiber-optic Tri-Loc, video jacks; BNC connectors, terminators, adapters, video jackfields, breakaway panels, patch cord assemblies; video patch plugs, terminations, adapters.
Circle (631) on Reply Card

Kintronic Laboratories 2119
Introducing RFC150-50-1 single-pole, double-throw 150A 60kV RF contactor; RFC250-30-1 single-pole, double-throw 250A 30kV RF contactor.
Circle (632) on Reply Card

Kline Towers 16367
Design, fabrication and erection of guyed, self-supporting, platform and multi-array towers, space frame structures and special-type antenna structures for broadcast and military applications; new tower designs, analyses of existing structures; inspection, maintenance service since 1953.
Circle (633) on Reply Card

Knox Video Products 16346
Introducing modular audio/video matrix router for up to 64x64 configuration; VFAX video information display system with integrated VCR control, full graphics capability.
Circle (634) on Reply Card

DISCOVER THE **NEW POTENTIAL** IN BARCO'S GROWING MONITOR FAMILY

BARCO's standard, yet flexible, CVM 3000 Series broadcast monitors offer the highest quality broadcast solution for any application be it viewing, control or master control. Its full interchangeability of boards and its easy to use set-up commands and menus quickly put you in control. The CVM Series allows you to customize your monitor solution based on: size, resolution or input. All CVM 3000 monitors support multiple standards and formats as well as accommodating optional serial digital component inputs.

Meet the BARCO Family at NAB, BOOTH 11450 or call (404) 590 79 00

4:3 and 16:9 scan formats
with guaranteed equal light output for both over and underscan.

Multistandard by design
BARCO's broadcast monitors have been designed to cover every known color standard. The relevant standard can be displayed on-screen.

Backlit keyboard
Push button control adjustments let you feel and see what you are doing. On-screen menus help for easy set-up.

VITC and Source ID
keep you informed on each frame and show the source displayed.

Automatic illegal color detection
when equipped with the optional digital 10-bit decoder.

Infrared remote control
up to 48 CVM 3000 monitors.

Barco, Inc.
1000 Cobb Place Boulevard
Kennesaw, GA 30144
Tel.: (404) 590-7900
Fax: (404) 590-8836

BARCO

See us at NAB, Booth #11450.

Head office: **BARCO nv/Video & Communications** Broadcast & Cable Products
Theodoor Sevenslaan 106 B-8500 Kortrijk, Belgium Tel: +32 56 23 32 11 Fax: +32 56 23 34 61

L

Larcan-TTC 12500
System controller or HDR series IOT transmitters, voice response remote control; aural corrector for HDR series IOT transmitters; FMS500/s dual 500W FM transmitters; introducing a new line of LTV transmitters ranging from 100W to 1kW.
Circle (635) on Reply Card

LDL Communications/Larcan 15855
Featuring 30kW VHF, 10kW UHF fully solid-state TV transmitters; 30kW IOT UHF transmitter; remote diagnostic system for Larcan transmitters; Alan Dick HDTV broadband panel or center-fed slot antennas; analysis demo to determine if existing tower can withstand additional load of HDTV antenna.
Circle (636) on Reply Card

Leader Instruments 12803-6
Test equipment, including LV-5100D D-1 waveform monitor with IDH, picture, component vector, stereo displays; LT-425D D-1 generator, serial, parallel, analog with EDH, digital audio; model 953 CATV spectrum meter.
Circle (637) on Reply Card

Lectrosonics 11232
Wireless mic systems; introducing UDR200 UHF synthesized receiver, UM200 synthesized belt-pack transmitter; UMC16 modular UHF multicoupler (8 diversity, 16 non-diversity receivers); 4-channel UHF, VHF receivers with integral RF, power distribution; 187 series VHF narrowband wireless system.
Circle (638) on Reply Card

LegaSys International M1028-30
Peripherals for Silicon Graphics platform; Quad Speed CE-rom, Vault-S, Vault-G, 9GB drives.
Circle (639) on Reply Card

Leightronix 18577-777
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 (640) on Reply Card

Leitch Inc. 15748, 5204
Introducing a digital disk recorder; distribution equipment.
Circle (1046) on Reply Card

LEMO USA 11222
Audio, video connectors.
Circle (641) on Reply Card

Lighthouse Digital Systems 12337
Featuring the Pathfinder series, SRX series, DCA series, Fiber Links series routing switchers.
Circle (642) on Reply Card

Lightmaker Company 16665-765
Manufacturers and marketers of AC ballasts for flicker-free HMI lighting instruments rated 200W to 12kW.
Circle (643) on Reply Card

Lightning Eliminators & Consultants 12900
Lightning prevention systems, Spline Ball Ionizer and Dissipation Array systems; Chem-Rod chemically activated grounding electrodes; transient voltage surge-suppression devices for power, communications lines.
Circle (644) on Reply Card

Light Wave Systems 16709-809
Circle (999) on Reply Card

Lightwave Systems 1807-8
FBDO-M, FBDO-SL digital audio modules for Fibox audio transmission system; IMS passes SMPTE 259M digital video, AES digital audio through a 20-bit analog audio signal.
Circle (645) on Reply Card

Lightworks 19054
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 (646) on Reply Card

Link Communications SA 5110-1
Circle (1000) on Reply Card

Link Electronics 18676-778
Signal distribution products; video processing equipment; captioning products; signal converters.
Circle (647) on Reply Card

Linker Systems Inc. M 813
The Animation Stand on Silicon Graphics platform.
Circle (648) on Reply Card

Lipsner-Smith Company 13845
Motion picture film cleaning equipment; featuring Multisolvent Excel 900, CF-3000 Mk VII for film-to-tape transfer houses.
Circle (649) on Reply Card

Listec Video 18748
Full range of prompter displays, A-6000 PC prompter DOS software.
Circle (650) on Reply Card

LNR Communications 2416
LVM series low profile data-quality video exciters; digital video flyaway system with new patented Unifold pedestal; LNA/B; MVC-10 mobile voice communication package.
Circle (651) on Reply Card

Logitek 2725
Featuring Ultra-VU audio meters with simultaneous VU, PPM, peak hold, 64dB range, high resolution zoom mode phase display; Mini RateGate low-cost digital audio sample rate converter.
Circle (652) on Reply Card

Loral Microwave-Narda 5425
Microwave products for ENG, STLs.
Circle (653) on Reply Card

Louth Automation 10158
Broadcast automation, machine control systems; L featuring B-100 time banking; Autoshow show timing; ADC-100 disk interfaces; Turbodisk disk preparation.
Circle (654) on Reply Card

Lowel-Light 17155
Featuring Softcases for Softlight series; Fren-L 650 lighting instrument; Rifa-lites.
Circle (655) on Reply Card

LPB 2727
Signature III and series 7000 stereo linear fader consoles; low-power AM transmitters meeting Part 73AM nighttime, Part 90 TIS/HAR and Part 15 unlicensed limited area broadcast; carrier current systems; radiating coaxial cable, limited area FM systems.
Circle (656) on Reply Card

LSI Logic M1205-7
Encoder, decoder chipsets for DBS, cable markets; channel decoding products including QAM, QSPK demodulation, 16VSB demodulation, Viterbi Reed-Solomon FEC; decoding products including MPEG-2, integrated audio/video, single-chip decoders, single-chip transport; encoder chipsets; JPEG compression chipsets.
Circle (657) on Reply Card

LTM Corporation of America 16561
Lighting products, including: Benzai 200W HMI light; HMI lights from Cinepar 2.5/4kW combo and 6kW spot; Moonlight HMI, tungsten, fluorescent lights.
Circle (658) on Reply Card

M

Macrovision 16576-776
Introducing Starshaker, a low-cost satellite scrambling system.
Circle (659) on Reply Card

Magic Teleprompting Inc 16559
Prompting systems.
Circle (660) on Reply Card

Magni Systems 17284
Video test equipment, including model WMV0710 automated video signal monitor; VIT-700 VITS inserter with GCR; TSG-700 NTSC/Y-C test signal generator; RG-400 NTSC/Y-C reference generator; SDA-100 S-video DA; STC-100 NTSC- S-video transcoder.
Circle (661) on Reply Card

Magnum Tower 4010-11
Manufactured radio, TV and communications towers.
Circle (662) on Reply Card

Management Graphics 15477-577
Solitaire Image Recorders used in post-production for animation, special effects, digital compositing; supporting Vistavision, Academy offset, full-frame, etc.) for file formats from D-1 to SGI bitmaps to numerous PC and Mac files.
Circle (663) on Reply Card

Manhattan Production Music 13633
Production music libraries, including Apple Trax CD, Chesky Records Classical series; Manhattan production music, Audiophile sound effects series.
Circle (664) on Reply Card

Marco Inc. 19584-6
Video edit suite furniture; production control

room consoles; equipment racks, accessories.
Circle (665) on Reply Card

Marconi Communications Systems 17101
Test, measurement equipment; radio/TV transmitters.
Circle (666) on Reply Card

Mark IV Audio Group 15717
Introducing Klark Teknik DN3600A stereo programmable graphic EQ, DN 782RM remote control for DN 728 delay; Midas XL-200 console; featuring Klark Teknik 300, 400 series equalizers; 500 series compressors, gates; 700 series digital delay, 800 series cross-overs; DDA Profile, FMR and Forum MUTE consoles.
Circle (667) on Reply Card

Matco Mfg. & Test 18937-19137
Video record/playback automation, MA-201 playback system; MA-300 tape duplication control.
Circle (668) on Reply Card

Matthews Studio Equipment 16648
Camera support products, ITE pedestal, pan/tilt series; MC 88 crane; SPAGS spacer bags.
Circle (669) on Reply Card

Maxell Corporation of America 18136
Featuring Digital Betacam videocassettes.
Circle (670) on Reply Card

MBNA Marketing Systems 4326
Circle (1001) on Reply Card

McCurdy Radio Industries 13110
DCS 3000 serial digital and Microcompact digital intercoms; M/2000 automation system; McCart digital audio storage, multichannel playback; UMD-32 3-color 32-character under monitor display; ATS-100 audio test set; AT2656 stereo audio monitor; UIO-80 serial/parallel machine control interface; series 9000 A/V DAs, accessories.
Circle (671) on Reply Card

MCL/Inc. 19582-3
Introducing Maxxim series - klystron/TWT high- power amps for satellite uplink communications, including MX2000 TWT low-power outdoor (C-/Ku); MX3000 TWT medium-power cabinet (C-/X-/Ku); MX5000 TWT high-power cabinet (C-/Ku-/KuDBS); MX9000 klystron high-power cabinet (C-/Ku-/KuDBS)
Circle (672) on Reply Card

M C Lights and Manufacturing 13162
Circle (1002) on Reply Card

Measuring Marketing 4803
Circle (1003) on Reply Card

Media Computing 11105-7
Broadcast automation packages, PROtec and ANGIS systems; Angis companion.
Circle (673) on Reply Card

Media Concepts 11442
Used broadcast TV production equipment.
Circle (674) on Reply Card

Meret Optical 12748
Fiber-optic products; LL500-G serial digital video FO card, to three TX or RX per card; LL700 laser-diode-based FM video link, meets short-haul specs over long distance; WFMS-3000 multichannel broadcast video FO system.
Circle (675) on Reply Card

Meson Technical Press Pty. Ltd. 18578
Circle (1004) on Reply Card

Micro Communications 19401
Transmission line; HDTV/NTSC UHF antennas; HDTV absorptive filters; LPTV all-band UHF antennas; transmitter output coax breakaway section; HDTV/NTSC line couplers.
Circle (676) on Reply Card

Micro Technology Unlimited M 313, 412
Circle (1005) on Reply Card

Micron Audio Products 16448-51
Wireless microphone systems, accessories; including model TX-505 hand-held transmitters; SDR range portable diversity receivers; SQN-IIIa portable stereo mixer; Tram lavalier mics.
Circle (677) on Reply Card

Micron Tool & Mfg./Cammate 17570-670
Camera support systems, Black Magic boom extensions with remote head, pan/tilt control.
Circle (678) on Reply Card

Look what's in the spotlight at NAB . . .

SHR CABLE

SYSTEM 4LD

MATRIX 200

This year the spotlight is shining on Extron's new *Super* High Resolution Cable, the System 4LD Switcher/Line Doubler, and the Matrix 200 Routing Switcher—three high-powered products sure to meet the heavy demands of any A/V user or video production house.

Visit us this year at the NAB Multimedia World in the Las Vegas Hilton and see these and Extron's full line of high resolution video products in action!

COME SEE US AT BOOTH #319 (HILTON)

Extron Electronics

EXTRON ELECTRONICS, 1230 South Lewis Street, Anaheim, CA, 92805, U.S.A., (800) 633-9876 (714) 491-1500 FAX: (714) 491-1517
EXTRON ELECTRONICS, EUROPE, Banningstraat 6, 3769 AB Soesterberg, The Netherlands, 31-3463-50150 FAX: 31-3463-53985

Circle (115) on Reply Card

MicroNet 15785
Video transmission services - terrestrial linking New York, Philadelphia, Washington DC, Dallas, Austin, Houston, San Antonio; earth stations in Dallas and New York for domestic and international services.
Circle (679) on Reply Card

Micropolis M 518
Introducing AV Gold Series high-capacity, high-performance drives for multimedia applications; 4MB/s transfer rate; from 2.1GByte to 9.1GByte capacities.
Circle (680) on Reply Card

Microsoft Corporation M 913
PC computer software.
Circle (681) on Reply Card

Microtime - See Digital Graphix 16624

Microvideo Ltd. 13626
Digital interfacing with NTSC/PAL to D-1 module; digital test pattern generator with EDH, embedded digital audio; digital proc-amp; digital logo generator for station ID; digital data inserter for closed-captions, VITC, etc.
Circle (683) on Reply Card

Microwave Filter/Comband 13240
Interference, bandpass, bandstop filters for cable TV, microwave, earth station signal applications.
Circle (684) on Reply Card

Microwave Radio 12327
Featuring portable microwave transmitters for ENG; fixed radio systems for STLS, ICRs, backbones; antennas, controllers.
Circle (685) on Reply Card

Milestek 16445
Connectors, cables for analog, digital video; cable tools; computer network adapters, cabling, connectors; distributors for Trompeter, North Hills, ADC Telecommunications.
Circle (686) on Reply Card

Miller Fluid Heads 16967
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 four feet for transportation.
Circle (687) on Reply Card

Minolta 11605-6
Color analyzer CA-100 with probe holder and training video; XY-1, CL-100 incident colorimeters; CS-100 spot colorimeter; CC-110 convergence meter.
Circle (688) on Reply Card

Miralite Communications 16377-477
Satellite communications products, 7900 LNB; Space Line digital telephone service system.
Circle (689) on Reply Card

Miranda Technologies 19648
Introducing Espresso integrated computer video interface; ISO-101i 4:2:2 detail enhancer; SOLO desktop housing for Miranda imaging series converters; Mindy serial 4:2:2 input module for SGI Indy.
Circle (690) on Reply Card

Mira Vision M1717
Circle (1006) on Reply Card

Modulation Sciences 11113-5
Audio processors, spatial image enlarger; modulation measurement equipment, digital FM peak deviation monitor; diversity subcarrier receiver for ENG/mobile crew communications; RDS/RBDS analyzer and RDS/RBDS data receiver.
Circle (691) on Reply Card

Mohawk/CDT Broadcast Cables 13404
Water-resistant triaxial cable with waterproof boot; serial digital D-1, 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 (692) on Reply Card

Mole-Richardson 16355
Lighting products, lamps, fixtures.
Circle (693) on Reply Card

Montage Group 16980
Non-linear videotape editing systems, Montage Picture Processors; Montage for the Video Toaster and Amiga AGA.
Circle (694) on Reply Card

MSE Video Tape Services 13046
Videotape products.
Circle (695) on Reply Card

Multidyne Electronics 12262
Signal distribution products, VPDA-2 video/pulse/subcarrier DAs with EQ; test products, TS-16 NTSC V/A test generator; solid-state audio recorders; video distribution tray.
Circle (696) on Reply Card

Murry Rosenblum Sound Assoc. 2428
Audio Ltd. diversity wireless microphone systems.
Circle (697) on Reply Card

MYAT 15714
Rigid coaxial transmission line components and accessories; $^{7}/_{8}$" to $9^{3}/_{16}$".
Circle (698) on Reply Card

N

Nady Systems 11226
Wireless mic systems using VHF and UHF frequencies.
Circle (699) on Reply Card

Nagra Kudelski SA 11805
Analog, digital audio recorders; introducing NAGRA AREA, solid-state recorder with PCMCIA support; single-channel records 40 minutes on 20Mbyte card; editing, G722 or MUSICAM compression; standard telephone output, ISDN, time-code options.
Circle (700) on Reply Card

Nalpak Sales 16964
TuffPaks tripod cases; RP series molded rack cases; Travel Kart series; Magliner series.
Circle (701) on Reply Card

NDG Phoenix 13043
OMS v1.5 upgrade to operations management software, increases performance with multiple sessions, work orders; LMS v1.6 upgrade to library management system with laser label option, improved interface, barcode and tape logging.
Circle (702) on Reply Card

L E Nelson Sales 13615-6
Stage and studio lamps by Thorn, GE.
Circle (703) on Reply Card

Nemal Electronics International 13636
Precision audio, video cable; flexible mic cable; Kings products, Cat wire and cable, Switchcraft, Amphenol, Blonder-Tongue, Belden Alpha, Cablewave.
Circle (704) on Reply Card

Neotek 1907-9
Featuring the Élan Extra, the Élite and Esprit audio mixing consoles; a multimedia module; Sytek microphone pre-amp line.
Circle (705) on Reply Card

Neutrik Instrumentation 2127
Portable and programmable audio system measurement products; 3501, 5500 test systems.
Circle (707) on Reply Card

Neutrik USA 2127
A and B series XLR receptacles, small size, many configurations, tuning-fork contact principle, optional pin 1 direct to ground; MiniCon 12-pin connector, for PCB mounting, fully metal polarizing guides, unique strain relief; EASY PATCH series of patchbays and panels.
Circle (708) on Reply Card

NewsMaker Systems 18585
Newsroom automation interface products for titlers.
Circle (709) on Reply Card

NewStar/Dynatec Video Group 17124
See Dynatec Video Group.
Circle (508) on Reply Card

Newswire 2000 15165
Circle (1007) on Reply Card

Newtek 15171
Video production graphics, effects system.
Circle (710) on Reply Card

Nigel B Furniture 16228
Featuring rack-mount kit for Videocube and for Macintosh computers; transportable workstation; articulated keyboard arm.
Circle (711) on Reply Card

Nikon Electronic Imaging 19536
Introducing S20x8 telephoto lens, a universal purpose, ENG zoom lens with the shortest MOD in class, compact and lightweight; S9x5.5II 9x zoom ratio with widest angle ENG lens; S15x8.5III most compact, lightweight internal focus ENG standard zoom.
Circle (712) on Reply Card

Norpak 19209-10
IntroducingTTX625 plus, VBI PC card and TTX645 plus set-top data receivers with on-board FEC, data rates to 57.6kbps; Electronic Newspaper Distribution, new service using Norpak products and software to deliver newspaper to home or office PC.
Circle (713) on Reply Card

Norsat Int'l./NII 1704-5
C-, Ku-band satellite communications system equipment; introducing new LNBs, Channel-on-Demand and Microsat 150.
Circle (714) on Reply Card

Northern Technologies 19777
Circle (1008) on Reply Card

Nova Systems 13842-14042
Featuring NovaSync3 modular frame synchronizer on PC plug-in cards; NovaBlox serial digital conversion products; NovaRouter A/V matrix routing system.
Circle (715) on Reply Card

NSM Euroson America 5201
Circle (1009) on Reply Card

N Systems/NSI 13132
Stiletto, Superquad central ENG receive antenna systems; Silhouette ENG transmit antennas; Super Pod helicopter ENG antenna systems; MC5 PC-based remote-control system.
Circle (716) on Reply Card

NUCOMM 11220
Microwave transmitters, receivers for ENG, STL, ICR; introducing a 12W ENG transmitter in 1.99-2.11GHz, 2.45-2.5GHz with two programmable audio subcarriers and 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 (717) on Reply Card

NVISION 15884
Introducing DAPS II digital audio processing suite with 16x16 I/O matrix; NV9301 router control panels; NV1055 mix/minus router/control panel; NV1050 4-channel sample rate converter; NV1035/1045 20-bit A/D, D/A converters; NV1308A router, RS-232 machine control router; NV1060 40-channel delay compensator; NV3128D digital machine control routing switcher.
Circle (718) on Reply Card

Nytone Electronics 19201-2
Film/slide transfer equipment, including the VSS-3C slide scanner with 3-chip camera, remote control; 750-line resolution; RGB/YC/NTSC.
Circle (719) on Reply Card

O

O'Connor Engineering Labs 17148
Carbon fiber models 25L lightweight 2-stage, 35L-Baby and 35L/C carbon fiber column tripods; #2575 fluid head with lighted level and counter balance indicator.
Circle (720) on Reply Card

Odetics Broadcast 15734
Introducing a hierarchical approach to program and spot management; DigiSpot-1 low-cost disk-based replay system for news, low-power TV; comprehensive ABS disk-based automation systems with RAID3 storage and control.
Circle (721) on Reply Card

Omicron Video 13040-2
Signal distribution products, including model 235 series video/audio DAs; model 225 series Audio Dubmaster; model 8047 duplication QC switcher.
Circle (722) on Reply Card

Omnimusic 16802-902
Music production libraries.
Circle (723) on Reply Card

Omnitronix 1527
Circle (1010) on Reply Card

OpAmp Labs 16674
Audio, video signal distribution, switching equipment, A-24/2ML audio and VA-16 1x16 video/audio press feed boxes.
Circle (724) on Reply Card

Optibase Inc. M1214
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 (725) on Reply Card

Optical Disc Corporation M1024-1026
LaserDisc recorders; recordable laser videodiscs (R.I.Vs) compatible with standard LaserVision or LaserDisc format consumer players; model 610A/620A recording system accepts composite video for cost-effective single-copy or low-volume duplication.
Circle (726) on Reply Card

OptImage Interactive Services M 512
Desktop video equipment; multimedia products.
Circle (727) on Reply Card

Optimum Productions 13429
Versioning, dubbing of videos, films with translations from and into English from other languages; meets broadcast and feature film specifications.
Circle (728) on Reply Card

Options International 13256
Utility products for telecines; Meta-RTS Plus systems; QuattroScan framestore; Component Shredder; Proof Positive film inspector; Magnasonic D-3000 film cleaner; Trans/EFX special effects filter system; rebuilding of capstan, reel motors; digital reclocking video amp;

Big News About Something Small.

The Varian Compact Satcom MPA.

Our new Compact Medium Power Amplifier (CMPA) is big news in the portable satcom market. It's ideal for SNG, flyaway and small earth terminals.

The CMPA packs high efficiency in a 5.25" single rack drawer. It's also easy to use, featuring microprocessor control. Digital and analog control interfaces make the CMPA a snap to integrate into the system. Plus, it's easy to maintain with modular construction and built-in fault diagnostics— all in a rugged design that can stand up to a world of conditions.

And, as with all Varian amplifiers, the CMPA is backed by the industry's largest sales and global service network.

No matter where in the world your story breaks, Varian's CMPA will be there transmitting the news.

Give us the opportunity to tell you more, call us:
Tel: (408) 496-6273 Fax: (408) 496-6235

ISO 9001 REGISTERED

Varian Microwave Equipment Products
3200 Patrick Henry Drive
Santa Clara, CA 95054 USA

varian

Circle (118) on Reply Card

reference link (NTSC/PAL changeover); DR6000 rewinder; APDU-2000/R automatic tape control system.
Circle (729) on Reply Card

Optivision M 612
Circle (1011) on Reply Card

Orad Hi-Tech Systems M 211-3
Circle (1012) on Reply Card

Orban/Harmon Pro Audio 2910
Introducing 8208 stereo generator, compact, stand-alone, all-digital processing for large network application; DSE 7000 digital sound editor with +/-25% time compression, expansion using V4.65 software; PC software for Optimod-FM-8200, demo for digital Optimod-TV 8282
Circle (730) on Reply Card

Orion Atlantic 10155
Featuring international satellite communication services for audio, video, data via Ku-band covering North America, Europe.
Circle (731) on Reply Card

Ortel 18377-477
Fiber-optic links, including System 8000 microwave fiber-optic interfacility links for every signal type between the antenna pedestal and control room.
Circle (732) on Reply Card

Otari 1414
Audio mixers and recording equipment; introducing STATUS RP, a digitally controlled console; the BR-10 broadcast console; and CDC-600 CD changer; featuring MR-10 minidisc recorder and RADAR random access digital audio recorder.
Circle (733) on Reply Card

Oxberry 20077-177
Animation equipment.
Circle (734) on Reply Card

P

Pacific Bell M 109
Multimedia CD publications.
Circle (735) on Reply Card

Pacific Radio Electronics 12946-8
Racks, panels; precut holes accommodating various manufacturers' connector products.
Circle (736) on Reply Card

Pacific Recorders & Engineering 3025
Audio mixing consoles, including BMX, AMX, STX, RMX and production mixer systems; ADX Ensemble and ADX Eight digital audio workstations; custom studio cabinetry.
Circle (737) on Reply Card

Paco Electronics USA 16764
NiCad battery products; DP series.
Circle (738) on Reply Card

Panasonic 18101
AJ-D351 D-3 VTR, LQ-D5500 digital optical disc recorder; Smart Cart automation system; WJ-MX100 Postbox non-linear editing system; AQ-235W all-digital studio camera; cost-effective digital component video system.
Circle (739) on Reply Card

Pandora International 11440
Enhanced DCP color processors; Pogle telecine control systems; Pogle tape-to-tape color processor systems; electronic cursor generators.
Circle (740) on Reply Card

Parallax Graphics Systems M1720-1
Video graphics, paint, animation software, including ADVANCE digital compositing, effects and sequence editing; DIPSS digital ink and paint software system.
Circle (741) on Reply Card

P E Photron M1329
Featuring DVDA-1 digital disk array; OSCON-BOX video frame capture box; PRIMATTE advanced chroma-key software.
Circle (742) on Reply Card

Peerless Sales Company 16012-3
Monitor/TV wall and ceiling mounts, the Jumbo and Designer series; floor stands for televisions and VCRs; speaker stands.
Circle (743) on Reply Card

Penny & Giles 3004-5
Signal controls, faders; M3000 linear, MRF 11 rotary motorized series; T-bar controls; precision controllers; Audio Control Module precision faders and control devices, including the PGF 8000 and 3000 series of linear faders.
Circle (744) on Reply Card

Penta Laboratories 1525
Transmission power devices, klystrons.
Circle (745) on Reply Card

PEP 16601-701
Videotape editing products, Shotlist software; DigiSpot digital recorder, player cart replacement.
Circle (746) on Reply Card

Pesa Switching Systems 19401
Introducing Cougar routers based on 32x32 matrix for audio, video, digital and widebandwidth; Lynx series routers for small-size audio, video and wideband matrices at low cost; Bobcat family of routers in 16x2 for A/V, wideband, D-1, RGB and Y/C; Route 66, Windows-based router control system for 6600E controller line; Panther control system on single board for stand-alone or in-router installation; model 2400E/EX/EXS control for simple routing requirements at effective cost; featuring RM5000, RM4000 routers, RC5500/5000, 6600E/EX/EXS control systems.
Circle (747) on Reply Card

Phasetek Inc. 5427-8
Manufacturers of AM antenna phasing equipment, antenna tuning units, RF components and RF inductors.
Circle (748) on Reply Card

Philips Consumer Electronics 18982
Circle (1013) on Reply Card

Philips TV Test Equipment A/S 16811-5
Introducing PM 5639/01 CRT color analyzer with PC software; PM 5639/02 auto color alignment for Barco monitors; PM 5639/21 industrial CRT color analyzer with double sensors.
Circle (749) on Reply Card

Photomart Cine-Video 17121-221
Distributor, video products.
Circle (750) on Reply Card

Pinnacle Systems 18380
Featuring Prizm video workstation with latest software; Alladin component video I/O option (525/625-line); introducing FlashFile, 3rd channel option to FlashFile still-store system for two independent program outputs with separate preview capabilities; FlashFile network via HP 100VG-AnyLAN.
Circle (751) on Reply Card

Pioneer New Media Technologies 19771
Real-time MPEG-2 encoder; high-capacity removable worm digital video disk (20GByte); digital video disk record, playback system; digital video disk archive changer with 252 disk capacity; multichannel video disk cart system, 500 disks, 12 drives.
Circle (752) on Reply Card

Pixel Instruments 18638
DS4200 10-bit serial digital video frame synchronizer; AD3100 digital audio delay, synchronizer; DD2100 video delay detector; AD2100 audio delay, synchronizer tracks variables in video delay; DA-300 digital DA.
Circle (753) on Reply Card

Pixel Power Ltd. 13348
Circle (1014) on Reply Card

Posthorn Recordings 1526
Circle (1015) on Reply Card

Potomac Instruments 2510-11
RF test/monitoring products; 1900 series directional array antenna monitors; FIM series MF/VHF/UHF field-strength meters; AA-51A automatic audio analyzer, AG-51 generator; QA-100 program audio analyzer; tower light monitor; remote-control systems.
Circle (754) on Reply Card

Power Productions Software M1531
Circle (1016) on Reply Card

Prime Image 19984
TBC/synchronizer systems; standards converters, delay unit with separable audio and video capability; self-contained logo inserter; plug-in TBC/synchronizer for computer-based effects systems.
Circle (755) on Reply Card

Pristine Systems 2903
Circle (1017) on Reply Card

Pro Battery 19151-251
Premium nickel-cadmium battery packs for professional TV; NP1As, NP1Bs, 12V, 13.2V, 14.4V bricks types; VP-90s, belts; full line of chargers, primary batteries; rebuilding services.
Circle (756) on Reply Card

Production Garden Library 13346-7
Production music libraries, Broadcast 100 and AV/Video 200 series.
Circle (757) on Reply Card

Professional Label Inc. 15728
Label Producer label printing software for Windows; video status label sheets; MII, D-3, CD label sheets; packaging products.
Circle (758) on Reply Card

Professional Sound Corporation 5116-7
Production audio equipment distributor; MilliMic lavalier microphones; VDB boompoles; audio distribution amps; battery supplies; mic power supplies; RF antennas; PSC sound carts, custom cables; headset microphones; omniplate microphones; universal shock-mount systems; solar panel/rechargeable power supplies.
Circle (759) on Reply Card

Progressive Image Technology 19926
Computer-to-video scan converters.
Circle (760) on Reply Card

Did You Say Odetics *Disk* Systems?

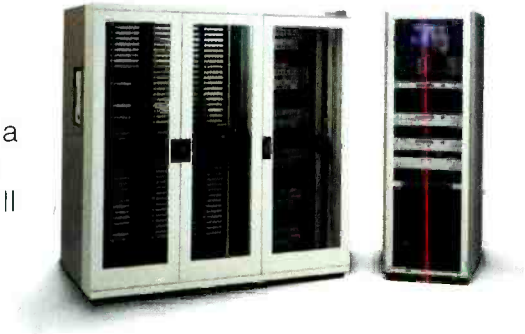
The CacheMachine™ From Odetics. The Automated On-Air System for Today and Tomorrow.

You've heard lots of promises about play-to-air disk systems. But only Odetics, a world leader in on-air presentation, gives you the first real-world disk solution for today's television station. With a new system called the CacheMachine.

The CacheMachine overcomes the barriers to successful on-air play from disk — without forcing you to go backward in station automation. It allows you to play programs as well as commercials automatically and cost effectively. It provides support for multiple channels from a single system. You don't have to abandon your present technology or change your format. And you don't need a crystal ball to tell you which data compression format will become standard.

How is this possible? Because the Odetics CacheMachine uses a technique called disk caching to maintain your valuable commercials on archive tape in an uncompressed format for a fraction of the cost of archiving them on disk. Then the spots are automatically loaded into a disk recorder, which later plays them to air on one or two channels — with all the speed and flexibility that disk provides.

Experts agree the CacheMachine is today's only real-world disk automation solution. But there's not enough space here to tell you all its great benefits. One thing's for sure. You can't afford to make a decision or an assumption about on-air automation until you talk to Odetics.



