

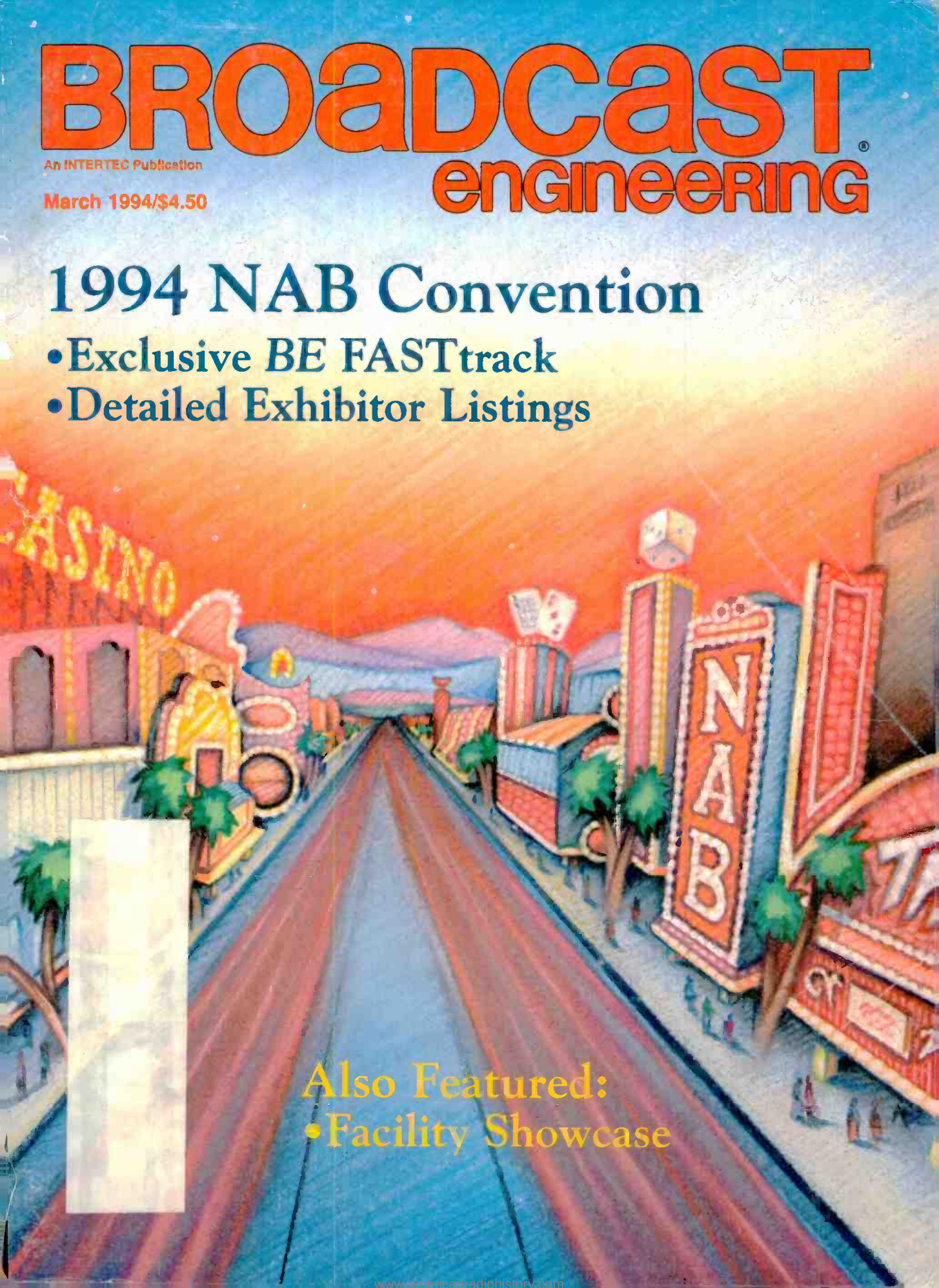
BROADCAST[®] engineering

An INTERTEC Publication

March 1994/\$4.50

1994 NAB Convention

- Exclusive BE FASTtrack
- Detailed Exhibitor Listings

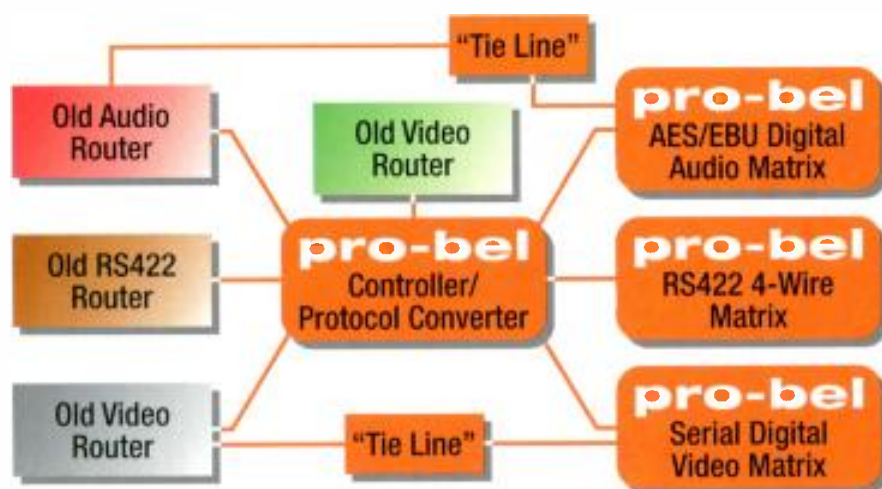


Also Featured:

- Facility Showcase

Who says you can't **expand** your old routing switcher?

pro-bel, The Solutions Company,
has the answer to your expansion dilemmas. It
doesn't matter whose routing switcher you have,
or even whether you use several different ones.



Our vast experience in systems engineering and interfaces enables us to create a system for your facility that extends the life of your existing hardware. You can then expand or add only the matrices you need such as serial digital video, AES digital audio, analog video, analog audio, or RS422 data, and control it all with the *sophisticated and user friendly* Pro-Bel control system. Our unique "tie line" software automatically facilitates digital to analog, and analog to digital path seeking in the system. You can even use your old control panels or add state-of-the-art touch screen control. Call us for more details or a system evaluation and quotation.

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 (1) on Reply Card

www.americanradiohistory.com

Choosing your new digital edit suite could be a complex, expensive and outdated decision

...or it could be an EDITBOX.™

Edit Box is the world's only on-line, non-linear editor. It blends the unmatched flexibility of true random access with the uncompromised quality of CCIR 601 pictures. And it conforms, cuts and corrects at a speed nothing else gets close to.

It's a unique combination - the one that clients demand.

Edit Box is built purely for the business of editing;

no compromises, no not-quite technology. It's a solution specific platform that guarantees a huge performance advantage and a framework for future development.

It does all this, and still costs no more than a traditional digital tape suite.

Edit Box debuts at NAB. Visiting booth 17126 will be the best edit decision you ever made.



**EDIT
BOX™**

Digital editing with a future.



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

Circle (4) on Reply Card

Contents

March 1994 • Volume 38 • Number 3

BROADCAST[®] engineering



Page 51



Page 66



Page 78

Facility Showcase:

It's back to Vegas for the 1994 NAB Convention. In addition to the regular extravaganza are the HDTV and multimedia conferences. Also, take a peek at a new BE feature called FASTrack. It's the shortest path to exhibitor listings.

DEPARTMENTS:

- 8 **FCC Update**
NRSC-2 deadline
- 10 **Strictly TV**
Cable selection
- 12 **Management**
Speed as a motivator
- 14 **Production**
Microphone basics
- 16 **Troubleshooting**
Power protection system
- 21 **Technology News**
Evolving CD standards
- 22 **SBE Update**
Certification
- 170 **Field Report**
Fujinon S16X lens
- 172 **Field Report**
Dorrough stereo signal
- 176 **Applied Technology**
KUB Systems DANCE
- 194 **New Products**

COLUMNS:

- 4 **News**
- 6 **Editorial**
- 184 **Industry Briefs**
- 216 **Classifieds**
- 220 **Advertisers' Index**

THIS MONTH...

40 CBS' Edit 12

By Craig Harrison

Implementing multiplexed serial digital editing.

51 KQED: Building for Durable Change

By John Aalto and Kevin Schaeffer

Designing a facility that can handle the changes ahead is a challenge.

58 Building the First DBS Facility: DirecTV

By Curtis Chan

A new kind of facility is the head-end of the information skyway.

66 Building on Fisherman's Wharf: Realtime Video

By Will Hoover

Transforming an historic building into a modern production facility.

78 Editel: Los Angeles

By E.L. Grant

Building a digital complex at a 20-year-old address.

SPECIAL NAB COVERAGE:

- NAB Conference Preview on page 31
- Exclusive NAB Map on page 85
- BE FASTtrack on page 102
- NAB Exhibitor Highlights on page 118

ON THE COVER:

The broadcast industry returns to Las Vegas for the 1994 NAB Convention. Cover illustration by Doug Bowles.

The Only Thing It Can't Do Is Open A Bottle Of Wine.



Telex V-Series headsets do it all. Their unique modular design make them the most versatile headsets you can buy, with interchangeable mic and cable assemblies that let you use one headset for most any application.

Comfort and sound quality are second to none, with revolutionary floating earcups that automatically adjust to any head size. And, like our other Telex headsets used by pilots and NFL coaches, the durability is built in. Of course, parts and accessories are easy to get and always available.

See and hear for yourself. For the Telex pro audio dealer nearest you, call 1-800-392-3497 (416-431-4975 in Canada).

The V-Series. Maybe we should have called it the swiss army headset.



The V-Series headsets, models V-220 and V-210

Made with pride in the USA.

©1994 Telex Communications Inc.

TELEX

Circle (5) on Reply Card

By Dawn Hightower,
senior associate editor

Fall exhibition named "World Media Expo"

World Media Expo is the name chosen for the combined exhibition associated with the 1994 NAB Radio Show and the conferences of the Radio-Television News Directors Association, Society of Motion Picture and Television Engineers, and Society of Broadcast Engineers.

World Media Expo will be held Oct. 13-15, 1994 at the Los Angeles Convention Center and separate conferences will occupy different meeting room areas at the convention center on Oct. 12-15. Registration for any of the four conferences includes admission to the exhibition. Total attendance is projected to exceed 15,000.

NAB, which is managing World Media Expo, expects more than 350 participating companies. Information on participating as an exhibitor is available from NAB's Eric Udler at 202-429-5336.

NAB comments on FCC revisions for EBS

The National Association of Broadcasters told the Federal Communications Commission that any government effort to revise the Emergency Broadcasting System (EBS) should maximize reliance on automation and minimize unnecessary costs and audience disruptions.

The EBS system is intended to warn Americans about emergencies so that citizens can prepare and safeguard themselves. Each year, the EBS provides approximately 1,000 warnings, alerting radio and TV audiences about local and regional emergencies. The FCC is now considering replacing an outmoded EBS system. The proposed new system would employ new digital equipment, automated procedures and integrate cable television for the first time.

In comments to the FCC, NAB said the FCC should recognize the important and continuing role of broadcasters in providing such warnings, both within and outside of the EBS structure. NAB's comments also outlined several problems that might be encountered under a new EBS structure – problems that should be resolved prior to any final FCC action.

One concern is costs. NAB said many broadcasters, particularly in small markets, would be unable to absorb any significant costs for new EBS equipment.

NAB also urged the commission to address the matter of station automation generically. Broadcasters want the FCC to take advantage of new statutory authority – conferred by the Congress – to reduce or eliminate the requirement for "licensed operator attendance" at broadcast stations. By reducing staff requirements, the FCC could help broadcasters lower overall costs.

NAB also cautioned regulators against adopting a revised EBS structure that would allow cable TV systems to delete or interrupt TV broadcast signals carried on cable. NAB outlined cases where cable operators deleted local stations' broadcasts of emergency information and substituted either erroneous or outdated information about these emergencies.

To address the challenges and concerns of broadcasters, NAB asked the FCC to first issue a tentative decision on any revised EBS rules, deferring final action until receipt of further comments on how to resolve the issues identified by NAB.

NAB to feature stand-alone conferences

The latest innovations in communications can be found at the 1994 NAB Convention, featuring 12 stand-alone conferences and more than 10 football fields of TV, audio, computer and multimedia exhibits, March 20-24, in Las Vegas.

The NAB conference and exhibition is the world's largest event for the TV and radio industry. It attracts more than 64,000 industry professionals, more than 800 exhibitors, and features more than 250 seminars and workshops, led by some of the industry's top leaders. Among the NAB '94 conferences and exhibitions will be NAB MultiMedia World, co-sponsored by the Interactive Multimedia Association and featuring more than 100 exhibitors in a separate exhibit area.

New conferences include the NAB HDTV World Production Conference, a series of sessions on widescreen production techniques, post-production and emerging HDTV technologies; the Society of Motion Pictures & Television Engineers' Post Experience, an all-day event for those interested in learning about movie and TV production techniques; and the Digital Transmission Tutorial, an Institute of Electrical and Electronics Engineers Broadcast Technology Society half-day seminar, which presents the basic concepts of transmitting digital information through over-the-air broadcasting.

Continued on page 180

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

Ruth Knotts, *Graphic Designer*

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, *Advertising Business Manager*
Nancy Hupp, *Advertising Production Supervisor*
Susan Jones, *Advertising Coordinator*
Greg Hembree, *List Rental Sales*
Doug Coonrod, *Corporate Art Director*
Virginia Picotte, *Circulation Manager*
Customer Service: 913-967-1711

TECHNICAL CONSULTANTS

Ned Soseman, *Contributing Editor*
Eric Neil Angevine, *Broadcast Acoustics*
John H. Battison, *Antennas/Radiation*
Dennis Clapura, *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
INTERNATIONAL

BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other station management personnel at commercial and educational radio and TV stations, teleproduction studios, recording studios, CATV and CCTV facilities and government agencies. Qualified persons include consulting engineers and dealer/distributors of broadcast equipment.

BROADCAST ENGINEERING (ISSN 0007-1994) is published monthly (plus three special issues) and mailed free to qualified persons within the United States and Canada in occupations described above. Second-class postage paid at Shawnee Mission, KS, and additional mailing offices. POSTMASTER: Send address changes to Broadcast Engineering, P.O. Box 12960, Overland Park, KS 66282-2960.

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.

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Intertec Publishing, provided that the base fee of U.S. \$2.00 per copy, plus U.S. \$0.00 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970 USA. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Service is 0007-1994/1993 \$2.00 + \$0.00.

CORRESPONDENCE

Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2215. Telephone: 913-341-1300; Editorial fax: 913-967-1905. Advertising fax: 913-967-1904.

© 1994 by Intertec Publishing
All rights reserved.

INTERTEC
PUBLISHING

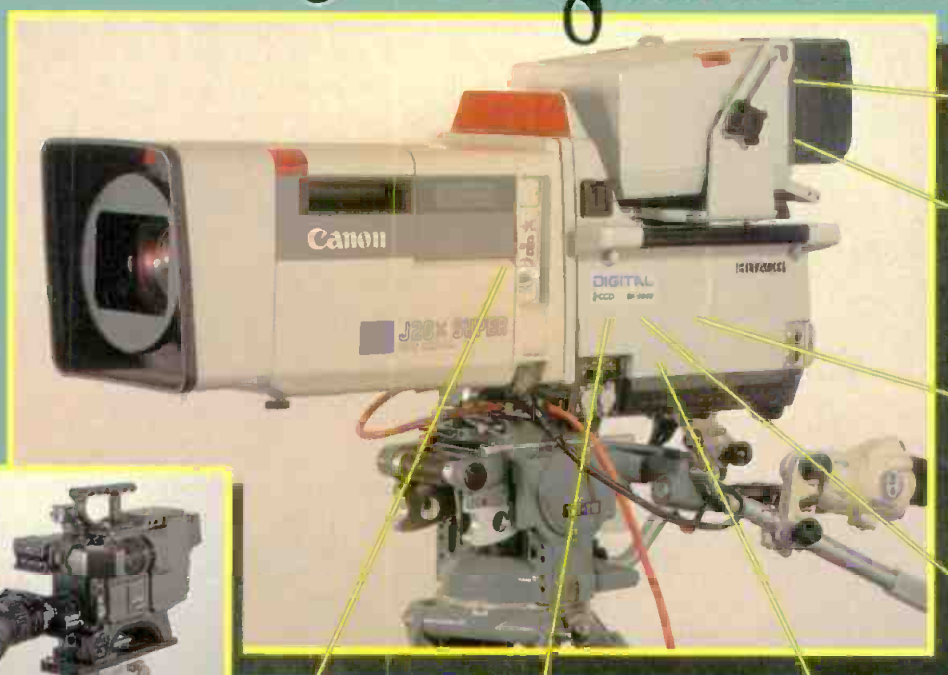
Buy a digital camera or else.....

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 benchmarks 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 of all cameras weeks or months later and serial digital outputs for D-1 or 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

The Hitachi developed single LSI device provides full 13 bit digital processing for RGB video including detail and masking. Only Hitachi offers 13 bit video processing.

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

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

Plug-in 6 position ND and CC filter wheels allow easy insertion of special effects filters



SK-2600P Portable Companion

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

Call today for more information or a demonstration.

HITACHI

Hitachi Denshi America, Ltd.

New York	(516) 921-7200	Atlanta	(404) 242-3636
Los Angeles	(310) 328-6116	Dallas	(817) 488-4528
Chicago	(708) 250-8050	Canada	(416) 299-5900

Circle (6) on Reply Card

Editorial

NAB '94: Showgirls to leisure suits

My bags are packed, plane tickets have been purchased, and I've got plenty of money (as long as I stay away from the Black Jack tables). Hotel reservations have been confirmed, unfortunately, the hotel is about 10 miles from the convention center...well, I guess I'm like 50,000 others frantically preparing for the 1994 NAB Convention.

This year's extravaganza is guaranteed to be bigger than anything in the past, which is saying something. From HDTV to multimedia to good ol' broadcasting, everything from showgirls to leisure suits are sure to be on site.

In preparing for the magazine's show coverage, I had the opportunity to visit with a lot of people about the convention. The typical questions were asked: "Are you going?" "What are you looking for?" "Are you planning to just look or are you going there to buy?"

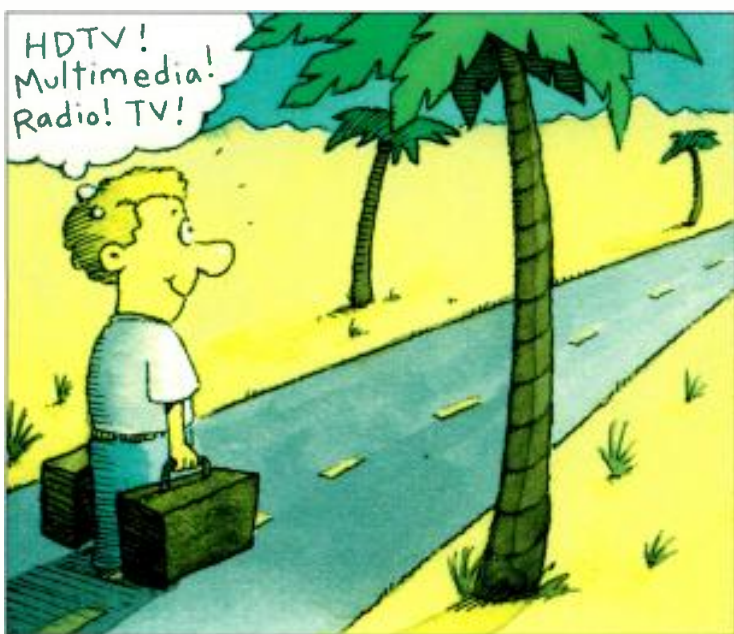
The answers to the first question were mixed. About half of those I talked with are not planning to go. However, of those planning to make the trek, most are going with specific equipment needs in mind.

This year's goal-oriented attendance to the show is somewhat different from what we've seen in years past. Previously, people sometimes attended the convention primarily because it was a social event, something many considered part of the job. Those that didn't have money to spend went to renew acquaintances or check out some of the sessions.

Not so this year. Those going to the this year's NAB Convention are planning on selecting equipment for their facilities. This attitude confirms the results of this year's *Industry Forecast*, which appeared in the January issue of *BE*. That survey showed that stations and post facilities need and are planning to buy new equipment this year. This year's NAB should be a good buying show for exhibitors and attendees.

However, if you can't attend, don't fret. The *BE* staff of editors and reporters will be there to capture all the important highlights and events. We'll replay them for you in the upcoming May issue.

Meanwhile, where did I put those plane tickets?



Brad Dick

Brad Dick, Editor

NAB Booth #2806
Radio/Audio Hall. Enter to
win an Optimod 8282



See spot.



See spot run.



See spot run without
aggravating the entire audience because it's
too damn loud.

Who needs the aggravation?
With the new OPTIMOD-TV
DIGITAL you never have to
worry about poorly mixed
programs, complaints from irate
viewers, or advertisers devising

diabolical new ways to "punch"
their sound. The 8282 handles
it all quietly, digitally, and
automatically. The OPTIMOD-
TV is fully programmable to
optimize audio processing of

your programs. And with built-in
presets, general programming,
news, sports, film, fine arts and
other broadcasts will always
sound great at home. Never too
loud, too soft, or too spotty.

urban[®]

H A Harman International Company

1525 Alvarado St., San Leandro, CA 94577 USA Phone 1•510•351•3500 Fax 1•510•351•0500.

© 1994 AKG Acoustics, Inc. Orban and OPTIMOD are registered trademarks of AKG Acoustics, Inc. All other trademarks are property of their respective companies.

Circle (7) on Reply Card

www.americanradiohistory.com

FCC Update

Recent fines assessed by FCC

By Harry C. Martin

The FCC has released a list of rule violations and the amounts the offending stations were fined:

- Defective lock on antenna tower fence; public file lacked ownership report and issues/programs list — \$2,500.
- Defective EBS equipment; licenses not posted; operation for more than 30 days with less than 90% of authorized power — \$4,600
- Failure to maintain EBS generator; failure to transmit weekly EBS tests — \$1,800
- Public inspection file not available when requested; lacked ownership report — \$2,000
- Public file not located in community of license — \$2,000
- Operation with defective EBS equipment; public file lacked issues/programs lists — \$2,600
- Public file not located in community of license — \$5,000
- Inoperative EBS receiver; defective remote-control equipment — \$4,200
- Unable to observe transmitter metering from operating position; public file lacked issues/programs list — \$3,750
- Tower enclosure fence destroyed; remote-control transmitter metering not available at remote studio — \$9,000
- EBS receiver and generator inoperative; no log records of EBS tests; remote-control metering of FM is inoperative; unable to observe AM transmitter metering from operating position; public file incomplete — \$11,300
- No EBS receiver or generator at remote-control location — \$3,000.

Quarterly issues/programs lists

All radio and TV stations, commercial and non-commercial, must prepare and maintain quarterly issues/programs lists in their public files.

The lists must provide a narrative of the important issues facing the broadcaster's community of license, and describe the programs that constitute the licensee's treatment of those issues during the preceding three months. The FCC has eliminated the requirement that a mini-



mum of five to 10 issues be listed. Licensees listing significant programming directed to five to 10 issues may be able to demonstrate compliance with their public service obligations at renewal time.

The broadcast time, date, title and duration of each program must be included. The type of programming should also be listed. If the licensee has used one pro-

NRSC-2 AM compliance

After June 30, 1994, all AM stations must comply with NRSC-2 emission limitations, as set forth in Section 73.44(b) of the FCC rules. Also after June 30, stations complying with the NRSC-1 audio processing standard must resume making annual emissions measurements as required by Section 73.1590(a)(6) and (b) of the FCC rules to assure compliance with NRSC-2.

The NRSC-2 emission standard went into effect on June 30, 1990, and was intended to reduce second- and third-adjacent-channel interference in the AM service. Stations adhering to the NRSC-1 audio standard are presumed to be in compliance with NRSC-2 through June 30.

See "Re: Radio" in the upcoming April issue for more detailed information on the regulatory requirements and how to make the required measurements.

gram to treat all of the listed issues, the dates, times and names of participants on specific programs should be maintained to establish that each specific community issue was discussed.

Stations should maintain records on all non-entertainment programming to provide crucial information should there be a license renewal challenge.

Issues/programs lists must be placed in a station's public inspection file by the 10th day of each calendar quarter. The lists must be retained in the public file through one license period (five years for television; seven years for radio).

If a station discovers that one or more of its issues/programs lists was erroneously prepared, it should draft a revised list and explain why the list was modified.

NAB proposes duopoly relaxation

The FCC has sought comment on a petition by the NAB seeking relaxation of certain aspects of the radio multiple ownership rules. The rules went into effect in September 1992 and permit the same entity to own multiple radio outlets in their markets.

In markets, defined by city-grade service contour overlap, of 15 or more stations, a single entity may own up to two AM stations and two FM stations as long as the stations' combined audience share in the market does not exceed 25%. In smaller markets (those having less than 15 stations), a single entity may own three stations (only two AMs or two FMs), but may not own as many as 50% of the stations in the market.

NAB's first proposal is directed to situations where ownership combinations of small-market stations are thrust into a "major" market audience share analysis because the rules do not always consider all of the listening in the "market" in connection with determining whether the 25% audience share benchmark has been surpassed. NAB wants parties in some situations where only one of the stations involved in a transaction converts the proposal into a large-market proposal to be able to elect to have it treated under the criteria for small-market transactions.

In smaller markets NAB wants the FCC to permit a broadcaster to own not more than 50% of the stations. Also, NAB proposes that the rules be changed to permit any single station or AM-FM combination owner to add one more station regardless of the percentage of market stations owned. ■

Date line

On April 1, 1994 renewal applications are due for TV stations in Delaware and Pennsylvania, and LPTVs and TV translators in Montana. Also on April 1, annual ownership reports (or ownership report certifications) are due for all commercial radio and TV stations in Delaware, Indiana, Kentucky, Pennsylvania, Tennessee and Texas. By April 10, all stations should place in their public files their quarterly Issues/Programs list for the first quarter of 1994. Also, June 30 is the deadline for NRSC-2 AM compliance.

Martin is an attorney with Reddy, Begley & Martin, Washington, DC.

Lighting. Latest Technology for News and Production.



Whether tungsten halogen or daylight, whether for on-board, hand-held or stand mounting you will find the right lighting fixture in the Sachtler range. Select the best. Halogen-Reporter 20 W up to 1000 W. Daylight-Reporter 125 W up to 575 W and Production 575 W up to 1200 Watts.

New:
The Reporter 200 DI system and Production 575 DSE open face fixture featuring a heavy duty housing and single ended daylight bulb for high light output. And if you are looking for PAR-fixtures: Sachtler's Production 1200 is the luminaire of your choice – and it's fully focussing.

1 More lighting power for less weight.

2 Better light distribution.

3 Wide focussing range – precise and durable.

4 Highly effective convection cooling – for long bulb life.

5 All tungsten halogen and daylight Reporters up to 270 Watts for mains or battery operation.

6 The range easily exceeds the latest safety standards.

7 Sachtler now offers flickerfree electronic ballasts

for all daylight Reporters combined with quick and quiet solid state ignitors.

processor, senses the state of the battery and charges it speedily and safely.



Sachtler – the most sophisticated on-location lighting system

sachtler®
corporation of America

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

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

Headquarters:
Sachtler AG
Kommunikationstechnik
Germany, Gutenbergstraße 5
85716 Unterschleißheim
bei München
Telephone (0 89) 32 158 200
Telefax (0 89) 32 158 227
Telex 5 215 340 sac d



sachtler
Support & Lighting

Circle (8) on Reply Card

Strictly TV

Digital video

Connectivity

By Curtis Chan

In the past two months, we have covered some of the connection standards used in the digital video domain. This month we will conclude the series with some suggestions on how to implement these divergent technologies.

Cable selection

To start with, even the best equipment's high-quality output can be significantly degraded if poor-quality cable is used to connect equipment. In analog, video cables have low losses from DC to approximately 10MHz, but show increasing attenuation (with respect to length and type) at the higher frequencies usually associated with digital video. In the case of serial digital signals, losses can be equalized easily by using a reclocking circuit consisting of a PLL with an LC or RC oscillator. Parallel regeneration and equalization is more complex and will be discussed later.

The only caveat with coax used for serial digital transmission is that the frequency response should be roughly proportional to one over the square root of the frequency for frequencies below 1MHz. This is because low-frequency deviation can impair the operation of automatic equalizers. Luckily, there are numerous cables that meet the requirements for serial digital transmission. In the United States, the main ones include Belden 8281, 9292, 1505A and equivalents. The 1505A cable is thinner, lower in cost, more flexible, and has less attenuation at high frequencies than 8281 cable.

Connectors and patch panels

Since the introduction of digital video, we have seen more BNC connectors with 75Ω impedance rather than the standard 50Ω. This impedance mismatch is not a problem at analog frequencies, but needs to be considered when routing digital video signals around a facility. It is advisable to use 75Ω connectors where applicable and to make sure they will mate with existing 50Ω BNC connectors. Ex-



tend the same practice to patch panels to avoid reflections. In newer installations, maintain the option of using 75Ω patch panels that exhibit low reactive components up to 300MHz.

Equalization and regeneration

Those who have installed digital signal paths understand that electronic properties, including frequency rolloff and

It is advisable to use 75Ω connectors where applicable and to make sure they will mate with existing 50Ω BNC connectors.

phase distortion, act on the digital signal's integrity. Although a digital signal has a certain degree of robustness, there is a point at which data cannot be recovered. In video, the most common problem will be either a degradation or complete loss of the picture. In either case, long cable runs are the main culprit. To combat this, most digital equipment provides some type of equalization and signal regeneration at its inputs for signal recovery. This allows signal retransmission with a minimal accumulation of errors. For digital video, both serial and parallel equalization and regeneration are available.

As discussed earlier, serial regeneration is the simplest process. It encompasses cable equalization for cable runs of 1m or less, clock and data recovery, and the retransmission of the data using the recovered clock. Reclocking of the signal is handled by a PLL-based oscillator circuit. Parallel regeneration is much more complex and involves three steps. The first step is deserialization of the signal and is usually handled by a decoder. From here, parallel reclocking of the signals takes place and then the signal is re-encoded and serialized through either an internal or external serializer. With

recent advances, this can take place on a chip with little support electronics or as a piggyback board integrated into the signal path.

It should also be noted that a parallel regenerator has a loop bandwidth of only a few hertz compared to its serial counterpart. As a result, the parallel scheme can reduce jitter more than a serial regenerator, but at the expense of greater complexity. The inherent jitter in a crystal-controlled time base used in parallel regeneration is much less than its LC or RC serial counterpart. This means that serial regeneration can be performed dozens of times before parallel regeneration is necessary. Invest in proper monitoring equipment to take the guesswork out of the process.

Format conversion processes

Beyond equalization, the other main consideration is rate or format conversion between the various digital composite and component standards with their respective serial or parallel interfaces. This takes place in two basic steps: the encode or decode process and the rate conversion process. The rates to convert are 13.5MHz for component, 14.3MHz for NTSC composite and 17.7MHz for PAL. The format conversion process is straightforward. For component to composite, first rate convert from 13.5MHz to 14.3MHz (NTSC), then encode. The opposite is true for composite to component. Decode the composite signal to component, then follow with rate conversion and output as a component signal.

The encode/decode process and the rate conversion process are major contributors to the quality of the output. If either one is flawed, output quality suffers. Because of this, rate converters use extremely accurate algorithms to compute between the physical location of the source pixel data and the physical location of the destination pixel data. The hardware must produce accurate coefficients and minimize any rounding errors in the process. Imagine having to do this in real time with a PAL composite image with close to 710,000 pixels.

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

TO 30 M-MOV
D-3 1/2 DIGITAL

Maxell of America 22-08 Route 208, Fair Lawn, NJ 07410 Phone 1-800-533-2836

Management



Departmental motivation

Speed as a departmental culture

By Rick G. Morris

Joe was proud of all that he had accomplished in his short time as chief engineer. He was beginning to turn his department around. His staff was happier because they knew that their boss was interested in them. They had a concept of where they were going and how they were going to get there because Joe had implemented the vision statement and departmental goals. But there was still much to be done. The time to turn around broken ENG equipment was high, his overtime report was high, and his transmitter routine maintenance was not getting done on time. His department was gaining respect, but the other department heads still perceived engineering as a bottleneck in getting work done. It was time to consider his department's efficiency.

The importance of efficiency

Much has been made of the change in American business; how we have once again become perhaps the most productive work force due to global competition and how business has become lean.

The first industries that adapted to the new business realities were those with international or other direct competition that fluidly changes. Unfortunately, broadcasting has been one of the last industries to adapt because its competition tends to be more static. However, in times of a sustained down economy, followed by times of low inflation, each cost center has become magnified in importance. Companies are able to replace entire segments of their business with fast, efficient specialists through outsourcing. Even engineering and maintenance departments can be replaced on a contract basis. Some stations even contract out their management or are merged into duopolies to downsize.

Speed as a departmental culture

An observer of broadcasters said that in today's competitive marketplace speed is life to the media company. A CEO of a company with broadcast interests had

promulgated the ideals of speed, simplicity and self-confidence for his employees. Why has the concept of speed impressed two such diverse people? Speed in corporate culture is part of economic and management efficiency and of employee empowerment. It is also a matter of survival on the corporate and on the departmental level.

The concept of speed involves providing employees with the necessary amount of empowerment needed to accomplish a task.

The concept of speed involves providing employees with the necessary amount of empowerment needed to accomplish a task. Empowerment begins with the lowest-level employee and is accomplished by giving employees the authority to do their job, removing barriers, and giving permission to enjoy creative interaction between departments with a minimum of structural bureaucracy.

To increase the speed in your department, review the current procedures your department follows to determine inefficiency. For example, purchases that are routine or budgeted for should be made by those responsible for their implementation and perhaps checked by finance. If it is not a budgeted purchase, it may require more significant scrutiny. If it is a budgeted purchase, you hired that person to do that job and too many checks can become inefficient. If they overspend, take corrective action at your monthly budget report time. But until they go astray, let them do their job unfettered.

Implementing speed as culture

Review your procedures, forms and reports. Most organizations have people doing unnecessary activities and moving unnecessary paperwork. Frequently, reports that were requested by people at one time are still being produced years

after those who required them have left the company. Look at every form, report and procedure. Who requested it? What purpose does it serve? Who reads it? Why? Is there another report or procedure that accomplishes the same thing? Ask those who deal with your department how quickly they can get common tasks accomplished. Are there any structural impediments, such as not trusting your workers with the resources needed to get their job done? How many people are involved in each task? How many are necessary?

Get all employees involved. Examining paper and procedures must be made from the ground up and should include everything and everyone. Pay attention to the tasks that the employees mention as unnecessary, take too long or are burdened with procedure and approvals.

One company saved a million pages of paper by simplifying its maintenance procedure to one step by having the person who discovered a problem communicating the situation to the person who was responsible for fixing it.

Speed as motivator

The benefits of a culture of speed are significant. First, by giving employees the *responsibility* and *authority* to accomplish their work, you will increase their job satisfaction and reduce job frustration. Second, an employee who gets to accomplish more significant work will feel a greater sense of contribution and importance. Third, speed and efficiency in getting the work done will reduce employee stress. Finally, the trust you place in your employees in a speedy workplace will make them realize the success of the organization depends on them.

Management of your department and your own job will also benefit from the culture of speed. You will be able to do more work in a shorter time and your department will have a "can do" attitude. Also, a swiftly reacting department that accomplishes tasks on schedule will improve your reputation within the station. Once again, engineering will be the reliable department that does what they do well while making it look easy.

Morris is an assistant professor of Radio/TV/Film at Northwestern University. He is a former TV manager at the station and network levels.

Dual Domain Audio Testing

Don't Take Chances



We have a System that works. System One from Audio Precision

In studios and labs, on benches and factory floors, in stations and networks, thousands of System One Audio test systems around the world attest to the fact that this is the System that works. Hardware and software refined to match the application produce both superior performance and superior reliability as demonstrated by our three year warranty on parts and labor.

THE RECOGNIZED STANDARD

System One is known the world over as the recognized standard in audio test and measurement. Component suppliers, manufacturers, equipment reviewers, and end-users all rely on Audio Precision for measurement quality they can trust.

COMPREHENSIVE & FAST

System One is a completely integrated digital and analog audio test system. By combining all the necessary instruments into one package System One provides higher performance at lower cost than conventional instruments. In addition, System One can grow with your needs. Your initial purchase of a basic System One allows you to add any option later.

Optional FASTTEST & FASTTRIG DSP capabilities test any audio channel, producing 160 measurements from a stimulus signal less than one second in duration. Options such as input and output switchers and the DSP-based FFT and digital domain modules make "one-stop" audio testing easy.

EASY TO USE

Straightforward features and stored sample audio tests make System One easy to use. Color graphic test results also may be copied to printers and plotters.

GO/NO-GO testing against limits and test sequencing with automated procedures save time and repetitive motions.

HIGH PERFORMANCE

New digital and analog technologies leave yesterdays "good enough" performance far behind. System One easily handles high performance challenges such as state of the art analog preamps or digital recording systems.

The Integrated System One offers premium specifications and performance, but at no premium in price compared to lesser test sets or equivalent separate instruments.

Our worldwide force of Audio Precision representatives will be pleased to provide further information and an onsite demonstration.



Audio precision

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

Circle (10) on Reply Card

INTERNATIONAL DISTRIBUTORS Australia: IRT Electronics Pty., Tel: (61) 2 439 3744 Austria: ELSINCO GmbH, Tel: (43) 222 815 04 00. Belgium: Trans European Music NV, Tel: (32) 2-466 5010 Bulgaria: ELSINCO, h.e. Strelbishte, Tel: (359) 92 581 698 Canada: GERRAUDIO Distribution, Tel: (416) 696-2779 China: Hong Kong: A C E (Int'l) Co. Ltd., Tel: (852) 424-0387 Czech Republic: ELSINCO Praha spol. s r.o., Tel: (42) (2) 4702 1, 451, 452 Denmark: npn Elektronik aps, Tel: (45) 86 57 15 11 Finland: Genelec OY, Tel: (358) 77 13311 France: ETS Mesureur, Tel: (33) (1) 45 83 66 41 Germany: RTW GmbH, Tel: (49) 221 70 91 30 Hungary: ELSINCO KFT, Tel: (36) 112 4854 India: HINDITRON Services PVT., Tel: (91) 22 836-4560 Israel: Dan-El Technologies, Ltd., Tel: (972) 3-544-1466 Italy: Audio Link s.n.c., Tel: (39) 521-598723 Japan: TOYO Corporation, Tel: (81) 3 (5688) 6800 Korea: B&P International Co., Ltd., Tel: (82) 2 546-1457 Malaysia: Test Measurement & Engineering Sdn. Bhd., Tel: (60) 3 734 1017 Netherlands: TM Audio B.V., Tel: (31) 034 087 0717 New Zealand: Audio & Video Wholesalers, Tel: (64) 7 847-3414 Norway: Lydconsult, Tel: (47) 9 19 03 81 Poland: ELSINCO Polska sp. z o.o., Tel: (48) (22) 39 69 79 Portugal: Acufon Electroacustica LDA, Tel: (351) 1 9414087 / 9420862 Singapore: TME Systems Pte Ltd., Tel: (65) 298-2608 Slovakia: ELSINCO Bratislava spol. s r.o., Tel: (42) (7) 784 165 South Africa: SOUNDUSION, Tel: (27) 11 477-1315 Spain: Telco Electronics, S. A., Tel: (34) 1 531-7101 Sweden: Tal & Ton Elektronik AB, Tel: (46) 31 80 36 20 Switzerland: Dr. W.A. Gunther AG, Tel: (41) 1 910 41 41 Taiwan: ACESONIC Intl Co., Ltd., Tel: (886) 2 719 2388 United Kingdom: SSE Marketing Ltd., Tel: (44) 71 387-1262

Production

Microphone basics

Mixing microphones in the field

By Christopher Lyons

The portable audio mixer has traditionally been a key element in remote broadcast and field production of news, sports and other programming.

Today's audio mixers offer additional features and better audio performance compared to earlier models. As the complexity of audio production has increased, audio mixers have continued to fill the role of go-anywhere, do-anything tools.

Today's audio mixers offer significantly better performance than earlier models.

Stereo mixers for mono programs

Even if true stereo recording is not part of a particular production, an audio mixer with stereo capability can have many applications. One option is *split-track* or *dual-mono* mixing. This allows individual voices to be isolated on different tracks of tape – a popular technique among some news magazine crews. By keeping the interviewer's microphone feed separate from the guest's, noises, such as clothes rustling against a lapel microphone will only be recorded on that microphone's track. The offending mic's channel can be muted or attenuated during post-production, keeping the problem out of the final mix. The two voices can also be independently processed, if necessary, and voice levels can be more closely controlled and matched.

A similar technique isolates the feeds from two microphones when they are redundantly miking the same source (for example, a wireless lavalier microphone and a hard-wired boom microphone on a moving interview subject). Recording the two microphones' outputs on separate tape tracks keeps the boom microphone's signal free of any momentary interference or dropouts from the wireless mi-

crophone.

An audio mixer with two output channels can also be used to create a different *utility mix*, which includes additional audio sources that are not included in the recorded or broadcast program mix. For example, you could feed the mixer's left channel to tape/air while its right channel is used for a monitoring or communications feed, including both the on-air microphones and a director's communications microphone. In this case, on-air microphones are assigned to both left and right channels (or panned center), while the communications microphone is assigned (or panned) to the right channel only.

Another application of secondary mix-

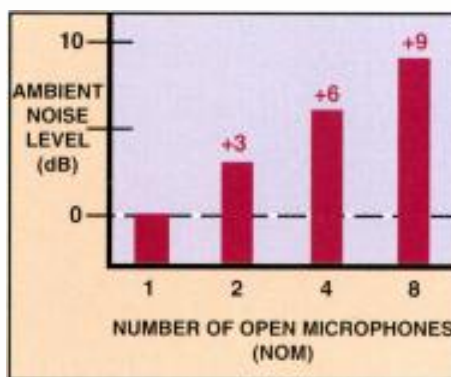


Figure 1. The increase in ambient noise pickup caused by increasing the number of open microphones. Graph assumes all microphones are of equal sensitivity.

ing occurs when a PA system is involved. For example, while the broadcast feed may require the added ambience provided by an audience microphone, this arrangement may cause feedback if it is fed to the audience's PA system. In this case, create a separate mix for the PA system that does not include the feedback-prone crowd microphone. Talent and guest microphones feed both channels of the stereo mixer, while the crowd mic is assigned only to the channel that feeds the broadcast.

Automatic mixers

A loud PA system combined with multi-

ple open microphones may result in feedback even without the use of a separate crowd mic. In these cases, guest microphones must be turned down when not in use and turned up quickly when the guest wishes to speak. However, factors, such as poor sight lines, fast pacing, and the unscripted nature of many talk shows often conspire to make it nearly impossible for a human operator to react quickly enough to avoid cutting off someone's first words.

One solution is to use an automatic or *voice-activated* mixer, which can recognize a talker and turn on the appropriate microphone in just a few milliseconds. This offers multiple benefits. First, keeping the number of open microphones to a minimum provides the most gain before feedback from the PA system. To maintain a safety margin below the feedback point, some automatic mixers also decrease the master gain slightly as additional microphones are turned on. This eliminates the risk of feedback during heated exchanges involving simultaneous talkers.

Similarly, each additional open microphone picks up an additional measure of ambient noise and room reverberation. (See Figure 1.) With a live audience or in a non-studio location, the audible effect of these additional open microphones can be considerable. By minimizing the number of open microphones, an automatic mixer reduces the amount of ambient noise and room reverberation in the broadcast mix. This makes for a cleaner, more intelligible audio signal with a better "speech-to-noise" ratio. (See "Solving Multiple Open-Microphone Problems," January 1992.)

By taking full advantage of the flexibility and portability of today's microphone mixers and mixing techniques, audio engineers can make studio and field production easier, while delivering a better quality product to their customers — both producers and listeners. ■

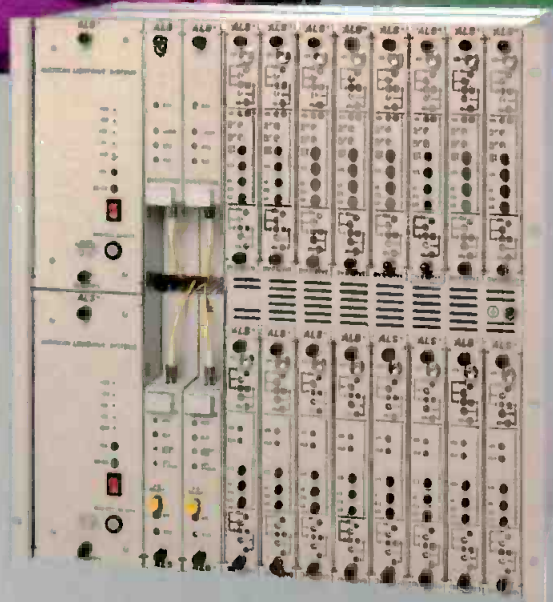
Lyons is an applications specialist at Shure Brothers, Evanston, IL. Respond via the BE FAXback line at 913-967-1905.

➡ For more information on portable microphone mixers, see pp. 55-56 of the 1994 BE Buyers Guide.

THE FUTURE IS REAL



The DV6000, 2.4 Gb/s, sixteen channel system with powerful drop/add/pass capability



DV6010, 1.3 Gb/s eight channel system, available also with Smart Alarm Panel (not pictured)

American Lightwave Systems brings uncompromised video quality and channel management flexibility to fiber video transmission. The DV6010™ and DV6000™ are high speed digital transmission platforms with eight and sixteen channel per wavelength capacities. Video and audio encoding does not employ waveform processing or compression, thereby eliminating artifacts. With 10 bit encoding,

RS-250C short haul specifications are exceeded. Audio is 20 kHz bandwidth and CD quality. Encoders and decoders are universal, and are available in a wide variety of formats. DS3/DS1 telephony channels may also be transported simultaneously. DV systems also support module and fiber path redundancy.

These systems are completely modular, compact, and NEBS compatible for telephony

Installation. The eight channel DV6010 provides bidirectional transmission within a single shelf and is ideal for point to point applications. The sixteen channel DV6000 has powerful channel drop and insert capabilities and is ideal for creating multipoint ring and star networks for metropolitan areas.

With DV6010 and DV6000, the future is real.

Circle (11) on Reply Card

ALS AMERICAN LIGHTWAVE SYSTEMS, INC.

999 Research Parkway, Meriden, CT 06450 (203) 630-5770; FAX (203) 630-5701

Domestic and International Sales Offices also in California, Colorado, Connecticut, Georgia, Illinois, Massachusetts, Minnesota, Texas, Virginia, Belgium, Canada, Japan, Korea, Singapore, United Kingdom, Venezuela.



Troubleshooting

Lightning and surge protection

Surge protection for technical equipment

By Michael F. Stringfellow, Ph.D

Even buildings with good lightning protection are vulnerable to lightning currents. Damage to sensitive electronic equipment cannot be mitigated simply by the installation of lightning rods.

Lightning injects transient currents into power and signal lines via direct and indirect means. Direct injection results from the flow of lightning through the building itself and some fraction of these currents will also flow in anything connected to the building. Roof-mounted electrical or communication equipment might also be struck by lightning, injecting severe currents directly into the building's wiring. The flow of large currents into the building's ground electrode raises the voltage of the whole building. This voltage stresses the insulation of interface equipment and serves to inject lightning currents in services entering the building from outside.

Indirect injection results from electromagnetic induction. The electrostatic, magnetic and RF fields transmitted by lightning discharges can induce large voltages and currents in unshielded wires.

Surge suppressors

Surge suppressors generally include at least one non-linear component, such as a gas tube, diode or varistor. These components are shunt-connected across the protected line, and when a transient voltage exceeds a threshold value, the resistance of the non-linear device drops. (See Figure 1.) This results in shunting of transient currents through the device and a lowering of transient voltage at that location. The unwanted surge current is reflected back to the source and away from the protected load.

A common myth is that surge suppressors *absorb* unwanted transient energy, and therefore, their "energy rating" is often used to select protection devices. In fact, the best suppressors have the *lowest* resistances when they operate and they actually absorb little energy. They would more aptly be called by their origi-

nal name, *diverters*.

The level at which a transient is restricted is the *let-through* or *clamping voltage*, and as Figure 1 indicates, it depends on the magnitude of the surge. Non-linear devices cannot operate too close to the working voltage of the line. In practice, clamping voltages are often double the initial operating voltage of the circuit, but this is usually more than adequate to protect equipment.

Cascading or networking suppressors

The first location to shunt surge current is as close as possible to its source. For lightning and external sources, this is the

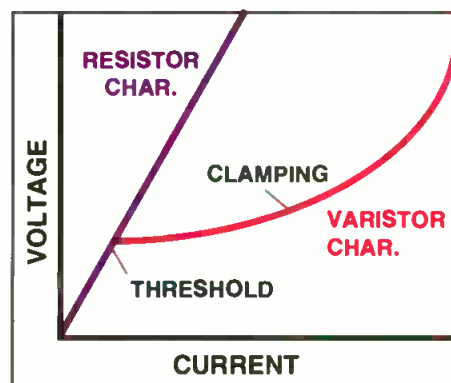


Figure 1. Varistors are typical non-linear surge suppressor elements.

point where the vulnerable service enters or leaves the building. Primary surge protection at the point of entrance is now a requirement of the U.S. National Electrical Code (Section 800-30) for any communication circuits exposed to lightning. Service entrance protection for AC power is not yet a code requirement but is recommended in several standards, including the new IEEE standard 1100-1992 (*Emerald Book*, "Powering and Grounding Sensitive Electronic Equipment").

Surge protection should also be applied at or close to sensitive electronic equipment, typically at the nearest distribution panel. Particularly hazardous for electronic equipment are differential voltages between AC power and signal lines, which can damage a device's communi-

cations interface and power supply. Suppressors protecting services and referenced to the same ground point are essential in these circumstances.

The use of two or more suppressors on a power or signal line is known as *cascading* or *networking*. The impedance of the line between stages generally results in the first suppressor encountered by a surge conducting a higher fraction of the surge current than those further down the line. This strategy is only effective if the clamping voltages of the cascaded devices are coordinated reasonably well.

Overall protection

Protection for broadcast facilities involves lightning protection, bonding/grounding for the structure, and surge suppressors on vulnerable lines. Cascaded suppressors offer the most cost-effective solution, especially in lightning-prone areas. The following steps can increase the reliability of lightning protection:

1. Install a lightning-protection system that diverts direct lightning strikes away from sensitive equipment, provides a low-impedance down-conductor path with bonding for isolated parts of the structure, and a grounding terminal that can discharge currents into the ground.
 2. Install heavy-duty surge suppressors on any service entering or leaving the building. Do not ignore roof-mounted equipment and all communications, control and signal lines. Coaxial cables should have their shields grounded where they enter or leave the building.
 3. Install medium-duty surge suppressors at distribution panels serving sensitive electronic equipment or in equipment racks, together with secondary signal line suppressors with grounds referenced to the local equipment chassis. Ground coaxial and signal line shields at each end.
- Finally, provide a bond between all grounding systems (signal, AC power and lightning protection). Avoid isolated grounding schemes.

Stringfellow is chief scientist at EFI Electronics Corporation, Salt Lake City. Respond via the BE FAXback line at 913-967-1905.

THE RICH NO LONGER HAVE ALL THE POWER

Witness

The Beginning Of A Revolution

At NAB Booth #11953.

Abekas
A Corbis Company

a radical
departure

Circle (12) on Reply Card

www.americanradiohistory.com

THIS WORKHORSE LEAVES EVERYTHING ELSE IN THE DUST.

DIGITAL BETACAM. THE NEW STANDARD IN BROADCAST VTRS.

Grab a hold of the future. And get everything you need today. Digital Betacam® VTRs are quickly becoming as accepted as one-inch. And this digital component quality VTR even gives you analog composite quality output superior to one-inch. It's Betacam based. It's reliable, consistent, and offers dramatically lower operating and maintenance costs than any other digital recorder. Everything's going digital. But this digital workhorse also pulls its weight today.



SONY



DIGITAL VIDEOCASSETTE RECORDER DVW-A500

Digital BETACAM

ANALOG/DIGITAL

INPUT
SELECT

AUDIO INPUT/MONITOR SELECT

VIDEO INPUT
SELECT

REMOTE
1 (BP)

SIF

CH-1

CH-2

CH-3

CH-4

SIF

CUE

COMPONENT
(Y-R-B)

2 (50P)

MONITOR
SELECT

AES/EBU

ANALOG

R

COMPOSITE

ANALOG

CHANNEL CONDITION

Digital

MENU

VTC

00:00
SECONDS FRAMES

RESET

TIME CODE

COUNTER

PAUSE

U-STEP

TC

CPL

EDIT

REC INHIBIT

F FWD

STOP

PLAYER RECORDER

PLAYER

RECORDER

SHUTTLE JOG VAR

REVERSE

FORWARD

WHY DIGITAL BETACAM IS THE ONE-INCH OF THE 90s.

SONY

We all know the future is digital. But the Digital Betacam® format is the format that also takes care of today. It's the industry's digital workhorse, and the one that should be working for you right now.

WE MADE DIGITAL COMPONENT QUALITY AFFORDABLE.

Production standards are rising all the time, but budgets and project times are not. Many formats and options are available. And naturally you're looking for the best quality, affordable systems, and the greatest value in extending what you own today. You may not know that even in an analog environment, Digital Betacam VTRs give quality in analog far superior to one-inch. In its true digital component domain, it's what you've been asking for: true component quality with many features that save time and money. Our pilot tone technology provides flawless tape interchange and consistently accurate insert edits. Built-in interfaces connect to virtually any system with our 43 connectors. And pre-read capability lets you use two machines in place of three. It all adds up to value.



YOU DON'T HAVE TO LEAVE THE PAST BEHIND.

What about your investment in your present system? Archive materials? Compatibility with other houses and stations? The feed from analog acquisition systems? Not to worry. This VTR is Betacam because that's the format the industry's been relying on for over ten years. You can play analog Betacam tapes in Digital Betacam VTRs.* And with Serial

Digital Interface connectors you can easily integrate with no worries that it'll be obsolete tomorrow.

LOWER OPERATING AND MAINTENANCE COSTS.

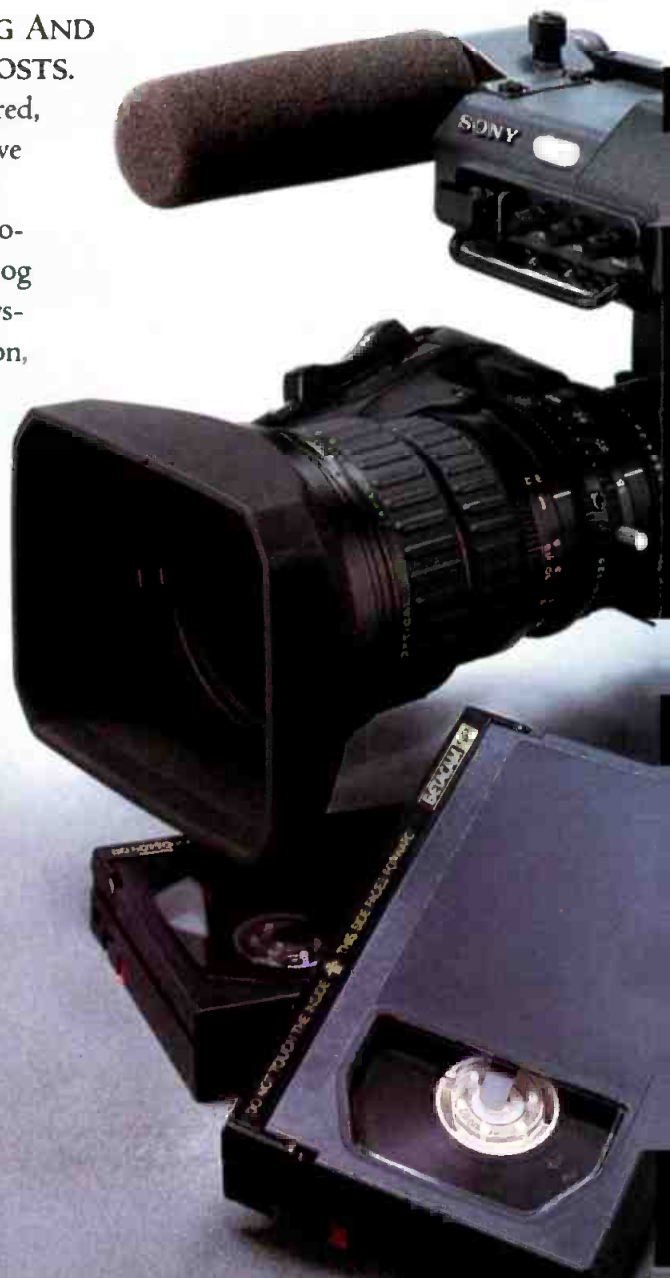
All things considered, Digital Betacam VTRs give you a far more economical way to do your broadcast production. It fits with your analog Betacam VTR or one-inch systems. With Bit Rate Reduction, it consumes less tape than any other digital format. This turns a 90-minute cassette into a 124-minute one. And it reduces wear and tear on internal parts as compared to other digital VTRs, keeping maintenance costs, on average, equal to analog systems. For example, you can replace a digital head in under 30 minutes. Which translates

into less downtime and a more profitable facility. And because its simple tape transport makes routine maintenance so easy, Digital Betacam VTRs require minimal test equipment or additional training.

MAKE IT WORK FOR YOU.

It's clear that Digital Betacam is the workhorse for the 90s. All that's left is to get it working for you. To find out how, call 1-800-635-SONY, ext. DVW.

INNOVATION AT WORK.

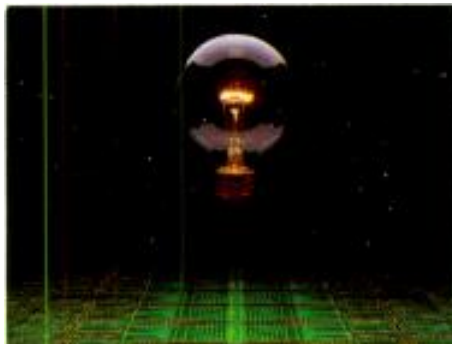


Sony Business and Professional Products Group, 3 Paragon Drive, Montvale, NJ 07645-1735.

© 1993 Sony Electronics, Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. Sony and Betacam are trademarks of Sony.

*A Series DVW VTRs.

Technology News



Evolving CD standards

By Curtis Chan

How many forms can a CD take? If you answered at least seven, you are right. It makes you wonder if Philips and Sony (the companies that introduced the CD) knew of the many forms that the CD would take. Their introduction of the compact disc digital audio standard, commonly known as the *Red Book* standard, would eventually change not only the way in which we listen to music, but would become one of the major driving forces behind the multimedia revolution.

Red Book audio CD standard

The Red Book describes the audio CD found in today's music stores. It is also the foundation for other CD standards. The track type is defined as CD-Digital-Audio (CD-DA) for audio music. The Red Book specifies that audio is on the CD in one or more tracks. These tracks are subdivided into sectors containing 2,352 bytes of audio data in digital form. Also specified are two layers of error detection and error correction code. Ninety-eight control bytes are added to each sector that contain the timing information. These bytes are read by the CD player as song playing time.

Yellow Book-CD-ROM standard

The second phase of the CD industry started when Sony and Philips introduced the CD-ROM standard known as the *Yellow Book*. The Yellow Book further defines the standards set by the Red Book by adding two types of tracks commonly known as CD-ROM Mode 1 for computer data and CD-ROM Mode 2 for compressed audio, video or picture data. Because the CD-ROM Modes 1 and 2 use the Red Book standard as a foundation, the Red Book error detection and correction and control bytes are also used.

The difference between the modes is in a redefinition of how the 2,352 bytes of data are organized. Mode 1 uses an additional layer of error detection and correction (for computer data) while Mode 2 does not and has 14% more capacity for storage. Generally, Mode 2 discs are re-

coded in an XA format. Otherwise, they require custom software and interface to be decoded on a normal CD-ROM drive.

When a CD has data (CD-ROM) and audio (CD-DA) tracks, it is referred to as a Mixed Mode Disc. These are distributed by mail or at trade shows where companies are trying to get their message out via a mix of CD-ROM data and audio. Two common methods are used in this mode.

The Red Book is the foundation for other CD standards.

One reads the program and data into the computer and runs the program from the computer memory while using the CD-ROM drive as an audio player. The other method alternately reads in a portion of the program and data.

CD-ROM/XA

The third standard, called *CD-ROM/XA*, was issued by Philips, Microsoft and Sony. The new track type defined by this standard is CD-ROM Mode 2, XA format and is used for computer data, compressed audio data and video/picture data.

Because a CD-ROM/XA track may interleave Mode 2 compressed audio and Mode 2 data sectors, additional hardware is needed to separate them when playing the disc. There are two types: CD-ROM Mode 2, XA Format, Form 1 for computer data and Form 2 for compressed audio data and video/picture data. Using audio compression, 1.25 hours (stereo) at 16-bits/sample and 44.1kHz for CD-DA can be achieved; up to five hours stereo or 10 hours mono at 4 bits, 37.8kHz; and 10 hours stereo, 20 hours mono at 4 bits, 18.9kHz. Playing time is reduced when other data is added. In either case, there is approximately 660MB of storage per disc.

CD-I ready format

CD-I Ready disc is a standard audio disc with some additional features. Audio discs

have a 2- to 3-second pre-gap of audio silence in front of track No. 1 that players skip over. A CD-I disc increases the track No. 1 pre-gap to at least 182 seconds and hides CD-I information in this area. The data can consist of lyrics, text, visual presentation, biographies and title information. CD-I also has three playback methods: 1) audio playback, 2) displaying information as the audio is playing, and 3) allowing compressed audio and data to be read from the hidden pre-gap at what appears to be the same time for playback.

CD-Bridge disc

The CD-Bridge Disc specification defines the way to add additional information in a CD-ROM/XA track to allow the track to be played on a CD-I player connected to a TV set or from a CD-ROM/XA player connected to a computer. A common example of a CD-Bridge Disc is the Kodak Photo-CD disc.

ISO 9660

Before ISO 9660, developers had to create their own file structures. This resulted in more time spent by the developer and confusion by the user. Often, users had to restart their computer when changing applications to load software for the new file structure. To resolve this dilemma, the ISO 9660 standard was drafted for CD-ROM. For computers reading ISO 9660 discs, a software extension must be loaded. ISO 9660 allows multiple types of computers to access the same files so that an IBM, Apple and UNIX computer can read the same disc.

Exceptions to the standard make many CD-ROMs not ISO 9660 compatible. These include the High Sierra discs that pertain to the period prior to ISO approval. The HFS by Apple is another, although Apple has written drivers to allow Macs to read ISO 9660, High Sierra and HFS. Finally, there are custom file formats with discs being written in file formats that have not been converted or are using other operating systems.

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

SBE Update

SBE certification update

By Jim Wulliman

With this issue, the SBE resumes a regular column in *Broadcast Engineering* magazine. Our purpose is twofold: To bring useful information about the SBE to the readers, while at the same time identifying elements of emerging technologies most likely to have a significant impact upon our membership and the broadcast profession. The column will begin with a report on one of the most important services the SBE offers — the certification program.

— Terry Baun, SBE vice president, and chair, Industry Relations Committee

The Program of Certification is a service of the SBE contributing to the advancement of broadcast engineering. It is one of many services the SBE offers to its membership and the broadcast industry.

SBE certification was conceived as a level of industry recognition superior to the FCC First Class License and was required in order for a person to advance to chief engineer at a radio or TV station. This idea evolved into the SBE Certification Program, which recognizes persons having at least 10 years of significant broadcast industry technical experience.

Certification by exam for the 5-year and 10-year experience level soon followed. When the FCC eliminated the First Class License, the SBE introduced the Technologist level of certification as the entry point to the certification process.

The SBE Certification Program is a valuable tool for station managers and chief engineers when they have to make personnel decisions.

The value of certification to members is made clear by *Broadcast Engineering* magazine's annual salary survey. (See the October 1993 for the latest information.) The survey shows that those who are certified generally receive higher salaries than those who are not certified.

Some companies offer a salary increase to their engineers when they become certified or advance to a higher level of certification. Others require a person to be SBE certified when hired or give them a reasonable amount of time to become certified during their employment.

Wulliman is director, Ennes Foundation, and chairman, SBE Certification Committee.



TEST DATE	TEST LOCATION	APPLICATION DEADLINE
March 22	NAB Convention, Las Vegas	Closed
June 3-13	Local chapters	April 15
Oct. 14	SBE Engineering Conference, LA	Aug. 13
Nov. 4-14	Local chapters	Sept. 9

Table 1. 1994 SBE certification test schedule.

New training course

In response to industry requests, the SBE Certification Committee has announced a new program: entry-level training and certification for radio operators. This Radio Operator Training Course and Examination was authored by John Barcroft, a radio chief engineer and San Diego chapter chair. The course will consist of a training manual, which includes exam questions coordinated with the text, and a written examination to be administered locally. The course will be available through the certification secretary at the SBE national office in Indianapolis.

The Radio Operator Training Course is designed to replace the former FCC Radiotelephone Third Class Operator License with the Broadcast Endorsement

Now available...

The SBE Radio Operators Certification Handbook. Order your copy from the SBE office or pick one up at the SBE booth at the NAB Convention. Cost is \$35 including S&H. Credit card orders: 317-253-1640.

that was discontinued by the FCC in 1977. SBE will offer this course in response to an expressed industry need for a benchmark verifying that new operators receive proper training in the performance of their FCC-mandated duties.

Supplemental information about the equipment in the station may be added to the basic material in the training manual to provide a training course customized for specific station operations. Radio station operators, as well as persons wishing to enter the broadcast industry, will find this training manual an excellent resource.

The Certification Committee plans to follow up the Radio Operator Training Course with a similar one for television and will continue to look into the need for additional certification specialties. Gerry Dalton, MIS director for SBE, is working on new software for generating our examinations that will allow us to select questions from various areas of specialization. This will permit the SBE to grant certification with special endorsements, such as satellite, video, computer editing, RF, contract engineering, management or other developments that may be important to the SBE membership.

The broadcast industry is undergoing many changes. People renewing their certification find that their "broadcast-related" experience has become a greater part of their job than in the past and call the national office to find out how this will affect their recertification. Continuing education, staying current and learning new skills for future positions in broadcast and related engineering, has always been a vital part of the SBE Certification Program renewal process.

SBE is responsive to the needs of its membership and the industry and will continue to develop the Certification Program and its associated educational opportunities to help members maintain and increase their skills in the broadening field of telecommunications.

The Certification Committee would like to hear your suggestions on how the SBE can help you learn skills and evaluate your understanding of the complex world of telecommunications. See the Editor's note for address information. ■

Editor's note: For more information, write to SBE at 8445 Keystone Crossing, Suite 140, Indianapolis, IN 46240; phone 317-253-1640; fax 317-253-0418; BBS 317-253-7555.

**Once you start
Engineering with Vision,
who knows what
you can achieve?**



?



?



?



?



?



?

Until now, every time you decoded an image, it became degraded. It was unavoidable. Until now. Prism from Snell & Wilcox allows you to break away from the technology of the past. The Prism digital decoding system is a virtually transparent bridge for multi-format interchange. And with the ever-growing need in broadcast and post-production to move between composite-based material and component processing devices such as digital effects, computer graphics, still stores, and standards converters, Prism has broken the mould at just the right time.

Prism is a quantum leap in quality and stability terms when compared to conventional decoders. Its output is, quite simply, a true reference standard signal in both PAL and NTSC, which therefore offers you the outstanding advantage of total repeatability, even with the most difficult movement, noisy archive material or off-air signals.

Not surprisingly, to achieve such a breakthrough, merely adapting existing technology was never going to be enough. Prism takes a new and innovative approach. Conventional comb decoders are adaptive, using different filters for different areas of the picture and different degrees of motion. But this often creates visible artifacts and requires on-line decision making. Instead, Prism uses just one filter. But a uniquely elegant one.

Prism's single multi-tap, spatio-temporal filter eliminates the unpredictable and user-dependent effects of even the best traditional decoders.

No need for special adjustments or adaptive threshold settings. Not only that, Prism incorporates a whole range of signal processing features that are usually expensive add-ons. The decoder of the future is here. What are you waiting for? Why not contact Snell & Wilcox at either one of the addresses below.

**Whatever decoder
you may have used before,
now it's time to
make a clean break.**

Prism Digital Decoder



 **SNELL & WILCOX** 
Engineering with Vision



Durford Mill, Petersfield, Hampshire GU31 5AZ, UK. Tel: +44 (0) 730 821188. Fax: +44 (0) 730 821199.

Circle (161) on Reply Card

www.americanradiohistory.com

Today, standards conversion is an integral part of the global TV market, but for most people it still remains a deep and complex mystery.

Programme makers now have the finest precision

acquisition and display technologies at their disposal. So naturally they'd like their work to reach audiences, wherever in the world, in its original pristine condition. But wide variations in the quality of standards conversion around the world only too often end in disappointing results. Ideally conversion should be absolutely transparent. However the sheer mathematical limitations of conventional standards conversion technology mean this ideal has always appeared unattainable. The only way to go beyond current limits was to throw out the old thinking and start with a clean sheet of paper.

The Snell & Wilcox design team did just that with Alchemist. And the results it achieves truly justify the word "miracle." Alchemist is the most advanced standards converter ever built. With 8:8:8 input sampling, 12 bit digital internal processing and a range of other unique features, it comes closer than any other standards converter to perfect transparency. And when combined with the power of Ph:C Phase Correlation motion estimation, Alchemist makes even that goal a reality.

Ph:C is the only motion estimation technology to have been developed specifically for real-time broadcast T.V. application, so it's the only one capable of handling effortlessly any material thrown at it. Without supervision. Without worries. Even poor quality input (a headache for normal converters) undergoes a transformation which can only be described as miraculous.

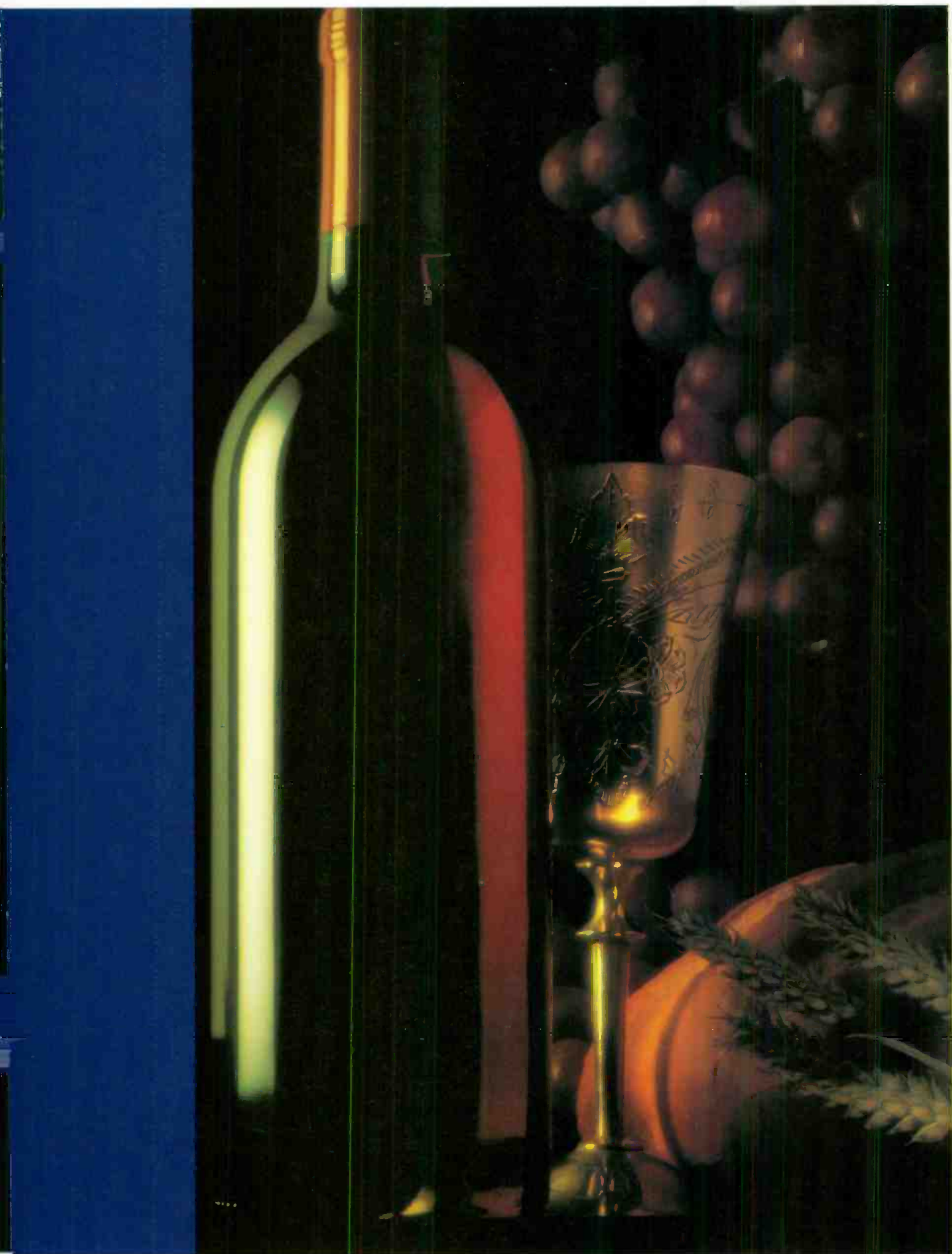
But you know what they say about miracles, you have to see it for yourself in order to believe. To do so why don't you simply contact Snell & Wilcox right now at either one of the addresses below.

**Standards conversion
used to be mysterious,
now it's miraculous.**

Alchemist with Ph:C



Engineering with Vision



Durford Mill, Petersfield, Hampshire GU31 5AZ, UK. Tel: +44 (0) 730 821188. Fax: +44 (0) 730 821199.

Circle (162) on Reply Card

www.americanradiohistory.com

HD5100 Upconverter



Engineering with Vision

Archives, graphics, ENG. Now they can all stretch to HDTV.

For the programme maker, HDTV seems to offer limitless creative opportunities. Until you try to be creative, that is. If only you could use your DVE's box of tricks on that shot. If only you could use your minicams on that action sequence. If only you could insert that piece of conventionally-shot archive footage. Now, you can stop saying "if only". Because to do all this on HDTV, you only need one of these. The Snell & Wilcox HD5100 universal upconverter.

Now, the creative possibilities for the HDTV programme maker have been dramatically stretched to encompass all those tools and techniques available to producers of conventional material. And as you would expect from Snell & Wilcox, all the options of the multistandard environment are catered for. Any 525 or 625 input can be converted to all current HDTV standards. And provisions have even been made for future standards. Picture quality is exceptional. The HD5100 gets the absolute maximum possible out of the 525 or 625 line image and passes it all on to the High Definition picture. The secret lies in the technology. Its unique spatio-temporal filter was developed in partnership with the BBC. (This partnership has resulted in a range of similarly innovative technologies). So now you can stretch to embrace the 35mm picture quality of HDTV without putting the squeeze on your creativity. Why don't you contact Snell & Wilcox at either one of the addresses below.



Durford Mill, Petersfield, Hampshire GU31 5AZ, UK. Tel: +44 (0) 730 821188. Fax: +44 (0) 730 821199.

Circle (163) on Reply Card

www.americanradiohistory.com

Engineering with Vision by Snell and Wilcox.



Prism Precision Digital Decoder



HD3100 HDTV Downconverter



Alchemist with Ph:C



HD5100 HDTV Upconverter



Gazelle Slow Motion



DVS1000 Component Digital Switcher

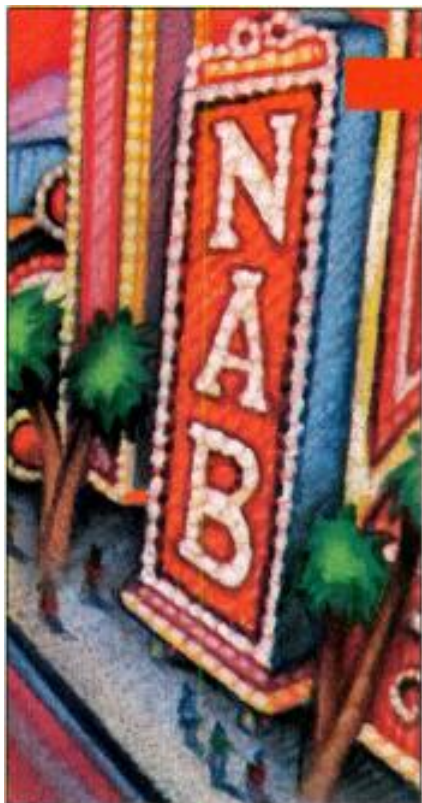


SNELL & WILCOX
Engineering with Vision

1289 Hammerwood Ave, Sunnyvale, Ca 94089, USA. Tel: +1 (408) 734 1688. Fax: +1 (408) 734 4760.
Durford Mill, Petersfield, Hampshire GU31 5AZ. UK. Tel: +44 (0) 730 821188. Fax: +44 (0) 730 821199.

NAB Conference preview

The telecommunications industry is all on line at NAB '94 in Las Vegas.



By John Collinson

Broadcasting and its growing number of related fields will all be major players in the much touted "information super-highway," though the access routes to this thoroughfare may run through presently unfamiliar territory. This year's NAB Engineering Conference will cover the most up-to-the-minute information available on the course of telecommunications technology.

Like last year, the NAB HDTV World Production Conference and Multimedia World will be concurrent with the Broadcast Engineering conference. This year's event occurs March 19-24, about three weeks earlier than last year's. The broadcast engineering and HDTV production conferences will be at the Las Vegas Convention Center, while the Multimedia World will be held at the Las Vegas Hilton.

More than 500,000 square feet of exhibit space will be filled by more than 800 exhibitors. Expected attendance is in excess of 64,000.

Two special technical sessions will be held on Saturday, March 19, ahead of the main conferences. SMPTE will present "The SMPTE Post Experience," a full-day tutorial seminar providing a detailed tour of the world of post-production. The session is scheduled for 9:00 a.m. - 5:30 p.m.

IEEE will sponsor a half-day "Digital Transmission Tutorial" from 9:00 a.m. - 1:00 p.m. on Saturday, as well. This session will provide a detailed examination of digital transmission and modulation techniques, signal robustness in the digital domain, and test methods for digital transmission schemes.

A traditional highlight is the Ham Radio Reception, which will be held on Wednesday, March 23, at the Las Vegas Hilton. An SBE membership meeting will be held on Tuesday afternoon at the Convention Center.

Broadcast Engineering Conference highlights

Leading off this year's conference is a

Collinson is a satellite uplink engineer for Home Shopping Network, St. Petersburg, FL.

keynote address by Jules Cohen, P.E., on Sunday morning. The remainder of the day will include an intensive examination of HDTV, ranging from the latest updates on the work of the Grand Alliance to practical planning for transmission of over-the-air HDTV. Another afternoon session will cover graphics and non-linear editing.

Monday morning will begin with an all-industry keynote address by Reed Hundt, newly installed chairman of the FCC. Sessions will then take up more aspects of HDTV, broadcast engineering management and multichannel TV delivery systems. In the area of maintaining present facilities, other sessions will cover tower maintenance, contract engineering, RFR and legal issues.

Tuesday is the annual SBE Day, with the technical sessions presented by the Society of Broadcast Engineers. Featured topics include designing a serial digital TV facility, TV automation, the new EBS system, and a digital TV test and measurement workshop.

The engineering achievement awards lunch will be on Wednesday. Awards will go to Charles Morgan, senior vice president and vice president of engineering of Susquehanna Radio, and Thomas Vaughan, president of Pesa Microcommunications. Sessions on Wednesday include an FCC industrial technical panel, HDTV system testing, a video compression tutorial, HDTV frequency allocation issues, satellite and auxiliary services and data broadcasting for television.

Wrapping things up on Thursday are workshops on digital videotape and cameras.

The Bottom Line

Change is in the wind. The broadcast industry as we know it may soon be radically altered. Many new services are under development, and their competitive impact will undoubtedly be felt by the broadcast industry. To remain successful, tomorrow's broadcasters must be fully prepared to understand and manage these emerging technologies. Nowhere is this vital information more available in one place than at NAB '94.



See page 102 for the *BE* FASTtrack, your personal guide to NAB products and services.

Broadcast engineering conference sessions (TV and Video)

Sunday, March 20

9:30 a.m. - noon: The Grand Alliance HDTV System

- System Overview
- Video Formats
- Video Compression
- Transport and Interoperability
- Transmission
- Audio

1:00 p.m. - 5:00 p.m.: HDTV Station Issues, Part I

- Structural Considerations for a Successful Transition to HDTV
- The Effect of Channel Assignment on the Transmitter and Receive Antenna for Equivalent HDTV/NTSC Coverage
- Absorptive Filters as an Integral Part of an HDTV Transmission System
- HDTV Coverage Optimization Using Advanced Coverage Prediction Techniques
- Managing Power-Line Harmonics in Advanced Broadcast Facility Design

1:00 p.m. - 5:00 p.m.: Graphics and Non-linear Editing

- Tips, techniques and demonstrations from six presenters.

Monday, March 21

10:30 a.m. - noon: Managing in Broadcast Engineering

- Managing USTs, MSDs and other Federally Regulated Environmental Matters
- The Americans With Disabilities Act and Broadcast Facility Design

10:30 a.m. - noon: HDTV Station Issues, Part II: UHF Transmission

- Full Band Linearity Correction Requirements for ATV Transmitter Systems
- HD Television Broadcast with a Klystron or IOT
- Keeping and Improving the NTSC Transmitter As You Transition to HDTV
- Digital Amplitude Modulation: UHF TV Transmitter Final Tests
- Pre-Correction Techniques Used in the ATTC 32 QAM Digital Transmitter

1:00 p.m. - 5:00 p.m.: Digital Modulation for TV Broadcasting

- The Grand Alliance Transmission System Profile
- The Japanese Advanced Television Transmission System
- Eurobits: Whither Digital Europe?
- Technical and Quality Issues for European Digital Television
- Evaluation of Multicarrier Transmission Systems for Advanced TV

1:00 p.m. - 5:00 p.m.: Multichannel TV Program Distribution Systems

- DirecTV: A Digital Multichannel Distribution System
- Large Scale Redundant Library Systems for Integrated Program and Spot Material
- Satellite Scheduling and Uplink Control

for a Multiple Carrier per Transponder Operation

- Automating Multichannel Broadcasting
- ABVS: Technology Tests of Advanced Video Services
- Multichannel Transport of Video Signals in the Telecommunications Exchange

1:00 p.m. - 3:30 p.m.: Towers and Other Transmission Support Equipment

- Understanding and Preventing Guyed Tower Failures Due to Anchor Shaft Corrosion
- Controlling Corrosion on Broadcast Towers: A Subject You Can't Afford To Be Rusty On
- Inspection, Maintenance and Troubleshooting of UHF/VHF/FM Antennas, Transmission Lines and Waveguides
- Performance of a Transmission Line Having a Rigid Outer Conductor and a Corrugated Inner Conductor

3:30 p.m. - 5:00 p.m.: RFR Update

- A panel discussion of the latest information in the RFR arena.

Tuesday, March 22 (SBE Day)

9:00 a.m. - noon: Designing a Serial Digital TV Facility

- Test Methods for Analyzing Digital Video
- Public Television Expanding into the Digital World
- The Merging of Computer and Video: Using Ethernet and SCSI for Digital Video Input and Output
- Real-Time Random Access Without Compression: The Technology and Applications to Keep Production and Programming Elements Readily Available
- Building and Operating a Multiformat All-Digital TV Plant

1:00 p.m. - 5:00 p.m.: TV Automation

- Integrating Manual and Automated Master Control Operations
- The Impact of Data Storage Systems on TV Automation
- WBNS: Station Automation Experiences
- Total Station Automation for the '90s
- WFMZ: Station Automation Experiences
- Embedded Encoding for Positive Event Identification

1:00 p.m. - 3:30 p.m.: The New EBS System

- Testing New Technologies for Emergency Alerting Systems
- This is No Longer a Test
- Cable TV and the New EBS
- User-Friendly EBS
- All-Channel Alert: Emergency Preparedness in Canada
- A Participant's Report on the FCC Tests of New Emergency Broadcast Systems

1:00 p.m. - 5:00 p.m.: Digital TV Test and Measurement Workshop

- A workshop on equipment and methods for making digital TV measurements

Wednesday, March 23

9:00 a.m. - noon: Video Compression Tutorial

- Video Resizing — How to Make that Bigger/Smaller Image the Best it can be

9:00 a.m. - 10:30 a.m.: FCC-Industry Technical Panel

- A panel discussion featuring seven key members of the FCC and the broadcast engineering community

9:00 a.m. - 10:30 a.m.: HDTV System Testing

- Developing the Laboratory Test Plans for the Grand Alliance Advanced TV System
- Testing the Grand Alliance Advanced Television Transmission System
- Developing and Implementing the Test Plan for Field Testing the ATV Transmission System.

10:30 a.m. - noon: HDTV Frequency Allocation Issues

- Assessment of Cross-Polarization for Interference Reduction in Broadcast Services
- Spectrum Studies for Advanced Television Services in the U.S.
- A Status Report on the FCC's Frequency Allocation Program for ATV.

2:00 p.m. - 5:00 p.m.: Satellite and Auxiliary Services

- How the New FCC Ruling for Earth Station Antennas Will Impact Broadcasters
- Direct Broadcast Satellite Sound

2:00 p.m. - 5:00 p.m.: Data Broadcasting

- NTSC Digital Broadcast: Possible Applications of the Technology
- VBI Data Broadcasting: New Business Opportunities for Broadcasting Organizations
- Network Management and Performance Requirements of a Data Broadcasting Network
- Broadcast 2-Way Technology
- e-on Net: A Novel Interactive Video and Data System
- Broadcasting Multimedia — A Complementary Service or the Mainstream of the Future?

Thursday, March 24

9:00 a.m. - noon: Camera Workshop

- A review of setup, adjustment, operation/ maintenance procedures for contemporary video cameras

9:00 a.m. - 10:30 a.m.: Digital Videotape Workshop No. 1

- Machines and methods to get the most out of digital storage technologies.

10:30 a.m. - noon: Digital Videotape Workshop No. 2

- Continuation of previous session



AT THIS YEAR'S WORLD CHAMPIONSHIPS ONE PERFORMANCE IS HEADS ABOVE THE REST.

SEE SCHMID
AT NAB BOOTH
1606-08

At soccer's World Championship Tournament, held at sites across America for the first time in 1994, one of the most powerful performances is being turned in by one of the smallest performers — Schmid's SIAT-MAX Audio Test Generator.

Using the portable, hand-held SIAT-MAX unit at live broadcast sites, along with a Schmid measurement receiver at its control center, the European Broadcast Union can quickly, repeatedly check site-to-center audio links. In doing so, EBU can assure the quality of its transmissions under the most challenging, time-critical conditions.

Innovative audio testing applications like the EBU's are what SIAT-MAX — and Schmid's entire family of short interval audio testing products — are all about. Portability, speed, accuracy, ease-of-operation and low cost all add up to the best, fastest, most versatile audio test solutions on the market today.

Whether you need to conduct audio proofs from remote sites or conduct fully automated tests across your entire network... whether you need to troubleshoot in the field or test audio paths in-house... Schmid has the products to give you peak audio performance. For more information or to arrange a free demo, call 800-438-3953 toll-free today.



SZ Schmid
Telecommunication
Intelligent by design

Sales Offices
Corporate Headquarters
Schmid Telecom AG
Binzstrasse 35
CH-8045 Zurich
Switzerland
Tel: 41-01-456-1111
Fax: 41-01-461-4888

U.S. Sales and Service
Schmid Telecommunication
America, Inc.
522 South Broadway
Gloucester City, NJ 08030
Tel: 800-438-3953
Tel: 609-742-1878
Fax: 609-742-0485

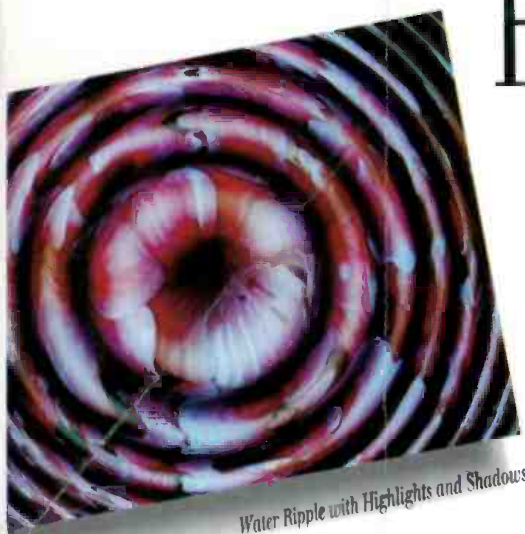
Schmid Telecom France
23, rue Colbert
F-78885 St-Quentin
Cedex
Tel: 33-1-3064-8006
Fax: 33-1-3058-2021

Circle (147) on Reply Card

What's a Page Turn Without Different Video Front and Back...or a



Single-Pass, Double Page Turn



Water Ripple with Highlights and Shadows

Back...or a Ripple Without Shading...or a Four- Corner Page Peel

That Takes More Than One Pass?

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.



Single-Pass, Four Corner Page Peel

NAB Booth #17569

PINNACLE

870 West Maude Avenue, Sunnyvale, CA 94086 Phone: (408) 720-9669 Sales
Offices: Midwestern U.S. & Canada: Phone: (515) 446-5168 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 (146) on Reply Card

www.americanradiohistory.com

Broadcast Engineering Conference (TV & Video sessions) at a glance:

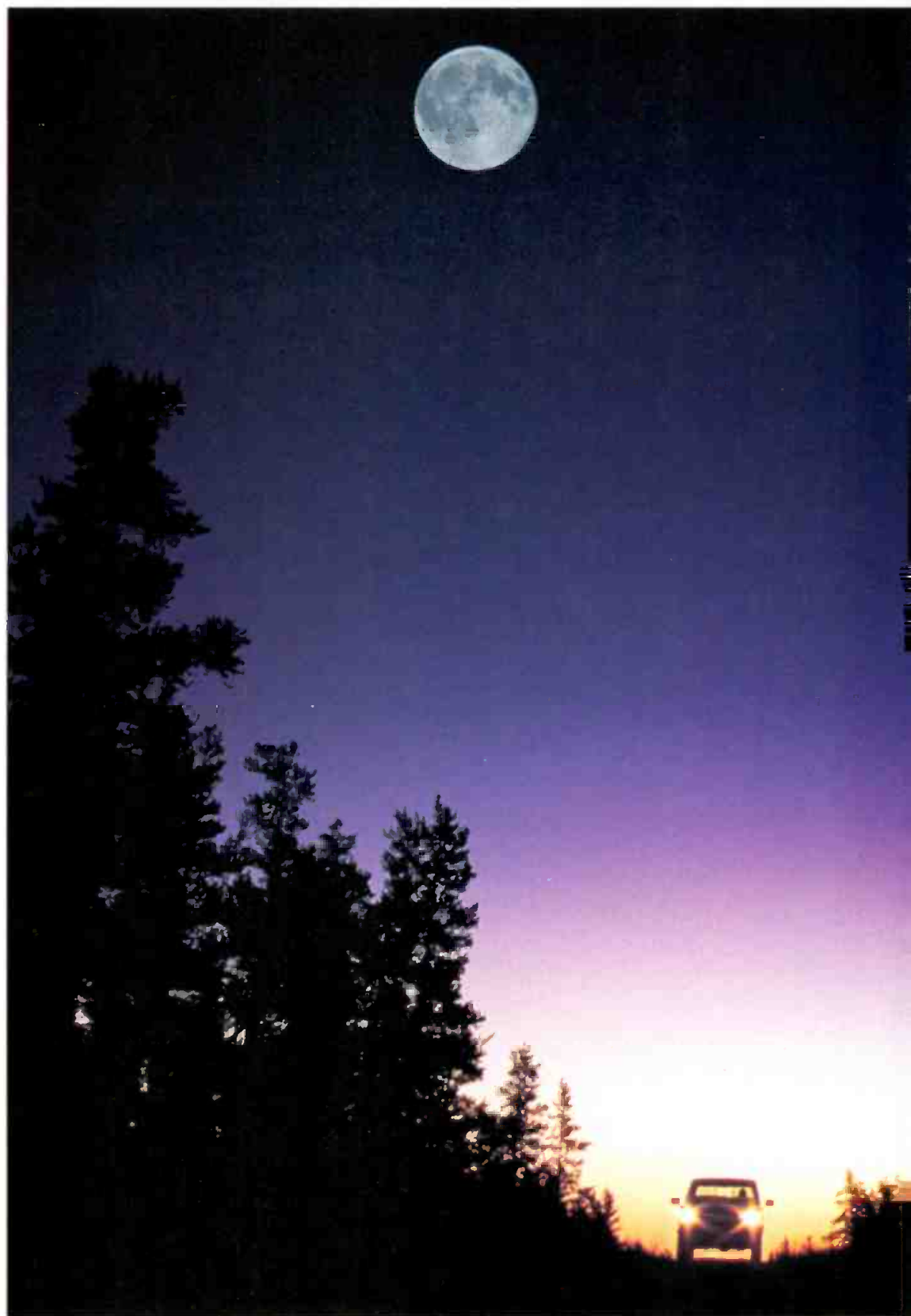
Sunday, March 20			Monday, March 21		Tuesday, March 22	Wednesday, March 23			Thursday, March 24	
A	Keynote Address		All-Industry Keynote Address		Designing a Serial Digital TV Facility	Video Compression Tutorial	HDTV System Testing	FCC Indust. Tech. Panel	Digital Videotape Workshop #1	Camera Workshop
	The "Grand Alliance" HDTV System		Managing in Broadcast Engr.	HDTV Station Issues Pt. 2					Digital Videotape Workshop #2	
P	HDTV Station Issues, Part 1	Graphic Non-linear Editing	Digital Modulation for TV Broadcasting	Multi-channel TV Delivery Systems	Towers & Transmission Support Equip.	Digital TV Test & Measurement Workshop	TV Automation	EBS	Engineering Achievement Awards Lunch	
M					RFR Update			Satellite and Auxiliary Services	Data Broadcasting For TV	

HDTV World Production Conference at a glance:

Sunday, March 20		Monday, March 21	Tuesday, March 22	Wednesday, March 23	Thursday, March 24
A		All-Industry Keynote Address	HDTV Production Equipment: New Tools of a New Trade	HDTV and Wide-Screen Production Techniques: Putting the Tools to Use	Handling HDTV Signals in the Studio: Compressed or baseband?
		Wide Screen & HDTV Prod.			
P		Keynote Address	HDTV Screenings: The Best From the U.S.	International Digital Program Exchange: Sharing the Wealth	
M		HDTV Production in Europe: Alive and Well		International HDTV Program Screenings: The Best from Around the World	

Multimedia World sessions at a glance:

Sunday, March 20				Monday, March 21	Tuesday, March 22			Wednesday, March 23			Thursday, March 24			
A				All-Industry Keynote Address	Keynote Address			Keynote Address			MM Networks	Platform Profile	Training	Intell. Property
				Multimedia Viewpoints	Interactive Games	Platform Profiles	Interactive Multimedia	MM Title Developing	Platform Profiles	Adapting Existing Material	MM Networks	Platform Profile	Interactive Scripting	Compatibility
P	Title Planning	MM Boot Camp	International Issues	What are the Multimedia Markets?	MM in Post Prod.	Platform Profiles	Licensing Agreements	In-House MM for Training	Platform Profiles	MM for Large Audiences				
M	Title Planning	MM Boot Camp	International Issues	Target Market Analysis	Info Svcs. Using MM	Platform Profiles	Interactive Broadcasting	Educational Titles	Platform Profiles	Interactive Marketing & Promotions				
				Educ. & Tng.	Games	Publishing								

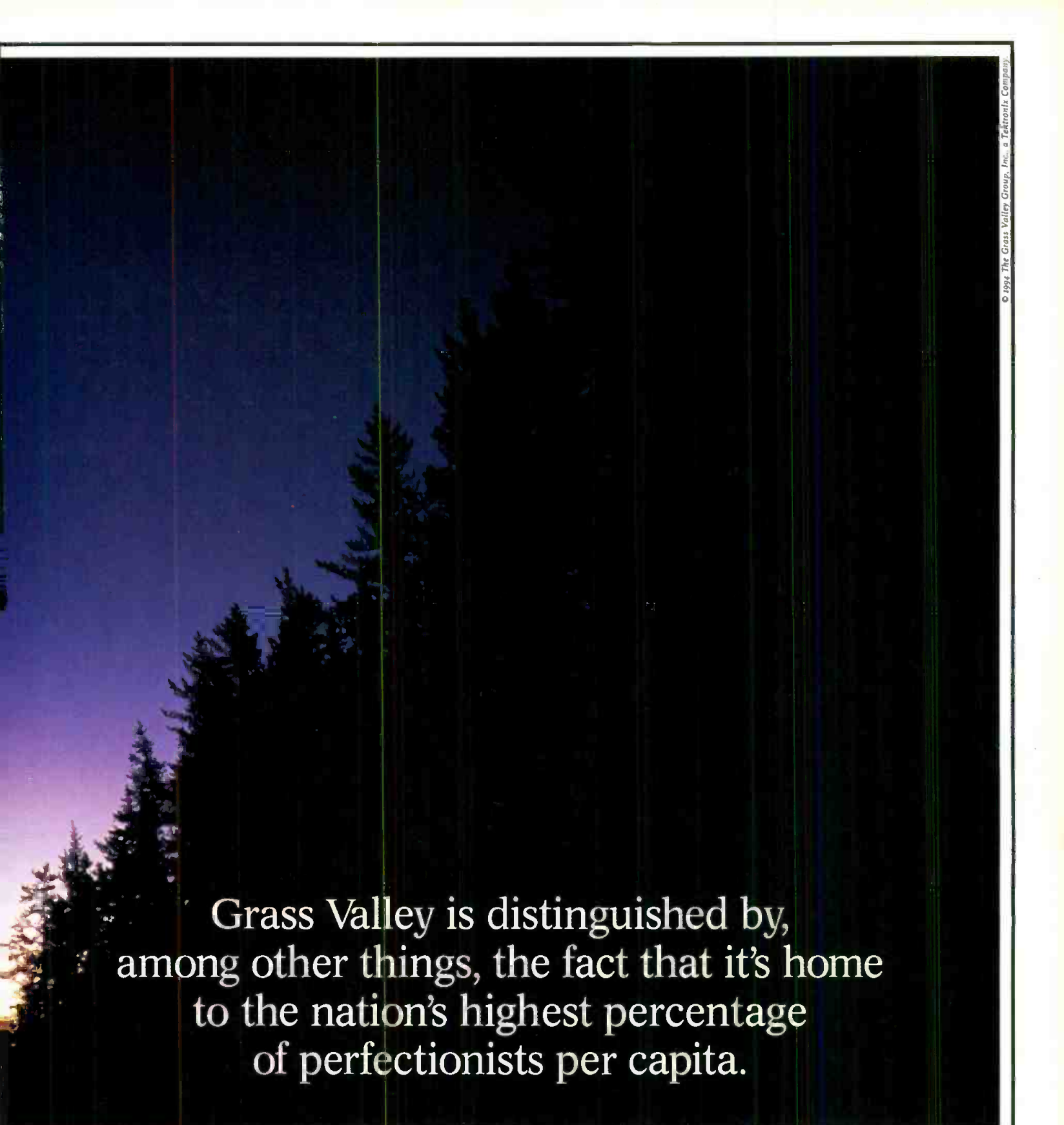


It may come as a surprise to you, but for the last 35 years these visionaries and idealists have been congregating right here. In this quaint little setting in the heart of the gold country. In droves.

They're electric. Eclectic. Even a bit eccentric. Yet these video experts share a zeal for the sub-

lime that borders on the fanatical. And, thankfully, they channel that singular conviction into everything Grass Valley does. From digital production switchers and graphics systems to distribution systems and fiber optic transmission systems. And more.

Even the landscaping is flawless.



Grass Valley is distinguished by,
among other things, the fact that it's home
to the nation's highest percentage
of perfectionists per capita.

The result is a family of products that are simply the standard of the industry. Systems that exude a feeling of quality comparable only to German cars, Cuban cigars, French pastries, and Russian vodka.

It's something you can't quite define. But you know it when you see it and feel it.

That is the perfection we strive for. Daily.

So if you're in the market for the best video production systems money can buy, you'll want to talk to Grass Valley first. Or come see us at the 1994 NAB show. We've got the perfect place for you too.

Grass Valley

Circle (14) on Reply Card

www.americanradiohistory.com

Facility Showcase

Photo credit: USA Network control room. Photography provided by A.F. Associates





The March issue of *Broadcast Engineering* magazine has always been my favorite issue of the year. First, it's always the largest issue of the year, which makes it an editorial challenge. Second, it's the NAB issue, which allows us to cover the industry's largest show. Finally, the March issue contains the Facility Showcase, one of my favorite features.

The Facility Showcase coverage is one of the most colorful and graphically interesting packages of the year. Best of all, this feature lineup allows us to provide the reader with an inside look at some of the hottest cable, post and TV facilities in the country, along with tips on how they were built.

An example of successful design and construction is shown with the photo on these two pages. Shown here is the USA Network control room in Jersey City, NJ. The new facility allows one of the nation's fastest growing cable networks to efficiently bring their audiences a wide variety of programming with the latest technology. Anytime a network, broadcaster or post house reaffirms its commitment to the audience or customer through top-notch technology, everyone wins.

Such is the case with the customers and viewers of the companies portrayed in this year's Facility Showcase. Whether it's a public TV/radio station converting an old warehouse or a post-production facility renovating an historic landmark, the viewer and customer were the beneficiaries of these efforts.

Like the facilities described here, to be successful, you need to consider first your customers' or viewers' needs. Only then will you be ready to begin the design process.

You too can turn your station or post-house into a top-notch facility, but learn first from these professionals. What follows are examples of how other successful companies completed the task.

- "CBS' Edit 12"page 40
- "KQED: Building for Durable Change"51
- "Building the First DBS Facility: DirecTv"58
- "Building on Fisherman's Wharf: Realtime Video"66
- "Editel: Los Angeles"78

Brad Dick

Brad Dick, editor

D I G I T A L L E A D E R S .

Since its inception as the nation's first advertiser-supported basic cable network in 1980, USA Networks has aggressively fulfilled its mandate to create a cable network providing a wide variety of programming for all family members.

USA's programming is seen in over 98 percent of America's cable households. Our network features exclusive original dramatic series and situation comedies. We produce over 24 original World Premiere movies per year featuring top Hollywood stars, and we continue to license top-rated off-network series. To our coverage of *The Masters*, we've added 11 PGA Tour Golf Tournaments. In 1994, we'll add the French Open Tennis Championships to the more than 90 hours of the U.S. Open Tennis Championships.

In 1992, we launched the Sci-Fi Channel, now in 15 million homes nationally, and in April, 1994 we will launch USA Network for Latin America. The Sci-Fi Channel formula blends classic favorites and contemporary off-network sci-fi shows. Its movies are theatrical blockbusters and original productions that are part of our "Planetary Premieres" series.

To accommodate our expanding networks, USA created a completely digital Broadcast Center

in Jersey City, NJ. The new Center handles all of our post-production needs and our entire network origination, including the signals for USA's East and West Coast feeds, the Sci-Fi Channel and our blackout programming.

At the heart of our facility is the Panasonic Digital M.A.R.C. Type III

**"THE LOOK VIEWERS DEMAND,
AND THE EFFICIENCIES A
GROWING COMPANY...REQUIRES."**

KAY KOPLOVITZ
President & Chief Executive Officer
USA Networks

automated record/playback library system. The system uses 10 Panasonic AJ-D350 D-3 VTRs with a completely redundant backup system, and is the major source of all program and commercial material seen on USA Network and the Sci-Fi Channel throughout the day.

In post-production, we are using the first non-linear edit systems with Panasonic D-3 VTRs. Our four edit suites connect to a "pool" of videotape machines, including 12 Panasonic D-3s.

NAB Booth 18001

Our decision to use the Panasonic M.A.R.C. system was the right decision. We've achieved the look our viewers demand and the efficiencies that a growing company in a highly competitive field requires. Panasonic worked with us to develop the right software and provided extensive training to our employees.

The Digital M.A.R.C. has run so much faster and more



accurately that we got an unexpected bonus: a few extra minutes of air-time in our schedule. We're using it to promote more of our programming to our viewers.

We firmly believe that we have the highest-quality, best designed Broadcast Center anywhere.

Panasonic's strategy offers a simple, combined composite and component digital system that provides all digital solutions for diverse video recording applications through the eventual HDTV era.

Panasonic believes that digital composite and component signal equipment will continue to co-exist for many years. The company sees interrelated D-3/D-5 facilities with each equipment performing the tasks to which it is best suited.

Kay Koplovitz is founder, president and chief executive officer of USA Networks. She continues to be one of America's most influential corporate executives, charting new territory and keeping her network in the vanguard of the television industry.

Whether it's buying off-network series, making World Premiere movies, or building the cable industry's first all-digital Broadcast

Center, Kay Koplovitz and USA Networks have never been reluctant to be first.