Director of Sales
Bill Keegan
(714) 774-2200

Northeast
George Anderson
(609) 953-9101

Southeast
Emerson Ray
(813) 960-0853

Odetics Broadcast

West
Chuck Martin
(818) 999-9796

North Central
Kevin Glenn
(800) 243-2001

South Central
David Scally
(404) 917-9506

Circle (119) on Reply Card

Promusic 13047-8
Music and sound effects library products.
Circle (761) on Reply Card

Proxima Corporation M 807-906
Introducing Ovation+ LCD panels; Desktop Projector 2800.
Circle (762) on Reply Card

Q

Q-TV 17148
Executive speech prompters; CueMac Macintosh-compatible computer prompter program; 9"-17" on-camera prompters; FDP-9S flat panel display; 15" prompter/monitor; upgrades for models QCP-LT, QCP-Mark 1.5; QCP Mark II.
Circle (763) on Reply Card

QSI Systems 15828-16028
Featuring 908 series multi-image inserter with time/temperature option; 808 single image inserter; model 1500 RS-232 control demod.
Circle (764) on Reply Card

Quality Video Supply 13246-8
Kramer video encoders, decoders, correctors; computer to video interface; video/audio switchers, DAs; digital TV standards converters.
Circle (765) on Reply Card

Quanta/Dynatech Video Group 17124
See Dynatech Video Group.
Circle (766) on Reply Card

Quantel 18151
Presentations: Editing - the Post-Production House of the Future; News - the News Operation of the Future; new developments for Paintbox, Hal digital compositor; Optical effects for Henry, Hal, Domino; enhancements to Picturebox still-store.
Circle (767) on Reply Card

Questar Systems (Farpoint Systems) 12862
AccuPrompt software for Macintosh desktop, PowerBook series computers; NTSC output.
Circle (768) on Reply Card

Quickset 11527
Introducing Apollo II tripod; Samson Huskey leg locks; electromechanical pan/tilt head QPT-15 for Telecommunications; joystick remote controllers.
Circle (769) on Reply Card

R

R-Columbia Products 13044
Wireless intercom products, TR-470/R1-60 IFB/ENG headphones; 6058/PT ENG/IFB pocket telephone; wireless IFB headset/receiver; miniature dynamic headset; full-duplex intercom headphones; replacement intercom headphones and beltpacks.
Circle (770) on Reply Card

Radamec EPO Ltd. 16338
TCP Touch Control Panel for full-shot storage, recall with SVGA touchscreen monitor, displays montage of frame-grabbed shots for eight cameras; RP4 pedestal drive unit for full XY control; HK435 VR pan, tilt head for Virtual Studio application.
Circle (771) on Reply Card

Radius M1102
Circle (1018) on Reply Card

Raffles Trade Press Pte. Ltd. 17869
Circle (1019) on Reply Card

RAM Broadcast 4413
Introducing audio mixers, intercom systems, switchers, jackfields and on-air lights.
Circle (772) on Reply Card

Ramsa Audio/Panasonic 18101
Professional audio mixers, monitors; R-DAT systems, SV-3700, SV-3900 with RS-422 control.
Circle (773) on Reply Card

Rank Cintel 12340
Analog flying spot, all-digital, and HDTV telecine systems, including Ursa Gold, Turbo 2 and Mk III HD.
Circle (774) on Reply Card

Rapco International 5413
Circle (1020) on Reply Card

Rasterops 19952, M1309
Featuring the Targa 2000.
Circle (775) on Reply Card

RCI Systems Inc. 10361
AVD series A/V wall plates, panels; BRO active/passive audio mult. boxes; CT-2 cable tester; introducing BMV series video mult. box and custom silk screening services.
Circle (776) on Reply Card

RE America 18378-478
Circle (1021) on Reply Card

RE Electronics 18378-478
Test, measurement equipment for audio, RDS data transmission products.
Circle (777) on Reply Card

Rean Products 5414-5
Circle (1022) on Reply Card

Recognition Concepts 16712-3
Featuring low-cost videodisc recorders, portable HD disk recorders, XVDR software package.
Circle (778) on Reply Card

Rees Associates 17122-222
Broadcast architecture.
Circle (779) on Reply Card

Research Technology Int'l./RTI 13845-14054
Videotape evaluation and cleaner systems, TapeChek 4100 for evaluating, recycling digital Betacam tape; DXA digital tape dropout counter; Capacitive discharge degaussers.
Circle (780) on Reply Card

RF Technology 13128
High performance heterodyne fixed links 1.5-15GHz; UPL series transmitters 1.5-15GHz; D-series portable systems, 1.5-15GHz; HCR series ENG central receive systems; SVX series analog/digital SNG systems in C, X and Ku bands.
Circle (781) on Reply Card

RGB Computer & Video M1321
AmiLink Pro Desktop video editing system; IBM- PC-compatible; V-Lan universal control features; CMX 3600 edit list compatibility; support for various peripherals including NewTek Video Toaster.
Circle (782) on Reply Card

RGB Spectrum M 310-2
Introducing Superview, RGB/Videolink 1700.
Circle (783) on Reply Card

Richardson Electronics 13100
Power transmitting tubes, NL347 1kW UHF device, UL1057 power tetrode to 960MHz.
Circle (784) on Reply Card

Roland Corporation 4713
Audio workstations, including the DM-800 and expandable DM-80; AR-2000 audio announcement recorder; AFP-700 anti-feedback processor; RSS-10 Roland Sound Space 3-D sound processor.
Circle (785) on Reply Card

Rosco Labs 16714-5
Lighting modification and control materials; chroma-key paint, material.
Circle (786) on Reply Card

Ross Video 18632
Introducing RVS 316 video production switcher; Enhanced Border Generator option package; digital distribution products; SR-8001 auto-clocking EQ amp, SRW-8002 reclocking, EQ amp, SEA-8003 serial EQ amp, DDL-8006 digital delay line, CMA-8011 component monitoring amp, DFR-8110 mounting frame, PS8101 power supply; analog distribution ADA-7801 mono, AD-7802 stereo DAs; AFR-7812 audio DA mounting frame; PS-7801 power supply.
Circle (787) on Reply Card

Rules Service Company 1528
FCC rules, regulations published monthly in loose-leaf and computer formats; copyright, patent, trademark rules.
Circle (788) on Reply Card

M S Russin Group 16112-3
Camrobotic systems for automated camera support system control.
Circle (789) on Reply Card

S

Sachtler 19526
Camera support, pan/tilt and tripod products; lighting equipment.
Circle (790) on Reply Card

SADie 1207
Digital audio workstation.
Circle (791) on Reply Card

SAIC-Information Display Systems 13405
Featuring Eidopher 5171B with signal converter; runs at 44kHz with flicker-free images, total H & V size control at 9,500 lumens.
Circle (792) on Reply Card

Samson Technologies 12829
Stage 33, install wireless mic systems; Behringer Combinator compressor; Soundtracs Solitaire consoles.
Circle (793) on Reply Card

Sandar Electronics 15661
Featuring V2000 video router with 64x64 6RU or 32x32 3RU configurations; 9644 audio router 32x32 3RU; VD2000 16x16 and 32x32 140 and 270Mb/s routers; systems to 300MHz bandwidth; ACS4000 audio conference system; PESE 2.2 software for PC control of routers.
Circle (794) on Reply Card

Future-Safe Audio Testing

Carved in Stone?

That's the way most audio test equipment is designed... The instrument maker chooses analog or digital, lays out a front panel, builds in a fixed level of internal processing power and adds a display from today's choices.

They'll never adapt to the future like System One and System Two from Audio Precision.

First a comprehensive selection of digital *and* analog measurement capabilities and options allows you to tailor your initial purchase to an exact fit for your needs of *today*.

Tomorrow, you benefit from continuous product and technology improvements, as System One and System Two grow with your needs. Both System One and System Two allow you to later add options not originally fitted.

DSP versions gain new functions and features by simply downloading different and newer versions of our DSP software.

You get better and faster system performance as well as higher resolution displays by upgrading PC technology without buying new audio measurement hardware. Upgrade to the popular Windows™ graphical user interface.

We introduced our first System One audio test sets in 1985. Today over 4000 of our PC and GPIB-based System One and System Two analyzers are in service worldwide, testing everything from aircraft to automobiles, satellites to cell phones, hi-fi to hearing aids.

Our customers who purchased System One in *1985* are still enjoying the benefits of our open-ended design philosophy. Those who purchase System Two in *1995* will enjoy the same benefits well into the next millennium. You can join them by contacting one of our worldwide Audio Precision representatives today for information and an onsite demonstration

Audio precision

P.O. Box 2209
Beaverton, OR 97075-3070
(503) 627-0832 , 1-800-231-7350
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 5010 **Brazil:** INTERWAVE LTDA., Tel: (21) 325-9221 **Bulgaria:** ELSINCO, h.e. Strelbishte, 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:** Teico 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 (105) on Reply Card

Sanders Media Adventures/C MAC M1709
OEM video filter manufacturer.
Circle (795) on Reply Card

Sanken/Developing Technologies 12802
Lavalier, hand-held and other microphone products.
Circle (796) on Reply Card

Sanyo M 201
Circle (1023) on Reply Card

Sascom Marketing Group 4003
Circle (1024) on Reply Card

Scala Electronic 15707
Broadband UHF TV panel antennas; wireless MMDS transmission antennas; base station antennas for communications; STL, RPU antennas, pre-amps; LPTV, translator antennas.
Circle (797) on Reply Card

ScheduALL by Visual Inc. 16340-41
Introducing ScheduAll facility management systems for Windows; ScheduAll library systems, ScheduAll personal manager.
Circle (798) on Reply Card

Schmid Telecommunication 1815-17
Audio test, measurement systems, RESCO network monitoring, control system; SIAT audio test systems.
Circle (799) on Reply Card

Scientific Atlanta 13828
Satellite communications equipment, earth station antennas, video receivers, antenna controllers; MPEG-based digital video compression system.
Circle (800) on Reply Card

Seem Audio A/S 4604
Studio and portable audio mixers.
Circle (801) on Reply Card

Selco Products 4121
Equipment replacement components, introducing Locking knobs, Soft Touch slider knobs and 3-shot push-on knobs.
Circle (802) on Reply Card

Sennheiser Electric 12035
Headphone, microphone and wireless RF products; TLM 193 large diaphragm cardioid condenser mic.
Circle (803) on Reply Card

SESCOM 13600
Rackem 'n' Stackem Electronics; Audio SIPs and transformers; in-line audio devices.
Circle (804) on Reply Card

Sharp Electronics Corporation M 103-5
Circle (1025) on Reply Card

Shereff Systems 16374-474
ProVideo 24 TV graphics composer.
Circle (805) on Reply Card

Shively Labs 4425
Broadcast antennas and related equipment; introducing MMOS and UHF series antennas.
Circle (806) on Reply Card

Shook Electronics A1
Remote operation vehicles, including model 48-63 sports trailer, network sports vehicle; model 16-24 EFP Cube Van for 4CAM field production; model 060 ENG/EFP van for 2-3 camera production; model Ku-band uplink trailer combo production, uplink unit.
Circle (807) on Reply Card

Shotmaker Dollies/Camera Platforms 10949
Camera support equipment, Super Panther, Mini Panther camera dolly; Super Aerocrane remote head crane, Super Jib II mini crane; Moviemaker portable motion control system.
Circle (808) on Reply Card

Shure Brothers 11800
Introducing the M367 mixer with 6-input portability for ENG/EFP using mic or line level signals; the VP3 Wireless System including the VP3 portable receiver and associated T2/58, T1P bodypack/WL93 or L11 bodypack transmitter.
Circle (809) on Reply Card

Siemens Audio 13813
Neve audio mixing systems; Mitsubishi digital audio recorders; AMS mics, automated mixers, workstations; Siemens analog, digital routers.
Circle (810) on Reply Card

Sierra Automated Systems 2710
Routing switchers.
Circle (811) on Reply Card

Sierra Design Labs 16585
SCSI Framer 4:2:2 component digital video server connects to Quick-Frame DDRs; Digital Audio Adapter merges four channels of AES/EBU digital audio with SMPTE 259M serial digital video; Quick-Frame EX48 48-minute capacity for 4:2:2, 4:2:2:4, 4:4:4 component digital video.
Circle (812) on Reply Card

Sierra Video Systems 11650
Featuring a serial digital video keyer; 3232D 32x32 and 8x8 serial digital video router; 84VS 8x4 video with stereo audio routing switcher.
Circle (813) on Reply Card

Sigma Electronics 19059
Introducing series 2100 switching, processing, distribution for multiformat systems; series 2100 serial digital video switcher; series 2100 control router (RS-422).
Circle (814) on Reply Card

Signal Technologies/ST Keltec 11500-1
Circle (1026) on Reply Card

Silicon Graphics 15779
Introducing Silicon Studio Live on-line support, training, industry information service; featuring Challenge network servers; Onyx Reality Engine graphics supercomputer; Indigo workstations with Galileo video; Indy desktop systems with digital camera.
Circle (815) on Reply Card

Sinar Bron 16773
Lighting products
Circle (816) on Reply Card

Sira Sistemi Radio srl 19359
FM, TV transmission antennas, UTV-01 and 3VTV panel antenna designs.
Circle (817) on Reply Card

SMPTE 13400-1
Professional organization.
Circle (818) on Reply Card

Meet the hottest...

...UHF wireless

Red hot performance and solid reliability...

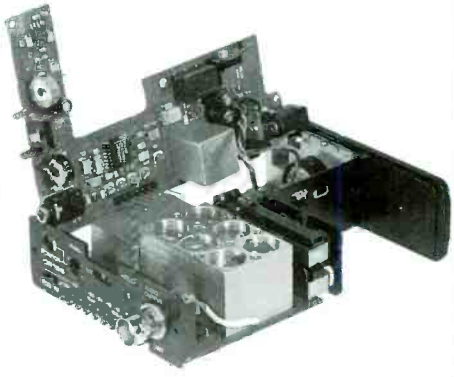
The UCR190 narrow-band UHF receiver utilizes the proven UNICHANNEL© design with helical resonator front-end filtering and narrow band crystal IF filtering. An all new dual-band compandor provides low distortion and a high signal to noise ratio. Aimed at broadcast ENG applications, the UCR190 receiver provides unmatched interference and IM rejection.

The 195 Series wide-band UHF system utilizes ±75KHz deviation for outstanding dynamic range and signal to noise ratio. An exclusive dual-band compandor and pulse counting detector provide audio quality well suited to the most demanding digital recording techniques. The balanced audio output is adjustable from mic level up to +8dBm studio levels.

More transmitter output power, plus higher receiver sensitivity than any other brand we've tested, all adds up to more operating range than you will probably ever need.

Belt-pack and plug-on transmitters are available in both narrow-band and wide-band UHF versions. Audio outputs are balanced XLR types with separate monitor outputs. All housings and panels are made of machined aluminum for a precise fit and lasting ruggedness. Shock mounted crystals and surface mount components withstand the toughest field use.

Inside Lectrosonics UHF products you will find advanced RF engineering, superb mechanical design and the very latest in surface mount technology. This is the present state of the art in wireless systems.



We invite you to compare these systems with any other wireless system, at any price.

Call for more information

800-821-1121

and a free copy of the 50 page "Wireless Guide"

Distributed in Canada by MILLER CANADA

LECTROSONICS

581 Laser Rd., Rio Rancho, NM 87124 USA
Ph: (505) 892-4501 FAX: (505) 892-6243

Circle (107) on Reply Card

Snell & Wilcox 19063
Featuring Kudos IQ with 19 new interface products for Kudos range; Magic Dave low-cost high-quality switcher and DVE; MAR1000 16:9-4:3 bidirectional aspect ratio converter; Magus 4-layer digital switcher and DVE with trail store; MDD500 composite analog to component digital decoder (NTSC, PAL); Pattern Master test pattern authoring for Kudos TPG20; DVS1000 4:2:2 vision mixer, integrated routing switcher, digital keyer, 16x9 operation; Alchemist Ph.C improved transparency during operation; numerous other products.
Circle (819) on Reply Card

Softimage 16972
Computer graphics software; Digital Studio; Mental Ray; Eddie 3.0; Creative Animator; Creative Designer.
Circle (820) on Reply Card

Solid Electronics Laboratories 5103
Circle (1027) on Reply Card

Solid State Logic 16621
Audio production equipment, including the Axiom digital production system; SL9000 J series total audio system; DiskTrack hard disk, multitrack recorder/editor; SL8000 GM on-air production console; OmniMix digital surround sound audio/video system.
Circle (821) on Reply Card

Solidyne 5107-8
Distributor, audio products
Circle (822) on Reply Card

Sonex Illbruck 2904-5
Acoustical material, treatments; Sonex I Classic, Sonex Techwedges.
Circle (823) on Reply Card

Sonic Science M2209
Sound effects and music libraries; effects retrieval systems.
Circle (824) on Reply Card

Sonic Solutions 12046
CD recording equipment, SS-105 pre-mastering system; audio utility NN-100 NoNoise sound restoration system.
Circle (825) on Reply Card

Sony Electronics/Business & Prof. 11514
Introducing DVW-250 portable digital Betacam VTR; DVW-100/1, DVW-A500/1 VTRs; DVW VTR enhancements; LMS Cache Buffer; DVS-7000 switcher, DMK-7000 keyer; DNE-300 digital news editorBK; E-9-102 remote-control unit; PCM-2600 DAT, DTC A-8 DAT; WRT-860A68 body pac microphone; new monitors; PVW-637 Betacam camcorder; UVW-1700G, SVO-2000 VTRs; DCK-500 digital chroma-keyer, DFS-300 digital multi-effects unit; HIX-900 MPEG1 real-time encoder.
Circle (826) on Reply Card

Sony Recording Media 11514
Featuring advanced metal evaporated media, HMEAD improved Hi8 tape with DLC covered magnetic material, improved base film backcoating; D-1 media in 8-minute length.
Circle (827) on Reply Card

Sound Ideas 11602-3
Production music, effects libraries; including Series 7000 Ambience II, Twentieth Centry Fox and Mix II/Pro Mix.
Circle (828) on Reply Card

Spectral Synthesis 4801
Circle (1028) on Reply Card

Sports Network 5104-5
"Dynamic Odds" instant odds data from Las Vegas Hotels and off-shore; Network designed for newspaper reception with upper/lower case reception to accommodate any new wire system; internet ready; transmission to Europe, the Caribbean, South America; facsimile product to clients or their audiences as service of TSN subscribers.
Circle (829) on Reply Card

Sprague Magnetics 5015
Tape head, DAT head reconditioning; hard, floppy and optical drive repairs; computer/audio DAT drive repair; computer and audio accessories.
Circle (830) on Reply Card

Sprocket Digital 12962-13062
PB 540 VTR audio interface, RG 177 reticle generator; DST-1000 multistandard digital serial transceiver; DST-4:2:2 digital serial transceiver; Rank telecine upgrade systems.
Circle (831) on Reply Card

Staco Energy Products 2427
Power protection products.
Circle (832) on Reply Card

Cash In On a Digital Audio Codec!

Intraplex is Making You an Offer You Can't Refuse.

HOW CAN YOU REFUSE?

Have your fax call our fax. For a digital audio codec that does it all:

- ☑ **CD Quality**
- ☑ **Full Duplex 7.5 kHz, 15 kHz, & 20 kHz**
- ☑ **ISDN S/T & U Interfaces**
- ☑ **MPEG II & G.722**
- ☑ **Musicore® Compatible**
- ☑ **Portable, Self Contained**
- ☑ **Plug and Play**

Name _____

Company _____

Call Letters _____

Address _____

City _____ State _____ Zip _____

Tel. _____ Fax _____

Hurry. Like All Good Offers, Ours Expires Eventually.

(In this case, on May 31, 1995).

Intraplex

Intraplex, Inc.
3 Lyberty Way
Westford, MA 01886-3636
Tel.: (508) 692.9000
Fax: (508) 692.2200

Circle (109) on Reply Card

Stainless 16608-908
Tower guy materials, towers.
Circle (833) on Reply Card

Standard Communication 19923
Introducing CAM830 Omni VU control access module, complete on-site, off-side control of all satellite receiver functions; Continental MT620 international satellite receiver; SMATV/CATV, special network receiver; ICM470 VSB AM TV modulator; MT900, MT830BR satellite receivers.
Circle (834) on Reply Card

Stanton-Video Services Unltd. 16373-473
Camera support products.
Circle (835) on Reply Card

Stantron 12832
Modular equipment racks, consoles and cabinets.
Circle (836) on Reply Card

Steenbeck 15811-12
Introducing Video-Solution, V-Mod 100 instant acccess digital video recorder using removable magneto-optical disks; COMBO BFL-35 studio quality film-to-video transfer, 24-side holoscope, shipping case.
Circle (837) on Reply Card

StereoGraphics Corporation M1711-1807
Circle (1029) on Reply Card

Sterling Technology M 200
Circle (1030) on Reply Card

Storeel 18114
Tape storage systems, including mobile and static designs for all formats.
Circle (838) on Reply Card

Strand Lighting 13817
Lighting fixtures, control products.
Circle (839) on Reply Card

Strassner Editing Systems 19633
SES Version 7 professional editing controllers for analog or digital devices, single-source off-line to high-end on-line; EdiQit Windows-based editing controller, single source and A/B roll with Pinnacle Alladin API control.
Circle (840) on Reply Card

Strata Inc. M1315
Circle (1031) on Reply Card

Studio Technologies 3003
StudioComm series model 60 central controller, model 61 control console; Studio Tools model 80 stereo analog audio DA; Studio Tools model 85 AES/EBU digital audio DA.
Circle (841) on Reply Card

Superior Electric 5113-4
Electronic, electrical control equipment; STABILINE power protection equipment; uninterruptible power supplies, power conditioners, transient suppressors, RFI filters; voltage regulators; AC disturbance monitors.
Circle (842) on Reply Card

Superscope Technologies/Marantz 5426
Circle (1032) on Reply Card

Sure Shot Teleproductions 16029
Ku-, C-band transportable earth stations; production facilities and transportable equipment.
Circle (843) on Reply Card

Svetlana Electron Devices 5313-4
RF power devices.
Circle (844) on Reply Card

Swintek Enterprises 11064
Intercom products, including Mark 200/MD, full-duplex transceiver; Mark 200/RPL base, 20-channel full-duplex remote system; Mark 200/DRJ base system; UHF, dual-channel ENG system.
Circle (845) on Reply Card

Switchcraft 5010-11
Featuring solderless 280DRY plug; black Tini Q-g connector; 188 heavy-duty $^1/_4$" phone plug; 299 heavy duty $^1/_2$" stereo phone plug; 3.5mm single mono jacks.
Circle (846) on Reply Card

SWR Inc. 14845, 15745
RF feed-line products; complete line of broadband TV antennas, FM antennas featuring economical performance, Field Engineer Service, 5-year limited parts, labor warranty; MMDS antennas.
Circle (847) on Reply Card

OPENING THE DOOR TO THE XXI[ST] CENTURY WITH...

The 21st Century is just around the corner and the time to prepare is now. Decisions that are made now will have tremendous impact on your company's competitive position in the next century.

With this in mind, MCL developed the MAXXIM Series HPAs. These HPAs give you the technology and performance to open the door now to the 21st century, giving you the edge that will be needed to succeed in the competitive satellite communications market.

Whether your uplink needs are for a fixed or transportable application, MAXXIM Series TWT and Klystron amplifiers will provide the technology and performance to take you into the 21st century.

For more information about these revolutionary new amplifiers, contact MCL today.

MCL, INC.
501 S. Woodcreek Road,
Bolingbrook, IL U.S.A., 60440-4999
708-759-9500 • FAX: 708-759-5018
24-HOUR CUSTOMER SUPPORT
NUMBER IN THE USA: 1-800-743-4625
OUTSIDE THE USA: (312) 461-4536

Circle (112) on Reply Card

Please come see us at NAB—Booth #'s 19852 and 19853.

MAXXIM SERIES

MCL INC

ISO 9001

Symetrix 1911
Featuring 528E voice processor; 488 Dyna-Squeez 8-channel compressor/interface; 602 digital stereo processor.
Circle (848) on Reply Card

Synclavier 3901-2
Digital audio production equipment.
Circle (849) on Reply Card

Synelec M 825
PRISM graphic workstation display walls, 72" retroprojectors.
Circle (850) on Reply Card

System Associates 13431
Used broadcast and TV production equipment brokers; meet new partner Roy Serna and learn interesting ideas on how to sell your used equipment.
Circle (851) on Reply Card

Systembase Ltd. 2202
Circle (1033) on Reply Card

Systems Wireless 13634-5
Wireless mic system with digital code squelco; antenna multicomputers for UHF; 5-, 9-key display stations for cable digital intercom systems; on-air announcer console; wireless video systems.
Circle (852) on Reply Card

T

Tactile Technology 2207-8
Circle (1034) on Reply Card

Tally Display Corporation 13259
Interactive and static under-monitor display systems; slim-line interactive and static displays; error detection display systems; messaging and scoreboard display systems.
Circle (853) on Reply Card

TAO/Technical Aesthetics Operations 15662-3
Edit controller and editing systems, including Editizer Macintosh versions.
Circle (854) on Reply Card

Target Technology 19776-876
Circle (1035) on Reply Card

Target Vision M 202-4
Introducing TVI Desktop messaging systems, Multimedia Networks; TVI subscription services; TVI VCR interface.
Circle (855) on Reply Card

TASCAM 17167
Audio recording equipment; M-5010/M5-FA, 102/202 MkII; portable DAT, single and dual cassette decks; 32-channel I/O console with automation.
Circle (856) on Reply Card

Taurus Communications Inc. 17522-622
Full-service telecommunications services.
Circle (857) on Reply Card

Techflex 11261
FLEXO sleeving, braided monofilament cable, wiring harness management and protection products.
Circle (858) on Reply Card

Techni-Tool 11547-8
Special-purpose tools.
Circle (859) on Reply Card

Technical Aesthetics Operation/TAO 15662-3
Video editing control systems.
Circle (860) on Reply Card

TECNEC/Technical Necessities 16711
Cables for camera to CCU, camera to VTR, digital composite video, digital balanced audio, composite video, component video, S-VHS video; DAs, routers; standards converter; S-VHS/composite patchbays.
Circle (861) on Reply Card

TEM /Tecnologie Elettroniche Milano 1813-4
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 (862) on Reply Card

Technosystem SpA 17770-18170
Mobile microwave links; transmitter remote-control systems; introducing transmitters for FM, a solid-state system rated at 5kW; for VHF, a solid-state 10kW system; for UHF, a solid-state 5kW system and a 60kW rated system using IOT technology.
Circle (863) on Reply Card

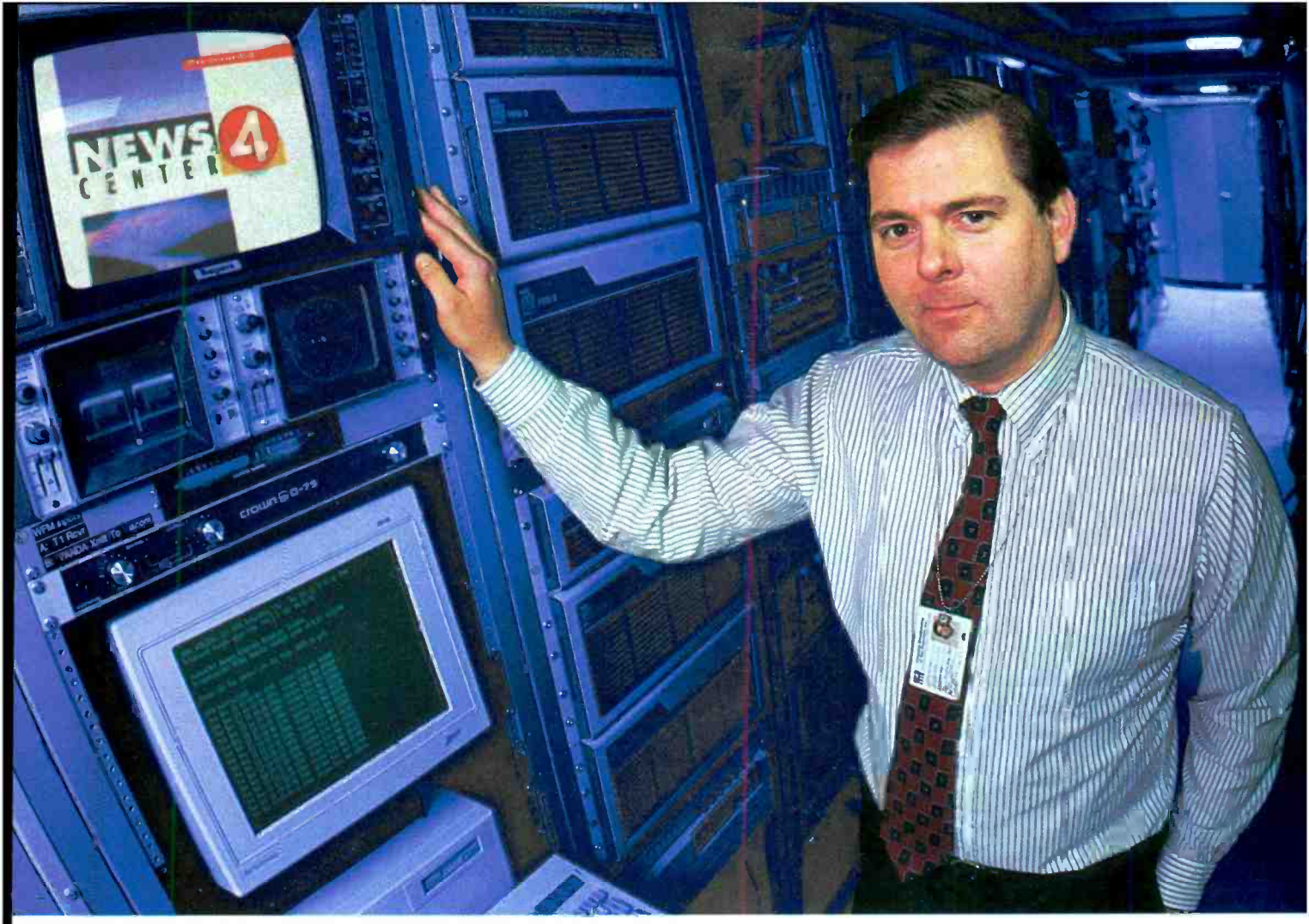
Tekskil Industries 19048
Introducing WinPrompt full-function prompting application for Windows 3.1 with selectable font style, size with NTSC or PAL video using Windows word processor; 12" Prompting Buddy mid-size camera prompting system.
Circle (865) on Reply Card

Tektronix 16528
Introducing TG2000 multiformat analog, digital signal generation platform; #764 digital audio monitor with measurement, analysis capabilities; VM100 economy version of VM700A video measurement set; featuring PRD100 Profile recorder; numerous signal generators, monitors, sync generator and change-over switch; oscilloscopes, spectrum analyzers; TDRs, demods.
Circle (866) on Reply Card

Tel-test 12107
Automation products, MC^2SS master control switcher; ACC air channel control automation.
Circle (867) on Reply Card

Telecast Fiber Systems 10458-558
Introducing Adder 882 - fiber-optic (FO) audio snake; Cobra - fiber-optic triax camera interface; TX/RX 259 - digitized video module set for Viper system; featuring Viper modular FO A/V/control snake; Sidewinder - A/V FO video/audio snake.
Circle (868) on Reply Card

Telemetrics 18932
Introducing fiber-optic camera control system; outdoor weather/traffic reporter camera system; heavy-duty pan/tilt system; desktop 8-camera preset control panel; computer control system with video insert.
Circle (869) on Reply Card

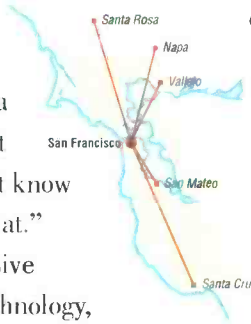


"We've been delivering MPEG digital video over T1 lines 24 hours a day for 8 months."

Craig Porter, KRON TV, San Francisco

"FutureTel™ made it possible for us to quickly get the BayTV channel out to remote cable headends without investing a lot of money. It can multicast and it's fault resilient. I don't know of anyone else that can do that."

Using FutureTel's exclusive digital video distribution technology, Craig avoids the problems of transmitting video over ISDN/T1 lines. He uses our PrimeView™ encoder to digitize the video which is multicast via an ethernet card to our TeleMux™ T1 cards.



Everything Craig uses to keep BayTV up and running over T1 lines is available today from FutureTel, including a Software Developer's Kit that you can use to customize your solution.

For more information on publishing and transmitting digital video, call FutureTel at **1-800-658-5868** now. We'll put you in touch with one of our authorized resellers, who will help you put together a complete digital video solution.

FutureTel

1092 E. Arques Avenue
Sunnyvale, CA 94086

Circle (120) on Reply Card

Telepak San Diego **11102-3**
Equipment transport products; convenience items, T-Brief Producer/Director briefcase; full line of soft-sided carrying cases for portable video equipment.
Circle (870) on Reply Card

Telescript **16735**
Monitor Prompting Systems with 9-17" Ikegami monitors, flat-panel dispay with mounting systems for camera, Telepod Direct View or public speaking; Telescript PC desktop, Telescript LT laptop and Telescript NR stand-alone or remote; closed-captioning systems.
Circle (871) on Reply Card

Television Engineering **13116**
Design and assembly of ENG mobile units; TEC IFB 19A communications IFB system; Eagle-Eye mast-mounted camera, control unit.
Circle (872) on Reply Card

Television Equipment Associates **13410-411**
Introducing a stand-alone active delay DA box; The Line-Labeller checks line integrity in digital equipment; 2500 series delay/video DAs, to 2s delay, 7 outputs; 1-line delay 1.5-75; video filters for CCIR-610 signal processing.
Circle (873) on Reply Card

Telex Communications **18827**
ADAM intercom system; mono and stereo listen-only keypanels; user stations; line monitor speakers; beltpacks; FMR-150, 450 wireless mic systems; log periodic antenna, antenna splitters.
Circle (874) on Reply Card

Telos Systems **4203**
Zephyr ISDN transceiver, Zephyr Net ISDN network hub; Telos 100 Delta and ONE telephone interfaces; Direct interface, ONE-X-Sx talk show system; Link intercom to phone line interface.
Circle (875) on Reply Card

Tennaplex Systems **15707**
Broadcast antenna products for FM, TV, HDTV offering omnidirectional and custom patterns.
Circle (876) on Reply Card

Tentel **13407-408**
Test products for VCR maintenance; Tentelometer tension meters; torque, reference plane, head protrusion and drum eccentricity gauges.
Circle (877) on Reply Card

Texscan MSI **20068**
2-series character generator; PRIZM digital commercial insertion system.
Circle (878) on Reply Card

Theatre Service & Supply **13637**
Studio furnishings, studio cyclorama curtains, track systems; scenic supplies, grip equipment.
Circle (879) on Reply Card

Thermodyne International **13114**
Equipment transport cases.
Circle (880) on Reply Card

Thomson Broadcast **16117**
Featuring series 1657 high-performance 16:9, 4:3 portable EFP camera, SPORTCAM and high-end PSC camera; #1270 digital Betacam camcorder; 9200 small/medium and 9500 large 4:2:2 digital component visual mixers; 9920 continuity mixer; Pixtore Graphics video storage system; Evolution interface series; MPEG encoder; DBSS digital satellite system; DVB specification digital receiver, decoder.
Circle (881) on Reply Card

Thomcast France **16117**
Tube or solid-state technology radio, TV transmission equipment; 1W-240kW VHF and UHF TF; 1W-10kW FM radio; 50kW-1000kW AM radio; antennas; world-wide design, installation, maintenance program.
Circle (882) on Reply Card

Thomson Components & Tubes **12505**
Circle (1036) on Reply Card

Thomson Tubes Electroniques **12505**
RF power devices for all broadcast applications; introducing TH610 Diacrode; air-cooled tube for UHF amplification in 10kW combined configuration.
Circle (883) on Reply Card

3dbm **15745**
Lower power TV transmitters rated 100W, 1kW, 2kW, 5kW.
Circle (884) on Reply Card

3M Pro A/V Products **16312**
Audio, video recording media.
Circle (885) on Reply Card

360 Systems **2116**
Featuring AM16 routing switcher, DigiCartII digital audio hard disk recorder, Instant-Replay hard disk audio player.
Circle (886) on Reply Card

Tiesseci SNC **4819-20**
Circle (1037) on Reply Card

Tiffen Manufacturing **16365-565**
Featuring FILTERFLEX matte boxes; warm polarizing filters.
Circle (887) on Reply Card

TimeLine **1821**
Time-code products; transport synchronizing systems; LYNX digital audio workstations.
Circle (888) on Reply Card

Advanced wireless intercom system

Vega Q600

- **Rugged, reliable, metal beltpack remotes**
- **Hybrid UHF/VHF operation to conserve scarce VHF frequencies**
- **Inexpensive VHF monitor receivers to lower system costs**
- **High-quality, low-noise, low-distortion audio**
- **Up to six beltpacks per master station**
- **Designed specifically for broadcast and production**
- **Directly compatible with all standard wired intercoms**
- **Many advanced circuit and system design features**

In the studio or on the set, Vega's wireless intercom systems are the choice of professionals who demand ruggedness, reliability, broadcast-quality audio, and a full set of professional features. Designed from the ground up for broadcast and production work, the Q600 UHF/VHF system provides all the functions and technical capabilities required for these demanding applications.

The Q600 system provides continuous, full-duplex, hands-off communications between up to six people plus an unlimited number of "listen-only" users.

The QTR-600 beltpack remotes are extremely easy to use and provide operation similar to that of hard-wired intercom beltpacks. They are compatible with popular dynamic or electret headsets, such as Beyer, Clear-Com, and Telex. The cases are welded aircraft aluminum alloy with a high-impact, molded Cycolac (ABS) control panel that will withstand the roughest use.

One QX-600 master station supports up to six QTR-600 remotes with "hands-free" two-way communications, and an unlimited number of PL-2 receivers for listen-only users. Circuitry is provided to interface external line audio with the system or to link two QX-600s into a 12-user system. The master station is directly compatible with all standard wired intercom systems such as Clear-Com, RTS, ROH, Telex, and many others via internal programming switches. A local headset position and extensive control, adjustment, and monitoring provisions are also included.

The PL-2 VHF mini-receiver provides a high-performance, low-cost solution to providing one-way "listen-only" communications. Very often, individuals need to receive instructions but are not required to speak. Using PL-2 receivers for this application avoids the expense of additional full two-way remotes and can significantly lower the cost of a typical system. The PL-2 is fully compatible with the Q600 system and is designed to provide reliable communications in the most demanding RF environments.

When the job demands hands-free, full-duplex operations in the most demanding environment, go with the Vega Q600, the system recommended by professionals worldwide.

VEGA

a **MARK IV** company

9900 East Baldwin Place
El Monte, California 91731-2294
Telephone: (818) 442-0782
Toll-Free Telephone: 800-877-1771
Fax: (818) 444-1342
FaxBack: (818) 444-2017
Toll-Free FaxBack: 800-274-2017

TMT Electronics AG 18669-869
Circle (1038) on Reply Card

Toko America 19152-352
Circle (1039) on Reply Card

Torpey Controls & Engineering 13418
Introducing all-digital display operating from SMPTE, ESE, DQS, Leitch codes; 1-, 4-inch LED digital displays, oak encased; master clock drivers, impulse clocks, count up/down timers.
Circle (889) on Reply Card

Toshiba Corporation 11740
Digital SNG/LINK systems; HDTV products, CCD cameras, VCRs, picture computers, FO transmission equipment; NTSC/PAL CCD cameras; Hi8 cameras, camcorders; desktop video production equipment.
Circle (890) on Reply Card

TTL/Multimedia Accessories M1120
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 (891) on Reply Card

TRF Production Music Libraries 13427-8
Bosworth BOCD 183 Creative Broadcast, BOCD 184 The Corporate Message; Pyramid Acoustic Guitar, Opening Themes, Solo Piano, Jingles.
Circle (893) on Reply Card

Trident Audio USA 1507
Audio mixers for radio, video production, post-production.
Circle (894) on Reply Card

Tripp Communications 10656-756
Videocassette, CD organizer/storage cabinets; double-density mobile or static cabinets fit room space limitations; Roll-Around trucks for videocassette applications.
Circle (895) on Reply Card

Trompeter Electronics 12800-1
BNC connectors; patching, distribution products.
Circle (896) on Reply Card

27th Dimension Inc. 11846
Production music libraries.
Circle (897) on Reply Card

TWR Lighting 4323
Tower lighting products.
Circle (898) on Reply Card

U

Ultimatte Corporation 17280
Video compositing systems, introducing the Ultimatte 8 digital unit; also Ultimatte 300, FORMATTE, SYSTEM 6, Ultimatte 45; Matte Shading system; Memory Head motion control; Ultimatt 7 digital compositing system.
Circle (899) on Reply Card

Union Connector 16358-9-459
Power distribution equipment, including the Location Box and 20-2P+G.
Circle (900) on Reply Card

Unique Business Systems 16558
Productivity, business software; RentTrace rental equipment availability tracking.
Circle (901) on Reply Card

UniSet Corporation 11600
Studio furnishings, sets.
Circle (902) on Reply Card

United Ad Label 13639-739
Tape format labels (for Inkjet printer); special event and library tape packaging; paperboard slipcases; Designer series printed labels; labels to automated labeling equipment; splicing tape; custom flexographic label printing.
Circle (903) on Reply Card

United Media 18914
Multivision system (MVS) desktop editing products; MVS linear editor with custom interface for Pinnacle Alladin; directly linked by software for complete remote control; runs under Windows, controls any RS-422 machine.
Circle (904) on Reply Card

United Press International M1530-2
Circle (1040) on Reply Card

United States Broadcast 13412-6
Used equipment source; batteries.
Circle (905) on Reply Card

U S Tape & Label 2508-9
Labels, promotional products.
Circle (906) on Reply Card

Utah Scientific\Dynatech Video 17124
See Dynatech Video Group.
Circle (907) on Reply Card

Utility Tower 2528
Tower products and services for AM, FM, TV, microwave and other communications.
Circle (908) on Reply Card

V

Valentino Production Music 12102-3
Production music and sound effects library packages, available on CD ROM.
Circle (909) on Reply Card

Varian Associates 13805
Microwave power devices, klystrons, Klystrodes, grid power tubes; TWT devices.
Circle (910) on Reply Card

Varian Canada Microwave Products 13805
Klystron tube amplifiers for satellite communications.
Circle (911) on Reply Card

Varian Microwave Equipment 13805
HPAs for satellite communications.
Circle (912) on Reply Card

Varian Microwave Power Tubes 13805
MSDC klystrons for UHF TV transmission.
Circle (913) on Reply Card

Varian Power Grid Tube Products 13805
Featuring K260W Klystrode IOT; CV-5000D cavity.
Circle (914) on Reply Card

Varian Traveling Wave Tube Division 13805
TWT devices for satellite communications.
Circle (915) on Reply Card

VAS Group 11447-8
Introducing RTC HD 3:2 for HD/NTSC mastering; real-time conversion of HR or LR analog signals with 3:2 framing; analog RGB, NTSC, PAL outputs.
Circle (916) on Reply Card

VEAM 16659-759
Electrical connectors, CIR series and VSC series multipin products; A/V FO products.
Circle (917) on Reply Card

Veetronix Inc./Reach 16909
Push-button and panel switches, illuminated, non-illuminated types; hermetically sealed; keycaps in various styles and colors.
Circle (918) on Reply Card

Vega/Mark IV Audio 15717
Wireless microphone systems, intercom components.
Circle (919) on Reply Card

Vertex Communications 10955
Design, engineering, manufacturing of earth station antennas and related components; tracking control systems; dual-reflector antenna systems (1.8m to 32m) for C-, Ku-, X-band frequencies, some L-band; turnkey installations, site testing, maintenance services.
Circle (920) on Reply Card

Vertigo Technology Inc. M
Vertigo Animation Machine offers high-end animation and modeling; fully integrated RenderMan; expanded distribution product delivery.
Circle (921) on Reply Card

Victory Battery Company 13630
Battery products.
Circle (922) on Reply Card

Video Accessory 11126
Video distribution, synchronization, utility products; BBG-2 blackburst generator, YCDA-1 S-video distribution amp.
Circle (923) on Reply Card

Video Associates Labs M 815
Video keying, capture devices; MicroKey/A with gen-lock, DigiView.
Circle (924) on Reply Card

Video Data Systems 15578
Automated text/message systems; #900, multicolor text keyer; #3000 real-time image capture display; #840C color DG with color preview; #EAS emergency alert CG; #CC closed-caption CG.
Circle (925) on Reply Card

VDP/Video Design Pro 13840-040
Computer software, hardware for computer-aided design.
Circle (926) on Reply Card

Video Int'l. Development 11200
Video standards conversion systems including DTC 1600 series models P5 and P6; DTC 1640 digital TV broadcast converter; DTC 4600 motion vector compensation standards converter.
Circle (927) on Reply Card

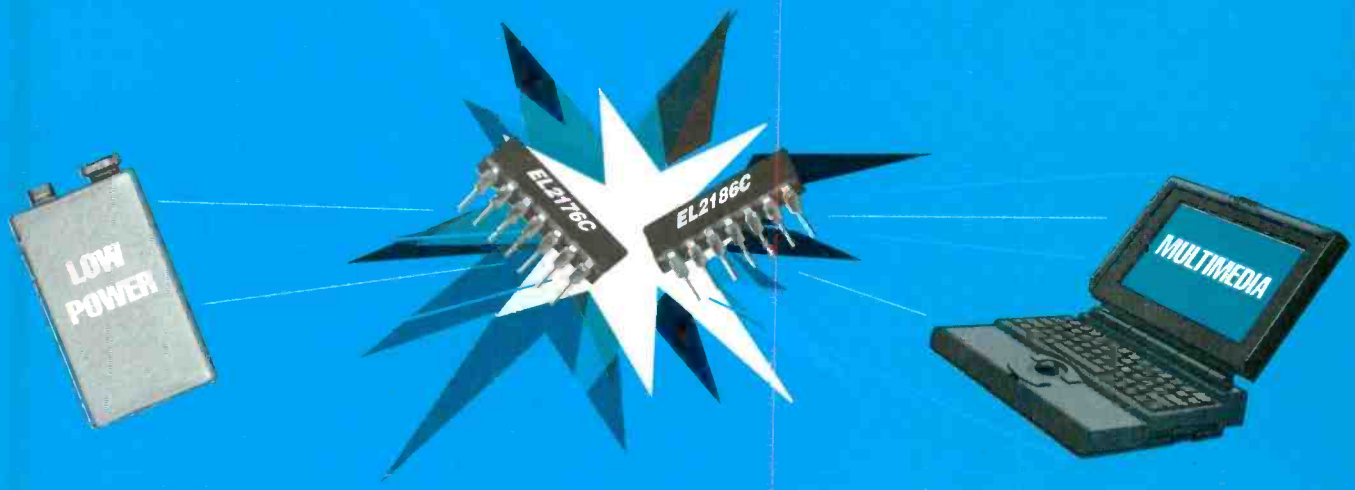
Video Matic Group 11446
Audio, video recording tape, tape containers.
Circle (928) on Reply Card

VideoLab Para Technologies 17322-422
Time-code processors, LCX-108 Logichron generates, reads, regenerates LTC, VITC code; auto log, edit list, error log; MIDI, GPI, RS-232, RS-422; LTC phase meter; NTSC/PAL, SMPTE/EBU; time-code upgrade retrofits for series 5000, 7000, 9000 3/4" Sony VTRs allows address track time- code capability.
Circle (929) on Reply Card

Another Breakthrough!

from élantec

Performance You Expect From the Supplier that Delivers



Introducing the EL2176C and EL2186C Low Power Amps for Signal Processing and Cable Driving Applications

Advantages of the 1mA, 70 MHz & 3mA, 250 MHz CMF Amplifier Family

- **Lowest Supply Current (as low as 1mA/Amplifier)**
- **Low Voltage Operation (as low as 3V)**
- **Outstanding Video Performance**
- **Packaged in P-DIP, SO**
- **Single, Dual and Quad Versions Available**
- **Pricing begins as low as $1.99 in 1K units**

NAB95
See us at Booth #16574

For Samples Call (800) 333-6314 ext 311 • For Literature Only ext 234 or e-mail your request to: sales@elantec.com

Circle (124) on Reply Card

ELANTEC, INC. ■ 1996 Tarob Court ■ Milpitas, CA 95035 ■ (408) 945-1323 ■ (800) 333-6314 ■ FAX (408) 945-9305
e-mail: sales@elantec.com ■ European Sales: 44-71-482-4596 ■ FAX: 44-71-267-1026

Distributed by: Marshall Industries • Nu Horizons • Insight Electronics • Gerber Electronics

Videomagnetics Inc. 17722-922
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 (930) on Reply Card

Videomedia 15724
Hardware, software for frame-accurate transport control via PCs, workstations; V-LAN universal control network/HUB control systems; machine controllers; videotape editing controllers; V-LAN products for multimedia, animation, video editing; OZ-PRO on-line video workstations.
Circle (931) on Reply Card

Videoquip Research 5315-17
Signal routing switchers, distribution products.
Circle (932) on Reply Card

Videotek 18132
Combo waveform/vector monitors, TVM-100 displays waveform/vector on picture monitor; video production switchers; synchronizers; sync, timing equipment; signal generators; Omniframe RS-61F video switcher; Omniframe ADS-24F stereo audio DA; audio program monitors; DM-154 agile stereo, cable-ready demodulator.
Circle (933) on Reply Card

VIDESSENCE 10059-61
Studio 2000 - 125 products in fixture, modular and specialty families; Vid-Lite portable studio or location lighting.
Circle (934) on Reply Card

Viewgraphics 17321-421
Information display products, including the Dataview serial/digital adapter and Sony GWM-3000 monitor.
Circle (935) on Reply Card

Vinten Broadcast/TSM 18939
Camera support products, Microswift robotic systems, Classic and Vision pedestals, tripods and pan/tilt heads.
Circle (936) on Reply Card

VistaCom Inc. M1029-1031
Circle (1042) on Reply Card

Vistek Electronics 13835
Video encoders, decoders, transcoders, V4130/V4228 Varicomb series; V2100 array routers; video processors; GM7500, GM7200 series color monitors; 4:4:4 digital production switcher D8001/4; V2000 array Windows router control interface.
Circle (937) on Reply Card

VYVX National Video Network 19763
Switched fiber-optic TV transmission services.
Circle (938) on Reply Card

W

Wadsworth/ITP 15656-7
Publisher of text materials for journalism.
Circle (939) on Reply Card

Ward-Beck Systems 15704
Renaissance series radio consoles; M405P portable extended range VU meter; D8212 audio DAs.
Circle (940) on Reply Card

Wavefront Technologies 16379
Videographics software packages, including Composer V3.5, Kinemation V2.5, Explore and IPR Interactive Photorealistic Rendering.
Circle (941) on Reply Card

Wegener Communications 16335
Digital video compression products, including MPEG-2 decoder, MPEG-1 IRD, MPEG-1 encoder, MPEG-2 audio workstation; digital video file server.
Circle (942) on Reply Card

Wenger Corporation 4001-2
Circle (1043) on Reply Card

Wescam Systems International 15470-570
Helicopter, aircraft camera support systems; installation on all types of moving vehicles and cranes.
Circle (943) on Reply Card

West Penn Wire/CDT 19570
Wire, cable products.
Circle (944) on Reply Card

The F J Westcott Company 15469-569
Illuminator reflectors; portable, collapsible scrims & mags in customized kits; portable, collapsible chroma-key Illuminator backgrounds in green and blue.
Circle (945) on Reply Card

Wheatstone Broadcast Group 4709
Audio mixing consoles, A-6000 Air Master, TV-600 master audio control console; signal processing equipment; modular studio furniture; digital audio hard disk system.
Circle (946) on Reply Card

Whirlwind/US Audio 12507
Audio mixers, MIX5-SB 4-channel mixer; audio, video cabling, distribution products; transformers.
Circle (947) on Reply Card

Will-Burt 16114-5
Telescoping masts, TMD-7-42-367 microwave antenna support; 25' Hurry Up; AC Alert live power-line detectors for telescoping masts.
Circle (948) on Reply Card

Winsted Corporation 11827, M1718
Special-purpose video, studio furnishings, model E4835 dual pedestal editing desk and K8643 editing console; Cabinet Design kits; Locking rack shelves; Avid and Matrox desks; black mini consoles for multimedia use; recessed monitor consoles; WELS software program for designing modular Winsted furniture.
Circle (949) on Reply Card

Wireworks 13602-3
Introducing TE-3+ combination audio and video cable tester; X series cable assemblies (multiple coax line assemblies with 3 to 5 lines).
Circle (950) on Reply Card

Wohler Technologies 18369-569
AMP series 1U and 2U high-performance audio monitors; VM 1U monitor; MSM series audible alarms; serial embedded audio/AES/EBU digital interface; analog, AES/EBU digital level metering and source select routers.
Circle (951) on Reply Card

Wolf Coach 15862
Mobile production vehicles.
Circle (952) on Reply Card

WSI 12956
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 (953) on Reply Card

X

Xaos Tools M1114
Videographic, digital effects software for SGI, Macintosh PCs.
Circle (954) on Reply Card

Y

Yale Electronics 15929
Distributors; components; racks; panel, cable connectors.
Circle (955) on Reply Card

Yamaha Music 2425
Audio mixers; DMC 1000 digital automated recording console; YPDR 601 compact disc recorder.
Circle (956) on Reply Card

Yamashita Engineering Mfg./YEM 12810
Video processing equipment, scan converters; digital EDTV decoder, sync generators; distribution amplifiers; CG switchers.
Circle (957) on Reply Card

Y/C Plus M1806
Products for use with Video Toaster.
Circle (958) on Reply Card

Z

Zaxcom 19069-269
HUB/HCP series TBC/machine controllers; DMX1000 hard disk audio storage; RTR100 stereo audio router; SRC100 sample rate converter; VTR100 VTR control system; DMX500 low-cost digital mixer for post-production, broadcast; digital proc-amp.
Circle (959) on Reply Card

Send your comments to the editors of Broadcast Engineering via on-line mailboxes:

Internet:
be@intertec.com

CompuServe:
74672,3124

J15ax8B IRS

IFplus

Internal Focus

IFPLUS: WE'VE TAKEN A GREAT TECHNOLOGY AND MADE IT BETTER.

IFplus: The Future Is Now.
Having pioneered IF technology, Canon takes another step forward with IFplus, the latest breakthrough in Internal Focus that provides important features and benefits that meet the requirements of new wide screen formats. Now for the first time ever, you can shoot as close as .65m with a wide angle of 8mm (57.6°) using Canon's J15ax8B IRS lens. Enjoy higher resolution, higher MTF, reduced chromatic abberation and improved optical performance.

With the shortest MOD and widest angle of any standard lens, Canon's J15ax8B IRS lets you shoot in tight or restricted areas at the closest minimum object distance ever possible and capture more of the subject as compared (right) to conventional lenses. (For illustrative purposes only).

Unsurpassed Optical Quality.
Consistent with Canon's reputation for outstanding lens quality, the IFplus utilizes a new and improved glass, which is stronger by design and able to provide extremely low dispersion, while correcting chromatic aberrations. Wide angle images, with substantially reduced distortion, is just one benefit of this technology.

Meets The Demands of 16 : 9.
You can depend on Canon s IFplus technology to meet the challenges of new formats that require increased screen line density (Outstanding performance is also achieved in 4:3). Offering the highest MTF required, the J15ax8E IRS will meet and exceed your expectations.

Canon's J15ax8B IRS features:

- The shortest MOD in a standard ENG lens: C.65m
- The longest focal range: 8-120mm
- The widest standard lens, with a wide angle of 8 mm (57.6°).

It all adds up to a lens you can rely on to let you get up close to the subject. We'd like to tell you more. Please call us at **1-800-321-4388**. *(In Canada, call 905-795-2012)*

Canon

The Number One Lens

Circle (125) on Reply Card

Exhibitor Highlights

S-6 Exhibition Hall

Too many exhibitors for too small of space is the case for this year's show. In February, NAB opened additional exhibit space for those exhibitors who could not get space in the main or audio halls. The solution was the S-6 hall, which is located south of the main exhibition center, across Desert Inn road.

Although it may be a long trek, it's worth the journey. This exhibit space contains some of the more innovative companies in the industry, so don't forget to allocate some time there.

Because of the lateness in announcing the new exhibit hall, it was impossible to provide complete information on the companies who will be there. The following represents the companies NAB has announced will be in the hall along with their booth number if known. The information was current as of press time. Please check the program for the latest information.

AATON ..... S 532
Circle (1801) on Reply Card

ABE Electtronica ..... S 138
Circle (1802) on Reply Card

AJA Video ..... S 741
Circle (1803) on Reply Card

Ampex Recording Media ..... S 714
Circle (1804) on Reply Card

Aston Electronic Designs ..... S 747
Circle (1805) on Reply Card

Audio Digital Imaging ..... S 804
Circle (1806) on Reply Card

Automated Weather Source ..... S 438
Circle (1807) on Reply Card

AVP Manufacturing S1005
Circle (1808) on Reply Card

Azden ..... S 154
Circle (1810) on Reply Card

B&H Photo ..... S 108
Circle (1811) on Reply Card

Beacon Software S1031
Circle (1812) on Reply Card

Best Power Technology ..... S 241
Circle (1813) on Reply Card

Brill Electronics ..... S 142
Circle (1814) on Reply Card

Broadcast & Surveillance Systems S1039
Circle (1815) on Reply Card

Cadex Electronics ..... S 139
Circle (1816) on Reply Card

Caption Colorado ..... S 341
Circle (1817) on Reply Card

Cartoni USA ..... S 632
Circle (1818) on Reply Card

Charter Leasing S1017
Circle (1819) on Reply Card

Chellis ..... S 246
Circle (1820) on Reply Card

Cine Power Int'l ..... S 549
Circle (1821) on Reply Card

CommSpec ..... S 343
Circle (1822) on Reply Card

Compression Labs ..... S 424
Circle (1823) on Reply Card

Data Translation ..... S 213
Circle (1824) on Reply Card

Data Check ..... S 739
Circle (1825) on Reply Card

Dawn Satellite Inc. ..... S 548
Circle (1826) on Reply Card

Digimusic ..... S 840
Circle (1827) on Reply Card

Digital Vision ..... S 704
Circle (1828) on Reply Card

DYP Filters ..... S 450
Circle (1829) on Reply Card

Entertainment Digital Network S1009
Circle (1830) on Reply Card

Evolving Video Technologies ..... S 649
Circle (1831) on Reply Card

FAST Electronics ..... S 203
Circle (1832) on Reply Card

Film & Video Systems ..... S 247
Circle (1833) on Reply Card

FoNet ..... S 848
Circle (1903) on Reply Card

Force ..... S 648
Circle (1904) on Reply Card

General Microwave Services ..... S 104
Circle (1905) on Reply Card

Geneva Aviation ..... S 249
Circle (1906) on Reply Card

Globeset Corporation ..... S 938
Circle (1907) on Reply Card

Graseby Optronica ..... S 551
Circle (1908) on Reply Card

Herman Electronics ..... S 939
Circle (1831) on Reply Card

High End Systems ..... S 433
Circle (1832) on Reply Card

Horizon Music ..... S 518
Circle (1833) on Reply Card

ICEX-ANIEL ..... S 348
Circle (1834) on Reply Card

Imatex Communications ..... S 128
Circle (1835) on Reply Card

Inscriber/Mainframe Graphics ..... S 223
Circle (1836) on Reply Card

Insync Corporation ..... S 233
Circle (1837) on Reply Card

Intelsis Sistemas Inteligentes ..... S 832
Circle (1838) on Reply Card

International Memory Products ..... S 338
Circle (1839) on Reply Card

IPITEK Inc. S1046
Circle (1840) on Reply Card

IRTE SpA ..... S 624
Circle (1841) on Reply Card

Kart-A-Bag S1043
Circle (1842) on Reply Card

Keith Austin Enterprises ..... S 239
Circle (1843) on Reply Card

KFRO-TV ..... S 750
Circle (1844) on Reply Card

Kino Flo ..... S 130
Circle (1845) on Reply Card

KUB Systems Inc. ..... S 724
Circle (1846) on Reply Card

LightechS 1027
Circle (1847) on Reply Card

Litton ..... S 941
Circle (1848) on Reply Card

J Custom Supply ..... S 152
Circle (1849) on Reply Card

J L Fisher ..... S 632
Circle (1850) on Reply Card

LM Engineering ..... S 847
Circle (1851) on Reply Card

Losmandy/Hollywood General Machine .... S 349
Circle (1852) on Reply Card

Lucassey Mfg. ..... S 240
Circle (1853) on Reply Card

Matrox Electronic Systems ..... S 304
Circle (1854) on Reply Card

Minerva Systems ..... S 324
Circle (1855) on Reply Card

Mirror Image Teleprompting S1031
Circle (1856) on Reply Card

Mobile Media ..... S 743
Circle (1857) on Reply Card

Nesbit Systems Inc./NSI S1013
Circle (1858) on Reply Card

New Avenue Communications ..... S 656
Circle (1859) on Reply Card

News/Sports Microwave Rental ..... S 318
Circle (1860) on Reply Card

Non-Stop Productions ..... S 550
Circle (1861) on Reply Card

Northern Telecom ..... S 614
Circle (1862) on Reply Card

NTL ..... S 504
Circle (1863) on Reply Card

Nurad Technologies ..... S 144
Circle (1864) on Reply Card

Pike & Fischer ..... S 451
Circle (1865) on Reply Card

Pixel Control ..... S 932
Circle (1866) on Reply Card

Prodelin ..... S 136
Circle (1867) on Reply Card

Pulizzi Engineering S1038
Circle (1868) on Reply Card

Raytheon/Semiconductors S1001
Circle (1869) on Reply Card

Roll 'Em Productions ..... S 346
Circle (1879) on Reply Card

Rorke Data ..... S 524
Circle (1880) on Reply Card

Russ Bassett ..... S 849
Circle (1881) on Reply Card

SoftTouch ..... S 947
Circle (1882) on Reply Card

Specialty Connector S1033
Circle (1883) on Reply Card

Spencer Technologies ..... S 457
Circle (18084) on Reply Card

Sumitomo Electric ..... S 949
Circle (1885) on Reply Card

Sundance Digital ..... S 100
Circle (1886) on Reply Card

SVS ..... S 453
Circle (1887) on Reply Card

Teracom Components ..... S 841
Circle (1888) on Reply Card

Tekniche/AVS ..... S 103
Circle (1889) on Reply Card

The Brughetti Corporation ..... S 824
Circle (1890) on Reply Card

This Town S1053
Circle (1891) on Reply Card

Topham Audio ..... S 442
Circle (1892) on Reply Card

Transcripts ..... S 651
Circle (1893) on Reply Card

Tron-Tek ..... S 749
Circle (1894) on Reply Card

Ultech S1047
Circle (1895) on Reply Card

Vela Research ..... S 814
Circle (1896) on Reply Card

Video Design ..... S 350
Circle (1897) on Reply Card

Video Engineering ..... S 414
Circle (1898) on Reply Card

Videonics ..... S 113
Circle (1899) on Reply Card

Weather Central ..... S 314
Circle (1900) on Reply Card

Weathernews ..... S 340
Circle (1901) on Reply Card

Wicom ..... S 238
Circle (1902) on Reply Card

Special Announcement for NAB '95

Leader Unveils

Digital Component

Waveform Monitor
LV 5100D

LV 5100D, a 4:2:2 component digital and analog waveform monitor, operates in both 525/60 and 625/50 systems and handles two serial digital inputs and one analog three-channel input for use in mixed digital/analog facilities. An EDH system based on SMPTE RP-165 provides transmission-error monitoring and analysis of signal status using the equivalent line-length technique. Full waveform monitor functions include overlay, parade and timing displays, component vector, line select, an X-Y mode for stereo monitoring, and a picture display of Y or G for program ID purposes. An active serial output is provided for retransmission purposes. Cursor measurements and preset/recall operations store up to 10 front panel setups.

Test Signal Generator
LT 425D

LT 425D, a 4:2:2 digital video generator that operates in 525/60 and 625/50 systems. It features EDH functions conforming to SMPTE RP-165 as well as embedded, internally-generated audio test tones. A full range of component test signals include an SDI pathological test field. Three serial outputs include menu-selected EDH and embedded AES/EBU audio. Parallel digital video and serial audio outputs are also provided. A fourth serial video out is digital black. Digital genlock and programmable 20-character source ID calendar and clock add to operating flexibility.

See us at Booth 12803

Call toll-free

1 800 645-5104

In NY State

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

Circle (114) for product information only **Circle (177) for product information & demonstration**

The New S-6 Exhibit Hall

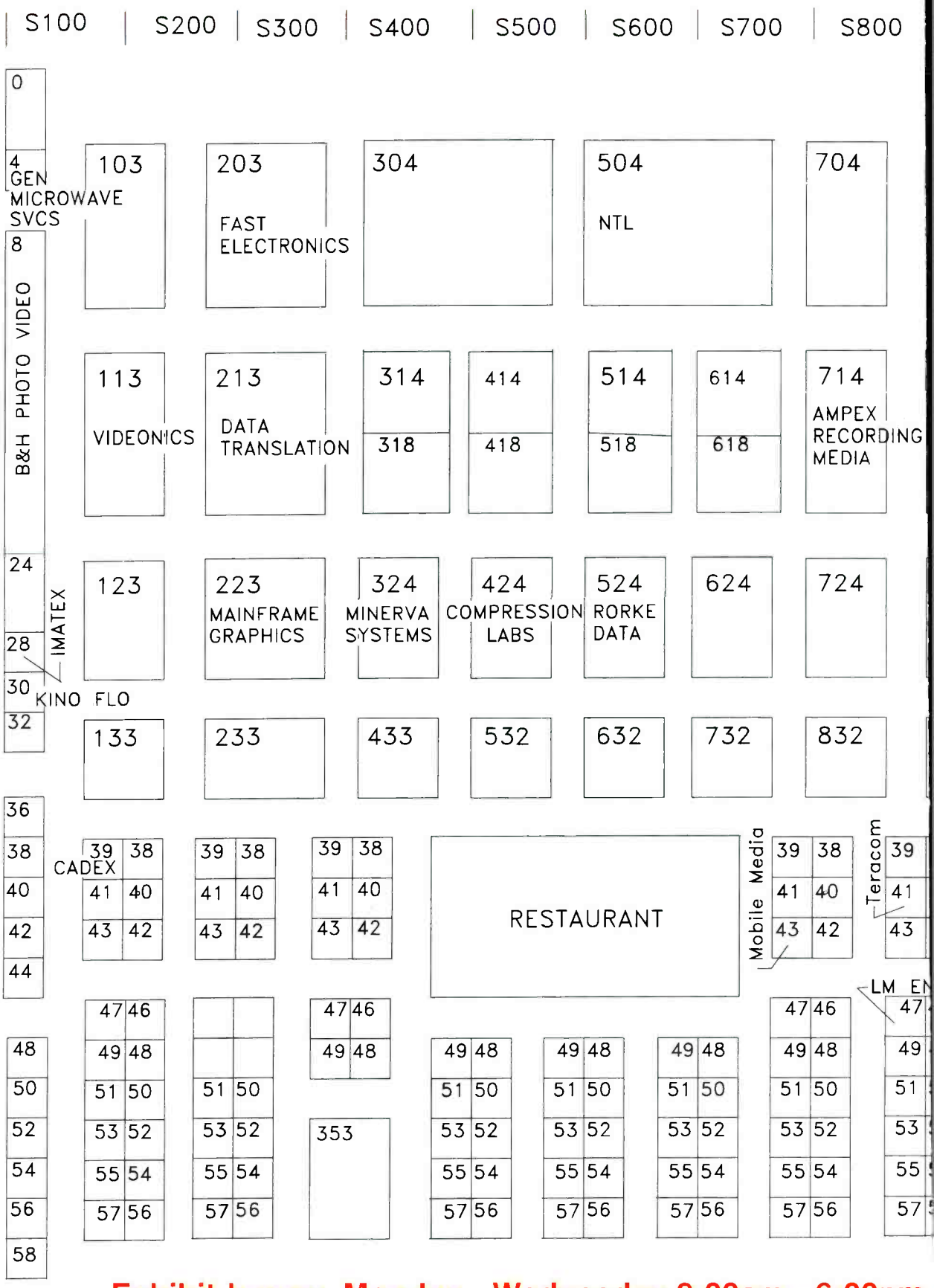
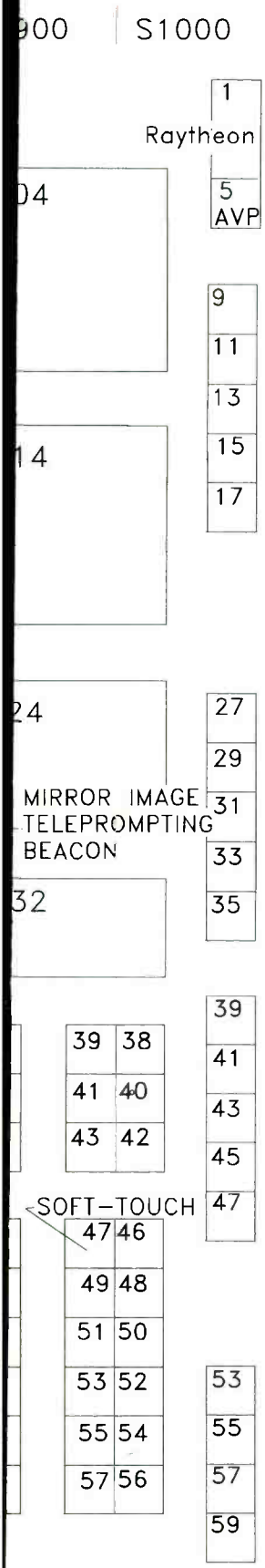


Exhibit hours: Monday - Wednesday 9:00am - 6:00pm
Thursday 9:00am - 2:00pm



SPECIAL EVENTS

Broadcast Engineering Conference

Saturday:

1:00pm - 5:00pm Digital radio broadcast transmission

Sunday:

9:00am - 9:30am	Keynote address: James Quello, Commissioner, FCC
9:30am - 12:00pm	The all digital radio station, Part 1: Digital audio broadcasting
1:00pm - 5:00pm	The all digital radio station, Part 2: Digital audio production

Monday:

9:00am - 10:30am	All industry opening featuring Eddie Fritz, President, NAB
10:30am - 12:00pm	Radio data broadcasting: Present and future technologies
1:00pm - 5:00pm	Computer technology for broadcast support: BBSs, LANs, WANs and the Internet

Tuesday:

9:00am - 12:00pm	Digital audio encoding: Concepts and realities
1:00pm - 5:00pm	Radio remote broadcasting: The latest technologies

Wednesday:

9:00am - 12:00pm	Technical regulatory issues: Radio and TV Part 1
12:30pm - 2:00pm	Engineering awards luncheon, speaker: Lewis Platt, Chairman/CEO of Hewlett Packard
2:00pm - 5:00pm	Technical regulatory issues: Radio and TV Part 2
6:00pm	Ham radio operators reception

Thursday:

9:00am - 12:00pm	Radio RF workshop: Maintaining the signal

Radio Management Conference

Sunday:

2:00pm - 4:00pm	Small/Medium market idea swap
2:00pm - 4:00pm	Raise Ratings and rates with better radio copy
4:00pm - 5:30pm	Radio opening reception

Monday:

9:00am - 10:30am	All industry opening featuring Eddie Fritz, President, NAB
11:00am - 12:15pm	25 management techniques to take you to the top
11:00am - 1:45pm	Radio production workshop
12:30pm - 1:45pm	Newsroom technologies
2:00pm - 3:15pm	Managers look at digital broadcasting
2:00pm - 3:15pm	Making satellite programming sound local
3:30pm - 4:45pm	Managing people new to radio
3:30pm - 4:45pm	Best of the best radio promotions

Tuesday:

9:00am - 3:30pm	RAB sales & marketing sessions
12:00pm - 1:30pm	Radio luncheon, Crystal awards
3:30pm - 4:45pm	Commissioners' regulatory dialogue

Wednesday:

9:00am - 4:00pm	RAB sales & marketing sessions
1:00pm - 2:30pm	Station acquisitions
2:00pm - 5:00pm	Radio station tours (sign up early, space limited)

Thursday:

9:00am - 10:30am	Round table Session: Cross promoting on radio and TV
10:45am - 12:00pm	Round table session: Money-makers, winning sales promotion ideas

By George Graham

AKG C3000 condenser microphone

Performance at a glance:

- Relatively low-cost, large-diaphragm, transformerless studio condenser microphone with "side-firing" design
- Selectable cardioid or hypercardioid pick-up pattern
- Accepts a wide range of phantom power voltages
- Effective internal shock-mount minimizes need for external elastic-suspension
- Matte-black finish for attractive appearance on-camera or on-stage
- Greater than 120dB dynamic range with low self-noise

For the past quarter century or more, studio engineers commonly have employed large-diaphragm condenser microphones from central European manufacturers when recording pop music vocals and acoustic instruments. Microphones of this type have also found increasing favor for announcing use, especially at the network level. In the early 1970s, a new large-diaphragm microphone cost approximately $400. Increased demand and a highly labor-intensive manufacturing process has pushed prices well beyond what could be justified for all but the most well-heeled broadcasters.