It's the industry's visionaries who see an all-clear path to the future.

Panasonic
Broadcast & Television Systems Company



AnthroCarts!®

AnthroCarts will knock your socks off! Imagine how great it'll be when you find the perfect furniture for your equipment — just the right size, tough-as-nails construction and dozens of accessories.

And you'll find our service so real and responsive, you'll get a kick out of ordering direct!

Call for a free catalog!



Lifetime Warranty.

Lots of choices.

Space saving.



800-325-3841

6:00 AM to 5:00 PM PST, M-F
3221 NW Yeon St.
Portland, OR 97210
Fax: (800) 325-0045

GSA contract no. GS-OOF-5040A. Available for OEM applications. Prices from \$149.00
Anthro, AnthroCart and Technology Furniture are registered trademarks of Anthro.

Continued from page 40

became clear. This article will discuss some of the problems, solutions and observations made during the design, construction and operation of Television City's first multiplexed digital edit room.

Edit 12 required only a minimum of sound-defining devices to provide a good stereo image.

Facility design

The space allocated by Television City for the construction of new digital edit rooms measured 37 feet long by 28 feet wide. It was divided into two separate 342-square foot edit rooms. The remaining space was used as a common equipment room servicing both edit rooms. (See Figure 1.) The ceiling of the allocated space had been acoustically designed for a previous technical facility and was a determining factor in the layout. By taking advantage of the existing ceiling's corner rise, Edit 12 required only a minimum of sound-defining devices to provide a good stereo image. To provide sound isolation between the three rooms, the design specified high-loss frame walls with neoprene gaskets.

Typical system diagram

The simplified block diagram of a serial D-2, multiplexed editing system is shown in Figure 2. The diagram illustrates a 2-machine editing system; additional D-2 VTRs would connect in the same configuration. The router, added later, is shown between the dotted lines.

The digital audio and digital video outputs of each D-2 are internally multiplexed by an optional VTR board. After multiplexing, each VTR output is then sent via coax to an external *demultiplexer*. The demux splits the digital bitstream apart, sending audio to the audio mixer and video to the video switcher. After processing by the audio mixer, program au-

Audio breakaway is a concern with multiplexed serial digital routers.

dio is then sent to be externally multiplexed with the program video. After *muxing*, the digital bitstream is distributed to the multiplexed input of each VTR.

The program path length of the audio mixer is less than one line of video and causes no problem during muxing or demuxing.

At this point you might be wondering, why multiplex at all? Muxing and demuxing allows a single-level serial router to route 4-channel audio, video and VITC, all gen-locked on a single coax. Television City is presently installing a new serial routing switcher. When this router comes on line, Edit 12 will be connected as shown.

Audio breakaway is a concern with multiplexed serial digital routers. To solve this problem during an edit session, the audio mixer can be used to perform the breakaway. In a dubbing situation, other methods could be used to achieve the desired breakaway. One method would be to integrate a breakaway station into the serial router.

The editor controls the VTRs using the standard RS-422 control cables. An external preview selector is not needed in this system; it has been replaced by the video switcher's internal aux bus. The aux bus, in communication with the edit controller, provides high-quality digital preview.

Optional auto-timed, analog inputs were used for analog integration. These inputs

are available on the serial D-2 video switcher and the digital audio mixer. The DVE has not been digitally integrated with the suite and makes full use of the auto-timed analog I/Os. Because the DVE

The test stations have two main purposes: check the digital integrity of the serial bit path and to check picture content, video levels, SC/H phase and overall picture quality.

is parallel D-1 and the suite is serial D-2, high-quality rate-conversion equipment is required to make the connection. During construction, the cost of reliable conversion equipment did not justify the increase in video quality that would result. When it becomes cost-effective, the DVE will be digitally installed.

Serial test stations

Two serial digital test stations are included in the design. Both consist of a vectorscope, a waveform monitor and a 13-inch color picture monitor. The first, located in the equipment racks, is fed digitally with multiplexed program and switcher aux bus 5. The waveform monitor has an internal, 10-bit, D-to-A converter. The DAC output is used to feed the analog vectorscope. The second serial digital test station is configured in the same manner and is located inside the edit room.

The test stations have two main purposes: to check the digital integrity of the serial bit path and to check picture content, video levels, SC/H phase and overall picture quality. The digital integrity of the bitstream can be checked with the waveform monitor's on-screen displays. Indicators are given for error data handling and audio-channel validity. A digitized picture of the serial EYE pattern also can be displayed. An equalization button on the waveform monitor allows observation of the eye pattern in the equalized and unequalized modes.

The test stations are not used for input timing adjustments — quite different from

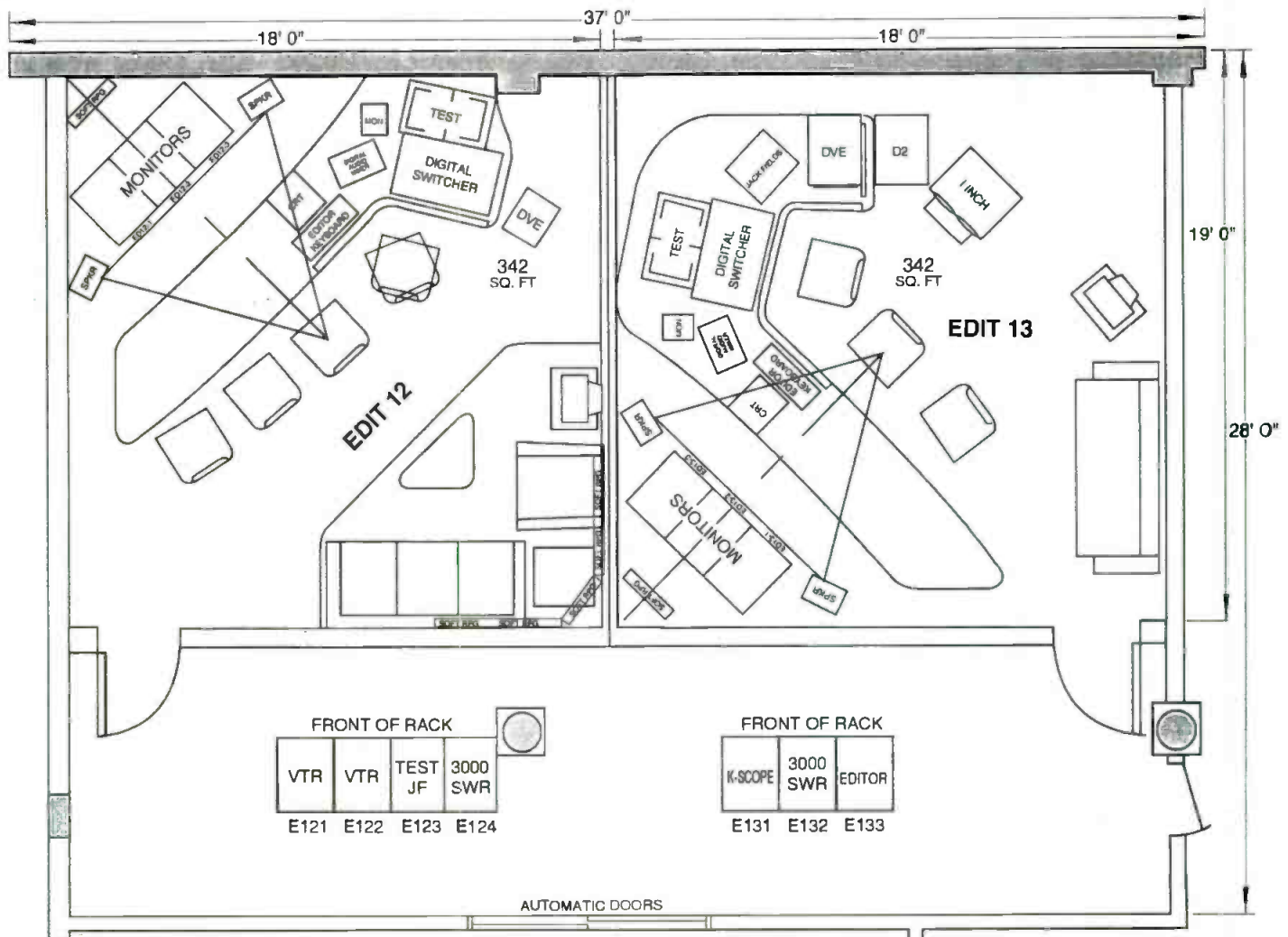


Figure 1. Floor plan of the area allocated for the two editing rooms and equipment.

an analog edit room, where the test station is sometimes called a timing station. Except for the optional RGB chroma-key inputs, all switcher inputs are auto-timed. The capture range of the auto-timing feature is $\pm 17.8\mu\text{s}$ for digital and analog inputs. For coax cables with propagation factors of 66%, $1\mu\text{s}$ equals 648 feet. Multiplying $\pm 17.8 \times 648$ gives a possible coax cable length of $\pm 11,534$ feet.

The video switcher also has an output delay of 1.18 lines or $75\mu\text{s}$, as shown in Figure 3. Because of the auto-timing inputs and the fixed output delay, any source selected on aux bus 5 will appear timed. If actual input timing must be checked, serial digital jacks are available. At some future date, a software upgrade for the video switcher might allow the auto-timing inputs to be switched off. Aux bus 5 could then be used for timing purposes.

Because of the $75\mu\text{s}$ delay (11.5 lines more than a line), the test station and all picture monitors on the output side of the switcher are not referenced externally. If they were, the waveform monitor's backporch clamp would be performed 11.5 lines into a line instead of during the back-



Racks in the equipment room that contain tape machines and electronics used for Edit 12.

porch. This discrepancy would appear as shifted video on the waveform monitor display. External reference is connected to both test stations, but it is normally not selected. It is important to note that, because of the video switcher's $75\mu\text{s}$ program path delay, external re-entry cannot be accomplished without a framestore device. However, once the router is installed, the framestore will be bypassed unless it is used for switcher re-entry.

The SC/H phase of any new switcher sources should be checked.

The SC/H phase of any new switcher sources should be checked. The video switcher attempts to correct all SC/H phase errors. This is a useful switcher feature but care should be taken in its use. The auto-timing inputs will correct SC/H phase errors within $\pm 170^\circ$. The video switcher makes the correction by repositioning the video with respect to

NTL brings you award winning systems...

NTL's Nexus International Division, offers a comprehensive design and construction service for radio and television studio centres and transmitter networks. Its project for NBC at the Barcelona Olympic Games took 18 months to complete and won a prestigious Emmy award earlier this year. Nexus is currently designing and constructing a digital studio production centre in Moscow for VGTRK.

NTL's total systems capability includes studios, satellite uplinking, transmitter turnkey systems, international video distribution and long distance corporate communications.



Find out more on stand 17346, NAB '94

NTL Crawley Court Winchester Hampshire United Kingdom Tel: +44 962-822243

Circle (138) on Reply Card

NTL



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

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

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

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

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

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

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

in no time and you well can



expect precise, easy steering and crabbing, smooth and jerkfree column movement thanks to

the patented Sachtler pneumatic system. Test for yourself the optimum camera support for all compact Studio/OB cameras, now!



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

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



sachtler
corporation of america

See us at NAB Booth #18938.

Circle (17) on Reply Card

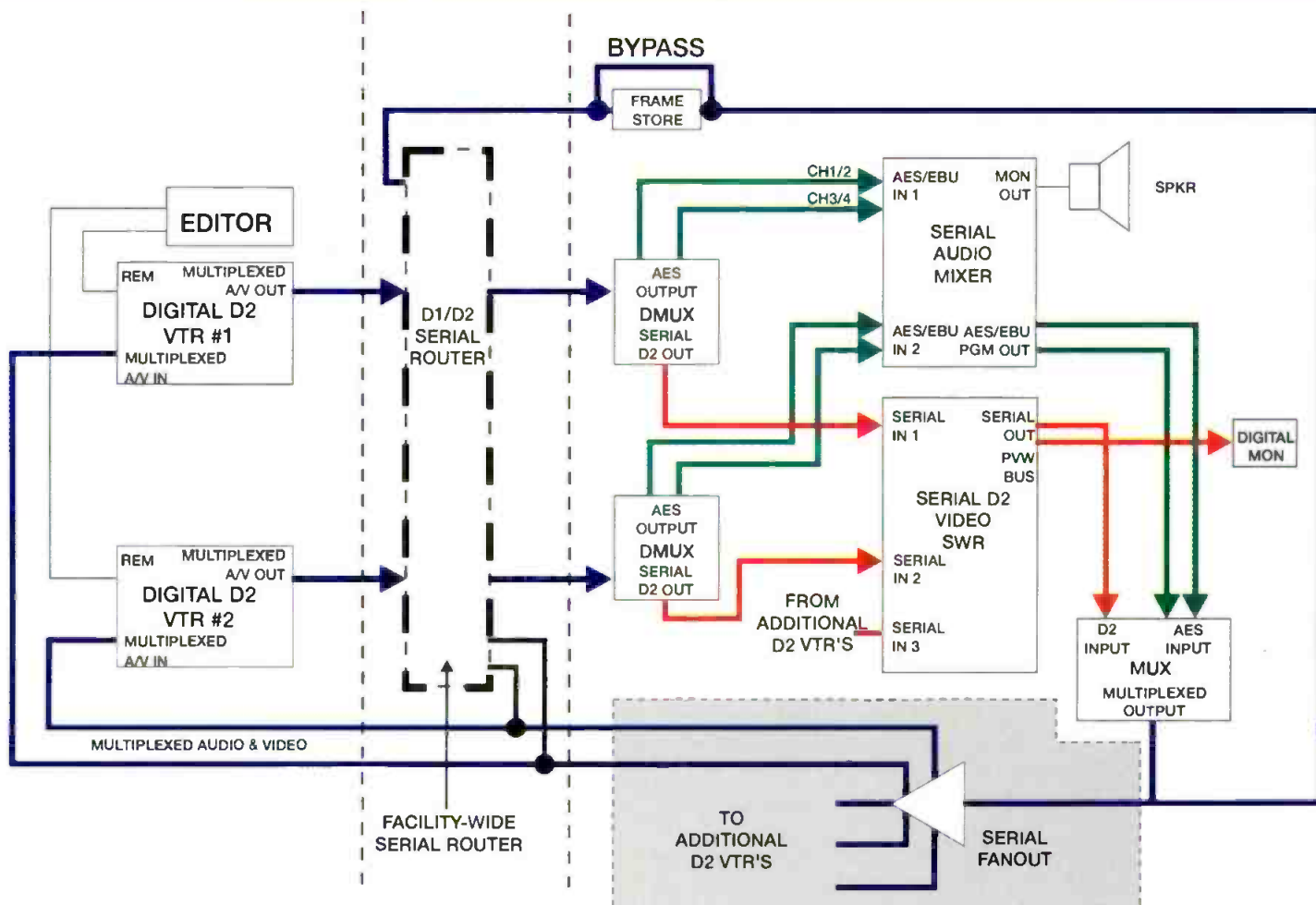


Figure 2. Simplified block diagram of a multiplexed edit suite. Serial fanout (shaded) was used before installation of a facility-wide serial digital router. Framestore bypass is used whenever switcher output is not used for switcher re-entry.

sync. Because of this horizontal repositioning, consistent SC/H phase of recorded material and playback sources is essential. If the SC/H phase of each source VTR is not consistently maintained, horizontal shift problems will occur during match-frame editing. All switcher inputs should be periodically checked for zero SC/H phase.

The vectorscope is used to check absolute and relative SC/H phase. To check relative SC/H, the vectorscope is externally referenced and the signal under test must be patched into the digital test station. The auto-timing feature does not allow aux bus 5 to be used as a source selector during SC/H measurements.

Sync generators

Edit 12 has two sync generators, a master generator for the VTRs and a secondary generator for the audio and video switchers. The master sync generator is locked to the facility's color black and feeds each VTR as well as the secondary sync generator. The master generator also feeds the edit controller with sync and color-frame ID pulses. The secondary sync generator feeds the audio switcher, the video switcher and the DVE. This configuration allows the video switcher

to be independently adjustable from the source inputs. Unlike most analog production switchers, the video switcher does not generate color black for external use. The color black it does generate is used only for program output.

A switcher-dedicated sync generator is a desirable feature.

A switcher-dedicated sync generator is a desirable feature because the video switcher's internal timing is not user-adjustable. In this configuration, the secondary sync generator provides flexibility. In the case of RGB chroma-key inputs, which are not auto-timed, the secondary sync generator could be used to accommodate them or it could be used to allow more timing flexibility in a networked DVE configuration.

Monitor router

The editing room includes a 20 x 10 analog video router. This router's main purpose is to route the character outputs

of each VTR to the edit room's monitor wall. The character outputs provide an analog video signal keyed with time code. A control panel for the 20 x 10 is located in the monitor turret at the technical director's position.

Although Television City presently uses longitudinal time code, it is hoped that either VITC or a new form of multiplexed longitudinal time code will become standard. True digital time code would allow a new type of digital picture monitor to extract the time code and display it. This ability would make serial digital edit-room design even more efficient, eliminating the need for a separate time-code or character router.

Construction

The design, construction and integration of Edit 12 was completed in four weeks, a relatively short time span considering that both facility and electronic construction were required. The multiplexed serial design saved many hours of documenting, wiring and integrating.

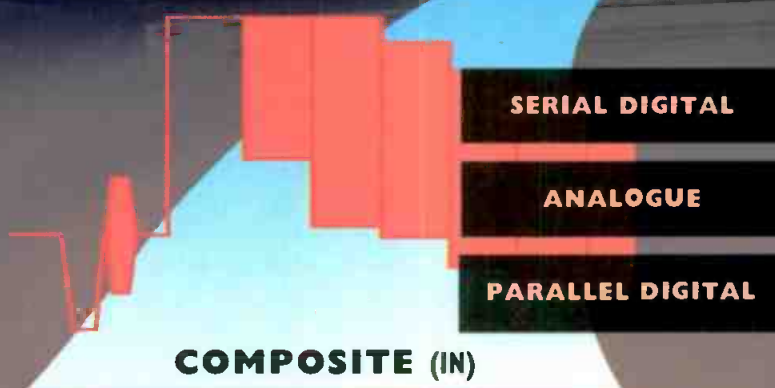
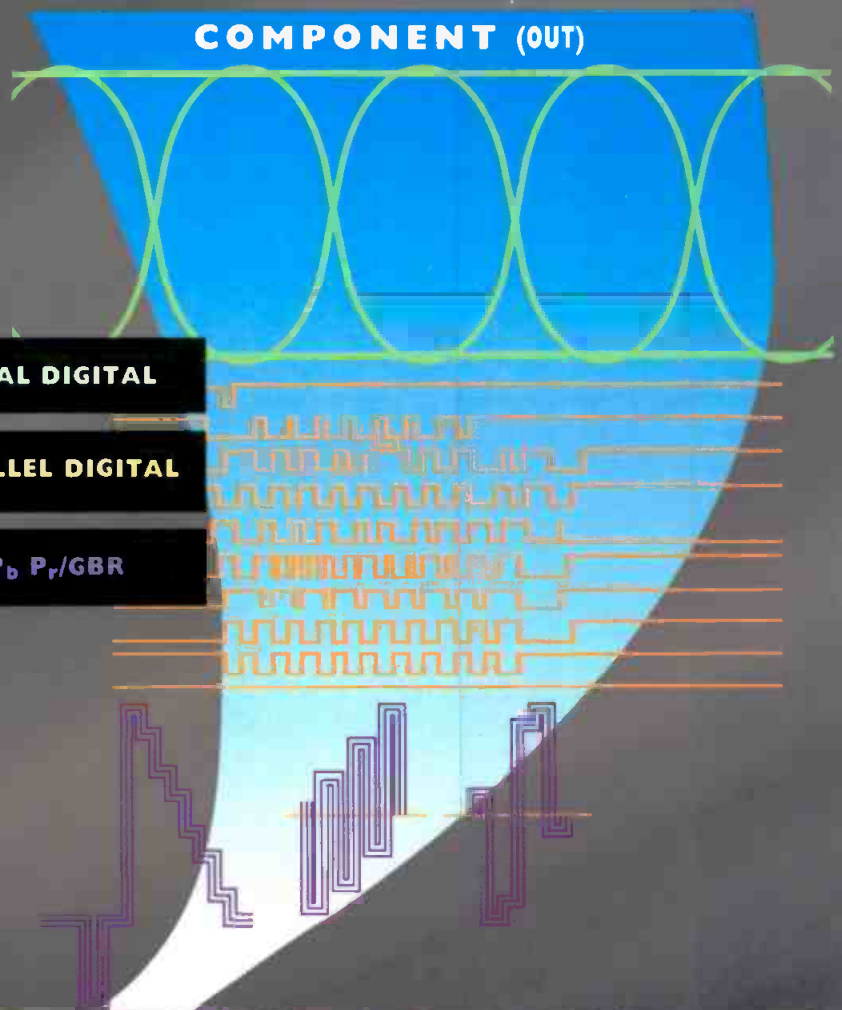
In the past, Television City edit rooms have required more than 40 drawings for proper documentation. Edit 12 required only nine drawings. Unlike other CBS edit rooms, Edit 12 uses no audio or video

The V4228 Digital Varicomb Decoder

Vistek Electronics is proud to announce the launch of the V4228 Digital Varicomb Decoder.

Designed to be the ultimate composite decoder for the analogue and digital world the industry standard Varicomb technology has been refined and implemented digitally providing performance that actually exceeds that of the existing Varicomb product!

The propriety Varicomb algorithm has long been acknowledged as the most transparent process for transferring from the composite to component domain for real pictures, eliminating the artifacts of cross colour and cross luminance without sacrificing resolution. Add to this the accuracy and stability of digital technology and the optional adaption to a frame comb for perfect decoding of still pictures, whilst maintaining all the conventional Varicomb benefits when there is motion and you have the best decoder available.



The flexibility of configuration allows the tailoring of analogue and digital interfaces to suit the requirements of any installation with the easy addition of interfaces as needs change. PAL or NTSC, analogue or digital, two dimensional or three dimensional adaption the V4228 IS the ultimate solution!



The World's Standard for all World Standards

Vistek Electronics Ltd., Unit C, Wessex Road, Bourne End, Bucks SL8 5DT, England Telephone: (+44) 0628 531221 Telex: 846077 Facsimile: (+44) 0628 530980
U.S. Sales contact: Preferred Video Products, 4405 Riverside Drive, Burbank, CA 91505 Tel. (818) 562 6544 Fax. (818) 562 3342

Circle (18) on Reply Card



connection blocks; in a serial digital design, audio and video blocks serve no purpose. If used, they can introduce reflections or errors into the high-speed datastream. Multiplexed digital audio, carried simultaneously with video, also reduces documentation and wiring complexity.

The Edit 12 audio/video block diagram was drawn with AutoCAD on a single sheet of D-size paper. Although the drawing is intended to be viewed as a complete picture, layering was used to separate the audio, video and pulse systems.

The maintenance department has often indicated that the block diagram, complete with all layers, is effective and easy to use. All system connections can

Timing problems in a serial D-2 edit room are generally associated with equipment, not cable length.

be seen in one glance. The engineering construction group built Edit 12 using only three drawings: the A/V block diagram, the serial video jack field and the serial audio jack field. As audio and video become recognized as digital data and not as individual systems, these documentation methods might become more common.

Edit 12 uses NEC-rated Belden 8281B for serial video and multiplexed A/V. As mentioned, timed cables are not required in a serial digital edit room design. Timing

problems in a serial D-2 edit room are generally associated with equipment, not cable length. Coax cables were cut to similar lengths but were not timed, which resulted in a considerable cost savings. To reduce coaxial cable reflections, only one 75 Ω self-normalizing jack pair is used between a source and its destination.

Although serial digital equipment is presently more expensive than parallel or analog equipment, increased hardware cost can be accommodated.

Trompeter 120 Ω twin-ax was used for balanced serial audio. Concentric 120 Ω tip jacks were used at the inputs and outputs of the audio mixer. The twin-ax cable and concentric jack field proved easy to wire and use. The jack field connects to the twin ax cables using concentric BNCs. This type of BNC/twin-ax connection provides full EMI shielding and allows the use of balanced audio. Presently there is talk in the industry of standardizing the digital audio connector to a 75 Ω BNC. It is the author's opinion that this standard will work well when BNCs are available on all equipment. The methods and materials that are used in Edit 12 have merit, however, and should be considered.

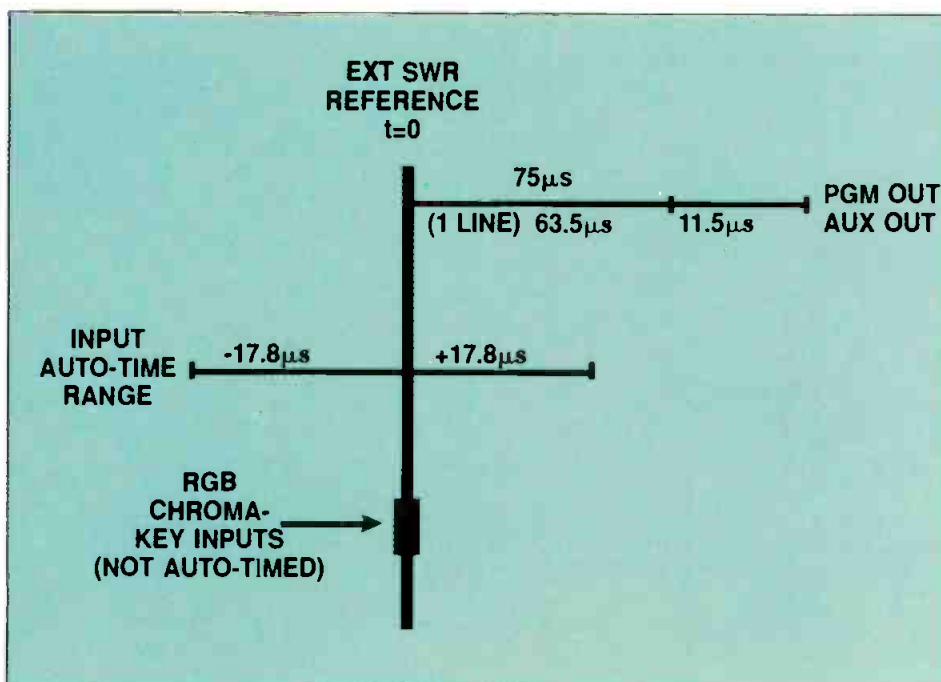


Figure 3. GVG switcher I/O timing relative to an external reference. (Not to scale.)

The design team

Client: CBS Operations and Administration
Charles Cappleman, Vice President

Occupant: *The Young and the Restless*

System Integrator: CBS West Coast Engineering
George Benkowsky, Director

Project Manager/CBS West Coast Engineering System Designer: Craig Harrison

Facility Design: CBS West Coast Engineering
George Benkowsky, Director
Robert Delgadillo
Fernando Quizon

Facility Construction: CBS TV City Facilities
Manfred Fiebig
Gary Gillett

Documentation: CBS West Coast Engineering
Robert Delgadillo
Roberto Gonzales

Interior Design: CBS Facilities
Linda Russ

Conclusion

Although serial digital equipment is presently more expensive than parallel or analog equipment, increased hardware cost can be accommodated through simplified system design and construction techniques inherent in a multiplexed serial digital project. The multiplexing performed in Edit 12 is truly transparent to the user and dramatically simplifies the system design. The long-term savings in a serial digital project are even more compelling because reduced maintenance costs and simplified operation are compounded over the life of the project.

Since the completion of Edit 12 in December 1992, CBS Television City has built two more multiplexed edit rooms and has integrated the rooms with a 96x128 serial digital router.

Editor's note: This article was taken from a paper presented at the NAB Broadcast Engineering proceedings, April 1993.

POWERED BY

The power behind the Kudbs range is Snell & Wilcox. Find out how it measures up to your needs

K U D O S

by



SNELL & WILCOX





TEST IMAGE GENERATOR KUDOS TPG20

- Complete source of ultra high quality, precision test signals
- Two complete frames of store allow moving patterns
- Outstandingly easy to use
- Patterns may be downloaded from a PC, including full-frame real images
- All standards, all formats, totally digitally encoded
- 16:9 aspect ratio compatible

- More than 450 resident patterns
- Exceeds specification for testing CCIR 601 digital equipment

ADVANCED ANALOGUE DECODER KUDOS MCD11

- Sharper pictures than adaptive comb technology
- Up to three decoders in a single 1RU enclosure
- Precision motion-tolerant analogue gate
- Supports all component levels
- Simultaneous output of YP_bP_r and RGBS
- Optional Digital Output analogue gate

NOISE REDUCER KUDOS NRS30

- Unique two-stage filtering
- Adaptive recursive noise reduction
- Unique spatio-temporal median filtering
- Superb concealment of random impulse noise
- Ideal for concealing satellite noise
- Single line dropout compensation

STANDARDS CONVERTER KUDOS CVR45

- Breakthrough in standards conversion design, performance and value
- Billed as "an ACE in a fraction of the space"
- Full power of 4-field, 4-line conversion within a single rack unit
- 8-bit, 4:2:2 processing throughout
- Digital luminance and chrominance noise reduction
- Built-in Vidiplex decoding

STANDARDS CONVERTER KUDOS CVR22

- 2-field 4-line aperture for sharper pictures
- 4:2:2 processing
- Built-in test signal generator
- Vidiplex decoding
- Proprietary Gate decoding technology reduces cross colour
- NTSC, NTSC4.43, PAL and SECAM inputs

MULTICHANNEL STANDARDS CONVERTERS KUDOS MCVR SERIES

- High quality reliable conversion of multiple channels
- Designed for unattended black-box operation
- Ideal solution for cable head-end and satellite downlink applications
- Allows any combination of 2-field and 4-field conversion channels

MULTISTANDARD TBC-SYNCHRONISERS KUDOS TBS24T

- Full broadcast quality multiformat wide-band synchroniser
- Operates in PAL, NTSC and SECAM
- 8 bit 4:2:2 processing throughout
- Digital horizontal and vertical enhancement
- Powerful frame-based recursive noise reduction
- Integral test pattern generator

KUDOS TBC11

- Full-frame infinite window timebase correction
- Composite and Y/C inputs in PAL and SECAM
- 8 bit 4:2:2 processing throughout
- Built-in Vidiplex decoding
- 8-field sequence genlockable SPG

COLOUR CORRECTOR KUDOS CC10

- Composite and Y/C Colour Correction
- Separate correction controls for Black, Gamma, White and Superwhite
- Full range of processing controls, including black stretch
- Split display of corrected and uncorrected pictures

K U D O S

by

SNELL & WILCOX





Kudos by Snell & Wilcox is a single rack-unit range of high performance, cost-effective image processing equipment for the broadcaster, corporate user and independent producer.

The Kudos range benefits from the technical innovation and engineering integrity which has taken Snell & Wilcox to the forefront of broadcast electronics.

TEST IMAGE GENERATION

Kudos TPG20

Digital or analogue, component or composite, the TPG20 delivers an enormous range of computer-synthesised still and moving test images, as well as real pictures in all broadcast standards.

DECODING

Kudos MCD Series

The MCD Series provides affordable, wide-band performance in single, double or triple decoder options.

NOISE REDUCTION

Kudos NRS30

With median and recursive filtering, the NRS30 is the most powerful unit available in its class. Ideal for satellite downlinks.

STANDARDS CONVERSION

Kudos CVR Series

From entry level to broadcast quality - including the four-field CVR45 which outperforms the classic ACE in just a fraction of the space.

TBC SYNCHRONISATION

Kudos TBS24 TBS24T & TBC11

These dual standard, multiformat units feature 4:2:2 signal-processing, with digital horizontal and vertical enhancement and digital noise reduction.

COLOUR CORRECTION

Kudos CC10

Powerful, non-decoding, composite colour correction.

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

If you think only of standards conversion when you hear the words Snell & Wilcox, we'd like to update you on our current product range.

☐ DECODING

☐ ENCODING

☐ HIGH DEFINITION

☐ UPCONVERSION

☐ HIGH DEFINITION

☐ DOWNCONVERSION

☐ HIGH DEFINITION

☐ CROSSCONVERSION

☐ FILM CONVERSION

☐ MOTION COMPENSATION

☐ SLOW MOTION

☐ DIGITAL VIDEO EFFECTS

☐ SWITCHING & ROUTING

☐ TEST IMAGE GENERATION

☐ NOISE REDUCTION

☐ COLOUR CORRECTION

☐ TBC SYNCHRONISATION

☐ VIDEO WALL & LARGE SCREEN

☐ DISPLAY ENHANCEMENT

☐ DIGITAL VIDEO INTERFACING

☐ DIGITAL SYNC PULSE

☐ GENERATION

☐ ANALOGUE AND DIGITAL

☐ DISTRIBUTION

☐ DIGITAL AUDIO DELAY

And of course the world's only complete

☐ STANDARDS CONVERSION range

FAX FOR MORE INFORMATION

For full product information, mark appropriate box

then fax this section with details below, to your

Snell & Wilcox office.

Name

Title

Company

Address

Country

Tel

Fax

Snell & Wilcox offices worldwide:

UK Tel: +44 (0) 730 821188 Fax: +44 (0) 730 821199

USA Tel: +1 (408) 734 1688 Fax: +1 (408) 734 4760

Tel: +1 (310) 458 8099 Fax: +1 (310) 458 6989

Japan Tel: +81 3 34 46 3996 Fax: +81 3 34 46 4454

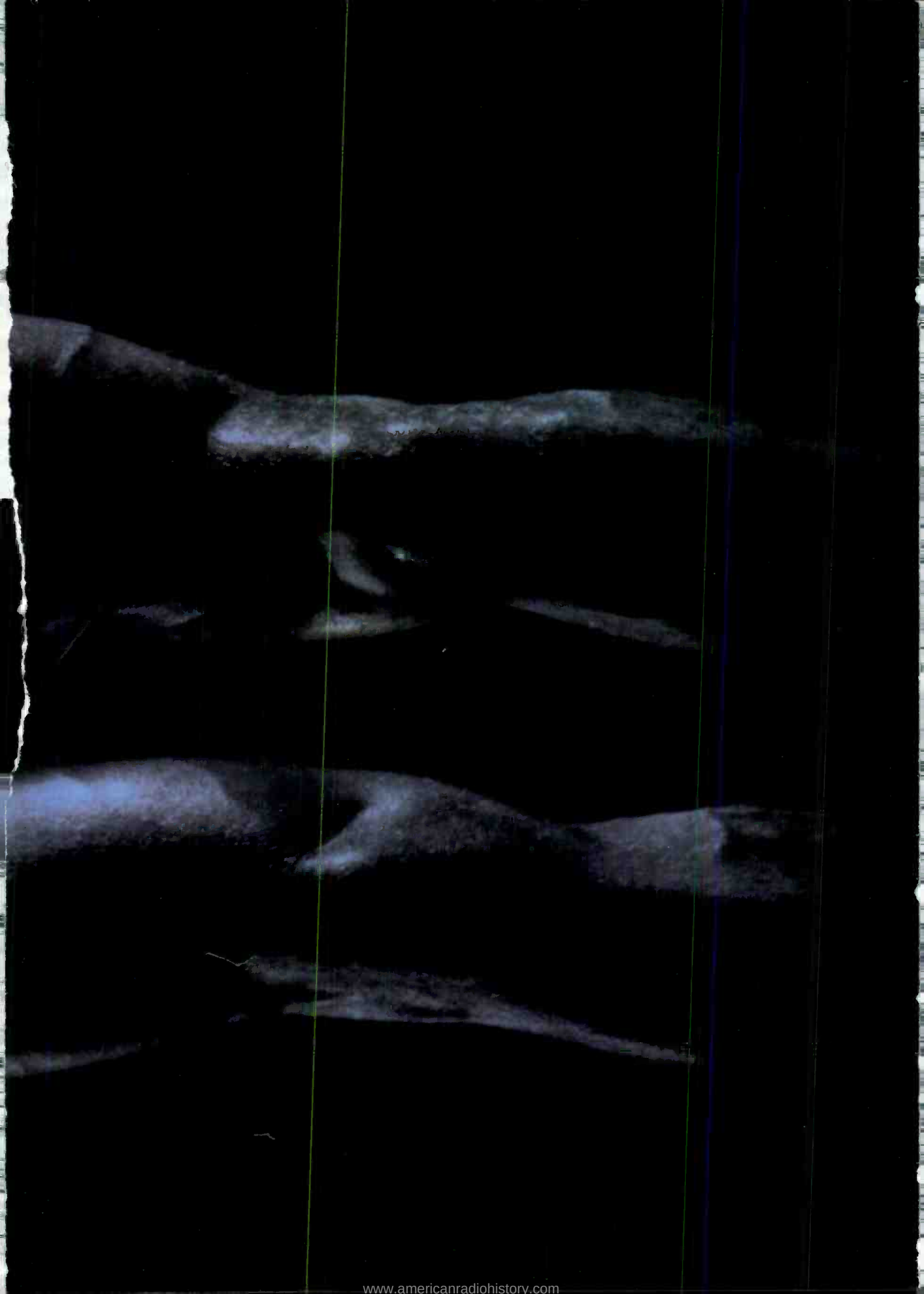
France Tel: +33 1 47 89 8308 Fax: +33 1 47 89 8572

Italy Tel: +39 (0) 6908 7557 Fax: +39 (0) 6908 7418

Germany Tel: +49 (0) 611 990840 Fax: +49 (0) 611 306004

Russia Tel: +7 095 192 69 92

Further Kudos product data on reverse



KUDOS

kū 'dos, Gr. kū 'dos, n.

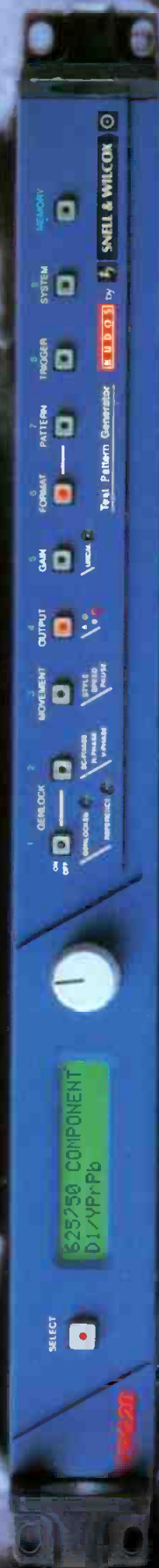
credit, fame, renown, prestige.

[Gr, *kȳdos*, glory.]*

*Chambers 20th Century Dictionary



13/4 inches you can be proud of





SNELL & WILCOX

Timebase Corrector

625 PAL-D2

SNELL & WILCOX

Digital Test Pattern Generator

625 PAL-D2

SNELL & WILCOX

Standards Converter

625 PAL-D2

SNELL & WILCOX

Noise Reduction

625 PAL-D2

SNELL & WILCOX

625 PAL-D2

625 PAL-D2 042



KQED: Building for durable change



Designing a facility that can handle the changes ahead is a challenge.

By John Aalto, P.E. and Kevin Schaeffer, AIA

Public broadcasting is often cited for the creativity, the commitment to excellence, and the high ideals of the men and women who make their careers there. Behind this admiration are the challenges public broadcasters face, however:

sometimes fickle public support, lean budgets and daunting mission statements. Although public broadcasting is often thought of as a place of idealism, when it comes to engineering, the public broadcast facility is often characterized by a cold, hard realism.

KQED-TV/FM, San Francisco, is a case in point. Early in 1990, KQED had an opportunity to relocate its TV and FM radio plant from aging facilities scattered among several buildings to a new location — a 52,000-square-foot warehouse with good amen-

ities where the operations could be housed under one roof. This meant there would be opportunities to modernize, consolidate and improve technical performance standards, as well as enhance the overall operational environment.

The Bottom Line

In public broadcasting, funding for new facilities is always hard to come by. When dollars do become available, chances are good that budgets are tight and that further facility funds won't be allocated again anytime soon. Therefore, the new facility's design must be highly functional to withstand the test of time. This requirement calls for a flexible, efficient and adaptable approach — sensible elements in any facility's plans.

\$



KQED's new on-air control room was the first new area to begin operation during the phased relocation.

Aalto is senior project director for National TeleConsultants, Glendale, CA. Schaeffer is a senior associate at Gensler and Associates, Architects, San Francisco. Respond via the BE FAXback line at 913-967-1905.

Photos by Chas McGrath.

By the end of 1990, KQED management and engineering had set its goals and objectives for the move and hired San Francisco architects Gensler and Associates to design the new space. National TeleConsultants (NTC) of Glendale, CA, was hired to work with Gensler on the planning of technical space. NTC also provided engineering design consulting

and project site management, using a KQED-hired team of installation to augment the station's own staff.

A blending of old and new

Public broadcasters' view tends to be longer than that of their commercial broadcast colleagues, a fact that is often reflected in their technical facilities. KQED management and engineering wanted to retain much of their existing TV and radio equipment for use in the new facility, but they also wanted a facility that would provide for future capabilities.

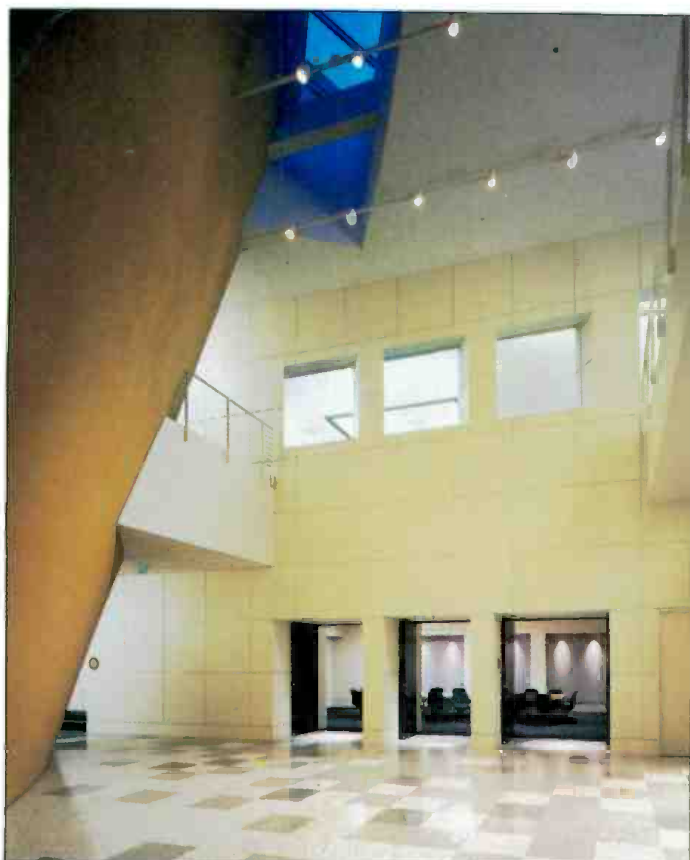
The theme that emerged in the plans of the station, architects and NTC was one of a flexible, forward-looking technical core that permitted the easiest, most practical evolution of equipment pos-

Any technical facility lives in a hammock strung between the past and the future...

sible. Any technical facility lives in a hammock strung between the past and the future, and its designers must try to make the users as safe and comfortable in that hammock as they can.

In KQED's case, significant expansion of the central TV routing switcher is possible with the future addition of electronics cards and DAs. Expansion router frames, jackfields and the associated wiring are already in place. Space also has been reserved to accommodate growth in the area of digital video effects and related systems.

Jack-row, DA-tray and other equipment placement and numbering schemes were also planned with easy expansion and change in



The atrium of the KQED facility produces dramatic visual effects with its unusual angular treatment. The conference room at the rear is wired as source or destination for audio and video signals.

Design team

Client: KQED
Tony Tiano, president

Architect: Gensler and Associates
Kevin Schaeffer, AIA

Broadcast systems designers: National
TeleConsultants
John Aalto, P.E.

Systems installation management: National
TeleConsultants
Michael Pusateri, project manager

KQED project team: Gene Zastrow
Larry Reid
Fred Crock

Acoustical consultants: Charles Salter & Associates,
San Francisco
David Schwind

Structural engineers: Stephen Tipping & Associates

Mechanical/electrical engineers: Syska and Hennessy

...and its designers must make the users as safe and comfortable in that hammock as they can.

mind. KQED also chose a flexible, state-of-the-art machine control system that is readily software-modified for changing and expanding needs. Audio and video tie-lines serve occasional-use production areas, such as the Green Room Atrium, Board Room and similar areas.

Close proximity to the telephone room allows expanded use of digital common carrier circuits, provided to the building on both copper and fiber-optic lines. Numerous roof-top tie lines and conduits allow expanded satellite and microwave applications.

Consolidation of assets between radio and TV

A flexible, expandable copper infrastructure was conceived for radio by Fred Crock, KQED-FM chief engineer and a veteran of commercial and public radio. Crock and Gene Zastrow (then KQED executive vice president and director of engineering) knew that change was likely to be the only constant encountered in the life of the new facility. As with the TV side, the radio operations required an accessible, large-capacity wireway system interconnecting all control rooms and studios, and a distribution backbone consisting of a central routing switcher and signal distribution system. In addition, a large number of dedicated and spare signal conductors between the central wire room and each control room were provided. This allows extensive future changes to inter-room wiring without disrupting the dense jackfields and DA wiring in the racks.

Although they are hundreds of cable feet away from the main TV-system router and are completely separate in operation, KQED-FM and TV share the same ethernet-linked, computerized routing system. Multiple audio and video paths also run between the operations. This setup

THOMSON BROADCAST would like to thank the National Academy of Television Arts and Sciences for once again recognizing the experience and savoir-faire of the mother of digital with an Emmy Award. In 1993, THOMSON BROADCAST's continual efforts to promote serial digital

STATE OF THE DIGITAL ART

technology, enhanced by the technical mastery of THOMSON-CSF/LER and super-efficient SGS-THOMSON VLSI components, have been unanimously lauded by the video domain. As both a manufacturer and systems integrator, THOMSON BROADCAST offers a full gamut of digital products which operate at the peak of performance. Cameras, routing switchers, color correctors, interfaces, production and post-production switchers, still stores, and master control rooms have all been conceived within the most sophisticated realm of research and development so that you can reap the benefits of tomorrow's technology today. Our drive to push the envelope of efficiency is visible in the 9200 switcher and the whole range of the 9000 series, which capitalize on the advantages of the latest THOMSON BROADCAST digital technology for the greatest satisfaction of video professionals.

MTBAYE GADUHO & ASSOCIES



 **THOMSON BROADCAST**



9200 Component Digital Switcher

THOMSON BROADCAST - 17, rue du Petit-Albi - B.P. 8244 - 95801 Cergy-Pontoise Cedex FRANCE - ☎ (33) 1. 34.20.70.00. - Fax : (33) 1. 34.20.70.47.
 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

Circle (102) on Reply Card

allows FM to control selected TV switcher outputs and vice versa, should special situations require it.

Electrical and mechanical systems

Primary electrical service is provided at 3,000A, 277/480V, 3-phase. Shielded technical power transformers are used to step down to 208/120V, 3-phase. Radio has 75kVA available, and 225kVA goes to television. All technical power feeders include oversized neutrals (2 AWG sizes) and separate branch-circuit neutrals to accommodate high third-order harmonic currents. A 300kW emergency diesel generator (277/480V) supports technical operations and emergency lighting in the event of power failure.

The radio and TV technical areas are served by a 350-ton mechanical HVAC unit, and the TV studios are served by a separate 300-ton unit in a redundant crossover system. One unusual design feature is the bilevel air distribution in Studio A. Supply air is provided just above the TV lighting zone, and the 72°F floor return re-enters the studio above the primary supply. It is either exhausted or returned depending on this top-level temperature and outside conditions.



KQED's Studio A, a 4,000-square-foot studio for large productions, features a unique bilevel air distribution system and a fully motorized lighting batten system.

MANAGE YOUR AUDIO

FAST TRAC II Voice-Over Workstation
solves audio management headaches!



NEW! *Fast Trac II* is a 6-input stereo "micro-console" that's perfect for TV and Radio audio!

- >> Voice-Over recording with auto-Ducking
- >> Audio control for digital editing systems
- >> Dubbing with timed machine control
- >> Stereo level and balance control
- >> Stereo line-source switching
- >> Comprehensive monitoring

Fast Trac II....it's "A Studio-In-A-Box"

HENRY ENGINEERING

503 Key Vista Drive
Sierra Madre, CA 91024 USA
tel (818) 355-3656 fax (818) 355-0077
See Us At NAB — Booth #3700.

Circle (21) on Reply Card

Beauty is often in the details

The facility design includes special task lighting and dimming, including an electrical and acoustical dimmer and filament noise control. Humidity control and air filtration per SMPTE videotape standards are provided for all technical areas. Temporary cableways are fitted in the TV studios for special telecommunications needs during fund-raising telethons. Rack installations include seismic bracing using custom steel bases that anchor the racks to the slab. The technical grounding systems for radio and television are based on a comprehensive consideration of audio, video and safety issues.

Important requirements for future growth and change in the building architecture and engineering included extensive use of access flooring, sufficient power and HVAC capacity, and some technical expansion space (including an HDTV room, a second TV master control and shop space).

The theme was one of a flexible technical core that permitted the easiest evolution of equipment.

On-site project management

The first access to the site for installation of technical equipment occurred in July 1991. All daily installation work was planned by NTC and KQED supervisors, who helped coordinate the efforts of the KQED staff and the team of professional installation personnel hired by KQED. By January 1992, final installation was completed.

As with any project of this scale, numerous operational goals could not be achieved with off-the-shelf

TAKE THE TEST FOR THE BEST

If you're faced with replacing your UHF transmitter, don't make that investment until you've compared the Harris Sigma™ Series family of IOT transmitters to its competition. Take a moment to consider these important questions.

	HARRIS	COMPETITION
1. Which transmitter has total system automatic gain control to keep power output from drifting?	☐	☐
2. Which transmitter design is impervious to AC power interruptions or transients up to 6 kV with proven results?	☐	☐
3. Who can offer you multiple sources for final amplifiers backed up with proof of performance data?	☐	☐
4. Which transmitter features full broadband correction for channels 14-69 for each IOT in the transmitter?	☐	☐
5. Which transmitter has the component accessibility and ease of service you'll like most 10 years after the purchase is made?	☐	☐
6. Which transmitter manufacturer has the reputation for introducing transmission technology when it works, but not until it works?	☐	☐
7. Who has the most on-the-air experience and the broadest line of UHF TV transmitters?	☐	☐
8. Which manufacturer supports its large installed base of equipment with a multi-million dollar inventory of parts and a parts department that is staffed around the clock, every day of the year?	☐	☐
9. Which manufacturer can you call 24 hours a day, 365 days a year, and speak to a service engineer who provides help so you stay on the air or get back on the air as quickly as possible?	☐	☐

NOTE: The short answer to each of these questions is Harris. For the whole story call us. U.S. and Canada: 217-222-8200 or fax 217-224-1439. International: 217-222-8290 or fax 217-224-2764.



**HARRIS
ALLIED**

© 1994 Harris Corporation

Circle (34) on Reply Card

www.americanradiohistory.com

hardware. As needed, NTC custom-manufactured control panels, circuits and other assemblies for KQED's requirements.

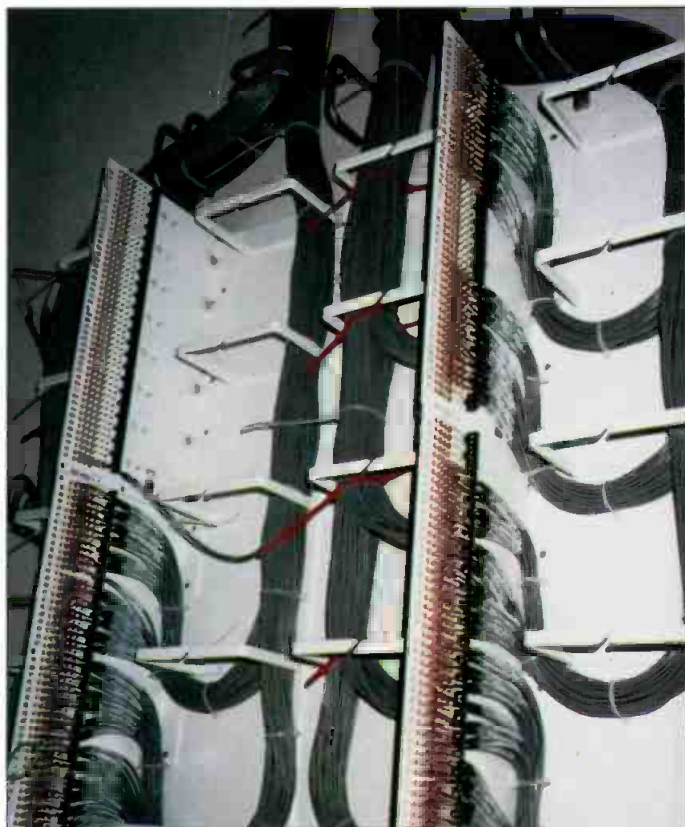
The 190 CAD drawings that fully document the designs were as important for initial installation as they will be for future modifications. They include detail of the 9,000 audio, video and control cables for the facility. A cable-run database of almost 200 pages was created with proprietary wiring management software.