Meanwhile, the worldwide proliferation of home and project recording studios has become a lucrative market for audio equipment manufacturers. This has brought to market a significant amount of cost-effective audio gear that can also be used by broadcasters. It is to this market that AKG has targeted its new C3000 condenser microphone, listing for about $700. The C3000 is a phantom-powered unit designed for studio use with a switchable directional pattern. Contemporary internal electronics provide a wide dynamic range. The C3000 comes with an internal shock-absorption feature and a degree of wind protection. A stand adapter and a padded carrying case are also supplied. An external windscreen and an elastic suspension mount are offered as optional accessories.

Eclectic design

The C3000 is an interesting combination of classical design and distinctive new features. It retains the *radial* or "side-firing" transducer alignment found in AKG's other large-diaphragm microphones (dating back to the Austrian manufacturer's C-12, originally produced in the 1940s), but with a rounded grille, are reminiscent of more recent models from other microphone manufacturers. The shape of the microphone housing can have a significant effect on a microphone's sonic character.

The C3000 is an interesting combination of classical design and distinctive new features.

Traditional large-diaphragm, multipattern microphones use two identical capsules facing in opposite directions. The outputs are combined in various phase relationships by the microphone's internal electronics to create the desired directional patterns. The C3000 uses a novel approach with one large and one small capsule, presumably as a cost-saving measure. Both are of the backplate electret design, permitting lower-powering voltages. Another innovative feature is an internal spider-type shock-mount that suspends the capsules in place within the mic while effectively absorbing most vibration transmitted from the stand or mount.

Physically, the C3000 exudes quality. The matte-black finish and distinctive shape are pleasing to the eye. This makes it attractive on stage or on camera. It's a fairly hefty (11.3 oz) unit that seems much more likely to stand up to the rigors of remotes than its more delicate studio cousins. One thoughtful design feature is a little flange around the edge of the connector-end of the C3000, which helps prevent the mic from slipping out of its stand adapter clamp when mounted upside down (i.e., connector-end up), as it would be placed for typical announcing use.

Electronically, the C3000 uses a fairly conventional FET pre-amp design and features a transformerless output. It operates via phantom (simplex) power from 9VDC to 52VDC, which must be supplied by the mixer or an external power supply. There is no provision for internal battery powering.

The C3000 is equipped with three 2-position selector switches, readily visible in red, but recessed and shaped in such a way that a small tool, such as a pocket screwdriver, is required to operate them. One of the switches selects between cardioid and hypercardioid patterns. Omnidirectional and figure-eight patterns (the latter useful in M-S recording techniques) traditionally found on multipattern mics are not available. However, they will not be missed for applications such as announcing and vocal recording. The other switches select -10dB attenuation and low-frequency rolloff.

In use

Perhaps most notable when first using the C3000 is its extraordinarily high output level relative to the typical condenser microphone. (It is nearly 20dB hotter than most dynamic microphones.) This certainly helps reduce noise, but take care that the microphone pre-amp driven by the C3000 can accommodate such a level. For example, if adequate mic pre-amp headroom is not available, a vigorous air personality might well cause clipping on a broadcast console, even with the C3000's -10dB switch engaged. Although not a line-level microphone, the C3000 can certainly be considered a hot

Most notable when first using the C3000 is its extraordinarily high output level.

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.

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.

The New TH 680 Diacrode High Power Tube

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

See us at NAB, Booth #13821.

Circle (127) on Reply Card

microphone.

The internal shock-mount feature is effective. There are probably few applications where the optional external suspension mount is necessary.

Although an internal windscreen is included, the manufacturer recommends use of the optional external windscreen for close vocal or outdoor work. In station announcer tests, plosives were often problematic with only the internal windscreen, especially when using the hypercardioid pattern. Of course, proper placement and announcer mic technique also can make a big difference.

AKG's claims of low self-noise are borne out. This is a quiet microphone, and its high output level further minimizes noise in quiet settings. The claimed 1% distortion point is at 137dB. This is well above the level at which human hearing can be compromised. The microphone's internal circuitry provides a separate FET pre-amp stage for each of its two capsules. Interestingly, the -10dB switch operates after these first stages. This is unlike many other condenser mics that use the attenuator to guard the first-stage electronics from high capsule levels. The microphone's rated source impedance is 200Ω, but minimum recommended load impedance is 2,000Ω. This might be a problem for older consoles that terminate their mic inputs with a low impedance.

So how does it sound?

The published frequency response for the C3000 is rather smooth — within 2dB between 70Hz and about 4kHz. Like many such mics, there is a rise above 5kHz, peaking at about +4dB at 7kHz. Above this, the response heads back down, however, crossing the 0dB line at about 10kHz, and falling to -4dB at 15kHz. The plot also shows a bit of a presence range dip of about 2dB between 4kHz and 5kHz. This dip is even more pronounced in the hypercardioid mode. Low-end response falls off smoothly, reaching -4dB at 50Hz, and staying there down to 20Hz.

The C3000's sound is warm and generally smooth.

Sonic results are as might be expected. The sound is warm and generally smooth. The presence dip seems more noticeable than the response plot would suggest, however, and the falloff at the high end means the C3000 lacks much of the sizzle or airiness that are the trademarks of large diaphragm condensers. This is partly because other popular mics tend to have a more prominent high-end peak. (The capsule materials used in classic tube-era mics tend to age in a manner that further accentuates the high-end rise.)

Like most directional mics, the C3000 exhibits a noticeable low-frequency proximity effect. For some announcing applications, this may be desirable. In this test, the resulting output sound was considered a little bass-heavy, especially in the hypercardioid mode at close range. On the other hand, the C3000's low-frequency rolloff feature is a steep -10dB at 100Hz. Using it to counteract proximity effect in an announcing situation can make the mic sound quite thin. A less dramatic rolloff — or a second "in-between" position — would be advantageous, and make the C3000 a more desirable announce mic. For several

voices the C3000 gave decent results, but most users wished for a bit more high-end airiness. Using the hypercardioid pattern allowed greater working distance from the mic to reduce proximity effect, but slight movements of the speaker's head then became noticeable.

In the recording studio, the C3000 was tested on vocals, where it sounded much more pleasing for singers than it did for announcers. Tests on an assortment of acoustic instruments such as guitar, folk fiddle and cello exhibited competent performance. The mic captured the sound of the instruments with a smooth midrange and low-end, though an occasional EQ adjustment was required to add a bit of top-end. In a remote classical recording, the C3000 was used as a spot mic. Again, the result was clean, quiet and hot.

A stereo-pair orchestral test of the C3000 was not included in these evaluations. Based on experience, however, it would probably provide a well-rounded, slightly "dark" quality to an orchestra. This could be just right for an especially reverberant hall.

It is attractive, well-made, relatively rugged, and includes a mix of design elements that can make it useful in many situations.

Conclusion

After careful listening, the C3000 could be characterized as "the perfect ribbon microphone." Its frequency response characteristics — and even its proximity effect — are like those of an idealized ribbon mic, but without the typical midrange roughness and low output common to that transducer class. Those looking for the sound of a U-87 or C414 may be a bit disappointed, but the C3000 is a versatile mic. It is attractive, well-made, relatively rugged, and includes a mix of design elements that can make it useful in many situations. Some may come to love it as a mellow announce microphone. The C3000's features, price and performance also could make it an ideal high-quality, reasonably priced, jack-of-all-trades mic for TV production work. ■

The C3000's features, price and performance could make it an ideal microphone for TV production work.

Graham is studio engineer and producer/host for WVIA, Scranton/Wilkes-Barre, PA. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

Editor's note: Field reports are an exclusive *BE* feature. Each report is prepared by the staff of a station, production facility or consulting company. These reports are performed by the industry and for the industry. Manufacturer's support is limited to providing loan equipment, and to aiding the author if requested. It is the responsibility of *Broadcast Engineering* to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Broadcast Engineering* magazine.

For more information on the AKG C3000, circle (307) on Reply Card.

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 transmission and recordable 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: professional transmission
- VES-TS: surveillance transmission
- VES-TD: industrial transmission
- VES-C1: videocassette security

For your total video security needs, call or fax Macrovision for details and distributor contacts.

Macrovision U.S.A.
Tel: +1 (415) 691-2909 Fax: +1 (415) 964-4735

Macrovision UK, Ltd.
Tel: +44 1895 251602 Fax: +44 1895 256951

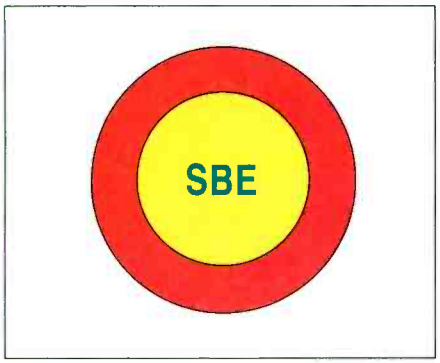
Macrovision Japan K.K.
Tel: +81-3-5496-0466 Fax: +81-3-5496-4066

MACROVISION
protecting your image

See us at NAB '95, Booth #16576.

Circle (140) on Reply Card

By Jerry Whitaker



Broadcast Engineering Conference at NAB '95

The finishing touches are being made to 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 offers the most comprehensive examination of new technologies, systems and products for radio and television ever presented. The conference runs from Sunday, April 9 through Thursday, April 13. On Saturday, three special tutorials are planned on the topics of digital radio broadcast transmission, similarities and differences between computer, film and video imagery, and general video technology. The main portion of the BEC 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. See Table 1 (below) for session topics.

The NAB Convention's unequaled educational programs give participants an unparalleled opportunity to explore new ideas. Furthermore, the 900+ exhibitors displaying the most innovative equipment, technologies and services will provide you with the best ways to equip your operation technically for success in the digital age.

At NAB '95 you will also benefit from unlimited networking opportunities in the technical sessions, during the exhibition and at any one of the many social gatherings. This one event provides the best opportunity to meet your peers from around the globe, make important contacts and learn from other members in the broadcast industry.

Convention planning services

Through an arrangement between SBE and NAB, SBE members can register at the NAB member rate, a savings of $300. Register early, and book your hotel and airline reservations as soon as possible. The following convention planning services are available. (See box at top right.)

Change is accelerating in the broadcast industry. Digital radio, advanced television and interactivity will profoundly affect how stations do business in the years to come. Staying on top of the latest developments is important. NAB '95 is the leading international conference and exhibition for the broadcast, production, post-production, multimedia and corporate communication marketplace. The full spectrum of industry professionals will be represented from around the world.

The joint NAB/SBE Broadcast Engineering Conference committee has worked hard to provide attendees with a wide range of topics and speakers. We hope you can take advantage of this opportunity and attend the show. ■

Numbers to know

1. NAB '95 Fax-On-Demand: 301-216-1847 (call from the handset on your fax machine)
2. General registration information: 800-342-2460 (ask for Justine Laccetti)
3. General registration information via Internet: register@nab.org>
4. Fax completed registration forms to: 301-694-5124
5. Mail completed registration forms to: NAB '95, P.O. Box 3379, Frederick, MD 21705, USA

Jerry Whitaker is editor of *Video Systems* magazine and chairman of the SBE Conference Committee. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

Table 1. 49th NAB Engineering Conference April 9-13, 1995

Date Time	Sunday April 9	Monday April 10	Tuesday April 11	Wednesday April 12	Thursday April 13
9:00	Opening Ceremony				
Morning	Advanced TV: Part I	TV Data Broadcasting: Technology Development	Tapeless Video Prod: The Evolution	Audio & Video Testing: New Technologies Regulatory Issues: Part I	TV RFWorkshop
Noon				Engineering Luncheon	
Afternoon	Advanced TV: Part II	TV On-Line: Interactivity and New Media Computer Technology for Broadcast Support: BBSs, LANs, WANs and the Internet	Designing the All-Digital Video Facility: Broadcast and Prod.	Luncheon Speaker: Lewis Platt CEO of Hewlett-Packard	
2:00				Digital Video Workshop: Maintaining the Image Regulatory Issues: Part II	
6:00				Ham Reception	

ITS-830
1 kW Transmitter

ITS-834
2 kW Transmitter

ITS-820
100 W Transmitter

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"

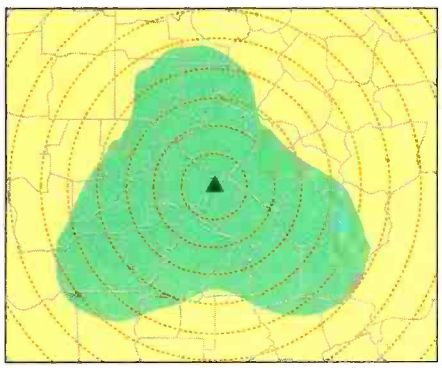
See us at NAB, Booth #12950.

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 (141) on Reply Card

By Don L. Markley



Television STL systems

TV STLs (studio-to-transmitter links) are an often ignored part of the station signal path. STLs deliver the studio output signal to the transmitter input. They are expected to quietly work without interruption, while delivering the signal to the transmitter site transparently.

In the real world, STLs usually perform as just described. They only come to the chief engineer's attention when they go down, when a change is made in the studio or transmitter location and for new facilities. To relocate or establish new links, seek help in Part 74 of the FCC rules. Requirements have changed over the last 20 years. This is mainly due to the frequency congestion in many of the larger market areas.

In some areas, the microwave STL is going the way of the buggy whip as fiber optics are installed. However, in many locations, fiber is not yet available or may never be. Mountain-top transmitters, miles away from populated areas, will probably never get fiber service because of the high installation costs. For many stations, microwave is still going to be the answer for STL purposes. Currently, old-fashioned analog microwave is still the medium of choice. Digital microwave systems have not come into widespread use or design due to the lack of a modulation standard. When such a standard is adopted, design work may lead toward all-digital STL systems.

Frequency

Selection of an STL frequency has been left up to the individual applicants by the FCC. Stations are expected to coordinate applications with other concerned licensees. The first move is usually contacting your local SBE frequency coordinator. An alternative and a recommended second step is to actually contact the chief engineers at all area TV stations to determine the frequencies they are using and what they are being used for — STLs, intercity links or remote pickups? Standby facilities or backup frequencies are a low priority use according to Section 74. Unfortunately, some chief engineers consider any frequency that their transmitter might cover to be theirs for exclusive use. This can cause problems in coordination. However, the commission expects the local stations to work problems out, if possible. If coordination cannot be worked out, file your application and obtain a license for use of a frequency.

If you receive interference from lower-priority services, make an interference complaint and the commission will resolve it. Fixed links, including STLs, for full-service broadcast stations have the highest priority when considering interference protection. The second layer of priority includes TV remote pickup stations. The third priority is fixed or mobile stations serving translators or LPTV stations. The fourth level of priority includes backup facilities and TV pickup stations used outside of a licensee's local service area. Therefore, if one station needs a particular frequency for its TV pickup truck and there is no other frequency for your fixed STL system, the STL has priority. The trick is to work out this frequency usage between stations. In any case, you do not have to accept the claims by an existing station concerning the use of a frequency for remote pickup. In the case of equal priority uses, the first licensee will be preferred.

In several of the larger markets, the channels from 1.99GHz to 2.1GHz have been semi-reserved for mobile unit use by gentlemen's agreement. The 6GHz frequencies have been more heavily used for STLs with the 12GHz frequencies used when the 6GHz band overflows. A much better working relationship can be maintained by adhering to local custom.

Frequencies are also available in the 18GHz and 23GHz band for use as STLs. However, those frequencies are shared with other services and require more extensive coordination. The coordination required is fully explained in Part 21 of the rules and requires a study of all users in the area as well as notification to give other users the opportunity to object or comment. Coordination is best done by firms offering commercial frequency coordination services because it is complex and requires an extensive database.

MINIMUM DISH SIZE

FREQUENCY (GHz)	CATEGORY	MAXIMUM .5 Pwr BW.	SIZE (ft)
1.99	A B	5° 8°	8 6
6.875 - 7.125	A B	1.5° 2.0°	8 6
12.70 - 13.25	A B	1.0° 2.0°	6 4
17.70 - 19.70	A B	--- ---	2 2

Table 1. The minimum dish size for STLs is specified by the FCC based on the signal frequency and whether the link is located in a congested area. (Category A.)

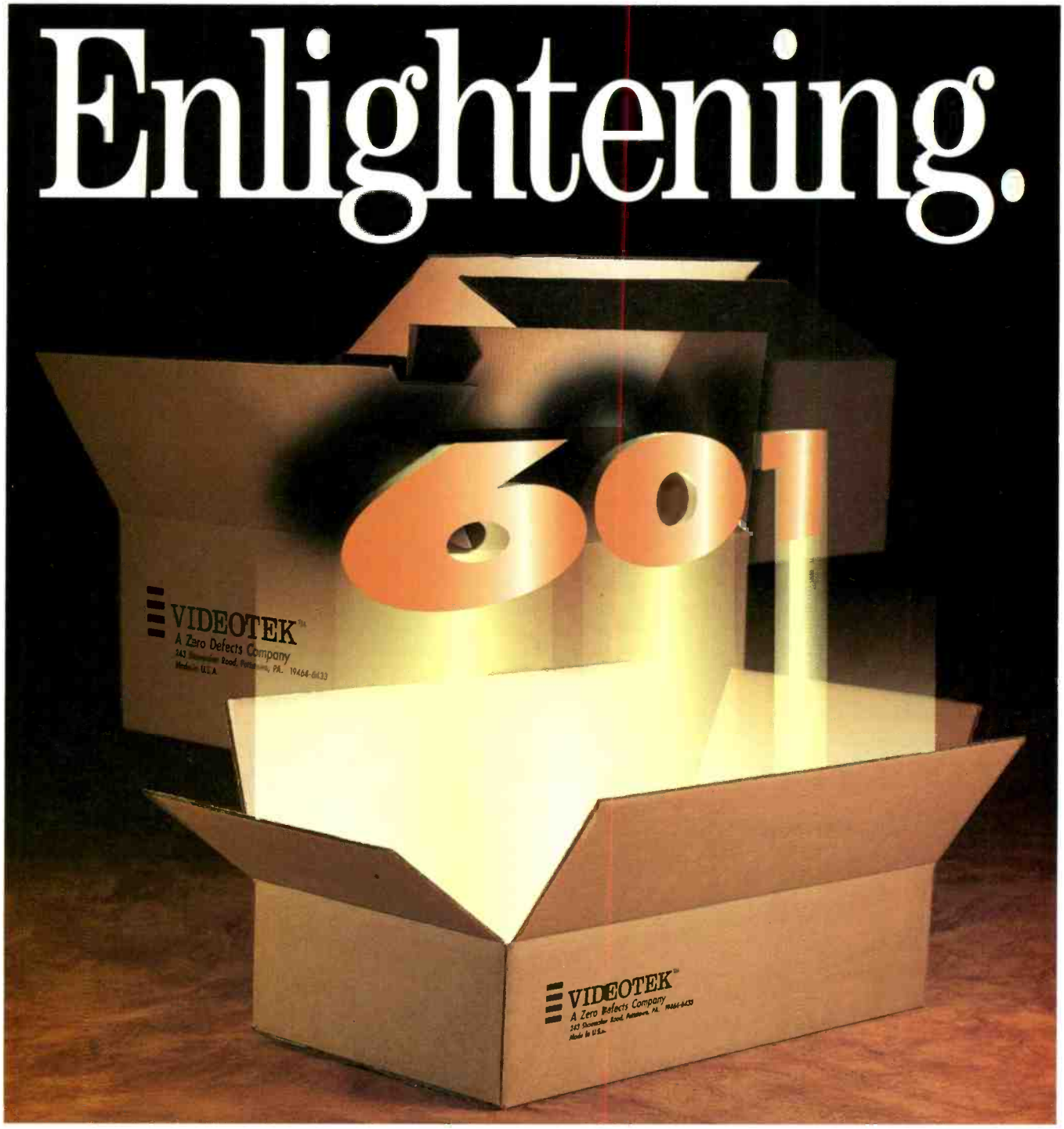
Antenna systems

The sole criteria for picking an STL system used to be based on the minimum dish size providing the necessary fade margin. That is no longer the case. Part 74 contains some definite antenna criteria limiting the minimum dish size. A summary is shown in Table 1. As an example, in the 6GHz band, the minimum transmitting antenna size would be six feet in non-frequency-congested areas and eight feet in frequency-congested areas. There is no clear definition of what constitutes a congested area. In general, it may be assumed that you are in a frequency-congested area if frequency coordination is difficult. If plenty of frequencies are available, you are in a non-congested area and can use Type B antennas. It is left to the individual user to select the size of the receiving antenna. Obviously, receiving antennas don't send off signals that could cause interference to other stations. However, if you receive interference from another station due to the fact that you are using a small receiving antenna with a broad beam, it is the station's responsibility to go to a larger antenna to eliminate the interference.

Old periscope antenna systems consisting of dish transmitting antennas with tower-mounted reflectors are generally frowned upon. However, it is possible to obtain a new periscope antenna system if the request is accompanied by a certification that the radiation from the entire system meets the antenna standards for Type A or Type B antennas. Realistically, that is difficult to do. The best way to design a new system is to start with a tower-mounted antenna.

Transmitting antennas are available on the market that meet the criteria for Category A antennas while not being full dishes. The entire surface of a round parabolic dish is not uniformly illuminated by the dipole feed structure. Some manufacturers have simply cut off that portion of the antenna that is not contributing heavi-

Enlightening.



Brilliant new products for digital system integration.

Videotek is ready to deliver the brightest solutions to your 601 digital system problems. At NAB '95, we'll show you better ways to test your digital signals, distribute them, and make analog connectivity a lot easier. Our TAD-101 transcoder is the first with EDH-error detection and handling.

Our innovative series of digital distribution amplifiers outshines the competition. And our VTM-100D test instrument revolutionizes the way you'll look at serial digital video. Call now or see us at NAB booth #18132 for details.

VIDEOTEK™
A Zero Defects Company

243 Shoemaker Road, Pottstown, PA 19464 1 800-800-5719 (610) 327-2292 Fax: (610) 327-9295

Circle (142) on Reply Card

ly to the total output signal. In this fashion, they have been able to construct antennas that meet the beam width and pattern restrictions for either Type A or Type B without going to the full windload associated with a round reflector. The gain and pattern shape are essentially the same but the weight and windload are reduced due to a reduction in the actual size of the structure.

Path and power

In a further effort to attempt to reduce interference on the STL frequencies, the commission has established minimum path lengths for full-power STL transmitting facilities. These range from 17km at 1.9GHz and 6GHz to 5km at 12GHz. Above 17.7GHz, there is no limit. This means the power must be reduced below the maximum permissible if the path link is less than the minimum specified in Section 74.644 of the FCC rules and regulations. If you are running a 7GHz STL on a path only 5km long, your maximum EIRP would be 19.37dBw as determined by the following equation:

EIRP = 30 - 20 LOG (A/B)

EIRP = equivalent isotropic radiated power in dBW
A = minimum path length in kilometers
B = actual path length in kilometers

This effective radiated power still permits stations to obtain a 40dB fade margin with reasonable size antennas. At the same time, it limits the overall amount of RF being propagated in the market area in an attempt to lower the overall interference to other auxiliary broadcast users.

Transmission lines

The preferred transmission line for 1.9GHz systems is still the old reliable 1⅝-inch coaxial cable. At these frequencies, it is relatively efficient and is inexpensive and easy to install. For higher frequencies, coaxial cable tends to become too lossy in anything other than short runs. The preferred transmission line at 6GHz and 12GHz is semiflexible elliptical waveguide. It is also easy to install and comparatively inexpensive while providing adequate efficiency. The need for more efficient line comes in situations where the path is long and the transmission line at one or both ends is also long. In those cases, better efficiency can be obtained by going to rigid waveguide. The best efficiency is found using circular waveguide, which tends to present its own set of problems. Circular waveguide can be difficult to install and tame. Once properly adjusted, it provides an efficient transmission line system. However, it is not recommended except in cases where the losses in elliptical waveguide are excessive.

Standby systems

It is highly advisable to use a 100% redundant system for a primary STL link. These systems include hot standby transmitters and receivers with automatic switchover if either unit fails. While the mean time between failures for modern microwave transmitters and receivers is long, they *will* fail and the station will be down until a backup system is found or until repairs are completed. Because most stations do not have the equipment necessary to repair these systems, the downtime could be significant. It is permitted to use the remote pickup system as an STL during periods when the STL fails. However, you may have to contend with an irate news department.

An option for difficult STLs makes use of redundant receivers. Most STLs are simple, straightforward systems with reasonable path links over normal terrain. However, some STL systems require fairly long paths,

35th ANNIVERSARY

EMCEE

because it's your future...

Since 1960 EMCEE has set world standards for performance and quality in broadcast and microwave products. Our research and development commitment and continued emphasis on refinement and product upgradability will provide EMCEE users with value and obsolescence protection well into the future. Consider our technology and the long term advantages of EMCEE ownership.

WORLD STANDARD PRODUCTS - WORLDWIDE DISTRIBUTION

PROVEN DIGITAL COMPRESSION COMPATABILITY

35th ANNIVERSARY

EMCEE

YEARS FROM NOW WE'LL STILL BE AHEAD

EMCEE Broadcast Products P.O. Box 68, White Haven, PA 18661
800-233-6193 or 717-443-9575 FAX 717-443-9257

See us at NAB, Booth #17106.

Circle (146) on Reply Card

especially when dealing with distant mountain-top sites. In other cases, the STL path may extend over large bodies of water where inverse beam bending may occur during some times of the day or under some unusual weather conditions. In those cases, severe fades can cause the received signal to dip into the noise level for extended periods of time. If two receivers are used, a second receive antenna can be mounted on the tower at different heights. There is no absolute value for the spacing, although at least 100 feet is desirable. Both receivers are operated continuously, with the better signal selected by automatic change-over equipment. This space diversity can add 10dB or more to the apparent fade margin because fades due to atmospheric conditions or inverse beam bending would not be expected to occur at both antennas simultaneously. This technique is not necessary for most systems but it can be a real lifesaver in those systems where the path terrain is less than optimum.

The basic physics of the STL path have not changed. That is, the path should clear all obstacles with nothing imposing on the 0.6 fresnel zone. For the high reliability needed, a fade margin of 40dB is required. The actual signal level depends upon the specific equipment used in the system, the actual EIRP, the noise threshold of the receiver and the receiving antenna gain with system losses.

Remember, establishing a good STL system starts with adequate frequency coordination with other users to avoid interference. Wading through the coordination process without stepping on any toes and getting the paper work prepared in accordance with the commission's requirements can be more difficult than actually selecting the equipment. The main point to remember is that a TV STL has the highest priority of all the auxiliary broadcast services. Although this doesn't mean that you should ignore other users, you have a good shot at obtaining a clean usable frequency, even in metropolitan markets. ■

For maps, contact the US Geological Survey at 303-236-7477 or your local map dealer. Also, for the name of the SBE frequency coordinator for your area, contact the SBE at 317-253-1640.

Don Markley is president of D. L. Markley and Associates, Peoria, IL. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

For more information on STL equipment, circle (305) on Reply Card. See also "Antennas" on p. 82 and "STL Components & Electronics" on p. 84 of the BE Buyers Guide.

- COMPOSIUM II
- HALO
- TYPEDEKO
- PRESTO
- PRONTO
- IMPACT
- DM/FS SERIES

Digital Compositing and VideoGraphic Workstations

Dimensional Video Typography

Open Platform Character Generator Solutions

Affiliate I.D. Systems

True 3D Multi-Channel Digital Video Effects

Digital Video Function Modules

See us at NAB '95 Booth 16624

DIGITAL GRAPHIX
Incorporated

6 Forest Avenue, Paramus, NJ 07652
Tel: 201-845-8900 Fax: 201-845-8063 Service: 800-433-2979
• HALO • TYPEDEKO • PRESTO • PRONTO

1280 Blue Hills Avenue, Bloomfield, CT 06002
Tel: 203-242-4242 Fax: 203-242-3321 Service: 800-243-1570
• COMPOSIUM II • IMPACT • DM/FS SERIES

Circle (131) on Reply Card

By George Fullerton

Louth Automation intelligent video disk control software for on-air presentation

During the past 18 months the major computer manufacturers have increased their efforts to market broadcast video servers for on-air presentation applications. Even though they are using proven computer technology, the storage and retrieval of video segments for broadcasting have proven to be far different from their core data processing applications.

Many manufacturers are on a learning curve to fully understanding those differences in order to produce the required broadcast operational software. This was apparent to us when last year in a joint meeting, the chief developer from a major computer vendor asked us, "What's an ID?"

A similar challenge is also facing the traditional broadcast product manufacturers who are announcing hard-disk products. Dubbing material into a disk while structuring a database that allows for instant retrieval of that material by ID requires a different approach than the processes used in a linear-tape environment. After all, do the commands "thread," "standby" or "eject" have any meaning with disk technology? They are now dealing with new terms, such as "archiving," "scalability" and "multistream management!"

Computer-based video disk system hardware is available today, but fully developed control software in the hard disk is still maturing. In some instances, the software doesn't take full advantage of the disk's random access capabilities as some vendors' software mimic controlling a VTR. In addition to basic control software, the industry needs disk software integration with older products, such as cart machines, and software integration with external broadcast applications, such as automation systems.

Since inception, Louth's ADC-100 software-based system has automated on-air presentation by integrating a diverse array of serially controlled devices. Hard-disk video servers and buffers are no exception. The system's video disk software activities provide an open-system disk-control protocol, a disk device "object," a tape-to-disk media management system, and software for caching from cart machines to video disk buffers.

The Louth disk control protocol

Late in 1993, it became apparent that many of the video disk vendors would be developing proprietary or closed systems. Experience shows that it would be more beneficial and cost-effective if there was an open, non-proprietary control protocol with a command structure enabling flexible and effective use of disks. The key was to get such a protocol adopted by all disk system developers.

With industry input, Louth engineers developed a control system protocol and distributed it to disk systems vendors. This protocol is in the public domain and Louth has proposed it as a SMPTE standard. It has currently been implemented or committed to be implemented by Accom, ADT, ASC, BTS, Digital, Dynatech, Hewlett-Packard, Silicon Graphics and Tektronix.

The protocol allows full use of hard-disk random access capability for broadcast presentation applications. Unlike a VTR protocol that uses linear addressing (time code), the disk protocol uses a file naming convention (ID) for random access and efficient storage space management. In addition, the protocol provides a mechanism to address multiple input and output ports. The protocol is based on a well-proven cart machine protocol structure, but implements commands specifically for control of video disks. Each command is simple and direct. Commands may be easily added to the protocol when new functions are required.

The protocol identifies media for record and playback by a simple ID and duration. A recorded ID may be played back in its entirety by requesting the ID. Or if a portion of the ID is to be played, then an offset start and duration time may be specified.

For multichannel applications, the protocol allows a control port to *open* multiple I/O channels. These may be opened as *locked* (not available to another controller) or *unlocked* as needed. Once a controller has opened multiple I/O ports, individual ports may be issued commands when *selected*. When multiple control ports are used by different controllers (e.g., a controller is recording into a disk while another is playing), the protocol provides a mechanism to examine changes to the directory. For example, changes that occur when spots are inserted or deleted from the traffic schedule.