KQED-TV also reused cameras, a production switcher, all VTRs, an audio console and an intercom system — all taken from active service in the old building and reinstalled in the new one. For additional economy, serviceable audio and video jackfields and racks were also reused. KQED-FM also reused a substantial amount of equipment.

Backbone equipment in radio and television (including the routing and source-distribution systems) were replaced, and new TV post-production switchers, a new TV master control switcher, and KQED-FM's new master control mixing console

A cable-run database of almost 200 pages was created with proprietary wiring management software.

were added. Thus, the core of the plant is new and is expected to provide between one and two decades of service. Change was likely to be the only constant encountered in the life of the new facility.



A main distribution frame (MDF) wiring system allows changes to be made conveniently, without disrupting equipment or jackrow wiring.

J24WHF Series Serial/Digital Patch Jacks

PREMIUM Normal-through video patch jacks that meet present and future broadcast standards!

Trompeter's J24WHF series 75Ω patch jacks provide an extended band width up to 360Mbits (720 MHz) with a typical return loss of $\geq 40\text{dB}$ through 720MHz. They meet and exceed present and proposed analog and digital standards.

J24WHF and J24WTHF-75 (self-terminating)



The J24WHF Series also offers:

- Greater reliability.
- 2.5 lbs. minimal withdrawal force to eliminate accidental removal.
- Long life, low contact resistance, consistent contact force.
- Superior dielectric and electrical contact properties.
- 100% compatibility with existing patch plugs, looping plugs and support equipment.

Trompeter's premium quality patching products and connectors are your best investment for ultra-high quality, reliable broadcast component performance.

*Quality doesn't cost...
It pays.*

TROMPETER
ELECTRONICS, INC.

31186 La Brea Drive • Westlake Village CA 91362
(818) 707-2020 • Fax (818) 706-1040

Contact your local representative or call us toll free - (800) 982-2629 for sales, service or technical support.

Everything you wished for in a hand-held lens...is here.

Imagine getting Aspheric Technology, Inner Focus, V-Grip, and Adjustable Zoom Speed, all in a single lens. Well, consider your wishes granted with Fujinon's A15X8EVM hand-held lens.

Aspheric Technology (AT) Redefines TV Zoom Lens Performance.

AT gives our A15X8EVM lens unparalleled performance with a wider angle, closer focus, and reduced flare and ghosting. You also won't find AT on any other TV zoom... it's a Fujinon exclusive.

Inner Focus Assures Filter Flexibility.

Imagine setting your graduated, star, polarizer, and other filters only once. There's no need to set them again after refocusing.

V-Grip Servo for Unparalleled Comfort and Control.

Our exclusive V-Grip adjusts to your hand in five angles from 3 degrees to 17 degrees. It also lets you focus from infinity to MOD without ever removing your fingers from the lens barrel.

Adjustable Zoom Speed for Exceptional Control.

You can adjust zoom speed from 7 seconds to an incredible 1 second wide-to-tele.

FREE!

To receive your free *Select-A-Lens* software, simply call 1-800-553-6611. Have the make, model and serial number of your current lens readily available.



Broadcast & Communications
Products Division

FUJINON FOCUSED ON THE FUTURE

FUJINON INC. 10 High Point Dr., Wayne, NJ 07470-7434 (201) 633-5600
Southern 2001 Midway, Ste. 114, Carrollton, TX 75006-4916 (214) 385-8902
Midwest 3 N. 125 Springvale, West Chicago, IL 60185-1560 (708) 231-7888
Western 129 E. Savarona Way, Carson, CA 90746-1406 (310) 532-2861
Latin American 15181 Southwest 113th St., Miami, FL 33196-2567 (305) 388-7399
FUJII PHOTO OPTICAL CO., LTD. 1-324 Uetake, Omiya City, Saitama 330 Japan.
Phone: 048-668-2152, FAX: 048-651-8517, TELEX: J22885

See us at NAB Booth #16958.

Circle (23) on Reply Card

AT

Building the first DBS facility: DirecTv



A new kind of facility is the head-end of the information skyway.

By Curtis Chan

The Bottom Line

The first true DBS TV service to U.S. homes is about to begin, originating from a brand-new, purpose-built uplink outside Denver. The facility includes several innovative features, including all-digital video operation, multichannel/multirate data reduction and multilevel automation, generating more than 200 independent, conditionally accessed program channels. The design of the unique facility and its systems was a cooperative effort of many diverse players.

\$

The launch and commissioning of the first Hughes Galaxy 601 direct broadcast satellite (DBS-1) last December signaled the beginning of a new era in entertainment distribution. This new direct-to-home digital satellite service will beam more than 150 channels of audio and video programming to 18-inch satellite dishes installed in homes across the 48 contiguous United States. The proponents of the system expect to acquire approximately 10 million subscribers by the year 2000 at rates comparable or lower than cable.

Two service providers will offer these DBS program streams when service begins in April 1994: Hughes' DirecTv and Hubbard Broadcasting's United States Satellite Broadcasting (USSB). (See "DBS — Tomorrow's Opportunity," July 1993.) The two services will share the use of DBS-1, which will carry approximately 60 channels of DirecTv programming and 25 to 30 channels of programming from USSB. A second satellite (DBS-2), scheduled for launch in mid-1994, will be used exclusively by DirecTv for an additional 80 to 90 channels of programming. Both satellites will be co-located in geosynchronous orbit at approximately 101°W.

A critical element of these systems is the program origination function. At uplink facilities, program streams are created, data-reduced (using MPEG-2), multi-

plexed, encrypted, channel-coded with error-correction data and modulated for uplinking at 17.2GHz to 17.7GHz via 13m antennas.

USSB's programming will originate from an uplink facility now under construction in Oakdale, MN. DirecTv's much larger operation is centered at the nearly completed Castle Rock Broadcast Center (CRBC) in Castle Rock, CO, located about 30 miles south of Denver.

Castle Rock Broadcast Center

The CRBC is unique in several ways. When it is fully implemented, it will be the first fully serial digital transmission facility capable of broadcasting more than 200 simultaneous channels of programming. The 55,000-square-foot facility houses a large amount of advanced technology, including state-of-the-art broadcast equipment, automated video processing,

The proponents of the system expect to acquire approximately 10 million subscribers by the year 2000.

conditional access, billing and logging management. In addition, there are three 1.5MW emergency generators with attached noise-suppression systems, a redundant electrical system with full UPS

Chan is principal of Chan & Associates, a marketing consulting service for audio, broadcast and post-production in Fullerton, CA. Respond via the BE FAXback line at 913-967-1905.

Sonic fidelity. Rugged reliability. And you can't trip over the cord.



News gathering and field production may seem light years away from rock and roll. But not to Ramsa. On the world's largest tours or in the unpredictable arena of breaking news, Ramsa technology delivers reliability and quality sound. **Introducing Ramsa Wireless Microphone Systems.**

☐ 800 MHz UHF operation. ☐ Phase Lock Loop (PLL) for stable carrier frequencies. ☐ Digitally switching diversity system dramatically reduces dead spots, drop outs and noise. ☐ Compressor system enables a dynamic range of over 100 db. ☐ 49 user selectable channels.

Circle (24) on Reply Card

To learn more, call (714) 373-7277. Or write Ramsa, 6550 Katella Ave., Cypress, CA 90630

See us at NAB, Booth 18001.

RAMSA

Panasonic

Broadcast & Television Systems Company

© 1994 Panasonic

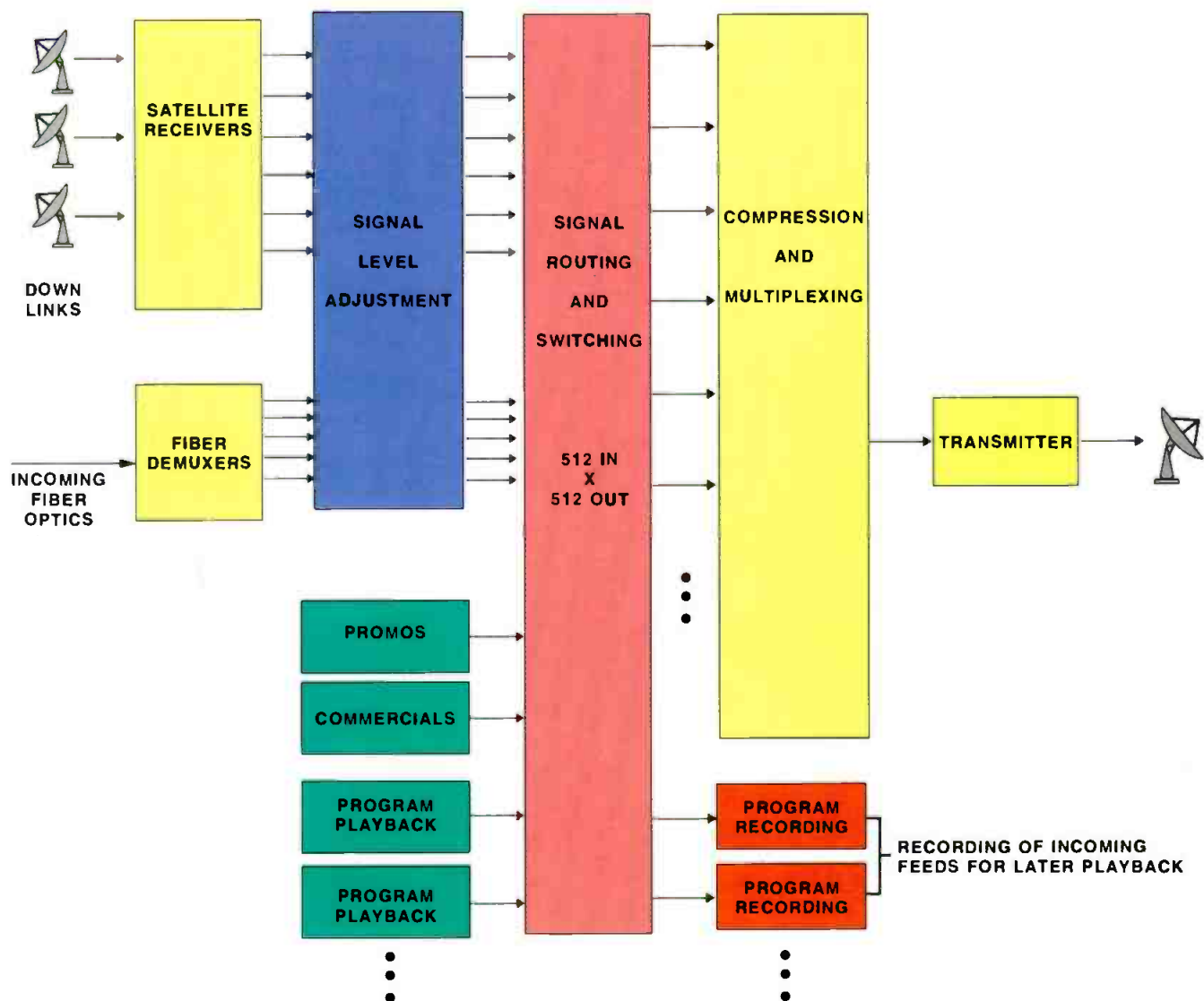


Figure 1. Signal routing for DirecTV program transmissions, incorporating both incoming real-time turnaround feeds (from other networks or sources) and on-site tape playback.

capability, computerized support-system monitoring and a 100,000-gallon fire-suppression system.

The Castle Rock site was chosen because it was an existing uplink facility, acquired by Hughes when it purchased the SBS fleet of satellites from MCI. The facility's 6,000-foot elevation minimizes the amount of rainfall and, therefore, mitigates the rain fade to which Ku-band signals are particularly vulnerable. The terrain around the site also provides a natural bowl that serves to shield it from terrestrial interference.

The design philosophy of the CRBC is based on a product-in/product-out style with a minimum of insertions. Programming comes into the facility in the multi-format Program Receiving area. This area can receive programming from a variety of mediums, including off the (terrestrial) air, via satellite, from incoming fiber-optic paths or from tape playback. From this incoming hub, program materials are sent to Quality Assurance, where the programs are screened and dubbed. The

compiled program materials are then sent to the Media Library, which in turn feeds them to the Playback and Record System (PARS) for playback to the uplink. An edit room is used for creating break materials, such as promos and bumpers.

At the center of the operation is the Broadcast Operation Control Center consisting of four large operator stations, two supervisor stations and a monitoring wall. The common link between all of these systems is an intelligent routing and distribution system designed by Sony. Within it is a sophisticated monitoring system that can detect anomalies along

the entire production path up to the uplink.

The broadcast system

The broadcast production system was also developed and integrated by Sony, which designed a complete turnkey facility for CRBC based upon Digital Betacam. Digital Betacam was chosen for its backward compatibility with analog Betacam, its high-quality 4:2:2 format at reasonable cost and its compact size. Complete redundancy is provided to maintain uninterrupted service.

The all-serial digital facility starts with the six quality assurance and formatting rooms, where programs supplied to DirecTV in recorded form are transferred to Digital Betacam. Other program materials (typically short-form) supplied via incoming feeds (satellite and fiber) are signal-adjusted and sent to the digital routing switcher, which directs these signals to Digital Betacam recorders as well.

The routing system includes five digital video switchers based on a number of

DirecTV's operation is centered at the nearly completed Castle Rock Broadcast Center in Castle Rock, CO.

YOU CAN'T
TURN THIS PAGE
FAST ENOUGH

virtual matrices working in tandem to provide the equivalent of 1,000 inputs by 1,000 outputs. The main router is a Sony-developed 512 x 512 serial digital router housed in 40 racks. Complementing this are matrices from other vendors, including analog NTSC matrices for cross-switching, TV monitoring and other functions. The router accommodates serial digital component video, two channels of AES/EBU digital audio, RS-422 and NTSC. Custom operating software can control up to 300 channels of programming.

After initial recording or dubbing, the Digital Betacam tapes are transferred to

tor stations, two supervisor stations and a large monitoring wall. The heart of this center is a sophisticated automation system, which helps to compile tapes, automates the dubbing process, formats tapes and monitors all specific functions in the plant. Every input and output, all processing functions and signal chains up to the transmission point can be monitored for any discrepancy. The automation system also houses a large media manager for identifying all tapes in the plant through the use of barcodes.

The programs are then fed to a data-reduction and multiplexing system using 56 separate MPEG-2 systems and sophisticated conditional-access encryption systems. The resulting signals are then fed to any of four 13m uplink antennas.

The facility also includes 54 high-power amplifiers (HPAs), six 6.1m and two 4.6m receive-only antennas and more than 300 satellite receivers.

The complete DirecTv system design is a model of integration for future delivery systems, with numerous, synergistic contributions from different specialist companies. The project has involved a collaborative technical evolution on many fronts, from the Hollywood movie com-

CRBC will be the first fully serial digital transmission facility capable of more than 200 simultaneous channels.

the Media Library, where two 1,000-cassette Sony Library Management Systems (LMS 4000s) are used for compilation of commercial insertions and other breaks. An edit room used for local production of insertions houses a DVS-8000 switcher, BVE 2000 editor, Digital Betacam decks and digital audio board. Finally, programs ready for air reside in the PARS, which comprises 56 Flexicart robotic videotape playback systems, within which more than 300 Digital Betacam VTRs are used to bring programs to air.

Keeping track of all the operations is the job of the Broadcast Operation Control Center, which consists of four opera-

The project has involved a collaborative technical evolution on many fronts.

community at the source end to consumer electronics manufacturers at the home receiver end. In addition to Sony's work at the CRBC, Thomson Consumer Elec-

Design team

Client: DirecTv, David Baylor, Project Manager

Architectural/Facility design & integration mgmt.: Hughes Communications, Technology and Implementation Division, Ronald Allen and Jeff Chandler

Architect: The Crosby Group, Roger Crosby and Tim Green

General contractor: Pinkard Construction, Jim Pinkard, Jr.

Video/Automation systems & integration: Sony, Systems Integration Division, Peter Ludé and Charles Steinberg

Downlink systems: Engineering and Technical Services (ETS), R.A. Tony Grimes

Uplink systems: Satellite Transmission Systems (STS), Roger Parsons

tronics (TCE) is manufacturing the consumer set-top receiver/decoder and receive dishes under the RCA brand name. (This hardware is marketed as the Digital Satellite System or DSS. After an initial period of TCE exclusivity, other companies may also produce DSS products. Sony has already announced such plans.) News Datacom, a division of Rupert Murdoch's News Corporation, will develop and manage the smart-card system built into the DSS receiver. Digital Equipment Corporation (DEC) will operate and manage the DirecTv national billing center; DBS Systems will provide billing software; the National Rural Telecommunications Cooperative (NRTC) will provide rural sales distribution. Matrixx Marketing, a division of Cincinnati Bell, will operate the DirecTv national customer service and telephone marketing center.

DirecTv and its Castle Rock Broadcast Center have provided the industry with its first look at what might become a standard among future facilities: The management and delivery of multichannel, conditionally accessed, data-reduced digital programming to a new generation of consumers.



DirecTv uplink facility in Castle Rock, CO, showing surrounding protective terrain. Four large dishes at left carry main uplink transmissions; the other smaller dishes at center rear receive incoming feeds. The building in the right foreground houses emergency generators. The building at left rear and its surrounding dishes are the control center for the Hughes fleet of communications satellites.

Acknowledgment: Thanks to Bill Butterworth, senior vice president of DirecTv, and Peter Ludé, vice president of Sony Systems Integration Division, for their contributions to this article.

TO MATCH THE SPEED OF THIS MACHINE.



Lightning speed. That's why just about anyone doing anything with video — from the major broadcast and cable networks to directors at sports arenas — is doing it with the VDR-V1000 Rewritable Videodisc Recorder from Pioneer.

With 0.3 seconds average access time and two playback heads, you can be cued and ready to switch to the next segment long before the current

segment is finished.

Find out why scores of O&O's, affiliates, independents, and PBS facilities including KMEX, KESQ, WSFP, WFMZ, TNN: The Nashville Network, KCOP, KCNC, KDFW, production houses like ReZ.n8 and Videofonics, and corporations like NIKE chose the VDR-V1000.

And if quick return on investment is another one of your speed requirements, call

any of the following people to find out why the VDR-V1000 is your ideal machine:

Northeast-Jim Burger at (201) 327-6400; North Central-Mike Barsness (612) 758-5484; Southeast-Rodger Harvey (404) 460-7311; South Central-John Leahy (214) 580-0200; West-Craig Abrams (310) 952-3021.

PIONEER
The Art of Entertainment

Pioneer is a registered trademark and LaserDisc is a trademark of Pioneer Electronic Corporation.

Circle (25) on Reply Card

See us at NAB, Booths 11908 & 17182.



The 22 Series of Editors, Players and Recorders from JVC.

JVC
PROFESSIONAL

The JVC 22 Series means no sacrifices. Each of the units, the 822... 622... 525... 522...

and 422, offers a standard of quality, performance and economy that is unmatched, when compared to other S-VHS, or any other video recording format. The lower purchase price is only one reason for its popularity – because the true value of JVC's 22 Series actually lies below the surface of each component. The 22 Series is incredibly rugged, and made to take whatever you can dish out, year after year. This kind of reliability means longer

uptime, so you can produce even more. In addition, since they utilize S-VHS tapes, you'll enjoy greater recording time at a far lower operating cost.

ADVANCED VIDEO TECHNOLOGY THAT'LL MAKE YOU, NOT BREAK YOU.

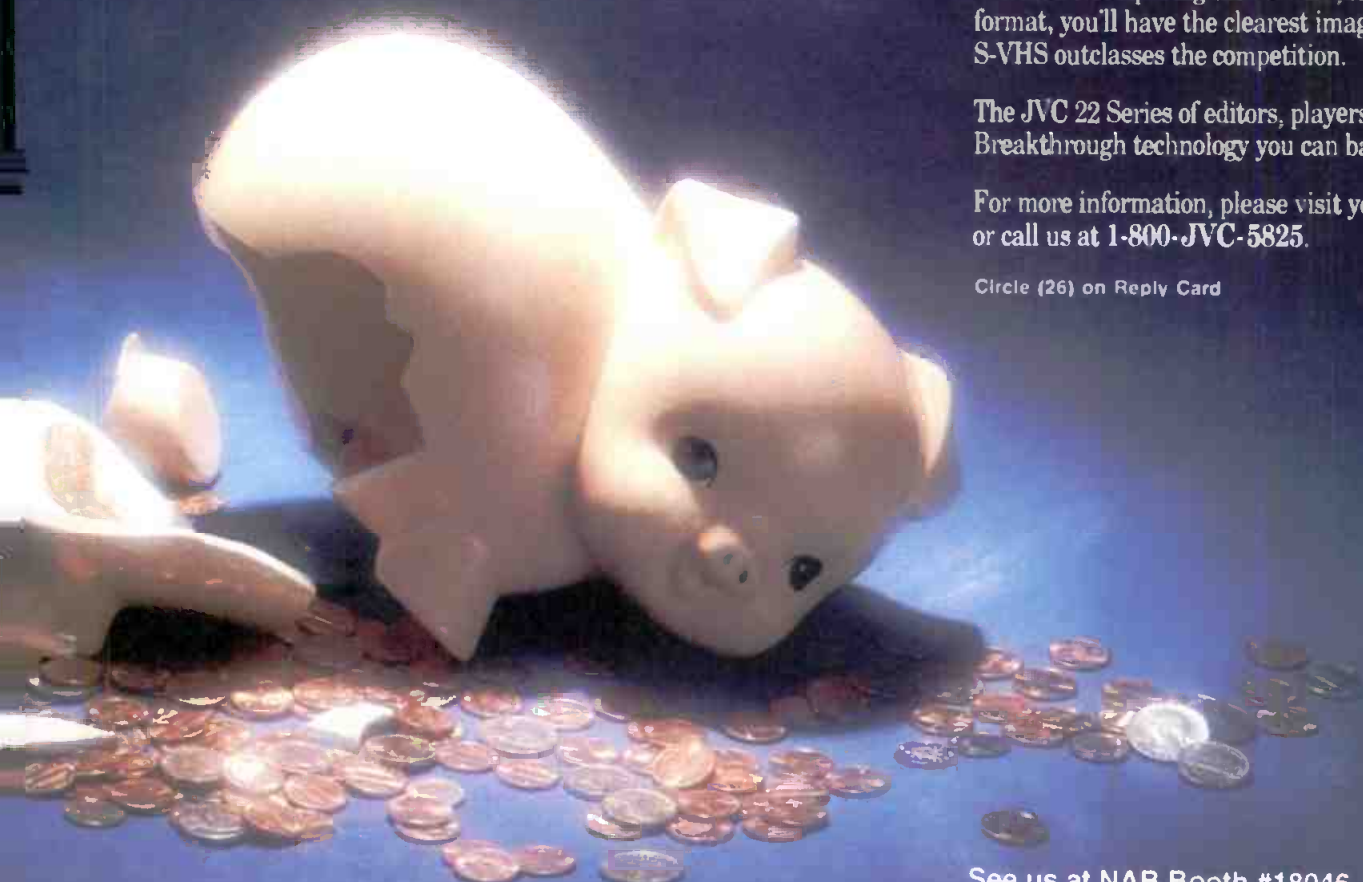
Add it all up, and it's a significant savings you can take to the bank.

When it comes to flexibility, the JVC 22 Series is number one in the industry. A unique, open-architecture design offers easy video signal interfaces with VCR's from all the other popular formats. And when comparing unit to unit, format to format, you'll have the clearest image of why JVC S-VHS outclasses the competition.

The JVC 22 Series of editors, players and recorders. Breakthrough technology you can bank on!

For more information, please visit your JVC dealer or call us at 1-800-JVC-5825.

Circle (26) on Reply Card



See us at NAB Booth #18046.

Building on Fisherman's Wharf: Realtime Video



It takes more than luck to transform an historic building into a modern production facility.

By Will Hoover

The Bottom Line

As with any building project's success, building a successful post-production facility requires careful planning and close attention to details. The staff at Realtime Video was up to this test as they transformed an historic San Francisco building into a state-of-the-art production house in record time.

\$

The colorful Northeast Waterfront historic district of San Francisco is known widely for cuisine and shopping. What isn't so well known is that the area also is home to some of the city's most notable media and advertising companies. For Realtime Video's president Will Hoover, a trained architect highly sensitive to folklore and aesthetics, the combination of an attractive and historic setting, combined with a pool of nearby clients, made the San Francisco Waterfront district an especially appropriate setting for the new home of his growing production and post-production facility.

Evolutionary process

The story of Realtime's multimillion-dollar move to 60 Broadway is a study in research, preparation and collaboration among his design team, the architectural firm of Whisler-Patri and the general contractor, Plant Construction. The result was the total subbasement-to-rafters renovation of an historic, 2-story 12,000-

square-foot brick building, a process completed in only 3½ months.

Realtime Video was formed in 1975 in the considerably smaller confines of an



Careful layout of operator-intensive controls, as shown here, makes this on-line suite convenient and ergonomically friendly.

old house (circa 1852) atop Telegraph Hill. The company name came from the computing industry's newly emerging concept of real time, in which computers control processes as they happen. In those early years, Realtime specialized in video production services, providing camera packages to a commercial and corporate client base.

Early on, Hoover considered adding on-line and graphics services, but his indus-

Hoover is president of Realtime Video, San Francisco.

Continued on page 70



South Florida's
#1

JVC
PROFESSIONAL
DEALER

(305) 633-2200

1-800-422-2880

(Florida, Puerto Rico and
U.S. Virgin Islands)



South Florida's #1 JVC Professional dealer.

Yes, **Centennial Video Systems** is South Florida's #1 JVC Professional dealer and only Premier dealer, where you can see the HOT JVC products displayed in our state of the art demo room in an environment similar to your own system. For more information, fax or mail this card TODAY!

(305) 633-2200 • 1-800-422-2880

(Florida, Puerto Rico and U.S. Virgin Islands)

PLEASE PRINT:

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Centennial Video Systems • 2500 N.W. 39th Street • Miami, Florida 33142
(305) 633-2200 • Fax: (305) 635-0030



NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 3920 ELMWOOD PARK, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

CENTENNIAL VIDEO SYSTEMS
C/O JVC PROFESSIONAL PRODUCTS CO
41 SLATER DRIVE
ELMWOOD PARK NJ 07407-9906



BANK ON THE 22 SERIES FROM JVC.



BR-S822U & BR-S622U Recorders

The 822 has been heralded as the industry's most comprehensive editing recorder. But now, JVC has made it even better by offering new Hadamard Digital Noise Reduction. Just plug the DNR board into a TBC equipped 822, and you'll have a picture quality never before achieved by an S-VHS recorder. This new DNR will remove up to 5dB of noise. And because our plug-in TBC is 4.2.2, you'll have component outputs that connect directly to Betacam and MII. And, by adding a Y-688 dub output board, you'll find that you have the cleanest transfer imaginable when plugged into a 3/4" system.

Only the open architecture of the 822 and the 622 gives you this high level of flexibility and picture quality. When you consider the system adaptability and low purchase price, the 822 and 622 both offer two of the best values in pro-video.

BR-S422U Dockable Recorder

The 422 is JVC's most popular compact dockable S-VHS recorder. The 422 not only delivers a superb picture and sound quality, but does it within a completely mobile package. At less than seven pounds, it's the lightest dockable recorder in its class. The 422 offers greatly reduced power consumption, quick response recording starts, optional plug-in time code generator, built-in AEQ, and 4 channel audio with two linear channels and two Hi-Fi channels. And the 422 uses full-size tapes, which provide up to two hours of recording time.

BR-S522U Feeder/Player

The latest addition to the 22 Series, the 522 is a cost-effective feeder/player that has been specifically designed for use with the 822 editing recorder. For maximum cost-effectiveness, the 522 is a playback-only unit. It boasts the renowned JVC picture quality, and high-performance edit/feeding capabilities. Durable and sophisticated in design, the 522 is ideal for video professionals working in high-end applications such as local broadcasting and post-production. For the price conscious buyer, the 522 lets you cut costs without ever cutting corners.

BR-S525UDNR Feeder/Player with Slow Motion

Fans of the 525 can be found not only among broadcasters, but even at the largest production houses. That's because if you're a video professional employing S-VHS, Beta, Beta UVW, MII or 3/4", you can now achieve slow-motion and reverse edits with a unit that's priced thousands less than comparable ones from other manufacturers. The 525 features a TBC with component outputs which allow for its easy link-up. And JVC's innovative Variable Tracking System delivers noiseless variable-speed playback at 72 different speeds between -2x and +3x normal. The unit also boasts JVC's advanced Hadamard Digital Noise Reduction technology, which improves the signal-to-noise ratio by up to 5dB - all while delivering the most impressive picture quality.

JVC
PROFESSIONAL

JVC PROFESSIONAL PRODUCTS COMPANY
41 Slater Drive, Elmwood Park, NJ 07407

1-800-JVC-5825

See us at NAB Booth #18046.

Circle (191) on Reply Card



SONY METAL BETACAM TAPE. A CLEARER PICTURE OF WHERE THE WORLD IS GOING.

You've never seen so many brilliant reasons for choosing Sony Metal Betacam® tape.

The inventor of the format and leader in metal tape technology announces new tapes that are even more advanced. You can step up to the future with Sony's unprecedented Digital Betacam BCT-D Series. For ENG, EFP and post production, choose the broadcast master tape that sets a higher standard, BCT-MA Series.

Or discover the tape that's making Betacam SP® recording affordable enough for industrial video, UVWT-MA Series. Whichever way you look, one thing is clear.

There's a Sony Metal Betacam tape for wherever your world is going.

Circle (27) on Reply Card

SONY



try savvy invited caution. In those early days, video production was straightforward and profitable, but post-production seemed fraught with difficulties, including substantial capital investment and labor costs. Although the concept of supplying post-production services seemed inevitable to him, he wisely decided to wait until client demand made it an absolute necessity.

By 1981, it was clear to Hoover that that point had arrived. Realtime then moved to a larger, 7,000-square-foot location and expanded into on-line and graphics capabilities. Ten short years later, continued growth required the search for yet a larger location.

This time, the goal was to build a full-fledged post house with the capability to serve all segments of the Northern California video market. This capability would include a facility to service a broad range of accounts, from ad agencies doing commercials to corporate, broadcast and independent production companies. The facility also wanted to be able to serve effects producers and editorial companies. This aggressive goal forced the Realtime staff to consider carefully all aspects of the building project, beginning with the location.

Finding a new home

To accomplish these goals, the facility needed twice the floor space then available. The expanded capabilities also created the need for a large electrical service and sufficient on-site client parking.

After the primary technical criteria were developed, location became the issue. A wide variety of options were available, but Hoover wanted to locate the new facility in the North Waterfront district. The reason was more than a good office view. Such a location would ensure that Realtime would be in the center of ad-agency activity.

The selected site was an expansive 2-story brick structure, parts of which predate the 1906 earthquake. The building was originally a warehouse in the heart of the Waterfront. At the time of its purchase, the building housed a collection of small agency-related creative shops for copy and art. Despite the buildings charm and location, the interior required total renovation to meet the firm's sophisticated creative, technical and oper-

ational demands.

Historic landmark

Renovation of old buildings is a sensitive issue in many cities, including San Francisco. Hoover recognized this important issue and was determined not only to respect the building's historic significance, but to capitalize on its charm.

The architectural firm of Whisler-Patri is long-established in San Francisco and highly experienced in working with the

projects on schedule.

Elliott Grimshaw, project manager for Plant Construction, originally proposed a 7-month construction schedule. Facing a considerable tighter deadline, Hoover suggested completion in less than half that time. Although the goal was aggressive, Hoover thought that, by carefully preplanning and scheduling the building trades to work in the space simultaneously, they could meet the goal.

Design considerations

The overall design process was begun by Steve Maggioncalda, vice president of technical operations, even before the building purchase was finalized. To speed the process, the planning for space and adjacency requirements for the interior was completed in advance. These plans incorporated important line-of-sight relationships, acoustic requirements, equipment interconnections, power requirements, transit and movement within the facility, plans for future growth and the implementation of new technology.

The goal was to shorten the construction phase by carefully completing the overall design with sufficient accuracy so that on-site changes would be kept to a minimum. Using a PC equipped with CAD-design software, Maggioncalda precisely developed room designs that would accommodate immediate and future needs. The plans were sufficiently detailed that even wiring harnesses were specified at this phase. By the time the purchase was finalized, the Realtime staff was ready to provide design drafts to the architect. This technique eliminated much of the early learning process an architect would have to understand the client's design goals.

Construction

Because mistakes can happen, especially with such an escalated time frame, Hoover, production manager Dennis Minnick and the Realtime design group inspected the site twice each day, morning and evening. In one case, an evening meeting with the architect resulted in a change in the plans. Unfortunately, when the Realtime staff arrived the next day, they discovered the building contractor was already pouring concrete — in the wrong location. The changes hadn't reached the contractor. This further em-



Creating an open-air look requires more than high ceilings. Shown here is the lobby staircase leading to the second floor offices and creative suites.

city's planning historic commissions — another important factor in the firm's selection. The possibility of discovering historic relics was a definite consideration in the reconstruction. For example, sunken Clipper ships have been found in the ground beneath some redeveloped buildings of the Waterfront district. This section of Broadway, and other streets that parallel it, were originally piers.

Whisler-Patri's chief architect for the project, Kevin Dill, was knowledgeable in dealing with red tape related to such discoveries. He also understood the myriad ways a project can be delayed by committee and bureaucracy and he had considerable experience in keeping

See us at
Booth #17119 at NAB!

THE path TO THE ALL-DIGITAL future IS LIT by TEKTRONIX.

Your all-digital environment is just around the corner. That's why Tektronix offers a full line of digital test equipment *now*.



The world's first hand-held serial digital test equipment gives you the features of full-sized equipment in the palm of your hand.

With monitors. Analyzers. Sync and Test Signal Generators. For every format. You choose the direction. Tektronix lights the way.

Our digital test equipment looks and acts like analog. It's familiar. Intuitive.

But that's no surprise. You helped us design it.

Our products also take advantage of the opportunities digital has to offer — like faster testing methods.

We let you do more and spend less. With Emmy award-winning technology. Our engineering expertise. And worldwide customer service.



A serial component waveform monitor and a master sync generator provide advanced capabilities for either system testing or digital component system manufacturing.

To learn more about the Tektronix vision for the all-digital future, contact your local Tektronix sales office or call **1-800-TEK-WIDE** ext. TV.

Tektronix

Copyright 1994 Tektronix, Inc. All rights reserved. TVG-130

Circle (28) on Reply Card

www.americanradiohistory.com

phasized the need for personal attention to every detail in the project.

One of the early challenges centered on the facility's HVAC requirements. The temperature-sensitive master control equipment called for a large air-conditioning system. However, the rest of the building required a much smaller load. To keep

One of the early challenges centered on the facility's HVAC requirements.

the MCR equipment properly cooled, Maggioncalda worked with the contractor to create an innovative and highly efficient 2-tiered cooling-vent system.

A lower tier of ductwork, built into the floor at the concrete-pouring state, distributes cold air directly into the base of the equipment racks. An upper tier of ductwork cools the top and front. The return ducts are located above and behind the racks. This localized air flow cools the MCR equipment so efficiently

that it requires half the tonnage used in comparably sized facilities. This design also keeps the staff environment at a comfortable level while producing less noise than other designs.

Two separate troughs were installed below the racks, one for the HVAC, the other one for wiring. In the wiring troughs, each cable is segregated by type: time code, data, video and audio. The power cables are also separated from signal cables to prevent hum-induction problems.

Another advantage of the ceiling-mounted and below-floor ducts and wiring troughs was that all operational and city code requirements were met, avoiding the problems often encountered with computer floors.

Building for the future

Planning for the use of serial digital video was done from the outset. Belden 8281 cable was used throughout the facility, ensuring that all signal paths would have sufficient bandwidth for today's and tomorrow's needs.

The internal wiring network uses ADC patch points and a BTS Venus routing switcher. The switcher handles all analog

Design team

Client: Realtime Video, Will Hoover, president
Anna Chao Hoover, chief operating officer
Steve Maggioncalda, vice president/technical operations
Dennis Minnick, production manager

Architect: Whisler-Patri
Kevin Dill, chief architect

General contractor: Plant Construction, Elliott Grimshaw, construction manager

composite, serial digital composite D-2 at 143Mbps and serial digital component D-1 at 270Mbps. The system is also capable of handling 16x9 digital signals at 360Mbps.

Universal Audio/Video Sync Generation

Digital Audio Transmission

Synchronous AES/EBU Digital Audio Routing

RS-422 Control Data Routing

Digital Audio Conversion, Processing & Sync

Digital Audio Sample Rate Conversion

AES/EBU & Time Code Routing

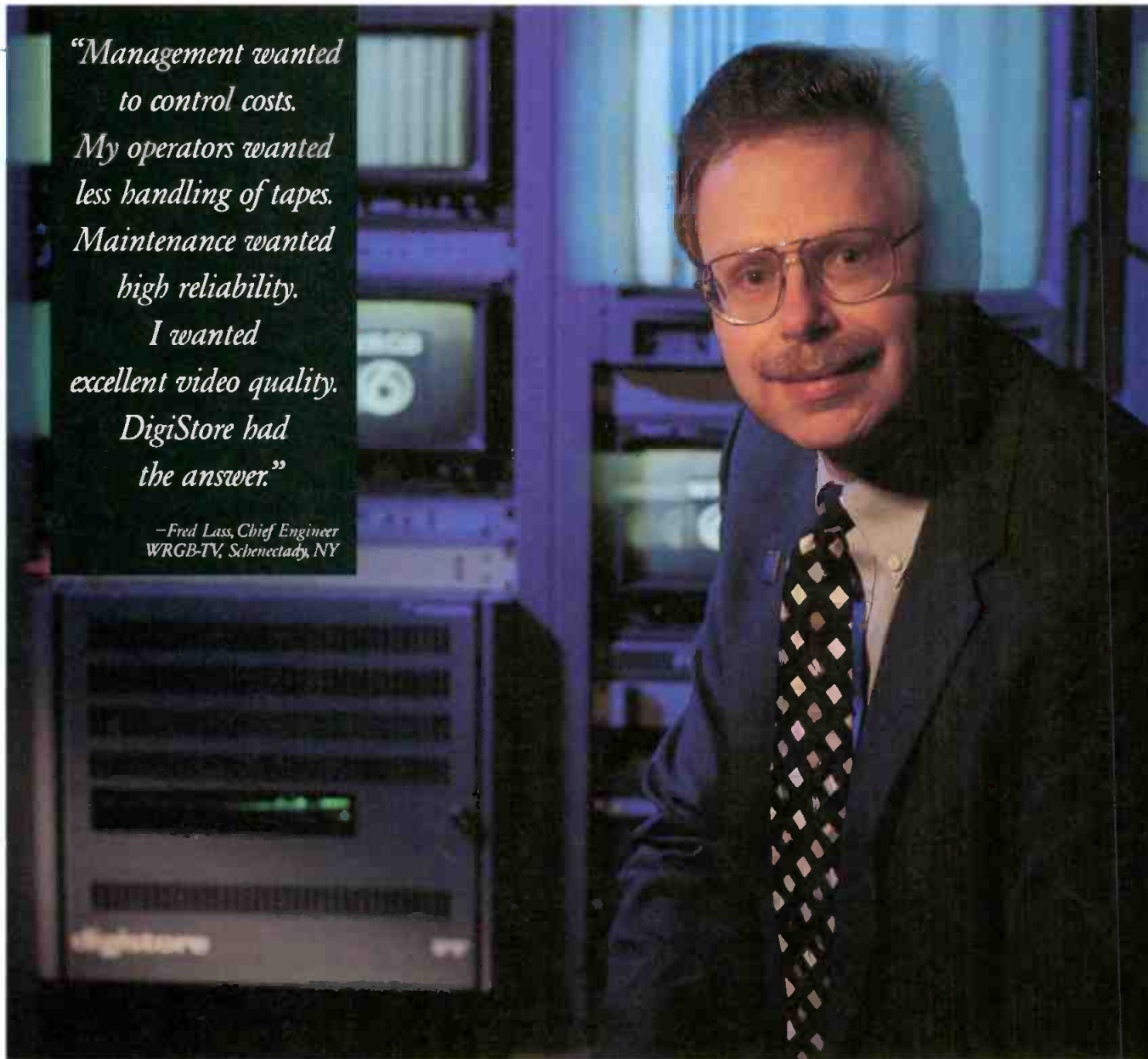
nVISION

**DEFINING THE CREATIVE EDGE
OF DIGITAL TECHNOLOGY**

Call for our Digital Audio
Design Handbook and
Product Catalog
nVISION, INC. • P.O. Box 1658
Nevada City, CA 95959
916/265-1000
800/719-1900

*"Management wanted
to control costs.
My operators wanted
less handling of tapes.
Maintenance wanted
high reliability.
I wanted
excellent video quality.
DigiStore had
the answer."*

*—Fred Lass, Chief Engineer
WRGB-TV, Schenectady, NY*



DIGISTORE IS VIDEO TECHNOLOGY WORTH WATCHING.

Fred Lass is careful. When it comes to reliable storage and dependable quality, he demands only the best for his operation.

He chose DigiStore, the leading installed video playback server in the broadcast industry. Like Fred, dozens of general managers and chief engineers realize that digital storage is the future.

DigiStore is superb video quality and automated dubbing and scheduling software designed to augment or replace traditional videotape cart machines. The perfect spot buffer, DigiStore supports library expansion for thousands of commercials, promos, and interstichals. DigiStore's AdWare gives you daily reconciliation and as-run logs.

DigiStore has the flexibility to plug into your operation today—without requiring extra software or new equipment.

So don't wait to call DigiStore, 801-328-1839. Don't wait to save on maintenance, support, and make-goods. Choose DigiStore, the sound, realistic choice for automating broadcast spot output that's good enough for the best station engineers.

digistore

180 Wright Brothers Drive
Salt Lake City, Utah 84116 U.S.A.
Phone: 801-328-1839
Fax: 801-328-3668



D Y N A T E C H
V I D E O G R O U P

The best professional video in the world

ALPHA IMAGE • CABLE PRODUCTS • CALAWAY EDITING • COLORGRAPHICS • DA VINCI • DIGISTORE • EMC • NEWSTAR • QUANTA • UTAH SCIENTIFIC

Circle (190) on Reply Card

www.americanradiohistory.com

Wiring for the second floor required a similar approach to that used in the first floor. Two large wiring trays running the entire length of the building were installed in the first floor ceiling. This design ensures the capability of future expansion anywhere on the second floor and provides easy interconnection between MCR and any suite or client lounge.

Two first floor on-line rooms connect to MCR wiring troughs via a total of six 6-inch PVC tubes, which were run through the newly poured concrete floor. Other rooms on the second floor connect to MCR via wiring troughs accessed by 6" x 6" metal hatches in each room.

Computer and telephone capability

Centrex telephone lines and computer local area network (LAN) lines are distributed through the facility walls, an installation accomplished when the facility was stripped bare. Centrex-type equipment was selected for two reasons: 1) Centrex lines receive first priority for repair; and 2) their higher bandwidth permits them to be used for computer data. These circuits can also be upgraded to fiber in the future.

To further guarantee sufficient commu-



Deadline pressures often require unusual solutions, such as sufficient space to relax. Shown here is the kitchen and dining area, which includes arcade games for creative minds that haven't had enough computer interfacing.

nication capability, 100, rather than 25, telephone lines were installed from the street into the building. Given the overall

installation costs, the extra 75 lines cost relatively little. However, such expansion later would be costly.

If You've Resorted To Digital Video Voodoo . . .

Then it's time for a second opinion on your digital video problems.

Advanced Audio Visual Systems introduces the S310 All Format Digital Video Analyzer.

The S310 is the only patented, all-in-one digital video analyzer capable of solving all your digital video problems by testing your entire system to CCIR and SMPTE specifications.

AAVS
Advanced Audio Visual Systems
By
SENCORE

See Us At
Booth # 19483.

For a new prescription to heal your digital video ailments,
call the Digital Doctors at **1-800-769-AAVS(2287)**.
We still make house calls.

Circle (31) on Reply Card

LET AFA DRIVE YOU UP THE DIGITAL HIGHWAY.

SYSTEMS INTEGRATION

TAPELESS TECHNOLOGY

NETWORKING

DIGITAL SERVERS

DIGITAL WORK STATIONS

DIGITAL RECORDERS

AFA's design engineers, in partnership with some of the most dynamic and innovative forces in the business, are ready to help you meet the challenges of a world without tape.

We can provide consulting services or design and build a new tapeless system for

you from the ground up. Or we can guide you in marrying your current system with this new technology.

See what the digital highway can do for you: visit us at NAB Booth 17353 or call us today at (201) 767-1200, FAX (201) 784-8637.



A.F. ASSOCIATES INC.

ADVANCED SYSTEMS AND PRODUCTS FOR THE VIDEO INDUSTRY
100 STONEHURST COURT, NORTHVALE NJ 07647 (201) 767-1200 FAX (201) 784-8637
A VIDEO SERVICES CORPORATION COMPANY

NAB 17353

Circle (170) on Reply Card

www.americanradiohistory.com

A level-4 ethernet LAN connects most rooms together into a network. Running four pair of wires to each computer location will facilitate future expansion. If this extra capability weren't built in, later expansion would be labor-intensive and expensive. Building in extra capability during the first construction phase is usually a wise move.

A highly detailed, zero-timed cable diagram was developed by Maggioncalda.

Using the CAD program, the technical team designed the entire distribution and interconnection system for the myriad of cables to the facility's video, audio and graphics equipment.

Installation began by marking the parking lot with specific cable lengths. Cables were then laid along these marks and cut, and the connectors were installed and tagged using the CAD-printed labels. This technique allowed less technical staff to assist in the cable preparation. The result was highly accurate cable lengths, all properly labeled, available before the rooms were even completed.

Functional touches

Realtime's 2-story facility suggests a separation between art and technology. The second floor provides an airy, loft-like environment. It features a spacious dining area and decorative art. Other spaces on the second floor include suites for the Quantel Henry, Aurora, Avid I and Mac graphics systems.

An innovative Macgrfx system is built around a number of Quadras equipped with D-1 I/O capability, ethernet and tied to MCR, Henry and Aurora. It provides machine control with com-

active input by bringing in elements they have generated themselves. A Video Explorer provides a direct digital interface with the Henry and the BTS D-1 router and enables files to easily be transferred to any tape format.

Even small points received careful attention. Today's editing systems and computers require the use of a mouse to control program functions. Operators often find the typical 7" x 8" mouse pad restricting. To increase operator speed and comfort, large mouse pads are integrated into the Avid system countertops. The pads surround the keyboard on both sides, making it equally convenient for left- and right-handed operators.

Client comforts

Post facilities recognize the importance of client comfort. To be sure these needs were met, Realtime surveyed their clients to see what they wanted. Their desires resulted in some surprises and some

These rooms are large, and most have windows. A full kitchen, pool table, a growing computer arcade and other games ease the pressure of long sessions.

Staff needs

The staff's needs also received careful attention. The operations and administrative groups were given ample work space in private offices on the second floor. The technical staff occupies spacious work areas, located primarily on the first floor. The 800-square-foot MCR provides a dedicated full-rack workstation for each creative operation. Centered in the room is an oversized counter-top to accommodate work needs and to provide extensive storage for tapes, carts and other materials.

The on-line, Avid and Henry suites average 400 square feet each and have custom consoles to provide the editor/artist with easy control of all equipment. Just as important, they are designed to provide for the most efficient monitoring

and interaction with clients in the creative process. Client seating allows for a short line-of-sight (not more than 13 feet) to a critical monitor. There is no need for clients to crowd around the operator just to see what's going on. Everyone, including those on the couches, can easily see the entire process.

Cooperative process

A primary ingredient to such a successful project is a dedicated and creative staff. Because



The master control room incorporates several unique features, including a highly efficient HVAC system and direct signal routing to all edit suites.

unique spaces in the facility.

For instance, because large numbers of people are often involved in the creative process, the Avid rooms are as spacious as on-line suites. Even the seating in all suites was considered. Although leather couches had been planned for client areas, in part because of the warm, rich look they provide, a survey showed that clients actually preferred cloth. The solution was to use a rich ultrasuede fabric, which has the classic look of leather but feels much more comfortable and inviting.

Clients and staff have access to an expansive lounge with several discreet areas dedicated as client workstations.

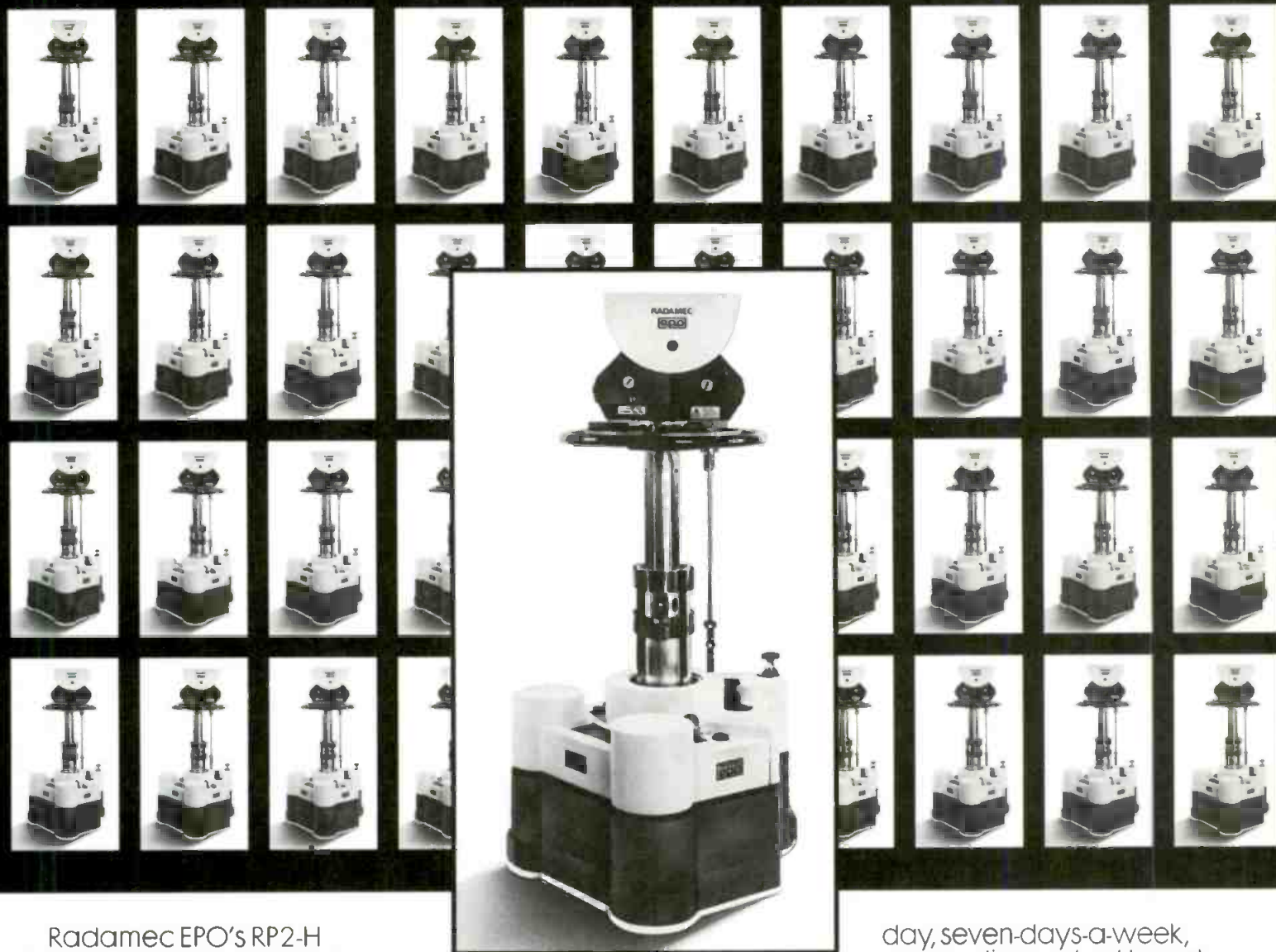
Realtime had to operate at its old location while the new one was built, everyone had to work together to cover all the bases. The situation required the staff to attend to construction needs while also handling full production schedules. Although the task was formidable, a motivated and involved team definitely made the difference.

The result of this effort can be measured in the pride of the staff and the quality of the product. At Realtime Video, both elements are first class.

Realtime's 2-story facility suggests a separation between art and technology.

plete gen-lock capability for on-line use. Ethernet allows multiprocessor rendering. The Macgrfx also provides clients with the option of adding their own cre-

**SOME PEOPLE THINK ALL ROBOTIC CAMERA SYSTEMS
ARE PRETTY MUCH THE SAME.
AND THEN THEY TAKE A CLOSER LOOK AT OURS!**



Radamec EPO's RP2-H Pedestal is the world's only second generation pedestal.

It has an advanced targeting navigation system that eliminates the need to re-position the pedestal on the studio floor for calibration.

It has the unique ability to operate 100% manually, and its small size enables it to go through standard doorways.

And now, its new color "See & Select" touch controller allows its users to store a series of actual miniaturized camera shots on screen for intuitive recall.

But that's not all. When you buy a Radamec EPO System from AFA, our in-house service department remains on call 24-hours-a-

RADAMEC EPO

The world's best-selling robotic camera system is sold and serviced exclusively in the U.S. by



A.F. ASSOCIATES INC.

ADVANCED SYSTEMS AND PRODUCTS FOR THE VIDEO INDUSTRY
100 STONEHURST COURT, NORTHVALE NJ 07647 (201) 767-1200 FAX (201) 784-8637
A VIDEO SERVICES CORPORATION COMPANY

Circle (32) on Reply Card

day, seven-days-a-week, *no-questions-asked*, to make certain that your equipment works at full capacity at all times.

This is not something we thought up last week.

For more than 25 years AFA engineers and technicians have designed, built and serviced video systems of all sizes and formats for the major players in the industry.

So, it is no wonder, that recently, when it came to buying a robotic camera system, WNYW, ABC, CNN and QVC, among others, chose Radamec EPO from AFA.

NAB #17353

Editel: Los Angeles



Building a digital complex at a 20-year-old address.

By E.L. Grant

The Bottom Line

Renovating an older facility is never an easy task. Decisions made over the years, many of which were correct at the time, are not always correct in hindsight. Over time, even carefully managed facilities can take on a kludge appearance. At some point, those involved are faced with the decision to start over. Whether that means moving to a new facility or undertaking a ground-up design of the current facility depends on many factors. Here are some of the factors that influenced Editel/LA's decision.



Editel/LA, an integral part of Hollywood's commercial post-production community, has been built over a period of 20 years. Like many other facilities, new equipment has been added with dedicated machine rooms according to available space. These additions have led to the present complement of five edit suites, four telecines and four graphics rooms, with individual machine rooms scattered throughout the facility. In today's multiformat post-production environment, it is imperative to have total flexibility for greater use of equipment. Stand-alone rooms are giving way to integrated technology, shared equipment and centralized digital centers.

In the spring of 1992, Editel was purchased by Unitel. With the purchase came a clear commitment to graphics and special effects. A team of key Editel executives began to map out a major facility upgrade. They quickly reached the conclusion that a new, centrally located machine room and a digital routing system were prerequisites for future growth, and that total facility reconstruction was the

only logical way to accomplish those goals.

Choosing specific technology is relatively easy. Finding a way to tie it all



The D-2 digital edit bay. The doorway on the right leads to the tech room.

together, renovate, rewire, install massive new air conditioning and fully integrate the entire physical plant into a single cohesive environment during business hours, while continuing to service a busy and demanding clientele — that was an entirely different matter.

Their mandate: Implement the best technological and aesthetic solutions available, write a plan integrating several new suites, and tie the facility together with a powerful new digital routing system.

Editel is currently halfway through a projected 1½-year renovation, which in-

Grant is a freelance writer based in the West Coast.

See us at NAB,
Booth # 17172.



**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.



Circle (33) on Reply Card

www.americanradiohistory.com

cludes a total redesign of all edit and telecine suites. By this time next year, clients will walk into a brand new and substantially digital Editel. There will be new component and composite suites and a new digital machine room complete with a 128 x 128 serial digital router for video, audio and control, completely integrating the post-production services.

When construction is completed in the spring of 1995, a new entrance way will open into a large, vaulted lobby with a 20-foot-high ceiling. By design, the new digital technology will be at the front of the building. Clients will be immediately confronted by the component and composite edit suites, Ursa, Henry, the Digital Center and two rooms available for future technologies.

Why not just move to a new building? That is an obvious alternative to the massive and complex project of rebuilding a facility in its original home during operating hours. In fact, an extensive search for a new site was conducted, and the decision to move was about to be made when the design team remembered the three most important rules in real estate: location, location, location.

The facility is extraordinarily well-situated in terms of client accessibility. If you were to sit down with a map of Hollywood and carefully plot out client locations, it would show that Editel is in the absolute optimum position. This factor, coupled with the expense of moving, the problems of major disruptions and the potential multimillion-dollar loss in business led to the decision to buy the current building and renovate.

The redesign team

Mike Orton was already in place as director of engineering and was familiar with the physical plant. Orton has a keen sense of where new technology is headed and how it can impact on Editel's position in the marketplace.

The search for an administration/finance director to manage the day-to-day activities of the plant upgrade led to Bill Scott. In addition to fiscal and management abilities, Scott had supervised several major leasehold improvement projects at previous posts.

Point man for Editel's physical and aesthetic redesign and renovation was architect Gary Heathecote of Heathecote Associates (LA). With credentials primarily in residential and avant-garde restaurant design, he had brought a fresh perspective to his initial and highly successful Editel Ursa suite assignment in 1991. Because the Ursa suite is a room that hosts 12- to 16-hour days of intense work, a soft, comfortable environment was created. Opening up the space gave it a living room feel rather than a cockpit feel. Another goal was to bring color into a previously dull environment. This was done by maintaining a monochromatic approach for the front of the room to keep it from interfering with the monitors. Brighter colors were applied to the back of the suite as a welcome visual break. Rounding off walls and raising the ceilings eliminated the



The Henry suite. Note the open ceiling and lighting grid.

feeling of confinement.

The same creative attitude was applied to the current renovation. For this major upgrade, the desire was to break the mold. The building is made from unreinforced masonry and was constructed in 1927 with huge bow-string trusses like a barrel-shaped vault. The plan was to take advantage of its height and expand the open, high-ceiling approach that had been so successfully received in the Ursa suite.

The Editel team was so enthusiastic about this concept that they agreed to give up valuable space on the second floor to raise the ceiling as much as 18 feet. The result was a 2-story-high, awning-like ceiling over a gently curved hallway.

Central digital room

Over the past several years, extensive digital technology was added, but space limitations forced the location of Harry, Henry and Ursa and their respective machine rooms in three different areas. This temporary solution did not represent optimum efficiency or provide the flexibility necessary for future growth.

The need for centralization was a prime concern. For example, because of Harry's location, it would have been necessary to buy another D-1 machine when the Henry was purchased. It became apparent that if the two suites were closer together and properly routed, they could share an existing D-1 machine. Rather than spend \$140,000 on a new machine, the facility could apply that money to the infrastructure.

The primary challenge was to accomplish the upgrade without shutting down. The first objective was to find a centrally located position for the new digital machine room. Focusing on a previously unused building in the Editel complex, the design team mapped out an area around the existing Ursa suite. A large L-shaped digital machine room was positioned in one quadrant; the component edit suite was planned to be directly across the hall adjacent to Ursa. The Harry and Henry suites

The design team

Client: Editel/LA

Ralph Horan, president

Bill Scott, director of administration/finance

Mike Orton, director of engineering

Rich Alcala, chief engineer

Claudia Baker, vice president of operations

Architect: Heathecote Associates (LA)

Gary Heathecote, architect/designer

Contractor: Heartwood Builders

Dave Brooks, general contractor

Controlling Broadcast Monitors Just Got Easier

Introducing BARCO's Third Generation of Automatic Alignment Broadcast Monitors

Consistent color control

With the BARCO light probe you've got complete control for consistent color throughout your monitor system.

Back lighted keyboard

Push button control adjustments let you feel and see what you are doing. On screen menus help for easy set-up.

Infra-red remote control

From your seat you have full access to control your entire room of BARCO monitors (up to 48).

Source ID and VITC

A built in VITC reader keeps you informed on each frame.

Of course BARCO's new CVM 3000 series supports multi standards and multi formats and offers serial digital component inputs.



Take in hand your control possibilities, at NAB, Booth 12428 or call (404) 590 7900

BARCO, Inc
1000 Cobb Place Blvd.
Kennesaw, Georgia 30144
Tel.: (404) 590-7900
Fax: (404) 590-8836

BARCO

Circle (22) on Reply Card

were moved to this new digital environment, and with room designated for expansion into emerging technologies, a true digital center was established.

The digital machine room was conceived as a functional environment that would enable operators to deal with multiple levels of digital operational video, digital audio, and control through a new Pro-Bel HD serial digital router with a system 3 controller. It is transparent and programmable and it offers ease of operation.

Edit bays

Refurbishing the four edit bays involved extensive cosmetic changes and the addition of new equipment. Edit 4 was the starting point. After rebuilding, a Grass Valley 3000 composite digital switcher was installed. Other major components included an Axial 2020 on-line editor and a new Graham-Patten D/Esam 800 digital 4-channel audio board.

Some genuinely imaginative concepts were devised for the edit bays. Switchers traditionally have been placed adjacent to



Editel's telecine Ursa suite bay. The telecine is located through the doorway on the right.

edit controllers in a straight line, requiring the editor to roll back and forth between stations. It was proposed that the switcher be placed at a 90° angle to the edit controller to get it closer to the editor. An innovative, precisely molded console was designed to accommodate this idea.

The console design was a huge hit with everyone. Because it plays such a pivotal role in the edit bay, everyone who would be working there had an opportunity to contribute to its design. Members of the design team made several visits to the cabinetmaker's studio, where a full-scale mockup was built for evaluation. There, the design team provided valuable input

that resulted in a console everyone is proud of, and one which has been adopted for the new component digital suite as well.

The component suite

The component digital suite houses a formidable array of new technology. Features include a Grass Valley 4000 component

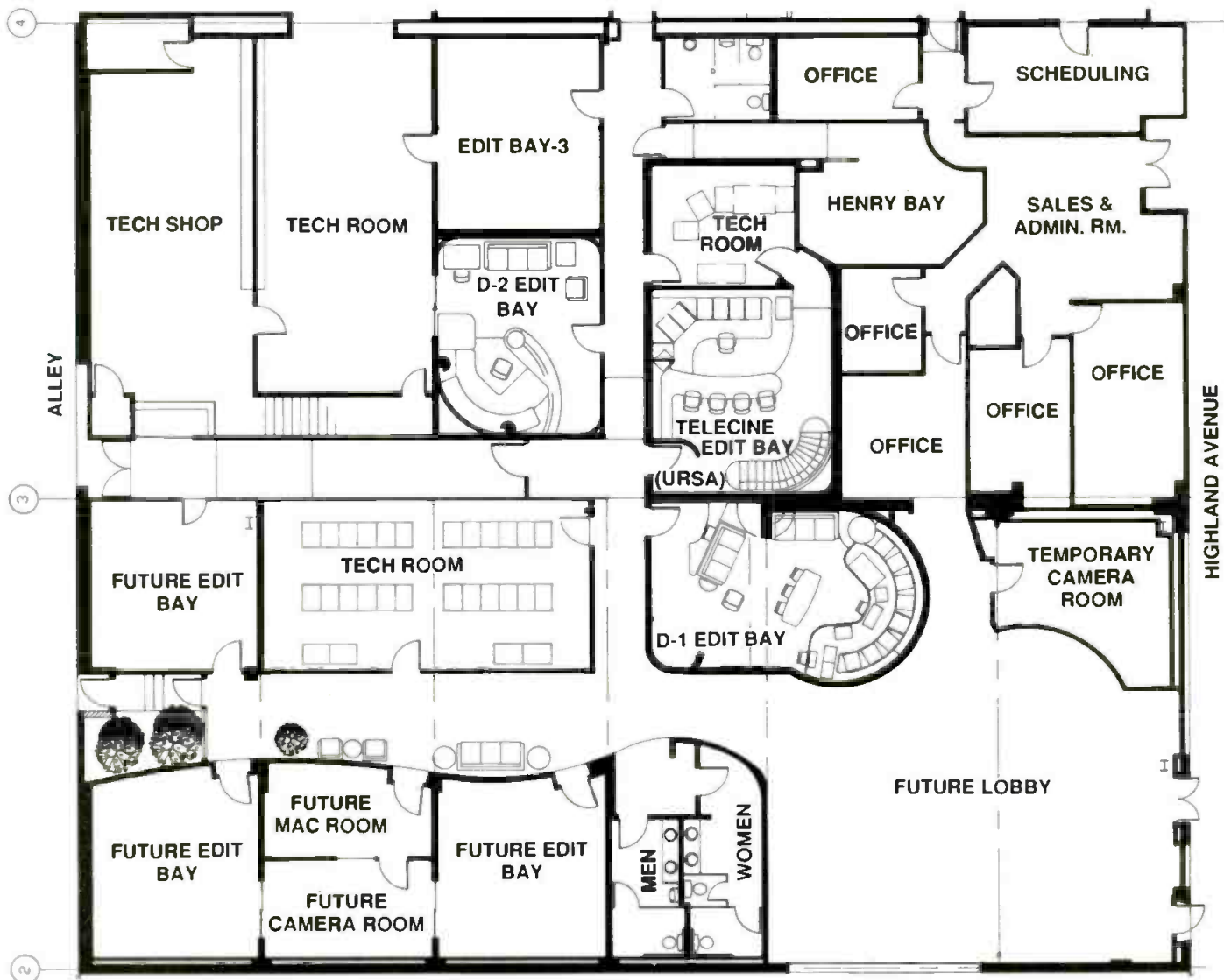


Figure 1. Floor plan for Editel LA. Drawing courtesy of Gary Heathcote, AIA.

THE BEST REASON TO BUY ODETICS ON-AIR AUTOMATION SYSTEMS TODAY?

TOMORROW.

Television managers come to Odetics looking for on-air systems that are futureproof. Systems that will help them avoid costly errors in light of approaching digital tape and disk technology. That's where we come in.

We're Futureproof

Odetics is the master of futureproof television technology. That's how we got to be the world leader in large on-air library management systems. Since day one, Odetics on-air automation systems have been completely format-independent. This means we can handle any tape format from S-VHS to digital Betacam. It also means we're ready to imple-

ment emerging digital technologies in a seamless evolution — not a costly "start over" process.

Automation Is Our Middle Name

And what about automation? It's the technology that made Odetics famous. So we can guide you in the development of phased-in "islands of automation" that let you expand productivity at a cost-effective pace — without forsaking your on-air quality or reliability.

With Odetics there's no need to fear your fate at the hands of an unproven supplier. Odetics is the leader in on-air automation technology for today and tomorrow. Call us to talk about your future.



1515 South Manchester Avenue, Anaheim, California 92802-2907
Phone (714) 774-2200 or (800) 243-2001

Director of Sales
Bill Keegan
(714) 774-2200

Northeast
Ray Baldock
(201) 305-0549

Southeast
Emerson Ray
(813) 960-0853

West
Chuck Martin
(818) 999-9796

North Central
Bill Boyd
(612) 894-2121

South Central
David Scally
(404) 917-9506

Circle (36) on Reply Card

www.americanradiohistory.com

The Aphex Audiophile Air Chain



Higher Quality *and* Extended Coverage!

Smart broadcasters know that quality sound is essential to attract and keep loyal listeners ... and advertisers.

That's why premier stations around the U.S.A., and around the world, rely on the Aphex Audiophile Air Chain.

Now there's one more reason to turn to Aphex — better coverage of your listening area.

Stations that have installed the powerful combination of the Aphex *Compellor*® Model 320, *Aural Exciter*® Type III, *Dominator*™ II Model 720 and the *new Digicoder*™ digitally controlled stereo generator — as well as their listeners — are raving about better signal quality and a reduction in multipath.

"A surprise bonus has been the apparent increase of coverage in fringe areas — we are getting very positive responses from listeners in Sacramento, 100 miles away," - Tim Pozar, CE, KKSF-FM, San Francisco.

"Immediate improvements in fringe signal quality were noted. These improvements included a reduction in multipath and picket-fencing," - Gary Greth, CE, KLON, Long Beach, CA.

"We have gotten a few responses from listeners in the fringes of our coverage area saying our signal is much stronger. They are reporting the actual carrier level has increased and they can hear us where they could not get a clear signal before," - Herb Squire, CE, WQXR, NYC.

The Aphex Audiophile Air Chain allows maximum loudness and modulation while maintaining the natural dynamic feel of the program. Quick and easy to set up, it maintains the same high quality regardless of the type of programming or who is controlling the board.

Other processors need to be tuned for almost every song, and achieve loudness only by crunching to the point of listener fatigue. But Aphex helps you reach more listeners — and keep them longer.

If you want to be a winner in the "no win modulation wars", contact your Aphex dealer to arrange a demonstration of the Aphex Audiophile Air Chain. You can't buy better quality at any price.

APHEX *Improving the way the world sounds*SM

SYSTEMS 11068 Randall Street, Sun Valley, CA 91352 ■ (818) 767-2929

Circle (35) on Reply Card

Compellor, Dominator, Aural Exciter and Digicoder are trademarks of Aphex Systems Ltd.

©Aphex Systems



Whenever.



Wherever.

Whether it's 15 minutes or 5,000 hours, no one has a more flexible inventory of C-band and Ku-band availability than Hughes Communications.

When it comes to coverage, no one has better orbital addresses than HCI.

And our friendly reservation agents are efficient, reliable and

available 24 hours a day.

Whether you have a single or multiple event, your transponder requirements are recorded, cross-checked and confirmed for availability in seconds by our sophisticated reservation system.

For more information on what we can do for you,

whenever and wherever, call our *Video Timeshare Services* at 1-800-824-8133.

We're on a Mission.

HUGHES
COMMUNICATIONS

A unit of GM Hughes Electronics

©1993 HCI, GM Hughes Electronics, NYSE Symbol GMH

Circle (37) on Reply Card

www.americanradiohistory.com

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 dilemma, the editors of **BE**

devised a better plan. The result was the **BE FASTtrack**.

Shortcut

The **BE FASTtrack** provides you with a shortcut to locating the companies that provide the products and services you're 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 24 cat-

egories, 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 (**FASTtrack**) 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, to relax and enjoy the other attractions Las Vegas has to offer.

Audio mixers – portable

AEQ	2300
Mark IV/E-V	2412
RAM Broadcast	3002
Logitek	3215
Henry Engineering	3700
Audio Services Corporation	4506
Wheatstone Broadcast Group	5108
Radio Design Labs	5406
Euphonix	5418
Sony Electronics/Business & Prof.	11711
Shure Brothers	11901
Audio Technica US	12506
SESCOM	13601
ATI Audio Technologies	13603
Yamaha Music	13840
TASCAM	15669
Soundcraft	15713
Audio Developments	16125
Neve/AMS (See Siemens Audio)	16623
Micron Audio Products	17151
AMEK Consoles/TAC	19166
Fostex	19185
JLCooper Electronics	19563

Audio Mixers – studio, on-air, recording

Otari	1209
Studer ReVox	1213
ART/Applied Research & Technology	1706
Hallikainen & Friends	1712
Fidelipac	1920
LPB	1924
Neotek	2226
AEQ	2300
Auditronics	2302
Mark IV/E-V	2412
RAM Broadcast	3002
Radio Systems	3012
Logitek	3215
Broadcast Electronics	3424
Pacific Recorders & Engineering	3612
Arrakis Systems	3912
Autogram	4520
Trident Audio	5106
Wheatstone Broadcast Group	5108
Euphonix	5418
AEV Snc di Vaccari GEC	5424

Harrison by GLW	11317
Graham-Patten Systems	11551
Whirlwind/US Audio	11627
Sony Electronics/Business & Prof.	11711
Ward-Beck Systems	12501
ATI Audio Technologies	13603
Yamaha Music	13840
TASCAM	15669
Soundcraft	15713
Siemens Audio Inc.	16623
Neve/AMS (See Siemens Audio)	16623
Dan Dugan Sound Design	17147
Ramsa Audio/Panasonic	18001
FOR-A	18013
Dorrrough Electronics	18815
Solid State Logic	19158
AMEK Consoles/TAC	19166
Fostex	19185
GML Inc.	19459
TOA Electronics/Digital Mixing Sys.	19471
Group One Ltd.	19569

Audio processing (compression, limiting, expansion, equalizing, noise reduction); Telephone hybrids, telco-related products, bandwidth extenders, audio codecs

Studer ReVox	1213
Studer Digitec	1213
HHB Communications Ltd.	1403
Lester Audio Laboratories	1613
Dolby Labs	1620
ART/Applied Research & Technology	1706
Harris Allied Broadcast Div.	2218
Inovonics	2306
Mark IV/E-V	2412
Lexicon	2524
Gentner Communications	2612
AKG Acoustics	2806
Orban/AKG Acoustics	2806
dbx/AKG Acoustics	2806
Circuit Research Labs	3015
Roland Corporation	3406
Aphex Systems	3924
Bradley Broadcast Sales	4002
Audio Processing Technology Ltd.	4306

Penny & Giles	4526
AKAI/IMC	4602
Symetrix	4622
Eventide	4809
Wheatstone Broadcast Group	5108
Intraplex	5118
Telos Systems	5200
AEV Snc di Vaccari GEC	5424
Modulation Sciences	11102
Sony Electronics/Business & Prof.	11711
Comrex	12206
SESCOM	13601
Hotronic	13614
Studio Technologies	13618
Manhattan Production Music	13635
TASCAM	15669
UREI	15713
JBL Professional	15713
Audio Developments	16125
Neve/AMS (See Siemens Audio)	16623
Siemens Audio Inc.	16623
Yamashita Engineering Mfrg/YEM	17744
Link Electronics	17981
Evertz Microsystems	18276
Dorrrough Electronics	18815
Solid State Logic	19158
Apogee Electronics	19181
GML Inc.	19459
FM Systems	19528
BGW Systems	19560
Group One Ltd.	19569
ASC Audio Video Corporation	19573
NVISION	20081

Recording and playback equipment (tape, hard drive, CD)

Digidesign	1002
Otari	1209
Studer ReVox	1213
Studer Digitec	1213
International Tapetronics/ITC	1218
HHB Communications Ltd.	1403
TM Century	1526
Sprague Magnetics	1612
Sonic Solutions	1700
ART/Applied Research & Technology	1706
Crouse-Kimzey Company	1708

Shooting Star.



The HK-377 Ultra-wideband Studio/Field CCD Camera System has the highest resolution, sensitivity and pixel count of any NTSC camera currently available. The camera employs newly-developed 2/3" FIT CCDs, each with more than 600,000 pixels. An ultra-wideband triax system with 10MHz



The HK-377P portable companion offers the same performance characteristics as the HK-377 and operates through the same Base Station or can be configured for stand-alone operation.

bandwidth for each RGB channel delivers an unprecedented 900 TV Lines resolution at the base station output. The new base station has provisions for digital signal output (optional) to accommodate the demands of high-quality production.

Unique features of Ikegami's new high-end

camera also include extensive remote control of detail functions, including the Skin Detail to soften the complexion and to give your stars a more youthful appearance. A high-resolution viewfinder has its own VF DTL (Viewfinder Detail) and PIP (Picture-In-Picture) circuits. The HK-377 has an AHD (Auto Hue Detect) circuit for "skin tone capture." Master Control Panels are equipped with memory card I/O Ports. A "Snap Shot File" permits control and scene file data to be written into, and read quickly, for shooting parameter replication.

Current users include: ABC-TV (*World News Tonight* and *All My Children*), CBS-TV (including *David Letterman's Late Show* and *60 Minutes*), Disney Studios, MTI, TNN, and Channel 13/Buenos Aires.

Shoot your stars, with the HK-377. Call the nearest Ikegami Regional Office.

T H E P R O F E S S I O N A L ' S C H O I C E

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

VISIT US AT THE NAB SHOW — BOOTH #19319.

Circle (38) on Reply Card

Clark & Associates
Fidelipac
Harris Allied Broadcast Div.
RAM Broadcast
Radio Systems
Roland Corporation
Broadcast Electronics
Pacific Recorders & Engineering
Henry Engineering
Sandar Electronics
Audi-Cord
DENON
Audio Services Corporation
AKAI/IMC
Alesis

1715 Kowa Optimed Inc.
1920 ENCO Systems
2218 AEV Snc di Vaccari GEC
3002 Sony Electronics/Business & Prof.
3012 Nagra-Plus SA
3406 Multidyne Electronics
3424 Barco-EMT
3612 McCurdy Radio Industries
3700 Yamaha Music
3703 TASCAM
3926 ASACA ShibaSoku
4303 Neve/AMS (See Siemens Audio)
4506 Siemens Audio Inc.
4602 Telex Communications/Pro A-V
4612 Pioneer New Media Technologies

4912 Ramsa Audio/Panasonic
5121 FOR-A
5424 JVC Professional Products
11711 Optical Disc Corporation
11906 PEP
11948 Solid State Logic
12429 Fostex
13111 ASC Audio Video Corporation
13840 Accurate Sound Corporation
15669
16619
16623
16623
17115
17182

Audio routing and distribution – routers, audio DAs, audio patch panels

Studer Digitec 1213
Studer ReVox 1213
International Tapetronics/ITC 1218
Auditronics 2302
RAM Broadcast 3002
Logitek 3215
Videoquip Research 5112
Radio Design Labs 5406
360 Systems 5420
Benchmark Media Systems 11059
Image Video 11311
Vistek Electronics 11543
Multidyne Electronics 11948
Barco-EMT 12429
BARCO Industries 12429
Lighthouse Digital Systems 12438
ESE 12808
Adrienne Electronics 12847
JEM-FAB 12849
Audio Accessories Inc. 13041
Di-Tech 13103
McCurdy Radio Industries 13111
Omicron Video 13141
Television Equipment Associates 13411
SESCOM 13601
ATI Audio Technologies 13603
Studio Technologies 13618
DYNAIR Electronics 13806
Datatek 13814
Nova Systems 13843
Leitch Video (M213) 15746
HEDCO div. of Leitch 15746
Videotek 16127
IRIS Technologies 16376
ASACA ShibaSoku 16619
Siemens Audio Inc. 16623
Broadcast Video Systems/BVS 16736
Grass Valley Group (M1633) 16933
ADC Telecommunications 17172
Pro-Bel Ltd. 17350
Yamashita Engineering Mgr/YEM 17744
OpAmp Labs 17778
Link Electronics 17981
BTS Broadcast Television Systems 18023
Utah Scientific 18032
AVP Manufacturing 18780
BAL Components 19113
Pesa Switching Systems 19401
PESA-Chyron Group 19401
Avitel Electronics 19478
AAVS US/Sencore 19483
Clark Wire & Cable 19537
Wohler Technologies 19539
IRT Electronics Pty. Ltd. 19839
NVISION 20081
ARTI/Advanced Remote Tech. M1214
AAVS Advanced Audio Visual Sys. 19483

NOW ISLATRON® "PLUS" ...before the damage is done

Now Outstanding Protection for a reasonable cost with Islatron-Plus: The real solution for today's power line related problems.

Its high speed "Active Tracking" filter safeguards both your income and broadcast equipment investment.

Islatron-Plus reduces equipment deterioration.

Your sensitive electronics are protected because Islatron-Plus continually tracks, attenuates and clamps incoming spikes and transients, absorbing the destructive energy and filling short duration undershoots. The results? Prevention of catastrophic equipment failure and loss of air time.



Single and 3 phase units through 1200A. Mean time between failure (MTBF) in excess of 100,000 hours. 5 year warranty.

Positive protection for both production and transmitting equipment.
For the Islatron-Plus success story see us at NAB, Booth 16336-16337 or call 800-288-6169 toll free.



CONTROL CONCEPTS

A Subsidiary of the Liebert Corporation

WE PUT OUR TECHNOLOGY ON THE LINE™

328 Water Street
Binghamton, New York 13902
607-724-2484 Fax 607-722-8713

Circle (39) on Reply Card

Strongest link.

Your satellite receiver is the most important link in your reception chain. And the one thing you can always count on - the signal never gets better than it is at the receiver. It creates the most important link to video and audio technical performance and initial S/N ratio.

Which is a very good reason to specify Standard Communications Corp.'s new rebroadcast *Intercontinental* satellite TV receiver - but it's not the only reason.

It has all the features professional operators need most: total flexibility in both C/Ku-band operation, rebroadcast quality

certified video on NTSC, PAL and SECAM signals, and a universal power supply built for the rigorous demands of 24-hour-a-day operation.

Never before has one receiver worked so well from INTELSAT to all DOMSAT formats in C, Ku and S-band frequencies. The 800 MHz or optional 1 GHz input will work with all known LNBs on all worldwide ITU regions. And our synthesized PLL tuning circuit provides direct frequency selection with crystal tolerance - 100 KHz accuracy in a continuous, self-monitoring control loop. The new digital AFC circuit improves performance in low threshold, severe interference, and multiple carrier per transponder operation.

A unique 70 MHz I.F. spectrum inversion circuit allows Ku-band to C-band or vice versa I.F. uplink or downlink turnarounds.

The *Intercontinental* is built for knowledgeable and discriminating engineers and offers proof of performance RS250C and CCIR567 certification. It features six I.F. bandpass filters, from 36 MHz to 16 MHz, five audio filter selections from 880 to 75 KHz, and six audio de-emphasis circuits.

There is much more you should know about the *Intercontinental* - and Standard Communications - than we can tell you in a single ad. Call us or fax us. We'll send you more information showing you how to get the best performance and peace of mind. Link up with our new *Intercontinental*.



Standard Communications

**SATELLITE
REBROADCAST
PRODUCTS DIVISION**

P. O. Box 92151

Los Angeles, CA 90009-2151

Phone (310) 532-5300 ext. 217

Toll-Free (800) 745-2445

Fax (800) 722-2329 (Toll-Free)

(310) 532-0397 (CA & Int'l Only)

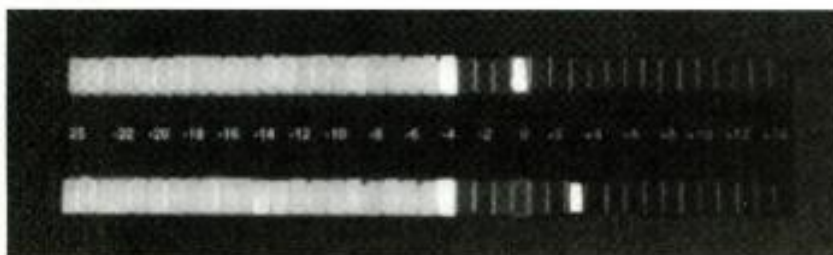


See the entire Standard line at the
NAB March 21-24, Booth #16075.

Circle (40) on Reply Card

Harris Allied Broadcast Div.	2218	Sanken/Audio Interview Design	2002	Wohler Technologies	19539
Lexicon	2524	Mark IV/E-V	2412	Lectrosonics	20019
Gentner Communications	2612	AKG Acoustics	2806	Neumann USA	
Gefen Systems	2803	RCI Systems Inc.	3702	Stanton Magnetics	
AKG Acoustics	2806	Crown International	4400	Automation systems - radio,	
Roland Corporation	3406	Audio Services Corporation	4506	radio business	
Pacific Recorders & Engineering	3612	Murry Rosenblum Sound Assoc.	5115	International Tapetronics/ITC	1218
Henry Engineering	3700	Professional Sound Corp.	5124	Sono-Mag	1324
Dalet Digital Media System	3803	ComTek	11114	CBSI Custom Business Systems	1624
Computer Concepts	3908	beyerdynamic	11315	Clark & Associates	1715
Arrakis Systems	3912	Nady Systems	11327	Gefen Systems	2803
ComStream Corporation	4000	Swintek Enterprises	11705	Circuit Research Labs	3015
Eventide	4809	Sony Electronics/Business & Prof.	11711	Henry Engineering	3700
Broadcast Supply Worldwide/BSW	4820	Shure Brothers	11901	Computer Concepts	3908
ENCO Systems	5121	Sennheiser Electric	12136	Schafer World Communications	4022
Sony Electronics/Business & Prof.	11711	Countryman Associates	12202	Radio Computing Services	5202
Yamaha Music	13840	Samson Technologies	12436	Prophet Systems	5221
Neve/AMS (See Siemens Audio)	16623	Audio Technica US	12506	Smarts Broadcast Systems	5224
Siemens Audio Inc.	16623	R-Columbia Products	13145	Alamar USA	11933
AVID Technology	17111	SESCOM	13601	Computer Engineering Associates	12259
Fairlight ESP	18076	ATI Audio Technologies	13603	McCurdy Radio Industries	13111
Solid State Logic	19158	Wireworks	13607	Videomedia	15722
Augan Instruments		Studio Technologies	13618	Adtec Productions	16478
Microphones, accessories -		Karl Heitz	13631	Louth Automation	17348
(lavalier, wireless, hand-held,		Systems Wireless	13636	AAVS Advanced Audio Visual Sys.	19483
pre-amps, mounting devices,		JBL Professional	15713	Automation systems - video, TV,	
mult-boxes); Speakers, monitors,		Electro-Voice	15716	newsrooms, TV business	
amplifiers; Headsets,		Vega Wireless	15716	Media Touch Systems	1006
headphones.		Hamlet Video International	16349	Tapscan	1325
Studer ReVox	1213	Siemens Audio Inc.	16623	TM Century	1526
HHB Communications Ltd.	1403	Telex Communications/Pro A-V	17115	CBSI Custom Business Systems	1624
Bec Technologies	1502	Micron Audio Products	17151	Register Data Systems	4508
Bryston	1609	Ramsa Audio/Panasonic	18001	Media Computing	11106
		JVC Professional Products	18046	Sony Electronics/Business & Prof.	11711
				Tel-test	11908
				Alamar USA	11933
				Computer Engineering Associates	12259
				Enterprise Systems	12562
				FloriCal Systems	12829
				Jefferson Pilot Data/JDS	13811
				Videomedia	15722
				Columbine Systems	15733
				Unique Business Systems	16473
				Adtec Productions	16478
				ASACA ShibaSoku	16619
				Louth Automation	17348
				Panasonic	18001
				BTS Broadcast Television Systems	18023
				Dynatech NewStar	18032
				Utah Scientific	18032
				Softtech Systems Inc.	18483
				Nesbit Systems Inc.	18780
				Odetics Broadcast	18932
				Matco Mfg & Test	19213
				BASYS	19247
				News Technology Corp.	19437
				AAVS US/Sencore	19483
				Leightronix	19534
				ASC Audio Video Corporation	19573
				NewsMaker Systems	20053
				Data Center Management	20055
				Video Communications	
				AAVS Advanced Audio Visual Sys.	19483
				Cameras, lens systems, camera	
				optical filters, matte boxes,	
				viewfinder shades	
				Sony Electronics/Business & Prof.	11711
				Toshiba Corporation	11841
				BURLE INDUSTRIES	11962
				BAF Communication	15174
				Miller Fluid Heads (USA) Inc.	15729
				Canon USA/Broadcast Optics	15738
				Thomcast	16113
				Concept W Systems	16253
				Philips Components	16628

SERIAL SOUND?



YOU NEED SERIAL METERS!

See Your Problems Before You Hear About Them

Expanded range - 40 Tricolor LEDs
 Simultaneous Display of Loudness & Peak
 Peak Hold Or Max Hold
 User Adjustable Zero Point
 Stereo Image / Phase Display
 Selectable Mono Sum or Density Display
 Brightness Adjustment
 Up to 6 Displays per Rackunit

Versions For Analog Or Digital Sources

Logitek

800-231-5870 or 713-782-4592

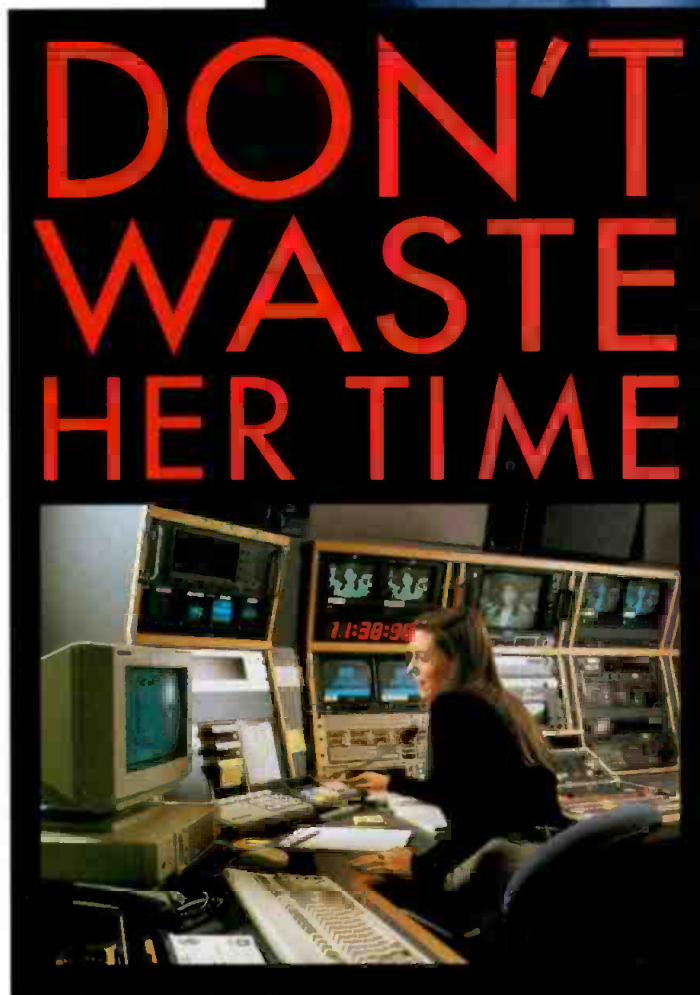
Circle (41) on Reply Card

Dana McDaniel can tell you anything you want to know about broadcast automation. But make it quick, ok?

As they say at ChicagoLand TV News, you've got five seconds. Four. Three. Two. Welcome to news when it happens, not when you expect it, or have the staff to handle it. It's broadcast on double espresso. Where any second a producer can override your play list and scream "Let's go live!"

So how *does* an Operations Supervisor keep her sanity at 24 hour news station? Meditation? Primal screaming? Sanka? Try total station automation, by Louth. From the moment it hit the air-waves on January 1, 1993, the entire station has been running on Louth: ADC-100 automation, Autoscreen media management, and the Traffic Interface Manager to tie it all together. All of which gives Dana and her staff absolute flexibility and control under any conditions. From merely frantic to those last second edits to 10,000-event playlists.

If you're considering broadcast automation, talk to the people who use Louth—like Dana. And don't be afraid to get right to the point. After all, air time is money. And she doesn't have a moment to waste.



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

545 Middlefield Road, Menlo Park, California 94025
(415) 329-9498 Fax: (415) 329-9530

Circle (130) on Reply Card

Band Pro Film/Video	16646
EEV	16663
Fujinon	16958
Arriflex	17169
Hitachi Denshi	17546
Angenieux Corporation	17615
Panasonic	18001
FOR-A	18013
BTS Broadcast Television Systems	18023
JVC Professional Products	18046
Innovision Optics	18169
Nikon Electronic Imaging	18178
Ikegami Electronics	19319
Century Precision Optics	19764

Camera support products, pedestals, tripods, pan/tilt heads, robotic equipment and controls

Cinema Products	11633
Quickset	12508
The M S Russin Group, Ltd.	13413
Karl Heitz	13631
Chapman/Leonard Studio Eqpt.	13833
Shotmaker Dollies/Camera Platforms	15177
Shotmaker Dollies & Cranes	15177
Miller Fluid Heads (USA) Inc.	15729
K&H Products	16465
Band Pro Film/Video	16646
Bogen Photo	16666
Vinten Broadcast	17107
TSM/Total Spectrum Manufacturing	17107
Arriflex	17169
Radamec EPO Ltd.	17353
AF Associates	17353
egripment	18072
Micron Tool & Manufacturing	18581
O'Connor Engineering Labs	18854
Sachtler	18938
Telemetrics	18951
Cinekinetic	19128
Stanton-Video Services Unltd.	19739
CSI Camera Support International	20139

Character generators, production titlers, prompters, captioning equipment

Clark & Associates	1715
Questar Systems (Farpoint Systems)	10061
Abekas Video Systems	11953
Horita	12751
Cue Tech Teleprompting	12762
Shereff Systems	15764
Sigma Electronics	16260
QSI Systems	16333
Hamlet Video International	16349
Norpak	16369
Knox Video	16433
Burst Electronics	16471
Magic Teleprompting Inc	16483
ASACA ShibaSoku	16619
Listec Video	16633
Grass Valley Group (M1633)	16933
Computer Prompt. & Captioning Co.	16943
SoftTouch	16943
Quantel	17126
Video Data Systems	17984
Texscan MSI	17985
BTS Broadcast Television Systems	18023
Quanta	18032
Tekskil Industries	18272
Brek Conner Group	18454
Discreet Logic Inc.	18563
Q-TV	18854
Comprompter	19164
Pesa Chyron Group (M1114)	19401
Chyron (See Pesa Chyron) (M1114)	19401

PESA-Chyron Group	19401
Telescript	19442
Image Logic Corp.	19566
Mainframe Computer Graphics	19769
Vertigo Technology	M1309
Vertigo	M1309

Desktop video equipment

Gefen Systems	2803
Matrox Electronic Systems	10650
TrueVision/RasterOps (M1415)	11559
Toshiba Corporation	11841
Nova Systems	13843
TouchVision Systems	16066
Comprehensive Video Supply	16346
Knox Video	16433
Burst Electronics	16471
Data Translation	16615
Grass Valley Group (M1633)	16933
Pinnacle Systems	17569
Microtime	17622
FOR-A	18013
BTS Broadcast Television Systems	18023
Minerva Systems	19076
Chyron (See Pesa Chyron) (M1114)	19401
Pesa Chyron Group (M1114)	19401
ASC Audio Video Corporation	19573
ImMX	19746
FAST Electronics	19766
Intelligent Resources	19969
Advanced Digital Imaging	20142
Hewlett-Packard/Video Comm. Div.	M 117
OptImage Interactive Services	M 414
Desktop Video World	M 518
Dubner International	M1121

Graphics and animation systems; Software for Mac/PC, dedicated computer systems

Matrox Electronic Systems	10650
TrueVision/RasterOps (M1415)	11559
Information Int'l/DMG	11629
Advanced Designs	11706
Toshiba Corporation	11841
Kavouras	13129
NDG Phoenix	13606
Progressive Image Technology	13829
Electric Image	16109
Comprehensive Video Supply	16346
SoftImage	16675
Magni Systems	16684
Grass Valley Group (M1633)	16933
Quantel	17126
Pinnacle Systems	17569
Parallax Graphics Systems	17575
ColorGraphics Systems	18032
Alden Electronics	18614
Bencher	19111
Accu-Weather	19208
Chyron (See Pesa Chyron) (M1114)	19401
Aurora Systems (See Pesa Chyron)	19401
Pesa Chyron Group (M1114)	19401
Getris Images	19743
Mainframe Computer Graphics	19769
Wavefront Technologies (M833)	19830
Intelligent Resources	19969
Flight Data Center	20186
Hewlett-Packard/Video Comm. Div.	M 117
Extron Electronics	M 319
Autodesk	M 901
Alias Research	M 913
Silicon Graphics	M1102

High-definition TV equipment, line doublers, all non-RF HDTV products

Astrodesign/Mira Vision	10153
Sony Electronics/Business & Prof.	11711

Toshiba Corporation	11841
Faroudja Laboratories	13101
Systems Wireless	13636
Thomcast	16113
ASACA ShibaSoku	16619
Eastman Kodak Company	16963
BTS Broadcast Television Systems	18023
Ikegami Electronics	19319
Pesa Chyron Group (M1114)	19401
Snell & Wilcox	19746

Intercom/IFB products

Wheatstone Broadcast Group	5108
Anchor/ROH	11601
Swintek Enterprises	11705
Ward-Beck Systems	12501
McCurdy Radio Industries	13111
Vega Wireless	15716
SoftTouch	16943
Telex Communications/Pro A-V	17115
Clear-Com Intercoms	18015

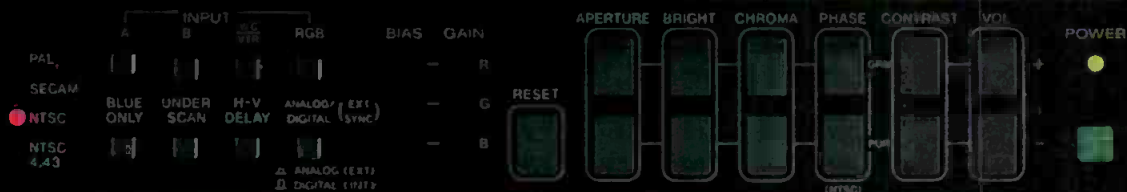
Lighting equipment, instruments, lamps; Light modification filters, reflectors; Lighting controls, dimmers

NRG Research	10259
Great American Market	13121
Anton/Bauer	13123
Frezzolini Electronics	13422
L E Nelson Sales	13616
Strand Lighting	13818
Chapman/Leonard Studio Eqpt.	13833
The F J Westcott Company	15481
DeSisti Lighting/DESMAR	15681
ETC-Electronic Theatre Controls	15743
American Studio Equipment	16078
Sinar Bron	16365
Lightmaker Company	16381
Tiffen Manufacturing	16636
Mole-Richardson	16640
Lowel-Light	16649
Matthews Studio Equipment	16653
Cinemills	16658
LTM Corp of America	17046
Dedotec USA	17148
Ushio America	17578
Chimera	17584
Lee Filters	17619
Colortran	17659
Balcar/TEKNO	17978
VIDESSENCE	18054
Leonetti Company	18082
Broadcast Marketing Int'l Ltd.	19328
Electronics Diversified Inc.	20083

Multimedia products

TrueVision/RasterOps (M1415)	11559
Videomedia	15722
Data Translation	16615
Minerva Systems	19076
Pesa Chyron Group (M1114)	19401
Chyron (See Pesa Chyron) (M1114)	19401
FAST Electronics	19766
Intelligent Resources	19969
AMX Corporation	20021
Advanced Digital Imaging	20142
Target Vision	M 101
Adda Technology	M 313
OptImage Interactive Services	M 414
Autodesk	M 901
Engineering Animation	M 907
Mira Imaging	M 929
Crystal Graphics	M1609
Adobe Systems/APD	M1615
Ampro	M1621
Color Computer Systems	M1627

Continued on page 111



Funny, he looks clean to us.

Nobody transmits higher quality television remotes than AT&T ACCUNET® Digital Television Service.

No matter what the picture, only ACCUNET Digital Television Service can transmit the cleanest picture possible — to over 80 locations.

Some carriers may have to relay their signals over other's facilities. With each "hand-off," quality can be lost, and a "dirty" picture results. The more hand-offs, the bigger the potential loss in quality.

But with over 35,000 miles of high

speed fiber optic lines, and the best codecs and switches, AT&T can always offer 100% end-to-end contribution quality broadcasts. So you can extend the reach of your television services as far as you need, and never worry about a drop-off in the quality of your picture.

Of course, with AT&T's highly reliable network, backed by our patented AT&T FASTAR™ restoration system, there's little else to worry about either.

You wouldn't expect anything less

from the quality leader in the remote broadcast industry.

We'd like to tell you more. Just call us at 1 800 248-3632.

We'll give you the dirt on how we transmit the cleanest pictures you've ever seen.

AT&T. The Best in the Business.™



invented the DigiCart[®] recorder to bring CD quality audio to broadcasting. Our on-going technical efforts provide customers with the service, upgrades and confidence expected in the broadcast community.

360



DIGICART/II

DIGICART/II

THE PROVEN UPGRADE FROM ANALOG CARTS

STANDARD FEATURES

- Instant access to any of 10,000 cuts
- 2-hour internal hard disk
- 68-minute Bernoulli cartridge drive²
- 16-bit linear recording for true CD quality
- Selectable Dolby AC-2 Data Reduction¹
- Normal operation provides 20 kHz stereo audio
- Digital Editing
- DSP generated fades & levels changes
- Bright 40-character display shows cut name, ID#, running time, and helpful user prompts
- Pre-program breaks and spot rotation
- Automatic record-on-audio
- Five year hard drive warranty
- Five year Bernoulli disk life
- Worldwide sales and service

BREAKTHROUGH PRICING

- Only \$4,995 record/play stereo, including a 2-hour hard disk. Other models from \$4,250 less hard disk. DigiCart/II is by far the *lowest* priced digital cart recorder on the market.
- Low-cost media—Only \$1.42 per minute²

OPTIONAL FEATURES

- Mini keyboard for titling and remote control
- Two new remote controls include LCD display
- "Hot Keys" give instant access to 16 spots
- Larger hard disks store 4 or 8 hours of stereo
- External hard disk arrays store up to 48 hours
- AES/EBU and SPDIF digital I/O³
- Toolkit for developing custom serial port programs

FOR A FREE 12-PAGE BROCHURE, CALL 818.342.3127

360 Systems

See us at NAB Booth #5420

PROFESSIONAL DIGITAL AUDIO

360 SYSTEMS 18740 OXNARD STREET, TARZANA, CALIFORNIA 91356 818.342.3127 FAX 818.342.4372

DigiCart/II

¹User-selectable. 2150 MB Bernoulli Disk. ²SMPT/EBU Time Code board and Digital I/O available 1994. Stated specifications are with Dolby AC-2 operation.

DIGICART/II IS A REGISTERED TRADEMARK OF 360 SYSTEMS. DOLBY IS A TRADEMARK OF DOLBY LABORATORIES INC. ©1993 360 SYSTEMS

Circle (44) on Reply Card

www.americanradiohistory.com

Continued from page 108

Communication Specialties M1711
Apple Computer M1731

Production and master control switchers

Image Video 11311
Vistek Electronics 11543
Sony Electronics/Business & Prof. 11711
Tel-test 11908
Abekas Video Systems 11953
J-Lab 12438
Echolab 13424
Beaveronics 13611
Ross Video 15704
Thomcast 16113
Videotek 16127
Grass Valley Group (M1633) 16933
Ampex Corporation 17101
Panasonic 18001
FOR-A 18013
VGV Incorporated 18017
BTS Broadcast Television Systems 18023
ALTA Group/Dynatech 18032
Utah Scientific 18032
Alpha Image 18032
Telemetrics 18951
Snell & Wilcox 19746

Routing and distribution switchers, video DAs, pulse DAs, video delays

Videoquip Research 5112
Video Accessory 11127
Image Video 11311
Vistek Electronics 11543
Sony Electronics/Business & Prof. 11711
Multidyne Electronics 11948
BARCO Industries 12429
Lighthouse Digital Systems 12438
ESE 12808
Adrienne Electronics 12847
JEM-FAB 12849
Di-Tech 13103
Omicron Video 13141
Television Equipment Associates 13411
DYNAIR Electronics 13806
Datatek 13814
Nova Systems 13843
HEDCO div. of Leitch 15746
Leitch Video (M213) 15746
Videotek 16127
Sigma Electronics 16260
IRIS Technologies 16376
Knox Video 16433
Burst Electronics 16471
ASACA ShibaSoku 16619
Broadcast Video Systems/BVS 16736
Kings Electronics 16831
Grass Valley Group (M1633) 16933
ADC Telecommunications 17172
Pro-Bel Ltd. 17350
Broadcast Electronic Services 17375
Sierra Video Systems 17443
Yamashita Engineering Mfgr/YEM 17744
OpAmp Labs 17778
Link Electronics 17981
BTS Broadcast Television Systems 18023
Utah Scientific 18032
Alpha Image 18032
AVP Manufacturing 18780
BAL Components 19113
PESA-Chyron Group 19401
Pesa Switching Systems 19401
Avitel Electronics 19478
AAVS US/Sencore 19483
Clark Wire & Cable 19537

Extron Electronics M 319
ARTI/Advanced Remote Tech. M1214
Communication Specialties M1711
AAVS Advanced Audio Visual Sys. 19483
Standards converters; Scan, format, A-D/D-A converters; Encoders, decoders
Video International Development 11321
Vistek Electronics 11543
Abekas Video Systems 11953
Chromatek Inc. 12462
JEM-FAB 12849
ACCOM 13056
Faroudja Laboratories 13101

Quality Video Supply 13347
Progressive Image Technology 13829
Leitch Video (M213) 15746
Thomcast 16113
Miranda Technologies 16255
James Grunder & Associates 16349
Digital Vision 17143
Prime Image 17184
NTL 17346
Yamashita Engineering Mfgr/YEM 17744
FOR-A 18013
Microvideo Ltd. 18781
BAL Components 19113
Intelvideo 19207

MATH FIBER OPTICS



Count on Math Associates, a subsidiary of General Microwave Corp., for precision, quality and proven product performance as well as unsurpassed customer support and service.