The Louth protocol also allows the user to set specific disk parameters, such as video compression ratios and audio sample rates. These commands are useful for systems that need to provide scalable presentation quality for different elements. The protocol supports deferred or timeline commands. This concept was added for instances when the data transport mechanism is indeterminate (e.g., Ethernet). The

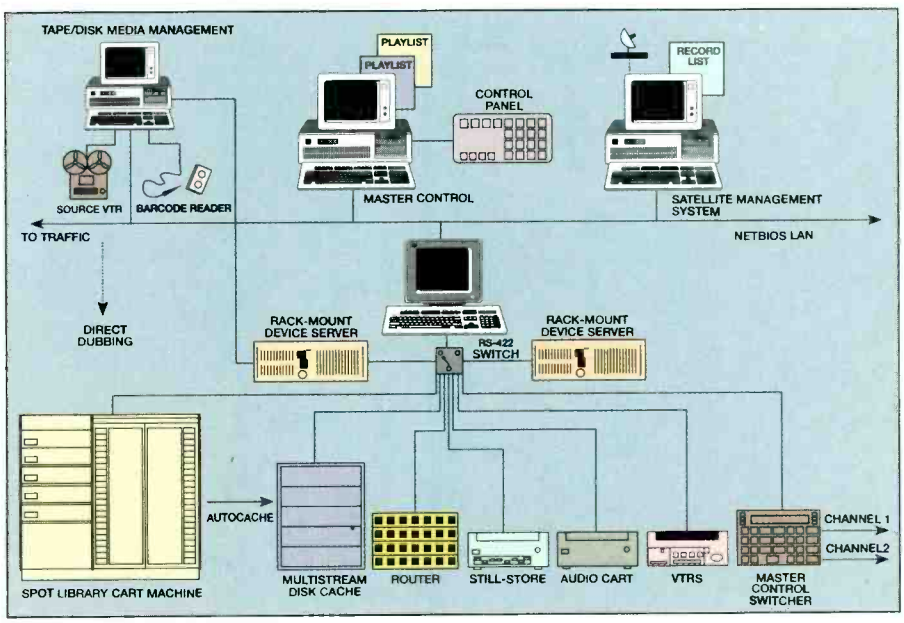


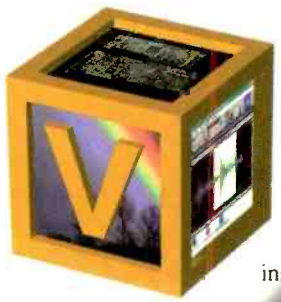
Figure 1. The ADC-100 automated master control caching from cart machine to disk.

Now Available to Developers and OEMs

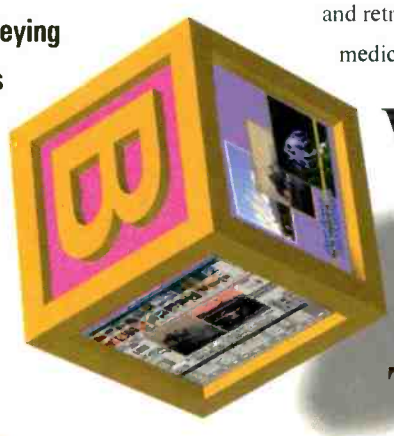
Digital Video Building Blocks

Choose the pieces you need to build your application.

- Broadcast-quality Digital Video
- CD-quality Digital Audio
- Realtime, 60 Field Motion-JPEG
- Industry-standard DV MCI Software Toolkit
- GUI Accelerator with Live Video
- 32-bit Videographics
- DVE, Switching, Mixing, Keying
- Nonlinear Random Access
- Machine Control



Digital Video Building Blocks deliver the superior performance required in demanding applications like: realtime nonlinear editing, commercial insertion, video-on-demand servers, digital video broadcasting, digital disk recorders, digital video archiving and retrieval, CGs, 2D and 3D graphics/paint, animation recorders and medical imaging.



We know the Digital Video Building Blocks work. We've used them to create two blockbuster products of our own — Matrox Studio, the only desktop video editing system with nonlinear productivity and linear production power combined and Matrox Animation Xpress (MAX), a professional realtime digital animation recorder.

Ask for a *Sneak preview* of our new PCI-bus Building Blocks

Tap into our expertise. Some of your competitors are probably using these tools. You owe it to yourself to check out our PROVEN state-of-the-art-hardware and the best software development tools in the business.

To speed your product to market, Matrox Digital Building Blocks are backed by the outstanding technical support team that has made Matrox a leading supplier of graphics, video and imaging solutions to OEMs the world over.

For more information call 1-800-361-4903 or (514) 685-2630

Matrox Electronic Systems Ltd.
1055 St-Regis Blvd., Dorval (Quebec) Canada, H9P 2T4
Fax: (514) 685-2853

See us at NAB 95 Booth S304

matrox
VIDEO PRODUCTS GROUP

Circle (132) on Reply Card

Denon's MD Cart™ Recorders and Players are the modern choice for *any* application that requires repeated recording and playback of audio, from broadcast to post-production. Why? Compared to NAB tape carts, the MiniDisc is free from wow, flutter, jamming, stretching, wrinkling, drop-outs and shedding.

MiniDisc's advantages (including *full* inter-machine, inter-brand compatibility) are quickly making it *the* universal standard. Compared to other digital formats, Denon's MD Cart technology offers the lowest cost per Megabyte of storage, shirtpocket transportability, and non-contact, optical media reliability.

Obviously, once you've chosen MiniDisc, your next decision is which MD to buy. Features like serial and parallel interfaces, digital and analog signal inputs and outputs, external sychronization, and *MD Remote*™ software (see side bar), make Denon MD Cart the obvious choice.

DN-990R MD Cart™ Recorder (shown) and the DN-980R/ DN-995R machines

Denon's MD Remote™ Software, running under Windows™, offers a graphical interface for fast, easy control of all functions and modes on any Denon MD Cart machine, including automatic dubbing of tracks or discs between machines, complete with titles and cue-point information.

See us at NAB, Booth #4004.

DENON

The First Name in Digital Audio

Denon Electronics Division of Denon Corporation (USA),
222 New Road, Parsippany, NJ 07054 (201) 575-7810

Circle (133) on Reply Card

command structure also provides a sequence of archive commands, such as *send to archive, get from archive, delete from archive*. The protocol is concise and direct, and provides comprehensive status reporting from the controlled devices.

Vendor implementation of the protocol allows the customer to choose the disk product and the application software separately. Because the capabilities of announced disk products vary widely (price, storage, channels, compression), having a flexible yet common protocol allows the right disk to be interfaced with the customer's application, all transparent to the end-user.

Object-oriented programming

Object-oriented programming (OOP) is used to develop the automation software solutions. A software *object* has been developed as the software interface module to disk devices under control of the ADC-100 automation system. This disk-driver module supports the disk as a peer with all the other supported devices (cart machines, switchers, etc.) under automation control.

This interface allows an operator to view the video disk as a cart machine equipped with two VTRs that have a thread and cue time of a second or two. The *object* supports all the functions available on a standard cart machine, but eliminates tape and VTR usage conflicts. The *object* also uses the system protocol to communicate with the disk.

The *object* status display appears to the operator as a cart machine with two VTRs. Normally, one status line (VTR-1) would be showing the current spot being played while the other status line (VTR-2) would show the status of the next spot to be played. This allows continuous monitoring of both the disk status and the spots to be played.

The key to media management for on-air presentation is closing the status and the control loop between the operator and the automation controller. The cart machine *object* keeps the list display accurate to the second as to the available spots and needed spots in the cart machine. The process is accomplished through *ID added* and *ID deleted* status and requests commands. Disk resources are displayed in blue, and those items needed are displayed in red. As spots are recorded into the disk, the display automatically turns blue indicating that the spots are available for playout. Additionally, the operator can bring up a window that lists all of the IDs currently in the video disk.

Each copy of the disk *object* supports one video disk input or output stream. Multiple copies of the disk *object* may be used for controlling multiple video ports from the same video disk. They can also control multiple video ports from different video disks. This allows the automation system to control several on-air outputs from a single disk. It also allows several outputs to play media from several different video disks (such as a commercial disk, news disk and program disk).

The ADC-100 system also interfaces the disk to Autocompile, the Louth automated tape compiler, for pre-compiled back-up tape. This is done as a background function directly from the disk in advance of airing the media.

Disk media management system

Turbodisk is a PC-based system for dubbing media into broadcast video disk products. It automates the labor-intensive tasks of dubbing, screening, and verifying media on video disks. It also creates a database where all dubbed media is logged including titles, station-specific information and notes. This database may be shared with other tape preparation products. Turbodisk also provides manual control of a disk recorder via a VTR-like control panel.

The *autocopy* feature simplifies and automates the entire dubbing process. The operator only has to load and unload source tapes. After the spot master has been cued and the spot information selected from a dub (record) list, the automated dubbing requires only a single keystroke. The system automatically rewinds the source VTR for tape preroll, prepares the video disk for the recording session, and prerolls the tape. Additionally, the system starts disk recording at the first frame of the video and stops both devices at completion. All spot information is automatically entered into the media database for use by the automation system. When the dubbing process is completed, a preview feature allows for automatic review of the entire spot, or the first or last three seconds of the spot.

Multiple PCs can be networked to share the same database. The database can reside on the Turbodisk PC or a network file server. Database retrieval and viewing are then available directly in Turbodisk. Deletion of the correct database entry is made automatically when a spot is deleted from a disk. The system can retrieve the complete spot inventory from a disk for display, or save it on a PC hard disk. This spot list may be sent to traffic or used for other verification purposes.

The current disk status and status of the current ID are always displayed on the PC screen. Complete disk status is available, such as the number of spots residing in a particular disk and the amount of free space available. A menu is provided to allow the operator to change the record

The problem is obvious.

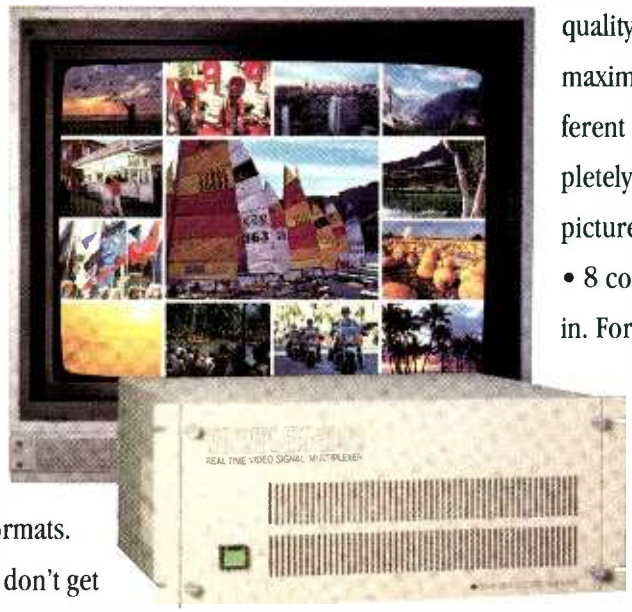
The solution is simple.

No more studio clutter! Reduce overall costs and simplify monitoring needs by letting one unit do all the work.

The VIEWPLEX-2000 is the ultimate video signal multiplexer. It will display up to 16 different channels on one screen with excellent clarity, making applications virtually unlimited.

VIEWPLEX-2000 is ideal for monitoring in a closed circuit set-up, broadcasting multiple images in a collage, or broadcasting sequential images for instructional formats.

If you're thinking of upgrading, don't get more equipment; just get the one you really need.



Features include: • Video signal format NTSC. • High quality 8 bit picture resolution. • 16 maximum input channels. • 40 different display configurations. • Completely programmable. • Real time picture refreshing at 30 frames/sec. • 8 color character generator built in. For dealer inquiries and further information, contact:

SUMITOMO ELECTRIC
U.S.A., Incorporated.
Telephone: (310)782-0227
Facsimile: (310)782-0211

See us at NAB, Booth #S949.

SUMITOMO ELECTRIC

Circle (135) on Reply Card

The Turbodisk media management system can be used for dubbing in source material.

parameters supported by the disk manufacturers. Recording parameters, such as video compression factors and audio channel usage can be set for all recordings or changed for individual elements.

Turbodisk supports simultaneous access to the disk media for both recording and playout. This allows last-minute dubs with preview and editing functions independent of on-air schedules. This permits rushed schedule changes to be made quickly and is well-suited for a news environment where last-minute production is routine.

The system provides a fully functional disk control panel on the PC monitor complete with all the functions of a traditional VTR front panel. Manual commands include cue, play, stop, record, still, reverse play, fast forward, fast reverse, step, jog and shuttle. Because disks are randomly accessed, a playing spot can be stopped and a new spot selected, cued and played in seconds. *Begin* and *end* markers can be placed while inspecting a spot in any play mode (including still). A new spot can be created from any segment of an existing spot without video encoding or decoding and the associated loss of quality. And this newly created spot is independent of the original spot. Either spot may be played or deleted without affecting the other. This simple editing feature allows fast and accurate news cuts, program segmenting or spot trimming.

Caching from cart machine to disk buffer(s)

Some video disk servers may provide sufficient storage to contain the user's entire spot inventory. If this is the case, they can work as cart machine replacements. Other disk systems are well-suited as on-air caches or buffers when interfaced to a tape library source. When news and program material are also included for video disk playout, an external archiving system is often required. Archiving is a task well-suited to tape, and digital tape storage technology ensures that the process maintains image quality.

The standard cart machine is an excellent device for storing spots for eventual video disk cache. Louth's Adplay system automates cart machine/disk buffer integration using caching and list management. Adplay is a stand-alone spot playout system, but it can be upgraded to total master control automation. This system allows the cart machine and disk buffer to act as peers of all the other devices (VTRs and switchers), all operating under automation control.

With either Adplay or ADC-100 control, the cart machine is converted from a direct-to-air device to a source library system. Both the cart machine and the disk must be under the control of the same automation software to manage the timely transfer of material. All of the inventory is contained in multispot tapes (up to 100 per tape) with the cart machine running proprietary control cart machine software. Control software for all Sony and Odetics cart machines is available now, and by March 1995, the Panasonic MARC family will be supported.

Disk caching has several advantages over the traditional direct-to-air cart machine application: 1) the workload on the cart is reduced as spots with multiple playouts are transferred only once to the disk buffer; 2) spots may be rearranged and/or replaced with greater ease and reliability; 3) redundancy is enhanced because the cart machine can be used as an emergency backup; 4) in multichannel applications, several channels can be presented to air from a cart machine with a limited number of VTRs; and 5) tape handling is reduced by directly dubbing from source tapes into the cart machine multicut cassettes.

The Louth software module that manages this transfer as a background function is called *Autocache*. The interface is dedicated to buffering audio/video material from a cart machine to a disk cache. Because the ADC-100 can simultaneously support up to eight asynchronous channels, *Autocache* will also support multichannel copying to disk.

The transfer to disk is done prior to air with a user-defined number of events in the *look-ahead* of each schedule. Depending on the amount of disk storage available, the *look-ahead* of a disk server could be as long as 48 hours. Typically, a disk cache contains only a few hours of storage.

Assuming 16 minutes of break material every hour, a 2.5 hour disk drive can store

Continued on page 219

By Jerry Cohen

CCD cameras

Over the past few years, technological advancements in new digital VTR formats, disk-based editing systems and compression algorithms have been stealing the headlines. But what about cameras? Although the number of new breakthroughs is not at the level it was five to eight years ago when CCDs were in their infancy, the steady pace of advancements is nonetheless noteworthy. This article looks at some of the recent advancements in CCD technology.

Horizontal resolution

When 3-CCD cameras were introduced, camera designers were plagued with the problem of controlling aliasing or moiré patterns. These patterns were generated whenever the camera was aimed at finer detail than Nyquist criterion would allow. Soon, the spatial offset technique, which displaces the green CCD horizontally by one half of a picture element (pixel), was incorporated into most 3-CCD cameras. The result of spatial offset is that aliasing is substantially reduced, which together with the appropriate shifting of the optical low-pass filter, permits the resolution that the CCD is capable of, to actually be seen.

One problem with spatial offset is that to be completely effective, the green signal must equal the sum of the red and blue signals. The formula for the luminance channel is:

$$Y = 0.59G + 0.30R + 0.11B$$

Because green represents 59% and the sum of red and blue is only 41% of the signal, spatial offset is not completely effective in canceling aliasing. The mixing ratio for the luminance signal must remain constant, because it affects color accuracy and luminance is a key component in deriving the color-difference signals. Recently, several manufacturers have adopted a frequency-dependent method for altering the luminance equation. Aliasing is a problem only at high frequencies and colorimetry is less critical at high frequencies because the color-difference signals are bandwidth-limited. Therefore, the following luminance equation is substituted only at high frequencies:

$$Yhigh = 0.50G + 0.25R + 0.25B$$

The ideal mixing ratio of 50-50 is achieved, and color reproduction is not altered. The drawback of this technique is that the mounting accuracy of the green CCD becomes even more critical. At this level, even chromatic aberrations caused by the lens must be taken into account. Otherwise, resolution will be reduced due to signal cancellation rather than alias cancellation. This technique, together with high-speed sample-and-hold circuits allows a horizontal resolution of at least 750 TV lines with well-controlled aliasing.

Continuous auto black balance

Color cameras have always suffered from color imbalances and drift in the dark portions of the picture. Cameras have high gain in the dark portions as a result of the required gamma correction. Small signal drifts are multiplied by the high gain. For this reason, most cameras incorporate an automatic black balance function. The automatic black balance calibrates the black clamping circuits for true black (lens iris fully closed).

Many camera manufacturers ease the design burden by reducing the gain of the gamma circuit in the dark portions. Although this may reduce the amount of drift, it also has negative consequences on reproduction in dark portions of a scene, including loss of shadow detail and color hue shifts. (For more information, see "The latest in CCD Camera Technology," p. 26, *BE* July 1993.) A new circuit has recently been introduced which, for the first time, totally eliminates the need for an external automatic black balance switch. Dubbed continuous auto black (CAB) it uses optically masked pixels at the edge of the CCD to maintain an absolute black reference.

In the past this optical black portion has been used as relative, rather than absolute, reference. Due to noise and spikes generated by the sample hold function of the first clamping stage, the optical black portion was cut and replaced with an electrically generated black reference. Hence the absolute optical black reference was lost and could not be used by subsequent stages. The only way to acquire an absolute black reference was to close the iris and perform a traditional automatic black balance, which takes time and could upset the flow

Continued on page 209

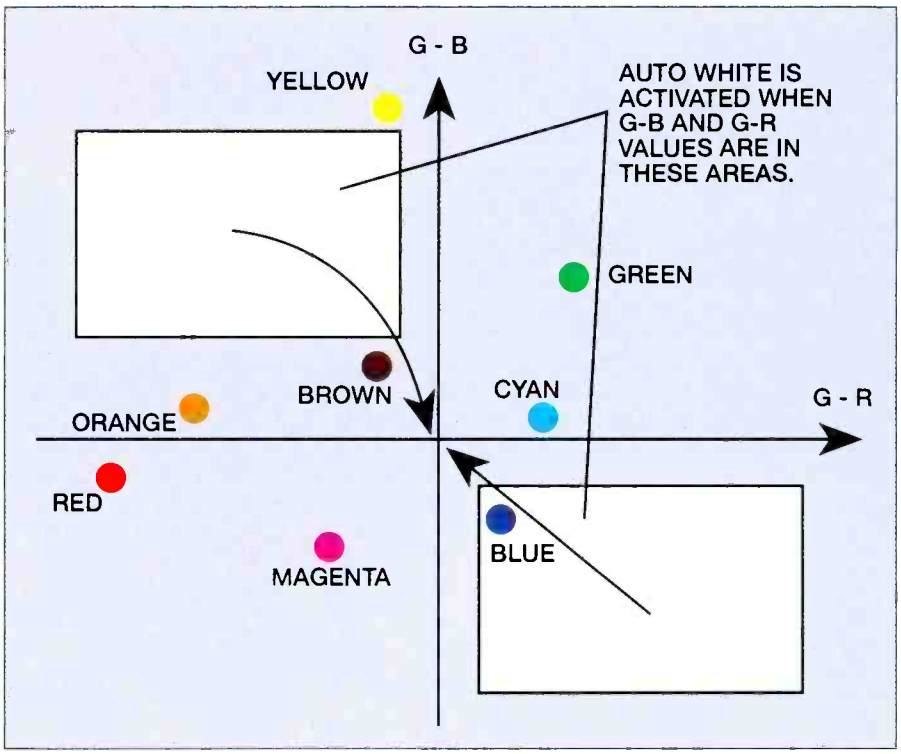


Figure 1. Newer auto-white circuitry uses lookup tables for gain vs. color temperature information. Correction circuitry only activates when G-B and G-R values are in the rectangular areas.

In videotape, quality is everything.

Processes that introduce dropouts — whether they are in manufacturing, shipping, storage, or usage — need to be identified and the sources of dropouts removed. That's why we at Ampex Recording Media Corporation have never taken our eyes off one goal: *No Dropouts.*

Every day, 365 days a year, we're identifying — and removing — the causes of dropouts *wherever* they are. This includes a world-class Quality Improvement Program within our manufacturing facility — but it also includes helping our customers improve *their* storage, handling, and usage of tape, to minimize dropouts.

AMPEX | Recording Media

Circle (150) on Reply Card

PLEASE CALL OUR TOLL-FREE NUMBER

800/240-7042

AND REQUEST A COMPLIMENTARY COPY OF OUR BOOKLET:

ACHIEVING EXCELLENCE IN VIDEO PRODUCTION — VIDEOTAPE QUALITY IS *EVERYONE'S* BUSINESS.

THIS BOOKLET PROVIDES THE AMPEX APPROACH TO REACHING THE GOAL OF "NO DROPOUTS."

AHEAD OF THEIR TIME

1900
TERM TELEVISION COINED
CONSTANTIN PERSKYI

1902
COLOR TELEVISION PATENT FILED
OTTO VON BRONK

1926
FIRST TELEVISION TRANSMISSION
VIA PHONE LINES
JOHN LOGIE BAIRD

1928
PHONOVISION – FIRST VIDEO DISK
JOHN LOGIE BAIRD

1936
2:1 COMPRESSION BROADCAST
(INTERLACE)

1953
6:1 COMPRESSION BROADCAST
(NTSC)

1994
MPEG-2 STANDARD ADOPTED

JANUARY 1995
REAL TIME MPEG-2
ENCODING SYSTEMS SHIP
DIVICOM

ALL AHEAD OF THEIR TIME. NOT ALL HOUSEHOLD NAMES, YET EACH AN HISTORIC MILESTONE.

NOW, DIVICOM HAS MADE HISTORY. THE FIRST WITH FULLY INTEGRATED RISC BASED MPEG-2 COMPRESSION . . . THE FIRST WITH ATM OUTPUT . . . THE FIRST WITH MPEG-2 TRANSPORT . . . AND, THE FIRST WITH MPEG-2 SYSTEMS THAT ARE HIGHLY AFFORDABLE, EFFICIENT, RELIABLE, INTEGRATIBLE AND ELEGANT.

DIVICOM™
LEADERS IN DIGITAL MEDIA COMPRESSION

800.286.1600
1708 McCarthy Boulevard
Milpitas, CA 95035

At NAB, visit us at Booth 1603 Multimedia World
In Dallas, visit us at NCTA

CCD cameras continued from page 206

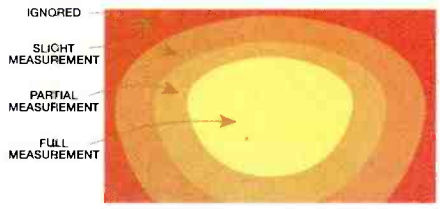


Figure 2. Multizone iris weighting is used to provide better overall contrast under less than ideal lighting conditions. Weighting allows white peaks near the edge to be completely ignored.

of a shooting sequence.

The first camera to use a continuous auto black circuit is the JVC GY-X2B camcorder. First, noise has been reduced to a minimum through careful design at the front end including proprietary signal detection methods. Next, high-speed sample-and-hold circuits have been developed that allow the original optical

High-speed sample-and-hold circuits have been developed that allow the original optical black to be retained through all clamping stages.

black to be retained through all clamping stages. This optical black is replaced with system blanking at the output of the signal processing circuit after all clamping is complete. The result is that black balance is maintained without drift continuously, and without the need to take a black balance in the middle of a shoot.

Improved automatics

Automatic functions not only make the cameraperson's job easier, they also can improve the picture quality and allow shooting in situations that could not otherwise be captured.

Full-time auto white is a function often associated with consumer cameras. But, if accurate, it allows the continuous shooting of a subject moving from incandescent to fluorescent to outdoor lighting without missing a single frame for white balance. In the past, the accuracy of the typical full-time auto white has been less than what is required for professionals. Recently, JVC applied some novel techniques to all of its cameras, greatly increasing the accuracy of the full-time auto white circuitry. All white balance circuits measure the green channel relative to red and blue, and adjust the gain of the red and blue channels until they equal the green channel. Applying this same method to a full-time auto white circuit indiscriminately can produce serious inaccuracies. It can make a red rose turn gray and make faces completely colorless. To prevent this, a look-up table contains the red to blue gain relationship of every color temperature from roughly 2,600K to 9,000K. This prevents the white balance circuit from responding to colored objects, only to changes of color temperature. (See Figure 1.)

In addition, a hysteresis loop is established for low saturation objects along the I-axis. This prevents the circuit from incorrectly responding to skin tone. Although still not as accurate as taking a white balance on a white card, it is

Picture this...

A broadcast console designed for operator comfort with the flexibility and durability to last for years. That's the hallmark of custom-designed communications furniture from STS, Inc.

Modular consoles by STS fit a variety of configurations so they can be modified as your needs change. And they'll outlast many changes because, beneath the high-quality laminates and the finest natural hardwood trim is a welded tubular steel framework. That means it can handle your heaviest equipment loads.

STS has earned a reputation for thoughtful design and rugged dependability in the public safety, utility and transportation industries. To learn how the complete line of STS consoles and racks can meet your communications needs, **call 800-879-1787 and see the difference for yourself.**

STS®
Skaggs Telecommunications Service, Inc.

5290 South Main • Murray, Utah 84107 • 801-261-4400 • Fax: 801-261-1580

Circle (153) on Reply Card

certainly superior in those situations where continuous shooting in multiple color temperatures is required.

Auto-iris problems

The accuracy of auto iris circuitry is another problem that has plagued shooters. Problems usually arise under high contrast, harsh lighting circumstances typical of field shoots. The subject of interest may be bright relative to the rest of the scene causing overexposed pictures. Or, a bright light or candle may be in the scene causing the subject to be underexposed. A multizone iris weighting system allows exposure priority based on a series of zones whose positions correspond to natural areas of interest. (See Figure 2.)

A multizone iris weighting system allows exposure priority based on a series of zones whose positions correspond to natural areas of interest.

In addition, another circuit automatically adjusts the detection ratio between peak detection and average detection called APB. Figure 3 illustrates the operation of the combination of multizone iris weighting and peak vs. average detection.

Future camera technology

The question arises as to what the future holds for camera development. Technically, expect to see even greater improvements in sensitivity, signal-to-noise ratio, and perhaps further reductions in vertical smear. Operationally, expect to see cameras that are even easier to use, with even better performing automatics so that the pros will not sneer at the thought of using them. Despite the advances of the past, there is little doubt that cameras will continue to improve in the future. ■

Jerry Cohen is a product marketing manager for JVC PROFESSIONAL PRODUCTS COMPANY, Elmwood Park, NJ. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

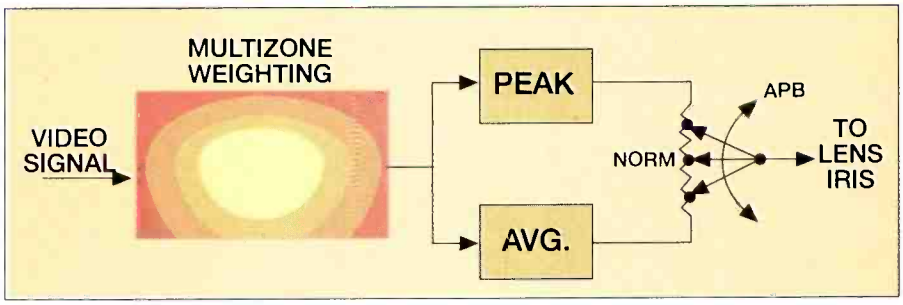


Figure 3. Intelligent iris detection circuitry uses the multizone weighting along with automatic peak and average detection circuits (APB) to determine lens iris setting.

INDUSTRY BRIEFS

BUSINESS

BTS, Simi Valley, CA, has earned worldwide ISO 9000 certification with the ISO 9002 qualification of BTUS, its marketing, sales and service headquarters for the Americas and Far East.

Harris Allied's Broadcast Division, Quincy, IL, has earned ISO 9001 certification, joining the October 1994 certification of its Cambridge, England facility.

Abekas Video Systems, Redwood City, CA, has shipped its ASWR8100 component digital switcher to CNN and Video Wisconsin.

Nvision has named several international sales representatives and distributors including: Boxner Systems Ltd., St. Albans, North London, UK; C.V.E., Seregno, Italy; f.f.d Vertriebsgesellschaft, Munich, Germany; Gerrit de Jonge bv Axel, Axel, Holland; IMMAD Broadcast Services, Markham, Ontario, Canada; LYNX SA, St-Prex, Switzerland; REA/Elda Video, Chatillon, France; VideoCad AB, Vallingby, Sweden.

Videssence, Inc. has relocated its headquarters to a larger facility in Burlingame, CA Tel: (415) 579-7577; Fax: (415) 579-7579.

Quantel has delivered its complete digital compositor, Hal, to Hammer & Pixel, Chicago, KTVU, Oakland, CA, and S.O.S., Columbus, OH. Its still-store system, Picturebox, has been installed at KNBC, Burbank, CA, and WWL-TV, New Orleans. Also, Quantel has installed Paintboxes, Pictureboxes, Picturenets and Hal for Scripps Howard.

Louth Automation, Menlo Park, CA, has delivered LTB-100 time delay systems. The network version, Time Banking, is currently undergoing final shadow testing at ABC headquarters in New York and will provide the west network delay feed.

Avid Technology, Inc., Tewksbury, MA, has announced that New Hampshire Public Television and Maine Public Broadcasting will use Avid's AirPlay system to broadcast promos, spots and station identification directly from disk.

The Network, Rainier, WA, has announced that Crow Film and TV are now using the Soundcraft DC2000 digitally controlled console.

Microwave Solutions, National City, CA, has received a $96,850 contract award from the U.S. Army Electronics Command, Fort Monmouth, NJ, for hardware and software for high-power microwave amplifiers and specialized testing.

Synergistic Technologies Inc., Pittsburgh, PA, has been chosen to provide international transmission services for The Texaco Metropolitan Opera International Radio Network.

ASC Audio Video Corporation, Burbank, CA, has supplied KOTA-TV, Rapid City, SD, with the Virtual Recorder system.

Advent Communications Ltd., has been awarded a contract from European News Exchange, Luxembourg, to supply all the complete fixed satellite earth stations for its new digital TV satellite network.

FilmCore Editorial, Los Angeles, has added the digital 8-track audio recording system Tascam DA-88 to its headquarters in Hollywood.

Siemens Audio, Inc., New York, has announced the sale of the first Capricorn digital recording console to Right Track Recording, New York.

Matthews Studio Equipment Group, Burbank, CA, has entered into a letter of intent to acquire all of the outstanding stock and operating rental assets of Studio Rentals, Inc., Chicago, for $3.5 million in cash and restricted common shares.

Otari Corporation, Foster City, CA, and TG Systems have agreed to give Otari worldwide exclusive rights to market and distribute PicMix products.

Graham-Patten Systems, Grass Valley, CA, has supplied the D/ESAM 400 Digital Edit Suite Audio Mixer to Desert Productions, Phoenix; Editel, Hollywood, CA; Foto-Kem, Burbank, CA; Lackland Air Force Base, San Antonio, TX; and Peachtree Post, Atlanta, GA.

Vistek Electronics, Ltd., Buckinghamshire, England, has sold the V4228 digital varicomb decoder to London's VTR, MPC, Soho Images and The Machine Room. The company has supplied Reuters Television and the BBC with Vistek Vector standards converters.

Morning Studios, Inc., a division of Fox Circle Productions, has purchased more than $500,000 of JVC professional cameras, S-VHS camcorders and S-VHS editing systems to equip its new fX cable network.

Audio Processing Technology Ltd., Los Angeles, has delivered more than 250 Digital Codec 3D2 systems to IDB, Culver City, CA.

Solid State Logic has installed two custom SL 8000 film consoles at the Warner Bros. Studios Post-Production Facility, Burbank, CA.

TimeLine Vista Inc., Vista, CA, has announced the purchase of 12 DAW-80 digital audio workstations and 13 Version 6.0 software upgrades for existing Waveframe 1000s by Sony Pictures Entertainment's Sound Production Department, Culver City, CA.

Pinnacle Micro, Inc. (NASDAQ:PNCL), Irvine, CA, has announced price reductions of more than 30% for its Orray optical disk storage system.

Nesbit Systems Inc., Princeton, NJ, has signed a license agreement with USA Networks to develop a software package that will streamline the marketing, selling, scheduling and billing of commercial spots.

Scripps Howard ordered $2 million-plus of Quantel graphics technology comprising Picturebox still-stores, Paintboxes, Picturenet networking systems and Hal. The first installation was at KJRH, Tulsa with Paintbox and Picturebox Twin. Other stations include KNXV Phoenix, WEWS Cleveland, WFTS Tampa, WMAR Baltimore, WPTV West Palm Beach and Home and Garden TV in Knoxville.

Chyron Corporation, Melville, NY, signed a Memorandum of Understanding to acquire all of the outstanding stock of Evolving Video Technologies Corporation, Arvada, CO. The total purchase price for the acquisition is $3,750,000 payable in a combination of cash and Chyron securities over a 5-year period.

Fujinon Inc., Wayne, NJ, has announced the use of its Ah66X9.5ESM lens by WSJK, Knoxville, for maximum focal length and close-up shots in sporting events.

Mobile Satellite Products Corporation, Baldwin, NY, has announced that its LYNXX Transportable Inmarsat-B Terminal became the first transportable Inmarsat-B terminal to receive Inmarsat-B type approval for high-speed data.

Respect Productions Limited has recently installed a Solid State Logic SL 4000 G plus console at its newly opened recording studio, Westpoint Studios.

Clean it up with the easy-to-use TS612.

Every day radio and television stations are airing more and more talk shows. Unfortunately, they aren't upgrading their studio telephone equipment. The result is a virtual *waste dump* of operational errors and bad caller audio.

The solution is the TS612 from Gentner. Designed specifically for talk show formats, the TS612 features six phone lines (expandable to 12), Gentner's newest Superhybrids with internal mix minus generation, automatic caller level control, and digital audio enhancement for consistently clear caller audio.

Your talent will love the TS612's unique talk show features like VIP caller, four-line conferencing, and call screening. Plus, its built-in handset and key pad will make your talk show run as smoothly as your callers' mouths.

Don't wait a day longer to clean up your "talk sick" phone system with the affordable TS612. Contact your Gentner dealer today and order your TS612, before your studio is designated as a Superfund site.