A Subsidiary of General Microwave Corporation

5500 New Horizons Blvd. • Amityville, NY 11701
Phones: 516-226-8950 • Fax: 516-226-8966

FIBERLINK • **FIBERVISION** • **Fiberlab**

**VOICE
VIDEO
DATA**

**MULTI-MODE
SINGLE MODE**

**FULLY
REDUNDANT
SYSTEMS**

Applications Include:

**SMART
HIGHWAY**
COMMUNICATIONS

COMPUTER
INTERFACING

INDUSTRIAL
CONTROL

SECURITY
MONITORING

Circle (45) on Reply Card

Solve Any VTR Audio Monitoring Problem in 1 U!



Shown: AMP-1A/VTR PLUS

There's a powered stereo monitor from Wohler just right for your requirements.

PROBLEM 1: Four-track VTR in a rack.

SOLUTION: AMP-1A/VTR

Two rotary switches select any of the four VTR audio tracks to Left and Right speaker outputs. The AMP-1A/VTR PLUS provides the same switching flexibility, but also includes 10-segment LED level indicators for all four inputs and a phase/polarity indicator for the two selected inputs.

PROBLEM 2: Digital VTR in a rack.

SOLUTION: AMP-1A/DIGI4

AES/EBU digital outputs from four audio tracks converted to analog, with channel selection as above.

PROBLEM 3: Two VTRs in one rack.

SOLUTION: AMP-1A/VTR2

A toggle switch selects one of the two VTRs. Then, two rotary switches provide channel selection as above.

PROBLEMS 4 to ??

SOLUTIONS: Over a dozen other versions and input options, as well as custom engineering for unusual requirements. Just call and ask!

Call or write today for FREE detailed application notes on these and other Wohler VTR monitoring solutions.

Audio solutions from...



Wohler Technologies

Innovative Audio Monitoring Systems

713 Grandview Drive
South San Francisco, CA 94080
(415) 589-5676 FAX (415) 589-1355

Interlace Engineering Corp.	19574	Matrox Electronic Systems	10650
CEL(See Snell & Wilcox)	19746	Sony Electronics/Business & Prof.	11711
Snell & Wilcox	19746	Fast Forward Video	11949
Extron Electronics	M 319	Horita	12751
Communication Specialties	M1711	Adrienne Electronics	12847
Time base correctors,		ACCOM	13056
frame synchronizers		Ensemble Designs	13353
Sony Electronics/Business & Prof.	11711	VideoLab Para Technologies	13629
Digital Processing Systems	11930	Editing Technologies Corporation	15466
Ensemble Designs	13353	Videomedia	15722
Hotronic	13614	TouchVision Systems	16066
Merlin Engineering Works	13836	Comprehensive Video Supply	16346
Nova Systems	13843	DNF Industries	16375
Leitch Video (M213)	15746	Amtel Systems	16642
Videotek	16127	Montage Group	16660
James Grunder & Associates	16349	Ultimate Corporation	16869
Ampex Corporation	17101	Grass Valley Group (M1633)	16933
Tektronix	17119	SoftTouch	16943
Digital Vision	17143	Ampex Corporation	17101
Prime Image	17184	AVID Technology	17111
Microtime	17622	Broadcast Electronic Services	17375
FOR-A	18013	Panasonic	18001
BAL Components	19113	FOR-A	18013
Zaxcom	19742	BTS Broadcast Television Systems	18023
Snell & Wilcox	19746	Calaway Editing	18032
Video accessories		EMC/Dynatech Video Group	18032
Astrodesign/Mira Vision	10153	JVC Professional Products	18046
Raytheon Co.	11356	Evertz Microsystems	18276
Pandora International	11506	United Media	18576
Vistek Electronics	11543	Steenbeck	18814
Digital Processing Systems	11930	PEP	19101
J-Lab	12438	Sundance Technology Group	19105
Rank Cintel	12441	Broadcast Marketing Int'l Ltd.	19328
ESE	12808	CMX (See Pesa Chyron)	19401
ACCOM	13056	TAO/Technical Aesthetics Oper.	19438
Faroudja Laboratories	13101	Image Logic Corp.	19566
Quality Video Supply	13347	ASC Audio Video Corporation	19573
Ensemble Designs	13353	O.L.E Limited	19934
Options International	13359	Lightworks	19934
Nytone Electronics	13406	Strassner Editing Systems	19978
Hotronic	13614	Lyon Lamb Video Animation	M 813
Research Technology Int'l/RTI	13646	Dubner International	M1121
Merlin Engineering Works	13836	RGB Computer & Video	M1403
Leitch Video (M213)	15746	Paltex	
Thomcast	16113	Gray Engineering Labs	
Videotek	16127	Video presentation equipment;	
Miranda Technologies	16255	Monitors, videowalls, projectors,	
EEG Enterprises	16324	screens	
Comprehensive Video Supply	16346	Sumitomo Electric	10060
ASACA ShibaSoku	16619	IDS/SAIC	10150
Broadcast Video Systems/BVS	16736	Vistek Electronics	11543
Ultimate Corporation	16869	Sony Electronics/Business & Prof.	11711
Digital Vision	17143	Toshiba Corporation	11841
Prime Image	17184	BARCO Industries	12429
NTL	17346	DYNAIR Electronics	13806
Sierra Video Systems	17443	Electrosonic Systems	15685
Macrovision	17581	Videotek	16127
daVinci	18032	Display Devices	16472
Alpha Image	18032	ASACA ShibaSoku	16619
Evertz Microsystems	18276	Panasonic	18001
Allen Avionics	19113	FOR-A	18013
Intelvideo	19207	BTS Broadcast Television Systems	18023
Allen Osborne Associates	19573	JVC Professional Products	18046
Snell & Wilcox	19746	Hoodman	18615
CEL(See Snell & Wilcox)	19746	Ikegami Electronics	19319
Sprocket Video Technologies	20016	PESA-Chyron Group	19401
Hewlett-Packard/Video Comm. Div.	M 117	AAVS US/Sencore	19483
Video Associates Labs	M 925	Management Graphics	19786
Folsom Research	M1120	Synelec	M 201
Gray Engineering Labs		Mitsubishi PED	M1129
Video editing control systems;		Electrohome	M1429
Time-code equipment		AAVS Advanced Audio Visual Sys.	19483
TimeLine	1702		

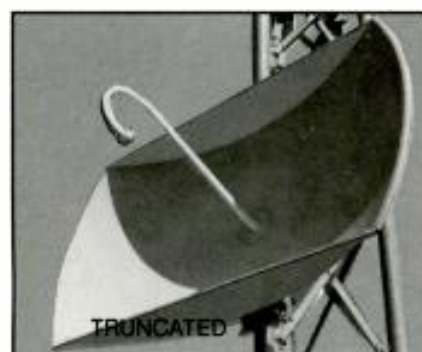
Circle (46) on Reply Card



UNCOMPROMISING



UNRIVALED



UNMISTAKABLE

Mark Antennas Division combines **uncompromising** quality with the latest technology and **unrivalled** reliability, its **unmistakable...**



Radiation Systems, Inc.
Mark Antennas Division
 1757 S. Winthrop Drive
 Des Plaines, IL 60018 U.S.A.
 Tel 708-298-9420 Fax 708-635-7946

Video recorders – all videotape formats, magnetic and optical disk, solid-state

DVS Digital Video Systems	10354
CMC Technology	11608
Sony Electronics/Business & Prof.	11711
Toshiba Corporation	11841
Abekas Video Systems	11953
Samson Technologies	12436
Hotronic	13614
Leitch Video (M213)	15746
Thomcast	16113
DNF Industries	16375
Knox Video	16433
ASACA ShibaSoku	16619
Ampex Corporation	17101
Tektronix	17119
Quantel	17126
Pioneer New Media Technologies	17182
Prime Image	17184
AF Associates	17353
Hitachi Denshi	17546
Pinnacle Systems	17569
Macrovision	17581
Video Data Systems	17984
Panasonic	18001
FOR-A	18013
Videomagnetics Inc.	18014
BTS Broadcast Television Systems	18023
JVC Professional Products	18046
Optical Disc Corporation	18949
ASC Audio Video Corporation	19573
Snell & Wilcox	19746
FAST Electronics	19766
Hewlett-Packard/Video Comm. Div.	M 117
Mitsubishi PED	M1129
New EVS	

Video duplicators

Sony Electronics/Business & Prof.	11711
Dwight Cavendish	16072
Panasonic	18001
JVC Professional Products	18046

Video special effects – DVEs, chroma keys, linear keys

Sony Electronics/Business & Prof.	11711
Abekas Video Systems	11953
Echolab	13424
Ross Video	15704
Broadcast Video Systems/BVS	16736
Ultimate Corporation	16869
Grass Valley Group (M1633)	16933
Ampex Corporation	17101
Quantel	17126
Pinnacle Systems	17569
Microtime	17622
FOR-A	18013
Evertz Microsystems	18276
Pesa Chyron Group (M1114)	19401
KUB Systems Inc.	19564
CEL(See Snell & Wilcox)	19746
Snell & Wilcox	19746
FAST Electronics	19766
Wavefront Technologies (M833)	19830

Microwave equipment – STL/ TSL, ENG, MDS, MMDS, ITFS, ICR

Dolby Labs	1620
TFT Inc.	1908
Utility Tower	2326
Moseley Associates	2824
Marti Electronics	3918
QEI	4218
Insulated Wire/Microwave Products	4916
Intraplex	5118
Wegener Communications	5414
Conifer Corporation	11301

RF Technology	11303
COMWAVE/Comm. Microwave	11329
NUCOMM	11333
AVCOM of VA	11607
Toshiba Corporation	11841
ITS/Information Transmission	11951
Broadcast Microwave Services	12301
N Systems/NSI	13133
Troll Technology	13801
Microwave Radio	13801
Italiana Ponti Radio SRL	15182
Andrew Corporation	15674
Scala Electronic	15726
Cablewave Systems/RF Systems	15753
Radiation Systems/Mark Antennas	15766
EMCEE Broadcast Products	16033
Varian Microwave Equipment	16101
Varian Canada Microwave Products	16101
Nurad Technologies	17685
Alcatel Network Systems/Telspan	18883
Alcatel Telspan	18883
Ikegami Electronics	19319
ITELCO spa	19414
Technosystem SpA	19575
AML Inc.	20039
Aydin Corporation-HPA/Magnetics	20042

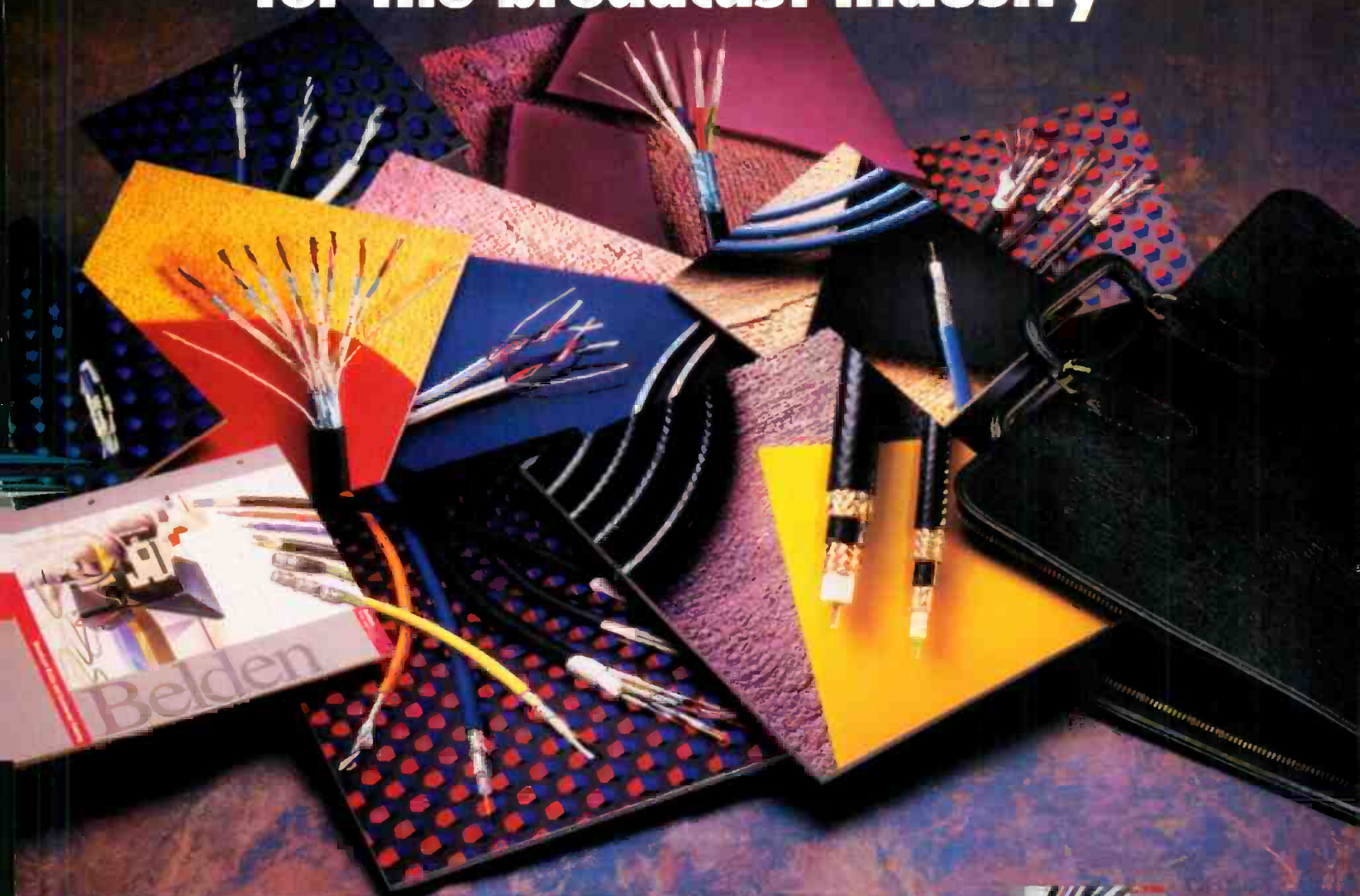
Satellite transmission and reception equipment; Satellite program transmission services

LNR Communications	1306
Norsat International Inc.	1503
ComStream Corporation	4000
Wegener Communications	5414
Conifer Corporation	11301
Comsat Systems	13051
Comtech Antenna Systems	13402
Miralte Communications	13447
Antenna Technology	13644
Scientific Atlanta	13825
BAF Communication	15174
Vertex Communications	15369
Andrew Corporation	15674
Radiation Systems/Mark Antennas	15766
IDB Communications	16064
Standard Communication	16075
Varian Traveling Wave Tube Div.	16101
Varian Microwave Equipment	16101
Sure Shot Teleproductions	16624
NTL	17346
Dawn Satellite Inc.	17779
GTE Spacenet	18946
Advent Communications	19255
MCL/Inc.	19558
Alpha Lyracom/Panamsat	19781

Radio, TV transmitters, translators, antennas; Towers, guys, tower lights; Waveguide, RF feedline

Elenos	1024
TTC (Larcant-TTC)	15708
Flash Technology	1618
Hallikainen & Friends	1712
Central Tower	1906
Nautel	1912
Jampro Antennas	1915
LPB	1924
Econco Broadcast Service	2208
Magnum Tower	2209
Harris Allied Broadcast Div.	2218
Utility Tower	2326
BEXT	2414
GEC-Marconi Comm. Systems	2526
Gentner Communications	2612
TWR Lighting	2704
CTE International	3000

Belden has **BIG NEWS** for the broadcast industry

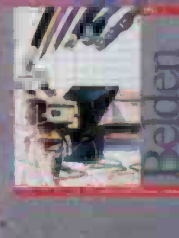


Belden is on the air with the industry's largest portfolio of new broadcast cables.

More than 60% of the products listed in Belden's Audio/Video Catalog didn't even exist just a few years ago! Belden's Audio/Video Catalog provides specifications for the industry's most complete line of cabling products, including digital audio multi-conductor cables, microphone cables, digital video coaxial cables, video triaxial cables, audio & video composite cables, bundled coaxial composite cables, and fiber optic cables.

New levels of excellence and innovation

During the past few years, Belden has introduced more product innovations for more broadcast cabling applications than any other cable company. This commitment to innovation and technical excellence is the reason Belden remains the broadcast industry's No. 1 cabling choice, worldwide. It's a position we've worked hard to earn and will fight hard to keep with new products, new options and even higher levels of excellence in the future.



For a copy of Belden's Audio/Video Catalog plus updates on our latest product innovations,

contact your local Belden distributor or call:
1-800-BELDEN-4.



© Copyright 1994, Belden Inc.

Circle (49) on Reply Card

www.americanradiohistory.com

Electronics Research
OMB America
Continental Electronics
Broadcast Electronics
SCA Data Systems
QEI
CCA Electronics
Hughes & Phillips Inc.
MYAT
Burk Technology
Tecnologie Elettroniche Milano/TEM
Phasetek Inc.
Energy-Onix
AEV Snc di Vaccari GEC
Penta Laboratories
Modulation Sciences
ITS/Information Transmission
BURLE INDUSTRIES
Thomson Tubes Electroniques
Broadcast Software Ltd./BSL
Richardson Electronics
Lightning Eliminators & Consultants
Acrodyne Industries
Antenna Concepts
Italiana Ponti Radio SRL
Advanced Broadcast Systems
Andrew Corporation
Larcan-TTC
Dielectric Communications
Scala Electronic
Tennaplex Systems
Cablewave Systems/RF Systems
LDL Communications/Larcan
EMCEE Broadcast Products
SWR Inc.
Varian Canada Microwave Products
Varian Power Grid/X-ray Tube Div.

3212
3400
3418
3424
4208
4218
4220
4301
4619
4818
4906
5215
5408
5424
5426
11102
11951
11962
12208
12862
12901
13401
13822
15169
15182
15486
15674
15708
15719
15726
15726
15753
15758
16033
16043
16101
16101
Varian Microwave Power Tubes
Comark Communications/Thomcast
Thomcast France
Thomcast
Sira Sistemi Radio s.r.l.
SG Communications
Philips Components
EEV
Doty Moore Services
Will-Burt
PESA Micro Communications
ITELCO spa
MCL/Inc.
Allen Osborne Associates
Technosystem SpA
Kline Towers
Aydin Corporation-HPA/Magnetics
Shively Labs

**Power products –
batteries, chargers, UPS, power
converters, power protection,
lightning protection products**

Cortana Corporation
Superior Electric
Professional Sound Corp.
NRG Research
Alexander Batteries
Christie Electric
Anton/Bauer
Lightning Eliminators & Consultants
PAG Ltd.
Frezzolini Electronics
Control Concepts/Leibert
Perrott - The Battery People
Band Pro Film/Video
Pro Battery

Paco Electronics USA
Cine 60
ENG Mobile Systems
Schwalm/Power Technologies

**Consultants –
engineering, system integration,
facilities design, engineering
software**

EDX Engineering
National Supervisory Network
Dataworld
Gefen Systems
Communications Data Services
Rules Service Company
Doug Vernier Broadcast Technologies
GE Support/RCA Broadcast
Raytheon Co.
Lakeside Associates
Television Engineering
Focal Press
NDG Phoenix
Antenna Technology
BAF Communication
Rees Associates
AF Associates
Nesbit Systems Inc.
DSI Communications
Kent Green Video Group
Doty Moore Services

**Dealers, distributors, equipment
brokers**

HHB Communications Ltd.
Crouse-Kimzey Company
Yale Electronics
Harris Allied Broadcast Div.
Broadcasters General Store
RAM Broadcast
RCI Systems Inc.
Bradley Broadcast Sales
Broadcast Supply Worldwide/BSW
Radio Express
Professional Sound Corp.
Media Concepts
GEPCO International
B&H Photo
System Associates
Nemal Electronics International
Systems Wireless
Antenna Technology
BAF Communication
Comprehensive Video Supply
Equipment Broker (The)
BCS Broadcast Store
Dawn Satellite Inc.
H L Dalis
AVP Manufacturing
Elantec Inc.
Group One Ltd.
ASC Audio Video Corporation

**Fiber-optic equipment, fiber
materials, terminal equipment**

Lester Audio Laboratories
Lightwave Systems
Telecast Fiber Systems
CCOR/Comlux
Mohawk/CDT Broadcast Cables
ADC Telecommunications
Meret Optical
Fiber Options
Ortel
IRT Electronics Pty Ltd



**We've Made It
Perfectly
Clear.**

The most advanced, innovative and best sounding digital audio boards come from Antex. That's why they're preferred by OEMs and integrators worldwide for broadcast, recording and multimedia applications.

- Multiple compression formats - ISO/MPEG/MUSICAM, Dolby AC-2, CD-ROM XA, MS ADPCM, IMA
- AES/EBU/SPDIF Digital I/O
- Balanced analog I/O
- Programmable floating point DSP
- Onboard EEPROM for software security
- 16-bit stereo, 64x oversampling Sigma Delta
- High-level DOS/Windows drivers
- Dual-device and multiple adapters
- Wavetable synthesis
- SCSI/MIDI interfaces

**ANTEX
digital
AUDIO**

The difference is clear.

800/338-4231 • 310/532-3092 • FAX 310/532-8509
16100 South Figueroa Street, Gardena, California USA 90248

Circle (96) on Reply Card

VIDESSENCE

EVOLUTION



CNN, Washington, D.C. Bureau

STUDIO 2000 LIGHTING SYSTEMS

On September 22, 1988, KCRA-TV (NBC-Sacramento) went on the air with the world's first VIDESSENCE Sustained RGB Lighting system. What followed is now history. The VIDESSENCE product line has since evolved into a complete energy-efficient replacement technology for incandescent lighting in the media.

On April 15, 1993, KVBC-TV (NBC-Las Vegas) converted its large-zone VIDESSENCE system to a small-zone VIDESSENCE SOFTSPOT STUDIO 2000 System. This system placed each newscast member in his/her own "pool" of light.

On January 17, 1994, KOIN-TV (CBS-Portland, Oregon) went on the air using the first VIDESSENCE MODULAR STUDIO 2000 Lighting System. This system produces one large zone of light for all the talent areas. While this controlled zone is large in size, there is a wide array of effects and styles within each facial zone.

On March 21, 1994 (NAB, Las Vegas), VIDESSENCE will release the complete potential of STUDIO 2000 Lighting Systems.



KTNV-TV, ABC, Las Vegas



KVBC-TV, NBC, Las Vegas

VIDESSENCE Sustained RGB Lighting Systems effectively replace incandescent lighting systems in television studios and video production centers around the world. These systems:

- eliminate 80-90% of the electricity needed for lighting and air conditioning in most studios
- operate without any refocusing or maintenance requirements for 3-5 years
- produce dynamic artistic results with mechanical and optical control devices
- can be configured to match your expense-to-feature needs
- provide a cooler, more comfortable environment for talent.

VIDESSENCE Lighting Systems make a daily contribution to profits in most installations while supporting the highest technical and artistic standards.

SPECIAL EFFECTS LIGHTING

VIDESSENCE Sustained RGB Lighting makes it easier to set up composite image and chroma-key production areas. The effect of the VIDESSENCE VID-KEY System can be seen regularly on over 150 broadcasts worldwide, and many of Hollywood's out-of-this-world special effects are created with VIDESSENCE lighting equipment.



The versatility of our VID-STICKS products makes them well-suited for miniature, table-top, small-set-piece accent lighting, rear-transparency lighting, down-lighting, and just about any other "gadget" application.



LOCATION LIGHTING PRODUCTS

VID-LITES and VID-STICKS products bring an array of instruments to the location and production industry. These fixtures produce the same results as incandescent fixtures, but with a long list of advantages and resulting benefits. VIDESENCE fixtures require a fraction of the power needed by incandescent lights, and VIDESENCE lights operate at a much cooler level. These VIDESENCE instruments also incorporate all the performance features of VIDESENCE studio lights, with the added benefit of being packaged for field work.

VID-LITES are professional-grade location lighting tools. Each fixture is designed to be extremely durable and to allow for hassle-free set-up in the field. VID-STICKS are smaller, modular gadget fixtures that individually supply a variety of lighting effects and, when "ganged" together, function as high-output luminaires.



VIDESENCE PRODUCTION SERVICES/RENTAL

As more video and motion picture professionals call upon the rental industry for VIDESENCE technology, VIDESENCE stands committed to supporting its standards and equipment within that industry. In 1994, large inventories of VID-LITES, VID-STICKS, VID-VISION Camera and Camera Support systems, and VID-KEY Composite Image Lighting Systems will be available for the rental industry.

VIDESENCE goods and services should be available through your favorite rental company. If it doesn't have them, ask that they call VIDESENCE.



RGB COSMETICS

VIDESENCE lighting maintains a literal relationship with the human eye and the camera – what you see is what you get. For this reason, VIDESENCE offers RGB Cosmetics, a complete line of high quality makeup and skin care products that have been tested and evaluated for critical color-rendering abilities.

Each VIDESENCE broadcast customer can receive professional cosmetic consultation for its talent and a customized inventory of RGB Cosmetics, as well as VIDESENCE lighting installed in its makeup area. Applying the cosmetics under VIDESENCE lighting gives talent an accurate rendering of the image that will be seen on air check. Look for VIDESENCE RGB Cosmetics in professional supply and expendable stores near you soon.



TELECONFERENCING/AUDIO-VIDEO LIGHTING

VIDESENCE is currently releasing a complete line of lighting systems that bring studio-quality Sustained RGB Light to large teleconferencing facilities, single desktop videoconferencing stations, and everything in between. These products will represent the first and finest standard in video environment illumination.

Many audio-video and telecommunications applications use inexpensive camera platforms and subject video processing to severe compression or encoding. VIDESENCE Sustained RGB Light is the simplest form of quality control and image enhancement for these situations.



VIDESENCE

LIGHT THAT REPLACES INCANDESCENCE



KOIN-TV, CBS, Portland, Oregon

VIDESSENCE is the most affordable video image enhancement system you can employ. If you produce video in a studio on a regular basis, the operational cost savings of a VIDESSENCE Lighting System should give you a short payback period. If you produce in the field, the minimal amount of power you will need for lighting and the long life of the VIDESSENCE products will save you time and money. If you produce special effects, table-top realities, etc., VIDESSENCE systems will speed your production process, improve your final quality, and perform consistently, day in and day out. In every case, VIDESSENCE offers a standard that is technically consistent, financially smart, and offers new levels of artistic expression.

VIDESSENCE

VIDESSENCE, Inc.
P.O. Box 1188, Burlingame, California 94011, U.S.A.
(800) 697-7033 (415) 697-7032 FAX

VIDESSENCE, Sustained RGB Light and SOFTSPOTS are trademarks of VIDESSENCE Inc.
VIDESSENCE products are manufactured and distributed under license of United States Patents 5,012,396 and 5,235,497. Other patents pending.

Studio support products, accessories; Sets, drapes, acoustic materials, equipment racks, furniture

SONEX Acoustical Products	2103
Arrakis Systems	3912
Wheatstone Broadcast Group	5108
AEV Snc di Vaccari GEC	5424
John Gorrell Woodworking	10757
AMCO Engineering	11307
Forecast Installations	11562
UniSet Corporation	11701
Winsted Corporation (M1715)	11927
Vortex Communications	12206
Acoustic Systems	12807
ESE	12808
EMCOR Products/Crenlo	12833
Pacific Radio Electronics	13047
Zero Stantron	13115
Great American Market	13121
Hi-Tech Furnishings	13362
Torpey Controls & Engineering	13415
Beaveronics	13611
Theatre Service & Supply	13638
Acoustical Solutions/Alpha Audio	13640
Industrial Acoustic/IAC	14041
TCS-Tripp Communications	15380
The F J Westcott Company	15481
American Studio Equipment	16078
Carpel Video	16338
Peerless Industries Inc.	16438
Bretford Manufacturing	16469
Display Devices	16472
Matthews Studio Equipment	16653
Cinemills	16658
Marco Inc	17579
Beck Associates	18170
Hoodman	18615
Electrorack Products	18943
Nigel B Furniture	19473
ERGO 90/Ergo Industries	20014
AMX Corporation	20021
Anthro	M 412
Studio Technology	

Tape, optical recording media; Tape storage systems; Degaussers; Videocassette labels, software; Music, video libraries; Translation/voice-over services

Broadcast Programming	1424
TM Century	1526
Fidelipac	1920
Fresh/The Music Library	2000
Gefen Systems	2803
Henry Engineering	3700
Energetic Music	3921
audiopak	4018
SCA Data Systems	4208
US Tape & Label	4209
Radio Computing Services	5202
Sonic Science	10057
Vistek Electronics	11543
Rorke Data	11555
Sound Ideas	11703
Sony Recording Media	11711
Optimum Productions	11862
27th Dimension Inc.	11947
Studio Film & Tape	12201
Valentino Production Music	12203
Network Music	12427
Data Security	12451
Capitol Production Music	12905
Killer Tracks Music	13043
Promusic	13148

Audio Action	13449
DeWolfe Music Library	13620
Garner Industries	13622
FirstCom	13625
Manhattan Production Music	13635
Sanix Corporation	13646
Research Technology Int'l/RTI	13646
Production Garden Library	13743
Professional Label Inc.	13841
TRF Production Music Libraries	14044
TCS-Tripp Communications	15380
Zonal	16325
Carpel Video	16338
3M Pro A/V Products	16605
Ampex Corporation	17101
Storeel	17612
Videomagnetix Inc.	18014
H L Dalis	18070
United Ad Label	19119
Apogee Electronics	19181
DIC Digital	19183
Associated Production Music	19201
Aircraft Digital Music	19205
MSE Video Tape Services	19741
CBS News	M1810
Soundtrack	

Test and measurement equipment

Schmid Telecommunication	1606
Delta Electronics	2224
Potomac Instruments	2310
Belar Electronics Lab	2508
Marconi Communications Systems	2526
Altronic Research	2700
Logitek	3215
Audio Precision	3402
RCI Systems Inc.	3702
RE Electronics	3801
Neutrik Instrumentation	3906
Neutrik USA	3906
Holaday Industries	3920
Crown International	4400
Selco Products	4618
Kintronic Laboratories	4824
Coaxial Dynamics	5116
Radio Design Labs	5406
Astrodesign/Mira Vision	10153
ComTek	11114
Canare Cable/Cables & Connectors	11118
Video Accessory	11127
Minolta	11605
AVCOM of VA	11607
ScheduALL by Vizual Inc.	11662
Multidyne Electronics	11948
B&B Systems	12147
Telecast Fiber Systems	12747
Horita	12751
Leader Instruments	12803
McCurdy Radio Industries	13111
Techni-Tool	13143
Tally Display Corp.	13162
Tentel	13408
Television Equipment Associates	13411
Jensen Tools	13605
Computer Assisted Technologies	13612
Antenna Technology	13644
Troll Technology	13801
Leitch Video (M213)	15746
Video Design Pro	15901
Videotek	16127
Concept W Systems	16253
Hamlet Video International	16349
James Grunder & Associates	16349
Burst Electronics	16471
Aerosonic Ltd.	16474
Milestek	16477
Maxell Corporation of America	16611

ASACA ShibaSoku	16619
Philips TV Test Equipment A/S	16630
Magni Systems	16684
Tektronix	17119
Veetronix Inc./Reach Electronics	17146
Techflex	17784
Link Electronics	17981
H L Dalis	18070
Microvideo Ltd.	18781
Dorrrough Electronics	18815
Faraday Technology Ltd.	19123
Wohler Technologies	19539
Hewlett-Packard/Video Comm. Div.	M 117

Vehicles; Equipment transport cases and bags

E-Z UP International	5212
Phoenix ENG	10962
Howe Industries	11547
Television Engineering	13117
Thermodyne International	13127
Clipper Products	13147
Star Case	13624
Professional Label Inc.	13841
BAF Communication	15174
Wolf Coach	16106
Calzone Case	16124
AF Associates	17353
Hardigg Industries	18314
Anvil Cases	18820
Telepak San Diego	19107
ENG Mobile Systems	19143
Will-Burt	19203
Advent Communications	19255
Wescam Systems Int'l	19778
Nalpak Video Sales	20027

Wire, cable, connectors

Neutrik USA	3906
Switchcraft	4909
Insulated Wire/Microwave Products	4916
Professional Sound Corp.	5124
Cole Wire & Cable	10759
Canare Cable/Cables & Connectors	11118
LEMO USA	11323
Whirlwind/US Audio	11627
Trompeter Electronics	12801
Audio Accessories Inc.	13041
GEPCO International	13351
Mohawk/CDT Broadcast Cables	13431
Wireworks	13607
Nemal Electronics International	13619
Connectronics	13628
Belden/Cooper Industries	16069
VEAM	16366
Union Connector	16435
Milestek	16477
Kings Electronics	16831
ADC Telecommunications	17172
H L Dalis	18070
United Ad Label	19119
Apogee Electronics	19181
Clark Wire & Cable	19537

Turn to page 118 for the comprehensive
NAB '94 Exhibitor Listing.

Booth numbers shown are based on
information from NAB and the manufac-
turers as of Feb. 1, 1994. It is possible
that some numbers will have changed
by show time. We have no control over
such changes and regret any inconve-
nience it may cause.

March 1994 *Broadcast Engineering* 117



See us at NAB Booth #3406.

Circle (133) on Reply Card

Exhibitor Highlights

A comprehensive listing by company of product

Alcatel Network Systems/TelSpace 18883
Microwave link products; TM 400 series for audio, video.
Circle (331) on Reply Card

Alden Electronics 18614
Weather graphics systems; NEXRAD data demonstrations.
Circle (333) on Reply Card

Alesis 4612
Digital audio products, ADAT multitrack recorder, remote control equipment.
Circle (334) on Reply Card

Alexander Batteries 11113
Batteries and battery maintenance equipment, tri-analyzers, Smart chargers; New Generation Smart chargers.
Circle (335) on Reply Card

Alias Research M 913
Graphics software, Animator, PowerAnimator 3-D modeling, rendering, animation.
Circle (336) on Reply Card

Allen Avionics 19113
Hum eliminator; video delay lines; video filters.
Circle (337) on Reply Card

Allen Osborne Associates 19573
Transportable masts; production utility products.
Circle (338) on Reply Card

Alpha Image 18032
Component digital production switchers; Alpha 500, Alpha 501; routers and signal conversion equipment.
Circle (339) on Reply Card

Alpha Lyracom/Panamsat 19781
Program distribution, transmission services.
Circle (340) on Reply Card

ALTA Group/Dynatech 18032
Video recording, processing and switching equipment.
Circle (341) on Reply Card

Altronic Research 2700
RF power measurement equipment, Model 6725 25kW, Model 640105 dual port VHF air-cooled loads.
Circle (342) on Reply Card

AMCO Engineering 11307
Electronic equipment enclosures; Frugal Frame vertical consoles.
Circle (343) on Reply Card

AMEK Consoles/TAC 19166
Audioconsoles, Hendrix, SR6000, TAC Bullet; console automation.
Circle (344) on Reply Card

American Lightwave Systems 17172
Fiber transmission equipment, DV6010 and DV6016 digital video transmission systems.
Circle (345) on Reply Card

AML Inc. 20039
Cellular power amplifiers; multichannel MMDS/ITFS boosters.
Circle (346) on Reply Card

Ampex Corporation 17101
Video recording equipment, editing, switching, effects products; video and audio recording media, accessories; DCT recorders.
Circle (347) on Reply Card

Ampro M1621
Video projection systems.
Circle (348) on Reply Card

Amtel Systems 16642
Editing controllers, E-Trax workstations and E-Pix interface products.
Circle (349) on Reply Card

AMX Corporation 20021
Teleconferencing, multimedia products.
Circle (350) on Reply Card

Anchor/ROH 11601
Multichannel monitoring, audio distribution, custom and standard intercoms.
Circle (351) on Reply Card

Andrew Corporation 15674
Transmission equipment; Antennas for UHF, VHF, MMDS, LPTV, HDTV, STL/TSL, earth stations; HELIAX, rigid coaxial lines, circular wave guide; satellite antenna controllers, receivers, accessories; jumper cable assemblies; dryline dehydrators; IEEC connectors; Cold Shrink weatherproofing kits.
Circle (352) on Reply Card

Angenieux Corporation 17615
Video camera lens systems, 20x8.5, 1x6.5 2/3" and 20x7, 15x5 1/2" cameras.
Circle (353) on Reply Card

Antenna Concepts 15169
UHF Blaster and Sizzler, FM Tracker antennas; wireless cable products; transmission line connectors.
Circle (354) on Reply Card

Antenna Technology 13644
Range of satellite earth stations and related electronics components; Simulcast multibeam antennas; receivers; LNAs, LNBs, jumpers, cables, connectors; heating systems; switching systems; test equipment; system design, consultation, services; Vanguard Instruments and PROline digital audio systems.
Circle (355) on Reply Card

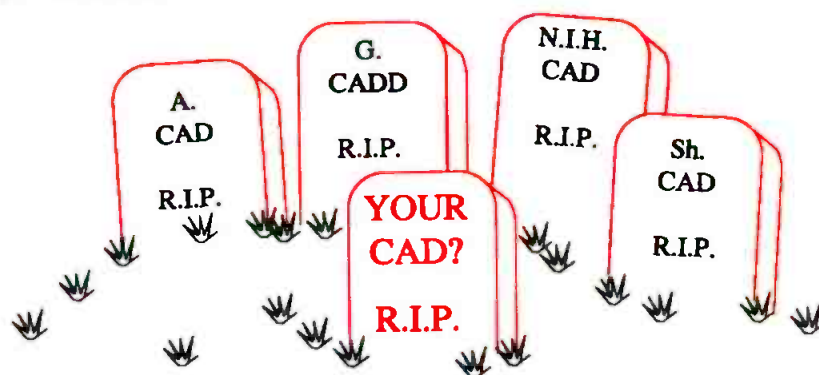
Anthro M 412
Facilities furnishings; 72" wide workstation rack cart with door; 60" wide cart.
Circle (356) on Reply Card

VidCAD

The fastest communications design software in the West!

A challenge rang forth through the West — "Betcha I'm the fastest and most thorough design software around." He drew his VidCAD mouse and drew 45 pieces of equipment, 120 cables, 6 jack designation panels and one router, all linked to cable and equipment databases and reports...before the others had a chance. It took them 3 to 5 days, but he only took 35 minutes. As the smoke cleared, our VidCAD hero said,

"I'm 70 times faster than you were"



Call or fax VDP today to find out how you can speed up your design, documentation and maintenance before its too late....

VDP

Video Design Pro • The CableDOC® Company

749 Carver Road, Las Cruces, New Mexico 88005 USA • 505-524-8959 • 505-524-9669 • 800-VidCAD-6

Circle (52) on Reply Card

Acrodyne...the best of all worlds.

UHF TV Transmitters

Solid State Technology

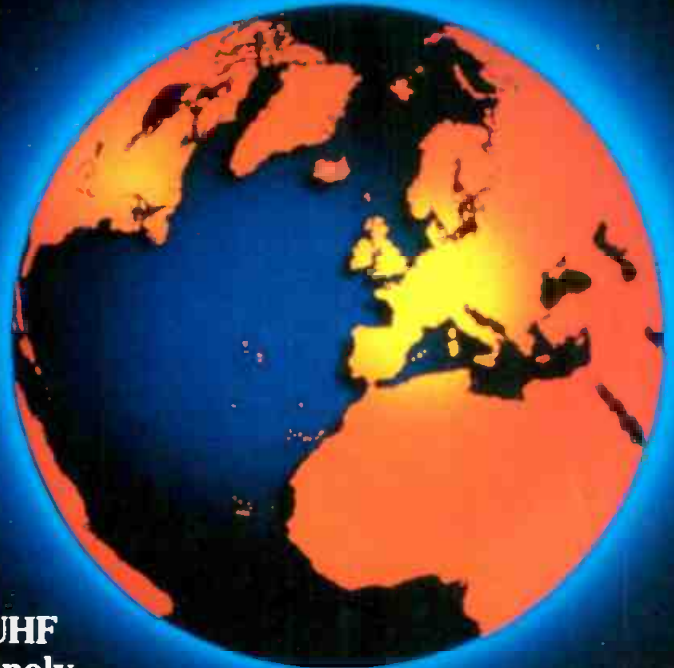
The proof is in! Since 1989, Acrodyne has been delivering affordable solid state 1 kW UHF TV transmitters—**no tubes, no tuning, no downtime.**

- Redundant power supplies
- Built-in diagnostics
- Modular construction
- Frequency agile designs

Advanced Tetrode Technology

Our product line includes the world's only single tetrode 30 kW UHF TV transmitter. Acrodyne's advanced systems are demonstrating exceptional field reliability—the **only new UHF transmitter development which meets and routinely exceeds expected tube life at full rated power.**

- Ultra high plant efficiency
- Solid state drivers
- Inherent linearity minimizes precorrection
- Low cost tube replacement
- Parallel systems available



The digital TV transmitter company

ACRODYNE

Acrodyne Industries, Inc.
516 Township Line Road
Blue Bell, PA 19422
800-523-2596
or (215) 542-7000
FAX: (215) 540-5837

© 1991 Acrodyne Industries, Inc. All rights reserved.

Circle (53) on Reply Card

See us at
NAB Booth
#13822



Anton/Bauer 13123
Battery/charger, lighting products; InterActive Logic series batteries; Satellight portable lighting system.
Circle (357) on Reply Card

Anvil Cases 18820
Transport cases for delicate equipment, A.I.R. isolated rack types.
Circle (358) on Reply Card

Aphex Systems 3924
Audio spectral exciter; Compellor 320, Dominator II dynamics controllers.
Circle (359) on Reply Card

Apogee Electronics 19181
Master digital audio tape; Wyde-EYE digital audio cable; A/D converters; UV1000 CD encoder.
Circle (360) on Reply Card

Apple Computer M1731
Personal computers, peripherals.
Circle (361) on Reply Card

Applied Digital Technology 11162
Information not available
Circle (362) on Reply Card

Arrakis Systems 3912
Audio mixers, Systems 6, 12, 18; studio furniture; Digilink, TrakStar production workstation audio management system.
Circle (363) on Reply Card

Arriflex 17169
Motion picture cameras, Arriflex 535; support products; ARRI geared head; lighting products.
Circle (364) on Reply Card

ART/Applied Research & Technology 1706
Audio processing systems including time

delays, digital reverbs, compressors, gates, time/pitch compressors; Phantom mixing consoles; DR8000 digital audio recorder.
Circle (365) on Reply Card

ARTI/Advanced Remote Techn. M1214
Desktop video, multimedia.
Circle (366) on Reply Card

ASACA ShibaSoku 16619
Audio analyzers; audio, video routers; multiformat, digital control, auto setup monitors; closed captioning equipment; decoders, encoders; DAs; envelop delay measuring sets; erasable rewritable MO disk audio files; still stores; dropout counters; GCR, HDTV motion picture memory; digital IF demod; HR color monitors; test signal, sync generators.
Circle (367) on Reply Card

ASC Audio Video Corporation 19573
CASE videotape editing systems, editing utility software; Avid, KRK, Lexicon, Drawmer, 360 Systems/Digi Cart, Focusrite, DK Audio, Aphex.
Circle (368) on Reply Card

ASC Press 16481
Information not available
Circle (369) on Reply Card

ASDG M1221
Information not available
Circle (370) on Reply Card

Associated Production Music 19201
Music, effects libraries, APM Best of the Best package, Broadcast 2 production package.
Circle (371) on Reply Card

Astrodesign/Mira Vision 10153
NTSC/HDTV programmable signal, test generators; HDTV converters, sync generators, still image recorders, frame grabbers, switch-

ing equipment; multimedia scan converters.
Circle (372) on Reply Card

AT&T 18558
Telephone, program transmission services.
Circle (373) on Reply Card

ATI Audio Technologies 13603
6-, 8-, 12-channel mixers; mic, line, monitor, turntable, interface, NANOAMP utility amplifiers; audio DAs, studio metering systems; headphone amps; press box distribution systems.
Circle (374) on Reply Card

Audi-Cord 3926
Audio cart recorders/players, DL series and S series.
Circle (375) on Reply Card

Audio Accessories, Inc. 13041
Audio jack panels, jacks; pre-wired audio patch panels; nickel-plated patch cords, cord holders; Polysand; video panels; RS-422 patching; Edac connectors; accessories.
Circle (376) on Reply Card

Audio Action 13449
Production Music Library on CD format.
Circle (377) on Reply Card

Audio Developments 16125
Portable mixers; audio processors AD151, AD152; AD153 audio DAs.
Circle (378) on Reply Card

Audio Precision 3402
Audio system analyzers, System One and Portable One Plus, Portable One, System One Dual Domain; reduced bit-rate coder testing software for digital broadcast systems; ATS-1 Lab Windows and Lab View BPIB software drivers.
Circle (379) on Reply Card



Focus: Design Services...defining the future.

Designing broadcast and production systems calls for innovative problem solving. The challenge lies in staying on-line or on-the-air while installing new systems or expanding existing ones. Our experience designing and installing systems - large and small - lets us anticipate real trends in technology. We recognize that what our clients really need is to be on time and on budget;

tangible results that make the difference on the bottom line. That's why WNED-TV,



digital post house North Coast Communications, Syracuse University, and WordPerfect Corporation have selected STI as their facilities consultant.

We know how to integrate audio, video, and computer technologies for your application. (And maybe some you haven't even dreamed of!) STI... defining the future in the design of:

- Systems
- Networks
- Facilities

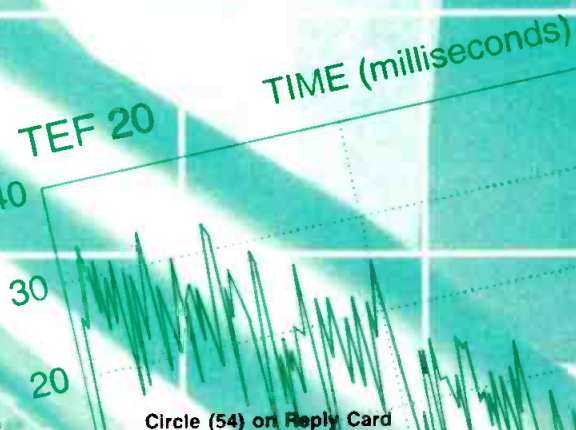


SYNERGISTIC TECHNOLOGIES INCORPORATED
Pittsburgh, PA
Columbus, Ohio
J-800-659-7715



Satellite Services

KU2



Circle (54) on Reply Card

Frezzi® 90's

The Frezzi Mini-Fill Light, a World Standard.

This beautifully engineered light head was designed by Frezzolini for the first ABC Network televised Mount Everest climb. It has since been improved for use at political conventions that require less obtrusive light heads. The Mini-Fill's reliability, performance and portability have established its international reputation and inspired an entire line of lighting products available today.

Compare the list of features:

- light weight (only 12 oz)
- compact (2"x 4½")
- operates from 12-14.4 or 30v batteries with choice of connectors
- utilizes high efficiency lamps 20-100 Watt
- available with a complete line of light studs and brackets
- available in a dual light head configuration for maximum light power
- flip-up daylight correction dichroic filter available as shown
- Professional Mini-Fill kit available in crush proof carrying case (shown below)



Dimmer Controlled
Mini-Fill, model MFIC

Circle (55) on Reply Card

Frezzi... Your Total Source for Power Products



AR124NP



AR304



FL650



Micromaster



Pro-Kit

Frezzolini Electronics Inc. 5 Valley Street Hawthorne, NJ 07506
201-427-1160 • Fax 201-427-0934 • Orders 800-345-1030

Audio Processing Technology Ltd. 4306

Digital audio processing units using data compression, apt-X 100 system.

Circle (380) on Reply Card

Audio Services Corporation 4506

Audio mixers, recorders, microphones, speakers and accessories, Professional Sound MilliMic and ASC wireless boom pole; Stellavox Stelladat and Fostex PD2 DAT recorders; Microtec-Gefell microphones.

Circle (381) on Reply Card

Audio Technica US 12506

Microphone products for all applications; mic accessories; SmartMixer mic mixer; AT4050/CM5 large diaphragm condenser mic; multimedia speaker systems.

Circle (382) on Reply Card

Audiotation Systems/Sellmark 5126

Information not available

Circle (383) on Reply Card

Audion Laboratories 1402

VoxPro digital sound workstation.

Circle (1168) on Reply Card

audiopak 4018

Cartridge media; broadcast A-2, AA-3 and AA-4 cartridges.

Circle (384) on Reply Card

Auditronics 2302

Audio mixing systems, 210 series radio on-air, 900 series TV news/production consoles; 1900 series IFB/Mix-Minus system; Destiny 2000 program management systems with control console, control software and 200MB computer.

Circle (385) on Reply Card

Augan Instruments

Digital audio workstations.

Circle (386) on Reply Card

Aurora Systems (See Pesa Chyron) 19401

Electronic graphics products; AU/240 and AU/250GT systems.

Circle (387) on Reply Card

Autodesk M 901

Graphics software, 3-D Studio Release 3 animation tool.

Circle (388) on Reply Card

Autogram 4520

Audio mixers for radio broadcast, production, Pacemaker series; Mini-Mix audio consoles.

Circle (389) on Reply Card

AVCOM of VA 11607

Portable spectrum analyzers (PSA-65A, -37D, -35A); network/spectrum analyzers; spectrum display monitors; SCPC/video/SCS satellite and portable receivers; microwave video links; microwave accessories; broadband noise generators.

Circle (390) on Reply Card

AVID Technology (M1301) 17111

Digital non-linear editing systems, Media Composer series, NewsCutter/Airplay broadcast news, Media Suite desktop editing; Video Shop, Avid Net, Media Server networking solutions; storage; AudioVision audio workstation; integrated film, video and audio production, post-production and broadcast news production environments; multiple production product lines; programming product lines; direct-to-air transmission systems.

Circle (392) on Reply Card

Avitel Electronics 19478

DSC 1100 signal corrector; under monitor displays; serial digital terminal equipment with DAs, D/As, serializers, deserializers.

Circle (393) on Reply Card

AVP Manufacturing 18780

Audio, video, digital jackfields; cable, patchcords; single, multipair cables.

Circle (394) on Reply Card

AVS Broadcast

Standards conversion products, including Cyrus Prime and EOS; Film Noire video processor; Integra digital vision mixer with 3D effects, routing; TK 3:2 frame integral transfer equipment; DVA 10 digital video analyzer; DX 120/DX210 digital video encoders.

Circle (395) on Reply Card

Aydin Corporation-HPA/Magnetics 200

Amps for satellite communications uplink applications; TWT, klystron power amps for S-, C-, X-, Ku- bands; Magnetic assemblies for broadcast applications; turnkey TV transmitter upgrade service.

Circle (396) on Reply Card

B

B&B Systems 12147

Audio measurement, monitoring products, Phasemonitor and Imagescope.

Circle (397) on Reply Card

B&H Photo 13428

Video, audio and multimedia equipment dealer.

Circle (398) on Reply Card

BAF Communication 15174

Satellite news, ENG, EFP, radio remote vehicles; turnkey earth stations; systems engineering, integration; IFB management systems; Dual-Path RF SNV switching systems; mast-mounted CCD color camera.

Circle (399) on Reply Card

EVERYONE'S DOING IT!



824 IMAGE INSERTER

- Self contained unit, one rack unit high.
- Image size, corner screen to full frame
- 24 bit true color
- Built in linear keyer, 256 step
- 16 million colors on screen at any time
- Resolution 720 x 480
- Auto fade in / out
- NTSC in / out
- Non volatile cmos memory

824P IMAGE INSERTER

- Same as 824 /PAL version, pixel resolution 720 x 512

808 IMAGE INSERTER

- Self contained unit, one rack unit high.
- Image size, corner screen to full frame
- 24 bit color (paletted)
- Built in linear keyer, 256 step
- 256 colors on screen at any one time, from a palette of over 16 million colors
- Resolution 720 x 480
- Auto fade in / out
- NTSC in / out
- Non volatile cmos memory

808P IMAGE INSERTER

- Same as 808 /PAL version, pixel resolution 720 x 512

908 MULTI IMAGE INSERTER

- Self contained unit 1 rack unit high
- Floppy drive 3.5" 1.44mb high density
- Full RS232 communications port
- Programmable input port
- Mouse controlled/menu driven
- Image size corner screen to full frame

(603) 893-7707 FAX (603) 893-7714

Circle (56) on Reply Card

From the big guys, to the affiliates, all the way down to the local access channels. Let the viewer know where the program's coming from!

LOGOS

- Images repositionable
- 24 bit color (paletted)
- Built in linear keyer 256 step
- Resolution 720 x 480
- Auto fade in / out

908P MULTI IMAGE INSERTER

- Same as 908 /PAL version pixel resolution 720 x 512

950 MULTI IMAGE/ VBI DECODER

Same as 908 with added ability to execute command code, embedded within the vertical interval of incoming video signals.

- Enables remote control and insertion of logos at affiliate stations

9000 IMAGE MANIPULATOR

- Self contained unit 2 rack units high
- Mouse/keyboard controlled, menu driven
- Floppy drive 3.5" 1.44mb high density
- Full RS232 communications port
- 1 AT/ISA buss expansion slot
- NTSC frame capture (256 level grey scale)
- 24 bit color (paletted)
- Video manipulation (editing, resizing, linear keying)
- Catalog and storage to internal hard drive.
- Built in linear keyer 256 step
- Imports image file formats PCX, IMG, TIFF, TARGA, BMP, etc.etc!