Gentner

1-800-945-7730 · 1-801-975-7200

Call Gentner for all of your telephone interface solutions, including conference calling services.

Circle (93) on Reply Card

LPB, Frazer, PA, may now be reached via electronic mail or Internet at lpbinc@aol.com.

Truevision, a subsidiary of RasterOps Corporation and Avid Technology, Inc., has entered a 3-year OEM relationship whereby Avid will continue to incorporate leading-edge technology developed by Truevision in its full product line. The agreement has an estimated value of $40 million over its term.

Microwave Networks Inc. (MNI), Houston, TX, has won the President's "E" award from the U.S. Department of Commerce for excellence in export standards and improving the U.S. balance of trade. Nationwide, MNI is one of 28 companies to win the award so far this year.

Panasonic, Secaucus, NJ, has announced the purchase of two Panasonic AJ-D350 D-3 digital studio recorder/players and an AS-D700 digital composite switcher to Branson Teleproductions, Branson, MO.

Also purchased from Panasonic were two AJ-D350 D-3 VTRs and four AG-A300 slow-motion controllers by Starliner Mobile Video, Primos, PA.

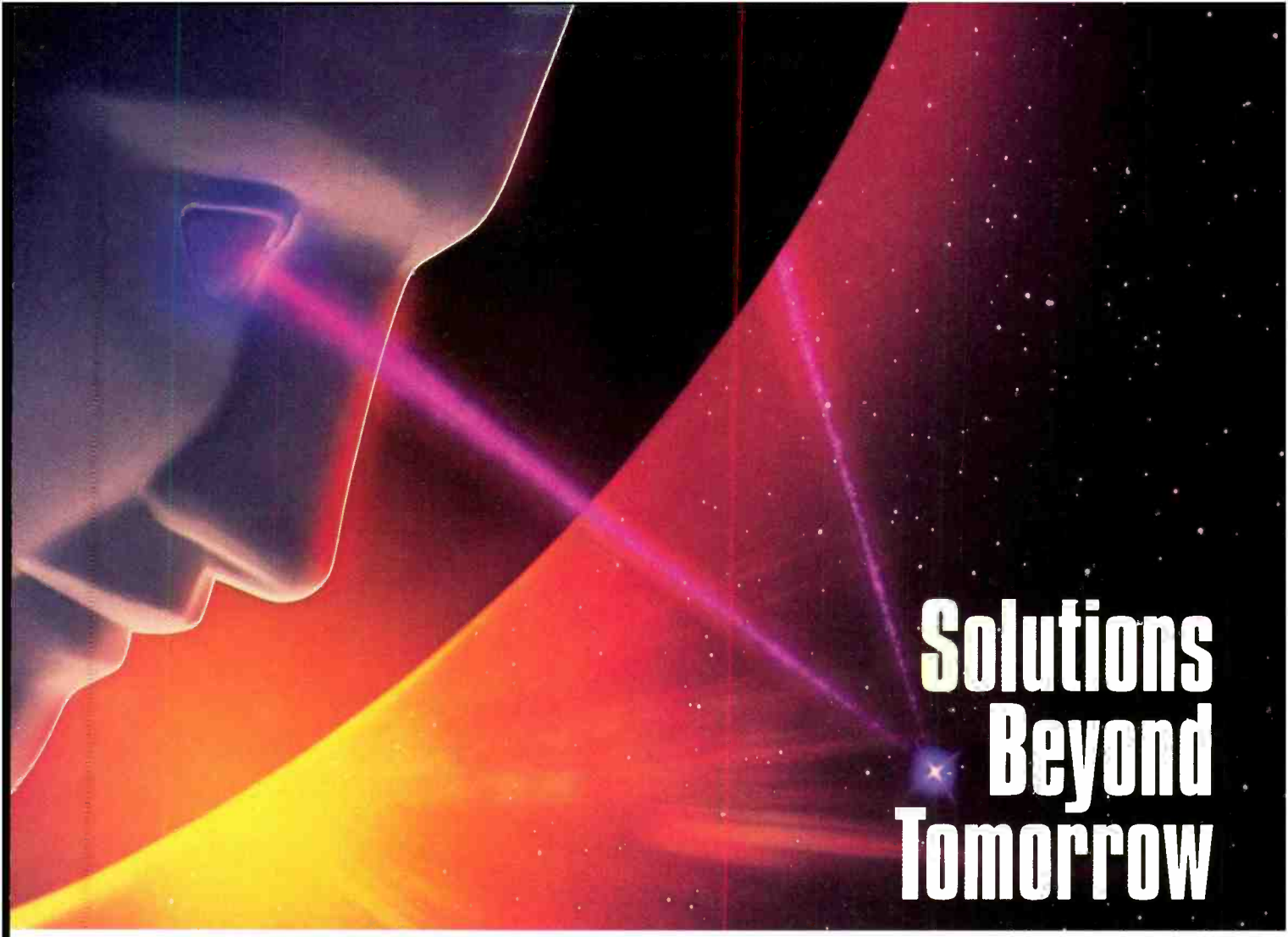
The Public Broadcasting Service (PBS) recently took delivery of 12 Panasonic ½-inch component digital VTRs for use in its National Program Service.

Computer Prompting & Captioning Co. (CPC), Washington, DC, was presented the "Distinguished Vendor of Accessible Technology Award" at the Washington D.C. headquarters of the U.S. Department of Commerce by Secretary of Commerce Ronald H. Brown.

ImMix, Grass Valley, CA, has announced the installation of two digital video post-production workstations, the VideoCube and the VideoCube PLUS, at CBS-affiliate KRQU-TV, Albuquerque, NM.

EEV Inc., Elmsford, NY, has appointed Enders and Associates, West Hills, CA, to represent EEV in the front line representation of the company's broadcast products in the states of Alaska, Arizona, Colorado, Hawaii, Utah and Wyoming. The company will also be responsible for Leddicon camera tube sales to all non-call-letter TV facilities in California and Nevada.

Xymox Systems, Inc., Van Nuys, CA, has been ranked 361 in *Inc.* magazine's 13th annual ranking of America's 500 fastest growing private companies.



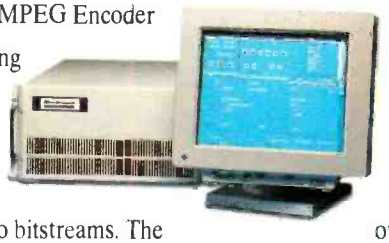
Waiting for the future? Vela Research — a subsidiary of Home Shopping Network, Inc. — has the technology solutions you need, and has them today. Vela has a complete family of innovative MPEG-based compression and video server equipment designed to offer the cable industry a solid migration path to the future.

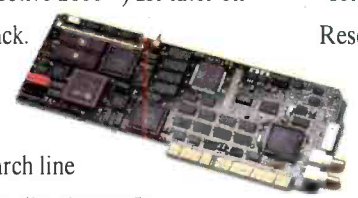
VIDEO SERVERS

The flagship of the Vela product line, the Perspective 2000™ Video Server answers the need for an interactive multimedia playback solution. It stores digitized video clips, such as movies or commercials, in an MPEG-compatible form, then decompresses the data in real time to support near video-on-demand, ad-insertion and other applications.

MPEG ENCODERS

Vela Research's MPEG Encoder is capable of taking NTSC video and compressing it to MPEG-1 and MPEG-2 video bitstreams. The bitstreams can then be transmitted through a cable TV system, or they can be stored on a digital storage medium (like the Perspective 2000™) for later on-demand playback.





DECODERS

Rounding out the Vela Research line is a complete family of MPEG decoder board solutions that can decode MPEG bitstreams at SIF and CCIR-601 resolutions.

SYSTEMS SOLUTIONS

Vela can also provide intelligent systems to help you with centralized management and administration of client sites and other facets of your business.

CHECK US OUT

Call Rick Chile at (813) 572-1230, ext. 7171, for an opportunity to explore the innovative "solutions beyond tomorrow" that Vela Research can offer today —

or write:

Vela Research, Inc. • P.O. Box 9090
Clearwater, FL 34618-9090

Meeting Tomorrow's Needs – Today[sm]

Vela Research™

Circle (137) on Reply Card

The Public Broadcasting System (PBS) has become an authorized Panasonic repair center, offering any TV outlet, including commercial broadcasters and cable networks, videotape machine maintenance and repair services.

Manhatten Transfer/Edit's new Manhatten Digital Center was used to produce a 3-D animated phone bill jet in a U.S. Sprint commercial. The image was created on a Macintosh then texture wrapped onto a 3-D wire airplane model generated by Softimage software on a Silicon Graphics Inc. system.

Lightworks, Hollywood, CA, has announced the purchase of its Heavyworks One systems, a multicamera digital nonlinear editing system, by Complete Post, Hollywood, CA.

JAMPRO Antennas Inc. has announced its expansion with the creation of JAMPRO RF Systems Inc., a new division of the company to specialize in the design and manufacture of passive RF components. Its product line will include harmonic filters, directional couplers, UHF RF systems, MMDS filters and channel combiners, and TV intermode filters.

ColorGraphics, Salt Lake City, UT, has announced the purchase of two DP/MAX machines by Atlanta Olympic Broadcasting, a division of the Atlanta Committee for the Olympic Games.

Channel One, London's first round-the-clock news cable TV station, is using Parallax Software's Matador 2-D and Acrobat 3-D software systems.

Sony, Park Ridge, NJ, has announced the purchase of two DVW-A500 digital betacam VTRs and two DVW-A510 players by Vision Video, Winston-Salem, NC.

Also purchased were two digital edit suites by ABC, New York, for on-line digital production of *Turning Point*.

Corporate Computer Systems, Inc., Holmdel, NJ, has announced the purchase of more than 140 CDQ-2012 codecs by Swedish Broadcasting. The codecs are being used to establish a nationwide digital audio network between Swedish Broadcasting's headquarters in Stockholm and its 25 regional offices.

Digipath Video Inc., Pointe-Claire, Quebec, Canada, is a new manufacturer of analog and digital broadcast equipment.

PEOPLE

Lucie Fjeldstad has been named president of Tektronix Video Systems Division, Wilsonville, OR.

Sam Cercone has been appointed vice president, sales, for Videssence, Inc., Burlingame, CA.

Chris Horne has joined Lawrence Behr Associates, Inc., Greenville, NC, as project engineer.

Richard Zabel has been appointed eastern sales manager for Tekniche, Northvale, NJ.

Patrick Griffis has been named vice president and general manager for Panasonic Broadcast & Television Systems Company, Secaucus, NJ. Other additions at Panasonic include Joseph Videtti as product marketing manager for optical memory disk recorders (OMDR) and Robert Caniglia as product specialist for switchers.

Beth Simon has been promoted to senior vice president at Audio Plus Video International (APVI) Inc., Northvale, NJ. Also, Leonard Schwartz has been appointed vice president in charge of the New York facility.

Don Lefebvre has been promoted to vice president of North America Sales for Dynatech Video Group's Production Business Unit, Salt Lake City, UT. Also, Michael Guess has been named product manager of the Production Business Unit.

Paul Burnham has been appointed field service manager for EEV Inc., Elmsford, NY.

Kim Wright has been named director of sales and marketing at FilmCore Distribution/Vault Services in San Francisco, CA.

Steven J. Spradlin has been promoted to sales application engineer for Harris Corporation's Broadcast Division, Quincy, IL.

Louis J. Doctor has been named president and CEO of RasterOps Corporation, Santa Clara, CA.

Larry S. Jefferson has been named director of the technical maintenance center at the Public Broadcasting Service.

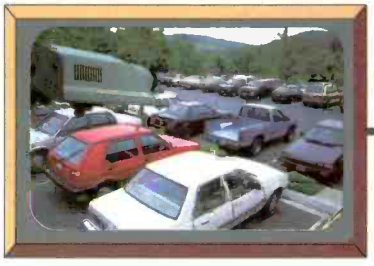
Mishele Vieira has been promoted to director of marketing for Xymox Systems, Van Nuys, CA. ■

PERFECT PICTURES

PICTURE PERFECT

DIGITAL VIDEO OVER FIBER






IMTRAN®

Multi Channel Digital
IMage TRANsmission
From IPITEK®

Broadcast Quality
Multiple Stereo Channels
Data Signaling Channel
Drop and Insert
Multimode or Single Mode
1310 or 1550 Nanometers
Channel by Channel
Upgradable
Digitally Repeatable
Baseband In/Baseband Out

IMTRAN® applications include *Broadcast Video, CATV, Distance Learning, Security and other uses* requiring high video and audio quality over long distances. Call our Application Center for more information.

Call today to discuss your IMage TRANsmission needs.

IPITEK® FIBER OPTICS
A TACAN COMPANY

2330 Faraday Avenue
Carlsbad, CA 92008
Phone: (619) 438-8362
FAX: (619) 438-2412

Louth continued from page 205

approximately 9.4 hours of scheduled break material. With an average of eight breaks per hour, containing four spots each, there would be 32 list elements per hour for the automation system to air. Material for 10 hours of breaks requires a 320-event *look-ahead*. All needed media within the *look-ahead* period is automatically copied to the disk. If the disk system does not have the media at airtime, the media will be automatically played from the cart machine. The system keeps the operator informed of all media that is unavailable to air within its *look-ahead* time-frame. This allows time for manual preparation of the media if required.

Disk-storage management will normally be done automatically. If there is enough disk space, Autocache will leave media on the disk after it has aired even though it's no longer required in the *look-ahead*. This will automatically save the media from removal. It may soon reappear on the *look-ahead* and will not have to be recopied to disk. When the disk is full and new media is needed, the system removes the oldest elements that are no longer required.

Elements used frequently can be tagged *delete protected* and can only be deleted by the operator.

An efficient system

Using the Louth Automation's disk software means a station can replace VTRs or cart machines with video disk recorders. This can result in a maximum return on the investment.

Video disks can also be used in place of VTRs. The time delay products (Timebanking and Autocycle) and Louth's automated satellite record program segmenting system (Autoshow) all integrate with ADC-100, Turbodisk, and the disk *object* interface providing an effective solution to stations' automation.

Louth manages state-of-the-art disk storage and retrieval technology, and couples it with existing technologies that allow for future expansion to more digital services — all integrated into traffic and master control. ■

George Fullerton is vice president sales and marketing for Louth Automation, Menlo Park, CA. Respond via the *BE* FAXback line at 913-967-1905 or via e-mail to be@intertec.com.

For more information on Louth Automation Intelligent Video Disk Control software, circle (301) on Reply Card.

NEW PRODUCTS

Multichannel video codec
Grass Valley

➤ J series multichannel DS3 video codec: features full-motion and full-color resolution video as well as CD-quality audio; package provides up to four channels of video and up to four channels of CD-quality audio per video channel, per module; 10 modules can be configured on a single 6-rack unit chassis for a total of 20 channels of video; modules can be configured in a mix-and-match manner to meet the exact requirements of the application; modules are based on a single board called the Main Add Drop (MAD) module; the coder and decoder are plugged onto the MAD board or onto one another in a variety of configurations to change the number of channels or function of the module; when fully populated, a MAD module is one inch wide.

Circle (2000) on Reply Card

UHF panel antenna
Jampro

➤ JUHD broadband UHF panel antenna: designed to broadcast any channel within the UHF band channels 14-69; antenna offers equal performance on any channel and is available in horizontal, vertical, or elliptical polarization; design allows new channels to be added to the existing system at any time; available for low, medium, or high-power applications; can be configured to produce directional or omnidirectional azimuth patterns.

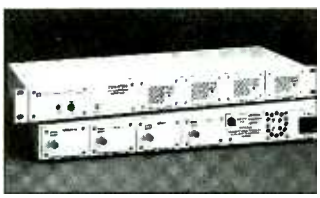
Circle (1001) on Reply Card

Audio/video cable tester
Sescom

➤ CT-6 cable tester: designed to test various combinations of audio and video cables; tester will advise the user of cable shorts, improper phasing, opens and intermittents; unit is constructed in a rugged aluminum housing; three switches with integral LEDs test XLRs 1/4-inch stereo, 3.5mm, RCA, "F", BNC and 5-pin DIN for midi; unit operates on two "AA" batteries.

Circle (1002) on Reply Card

Fiber-optic transmission system
Opticomm



➤ Model FMX-47000 series: fiber-optic transmission system transmits multiple RS-170 composite video, subcarrier audio or digital signals over one multimode fiber; pulse frequency modulation (PFM) video transmission provides adjustment-free operation over distances up to 4km; wavelength division multiplexing (WDM) techniques enable each channel to transmit in either direction; system offers full electrical isolation against noise, lighting, and ground loops; modular transmitters and receivers permit custom configurations; front-panel indicators display the status of each channel.

Circle (2003) on Reply Card

Jack connector
Re an

➤ PerpJack: a 1/4-inch jack connector featuring the "quick fix nut;" pin-for-pin compatible with existing market standard; pin design pops into place for rapid flow soldering.

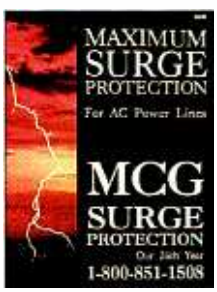
Circle (2003) on Reply Card

Non-linear digital video editing software
Radius

➤ Radius Edit: non-linear digital video editing for QuickTime with integrated titling and special effects capabilities; features dual monitor display, built-in titling, built-in professional transitions and multiple key frames; Do-It-Once FX feature permits the saving and storing of original effects and style shots for future use and collaboration with other designers.

Circle (2004) on Reply Card

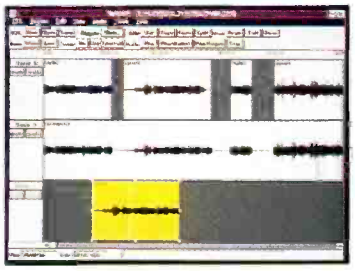
Surge protection catalog
MCG Surge Protection



➤ Surge Protection for AC Power Lines: 24-page full-color catalog includes a coordinated surge suppressor selection guide that enables the user to select an appropriate protector based on the National Electrical Code's service entrance, panel board and branch panel designation; also features full technical specifications and installation instructions for MCG's complete line of AC power line protection devices as well as an explanation of ANSI/IEEE C62.41-1980; AC line protectors range from wall plug-in units and 6-outlet strips to computer room and complete facility protectors.

Circle (2005) on Reply Card

Advanced digital audio editor
Antex Electronics



➤ NuWAVE: Microsoft Windows-based digital audio editor designed to support multiple .WAV compression formats including Dolby AC-2, MPEG Layer I/II and MS-ADPCM, as well as standard 8- and 16-bit PCM; all file formats are transparent allowing user to handle multiple compression formats within a single edit decision list (EDL); features non-destructive editing and "drag and drop" interface; user can add to the EDL by importing existing audio files or recording new files in real-time from the editor.

Circle (2006) on Reply Card

Vehicle mount
Cinema Products

➤ Vehicle mount: film and video camera support system designed for use with Cinema Products' line of Steadicam products; versions available for use with the Steadicam Video SK or the Steadicam EFP, Steadicam III A and Steadicam Master series; features precision aluminum construction and scratch-resistant powder coat exterior coating.

Circle (2007) on Reply Card

Graphics overlay module
Pivotal Graphics/ Primagraphics

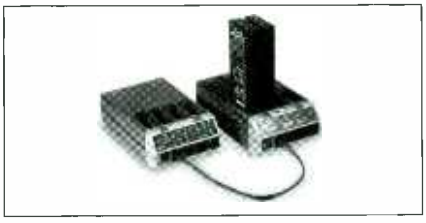
➤ Valiant: a graphics overlay generator that provides superimposition of text and graphics over full color images from any manufacturer's imaging or graphics display system; configured as a 6U VME-compatible printed-circuit card; incorporates a Texas Instruments TMS34020 32-bit graphics processor and dual Brooktree Bt459 RAM-DACs with hardware cursors; monochrome or RGB signals can be simultaneously acquired from one or two genlocked sources via Valiant's dual video input channels; two 8-bit pseudocolor or gray scale outputs are refreshed from an on-board, dynamically allocatable, frame buffer.

Circle (2008) on Reply Card

FREZZI AR304 CHARGER

This new four channel, autoranging model fast charges *any* four batteries in the range of 12 to 30V (2-10Ah), via XLR4(M) connectors, simultaneously. This fast charging technology which was previously only available to lower voltage battery users now enables the charging of higher voltage batteries in 1 to 2 hours. Measures only 9.5"x5.5"x3" and weighs less than 2.5 lbs.

FREZZOLINI ELECTRONICS INC 5 Valley St. Hawthorne, NJ 07506; (800)345-1030; Fax (201)427-0934



FREZZI AR124NP FAST CHARGER

The AR124NP accepts four NP1 batteries, and four BP90 batteries via direct connection. With optional adapters, it charges any battery in the range of 4.8 to14.4 Volts (1to7 AH). The AR124NP prevents overcharging, automatically maintains peak capacity, uses a recovery program for over-discharged batteries and operates anywhere in the world.

FREZZOLINI ELECTRONICS INC 5 Valley St. Hawthorne, NJ 07506; (800)345-1030; Fax (201)427-0934

FREZZI SUN PANEL

Today's most advanced and portable solar panel to date. The Frezzi Sun Panel is field tested and military qualified. Rugged, compact (9"x12"x0.5"), and lightweight(1.5 lbs). The Frezzi Sun Panel charges NP1s in 2 hours and will output 15 Watts of DC power in continuous sunlight. Adapter cables are available for all standard batteries .

FREZZOLINI ELECTRONICS INC 5 Valley St. Hawthorne, NJ 07506; (800)345-1030; Fax (201)427-0934

FREZZI MFIC MINI-FILL

Frezzi's popular Mini-Fill light is now available with built-in dimmer control and has won Videomaker's product of the year award. The MFIC Mini-Fill with pulse width modulation, provides the performance of a 50 to 100 Watt light for added flexibility in different shooting environments. Originally designed by Frezzolini for the first televised Mount Everest climb (ABC Network) the Mini-Fill has become a light of choice among broadcasters.

FREZZOLINI ELECTRONICS INC 5 Valley St. Hawthorne, NJ 07506; (800)345-1030; Fax (201)427-0934

FREZZI NPX1 BATTERY

Frezzi's NPX1 batteries are computer verified. They are compatible with all equipment that uses NP1 type batteries. Frezzi's NPX1 is readily fast chargeable and is a high capacity eleven cell NiCd battery. This battery extends the running time of cameras even those with high lock out voltages. Overload protected via self resetting cut out, Frezzi's NPX1 is suited for use with Frezzi's latest advanced microcomputer controlled autoranging fast chargers.

FREZZOLINI ELECTRONICS INC 5 Valley St. Hawthorne, NJ 07506; (800)345-1030; Fax (201)427-0934

FREZZI MFNP1-HC

A new Mini-Fill combined with the NP-1 battery holder and universal clamp. Ready to mount directly to your professional camera. Simply attach and plug in any NP-1 battery. The most cost effective on-camera professional light.

Sony is a registered trademark of Sony Corporation

FREZZOLINI ELECTRONICS INC 5 Valley St. Hawthorne, NJ 07506; (800)345-1030; Fax (201)427-0934

Frezzi®
ENERGY SYSTEMS

The Frezzolini NP Bracket System mounted on a Sony BVW-400 camcorder.

The Frezzolini NP Bracket System is an external battery holder designed to attach to the Sony NP battery box. When the Frezzolini NP Bracket is attached, it enables a second NP battery to be mounted on the camera for powering a Frezzi Mini-Fill light. The advantage of this system is to allow the use of NP batteries to power both your light and camera without a side battery pack or external cables getting in the way.

NP batteries are lightweight and relatively inexpensive. With the NP Bracket attached, the camera will easily fit into its carrying case. The Frezzolini NP Bracket system is a perfect choice for camera operators to fully utilize their originally supplied equipment by adding the Frezzi Mini-Fill quickly at minimum effort and cost.

Sony is a registered trademark of Sony Corporation

Frezzolini Electronics Inc. 5 Valley Street Hawthorne, NJ 07506
Orders 800-345-1030 • 201-427-1160 • Fax 201-427-0934

Batteries
Ikon Video

➤ NP-23dx: NiCad NP-type professional video battery with LED charge status indicators; the NP-23dx is a direct replacement for all common NP-type batteries including the NP-1B; compatible with all standard NP-type battery chargers.
Circle (2009) on Reply Card

Headsets
Noise Cancellation Technologies
➤ ProActive 1000 series: line of active industrial headsets; product consists of two lightweight open-back active noise reduction headsets (ProActive 1000 without communications, ProActive 1500 with a boom microphone for communications); headsets electronically reduce noise in 30 to 1,200Hz range by up to 15dB; powered by a rechargeable NiCad battery; one charge lasts 12 hours.
Circle (2010) on Reply Card

MPEG encoding system
Minerva Systems
➤ Compressionist: an integrated system consisting of the Minerva encoding engine, a Macintosh-based host system, and the MPEGmaker application software; the real-time, scalable video processing engine is capable of digital or analog video input, high-quality audio capture, and MPEG audio and video encoding and multiplexing at bit rates up to 4mb/s; the platform can simultaneously encode and decode audio and video so user can instantly preview results of the MPEG encoding process and adjust the engine parameters based on the visual feedback.
Circle (2011) on Reply Card

Send your comments to the editors of *Broadcast Engineering* via on-line mailboxes:

Internet:
be@intertec.com

CompuServe:
74672,3124

Uninterruptible power supplies
Superior Electric

➤ SL series Stabiline: series provides a reliable source of clean, continuous sine wave AC power for mission-critical, voltage-sensitive electronic equipment; offered in 12 models with power ratings between 400-2,200VA; available in North American styles that permit user selectable 110, 120 or 127VAC, 60Hz operation and international configuration that permit user selectable 220, 230 or 240VAC, 50/60Hz operation; units use a "boost/buck" tap system for tight output regulation and control over chronic low or high input voltage conditions; bidirectional surge diverting/filtering circuitry is used for protection of electrical noise generated from either the AC input or the protected load; front panel features a self-diagnostic routine on start-up and indications for site wiring fault, battery service, communication operation, input line condition, battery and percent load levels; "battery sleep" feature prolongs battery life.

Circle (2012) on Reply Card

Graphics workstation
Silicon Graphics

➤ Reality Station: newest member of the Onyx family is a single-processor graphics workstation; features a single 200MHz MIPS R4400 microprocessor and includes RealityEngine^2 graphics; also features a real-time 3-D graphics feature set including real-time texture mapping; full-scene anti-aliasing of polygons, vectors and points; quad buffering for interactive high-resolution stereoscopy; hardware support for image processing; standard NTSC/PAL/S-video output; and broadcast video options.

Circle (2013) on Reply Card

Digital time base corrector
Ikon Video

➤ IXT-7 "Super Seven:" digital time base corrector available in single and dual channel modes; unit is contained in a one U metal rack frame or table-top configuration; this family of TBCs will include NTSC or PAL and will accept and transcode composite, Y/C, component, and RGB formats; correctors will also include a full 3-field synchronizer.

Circle (2014) on Reply Card

FM switchless combiners
Jampro Systems

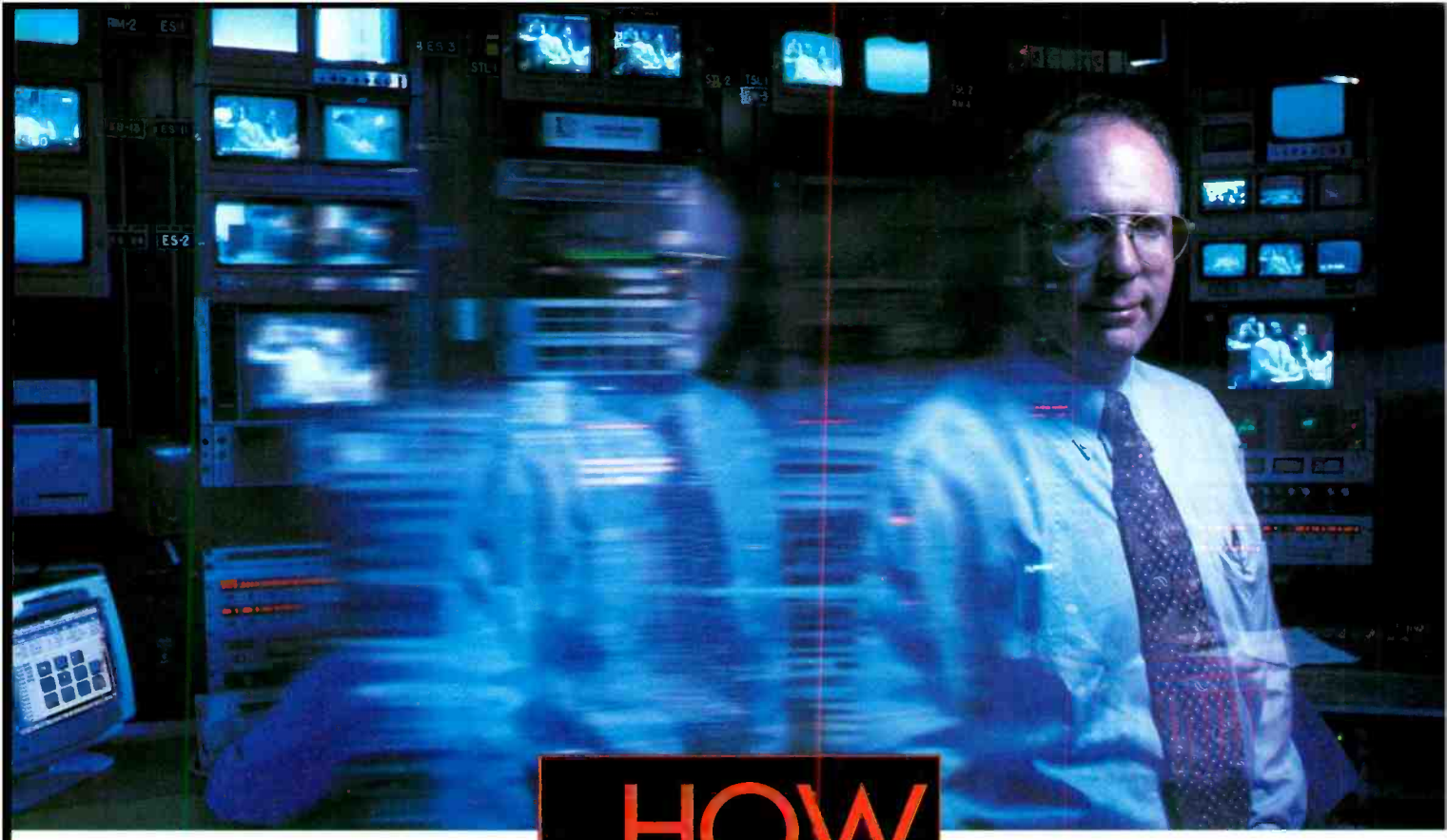
➤ FM switchless combiners: ensures maximum output power availability at the antenna at all times; allows full power on-air transfer between active and standby transmitters as well as multiple transmitter combining; available in 1 $^5/_8$-inch to 6 $^1/_8$-inch coax line sizes with power ratings up to 125kW; high levels of isolation between the transmitters are maintained for all positions of the phasing line by the input hybrid.

Circle (2015) on Reply Card

Interface
United Media/Pinnacle Systems

➤ API/DLL interface: a direct software link between United Media's MultiVision system (MVS) linear editor and Pinnacle's Alladin media printer; with the flexibility of sync rolling from 2-7 VTRs from a single plug-in card, the MVS linear editor uses all four inputs of the Alladin's switcher by sync rolling A/B/C/D/E and F rolls; both the MVS editor and the Alladin run under Windows and can reside in the same computer or on different computers.

Circle (2016) on Reply Card



HOW FAST CAN YOU DISKO?

IF you want to make the move from tape to disk, Ira Goldstone has a few quick words of advice:

Q: As Director of Engineering at Tribune Broadcasting, you're in the midst of updating your entire system. How do you deal with the pressure?

A: *Carefully.*

Q: Right. So did you choose the Louth ADC-100 automation system to bridge to disk or give you future flexibility?

A: *Yes.*

Q: Meaning you liked Louth's ability to control all types of different devices?

A: *Yes.*

Q: And you weren't worried about any problems with proprietary automation software or choosing any disk vendor you wanted?

A: *No.*

Q: So if you were to give advice on how to make the transition to disk, without worrying about where your station goes in the future, what would it be?

A: *Louth.*

Q: And what about the multi-casting environment?

A: *Louth.*

Q: Of course, you'd still need a media management and traffic interface system to tie it together. Any final words of advice?

A: *Louth.*

LOUTH AUTOMATION

CORPORATE OFFICE: 545 MIDDLEFIELD ROAD, SUITE 160, MENLO PARK, CALIFORNIA 94025 (415) 329-9498 FAX: (415) 329-9530
REGIONAL OFFICE: 8400 NORTH UNIVERSITY DRIVE, SUITE 309, TAMARAC, FLORIDA 33321 (305)722-5116 FAX: (305)722-5104

NEW PRODUCTS

Control access module
Standard Communications

➤ Omni Global VU CAM830/830I series control access module: designed as an upgrade solution to Standard's Omni Broadcast MT830 satellite receiver; offers access and adjustment of all essential features and functions of the receiver manually or by remote control; allows user to operate up to 30 receivers located at multiple offsite locations; CAM830 module is easily field retrofitted in any existing Omni Broadcast MT830 satellite receiver installation.

Circle (2017) on Reply Card

Software
Re an

➤ PatchLabel: software for accurate and neat labeling of all patchbay connectors; can be used with Apple Mac or IBM-compatible PC; allows user to select position of headings for perfect alignment with designation strips.

Circle (2018) on Reply Card

Video titling software
McRoberts Software Inc.

➤ Comet/CG 3.0: professional video titling software for compositing high-quality anti-aliased text and graphics over digital or analog video; features added text and graphic options including PowerPC native code for fast rendering, general-purpose interface control, and soft edge shadows with variable softness, depth, color and transparency; also features beveled rules and bars, style palette, thumbnail palette, storyboard importing, super-fast sequencer and alignment controls with seven object alignment options.

Circle (2019) on Reply Card

AV disk drives
Micropolis

➤ AV Gold series: new generation of drives offering a minimum sustained transfer rate of 4MB/s; drives are optimized for continuous and sustained delivery of data; eliminates the possibility of delays in the datastream that cause frame dropouts and jerkiness in digital audio/video playback or recording; disk drives feature a 650,000-hour mean-time-between-failure (MTBF).