OPTION 1: 9000 PREVIEW BOARD

- Allows full on line editing and switching between preview and program frames

OSI systems, inc.

Southeast Salem Business Park
7B Raymond Ave. Unit 8
Salem, NH 03079

DIGITAL VIDEO MONITORING

Composite Serial D to A



Serial Monitoring Unit-SMU-1

9 bit conversion
>58 db S/N
DP DG 1° 1%
Small and Handy
Low Power
\$900 List

Panasonic

Broadcast & Television Systems Company

DIRECT SALES OFFICES

Headquarters 201-392 6593 Eastern 201-392-6590 Central 708-468-5160
Western 818-562-1501

See us at NAB booth #15738



IF The Next Generation

PLUS

The New Standard J15ax8B IRS

A new generation of lens technology...for a new generation of broadcast production. With 4:3/16:9, compatible cameras just around the corner, it is critical that lenses have higher resolution, higher MTF, and reduced chromatic aberration.

The answer to this need is Canon's J15ax8B IRS, the first lens featuring "IF Plus" 2nd generation Internal Focusing. After extensive research the newly developed Hi-UD Glass was the final addition needed to complete the R&D teams newest and best Internal Focus design.

Specifications previously unavailable are now available from Canon's IF Plus, featuring the most effective control of chromatic aberration, and unrivaled sharpness.

- Widest standard lens, with a wide angle of 8 mm (57.6 °)
- Local Focal Range of 8~120 mm
- Shortest MOD in a standard ENG lens: 0.65 m

Canon has been the leader in IF technology and has over 15,000 units in service worldwide. Follow the leader and be ready for the next decade with the Next Generation.

Canon
The Number One Lens

Canon USA

610 Palisade Avenue Englewood Cliffs, NJ 07632
Telephone: 201-816-2900 Fax: 201-816-9702

Canon Canada

6390 Dixie Road, Mississauga, Ontario, Canada 07632
Telephone: 905-795-2012 Fax: 905-795-2104

Circle (58) on Reply Card

BAL Components 19113
Serial, digital DigiStream 3 interfaces; NanoDelay HDTV delays; Synchrotime synchronizer; comb filters; utility video switchers.

Circle (400) on Reply Card

Balboa Capital 10557
Information not available

Circle (401) on Reply Card

Balcar/TEKNO 17978
U.S. distributor for Balcar (France) lighting products, Fluxlite.

Circle (402) on Reply Card

Band Pro Film/Video 16646
Remote control for camera support equipment, camera lenses; dollies, pan/tilt heads; miniature special purpose cameras; film, video production equipment.

Circle (403) on Reply Card

BARCO Industries 12429
Video monitors, CVM series; video projectors, HDM series; BVRS, BARS signal routers; CATV headend equipment, FSM860 headend monitor/supervisor system; Reference Calibrator 120T/121FS monitors.

Circle (404) on Reply Card

Barco-EMT 12429
Digital cartridge recorders, players EMT-460, -461; EMT-710 audio router.

Circle (405) on Reply Card

BASYS 19247
Complete newsroom automation systems, NetStation PC workstations, machine control and archiving.

Circle (406) on Reply Card

BCS Broadcast Store 17112
Broadcast equipment sales, brokerage.

Circle (407) on Reply Card

BE Radio magazine (M706) 10359
Beaveronics 13611
Studio clock, timing systems.

Circle (408) on Reply Card

Bec Technologies 1502
Information not available

Circle (409) on Reply Card

Beck Associates 18170
Custom configurations of modular console components; TBC remote controls; stereo audio monitors; stereo audio VU/phase meters.

Circle (410) on Reply Card

Belar Electronics Lab 2508
Modulation monitoring products for radio, TV; FMMA-1 The Wizard digital FM analyzer; RFA-4 agile FM RF amp with memory presets; digital FM stereo monitor/analyzer.

Circle (411) on Reply Card

Belden/Cooper Industries 16069
Complete range of wire, cable products, 1505A precision video cable, 1508A-1519A Belden series 24-gauge multipair snake cables.

Circle (412) on Reply Card

Bencher 19111
Graphics camera support products, Copymate II, M2, VP200 and VP300 copy stands.

Circle (413) on Reply Card

Benchmark Media Systems 11059
Audio signal control and distribution products, MIA-4 pre-amps, LoudMouth reporter control station, Junior Audio Director Plus monitoring module, AudioWorld Interface and MDA-102PA microphone preamp.

Circle (414) on Reply Card

BEXT 2414
FM transmitters, amplifiers, exciters, PTX

30, LC FM composite receiver.

Circle (415) on Reply Card

beyerdynamic 11315
Wireless equipment, microphones, headsets; S170H handheld and S170P pocket microphones and NE170 diversity receivers; DT 150 monitoring headphones; DT 190 sportscaster headset/microphone combo.

Circle (416) on Reply Card

BGW Systems 19560
Audio power and distribution amplifiers; rack-mount computers; accessory rack-mount products; subwoofers; bi-amplified personal monitors.

Circle (417) on Reply Card

Bogen Photo 16666
Line of camera support products, Mini-Pro tripods; Top Video suspension systems; Top Lift self-climbing hoists; lighting filters; Bo-Flex collapsable reflectors; Gitzo tripods and heads.

Circle (418) on Reply Card

Bonneville Broadcasting 1424
See Broadcast Programming

Circle (419) on Reply Card

Bradley Broadcast Sales 4002
Distributor; Telos telephone systems; Unity audio processors; audio signal bandwidth filters.

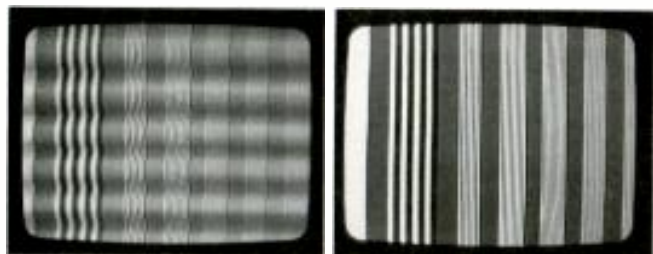
Circle (420) on Reply Card

Brek Conner Group 18454
Production titling systems.

Circle (421) on Reply Card

Bretford Manufacturing 16469
Equipment mounting products, wall-, ceiling mounts; BBPN48-E8 wide-body A/V table, VRC70E TV/VCR security center.

Circle (422) on Reply Card



Hum-Stoppers

**Eliminate ground-loop
and pickup problems on video
and wideband data lines.**

For hum. Pickup. Voltage differentials.
In medical imaging, process control,
CCTV and more. North Hills Hum-Stopppers
insure interference-free signal
transmission with over 120 dB attenuation
at power line frequencies.

Call

516-682-7708

for details.

North Hills™ Signal Processing

A Porta Systems Company
575 Underhill Blvd., Syosset, NY 11791
Fax: 516-682-7704

™North Hills is a trademark of North Hills Electronics, Inc.

Circle (59) on Reply Card

CLOSED CAPTIONING

CHEETAH SYSTEMS

the Worldwide Leader in

Closed Captioning offers the most advanced and
comprehensive line of captioning solutions available.

CHEETAH SYSTEMS

is the only vendor offering a complete line of
cross compatible captioning
products with 24 hour support, 365 days a year.

Join the leader!

Call us for more information and
our demo videotape at 800-829-2287.

"Se Habla Espanol"



109 Fourier Avenue
Fremont, CA 94539-7482
Voice/TDD: 510-656-0700
Fax: 510-656-0527

Circle (60) on Reply Card

"YOU WANT WHAT!?!!"



So, there he was, this *client*, for want of a better word, telling me, in no uncertain terms we needed a piece long ago consigned to the bin. I could see myself burning the midnight oil again, desperately trying to find this 3 second out-take from the 2000 feet on the cutting room floor.

And what about the night before! I'd mixed down a couple of nifty, if a little time-consuming crossfades, then realised I had a problem - all the edits from earlier that evening also needed crossfades to cover the gaps. Oh well, Sleep's overrated anyway! It's just something else to do in bed!

I should've listened to Jim! I'd just replaced my ageing tape deck with a gleaming new machine when he said, "You could get a complete **SADiE™** system for less than that - *real-time crossfades, non-destructive editing and so fast to use, it's incredible!*"

What next! I need more tape, more time, less grey hair.....

- Windows 3.1* on 486 host computer
- Rapid graphical editing
- Clear user interface
- Local SCSI drive fast audio access
- All crossfades calculated in real-time
- Fully non-destructive, sample accurate editing
- Up to 8 track playback with real-time mixing
- Unique Trim Window allowing real-time adjustment of audio
- Log and shuttle scrub modes
- AES/EBU, SPDIF and analog I/O
- All standard sample rates
- Full SMPTE timecode support with chase and trigger lock
- 16, 20 and 24 bit digital audio editing

- Bounce down
- Overdub
- Reverse playback
- Real-time dynamics control
- Real-time EQ
- Real-time digital resampling
- Real-time duration change
- Real-time noise reduction



BRITISH INNOVATION



MANUFACTURED IN THE EUROPEAN COMMUNITY BY STUDIO AUDIO & VIDEO LTD

Studio Audio & Video Ltd
The Old School, Strettham
Ely, Cambridge
CB6 3LD, UK
TEL: +44 (0)353 648888
FAX: +44 (0)353 648867

USA

Studio Audio Digital Equipment Inc
1808 West End Avenue
Suite 1119
Nashville, Tennessee 37203
USA
TEL: +1 615 327 1140
FAX: +1 615 327 1699



SADiE™ DISTRIBUTORS WORLDWIDE

Argentina Kappa T 081 31 0818 F 081 31 1493 • Asia Pacific VW Marketing T +44 372 728481 F +44 372 724009 • Australia Audio & Recording T 02 316 9935 F 02 666 3752 • Canada JSGS Ltd T 416 751 7907 F 416 751 7975 • China Wo Kee Eng. Ltd T +852 774 2628 F +852 363 7808 • Denmark SC Sound T 43 99 88 77 F 43 99 80 77 • Finland Oy HedCom AB T 90 682 866 F 90 682 8489 • France Coach Audio T 87 77 00 00 F 87 77 01 21 • Germany Stefan Mayer Audio Engineering T 0 6851 6519 F 0 6851 6519 • Hong Kong Digital Professions Ltd T 318 0588 F 305 1455 • Israel Sontronics Electronic Equipment T 03 5705223 F 03 6199257 • Korea Avix Trading Co. Ltd T 02 565 3565 F 02 565 3561 • Philippines Tracks T 2 631 3277 F 2 631 3267 • Poland Unico T +44 223 63025 F +44 223 301488 • Singapore, Malaysia, Indonesia Team 108 Technical Services T +65 748 9333 F +65 747 7273 • South Africa Tru-fi Electronics SA (Pty) Ltd T 011 462 4256 F 011 462 3303 • Spain Lexon T 93 203 48 04 F 93 280 40 29 • Sweden Tranziom T 08 730 3710 F 08 730 5125 • Taiwan Acesonic T 2 716 8896 F 2 719 2065 • Thailand KDM Trading T 2 318 2724 F 2 318 6186 • USA SADiE Inc T 615 327 1140 F 615 327 1699 •

*Windows is a registered trademark of Microsoft Inc. Studio Audio & Video Ltd reserve the right to change specifications without prior notice

Circle (61) on Reply Card

www.americanradiohistory.com

Broadcast Electronic Services 17375
Video signal distribution, format conversion products, GPI Network 4104x router; Betabox interformat editing unit.

Circle (423) on Reply Card

Broadcast Electronics 3424
FM broadcast transmitters; digital audio storage equipment, AV-90 AudioVAULT; cartridge recorders; audio mixers.

Circle (424) on Reply Card

Broadcast Engineering mag. (M706) 10359
Broadcast Int'l Group 17582
Information not available

Circle (425) on Reply Card

Broadcast Marketing Int'l Ltd 19328
Kobold production and ENG HMI lighting products; Noriyuki time code devices, including Scriptboy wireless TC reader.

Circle (426) on Reply Card

Broadcast Microwave Services 12301
Microwave radio equipment, BMA-3000 Autotrac King antenna pedestals, TBT-50A frequency agile portable transmitters.

Circle (427) on Reply Card

Broadcast Programming 1424
24-hour program formats, including Country, Adult Contemporary Christian, Classic EZ and Easy Mix.

Circle (428) on Reply Card

Broadcast Software Ltd./BSL 12862
Transmission system management software products.

Circle (429) on Reply Card

Broadcast Supply Worldwide/BSW 4820
Distributor, approximately 200 lines of professional audio, RF/radio products; digital audio workstations.

Circle (430) on Reply Card

Broadcast Video Systems/BVS 16736
Signal distribution and video processing products, D100-NTSC comb filter decoder and MASTERKEY downstream keyer; MASTERKEY 5 component linear keyers; VBI 232 encoder/decoder; VM+4 summing switcher.

Circle (431) on Reply Card

Broadcasters General Store 2506
Distributor of audio products for radio, Telos Systems digital hybrids and Frank Foti Unity 2000; also distribute DNF ST-200 VTR controllers, Roland DM-80 hard disk recorders, Auditronics consoles/mixers and Fidelipac digital cart recorders.

Circle (432) on Reply Card

Bryston 1609
Audio monitor amplifier, Model 7B-PRO.

Circle (433) on Reply Card

BTS Broadcast Television Systems 18023
Video cameras, LDK 10 DPM dynamic pixel management series with 4x3-16x9 switchable aspect ratio; LDK9 wide screen update; HDTV cameras; Series 3000/300 control panels; expanded control panels for Venus routers; Saturn master control switchers with mix and match of digital and analog sources; DCR 6000 gigabit recorders; Video Gallery graphics system; FLH 1000 HDTV telecine.

Circle (434) on Reply Card

Burk Technology 4818
Remote control systems, AutoPilot multisite units.

Circle (435) on Reply Card

BURLE INDUSTRIES 11962
Power devices for RF transmission; camera tubes.

Circle (436) on Reply Card

Burst Electronics 16471
Micro character generator, audio mixer/switcher for Video Toaster; Video DAs.
Circle (437) on Reply Card

C

Cablewave Systems/RF Systems 15753
Antenna products, Bogner wideband and MMDS, ITFS, FM, STL antennas; high power FlexWell transmission line; Cablewave broadcast antenna pattern computing software.

Circle (438) on Reply Card

Calaway Editing 18032
On-line, off-line editing controllers.

Circle (439) on Reply Card

California Amplifier 10860
Information not available

Circle (440) on Reply Card

Calzone Case 16124
Equipment transport products, Titan, Utime series.

Circle (441) on Reply Card

Canare Cable/Cables & Connectors 11118
Signal distribution patchbays, 242U-VJ22W-C for video; tools, wire, connectors, BCP-C4B 75Ω BNC crimp plugs; audio transformers; BCJ-XJ-A10TR; L-5CFB 75Ω coaxial cable.

Circle (442) on Reply Card

Canon USA/Broadcast Optics 15738
Broadcast lenses including J14ax17B KRS V with vari-angle prism optical stabilization system; standard and internal focus lens systems; LX-200 Hi8 prosumer camera; laser transmission systems.

Circle (443) on Reply Card

Capitol Production Music 12905
Music libraries, including Archives IIine.
Circle (444) on Reply Card

If You Think We Only Supply Bulk A/V Cables ...



Think Again.

Clark Wire & Cable provides custom high quality cables, cut to length and terminated to your specifications.

- Patch Cords
- ADAT Harnesses
- DA-88 Harnesses
- DT-12 Audio Snakes/Harnesses
- RGB Cables
- Remote Camera Cables
- Digital A/V Assemblies
- Complete Facilities
- And More!



1-800-CABLE-IT!

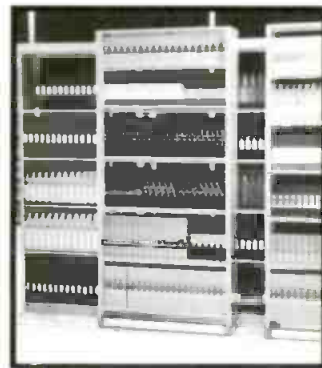
151 S. Pfingsten Road #B
Deerfield, IL 60015

Circle (62) on Reply Card

STOREEL[®]

NOTHING REMAINS THE SAME

Whatever the size . . . Worldwide, Storeel can help!



Technology is transforming the tape storage industry. Keeping in touch with customer requirements is our top priority. Call Storeel today when space saving becomes your priority.

STOREEL[®]

3337 West Hospital Avenue, Post Office Box 80523, Atlanta, Georgia 30341
404-458-3280, Fax 404-457-5585

Call Today For A Free System Design Consultation
Tailored To Your Individual Requirements

See us at NAB Booth #17612.

Circle (63) on Reply Card

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:

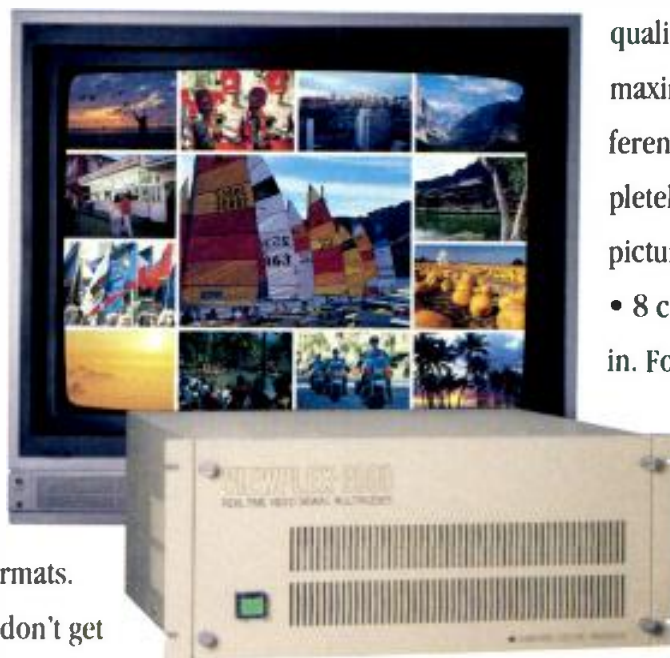
SUMITOMO ELECTRIC

U.S.A., Incorporated.

Telephone: (310)782-0227

Facsimile: (310)782-0211

See us at NAB Booth #10060.



SUMITOMO ELECTRIC

Circle (64) on Reply Card

Carpel Video 16338
Evaluated recording media, 3/4" KCA U-matic, 1"; clocks/timers; utility products.
Circle (445) on Reply Card

CBS News M1810
Video libraries.
Circle (446) on Reply Card

CBSI Custom Business Systems 1624
Broadcast and related accounting systems, Classic, Elite traffic and billing, InterAcct accounting systems.
Circle (447) on Reply Card

CCA Electronics 4220
Solid-state FM transmitters; high performance FM exciters; AM and SW transmitters to 50kW; FM transmitters to 45kW.
Circle (448) on Reply Card

CCOR/Comlux 13356
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 (449) on Reply Card

CEL (See Snell & Wilcox) 19746
Video encoders, standards converters (Tetra series, Standi), Myriad digital effects; Maurice effects systems.
Circle (450) on Reply Card

Centaur Development M1403
Desktop, video and animation products.
Circle (451) on Reply Card

Central Tower 1906
Towers, monopoles for broadcast applications; structural engineering analysis; construction services, antenna, line installation; turnkey projects; self-supporting towers.
Circle (452) on Reply Card

Century Precision Optics 19764
Wide-angle optical adapters, slide-to-video transfer equipment.
Circle (453) on Reply Card

Chapman/Leonard Studio Eqt. 13833
Lighting, camera support products.
Circle (454) on Reply Card

Chimera 17584
Lighting products, Chimera Quartz, Daylite Cine Banks.
Circle (455) on Reply Card

Christie Electric 11709
Battery chargers/analyzers, CASP/1200, CASP/2000 systems.
Circle (456) on Reply Card

Chromatek Inc. 12462
Signal, scan conversion equipment.
Circle (457) on Reply Card

Chyron (See Pesa Chyron) (M1114) 19401
Character generators, production titlers, graphics products.
Circle (459) on Reply Card

Cine 60 19117
Lighting products, batteries, chargers.
Circle (460) on Reply Card

Cinekinetic 19128
Utility camera support products for ENG, outdoor production.
Circle (461) on Reply Card

Cinema Products 11633
Camera support products, SteadiCam video SK; camera control systems.
Circle (462) on Reply Card

Cinemills 16658
Lighting products and systems; studio furnishings.
Circle (463) on Reply Card

Circuit Research Labs 3015
Audio processing equipment, Audio Signature 4-band stereo, MBL-100 news/talk AM processing systems; FM generators; event sequencing systems.
Circle (464) on Reply Card

Clark & Associates 1715
Digital audio products, including multichannel, hard-disk recorders; audio delays; automation products for radio, TV, cable; SMPTE TC PC cards; video titling, multichannel switcher status displays.
Circle (465) on Reply Card

Clark Wire & Cable 19537
Series 1300 audio snakes; Hannay cable reels; bulk audio, video cable, connectors; remote composite cables, patchbays, reminated reels; custom assemblies, harnesses.
Circle (466) on Reply Card

Clear-Com Intercoms 18015
PL-Pro 2-channel, single rack-space speaker station with IFB; TEL-1000 auto answer auto null telephone-to-intercom interface; Paragon single-rack, shielded, amplified stereo monitor speaker; ICS-2102 24-button Matrix Plus II station; 26x26 Mini Matrix.
Circle (467) on Reply Card

Clipper Products 13147
Utility, equipment carts; Cosmos carry-on storage mobile organizer system.
Circle (468) on Reply Card

CMC Technology 11608
Replacement video head assemblies for VPR 1" C; upper drum refurbishing for BVH 1" C.
Circle (469) on Reply Card

CMX (See Pesa Chyron) 19401
Videotape editing systems, OMNI systems.
Circle (470) on Reply Card

**If You Think We Only
Supply Cable Harnesses ...**



Think Again.

You should see the quality and pricing on Clark Wire & Cable bulk cable and connectors.

Clark Wire & Cable has industry standard audio and video cables available in as many as ten jacket colors. Our customized A/V cables are designed with your needs (and pocketbook!) in mind.



1-800-CABLE-IT!
151 S. Pfingsten Road #B
Deerfield, IL 60015

Circle (65) on Reply Card

NEW TECHNOLOGY

**Gentner will revolutionize
the way you use telephone
interface products!**

**Introducing
DCT**

Don't miss it! NAB Booth #2612

Gentner

Gentner Communications Corporation
Professional Audio Products
1825 Research Way, Salt Lake City, UT 84119 USA
(801) 975-7200 FAX (801) 977-0087

Circle (66) on Reply Card

Power and Performance from the New GEN III



Well Within Reach.

Easy operation has arrived with the Varian GEN III klystron high power amplifier for satcom applications. Behind the stylish exterior is an intelligent microprocessor control that lets you adjust and monitor all parameters from an easy-to-read menu-driven control panel. An integrated computer interface provides automatic level control and computer command of the HPA.

The GEN III also offers proven performance over a range of frequency bands, with a large selection of klystron tubes.

The GEN III meets the stringent international transmitter safety standard IEC 215 and accommodates worldwide line voltages with a simple internal adjustment.

And when it comes to service, the GEN III offers the best in the industry: 24-hour-a-day support and a 24-month warranty backed by Varian, the leader in satcom HPAs worldwide.

For a free brochure, call 1-800-544-4636 in the U.S. or contact our Santa Clara, CA, headquarters.



Varian: 3200 Patrick Henry Drive, Santa Clara, CA 95054 Tel: (408) 496-6273 Fax: (408) 496-6235

Please visit us at NAB, Booth #16101.

Circle (67) on Reply Card

varian 

Coaxial Dynamics 5116
RF wattmeters, RF loads.
Circle (471) on Reply Card

Cole Wire & Cable 10759
Information not available
Circle (472) on Reply Card

Color Computer Systems M1627
Information not available
Circle (473) on Reply Card

ColorGraphics Systems 18032
Videographics workstations, DP/MAX.
Circle (474) on Reply Card

Colortran 17659
Lighting products and control systems, compact Elite controllers and ENR series dimmers; lamps; Studio Fresnels; Encore software, version 2; Medallion control console; DMX wall station.
Circle (475) on Reply Card

Columbine Systems 15733
Broadcast automation products.
Circle (476) on Reply Card

Comark Communications/Thomcast 16113
UHF TV transmitting equipment, Comark "S" series transmitter systems with high-power D-HDTV compatibility; IOT UHF TV transmitter systems.
Circle (477) on Reply Card

Communication Graphics 4813
Promotional products and professional logo design.
Circle (478) on Reply Card

Communication Specialties M1711
Computer-to-video scan converters; VGA, S-video, video DAs.
Circle (479) on Reply Card

Communications Data Services 4019
RFCAD; International terrain data; Fryers Site Guide/CDS on-line services; North American Terrain Data (U.S., Mexico, Canada).
Circle (480) on Reply Card

Comprehensive Video Supply 16346
Video amplifiers, multimedia monitor cables, desktop video production accessories; PC-/Mac-based Edit Master; Walter Brewer lighting systems integrations services.
Circle (481) on Reply Card

Compression Labs 16682
Video signal compression systems.
Circle (482) on Reply Card

Comprompter 19164
Electronic newsroom software ENR V2.4, AutoWire and VoteMaster.
Circle (483) on Reply Card

Computer Assisted Technologies 13612
BCAM 4.0 maintenance management software; CAT/SV service center management software; CATest 2.0 VTR, switcher and router interfaces.
Circle (484) on Reply Card

Computer Concepts 3908
Radio automation products, DCS digital commercial system, Audio Switcher.
Circle (485) on Reply Card

Computer Engineering Associates 12259
Computerized newsroom equipment, the CEA Newsroom System on a PC network with Windows.
Circle (486) on Reply Card

Computer Graphics World M 202
Trade publications.
Circle (487) on Reply Card

Computer Prompting & Capt Co. 16943
Videoprompters, CPC-2000 SmartPrompter+, CPC-500 closed/open-captioning system; CPC-1000D flat-screen display; CPC-700 CaptionMaker Plus closed-captioning software.
Circle (488) on Reply Card

Comrex 12206
Audio Frequency Extenders for remote au-

dio pickups with integrated mixing; DX-100/DX-200 Digital Audio codecs; telephone couplers and hybrids; wireless IFB system for van-to-field cueing; TV aural monitors.
Circle (489) on Reply Card

COMSAT 13051
Satellite communications products. International satellite program distribution systems.
Circle (492) on Reply Card

ComStream Corporation 4000
Satellite reception electronics, ABR200 digital audio receiver and integrated digital audio network; ABR200 desktop broadcast receiver; Remote Performance monitors; broadcast-quality video transmission systems.
Circle (493) on Reply Card

Comtech Antenna Systems 13402
Satellite communications products, 5M motorized antenna system, EC6, offsat transmit satellite antenna.
Circle (494) on Reply Card

ComTek 11114
Wireless microphone equipment, MRC-82 Camera Companion receiver; IFB-72 cueing and talent feedback system; BST-25 base station transmitters and PR-25 personal receivers.
Circle (495) on Reply Card

COMWAVE/Communications Microwave 11329
20W transmitter model SB020B; 10W transmitter model SB010B.
Circle (496) on Reply Card

Concept W Systems 16253
Single-coax, field adaptable CAMPLEX multiplexer systems for bidirectional A/V signal and CCU data signals, power; for ENG, EFP, SNG remote camera productions; NTSC, PAL, SECAM standards.
Circle (497) on Reply Card

Conifer Corporation 11301
Antennas, block downconverters, low noise preamplifiers; frequency conversion formats; reception products for wireless cable, MMDS and ITFS.
Circle (498) on Reply Card

Connectronics 13628
Connector products, One Piece series adaptors.
Circle (499) on Reply Card

Continental Electronics 3418
Complete line of AM, shortwave and FM radio transmitters and associated equipment.
Circle (500) on Reply Card

Control Concepts/Leibert 16336
Power protection/conditioning equipment, the Isolatron, Isolatron active tracking filters; complete protection for low- to high-power transmitter requirements as well as computers and automation systems.
Circle (501) on Reply Card

Corporate Computer Systems 4826
CCS Audio Products: audio transmission codecs, Micro 56+ 7.5kHz and Micro 66i 7.5kHz dual rate units; CDQ1000/CDQ2001 audio codec; CDQ2000 stereo MUSICAM codec; PACE digital audio editing workstations.
Circle (502) on Reply Card

Cortana Corporation 3704
Lightning, static protection products, Stati-Cat, Stati-Kitty and Stati-TomCat systems.
Circle (503) on Reply Card

COSA/Company of Science & Art M1235
CoSA After Effects 2.0, special effects software.
Circle (504) on Reply Card

Countryman Associates 12202
Microphone products, the EMW series.
Circle (505) on Reply Card

Creative Logic M1124
Information not available
Circle (506) on Reply Card

Crouse-Kimzey Company 1708
Audio distributor; Otari Prodisk 464 digital workstation; Denon DN970FA CD player.
Circle (507) on Reply Card

Crown International 4400
CM-312 head-worn mic; full line of microphones, amplifier products.
Circle (508) on Reply Card

Crystal Graphics M1609
Information not available
Circle (509) on Reply Card

CSI Camera Support International 20139
Camera support, dollies, tripods, pan/tilt heads.
Circle (510) on Reply Card

CTE International 3000
FM broadcast transmitter products, excitors, power amplifiers.
Circle (511) on Reply Card

Cue Tech Teleprompting 12762
Prompting systems.
Circle (512) on Reply Card

Cycle Sat 12447
Program distribution services, transmission security equipment, Cyclecypher.
Circle (513) on Reply Card

D

Dalet Digital Media System 3803
Digital audio workstations.
Circle (514) on Reply Card

Dan Dugan Sound Design 17147
Automated mixer controls.
Circle (515) on Reply Card

Daniels Publishing Group 12909
Publications listing broadcast equipment technical data, applications information; equipment buyers guide.
Circle (516) on Reply Card

Data Center Management 20055
Supplier of newsroom automation systems.
Circle (517) on Reply Card

Data Security 12451
Bulk tape degaussers, including MP-14, TC-14 and Type II-A.
Circle (518) on Reply Card

Data Translation 16615
Multimedia, desktop video products, including Media 100/V2.0, FX option and CG option.
Circle (519) on Reply Card

Datatek 13814
Signal routing, distribution equipment; D-2800 series routers, increased density with surface mount techniques; all signal formats - analog audio, video; digital audio, video; time code, data.
Circle (520) on Reply Card

Dataworld 1918
Broadcast industry database; reports, research services; customized marketing maps and maps for the broadcast industry, including international.
Circle (521) on Reply Card

daVinci 18032
Color correction processors for video, telecine Renaissance Hi-Res Kilovectors.
Circle (522) on Reply Card

Dawn Satellite Inc. 17779
3.1 and 5.0 meter motorized satellite downlinks; digital-ready LNB amplifiers; Coversat ice and snow prevention covers; distributors of commercial satellite communications products.
Circle (523) on Reply Card

DB Elettronica 4600
FM, TV transmitters, translators.
Circle (524) on Reply Card

dbx/AKG Acoustics 2806
Full line of audio processors, compressors, limiters, equalizers, de-essers and noise control products.
Circle (525) on Reply Card

Dedotec USA 17148
Precision lighting instruments for ENG/EPF, film, still photo, architectural uses.
Circle (526) on Reply Card

Delta Electronics 2224
Broadcast transmission monitoring products, SM-1 splatter monitor, OIB-3 operating impedance bridge.
Circle (527) on Reply Card

DENON 4303
CD cart recorders, cassette decks; CD cart players.
Circle (528) on Reply Card

DeSisti Lighting/DESMAR 15681
Lighting products.
Circle (529) on Reply Card

Desktop Video World M 518
Publication.
Circle (530) on Reply Card

DeWolfe Music Library 13620
Production music libraries.
Circle (531) on Reply Card

DGS Pro Audio (Gotham Ltd.) 5214
Audio products.
Circle (532) on Reply Card

DH Satellite 13609
Information not available
Circle (533) on Reply Card

DI-Tech 13103
Model 5886 analog video and D1/D2 digital router with matrices to 64x64; digital inputs equalized, outputs reclocked.
Circle (534) on Reply Card

Diaquest M 801
Computer animation controllers.
Circle (535) on Reply Card

DIC Digital 19183
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 (536) on Reply Card

Dielectric Communications 15719
digiTLine broadband, digital transmission line; TUP NTSC standby antenna systems, HDTV ready; transmission line accessories.
Circle (537) on Reply Card

Digidesign 1002
Digital audio recording systems.
Circle (538) on Reply Card

Digimusic 2703
Information not available
Circle (539) on Reply Card

Digital Arts Film/TV Pty M 109
Information not available
Circle (540) on Reply Card

Digital Micronics M1421
Information not available
Circle (541) on Reply Card

Digital Processing Systems 11930
Time base correction, synchronizer products, video format converters; sync, test generators; video monitoring systems; DR-2100 personal animation recorders for PC; universal remote controls.
Circle (542) on Reply Card

Digital Vision 17143
Digital video processing products, DVNR 1000 noise, film grain reducer, DVCC 1000 YRGB 4:4:4 color corrector; TelevEyes pro scan converter.
Circle (543) on Reply Card

Disc Manufacturing Inc. M 209
Information not available
Circle (544) on Reply Card

Discreet Logic Inc. 18563
High-resolution, high-speed on-line software systems for film, HDTV, video; INFERNO, FLAME and FLINT software systems for special visual effects.
Circle (545) on Reply Card

Display Devices 16472
Large screen projector support systems, Datalift series.
Circle (546) on Reply Card

DNF Industries 16375
Editing accessory products, including ST series VTR controllers; numeric pad time code, GPI, switch closure.
Circle (547) on Reply Card

Dolby Labs 1620
Noise reduction, TV surround sound and film sound technologies; digital STL; spectral processors; 4-channel digital STL; AC-3 digital audio coding; Codecs for AC-2 and AC-3 audio coding.
Circle (548) on Reply Card

Dorrough Electronics 18815
Signal measurement products, Loudness and Composite Video Luminance meters; Model 280-D AES/EBU digital reading meters; Model 480-D AES/EBU digital sum & difference meters; Model 40 video level meters.
Circle (549) on Reply Card

Doty Moore Services 19180
Broadcast consultants.
Circle (550) on Reply Card

Doug Vernier Broadcast Tech. 5152
Broadcast consultants.
Circle (551) on Reply Card

DSI Communications 18817
Engineering, construction firm; specialization in video, RF system design, construction, maintenance.
Circle (552) on Reply Card

Dubner International M1121
Videotape logging systems software; SCENE STEALER automatic scene detector for Win-

dows with STORYBOARDER software.
Circle (553) on Reply Card

DVS Digital Video Systems 10354
Solid-state video storage, retrieval systems.
Circle (554) on Reply Card

Dwight Cavendish 16072
Videotape duplication equipment, Copymaster 250-5, QC-2500 monitor system.
Circle (555) on Reply Card

DYNAIR Electronics 13806
Signal routing, distribution and control products, including System 2000, Series 36 and Digital X; fiber optic video, audio and data transmission systems; interactive graphics/video walls; Genesis modular line of digital interfacing and conversion equipment.
Circle (556) on Reply Card

Dynatech Corporation 18032
See: Alpha Image; ALTA Group; Calaway Editing; ColorGraphics Systems; daVinci; Dynatech NewStar; Quanta; Utah Scientific; technology companies developing, manufacturing, supporting digital and analog products for broadcast, production and post-production businesses; Digistore D²S².
Circle (557) on Reply Card

Dynatech NewStar 18032
Newsroom automation equipment, NewStar systems.
Circle (558) on Reply Card

E-Z UP International 5212
Quick setup shelters, require minimal tools, time.
Circle (559) on Reply Card

GPS MASTER CLOCK/TIME CODE GENERATOR -Worldwide Time-

Locked to the Atomic Clock in the Global Positioning Satellite System, you can have time, date and time code within nanoseconds of UTC, any where in the world!!

ES-185

\$2495.00



STANDARD FEATURES INCLUDE:

- SMPTE/EBU, ESE, IRIG-B & ASCII Time Code Outputs
- 1PPS Output • 6 Satellite Tracking • Battery Back-up
- GPS Locked Indicator • Automatic Daylight Savings Time Correction
- Time Zone Offset • Antenna • AND MORE!!

OPTIONAL FEATURES INCLUDE:

- Parallel BCD Output • 1 KPPS • 10 MHz Output • 220 VAC • 12 VDC
- Video Inserter • Video Sync-Generator

3 YEAR WARRANTY



142 SIERRA STREET, EL SEGUNDO, CA 90245
(310) 322-2136 FAX: (310) 322-8127

See us at NAB Booth #12808.

Circle (68) on Reply Card



It's Basic

When it's air time, and you have to worry about; a fast-paced camera sequence, unpredictable sequence timing, audience reaction, VTR cuts and commercial breaks – clean, clear, efficient communication shouldn't be among your concerns.

E

EarthWatch Communications 19485
Information not available

Circle (560) on Reply Card

Eastman Kodak Company 16963
Motion picture films; HDTV processing systems; Cineon.

Circle (561) on Reply Card

Echolab 13424
MVS6-3W, MVS5-3W component video production upgradable switchers; Tempest digital effects; PC-3 video switcher on PC card.

Circle (562) on Reply Card

Econco Broadcast Service 2208
Rebuilt power transmitting tubes, klystrons.

Circle (563) on Reply Card

Editing Technologies Corporation 15466
Video editing products, Ensemble editors.

Circle (564) on Reply Card

EDX Engineering 1327
Engineering software, SHOWMAP V4.10 for coverage based on terrain data, RPATH V6.10 for microwave and STL path analysis.

Circle (565) on Reply Card

EEG Enterprises 16324
VBI data products, VDR-2 data receiver, TVCD100 line-21 encoder.

Circle (566) on Reply Card

EEV 16663
UHF TV power products; high efficiency IOT7340R air-cooled and IOT7360 water-cooled inductive output tubes; KSC3371 70kW ESC klystrons.

Circle (567) on Reply Card

egripment 18072
Camera support products, Skymote; Dinky dolly; accessories, grip kits; Kaleidoscope Hot Head II; Piccolo, VIP, Sky-King cranes.

Circle (568) on Reply Card

Elantec Inc. 19463
High-performance analog and mixed signal standard and application-specific integrated circuits for applications ranging from high-end broadcast equipment to consumer electronics.

Circle (569) on Reply Card

Electric Image 19485
Graphics software; ElectricImage animation system, version 2.0.

Circle (570) on Reply Card

Electro-Voice 15716
Microphone products, including RE27N/D, TE36N/D dynamic cardioids; S-40 compact monitor system.

Circle (571) on Reply Card

Electrohome M1429
Video projection systems.

Circle (572) on Reply Card

Electronics Diversified Inc 20083
Lighting control systems, dimmers.

Circle (573) on Reply Card

Electronics Research 3212
FM transmission antennas, Panel types and Super High Power side-mount systems.

Circle (574) on Reply Card

Electrorack Products 18943
Equipment rack systems.

Circle (575) on Reply Card

Electrosonic Systems 15685
Video display systems, Procube II, PICBLOC 3; ImageMAG controller for single-source videowalls; PICBLOC videowall control system.

Circle (576) on Reply Card

Elenos 1024
Radio transmission equipment.

Circle (577) on Reply Card

EMC/Dynatech Video Group 18032
Non-linear video editing equipment, digital

Primetime Editor editing controller.
Circle (578) on Reply Card

EMCEE Broadcast Products 16033
Transmitter systems for MMDS, VHF, UHF, wireless cable; field engineering, systems engineering, shadow mapping, site surveys; transmission system components; installation packages.

Circle (579) on Reply Card

EMCOR Products/Crenlo 12833
Electronic equipment cabinetry, ESQ and 10 series modular enclosure lines.

Circle (580) on Reply Card

ENCO Systems 5121
Hard disk audio storage systems.

Circle (581) on Reply Card

Energetic Music 3921
Music Libraries.

Circle (582) on Reply Card

Energy-Onix 5408
AM and FM transmitter products, MK series 1-tube FM systems, conventional plate-modulated AM models, SSA/SST series low-power FM, Legend series medium-power FM.

Circle (583) on Reply Card

ENG Mobile Systems 19143
Products for remote production, Camera transport cradle and NITEK NiCad battery maintenance products.

Circle (584) on Reply Card

Engineering Animation M 907
Information not available

Circle (585) on Reply Card

Ensemble Designs 13101
Video production equipment, serial/digital systems products.

Circle (586) on Reply Card

Enterprise Systems 12562
Broadcasting business systems.

Circle (587) on Reply Card

Entertainment Digital Network 1026
High-fidelity digital audio interconnection services.

Circle (588) on Reply Card
Entertainment Technology Inc. 16373
Information not available

Circle (589) on Reply Card
Equipment Broker (The) 16385
Broadcast, production equipment brokers.

Circle (590) on Reply Card
ERGO 90/Ergo Industries 20014
Equipment rack, mounting utilities.
Circle (591) on Reply Card

ESE 12808
Time-code products, ES-488 SMPTE generator, reader, inserter; ES-247 quad 1x6 video DAs; signal generators; master clock systems; ES-185 GPS master clock/time code generator; ES-2940 dual 1x4 audio/video DAs and 5-output blackburst generators; ES-195 GVG Master 21 interface/calendar; LUX line products.

Circle (592) on Reply Card
ETC-Electronic Theatre Controls 15743
Lighting control products, response series dimmers, microVision[®] FX control, effects consoles.

Circle (593) on Reply Card
Euphonix 5418
Digitally controlled audio mixing systems, CSII console with Snapshot Recall and Total Automation control.

Circle (594) on Reply Card
Eventide 4809
Time modification systems, Ultra-Hamonzizer effects processors; broadcast audio and video delay systems, the BD941/942/980 and BD1000/1002; VR240 digital logger.

Circle (595) on Reply Card
Evertz Microsystems 18276
Time-code equipment, 4015 film footage en-

coders; 7100 transport emulator; EV-35 Keycode readers; Key-Log telecine data logging software; digital video keyers/converters; digital audio decoder/delay processors; digital audio encoders.

Circle (596) on Reply Card
Extron Electronics M 319
Matrix 200 series switcher, router; Andora scan doubler; CD 400 digital quad decoder.
Circle (597) on Reply Card

F

Fairlight ESP 18076
Digital audio workstations.

Circle (598) on Reply Card
Faraday Technology Ltd. 19123
Remote-operated, rack-mounted cable clones for testing the integrity of serial digital datastreams.

Circle (599) on Reply Card
Faroudja Laboratories 13101
Video signal processing products, CTE-SN/CFD-SN encoder/decoder, detail enhancers, CTC-2 component transcoders; multi-standard, PAL/NTSC line doublers.

Circle (600) on Reply Card
FAST Electronics 19766
Multimedia, DTV products; Video Machine desktop studio; digital players/recorders; YUV option; VM video production switcher for Macintosh.

Circle (601) on Reply Card
Fast Forward Video 11949
Time-code products, P2 portable generator, F30 generator.

Circle (602) on Reply Card
Fiber optic transmission systems with diag-

nostic indicators; AM RGB video to 35MHz; FM video, stereo audio; FM stereo audio; AM video/stereo audio; single- and multi-mode versions; bidirectional dual-fiber systems; digital processing.

Circle (603) on Reply Card
Fidelipac 1920
Air Marshal hard-drive digital audio system for cart replacement or total automation; DYNAMAX MX, MXE series mixers; Dynamax series DCR1000 digital cartridge machines.

Circle (604) on Reply Card
FirstCom 13625
Production music libraries and assistance products, CD format; Online music service; MusiQuick search software.

Circle (605) on Reply Card
Flash Technology 1618
Tower lighting products, beacons.

Circle (606) on Reply Card
Flight Data Center 20186
MS-DOS software to retrieve weather radar maps via modem; HR 2D or 3D maps for Doppler NEXRAD and RRWDS sites.

Circle (607) on Reply Card
FloriCal Systems 12829
SpotLinker produces station breaks from announcement inventory stored in Sony Flexicart; NewsRepeater monitors and records live news, then repeats newscasts until next live news; ShowTimer, AirBoss on-air TV automation; TV tape delay automation; robotic cart machine controller.

Circle (608) on Reply Card
FM Systems 19528
Audio level controllers; digital video sync meters; ATIS Eater ID signal filter.

Circle (609) on Reply Card
Focal Press 13404
Professional, educational and reference ma-



"Great shot!"
"Nice move!"

Quality Production, Quality Intercom...

No Coincidence!

Anyone who's been on the working side of a hectic control room knows that the relationship between communication and a successful production is basic. So, as production demands increase, make sure your most basic piece of equipment, the intercom, is the one that broadcasters the world over rank best — an RTS Intercom System!

Check out the new modular series, it has all the quality and reliability that RTS is famous for, with system costs that fit just about any budget. And as always, you'll benefit from the same knowledgeable customer support on which the industry has come to rely. In New York, call (201) 891-6002; in the Midwest: (313) 360-0430; in Burbank, CA: (818) 566-6700.

When it comes to communication, let's get down to basics.

Shown here, the MCE 325 User Station with MCS 325 Speaker Station in various modular combinations. Shown above, Model 802 Master Station.

RTS^{BY} TELEX

Circle (69) on Reply Card

terial for broadcast and other electronic media; backlist of more than 150 books.

Circle (610) on Reply Card

Folsom Research M1120

Information not available

Circle (611) on Reply Card

FOR-A 18013

Audio mixers, disk recorders; video products, HMC-1010 capture system, PVM525 production mixer; TBCs, synchronizers, effects systems, still stores, display and projection products; scan converters; edit controllers; universal digital processors; PC-based editing systems; switchers; DVEs.

Circle (612) on Reply Card

Forecast Installations 11562

Consoles, cabinets, including Image Master edit consoles; custom designs for video production facilities.

Circle (613) on Reply Card

Fostex 19185

Audio recorders, analog, R-DAT, multitrack; audio mixing systems.

Circle (614) on Reply Card

Fresh/The Music Library 2000

Production music libraries.

Circle (615) on Reply Card

Frezzolini Electronics 13422

Frezzi Mini-Fill light; AR124, AR304 autoranging computer-controlled chargers for all batteries; MA1 diagnostic all-battery type charger, discharge analyzer.

Circle (616) on Reply Card

Fujinon 16958

Lens products for ENG, studio, field and HDTV; micro-computer controlled studio lenses.

Circle (617) on Reply Card

Full Sail Center for Recording Arts 18885

Education in film, video, audio production; 1", 3/4" and Beta SP formats.

Circle (618) on Reply Card

Future Network Inc. 11130

Information not available

Circle (619) on Reply Card

G

Garner Industries 13622

Complete line of tape degaussers to erase 1" reels, S-VHS, MII, Betacam SP, U-matic SP, D-1, D-2, D-3, 8mm and NSA Type I/II media.

Circle (620) on Reply Card

GE American Communications 16601

Total program delivery services for broadcasters via satellite; digital audio, SCPC network programming, SCPC data, broadcast TV, syndication, SNG, international/occasional TV, business video.

Circle (621) on Reply Card

GE Lighting 11708

Information not available

Circle (622) on Reply Card

GE PDPO M 518

Information not available

Circle (623) on Reply Card

GE Support/RCA Broadcast 11128

Field maintenance service for existing RCA equipment.

Circle (624) on Reply Card

GEC-Marconi Comm. Systems 2526

Test, measurement equipment; radio/TV transmitters.

Circle (625) on Reply Card

Gefen Systems 2803

Background music systems, CDJ classical

music/M&E organizer for MAC, IBM-compatible/Windows system for SFX post-production; CDJ net broadcasting automation software; multimedia software management system; Filemaster interface software.

Circle (626) on Reply Card

General Microwave Services 17982

Information not available

Circle (627) on Reply Card

Genesis Microchip M 807

Specialty integrated circuits.

Circle (628) on Reply Card

Gennum/Video-Broadcast 17377

Specialized integrated circuit products; GENLINX serial digital chipset for SMPTE 259M, GS9010 receiver, GS9015 reclocker, upgraded GS9005 receiver, GS9004 cable equalizer; GS series sync separators; GF9102 filter for digital video processing.

Circle (629) on Reply Card

Gentner Communications 2612

Audio processors, bandwidth extenders, telco hybrids, pre-wired patch panels, digital audio workstations, transmitter remote control systems.

Circle (630) on Reply Card

GEPCO International 13351

Complete line of audio and video cable products; single, multi-pair audio, dual channel stereo, coaxial, triaxial, multi-core, mic, component analog, digital audio and parallel digital video cables; breakout boxes, cable reelers, panels, rack rails, cable assemblies; authorized Kings distributor.

Circle (631) on Reply Card

Getris Images 19743

High-end computer-based digital videographics systems for post production,

New
Technology

Breakthrough.

The Biggest Breakthrough
EVER in Rigid Transmission
Line Technology!

- BROADBAND
- HIGH EFFICIENCY
- HIGH POWER HANDLING

Introducing
digiLine™

1993

The Transmission Line
of the Future.

1994*

HDTV
Standard
Set

2000

HDTV-CPs
Expire

2004

Transition
Period
Continues

2009*

HDTV-Only
Era Begins

digiLine™ is
the ONLY rigid
transmission
line designed
for NTSC,
digital HDTV, or
BOTH. That's
right, operation
at ANY
CHANNEL!

Prepare now for
your HDTV
future.

*Present FCC HDTV Implementation schedule.

NTSC...HDTV...or BOTH!

digiLine™

P.O. Box 949 • Raymond, ME 04071
800-341-9678 • 207-655-4555 • FAX 207-655-7120



Circle (70) on Reply Card

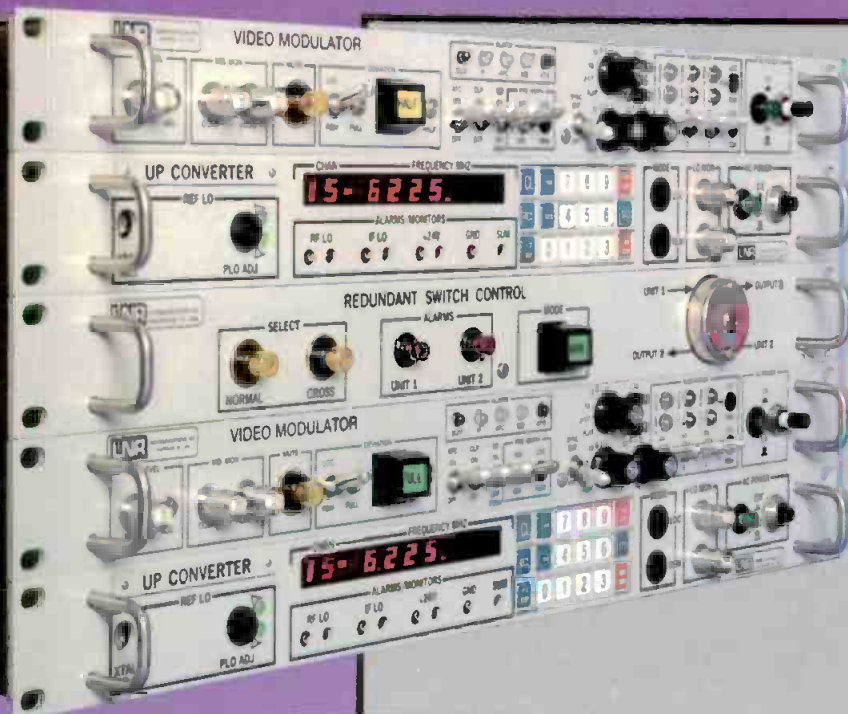
Specialists in Miniaturized
Portable Microwave
Systems for Entertainment,
Business, Security, News
and Sports

the **NEW**
VISION
GROUP

270 East Drive • Suite A
Melbourne, Florida 32904
(407) 951-0219 • Fax: (407) 727-8315
Toll Free; 1-800-550-9006

Circle (71) on Reply Card

The Most Versatile VIDEO EXCITER of All



LVM Analog/Digital SERIES

LNR Series LVM Low Profile Data Quality Video Exciters are broadcast-quality units that combine a compact satellite video modulator with a low phase noise digital-ready upconverter.