Circle (2020) on Reply Card

Performance PLUS

REAL SAVINGS

OVER $7M SAVED IN ENERGY COSTS

OVER 2M IOT OPERATING HOURS

EEV IOT

EEV has always accepted the Broadcast Industry's continuing challenges to lower energy consumption resulting in technologies such as high efficiency external cavity klystrons, BCD pulsing, higher efficiency wideband klystrons and high power compact IOTs. The results are now in. Since their introduction:

Over 2 million IOT Operating Hours achieved! Over $7 million* saved in Energy Costs!

EEV's IOTs are continuing to set completely new standards in design, efficiency, and lower energy consumption. And, of course, all EEV's IOTs are digital ATV/HDTV ready.

Start saving today!

Call us to find out how you can start enjoying your share of these energy savings.

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., Tel: (416) 745 9494 Fax: (416) 745 0618
UK: EEV Ltd., Tel: (01245) 493493 Fax: (01245) 492492

*Based on 7.5c/kWhr

Subsidiary of the General Electric Company plc of England G&C

Circle (166) on Reply Card

See us at NAB, Booth #17136.

PAL/NTSC decoders
Faroudja

➤ DFD-U series: makes use of digital adaptive comb filter technology to convert PAL, NTSC or Y/C inputs into RGB, component, or D-1 serial and parallel outputs; all models make use of 10-bit processing, ACC and APC, and digital chroma enhancement; options include frame synchronizer with full time-base correction and remote control via an RS-232 terminal.

Circle (2021) on Reply Card

MMDS transmitters
ITS

➤ 1700A series: line of MMDS transmitters accommodating NTSC or PAL TV standards; packaged in an upgradable configuration permitting 10W or 20W transmitter to be upgraded to 50W; features include low phase noise oscillators, phase locking capability, and offset frequency control; also features advanced multilevel diagnostics with local or remote monitoring capabilities.

Circle (2022) on Reply Card

Fluorescent lighting
Strand Lighting

➤ Videolux fluorescent softlights: designed around 6x26W and 2x36W compact fluorescent lights, Videolux provides a smooth, wide spread; this spread is concentrated by its intensifier attachment that collects the light from the edge of the beam and re-directs it toward the center; the high lumens-to-watt ratio means low power consumption and low heat generation; can be used in conjunction with Strand Lighting's dimming control products for full control of studio lighting.

Circle (2023) on Reply Card

Tower lighting controls guide
SSAC

➤ Tower and Obstruction Lighting Controls Application Guide: 16-page applications and product selection guide; new guide includes lamp outage and beacon flasher monitoring relays that are now required to meet new FAA lighting inspection procedures; also features controls for beacon flashing, synchronous flashing of beacons, dusk-to-dawn operation, lamp outage and failed flasher alarm modules, 3-phase voltage monitors and more.

Circle (2024) on Reply Card

Enclosures catalog on disk
Equipto Electronics

➤ CAB-NET: catalog available on IBM-compatible PC disk; features a full line of modular electronic cabinets and computer furniture.

Circle (2025) on Reply Card

Satellite earth station interfacility link
Ortel

➤ Remote RF monitoring via fiber: service previously available as an option for the System 8000 interfacility links, this capability is now available as a stand-alone item; capability allows for the remote spectrum monitoring of radio frequency (RF) uplink signals; monitoring maintains the proper effective isotropic radiated power (EIRP), intermods, spurious emission and frequency stability; allows operators to add microwave fiber options to systems at earth stations already in place and interconnected with waveguide and coaxial cable.

Circle (2026) on Reply Card

WHEN THE NEWS IS HOT . . .

MILLER

VISCOSITY DRAG

. . . COUNT ON MILLER FOR SUPPORT

Experience counts for everything in news. Experienced professionals count on Miller camera support.

MILLER. The ENG experts.

See us at NAB on Booth #16967

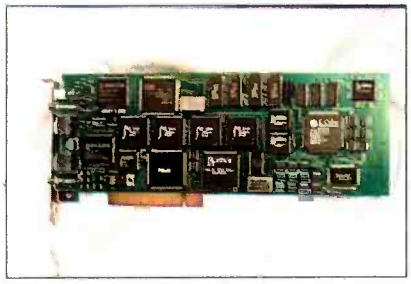
Miller Fluid Heads (USA) Inc. Tel: (201) 473 9592 Fax: (201) 473 9693

Miller Tripods Canada Tel: (604) 685 5331 Fax: (604) 685 5648

Circle (167) on Reply Card

NEW PRODUCTS

Non-linear digital video editing system
Interactive Images



➤ Plum: Plug n Play, PC-based system produces broadcast-quality video (CCIR 601 video sampling at 720x480 NTSC or 720x576 PAL at 59.94/50 fields/second); the design features an on-board rendering engine that reduces rendering time by approximately 95% compared to more conventional cards; using the superfast PCI bus, Plum supports a databurst rate of up to 132MB/s and sustained compressed frame sizes of 125kB without expensive RAID disk arrays; Plum is bundled with a high-quality audio card, a fast SCSI-2 card, and the Adobe Premiere 4.0 editing software.

Circle (2027) on Reply Card

Automatic line voltage regulators
Phenix Technologies

➤ SBL series: line of regulators offering improved performance through the use of Phenix's CTR linear variable transformers and roller-type contacts; features include single-board computer control, individual phase regulation, input circuit breaker, output contactor, no break bypass, and digital meters.

Circle (2028) on Reply Card

Products catalog on disk
Remee

➤ Master Catalog: Remee's complete electronic wire and cable product offering for PVC, plenum, fiber-optic and composite cables available on computer disk; a built-in assistant guides the user through the computer program.

Circle (2029) on Reply Card

Video production system
Radius

➤ VideoVision Telecast: a BetacamSP-quality video capture and playback system for QuickTime-based digital video editing; includes professional-level digital audio and time-code support; features comprehensive video I/O offering component (YUV and RGB), S-Video, and composite connectors; also features high-quality 16-bit, 48kHz stereo sound locked to the video signal; front-panel LEDs show current input/output selections; system has full gen-lock capability for flicker-free video mixing; other features include longitudinal and vertical interval SMPTE/EBU time code for both audio and video, RS-422 device control, GPI trigger, and built-in adaptive JPEG video compression/decompression engine.

Circle (2030) on Reply Card

Kunde & Co. Copenhagen

GET THE COLORS RIGHT

With the increasing interchange of programme material from different sources such as studios and production houses, ensuring high standards of picture quality has become even more important.

Enter the Philips CRT color analyzer. There's simply no faster way to adjust black level, gain, or color tracking, with such high accuracy. And to extend its

potential even further, you can also couple it to a Philips color alignment generator, which supplies you with all the signals needed for adjustment of monitors, projectors or video walls.

As leaders in color monitor alignment, we have built up a store of knowledge and practical advice on the subject. It's all in our popular book "The Color Truth", available free from Philips TV Test Equipment. Ask for your personal copy now.

85 McKee Drive, Mahwah, NJ 07430, Phone (201) 529 2188, (800) 421 0888, Fax (201) 529 2109

Circle (168) on Reply Card

Philips
TV Test
Equipment

PHILIPS

PHILIPS

It takes a pioneer to invent the future.

What makes a pioneer different? Vision. Plus the ability and resources to act successfully on that vision.

HCI's determination to think years ahead of the curve has made us the world's largest commercial satellite operator.

Our fleet of GALAXY® and SBS satellites has set the pace for the future of today's broadcast, cable, radio and data transmission industries. HCI developed DIRECTV,® the first high-powered digital DBS system, and is now working with partners around the globe to establish regional direct-to-home systems.

We are a partner in AMSC, North America's first satellite mobile phone system, and are working with various partners to establish similar systems internationally. And in 1998, we will launch SPACEWAY,™ a broadband global network.

If telecommunications are vital to your company, chances are we're inventing your future right now.

See us at NAB, Booth #17548.

HUGHES
COMMUNICATIONS

A unit of GM Hughes Electronics

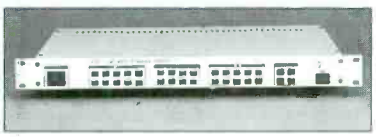
Circle (175) on Reply Card

Fiber feed module
Ipitek

➤ Imtran 10-bit professional line: high-speed digital fiber delivery for the broadcast chain; offers better than RS-250C short-haul video and audio performance; four or eight discrete NTSC composite analog video feeds may occupy a single fiber; each video channel may optionally have up to four CD-quality balanced audio lines and one simplex RS-232 data line; standard Imtran frame occupies 3RU of vertical rack space.

Circle (2038) on Reply Card

Digital TV broadcast standard and format converter
Video International



➤ DTC 1600P6: based on the DTC 1600P5 "Worldwide Problem Solver;" features 4-field/4-line motion adaptive interpolation, up to 20dB noise reduction, 4:2:2 processing and digital encoder/decoder; stand-alone unit requires no additional TBC or synchronizer for operation; serves as an analog-to-digital as well as digital-to-analog format converter when equipped with the optional D-1, 4:2:2 serial or parallel interface.

Circle (2039) on Reply Card

Stereo audio tone generators
Link Electronics

➤ Model PTG-616 and Model 6160: high-quality audio tone generators designed for the Link PFM-600 mounting frame and the Starflex 3000 frame respectively; both models feature simultaneous 1kHz and 400Hz balanced, low impedance outputs; a third output is provided for 1kHz or 400Hz, selectable from the front panel; units are designed as a stereo tone source with independent A and B channel outputs; total harmonic distortion is <0.06% for all outputs; output amplifiers feature a cross-coupled feedback configuration for the precise phase and level matching of the balanced output.

Circle (2040) on Reply Card

Measurement products catalog
Tektronix

➤ 1995 Measurement Products Catalog: 596-page, soft-cover catalog featuring a full-color product section with new form-factor measurement solutions; 900 products are featured including additions to the color printing and imaging, network displays, and video systems divisions; catalog also includes Tektronix partnerships/alliance solutions offered by Advantest, Japan, and Rohde & Schwarz, Germany.

Circle (2041) on Reply Card

Digital audio monitor
Tektronix

➤ 764 Monitor: operates as an audio phase and level meter and as a digital data monitor; uses interpolation to calculate accurate audio levels; the passive loop-through inputs allow the 764 monitor to be installed in-line with the signal of interest; has the ability to compile statistics associated with an audio passage; also displays English language descriptions of digital information in its channel status decode screen; can accept balanced or unbalanced format signals.

Circle (2042) on Reply Card

Switcher
DNF Industries

➤ SW1X8 RS-422 switcher: allows the ST200 and ST100 Universal VTR controllers, an edit controller, or any other RS-422 VTR controller to control up to eight VTRs; operator can select one out of eight VTRs for individual control, select a group of VTRs to control, or gang roll all eight VTRs at the press of a button; two or more switchers can be connected to control more than eight VTRs.

Circle (2043) on Reply Card

Digital video system
Truevision

➤ Targa 2000: a QuickTime-compatible digital video system that allows users to digitize, compress, store, edit and playback digital video on Macintosh and Power Macintosh computers; system delivers full-screen, full motion, 60-field video recording and playback; system also outputs high-quality videostreams directly to tape or video monitor while simultaneously displaying a resizable video-in-a-window image on the Macintosh desktop.

Circle (2044) on Reply Card

Continued on page 239

HORITA

WG-50
Window Dub Inserter

- Makes burned-in SMPTE TC window dub copies
- Indicates drop-frame or non-drop-frame time code
- Also functions as play speed SMPTE time code reader
- Adjustments for horizontal and vertical size and position
- Dark mask or "see-thru" mask surrounds display
- Provides reshaped time code output for copying TC
- Displays time code or user bits • Display on/off
- Field 1/ field 2 indicator • Sharp characters
- Always frame accurate (on time)

$269

TG-50
Generator / Inserter

Combination time code generator and window dub inserter. It includes all features of WG-50 **PLUS**--

- Generates SMPTE time code in drop/non-drop-frame format
- Jamsync mode jams to time code input and outputs new TC
- Simple "on screen" preset of time code and user bits
- Run/stop operation using front panel momentary switch
- Selectable 30/60/90/120-second automatic generator back-time
- Make a window dub copy while recording TC on source tape

$349

BSG-50
Blackburst/Sync/Tone Generator

The BSG-50 provides an economical means for generating the most common RS-170A video timing signals used to operate various video switchers, effects generators, TBCs, VCRs, cameras and video edit controllers.

- 6 BNC video/pulse outputs
- Now available: 6 blackburst, 4 sync, 2 subcarrier
- Each sync output individually settable for composite sync, composite blanking, H-drive, or V-drive.
- Separate buffer for each output--maximum signal isolation
- 1KHz, 0dB sinewave audio tone output, locked to video
- Outputs can easily be configured to meet specific user and equipment needs

$269

CSG-50
Color Bar/Sync/ Tone Generator

- Generates full/SMPTE color bars, blackburst and composite sync signals.
- Built-in timer can automatically switch video output from color bars to color black after 30 or 60 seconds. Easy and convenient for producing tape leaders and striping tapes with color bars and black.
- Front panel selection of full-field or SMPTE color bar patterns or colorblack (blackburst) video output.
- Includes crystal-controlled, 1KHz, 0dB audio tone output.
- Outputs: video, sync, ref frame, 1 KHz, 0dB
- Audio tone switches to silence and color bars change to black when using 30/60 second timer
- Fully RS-170A SC/H phased and always correct. No adjustment required

$349

TSG-50
NTSC Test Signal Generator

The TSG-50 generates 12 video test signals suitable for setting up, aligning, and evaluating the performance of various video equipment found in a typical video editing system, such as video monitors, distribution amplifiers, VCRs, switchers, effects generators, TBCs, etc. In addition to the video signals, the TSG-50 also generates composite sync and, with a video DA such as the Horita VDA-50, becomes a high quality, multiple output, house sync generator.

- Fully RS-170A SC/H phased and always correct. No adjustments ever required
- Built-in timer automatically switches video output from color bar pattern to black after 30 or 60 seconds. Makes it easy to produce tape leaders of color bars followed by black.
- Video signals generated are in accordance with industry standard EIA RS-170A video timing specification.
- Audio tone switches to silence and color bars change to black when using 30/60 second timer.
- Convenient pattern selection - 12 position front panel switch.
- Includes crystal controlled, 1 KHz, 0dB audio tone output.
- Generates precise oscilloscope trigger output signal one H line before start of color field 1.
- Outputs: video, sync, ref frame, 1KHz, 0dB

$439

WE STOCK THE FULL LINE OF HORITA PRODUCTS INCLUDING:

WG-50 ~ Window Dub Inserter
TG-50 ~ Generator/Inserter
TRG-50 ~ Generator/Inserter/Search Speed Reader
TRG-50PC ~ Has all of the above plus RS-232 control.
VG-50 ~VITC Generator, LTC-VITC Translator
VLT-50 ~ VITC-To-LTC Translator
VLT-50PC ~ VITC-To-LTC Translator / RS-232 Control
RLT-50 ~ Hi8 (EVO-9800/9850)TC to LTC translator
TSG-50 ~ NTSC Test Signal Generator
SCT-50 ~ Serial Control Titler "Industrial" CG, Time-Date Stamp, Time Code Captioning
SAG-50 ~ Safe Area, Convergence Pattern and Oscilloscope Line Trigger and Generator

SONY

NEW! SVP-5600 and SVO-5800
S-VHS Player/ S-VHS Editing Recorder

SVP-5600 and SVO-5800 features:

- By combining the high resolution (400 horizontal lines) of S-VHS with high quality signal processing techniques like DNR, Digital Field DOC and Chroma Process improvement, they deliver the consistent picture quality so essential to editing. They also incorporate a wide video head gap and track width (58mm) for stable and faithful picture reproduction.
- Each has a built-in TBC plus an advanced Digital Noise Reducer (DNR) for both the chrominance and luminance signals to eliminate noise during playback. At the same time, a field memory incorporated in the noise reducer removes jitter to provide sharp, stable pictures. The field memory, also includes a Digital Field DOC (Dropout Compensator), which replaces signal dropout with information from the previous field.
- They also incorporate Chroma Process Improvement circuitry for excellent color picture quality in the playback mode. This advanced circuitry greatly improves the chroma bandwidth, thus enabling sharper and clearer color picture reproduction.

ADVANCED EDITING FUNCTIONS

- For frame accurate editing, both machines employ a sophisticated servo system, an improved quick response mechanism and built-in LTC/VITC time code capability. This makes them ideal for animation and computer graphic recording, where a frame-by-frame editing function is indispensable.
- They are equipped with industry standard RS-422 9-pin serial interface. The 9-pin connector carries edit commands and time code data between the VCR and the edit controller.
- When connected to an RS-422 equipped edit controller, the SVO-5800 functions as an editing recorder. It performs assemble and insert functions and also provided audio split editing capability of norman audio tracks 1 and 2. In the insert mode, video, audio and time code can be inserted independently, or in any combination.

FOUR CHANNEL AUDIO SYSTEM

- They each incorporate four-channels of high quality video. There are two channels with Hi-Fi (AFM) tracks and two with longitudinal (normal) tracks. The Hi-Fi tracks provide a wide frequency response from 20hz to 20khz and a superb dynamic range of 90db. The normal tracks incorporate Dolby B noise reduction for high quality sound reproduction. XLR connectors are used for the inputs and outputs for all four channels.

MULTIPLE INPUTS AND OUTPUTS

- Both machines employ composite and S-Video connectors. With optional SVBK-170 Component Output Board, they provide component signal output through BNC connectors. With the board, the VCRs can be integrated into Betacam SP editing systems.

USER FRIENDLY OPERATION

- They have a built-in character generator which superimposes characters on the "video monitor output" signal. This allows time code data, control track, menu setup and VCR function status to be shown on a monitor.
- For more efficient operation they have an on-screen setup menu which allows a variety of customized VCR mode operations. Programmed in the form of a layer structure, you simply go through the menu and initialize VCR operation.
- All parameters of the TBC, such as luminance level, chroma level, setup, hue, Y/C delay, sync phase and SC phase are easily controlled from the front panel, and can be remotely controlled from the optional UVR-60 TBC Remote Control. The UVR-60 also accesses field freeze function in the still mode and allows on/off control of the chroma and luminance noise reducer.
- Quick and smooth picture search can be performed by either using an RS-422 equipped edit controller or the optional SVRM-100 Remote Control Unit. Recognizable color pictures are provided at up to10x normal speed in forward or reverse.

REBATES: Buy an SVP-5600 or SVO-5800 Professional S-VHS VCR or UVW-1600, UVW-1800, Betacam SP VCR with:
• Sony PVE-500 A/B Roll Edit Controller and receive $500 instant rebate!
• Sony FXE-100 A/B Roll Edit Controller/SEG and receive $1000 instant rebate!
• Sony DFS-300 Switcher/SEG and receive $2000 instant rebate!

FXE-100 ALL-IN-ONE VIDEO EDITING SYSTEM

The new FXE-100 is an A/B roll editing system designed for quicker, easier video editing, and is well-suited for today's professional audio/visual communications. It is at once an edit controller which controls basic VCR functions, a special effects generator which cuts, mixes, wipes and composites the video sources with stunning effects; and an audio mixer with various fading and switching abilities. There is no longer a need to configure multiple devices for video editing. With either Hi-8 or S-VHS VCRs and the FXE-100, an ideal professional editing system can be easily configured.

- Switchable machine control of three RS-422 equipped VCRs or three RS-232 equipped VCRs. Basic VCR functions, such as play, stop, still, fast forward, rewind and record are controlled through these interfaces. Variable speed control is also possible for VCRs equipped with Dynamic Tracking.
- Accepts time code, control track (CTL), and 8mm time code as editing references. These can be set separately for each VCR.
- Performs assemble and insert editing (Video, Audio 1, Audio 2). The first EDIT mode, which allows you to record sufficient timecode for synchronization to a new tape is also featured.
- Features a split audio edit function which allows setting of audio and video in-points separately. This permits you to bring in the audio source before a visual transition.
- Store up to 99 scenes, including effects settings, in memory.
- Edit list data can be saved and downloaded to an IBM-compatible PC, allowing you to review or modify edit data at any time.
- The FXE-100 has two program busses, the A- and B-bus. Each bus provides Player 1, Player 2, Aux inputs and Background Color. Both composite and S-Video signals can be input.
- Taking advantage of the freeze function, two machine editing with effect transitions is realized by freezing the recorder OUT point picture. Also, by selecting the same video source in both A and B bus, wipe or mix In/Out of the digital effects is possible without picture transition. This "Self A Roll" function is another feature which allows effective two machine video editing.

SWITCHER AND SPECIAL EFFECTS GENERATOR

- Multiple wipe patterns, including picture scroll and slides, are programmed in. Wipe patterns are easily accessed, and transition rates can be set. Soft edges or a choice of 15 color borders can be added to most wipes and effects.
- Variety of mix effects, such as mosaic mix, black and white mix, posterization mix and picture-in-picture (PIP). Also fade to black and fade to white effects.
- Digital effects, such as mosaic, paint, pixel trail, multi-picture, monochrome, and zoom. Picture freeze function is also featured in frame or field mode.
- Because all the special effects can be set separately to the video sources of each bus, wipes or dissolves of the sources with the digital effects can be executed. It is also possible to combine multiple effects to create stunning images, such as wiping the multi-picture effect with the paint effect and dissolving color corrected picture with mosaic effects.

ADJUSTABLE TRANSITIONS

Transitions are done using the fade lever, or they can be automatically set. Transition time can be set from 0 to 999 frames. Transition can also be paused and reversed. Other parameters such as GPI timing, wipe selection and pre-roll time can be set.

CHROMA KEYER

The FXE-100 features chroma and luminance keyers to superimpose characters, figures, or video sources onto a background. Clip and gain levels can be adjusted to give clean and sharp key edges. Color correction is done via the joystick for both busses with memory to hold a favorite setting for storage and recall.

WIPE CONTROL

By moving the location stick, you can move the closed wipe patterns such as square, circle and heart, around the screen. This function also enables you to start the wipe transition from any desired position on the screen.

AUDIO MIXING

Audio-follow-video editing can be performed with the FXE-100. Two channels are assigned to each player VCR's input and one channel for the recorder VCR's input. Two channels of AUX inputs and a MIC input are available for mixing background music with voice-over. All audio input levels can be adjusted separately. Two Program output channels and one monitor channel are provided. A switch for -7.5dB and +4.0 dB is provided for flexibility in choosing input levels for VCRs with either RCA or XLR connectors.

USER FRIENDLY OPERATION

- All keys and buttons are logically grouped by function, and are color coded for quick identification and economy of keystrokes.
- Permits one monitor operation. No need for multiple monitors. Various editing data, such as edit mode and time code address of each VCR, can be monitored on the same screen.

VERSATILE SYSTEM INTEGRATION

- No need to configure multiple devices. By simply connecting three VCRs, a professional video editing system is formed.
- Two frame synchronizers allow perfectly synchronized wipes and dissolves without time base correctors.
- Equipped with two GPIs for control of external devices, such as character generators and audio mixers. Also has a GPI input, allowing it to be controlled from an external edit controller.
- Has four black burst outputs to distribute internally generated sync signal, synchronizing connected devices. There is no need for an external sync generator.

WE BUY, SELL AND TRADE USED VIDEO EQUIPMENT

MAGNI

MM-400

- The MM-400 is a combination waveform and vector monitor especially configured for the cost-conscious producer. A low-cost alternative to CRT-based waveform monitoring the MM-400 produces a video picture of the input signal's waveform and displays it on any video monitor. It provides a simple, affordable and accurate way to set camera levels before a shoot, or to check time base correctors and color fidelity in editing. Problems like hue shift, smearing, muddy contrast and loss of detail are easily identified for correction.

FEATURES:

- Converts waveform or vector display information into a standard video signal which can be displayed on a video monitor or routed around a video facility. no need for additional expensive monitors. Switch between pictures and waveforms at the push of a button.
- Incorporates an advanced SC/H phase and color frame indicator that is a must for editing and post production. At a glance it tells you if a signal's subcarrier-to- horizontal phase is properly adjusted and if the signal's color frame matches the house black burst connected to the MM-400 external reference input.
- Works anywhere and with any analog video format—NTSC, PAL, Component or S-Video. It has automatic detection between NTSC and PAL formats.
- Three loop-through inputs can accept three composite signals or one component, or RGB signal
- No complex displays or special test signals are required for component video monitoring
- Interchannel timing and amplitude display make component analog monitoring easy. has color bar limit markings for Betacam, M-II and SMPTE formats.
- Waveform and vectorscope controls, including channel, sweep speed, position control, phase rotation are on easy-to-see dedicated pushbuttons.
- Besides instant toggling between picture and waveform, a mix mode combines waveform and picture displays for simultaneous viewing.
- The MM-400 can be readily used by even novice operators. It has easy-to- understand set-up menus for display color, interchannel timing, SC/H phase alarm.
- Usable in any video facility of any size for displaying signals. its low cost makes it affordable by the smallest studio, while its features and performance make it ideal for monitoring in high-end facilities as well.

LEADER

Model 5850C
Vectorscope

An ideal companion for the 5860C Waveform Monitor, the 5850C adds simultaneous side-by-side waveform and vector monitoring. Featured is an electronically-generated vector scale that precludes the need for fussy centering adjustments and eases phase adjustments from relatively long viewing distances. Provision is made for selecting the phase reference from either (A or B) inputs or a separate external timing reference.

Model 5860C
Waveform Monitor

A two-input waveform monitor, the 5860C features 1H, 1V, 2H, 2V, 1 µs/div and 2V MAG time bases as well as vertical amplifier response choices of flat, IRE (low pass), chroma and DIF-STEP. The latter facilitates easy checks of luminance linearity using the staircase signal. A PIX MON output jack feeds observed (A or B) signals to a picture monitor, and the unit accepts an external sync reference. Built-in calibrator and on-off control of the DC restorer is also provided.

Model 5864A
Waveform Monitor

A fully portable waveform monitor for field use, the Model 5864A is a two-channel unit that provides 2H and 2V sweeps with MAG, FLAT and IRE response, and normal and X4 gain.

Model 5854
Vectorscope

2-channel portable vectorscope is ideal for field use and features A and B phase reference, fixed and variable gain. Both units shown with optional battery holder and NP-1 type battery.

ALL ITEMS ARE COMPLETE WITH ALL ACCESSORIES AS SUPPLIED BY MANUFACTURER

Application for Membership

Society of Motion Picture and Television Engineers
595 West Hartsdale Ave., White Plains, NY 10607
Phone: (914) 761-1100 Fax: (914) 761-3115

OFFICE USE ONLY

I wish to apply for SMPTE Membership. The grade I desire is:

☐ Active Member — Dues: $80.00
☐ Student Member — Dues: $25.00
☐ Transfer in grade _____

Payment by (check one) ☐ Visa ☐ MasterCard ☐ American Express ☐ Check (Payable in U.S. Bank)

Card No. _____ Exp. Date Mo. ☐☐ Yr. ☐☐

Name. (First/Given) _____ M.I. (Last/Family) _____

Mailing Address _____ Business Phone # (_____)

_____ City _____ Fax # _____

State _____ Country _____ Zip Code/Postal Code _____

Employer _____ Title/Position _____

Business Address _____ City _____

State _____ Country _____ Zip Code/Postal Code _____

Date of Birth _____

School Attending (students only) _____ Date of Graduation _____

If elected to membership, I agree to be governed by the Society's Constitution and Bylaws as long as I am a member.

Dated _____ Signed _____

This form may be duplicated

Confidential. This form is for SMPTE records.

MAIL WITH PAYMENT OR CREDIT CARD NUMBER TO SMPTE MEMBERSHIP DEPT.

$20.00 of dues is allocated for a subscription to the *SMPTE Journal* and is non-deductible therefrom.

Requirements for Membership

A clearly defined interest in any phase of motion-picture and television imaging is the principal requirement for membership in the SMPTE.

SMPTE JOB CLASSIFICATION

Job Function

Please check the one category that best describes what you do.

01 ☐ Management
02 ☐ Engineering/Technical
03 ☐ Production
04 ☐ Post-Production
05 ☐ Consultant
06 ☐ Sales/Marketing
07 ☐ Educator
08 ☐ Other (specify)_____

Business Category

Please check the one category that best describes the company you work for.

09 ☐ TV Station/Network
10 ☐ Non-broadcast TV (cable, industrial, etc.)
11 ☐ Production Facility
12 ☐ Post-Production Facility
13 ☐ Manufacturer, Dealer, Distributer, Rental House
14 ☐ Educational Institution, Gov't., Research Facility
15 ☐ Satellites, Telecommunications
16 ☐ Computers, Multimedia
17 ☐ Other (specify) _____

"If you are interested in any phase of motion pictures, television, and advanced technology for motion imaging, there is a place for you in the Society of Motion Picture and Television Engineers."

Continued from page 234

NEW PRODUCTS

Lens
Fujinon

➤ S15X6.1ESM: studio production lens for ½-inch format 3-CCD cameras; features Aspheric Technology (AT) which provides control over spherical aberration and better overall optical performance than lenses employing only spherical lens elements; lens also features a built-in 2X extender that can be deployed via a remote demand unit or shot box; focal length is 6.1 to 91.5mm and zoom ratio is 15X; maximum aperture is F1.4 to 82mm and F1.6 at 91.5mm while the minimum object distance (MOD) is 0.75m.

Circle (2045) on Reply Card

Test and measurement instruments
Tektronix

➤ TekBench portfolio: more than 40 different basic test and measurement products; portfolio includes oscilloscopes, function generators, universal counters and counters/timers, bench-top multimeters, power supplies and measurement accessories; all instruments are compatible, fully integrated and have a uniform look and feel.

Circle (2046) on Reply Card

Stereo audio router
Dynair Electronics Inc.

➤ Series 36 stereo audio router: 36x36 audio switcher in 3 rack units featuring a high crosspoint density (864 crosspoints per RU); router uses Dynair's new proprietary integrated crosspoint circuit (ASIC); control features include actual switch closure and switch status verification from the crosspoint, external control through Ethernet, source preview-before-take, MS DOS-based system control software programs, and critical-function alarm system.

Circle (2047) on Reply Card

Catalog
B & H Photo-Video

➤ The Professional Video SourceBook (2nd edition): 446-page catalog featuring video products; catalog features cables, tapes, tripods, camcorders, editors, VCRs, night vision lenses, wireless microphones with space diversity reception and more; expanded audio section features professional grade mixers and CD players, DAT machines and high-performance microphones; catalog also features products for the computer-based video market such as Truevision's Targa 2000 EISA, TouchVision's Cineworks, and Fast's Video Machine Lite.

Circle (2048) on Reply Card

GPIB computer port option
Thurlby Thandar Instruments (TTi)

➤ PIP-488: interface available from TTi for the Audio Precision Portable One Plus audio test set; complies with most recent IEEE-488 recommendations for programmability; enables the test set to be used for automated testing and computer-controlled monitoring; features a National Instruments LabWindows software driver to simplify program generation.

Circle (2049) on Reply Card

PROFESSIONAL SERVICES

CLASSIFIED

FOR SALE

Did you know...

Broadcast Engineering now reaches 32,000 television-only professionals who make decisions? They specify, recommend and buy your products and services.

Be sure they see your ad message in the industry's leading publication. Call Renée Hambleton at 913-967-1732 or fax your ad to 913-967-1735 today. We make it easy!

CLASSIFIED

FOR SALE

IKEGAMI HLV 55E Beta Camcorder-Virtually new w/ paintbox $43,000. Sony BVW 35 Betacam recorder/ player $7,000. Harris 415-456-7900.

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.

BY SEALED BID, 3-complete Harris TC-85 Studio Camera Chains, (less pedestals and heads). Call CE at (314) 882-8888 for more information.

FOR SALE: G.E. Industrial Voltage Regulator. Model GEK-26035. In excellent condition. Recently overhauled by G.E. $3,500.00 plus shipping. Call Vic (818) 440-1147. Fax (310) 676-1033.

1" VTR. AMPEX VPR-80, Hitachi Waveform Monitor and Vectorscope V-079 and V-069. Excellent condition. $14,900 or take over lease. (713) 432-0435, Houston, Tx.

NEW, HDCA 5 EB SCALA ANTENNA, 4 x 4 ARRAY. 300 stack harness, connectors. New, GE-HT Transformer, Voltage 1-4. Misc. Call 904-893-1382.

EDUCATIONAL TRAINING

REPS WANTED

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.

WANTED: Hitachi FP60S studio cameras, lenses, CCU, cables, extenders, any parts, any condition. (818) 556-5030.

TRAINING

FCC GENERAL CLASS LICENSE. Cassette recorded lessons for home study. Our 30th year preparing radio technicians for the license. Bob Johnson Telecommunications. Phone (310) 379-4461.

CLASSIFIED

SERVICES

BIG DOG COMMUNICATIONS
System Design and Integration
Installation • Troubleshooting
DIGITAL • VIDEO • RF • AUDIO
(209) 962-6254
P.O. Box 39, Groveland, CA 95321

Advertise in BE and see how your money speaks for you!

Monitor Service Center

Varitek specializes in high resolution broadcast video monitors.
Digital or analog. In all formats NTSC, PAL, SECAM.

IKEGAMI, SONY, HITACHI, MITSUBISHI
JVC, PANASONIC, CONRAC, NEC
BARCO, TEKTRONIX, And More...

We at Varitek have been providing quality service to our clients throughout United States since 1982.

(800) 346-4380 Ext. (16)
VARITEK
415 W. Taft Ave., Orange, CA

Circle (257) on Reply Card

Classified Advertising

Advertising rates in **Broadcast Engineering** Classified Section are 119^{00} per column inch, per insertion, with frequency discounts available. There is a one inch minimum and ten inches maximum.

Ads may also be purchased By-The-Word for $1.75 per word, per insertion. Initials and abbreviations count as full words. Minimum charge is $40 per insertion.

Blind box ads (replies sent to **Broadcast Engineering** for forwarding) are an additional 40^{00}. Reader Service Numbers are available for 50^{00} per insertion. Ads 4 inches or larger receive a Reader Service Number free.

Spot color, determined by **Broadcast Engineering**, is available at 95^{00} per insertion.

No agency discounts are allowed for classified advertising.

Call Renée Hambleton at 913-967-1732 to reserve your classified ad!

HELP WANTED

ENGINEERS & ENGINEERING MANAGER

Company in Houston, Texas is seeking Engineers and an Engineering Manager. Individuals must have an excellent understanding of Television System Integration, High Definition Television and Digital Video Processing and Compression. Must be highly disciplined in creating and maintaining schedules and budgets, creating high level detailed documentation and must possess excellent communication, supervisory and people skills. Desired background should include Government Contracting or Government Consulting in engineering field. Education of Manager should include an Electrical Engineering degree and a Masters in Business Administration. Education for Engineers should include an Electrical Engineering degree. A minimum of 15 years experience is required. AA/EOE Principals only. Please submit your resume and salary requirements to Intertec, Dept. 755, 9800 Metcalf, Overland Park, KS 66212

BROADCAST TECHNICIAN Immediate opening. Minimum 3 years experience in troubleshooting, to component level, of RF, video, and audio TV equipment. Some experience with major equipment manufacturers of video projectors, control systems, switchers, editors, and VTR's of all tape formats a big plus. Need S.B.E. broadcast technologist certification, F.C.C. G.R.O.L., or equivalent other combinations of experience and education may be substituted. Some contracting labor, running cables, assist in many installations, dirty work, etc. Training of interns, jr. technicians and scheduling of subordinates will be required. Exceptional opportunities, minimal travel, product training, and supervisory possibilities. Salary range 25 to 28K with possible bonus incentives. Send resume only, no phone calls please, to Tom Beck-Engineering Manager, Consolidated Media Systems, 2851 Business Park Drive, Memphis, TN 38118.

WE PLACE

(Technical Engineers-Post Production Editors & Colorists)

• All Levels, Locations, & Disciplines •

Employer Paid Fees
Guaranteed Confidential
15 Years Service

FAX and/or Mail your Resume to Mike Kelly

KEYSTONE INT'L, INC.
16 Laflin Road
Pittston, PA 18640

Fax 717-654-5765 • Phone 717-655-7143

KCCN-TV
CENTRAL COAST NEWS 46

TRANSMITTER/STUDIO ENGINEER

Full time position. Experience with television transmitters, preferably UHF. Experience with Beta SP, GVG, Sony 3/4 inch. SBE certification or FCC preferred.

MAINTENANCE ENGINEER

Full time position. Some transmitter experience would be preferred. We have 3/4 inch Sony, Beta SP and a GVG 300 switcher. SBE certification a plus.

Send Resume to:
Personnel Department,
KCCN-TV, 2200 Garden Road
Monterey, CA 93940.

No phone calls accepted.

KCCN-TV is an equal employment opportunity employer and does not discriminate on the basis of race, color, religion, national origin, disability, sex, age or other factors prohibited by law.

WOLF COACH

BROADCAST SYSTEMS ENGINEERS

We are seeking broadcast professionals to join our expanding systems division. Full time salaried positions in our New England office. Expected qualifications include extensive experience in the design, implementation and test of television broadcast systems. Candidate must be adept at AutoCad drafting, systems design, operation of traditional test equipment, and be well versed in current broadcast equipment. Experience with satellite and terrestrial microwave systems, in addition to broadcast television and audio is desired. High quality standards a must.

Send resume and salary history.
Written responses only.
Wolf Coach, Inc.
7 B Street
Auburn, MA 01501
FAX 508-799-2384

MAINTENANCE TECHNICIAN WABU-TV, Boston, the engineering department is seeking an individual with five plus years of experience to act as a bench technician. Responsibilities include component level repair and operation of Sony Beta tape machines, Betacart, and broadcast studio equipment. Assist in transmitter maintenance, and emergency response. Knowledge of analog and digital technology, computer programming experience a plus, and limited RF experience related to microwave and broadcast transmitters. FCC general class license required, SBE certificate preferred. Please send resume and salary history to Kathryn Barnicle, Manager of Human Relations, 1660 Soldiers Field Road, Boston, MA 02135. An equal opportunity employer.

APPLICATIONS ENGINEER
(SAN DIEGO)

General Instrument is the pioneer and recognized world leader in the ongoing development of high-definition television. In response to the increasing demand for our technology, we have an opportunity for an Applications Engineer on our business development team.

You will develop customer-specific system overviews and provide support in the following areas: development team, new business development, proposal generation, and tradeshows.

Requires a BS/BA, understanding of competitive system configurations, strong technical background (satellite or cable industry related), strong presentation skills, good interpersonal skills and ability to work in a team atmosphere. Technical sales experience is a plus.

Send your resume with salary history/requirements to: *General Instrument, HR Dept., CODE JDKBE, 6262 Lusk Blvd., San Diego, CA 92121.* EOE.

GI General Instrument

Looking for a job?
Have something to sell?
Have a professional service to offer?

Put Broadcast Engineering's Classifieds to work for you!

- BE's total readership of over 77,000*
- Low, low rates of only $1.75/word...

and

- 96% of all respondents have purchasing influence*

-means you get results for a very small investment

Call Renée Hambleton at 913-967-1732 or fax 913-967-1735 to place your classified ad in the next available issue.

*Harvey Research Organization-April 1994

STUDIO MAINTENANCE ENGINEER Prefer five years experience in: installation, testing and maintenance of TV broadcast related equipment. MII and computer knowledge a plus. Resumes to: Capitol Broadcasting Company/WRAL-TV, P.O. Box 12.800, Raleigh, NC 27605. Attn: Human Resources.

SENIOR VIDEO ENGINEER Medium sized video production company looking for Sr. Video Engineer familiar with systems, maintenance for both production & post equipment and live video operations. Send resumes to E. Zalk at Com/Tech, 770 Lexington Ave., NY NY 10021 or Fax 212-688-4264.

QUANTEL PRODUCT APPLICATION ENGINEERING Quantel is seeking Engineers for its Product Support Department based in Connecticut. It is preferable that the successful candidate have engineering experience in the Broadcast and Post Production industry. Please forward resume and salary history to Vice President Product Support, Quantel, 85 Old Kings Highway North, Darien, CT 06820.

MAINTENANCE TECHNICIAN Immediate opening for experienced technician at an ABC affiliate. Must have a minimum 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 Human Resource Department, KOMO TV, 100 Fourth Ave N, Seattle WA 98109. No phone calls please. KOMO is an EOE. Women and minorities are encouraged to apply.

MAINTENANCE ENGINEER Immediate opening for broadcast Maintenance Engineer in desirable Pacific Northwest area. Applicants should have a minimum of four years experience in daily maintenance of video, audio and digital broadcast devices. Strong emphasis placed on communicative and team skills. Must be CDC licensable. Send cover letter, resume and salary requirements to: Tim Anderson, Chief Engineer, KXLY TV, 500 W. Boone Ave., Spokane, WA 99201 or Fax to: (509) 328-5274. No phone calls please. KXLY is an Equal Opportunity Employer.

"Great article! Can we get copies for our clients and sales force?"

Whether it's an article, ad, or an interesting column, take advantage of this unique opportunity to promote your business and products through reprints – available from this magazine. Reprints are great promotional pieces and make excellent marketing tools ... all at a minimal cost.

Available in full-color or black & white, reprints can be obtained from any issue.

For a free price quote, contact Chris Lotesto, toll-free at 800-458-0479 or 312-435-2357.

GO WHERE NO ONE HAS GONE BEFORE.

DIRECTV®, the nation's premier direct broadcast satellite service, delivers 150 channels to American homes that are equipped with the DSS™ home receiving unit, which features an 18-inch satellite dish. We are seeking the following professionals for our state-of-the-art, 24-hour a day broadcasting facility near Castle Rock, CO.

SPORTS CENTRAL SUPERVISOR

Will supervise on-air broadcast and sports operations activity. Desired qualifications include a 2-year college degree, technical training (or equivalent); 6+ years experience at TV station, cable master control operation, TV network operation (or equivalent); and experience with TV coverage formats of various sports.

BROADCAST OPERATIONS SHIFT SUPERVISOR

Will supervise on-air activity within the broadcast center. Desired qualifications include a 2-year college degree, technical training or equivalent work experience; and 6+ years experience at major station, cable master control operation, TV network operation (or equivalent).

Both positions will be responsible for resolving all major broadcast and plant related problems, directing operating personnel, implementing procedures, providing feedback to employees and communication to upper management regarding operations. Both positions require computer literacy; experience supervising TV broadcast and satellite operations personnel; knowledge of broadcast automation systems, digital and analog broadcast signals, fiber and satellite receive/transmit systems, quality measurement devices. Excellent vision (including color perception) and hearing essential. Must be willing to work all shifts, including early morning, late night and/or weekends.

DIRECTV offers an exciting compensation and flexible benefits package, along with a rare opportunity to make a major impact in a developing industry. For immediate consideration, please send your resume with salary history to: **DIRECTV, Inc., Attn: Employment-DJ, 5454 Garton, Rd., Castle Rock, CO 80104, Fax (303) 660-7199.**

An Equal Opportunity/Affirmative Action Employer. We foster a culturally diverse workforce and strongly encourage women and minorities to apply for this position.

DIRECTV.

CLASSIFIED

HELP WANTED

TRANSMITTER ENGINEER WPWR-TV has an immediate opening for an experienced transmitter engineer to maintain primary UHF transmitter, station STL, and other microwave equipment. This position demands a minimum 5 years experience maintaining high power UHF transmitters. FCC General class license required. Knowledge of Comark transmitters a plus. Familiarity with other broadcast equipment would be helpful. Please send resume addressed to Emile Lazardo, WPWR-TV 2151 North Elston Ave. Chicago, IL, 60614. Please no phone calls. WPWR-TV is an equal opportunity employer.

KRIV-FOX TELEVISION-HOUSTON Maintenance Engineer. Component level experience in 1" video tape equipment; Sony betacam; Analog/Digital Switchers, graphic generators, etc. Knowledgeable in test & measurement procedures with both video & stereo audio systems is beneficial. Ability to work under pressure of fast pace operations. Min. 5 years experience, and FCC or SBE certification. Send resume with salary history to KRIV, Fox Television, P.O. Box 22810, Houston, Tx., 77227, Attn: Charmaine Williams. EOE.

MAINTENANCE ENGINEER: Mid-South Post House has immediate opening for experienced assistant engineer. Digital and analogue equipment includes Sony switchers, editors, DMEs, D2, 1", Beta SP, monitors, ADO, Delta CG, Rank Cintel, Composium, Avid, etc. Mac and PC computer skills very helpful. Minimum 3-5 years experience required. Some night and weekend work required. Must have good people skills and be a self starter. Competitive salary and benefits. This is a good opportunity for a motivated individual with a clear vision and professional goals. Please submit cover letter, resume and salary requirements to: Erv Vanags, Elite Post, 1025 16th Ave. S, Suite 302, Nashville, TN 37212.

MAINTENANCE ENGINEER-KIRO-TV Has an immediate opening for a maintenance engineer with a minimum of 3 yrs experience. Must be capable of component level trouble shooting. Experience in maintaining Beta recorders, Sony camcorders, Grass Valley switching & effects equipment desired. Computer literate and satellite uplink knowledge preferred. Send resume to: Paul E. Polzin, TV Chief Engineer, KIRO-TV, 2807 Third Avenue, Seattle, WA 98121.

MAINTENANCE ENGINEER Major Los Angeles Post Production facility is seeking to add to its staff in the Telecine Engineering Department. This is an excellent opportunity to join with a company on the leading edge of technology. Applicants must have a strong background in all troubleshooting procedures required to support modern Digital Color Correction systems. Send resumes to: T.P.G., 6335 Homewood Ave., Los Angeles, CA 90028 / FAX to (213) 462-0836. Attention: Rick Girardi.

RF MAINTENANCE ENGINEER Oklahoma PBS affiliate has an opening for a Network Maintenance Engineer. Component level trouble shooting skills required. Ideal candidate will have UHF and VHF translator and transmitter, and a good working knowledge of microwave systems. In state travel required. Comprehensive benefit package. Please send resume with salary history to the Personnel Department, Oklahoma Educational Television Authority, P.O. Box 14190, Oklahoma City, Oklahoma 73113. AA/EEO.

SATELLITE ENGINEER The Disney Channel, a subsidiary of The Walt Disney Company, has an opportunity for a Satellite Earth Station Engineer in our Burbank, CA facility. To qualify, candidates must be fully conversant with the integration of multiple video and audio sources into the satellite transmission chains. Must also be able to troubleshoot transmission problems and fully analyze video and audio signals. Three or more years of engineering experience with a satellite transmission facility or transportable uplink facility are required. Some electronics training or degree desired. Local candidates preferred. Please send resume and salary requirements to: Walt Disney Pictures & Television, Staffing Services, Attn: JF/SE/BE, 500 S. Buena Vista St., Burbank, CA 91521-7376. Or, fax: (818) 563-3551.

WAGM TV Seeking experienced maintenance engineer to perform general maint on various studio, production, videotape equipment and microwave systems. 2 yrs experience in TV broadcasting required. SBE or FCC license preferred. Must be able to work full time and on call hours. Starting rate of pay is dependent on experience. Send resume to WAGM Box 1149 Presque Isle, ME 04769.

MAINTENANCE ENGINEER Top broadcast/production facility based in New York City seeks full-time staff Maintenance Engineer. Experience with Ikegami studio cameras, 1" and Betacam tape machines. Good bench skills. Several years experience in maintenance to component level repair required. Knowledge of Unix workstations desirable. Send resume with references and salary requirements to: Broadcast Engineering, Dept. 754, 9800 Metcalf, Overland Park, KS 66212-2215.

WFIE-TV STAFF ENGINEER Variety of technical & mechanical skills required. Must possess knowledge of digital & analog electronics; component level, and trouble-shooting. Broadcast experience helpful. Send resume to: Personnel, Engineering Position, WFIE-TV, P.O. Box 1414, Evansville, IN 47701. All replies confidential. EOE.

MAINTENANCE ENGINEER FCC General Class license required. Must have 3 years experience trouble-shooting to component level in RF, video and audio TV equipment. Experience in maintaining digital and microprocessor based equipment required. SBE certification desirable. Resume and salary requirements to: Elmer Chancellor, WEHT-TV, P.O. Box 25, Evansville, IN 47701. Fax 502-826-6823, EOE, M/F/D.

ENGINEER/SUPERVISOR Editel Chicago is looking for an Engineer that will work along side our Chief Engineer in a supervisory capacity. This individual must be able to deal with the overall issues facing the Engineering department as well as the specifics of any project. If you are interested in expanding your horizons as we move into the future send your resume to: Editel Chicago, 301 E. Erie, Chicago, IL 60611. Attn: John Stevens. No phone calls please.

CHIEF ENGINEER KETA-TV, Oklahoma City, is seeking a hands on leader with a strong maintenance background. Supervisory and organizational skills will be essential in guiding our technical team in planning and implementing projects. Please send your resume and salary history to the Personnel Department, Oklahoma Educational Television Authority, P.O. Box 14190, Oklahoma City, Oklahoma 73113. AA/EEO.

BROADCAST EIC/MAINTENANCE ENGINEER Description: Turner Broadcasting is seeking client oriented Engineers to work on our Mobile Units and in our Field Shop. Maintenance requires troubleshooting and repair to component level on all Mobile Unit related systems. Remote duties include serving as a Maintenance Engineer and also as an EIC with complete responsibility for all technical aspects of remote telecasts. This position requires extensive travel. Qualifications: Five years experience as a Remote EIC and/or Maintenance Engineer. Must be experienced on GVG-300, Horizon Router, BVW-75 and VPR-6 VTRs, Abekas A42 and A53, IKE 357/79E and 377 series cameras, Chyron Infinit!, RTS system. SSL audio experience a plus. Send Resume and Salary History to: Scott Marks, Field Operations Manager, 1050 Techwood Drive, Atlanta, Ga. 30318. *No phone calls please.*

ATLANTA ASST...CHIEF ENGINEER: Trinity Broadcasting station seeks qualified engineer with SBE certification or FCC general class license, 1 or 2 years studio experience, UHF, RF familiarity a big plus. Submit resumes and salary requirements to: Chief Eng., WHSG TV/63, 1550 Agape Way, Decatur, GA 30035. M/F EOE.

ENG ENGINEER, SNG ENGINEER, AND ENGINEERING TECHNICIAN. Experience required. Send application and resume to KSTW-TV, PO Box 11411, Tacoma, WA 98411. Telephone number 206-572-5789 EOE

ENGINEER - Quantel, a leader in Digital Broadcast Equipment, has immediate opening for a Field Service Engineer working from its Connecticut office. Applicants must have experience in the Broadcast Field or Post Production. Send resume and salary requirement to Vice President Product Support, Quantel, 85 Old Kings Highway North, Darien, CT 06820.

CHIEF ENGINEER/MAINTENANCE ENGINEER combination for full broadcast station. UHF experience a must. KNAT-TV 23, 1510 Coors Rd NW, Albuquerque, NM 87121. EOE.

AD INDEX

Advertiser	Page Number	Reader Service Number	Hotline
AAVS/Div. of Sencore	3	5	800-769-AAVS
Acrodyne Industries, Inc.	187	127	800-523-2596
ADC Telecommunications	21	14	800-726-4266
Adtec Productions Inc.	196	143	615-256-6619
Advanced Broadcast Systems	Map, 158	103	606-282-7580
Alamar Electronics USA, Inc.	214	156	408-866-9373
Ampex Recording Media	207	150	800-240-7042
Aphex Systems Ltd.	106	174	818-767-2929
Asaca/Shibasoku Corporation	203, 205	134, 136	310-827-7144
Associated Press	Map		202-736-1152
Audio Precision	167	105	800-231-7350
Avid Technology	Map		800-949-2843
Avitel Corporation	162	117	801-977-9553
Barco Inc.	155	100	404-590-7900
Beck Associates	234	170	512-388-9777
Belar Electronics Laboratory	176	164	610-687-5550
Belden Wire & Cable	156, 157	101, 102	800-235-3364
B&H Photo-Video	235-237	171-172	800-947-9928
Broadcast Microwave Services	103	65	619-560-8601
Broadcast Video Systems Ltd.	176	122	905-764-1584
BTS Broadcast TV Systems	96A-F, 135	58,70	800-962-4BTS
Burle Industries	104	66	717-295-6123
Canare Cable, Inc.	96	48	818-365-2446
Canon USA Broadcast Lens	43, 181	33, 125	201-816-2900
C.H. Ellis Co. Inc.	139	75	317-636-3351
Chyron Graphics	64A-B, 65	39	516-845-2173
Cipher Digital, Inc.	241	250	800-331-9066
Clark Wire & Cable	154	84	800-CABLE-IT
Clear-Com Intercom Systems	27	17	510-527-6666
Comark Communications, Inc.	69	87	215-822-0777
COMSAT RSI, Mark Antennas	174	113	708-298-9420
Concept W Systems	66	40	316-342-7743
Conex Electro Systems	198	148	206-734-4323
Control Concepts	95	47	607-724-2484
Datatek, Inc.	Map		800-882-9100
DB Elettronica Telecomunicazioni	28	18	049-870-0588
Denon	202	133	201-575-7810
Dielectric	136	71	207-655-4555
Digital Graphix Inc.	199	131	201-845-8900
DPS	Map, 29	9	606-371-5533
Divi Com	208	151	408-944-6700
DNF Industries	196	144	213-650-5256
Duracell USA	160-161	116	800-548-5489
DVision	54-55	35	800-D-VISION
Dynatech Video Group	35	19	800-453-8782
EEV, Inc.	147, 227	95, 166	800-DIAL-EEV
Elantec	179	124	408-945-1323
Electro-Voice	89	49	616-695-6831
Emcee Broadcast Products	197	146	717-443-9575
ESE	17	7	310-322-2136
Extron Electronics	159	115	800-633-9876
Faraday Technology	152	80	+44 782 661501
Faroudja Laboratories	67	41	408-735-1492
Fiber Options	168	106	800-342-3748
France Telecom	123	67	434-297-99
Frezzolini Electronics Inc.	222	160	201-427-1160
Fujinon Inc.	141	77	201-633-5600
Futuretel Inc.	175	120	408-522-1400
Gentner Communications	213	93	800-945-7730
Gepco	150	98	312-733-9555
Graham-Patten Systems Inc.	209, 211	154	800-422-6662
Grass Valley Group	23		800-343-1300
Grass Valley Group	24-25	15	800-343-1300
Grass Valley Group	216, 217	138	800-343-1300
Gray Engineering Laboratories	219	157	714-997-4151
Harris Allied	47, Map	22	606-282-4800
Henry Engineering	150	99	818-355-3656
Hewlett Packard	132	89	800-452-4844
Hitachi Denshi America	5	10	516-921-7200
Horita	223	111	714-489-0240
Hotronic Inc.	97	60	408-378-3883
Hughes Communications Inc.	232	175	213-607-4377
IDX Technologies	134	91	714-541-3460
Ikegami Electronics Inc.	133	90	201-368-9171
ImMIX	Map, 48A-B	29	916-272-0800
ITS Corp.	193	141	412-941-1500
Intelligent Resources	125	68	708-705-9388
International T.V. Symposium	79	43	+41 21 963 3220
Intraplex, Inc.	171	109	508-692-9000
Ipitek	218	139	619-438-8362
Jampro Antennas, Inc.	26	28	916-383-1177
Jem-Fab Corp.	241	255	919-435-6179
Jensen Tools Inc./Axia Ent.	240	251	602-968-6231
JVC Professional Products Co.	137	72	800-JVC-5825
Lamp Technology	241	253	516-567-1800
Larcan - TTC	7	11	303-665-8000
Leader Instruments Corp.	183	114, 177	800-645-5104
Lectrosonics	169	107	800-821-1121
Leitch	BC	3	800-231-9673
Leitch	Map		800-231-9673
Leitch	91-94	45, 46, 56, 57	800-231-9673
Lightwave Systems Inc.	64	16	214-741-5142
Link Electronics	139	74	314-334-4433
LNR Communications Inc.	129	55	516-273-7111
Louth Automation	225	163	415-329-9498
Macrovision	191	140	415-691-2909
Magni Systems, Inc.	142	78	800-237-5964
Major Technologies	233	169	905-821-8845
Matrox Electronic Systems	201	132	800-361-4903
Maxell Corporation of America	11	13	800-533-2836
MCL Inc.	173	112	708-759-9500
Micropolis	80A-L	59	818-709-3407
Miller Fluid Heads	Map, 229	167	201-473-9592

Continued...

AD INDEX Con't.

	Page Number	Reader Service Number	Advertiser Hotline
Miranda Technologies Inc.	188	128	514-333-1772
National Transcommunications	131	88	+44 1703-498000
Neutrik Canada	148	96	514-344-5220
NVision Inc.	126, 138A-F	69, 126	916-265-1000
O'Connor Engineering	58	37	714-979-3993
Odetics, Inc.	165	119	800-243-2001
OEI Electronics Systems, Inc.	241	254	908-735-0543
Opamp Labs, Inc.	198	149	213-934-3566
Panasonic Broadcast & TV	32A-H, 149		800-524-0864
Panasonic Pro Audio	70-71	50	800-777-1146
Philips Components	52-53	25	800-447-3762
Philips TV Test Equipment	231	168	201-529-2188
Pinnacle Systems Inc.	105	173	408-720-9669
Pioneer New Media Tech	IFC	1	800-421-6450
PiROD, Inc.	IBC	2	219-936-4221
Pixel Instruments Corp.	226	179	408-354-9122
Pro-Bel Inc.	127	85	404-396-1971
Quantel	37	30	203-656-3100
Recognition Concepts Inc.	190	130	702-882-7817
Roland Corp US	45	21	213-685-5141
Sachtler Corp. of America	51	24	516-867-4900
Sachtler GmbH	9	12	32-909-150
Sanix Corporation	49	23	708-677-3000
Sealevel Systems Inc.	221	165	803-843-4343
Shure Brothers Inc.	83	44	800-25-SHURE
Sierra Design Labs	128	86	702-831-7837
Skaggs Telecommunications Service Inc.	210	153	801-261-4400
Snell & Wilcox Ltd.	13, 14, 15	6	730-821-1188
Snell & Wilcox Ltd.	57, 59	38	730-821-1188
Snell & Wilcox Ltd.	61, 63	26, 27	730-821-1188
Snell & Wilcox Ltd.	99-102	62, 63, 64	730-821-1188
Sony Business & Professional Products Group	Map, 16A-D		800-635-SONY
Stainless Inc.	224	162	215-699-4871
Standard Communications	75	52	310-532-0397
Storeel	154	83	404-458-3280
Sumitomo Electric	204	135	310-782-0227
Switchcraft Inc./Div. Raytheon	153	82	312-792-2700
Tally Display Corp.	138	73	914-365-6393
Tekniche	Map		201-784-2288
Tektronix Inc.	Map, 40-41	32	800-TEK-WIDE
Telemetrics, Inc.	146	94	201-848-9818
Telex Communications, Inc.	1, 151	4, 79	800-392-3497
Tentel Corp.	196	145	916-939-4005
TFT	77	42	800-347-3383
The New Vision Group	230	180	407-951-0219
Thomson Broadcast	73	51	800-882-1824
Thomson Tubes Electroniques	219, 221, 223	158, 159, 161	201-812-9000
Touchvision Systems	54-55	35	800-D-VISION
Trade Commission of Spain	140	76	213-628-1405
Trompeter Electronics	198	147, 178	818-707-2020
Ultimatte	189	129	818-993-8007
United States Broadcast	158	104	606-282-1802
Varian Associates Inc.	85, 87	53, 54	800-414-8823
Varian Microwave Equip. Prod.	163	118	408-496-6273
Varitek	242	257	714-283-8980
Vega, A Mark IV Company	177	123	818-442-0782
Vela Research Inc.	215	137	813-572-1230
Video Accessory Corporation	172	110	800-821-0426
Video Design Pro	188	97	800-VID-CAD6
Video Media Inc.	170	108	408-227-9977
Videotek, Inc.	195	142	800-800-5719
Vinten TSM	143	92	914-268-0100
Vistek Electronics Limited	19	8	628-531-221
Viz Inc.	240	256	718-714-9873
Weircliffe International Ltd.	172	121	139-272-132
Winsted Corporation	36	20	800-447-2257
Wohler Technologies, Inc.	152	81	415-589-5676
3DBM Inc.	39	31	805-445-4700

SALES OFFICES

NEW YORK, NY
Gordon & Associates
Josh Gordon
210 President Street
Brooklyn, NY 11231
Telephone: (718) 802-0488
FAX: (718) 522-4751

Joanne Melton
888 7th Avenue, 38th Floor
New York, NY 10106
Telephone: (212) 332-0628
FAX: (212) 332-0663

OXFORD, ENGLAND
Richard Woolley
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
5236 Colodny Ave., Suite 108
Agoura Hills, CA 91301
Telephone: (818) 707-6476
FAX: (818) 707-2313

SANTA MONICA, CA
MC² Magazine Communications
Marketing Corporation
Jason Perlman
Telephone: (310) 458-9987
FAX: (310) 393-2381

CHICAGO, IL
Vytas Urbonas
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
Renée Hambleton
P.O. Box 12901
Overland Park, KS 66282
(913) 967-1732 Fax: (913) 967-1735

LIST RENTAL SERVICES
Chris Coughlin
9800 Metcalf
Overland Park, KS 66212-2215
Phone: 913-967-1928
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*
Tom Cook, *Senior Managing Editor*
Carl Bentz, *Directory Editor*

ART
Stephanie Masterson, *Associate Art Director*

BUSINESS
Raymond E. Maloney, *President*
Cameron Bishop, *Group Vice President*
Dennis Triola, *Publisher*
Tom Brick, *Marketing Director*
Stephanie Hanaway, *Group Director, Special Projects*
Kathryn Buckley, *Promotions Manager*
Sandra Tomczak, *Promotions Coordinator*
Dee Unger, *Director Advertising Services*
Nancy Hupp, *Advertising Production Manager*
Annette Hulsey, *Classified Advertising Coordinator*
Pat Eiserman, *Production Supervisor*
Susan Jones, *Advertising Coordinator*
Doug Coenrod, *Corporate Art Director*
Barbara Kummer, *Circulation Director*
Eunice Longanecker, *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

Member, American Business Press ABP
Member, BPA International BPA

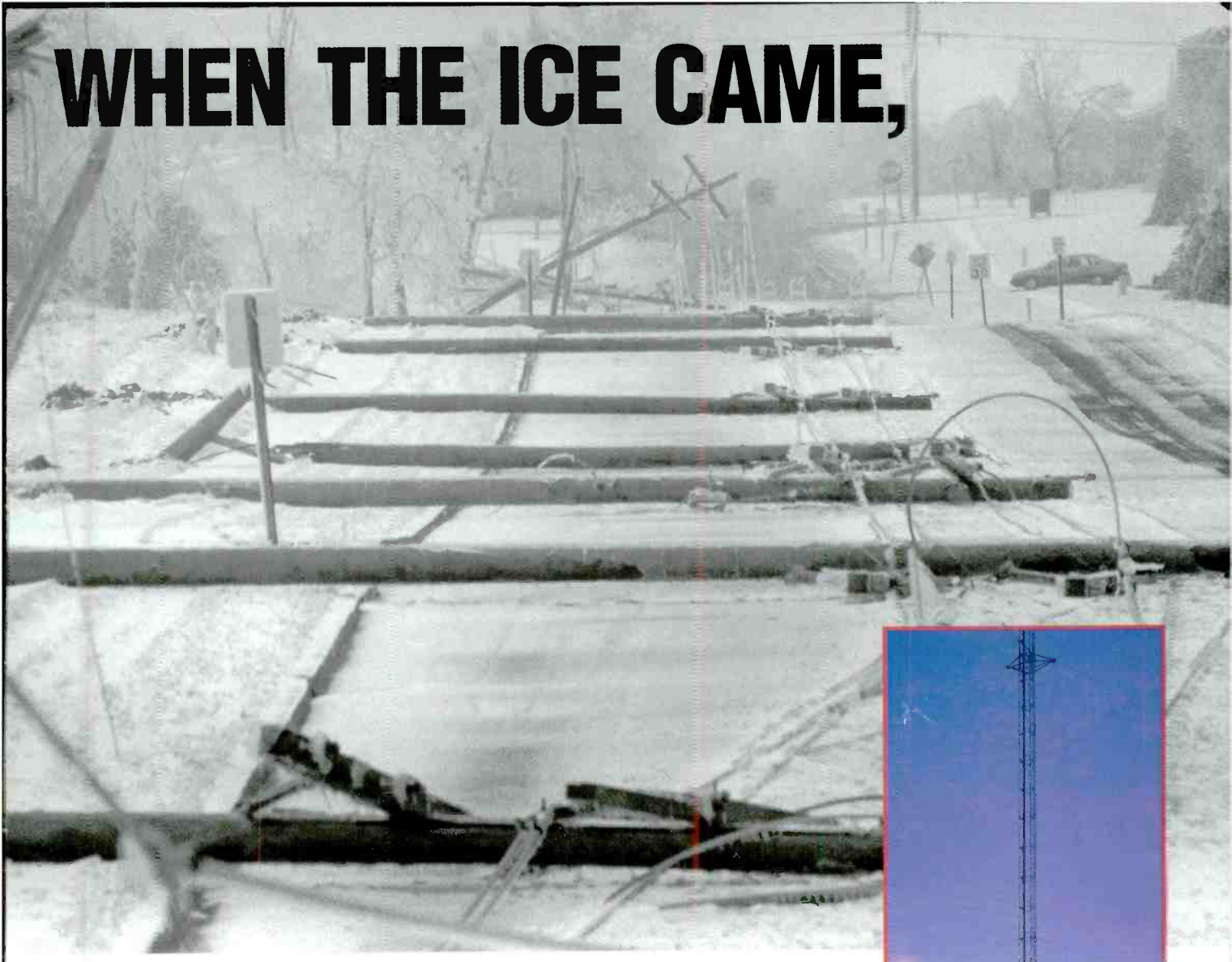
BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other management personnel at commercial and public TV stations, post-production and recording studios, broadcast networks, cable, telephone and satellite production centers and networks. Qualified persons include consulting engineers and dealer/distributors of broadcast equipment.

SUBSCRIPTIONS: Non-qualified persons may subscribe at the following rates: United States and Canada; one year, $50.00. Qualified and non-qualified persons in all other countries; one year, $60.00 (surface mail); $115.00 (air mail). Subscription information: P.O. box 12937, Overland Park, KS 66282-2937.

CORRESPONDENCE
Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2215. Phone: 913-341-1300; Edit. Fax: 913-967-1905. Advt. Fax: 913-967-1904.

INTERTEC PUBLISHING

WHEN THE ICE CAME,



OUR PIROD TOWER DIDN'T EVEN SHIVER.

Dave Turner
WMCC TV, Channel 23
Indianapolis, Indiana

"With more than two feet of ice at the antenna of our 1,000-foot PiRod tower, and guy wire ice eight inches in diameter, our tower bent like a banana. I recall my engineer saying that the tower wouldn't last five more minutes. But our solid rod PiRod tower stood there and straightened as the ice melted. No damage. No stress fractures. No problems. I guess that's when the quality of a solid rod PiRod tower comes through."

Solid Rod, Solid Service, Solid Value

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

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 (2) on Reply Card

You Only Have A Few Seconds To Make A Lasting Impression.

LogoMotion™ Makes Every Frame Count.

LINEAR KEYING
LogoMotion™ features a high quality linear keyer giving transparency and soft edges to your logos.

ANIMATED LOGOS
LogoMotion's™ real time playback capability can be used to display animated logos.

MULTIPLE LOGO STORAGE CAPACITY
LogoMotion™ stores up to 50 individual logos allowing you to tailor your logo for specific programs.

Now you can bring on-air logos to life. LogoMotion™ is the first logo generator to store and playback animated logos opening up a new world of creative options for on-screen presentation. With LogoMotion™ logos make a lasting impression.

LogoMotion™ combines a comprehensive range of features in a simple, easy-to-use package. New solid-state technology allows static and animated logos to be recorded directly from a video signal. LogoMotion™ stores any combination of up to 50* static and animated logos totalling up to 13.4* seconds. Logos may be positioned anywhere on screen, repeated on timelines or looped to other logo sequences 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!

LOGO MOTION

Whether a station "bug," apology caption, sponsorship message, rating warning, program animation, or public announcement, LogoMotion™ is the ideal tool for the job. What's more -- it's simple to use and is a great value!

LogoMotion™ is loaded with sophisticated features that can add life to any program. Call Leitch today and find out how LogoMotion™ can make a lasting impression for your station.

LEITCH®

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 Road, North York, ON, Canada M3B 1V7 - 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

*NTSC only, PAL and Digital systems vary.

See us at NAB '95, Booth #15748

Circle (3) on Reply Card