Features:

- Video modulator exceeds RS-250C and IESS-306 standards and has consistently outperformed all others.
- Agile data upconverter for inclusion of an SCPC data channel or digital video.
- Slimline construction - complete system in 3 1/2" rack panel space. Offers a full range of front panel controls, indicators, and monitor points including:
 - Full/half transponder switchable
 - Subcarrier pre-emphasis selectable
 - Subcarrier level/deviation adjust
 - NTSC/PAL/B-MAC/SECAM switchable

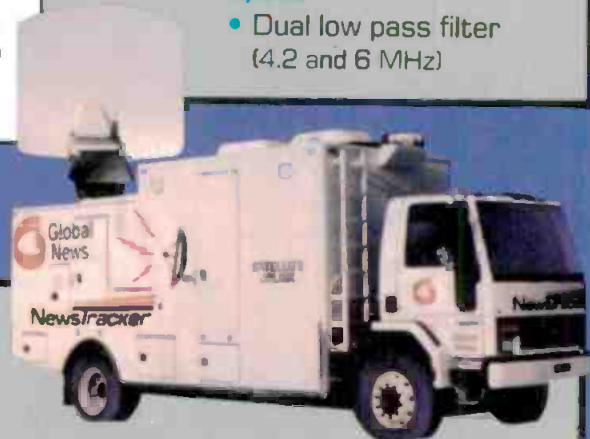
TYPICAL REDUNDANT
CONFIGURATION

Available Models:

C-Band Model	LVM6-D4	(5.925-6.425 GHz)
C-Band Model	LVM6-D4/575	(5.850-6.425 GHz)
Ku-Band Model	LVM14-D4	(14.0-14.5 GHz)
DBS Uplink Model	LVM17-D4	(17.3-17.8 GHz)
IF Output Model	LVM70	(70 MHz)

Option:

- Dual low pass filter
(4.2 and 6 MHz)



GDE SERIES Group Delay/Amplitude Equalizers

PROTECTION SWITCHING 1:1 and 1:N Switching Systems for both video and audio.

TURNKEY SYSTEMS LNR equipment is available in racks on a turnkey basis for INTELSAT, ARABSAT, DOMSAT and related applications.

Also Available...

LVE SERIES Low Profile Ku-band Video Exciters for SNV Mobile Uplinks

UEV and DRV SERIES Video and FM-FDM Exciters and Receivers (C, Ku, IF Output) Top of the line broadcast quality units for fixed and mobile operations. These modular units are field proven and have been selected by Comsat, AT&T, broad- casters and telecom organizations worldwide.

LNR

COMMUNICATIONS INC. 180 MARCUS BLVD. • HAUPPAUGE, NY 11788-3795 • TEL: (516) 273-7111 • FAX: (516) 273-7119

Circle (143) on Reply Card

www.americanradiohistory.com

broadcast, corporate communications, product design; Eclipse paint and animation; Venice paint, rotoscope, animation, compositing; Studio Venice 4:4:4 studio; Hurricane line, the multi-DVE-layers graphic suite.

Circle (632) on Reply Card

GML Inc. 19459
High-end all-discrete signal processing peripherals; rack-mount mixers; series 2000 moving fader automation.

Circle (633) on Reply Card

Gorman Redlich 4812
EBS and weather service equipment, Model CEB EBS encoder and decoder, Model CRW weather radio.

Circle (634) on Reply Card

Graham-Patten Systems 11551
Digital edit suite mixers, D/ESAM 800 digital system; digital interface converters; D/ESAM 400 digital edit suite audio mixer.

Circle (635) on Reply Card

Grass Valley Group (M1633) 16933
Signal management systems, routers; MCF fiber optic products; VPE series, Sabre editing controllers; production switchers #4000, #3000, #1000, #1200; DPM-700, DPM-4300 effects; Windows NT PC-based graphics systems, Presto titlers, VideoDesigner paint systems; Master-21 master control switchers; scalable graphics products.

Circle (637) on Reply Card

Gray Engineering Labs
Professional SMPTE time code equipment, data encoding/decoding systems; time code generators, readers, analyzers, code phase correctors, character inserters, video-assisted film editing, safe area generators.

Circle (638) on Reply Card

Great American Market 13121
Lighting utility equipment; grip products; random and strobe flicker generators; electrical testers, including 3-in-1 GamChek; New Great American patterns 'breakups'.

Circle (639) on Reply Card

Group One Ltd. 19569
Information not available

Circle (640) on Reply Card

GTE Spacenet 18946
Satellite program distribution/relay services.

Circle (641) on Reply Card

H

H L Dalls 18070
Distributor for Belden Wire & Cable, Neutrik and SwitchCraft connectors, Fluke meters; distributor for Sony, JVC and Denon DAT and S-VHS videotape.

Circle (642) on Reply Card

Hallikainen & Friends 1712
Audio mixers, TVA series, programmable transmitter control systems, DRC190.

Circle (643) on Reply Card

Hamlet Video International 16349
Waveform, vector, stereo audio measurement and monitoring devices using digitally generated outputs on standard monitors; Hamlet picoscope 300, videoscope 301WVA, microscope 302x; hand-portable WF units; cellular power amplifiers; multichannel MMDS/TTFS boosters.

Circle (644) on Reply Card

Hardigg Industries 18314
Equipment transport cases; ProRack 19" EIA enclosure.

Circle (645) on Reply Card

Harris Allied Broadcast Div. 2218
Radio, TV transmission equipment, solid-state AM, FM, UHF, VHF, medium wave transmitters; KOT, MSDC UHF transmitters; short-

wave transmitters; medium wave phasing systems, antennas; remote control products; digital FM exciters; distributor.

Circle (646) on Reply Card

Harrison by GLW 11317
Audio mixing consoles and control equipment, Series Ten B.

Circle (647) on Reply Card

HEDCO div. of Leitch 15746
Routing, distribution equipment for analog and digital audio, video, pulse and data; audio, video distribution amplifiers.

Circle (648) on Reply Card

Henry Engineering 3700
Audio, control interface products, dubbing workstations; Stereoswitch 3-input stereo audio switchers; caller-interactive voice information systems; CD music libraries.

Circle (649) on Reply Card

Hewlett-Packard/Video Comm. Div. M 117
Plain paper video printers; mag-disk video recorder, storage system and broadcast server; Video-on-Demand interactive systems; A/D, D/A converters, encoders, decoders, serializers, deserializers; Quality Advisor signal analysis; HP VidJet Pro video print manager; Digital Video Disk Recorder.

Circle (650) on Reply Card

HHB Communications Ltd. 1403
PORTADAT range of portable DAT recorders, PDR1000, PDR1000TC; Advanced Media Products DAT tape; CEDAR audio restoration products; CDR indexer; ATC studio control monitors, Coles mics.

Circle (651) on Reply Card

Hi-Tech Furnishings 13362
Work area furnishings.

Circle (652) on Reply Card

Hitachi Denshi 17546
Video cameras and imaging, digital SK-2600 studio and portable; Z-2000 portable camera; video recorders, digital cameras.

Circle (653) on Reply Card

Holaday Industries 3920
Magnetic field, RF radiation metering products, HI-3624 ELF and HI-3012 field strength meters.

Circle (654) on Reply Card

Hoodman 18615
Sunshades, monitor hoods for glare-free viewing of monitors; Video Chariot video cart.

Circle (655) on Reply Card

Horita 12751
SMPTE LTC, VITC time code readers, generators, inserters; TC TOOLKIT tape logging software; color bar, blackburst, sync, audio tone generators; safe area generators; titler, character generator, time/date-stamp generators; GPS-based SMPTE time code and position logging products.

Circle (656) on Reply Card

Horizon Technology M1603
Information not available

Circle (657) on Reply Card

Hotronic 13614
Audio delays, solid-state video recording devices, video processing equipment; TBC, frame synchronizers.

Circle (658) on Reply Card

Howe Industries 11547
Custom transit cases and shipping containers.

Circle (659) on Reply Card

Hughes Communications 19253
Broadcast satellite services, program distribution.

Circle (660) on Reply Card

Hughey & Phillips Inc. 4301
FAA-approved obstruction lighting, controllers and remote monitoring for tall towers.

Circle (661) on Reply Card

I

IBM M1321

Information not available
Circle (662) on Reply Card
IBM Corp./U.S. Mktg/Sales/Comm. 17501
Computers, software.

Circle (663) on Reply Card

IDB Communication Group 5226
Information not available

Circle (664) on Reply Card

IDB Communications 16064
Satellite communications systems, the Flyaway Phone satellite terminal in a suitcase; digital video compression services; Atlantic, Pacific and domestic cable distribution.

Circle (665) on Reply Card

Ideal Industries/Electronics 18284
Information not available

Circle (666) on Reply Card

IDS/SAIC 10150
Eidophor video projection systems.

Circle (667) on Reply Card

Ikegami Electronics 19319
Video cameras for studio and portable use; HK-366 2/3" FIT wideband cameras; HDTV camera, monitors; video monitors; DMC-4500 digital encoder, decoder; PF-701S portable mini microwave link; display monitors.

Circle (668) on Reply Card

Image Logic Corp. 19566
Videotape Log Producer software, controls many RS-422 and non-422 VTRs; closed captioning to ADA and VDD requirements; LTC/VITC SMPTE time code reader for ISAPC computer bus; foreign language captioning; AKSESS open caption generator for meetings, conferences.

Circle (669) on Reply Card

Image Video 11311
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 (670) on Reply Card

Imagica Corporation 16081
Information not available

Circle (671) on Reply Card

ImMIX 19746
Digital video post-production workstations, VideoCube and VideoCube Plus.

Circle (672) on Reply Card

Industrial Acoustic/IAC 14041
Acoustic, sound control products.

Circle (673) on Reply Card

Information Int'l/DMG 11629
Graphics software for design, production of 2D, 3D animation; ARKImage, Morf-DMG.

Circle (674) on Reply Card

Innovision Optics 18169
Probe lense camera system; Mini-Mover motion control system; remote mini-jib arm.

Circle (675) on Reply Card

Inovonics 2306
Audio processing systems, Model 250 digital controlled system; FM generators, Model 706 FM/FMX system.

Circle (676) on Reply Card

Insulated Wire/Microwave Products 4916
Information not available

Circle (677) on Reply Card

Intelligent Resources 19969
Graphics for Macintosh PCs, Video Explorer video processor; VideoBahn interface; Docking Cards; RGB input module digitizers; RGB output module 32-bit to video converters.

Circle (678) on Reply Card

Intelsis Sistemas Inteligentes 10562
Information not available

Circle (679) on Reply Card



WE'VE SOLVED THE KNOTTY PROBLEM OF INTERFACING YOUR AUTOMATION, ROUTERS AND MASTER CONTROL.

Utah Scientific is the *only* source for a completely integrated broadcast automation system. TAS, our Total Automation System, effectively squeezes seconds into the day and makes control effortless. TAS speaks directly to our AVS family of routing switchers and the MC-500 Master Control Line, featured in more stations than any other single master control switcher.

This system is unique in the industry. With it, Utah Scientific has powered working solutions for important customers such as CBS-TV, WGN and Star Television, Hong Kong.

And now, the transition to digital is in your

reach with our new DMC-601, the world's *first* Digital Component Master Control Switcher. The DMC-601 is easily upgradable from Utah's famous MC-500 series, smoothing the transition to digital at the important final step before you go on-air.

Let Utah Scientific help you make the right tie. Call 800-453-8782. Knot calling could be costly.

utah scientific



4750 Wiley Post Way, Salt Lake City, UT 84116-2728 United Kingdom FAX: 44-734-892022 PHONE: 44-734-890111 Hong Kong FAX: 852-525-8297 PHONE: 852-868-1993

DYNATECH
VIDEO GROUP

The best professional video in the world

ALPHA IMAGE • ALTA • CABLE PRODUCTS • CALAWAY EDITING • COLORGRAPHICS • D'S² • DA VINCI • NEWSTAR • QUANTA • UTAH SCIENTIFIC

Circle (72) on Reply Card

See us at NAB Booth #18032

Intelvideo 19207
Video encoding, decoding, enhancement products, IV-5 pre-coder/color detailer and IV-6 digital color encoder, digital NTSC color encoder/decoder, IV-9R color corrector, SG sync generator and others, picture-quality restorer model HQ, co-channel filter model CE

Circle (680) on Reply Card

Interface Control M 315
Information not available

Circle (681) on Reply Card

Interlace Engineering Corp. 19574
VMAXX frame buffers; E10 digital composite encoders; M10 memory expansion board.

Circle (682) on Reply Card

International Datacasting Corp. 3922
Reception equipment for satellite data transmission, SR250 and IDC FM/FM receivers.

Circle (683) on Reply Card

International Film Workshops 10559
Information not available

Circle (684) on Reply Card

International Tapetronics/ITC 1218
Audio recording systems, ITC 99B, Delta series cartridge machines; Digital Program Repeaters; audio routing systems; CD players, hard drive storage devices; DigiCenter digital audio management system.

Circle (685) on Reply Card

Intraplex 5118
Digital transmission equipment, T-1, E-1 and

variable rate multiplexers for audio, voice and data transmission via satellite and terrestrial networks; PT/PR350 PT/PR355 codec modules; Intralink STL+ integrated STL package for digital T1 lines.

Circle (686) on Reply Card

IRIS Technologies 16376
Audio, video switching and control systems.

Circle (687) on Reply Card

IRT Electronics Pty. Ltd. 19839
FO transmitter, receiver systems; vertical interval audio transmission products.

Circle (688) on Reply Card

Italiana Ponti Radio SRL 15182
Radio transmission, STL products.

Circle (689) on Reply Card

ITELCO spa 19414
Radio, television transmitters, STL products.

Circle (691) on Reply Card

ITS/Information Transmission 11951
Solid-state 1kW UHF transmitter, translator, ITS-830/ITS-832; Series 1700 MMDS/ITFS transmitters; Filterplexers, combiners; UHF/VHF Exciter Plus system retrofits.

Circle (692) on Reply Card

J

J-Lab 12438
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 (693) on Reply Card

James Grunder & Associates 16349
Video processing equipment, Yamashita scan converters, sync generators; Feral Industries TBC/synchronizers; Hamlet Video International video test equipment.

Circle (694) on Reply Card

Jampro Antennas 1915
TV, FM broadcast transmission antennas, circularly polarized models; inter-digital combiners, filters; flat-panel FM, cavity panel, HDTV/NTSC simulcast antennas.

Circle (695) on Reply Card

JBL Professional 15713
Audio monitoring products, Control Series speakers, SR and series power amplifiers; MPS series amplifiers; audio processors.

Circle (696) on Reply Card

Jefferson Pilot Data/JDS 13811
Broadcast business systems, software.

Circle (697) on Reply Card

JEM-FAB 12849
Digital signal distribution products, Model One D-Patch RS-12B machine control patching system; routing switchers; B-MAC monitors.

Circle (698) on Reply Card

Jensen Tools 13605
Numerous tools and tool kits for video, audio technicians, broadcast engineers; various metering, signal source products, JTK-5000 computer maintenance kit; Fluke Model 87 DMM.

Circle (699) on Reply Card

JLCooper Electronics 19563
Audio mixers.

Circle (700) on Reply Card

John Gorrell Woodworking 10757
Model 3046 slant front console systems; equipment racks, desktop editing workstations, models 3672, 3684, 3696.

Circle (701) on Reply Card

JVC Professional Products 18046
Video cameras, including low-light capability to 1.5 lux; new models of video recorders, recorder/editors, editing controllers and playback decks; video monitors; microphones, audio recording equipment.

Circle (702) on Reply Card



If you see this as a ten, not a binary two, we've got the digital audio system for you.

The DAD486x Digital Audio Delivery System combines the benefits, reliability, and economics of modern computer technology to provide a powerful CD quality digital audio system that does not require a programmer to operate it. With DAD on the job, you can instantly switch between Live Assist and fully Automated formats, and reap the advantages of instantaneous access to hundreds of tracks or completely controlled programming.

Operating DAD requires virtually no learning curve, as it emulates the equipment that you have always used. The optional Touchscreen is the ultimate in intuitive operation, or you can use the same fader starts or other remote controls that you do now. The super fast Graphic Waveform Cut and Paste Editing will make you wonder how you ever tolerated grease pencils and razor blades. And interface to satellite program networks is so easy that it takes only minutes to install, no special software required.

Maybe the most remarkable feature of DAD is that it runs under DOS, the most

commonly utilized software in the world, and on standard off the shelf hardware. Maintenance support, parts, and expansion hardware can be easily obtained anywhere. And you are assured that as computer technology continues to evolve, DAD will grow with it. You never need to be out of date. There are no monthly licensing fees and upgrades are free for the first year.

DAD can be configured to fit any size facility, from a stand alone Workstation that does double duty for both Production and On-Air to multiple Workstations, each equipped for a specific application, operating on a true Local Area Network. Redundancy and backup features can be configured to meet any need or budget. And DAD talks to CD Jukeboxes, Routing Switchers, and more.

DAD486x rates a "Ten" as the ultimate digital audio system!



To receive more information call us at 1-800-ENCO-SYS



1866 Craigshire Drive, St. Louis, Missouri 63146 USA
Tel: 800-362-6797 or 314-453-0060 Fax: 314-453-0061

Circle (73) on Reply Card

non-linear editing offline online 3D DVE CG digital audio processing tape-based production animation luminance keying

graphics special effects mosaic chroma keying multilayer compositing 2D DVE audio mixing timebase correction posterization titling still store transitions

Do it all!

with the



MATROX STUDIO

**We've kept the best and improved the rest.
Totally NEW for '94.**

See us at

NAB94

Booth 10650

matrox
VIDEO PRODUCTS GROUP

Or call:
1-800-361-4903
or (514) 685-2630

Matrox is a registered trademark and Matrox Studio is a trademark of Matrox Electronic Systems, Ltd.
1055 St. Regis Blvd. Dorval, Québec, Canada H9P 2T4 Fax: (514) 685-2653

graphics special effects mosaic chroma keying multilayer compositing 2D DVE audio mixing timebase correction posterization titling still store transitions

luminance keying animation tape-based production digital audio processing CG 3D DVE online offline non-linear editing

Circle (74) on Reply Card

The Industry Standards have *Changed.*



Now they're also available in **BLACK.**

A lot of microphones have come and gone, but the Electro-Voice 635A and RE50 have remained a constant. *Until now.*

Don't panic! The 635A and RE50 are still designed specifically to meet the challenging, "real-world" rigors of broadcasting on location. The only change is that both are now available in black, as well as their original fawn-beige color. Everything else is exactly the same.

Debuting more than two decades ago, field and ENG crews quickly adopted the 635A and RE50 as industry standards, instantly recognizing their trendsetting shape and design, unmatched reliability and clean sound. And they continue to set the industry standard like no other microphones!

When there is only one chance to get it right, the 635A and RE50 remain *the* choice — in black or beige — no matter the conditions.



Electro-Voice, Inc., a MARK TV company, 600 Cecil St., Buchanan, MI 49107 616-695-6831 800-234-6831 In Canada: 613-382-2141

Circle (75) on Reply Card

K

- K&H Products** 16465
Camera support products; equipment transportation cases, Shoulder Case for Sony BVW 400, Camera Case for Sony DXC-537.
Circle (703) on Reply Card
- K6500** 17858
Information not available
Circle (704) on Reply Card
- Karl Heitz** 13631
Mic fishpoles; camera support equipment, GITZO tripods, fluid heads, monopods, related equipment.
Circle (705) on Reply Card
- Kavouras** 13129
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 software; TDR series radars.
Circle (706) on Reply Card
- KD Kanopy** 5003
Information not available
Circle (707) on Reply Card
- Kent Green Video Group** 19081
Consulting, facilities design; production services, producing, tech direction, engineering; computer support.
Circle (708) on Reply Card
- Keystone Communications** 12433
Production services.
Circle (709) on Reply Card
- Killer Tracks Music** 13043
Production music libraries.
Circle (710) on Reply Card
- Kings Electronics** 16831
Connectors, including fiber optic Tri-Loc, video jacks; BNC connectors, terminators, adapters, video jackfields, breakaway panels, patch cord assemblies; video patchplugs, terminations, adapters.
Circle (711) on Reply Card
- Kintronic Laboratories** 4824
Antenna phasing, isolation products for AM/MW radio facilities, custom AM/MW directional phasing system and Isolator for multiantenna installation on an AM tower.
Circle (712) on Reply Card
- Kline Towers** 19755
Design, fabrication and erection of guyed, self-supporting, platform and multiarray towers, space frame structures and special type antenna structures for broadcast and military applications.
Circle (713) on Reply Card
- Knox Video** 16433
RS audio, video routing switchers, 12x2, 8x8, 16x16 matrices; Desktop Video Manager products, PC switcher, PC event controller, PC still-store.
Circle (716) on Reply Card
- Kowa Optimed Inc.** 4912
Magneto-optical disk recording for audio.
Circle (717) on Reply Card
- KUB Systems Inc.** 19564
DANCE digital animation compositing effects system.
Circle (718) on Reply Card

L

- L E Nelson Sales** 13616
Stage and studio lamps by Thorn, GE.
Circle (719) on Reply Card
- Lakeside Associates** 11549
Production facility design, construction; consulting service.
Circle (720) on Reply Card

France : VELIZY-
VILLACOUBLAY
Tel. : (33-1) 30 70 35 00
Fax : (33-1) 30 70 35 35

Asia : SINGAPORE
Tel. : (65) 227 83 20
Fax : (65) 227 80 96

ELECTRON TUBES FOR TV AND RADIO BROADCAST.



Extending your broadcast performance.

We make broadcast performance go further with a complete selection of tubes and circuit assemblies for TV, FM and radio. OEMs and broadcasters choose Thomson time and again for reliability, power and ongoing optimization of tube lifetime.



Our TH 563, featuring 30 kW UHF in common amplification, opens new horizons in tetrode performance, and joins our full range of VHF and UHF tubes for TV.

Our FM tubes, from 10 to 100 kW, are economical, easy to use and available in industry standard designs.

For the latest radio transmitters, our outstanding new 500 kW TH 576 offers a higher level of efficiency, resulting in lower operating costs.



Whichever tube you need, Thomson delivers the service, quality and innovation that's ready to take your performance to new heights.

Brasil : SÃO-PAULO
Tel. : (55-11) 542 47 22
Fax : (55-11) 240 33 03

Deutschland : MÜNCHEN
Tel. : (49-89) 7879-0
Fax : (49-89) 7879-145

España : MADRID
Tel. : (34-1) 564 02 72
Fax : (34-1) 564 19 40

India : NEW DEHLI
Tel. : (91-11) 644 7883
Fax : (91-11) 645 3357

Italia : ROMA
Tel. : (39-6) 639 02 48
Fax : (39-6) 639 02 07

Japan : TOKYO
Tel. : (81-3) 3264 63 46
Fax : (81-3) 3264 66 96

Schweiz : LENZBOURG
Tel. : (41-64) 50 45 01/45
Fax : (41-64) 50 45 11

Sverige : TYRESÖ
Tel. : (46-8) 742 02 10
Fax : (46-8) 742 80 20

United Kingdom :
BASINGSTOKE
Tel. : (44-256) 84 33 23
Fax : (44-256) 84 29 71

USA : TOTOWA, NJ
Tel. : (1-201) 812-9000
Fax : (1-201) 812-9050

For other countries,
call France

 **THOMSON TUBES ELECTRONIQUES**

Circle (76) on Reply Card

www.americanradiohistory.com



Larcan-TTC 15708
Manufacturer of AM/FM, TV broadcast transmitters; XL series of UHF/UHF LP transmitters, translators; digitally synthesized TV exciters.

Circle (721) on Reply Card

LDL Communications/Larcan 15758
VHF TV transmitters, type TTS30M 30kW; ADC LAMBDA low-band VHF CP transmission antennas.

Circle (722) on Reply Card

Leader Instruments 12803
Audio, video and RF test equipment; component/composite vector and waveform monitors, signal generators; surround sound and stereo monitors.

Circle (723) on Reply Card

Lectrosonics 20019
Wireless mic systems, Pro-Mini ENG and H185 plug-on transmitter mics.

Circle (724) on Reply Card

Lee Filters 17619
Color effect, correction and diffusion lighting filter media for professional lighting designers, cinematographers.

Circle (725) on Reply Card

Leightronix 19534
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 (726) on Reply Card

Leitch Video (M213) 15746
DigiBus modular products for D1, D2 formats, synchronizers, A/D and D/A converters; audio demultiplexers; StillFile still store; VSR-16x16 serial video routers; video DAs, sync generators, serial video test generator; EDH encoding/monitoring DAs; serial video DAs

Circle (728) on Reply Card

LEMO USA 11323
Audio, video connectors.

Circle (729) on Reply Card

Leonetti Company 18082
Studio lighting products, Sunray HMI and EB series electronic ballasts.

Circle (730) on Reply Card

Lester Audio Laboratories 1613
Fiber-optic transmission equipment; DAS-2000 system converts up to 64 analog audio inputs with 16 return lines to a data stream on one fiber cable for transmissions to 3 miles.

Circle (731) on Reply Card

Lexicon 2524
Digital audio workstations, Opus; Model 2400 stereo audio time compressor, expander systems.

Circle (732) on Reply Card

Lighthouse Digital Systems 12438
Digital signal routing switches, including DCR digital router, SRX 400Mbit/s system, 32x32 Pathfinder with AES audio and HDTV switching rates.

Circle (733) on Reply Card

Lightmaker Company 16381
Manufacturers and marketers of AC ballasts for flicker-free HMI lighting instruments rated 200W to 12kW.

Circle (734) on Reply Card

Lightning Eliminators & Consult. 13401
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 (735) on Reply Card

Lightware 15485
Information not available

Circle (736) on Reply Card

Lightwave Systems 1613
Fiber optic transmission systems for 2-channel, 20-bit audio.

Circle (737) on Reply Card

Lightworks 19934
Heavyworks; Lightworks editor, turbo, assistant and distation; off-line, random-access non-linear editing systems.

Circle (738) on Reply Card

Link Electronics 17981
Signal distribution products; test and measurement equipment, system timing unit; audio monitor amplifiers.

Circle (739) on Reply Card

Listec Video 16633
Video prompting systems.

Circle (740) on Reply Card

LM Engineering 19571
Information not available

Circle (741) on Reply Card

LNR Communications 1306
LVM series digital video flyaway earth stations, dual-band C/Ku; earth station components.

Circle (742) on Reply Card

Logitek 3215
Audio mixing systems, Mariner water resistant, Stereorack and TR2 mixers; audio level metering systems; audio DAs.

Circle (743) on Reply Card

Loral Microwave-Narda 4310
Information not available

Circle (744) on Reply Card

Louth Automation 17348
Broadcast automation systems; machine control systems.

Circle (745) on Reply Card

Lowel-Light 16649
Lowel Fresnel lighting instrument; location lighting equipment, lighting kits, accessories.

Circle (746) on Reply Card

LPB 1924
Signature III and series 7000 stereo linear fader consoles; low power AM transmitters meeting Part 73AM nighttime, Part90 TIS/HAR and Part 15 unlicensed limited area broadcast; carrier current systems; radiating coaxial cable, limited area FM systems; Signature series rotary fader audio consoles.

Circle (747) on Reply Card

LSI Logic M1220
Information not available

Circle (748) on Reply Card

LTM Corp. of America 17046
Lighting products, Superlite 12k HMI, Cinepar 2500 HMI, Pepper and Sungun lighting systems.

Circle (749) on Reply Card

Lyon Lamb Video Animation M 813
Animation systems, Mini VAS-2 systems; RTC real time scan converter.

Circle (750) on Reply Card

LYS Electronic DTDA 19979
Information not available

Circle (751) on Reply Card

Macrovision 17581
Videotape nonduplication products.

Circle (752) on Reply Card

Magic Teleprompting Inc. 16483
Prompting systems.

Circle (753) on Reply Card

Magni Systems 16684
Signal monitoring products, Magni Monitor; multimedia equipment, VGA Producer Pro;

WVM-710 video monitoring system.

Circle (754) on Reply Card

Magnum Tower 2209
Manufactured radio, TV and communications towers.

Circle (755) on Reply Card

Mainframe Computer Graphics 19769
Newsroom, graphics products, INSCRIBER titling environment; INSCRIBER character generator.

Circle (756) on Reply Card

Management Graphics (M1134) 19786
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 PC and Mac files.

Circle (757) on Reply Card

Manhattan Production Music 13635
Production music, Chesky Records classical series; MPM 47 Corporate Culture, MPM 48 Under Siege.

Circle (759) on Reply Card

Marco Inc. 17579
Modular rack systems.

Circle (760) on Reply Card

Marconi Communications Systems 2526
Test, measurement equipment; radio/TV transmitters.

Circle (761) on Reply Card

Mark IV/E-V 2412
Wired, wireless mics; audio compressors, gates, Klark Teknik DN-3600 programmable graphic equalizer; digital delays; DDA QII LCR audio console; Midas remote consoles; crossovers; parametric equalizers.

Circle (762) on Reply Card

Marti Electronics 3918
STL and ENG products, STL-10 studio transmitter link and RPT-30 ENG transmitters.

Circle (763) on Reply Card

Matco Mfg & Test 19213
Video record/playback automation, MA-201 playback system; MA-300 tape duplication control.

Circle (764) on Reply Card

Matrox Electronic Systems 10650
Desktop video production systems for PCs; Matrox Studio for high-end video post-production; Personal Producer for video editing; Illuminator PRO videographics board; Matrox Marvel multimedia controller; MAX real time digital animation recorder.

Circle (765) on Reply Card

Matthews Studio Equipment 16653
Camera support products, ITE pedestal, pan/tilt series; MC 88 crane; SPAGS spacer bags.

Circle (766) on Reply Card

Maxell Corporation of America 16611
Recording media for Betacam SP, D-2, D-3 formats; Digital Betacam.

Circle (767) on Reply Card

MC Lights and Manufacturing 17785
Information not available

Circle (768) on Reply Card

McCurdy Radio Industries 13111
DCS 3000 serial digital and Microcompact digital intercoms; M/2000 automation system; McCard 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.

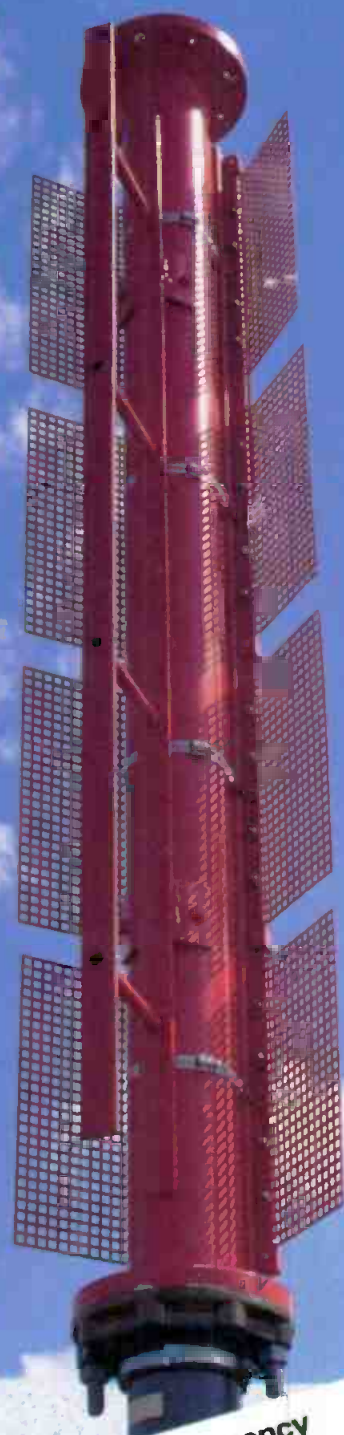
Circle (769) on Reply Card

MCL/Inc. 19558
TWT amplifiers for M/N 10961 700W C-, M/N 10999 300W Ku-band, multiband (C-, X-, K-bands).

Circle (770) on Reply Card

CONNECT WITH THE BEST

Cablewave Systems ISO 9001 Certified.



- BOGNER high and low power UHF TV antennas
- BOGNER circular polarized UHF TV antennas
- BOGNER MMDS/ITFS/MDS antennas
- PTV4 panel HDTV antennas
- Low- & high-power circular polarized FM antennas
- STL microwave parabolic antennas
- FLEXWELL® coaxial cables, elliptical waveguides, and rigid transmission lines
- FLEXWELL® radiating cables
- Coaxial cable and elliptical waveguide R.F. connectors
- Installation accessories
- Pressurization equipment



**Radio Frequency
Systems, Inc.**
Cablewave Systems Division

Cablewave Systems

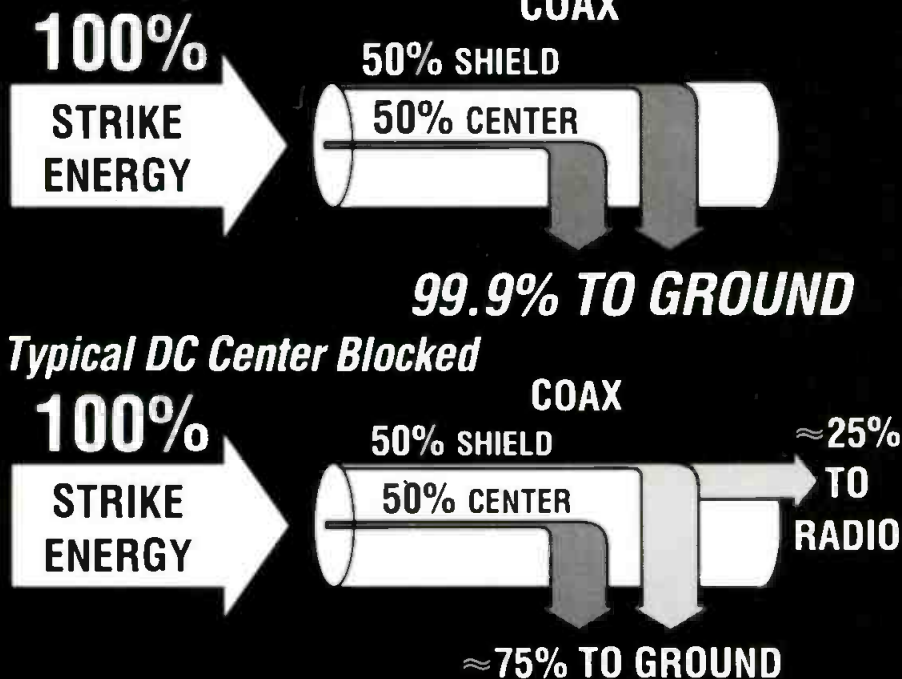
60 Dodge Ave.
North Haven, CT 06473
☎ (203) 239-3311
FAX (203) 234-7718

See us at NAB Booth #15753.
Circle (77) on Reply Card

NEW Isolating Protector Stops Lightning on Coax Line



New IE Series Protector COAX



Typical DC Center Blocked

Our patented Isolated Equipment (IE) Series Protectors ground and then *isolate* both the *shield* and the *center* conductor of your coax line. Lightning is diverted to the outside ground system. It can not travel to the equipment chassis and follow the electrical wires to ground which can happen with all other type protectors including 1/4 wave shorted stubs. The IE Series Protectors are available from 1.5MHz to 2.6GHz (to 20GHz Special). This innovative and unique series is **99.9% effective**, setting a whole new meaning to the term "Coax Protector". Of course it's from the World Leader in RF coax protection.

1500 models of coax, power and twisted pair protectors . . . plus lightning/EMP and grounding solutions.

K PolyPhaser
CORPORATION

(800) 325-7170
(702) 782-2511
FAX: (702) 782-4476

2225 Park Place ■ P.O. Box 9000 ■ Minden, NV 89423-9000

Circle (78) on Reply Card

Media Computing 11106
Broadcast automation packages, PROtec and ANGIS systems; Angis companion.

Circle (771) on Reply Card

Media Concepts 11647
Used broadcast TV production equipment.

Circle (772) on Reply Card

Media Touch Systems 1006
Automation control products, AutoPLAY satellite-studio integration; MIDAS digital audio playback unit; Media Touch digital audio editing program; Pick 'N Play studio control software package; "Auto-Record" workstation.

Circle (773) on Reply Card

Meret Optical 17278
Fiber optic products.

Circle (774) on Reply Card

Merlin Engineering Works 13836
Video processing equipment, ME-278-S synchronizer; ME-981/-991 data encoder, decoder.

Circle (775) on Reply Card

Micron Audio Products 17151
Complete line of Micron wireless and diversity systems, accessories, for ENG/EFP, film, stage; SQN-4SIIIa stereo portable audio mixer.

Circle (776) on Reply Card

Micron Tool & Manufacturing 18581
Camera support systems, Black Magic boom extensions with remote head, pan/tilt control.

Circle (777) on Reply Card

MicroNet 19466
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 (778) on Reply Card

Micropolis M 512
Information not available

Circle (779) on Reply Card

Microtime 17622
Video effects systems, including IMPACT; TBCs, synchronizers; version 5.0 software for Composium II workstations; image processing products for video synchronization and format conversion.

Circle (780) on Reply Card

Microvideo Ltd. 18781
Serial digital test generator; logo generator; serial digital keyer; D-1 proc-amp; data inserters; serial digital component to analog NTSC converter; 4:2:2 and 4:4:4 A/D and D/A converters.

Circle (781) on Reply Card

Microwave Filter/Comband 13341
Interference, bandpass, bandstop filters for cable TV, microwave, earthstation signal applications.

Circle (782) on Reply Card

Microwave Radio 13801
ENG, microwave radio products, FLR/FLH direct modulation and heterodyne systems and ProStar 2T2WB 2GHz portables.

Circle (783) on Reply Card

MII Users Assoc. 17277
MII tape format user group.

Circle (784) on Reply Card

Milestek 16477
BNC connectors, cabling for analog and digital video; cable cutting, stripping, crimping tools; computer networking adapters, cabling, connectors; also distributors for Trompeter, North Hills, ADC Telecommunications; video tool kits; 75Ω BNC plugs; coax cable assemblies.

Circle (785) on Reply Card

Miller Fluid Heads (USA) Inc. 15729
Camera support systems, pan/tilt heads,

You Need It.

TBC/Synchronizer with S-Video and NTSC full bandwidth I/O
Single Channel \$1,995 Dual Channel \$3,495



You Need It.

With true Wide Band performance in all modes including heterodyne
\$2,995



You Need It.

S-Video, U-Dub and NTSC video inputs and outputs plus Betacam/MII output and 48 built-in test signals
\$5,495



You Need It.

Four Field Synchronizer features Wide Band composite processing and auto-switch TBC
\$5,495



You Need It.

10-Bit Master Sync/Test Generator with 32 test signals, source ID and audio tone
\$2,995



You Got It?

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



DIGITAL
PROCESSING SYSTEMS INC.
Circle (79) on Reply Card

www.americanradiohistory.com

matte boxes; Series II ENG/EFP tripods.

Circle (786) on Reply Card

Minerva Systems 19076
MPEG encoding systems for digital video publishing with A/V capture, encoding and decoding for real-time, operator-assisted video compression.

Circle (787) on Reply Card

Mnolta 11605
Light meters, analyzers, CA-110 LCD color analyzer; CA-100 CRT color analyzer with upgraded white balance process for TV, computer monitors.

Circle (788) on Reply Card

Mira Imaging M 929
Information not available

Circle (789) on Reply Card

Mira Vision 11962
Information not available

Circle (790) on Reply Card

Miralite Communications 13447
Satellite communications products, 7900 LNB; Space Line digital telephone service system.

Circle (791) on Reply Card

Miranda Technologies 16255
A/D and D/A converters; SMD oversampling converter between component video and RGB analog, serial/parallel video to composite, S-VHS NTSC or PAL; NTSC encoders; Imaging Quartet single R/U 4-card frame for imaging modules; SDA-100 serial digital DA; toccata-STD I/O card; tania V1.4 software; VFC-321 video format converter..

Circle (792) on Reply Card

Mirror Image Teleprompting 10059
Information not available

Circle (793) on Reply Card

Mitsubishi PED M1129
High-resolution, large screen monitors; monochrome and color printers; industrial VCRs.

Circle (794) on Reply Card

Mobile Media 20040
Information not available

Circle (795) on Reply Card

Modulation Sciences 11102
Audio processors, spatial image enlarger; modulation measurement equipment, digital FM peak deviation monitor; Diversity subcarrier receiver; RDS/RBDS encoder; RDS/RBDS data receiver.

Circle (796) on Reply Card

Mohawk/CDT Broadcast Cables 13431
Water-resistant triaxial cable; serial digital D-1, D-2, D-3 video coax; parallel digital D-1, D-2, D-3 data cable; digital audio, video, camera cable; fiber-optic video link.

Circle (797) on Reply Card

Mole-Richardson 16640
Lighting products, lamps, fixtures.

Circle (798) on Reply Card

Montage Group 16660
Non-linear videotape editing systems, Montage Picture Processors; Montage for the Video Toaster and Amiga AGA.

Circle (799) on Reply Card

Moseley Associates 2824
PCL 6000 aural STL; DSP 6000 digital STL with ISO/MPEG codec, AES/EBU rate converter options; MRC 2 (with programmable coprocessor module) and MRC 1620 remote control systems; TASKMASTER 20, MASTERCONTROLLER PC software for transmitter remote control; RPL-4000 remote programming link; StarLink 9000 digital modular simplex/full duplex system with personality modules.

Circle (800) on Reply Card

MSE Video Tape Services 19741
Videotape products.

Circle (801) on Reply Card

Multidyne Electronics 11948
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 (802) on Reply Card

Murry Rosenblum Sound Assoc. 5115
Audio Ltd. div. wireless microphone systems; cases for four diversity receivers.

Circle (803) on Reply Card

MYAT 4619
Rigid coaxial transmission line components and accessories; 7/8" 50Ω to 9/16" 50Ω.

Circle (804) on Reply Card

N

N Systems/NSI 13133
Stiletto central ENG receive and transmit antennas; MCS 2.0 PC-based remote control systems; Silhouette ENG transmit antennas; Superquad central ENG receive antennas; Super Pod helicopter ENG antenna systems.

Circle (805) on Reply Card

Nady Systems 11327
Wireless mic systems using VHF and UHF frequencies.

Circle (806) on Reply Card

Nagra-Plus SA 11906
Nagra analog, digital audio recorders.

Circle (807) on Reply Card

Nalpak Video Sales 20027
Utility grip products, TP 1460/ TP 1344 TuffPaks, RP series molded rack cases; Travel Kart series; accessories for Magliner; sandbags.

Circle (808) on Reply Card

National Supervisory Network 1426
Transmission plant monitoring service.

Circle (809) on Reply Card

Nautel 1912
Solid-state AM, FM radio broadcast transmitters, AMPFET ND50 50kW; AMPFET ND10 10kW AM systems; NE50 digital FM exciter.

Circle (810) on Reply Card

NDG Phoenix 13606
Software products for graphics and facilities management, Studio Management and Library Management software.

Circle (811) on Reply Card

Nemal Electronics International 13619
Precision audio and video cable, #1570 and #2201A; MC424P flexible mic cable; Kings broadcast products, Cat wire and cable, Switchcraft, Amphenol, Blonder-Tongue, Belden Alpha, Cablewave.

Circle (812) on Reply Card

Neotek 2226
Audio mixing consoles, The Elite and The Elan.

Circle (813) on Reply Card

Nesbit Systems Inc. 18780
Software systems for facilities, equipment tracking; business tracking, reporting, ad sales planning, affiliate sales, budget building; media library system; travel manager.

Circle (814) on Reply Card

Network Music 12427
Production music libraries.

Circle (815) on Reply Card

Neumann USA
Microphone products, RMS-191 stereo, KRM 81 shotgun microphones.

Circle (816) on Reply Card

Neutrik Instrumentation 3906
Portable and programmable audio system measurement products; 3501, 5500 test systems, Nanocon, smallest 3-pole connector available; EZ Patch patch panel with switching configuration; XY series XLR cable connector, IDC termination; ¼", TT (Bantam)

plugs, jacks; audio test systems.

Circle (818) on Reply Card

Neve/AMS (See Siemens Audio) 16623
Audio consoles, Neve 66 series TV/production mixers; audio processors; analog, digital audio recorders; stereo mics; audio editor/workstations, AMS Logic 1.

Circle (819) on Reply Card

New EVS
Slow-motion video equipment, the LSM Live Slow Motion system.

Circle (820) on Reply Card

New Media
Information not available

Circle (821) on Reply Card

Newark Electronics 16364
Information not available

Circle (822) on Reply Card

News Technology Corp. 19437
Election Central news computer systems.

Circle (823) on Reply Card

NewsMaker Systems 20053
Newsroom automation interface products for titlers.

Circle (824) on Reply Card

Nigel B Furniture 19473
Custom furniture for broadcast and video post-production; multimedia work consoles; radio broadcast STN furniture consoles; audio workstation consoles; software for laying out facilities.

Circle (825) on Reply Card

Nikon Electronic Imaging 18178
FW-ENG, F-ENG converters; S19x8B, S15x8.5B S9x5.5B TV Nikkor zoom lenses; full selection of lens accessories; film scanners, color printers, ImageAccess archiving and image management software; HDTV still cameras.

Circle (826) on Reply Card

Norpak 16369
Teletext data transmission products, TTX6X0 receivers with integrated VCR.

Circle (827) on Reply Card

Norsat International Inc. 1503
Satellite communications systems, receivers; C-band LNBs; C-band, Ku-band PLLs; dual LNBs; C-band DROs; Cygnus receivers.

Circle (828) on Reply Card

Northern Technologies 18069
Information not available

Circle (829) on Reply Card

Nova Systems 13843
NovaMate XT transcoding TBC and NovaSync3 modular frame synchronizer; NovaBlox modular video processing systems; TBCs, synchronizers, encoders, decoders, transcoders, DAs, routers.

Circle (830) on Reply Card

NPR Satellite Services 4807
Satellite transmission services for radio broadcasting.

Circle (831) on Reply Card

NRG Research 10259
Power sources, including Power Station II, Power Can, Motive Pro; Vari-lite.

Circle (832) on Reply Card

NTL 17346
Video processing technology; satellite uplink, downlink products; broadcast network facilities; EDTV 1000 upconverters; video compression systems; MPEG video compression products.

Circle (833) on Reply Card

Nu-Media M1224
Information not available

Circle (834) on Reply Card

NUCOMM 11333
Antenna products for ENG and other microwave applications.

Circle (835) on Reply Card

Be Quiet!



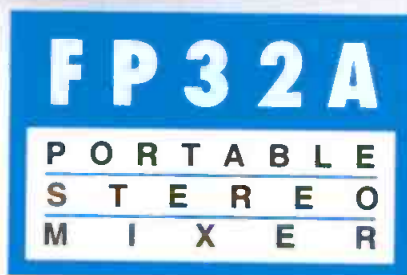
The original Shure FP32 set the standard in field production for portable stereo mixers. Now, with the new FP32A, you can count on getting even less. Noise, that is...30dB less! In fact, the FP32A is so quiet and improved that it's perfect for use with DAT and other digital recording media.

Professional Mixing You Can Take Anywhere.

The Shure FP32A is a 3-input, 2-output portable mixer specifically designed for:

- remote audio recording
- electronic field production
- electronic news gathering
- location film production

The FP32A weighs just 3.5 lbs and is only 2-1/4" H x 6-3/8" D x 7-1/4" W in size.



With 8 hours use from two 9V alkaline batteries — or powered by any 12 to 30 VDC source — the FP32A goes wherever you do. And since it's from Shure, you can count on its durability and ruggedness.

So Many Features In So Little Space.

You get all the features of the original FP32 plus:

- 48V phantom power
- pop-up pan pots
- input level LED indicators
- mix bus jack and cable
- headphone mode switch
- mixer/monitor switch
- adjustable peak output LEDs
- stereo link for inputs 2 and 3
- more than 30 other new features and improvements

So go to your nearest dealer and pick up an FP32A. Once you use it, you'll see why we're making so much noise about something so quiet.

For the Shure FP dealer nearest you, call 1-800-25-SHURE.

SHURE®

The Sound of The Professionals®...Worldwide.

Circle (150) on Reply Card

www.americanradiohistory.com

Come see us at NAB Booth #11901.

Nurad Technologies 17685
Microwave antennas, electronics.
Circle (836) on Reply Card

NVISION 20081
Digital audio accessories, NV4448, NV1050 sample rate converters; NV3512 router; NV 1000 terminal equipment; NV1055 4-channel digital audio mix/minus and routing module; NV1060 digital audio delay compensator module; optional BNC/1-volt digital I/O interfaces; video products.
Circle (837) on Reply Card

Nytone Electronics 13406
Film/slide transfer equipment, 35mm slide system with pan, zoom, fade functions between slide.
Circle (838) on Reply Card

O

O'Connor Engineering Labs 18854
Camera support products, Ultimate series 515S and 1030S fluid heads; model 2575V; TLT tripod.
Circle (839) on Reply Card

O.L.E. Limited 19934
Lightworks editing control systems.
Circle (840) on Reply Card

Odetics Broadcast 18932
Enhancements and expansions to large library maintenance systems; TCS90 cart machine with Digital Betacam format with digital cache capability; News Control Terminal; WorkStation accessories.
Circle (841) on Reply Card

OMB America 3400
Radio/TV transmitters.
Circle (842) on Reply Card

Omicron Video 13141
Signal distribution products, Model 500 series A/V routing switchers and Model 200 series A/V DAs; video keyers, genlock systems.
Circle (843) on Reply Card

OpAmp Labs 17778
Audio, video signal distribution, switching equipment, A-24/2ML audio and VA-16 1x16 video/audio press feed boxes.
Circle (844) on Reply Card

Optibase M1315
Information not available
Circle (845) on Reply Card

Optical Disc Corporation 18949
LaserDisc recording systems and Recordable Laser Videodiscs (RLVs); Model 610A/620A recording system accepts composite video; digital video and CD technology.
Circle (846) on Reply Card

Optimage Interactive Services M 414
Desktop video equipment; multimedia products.
Circle (847) on Reply Card

Optimum Productions 11862
Versioning, dubbing of videos, films with translations from and into English from other languages; meets broadcast and feature film specifications.
Circle (848) on Reply Card

Options International 13359
Telecine utility products; Meta-RTS Plus interface kit; telecine alignment and resolution test film; combination 16mm and 35mm Keycode reader head; 8001/8002 digital video serial-to-parallel/parallel-to-serial converters; 8025 digital keyers.
Circle (849) on Reply Card

Optivision M 609
Information not available
Circle (850) on Reply Card

Orban/AKG Acoustics 2806
Over-the-air Optimod audio processor series; OPTIMOD-TV digital 8282 audio processors; DSE 7000 workstation.
Circle (851) on Reply Card

Ortel 18181
Fiber-optic links, including System 8000 microwave fiber-optic interfacing links for every signal type between the antenna pedestal and control room.
Circle (852) on Reply Card

Otari 1209
Audio mixing systems; analog, digital audio recording equipment; console automation.
Circle (853) on Reply Card

Oxberry M1024
Animation equipment.
Circle (854) on Reply Card

P

P E Photron (M1719) 10256
Information not available
Circle (856) on Reply Card

Pacific Radio Electronics 13047
Racks, panels; precut holes accommodating various manufacturers' connector products.
Circle (857) on Reply Card

Pacific Recorders & Engineering 3612
Audio mixing consoles, cassette recorders; digital audio workstations.
Circle (858) on Reply Card

Paco Electronics USA 19115
NiCad battery products; DP series.
Circle (859) on Reply Card

PAG Ltd. 13422
AR series batteries, chargers and analyzers, PAG SFI NP1 fast charger and PagLok batteries and associated products; PAG battery analyzer.
Circle (860) on Reply Card

Paltex
ECS-85 joystick video editors; DYAD composite digital mixer-keyer; enhancements for high-end Paltex multi-machine inter-format, inter-manufacturer editors.
Circle (861) on Reply Card

Pan American Satellite 19781
Program distribution/transmission services.
Circle (862) on Reply Card

Panasonic 18001
Video cameras, camcorders including AG-DP800 "SUPERCAM" with digital signal processing; D-3, M-II, S-VHS recorders, including AG-DS800 slow motion VTR; AJ-D580 D-5 VTR; monitors; switchers; AQ-235W 16:9/4:3 digital studio camera; "W" series of MII VTRs; WV-E550 DSP, a 3-CCD digital signal processing multipurpose camera; AG-DS850 S-VHS editing VCR with Digital Slow-Motion capability; AG-5210 multipurpose VHS VCR; AJ-EV30 tape evaluator, monitors, TV automation library management system and switchers.
Circle (863) on Reply Card

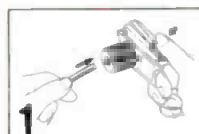
Pandora International 11506
Enhanced DCP color processors; Pogle telecine control systems; Pogle tape-to-tape color processor systems; electronic cursor generators.
Circle (864) on Reply Card

Parallax Graphics Systems 17575
Video graphics, paint, animation software, including ADVANCE digital compositing, effects and sequence editing; DIPSS digital ink and paint software system.
Circle (865) on Reply Card

Coaxial Cable Stripper FOR CANARE 75Ω BNC CRIMP PLUGS



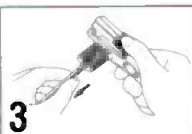
15 Second Quick



1 Insert end of cable into the stripper.



2 Rotate the stripper.



3 Press down lever and pull out cable.



4 Peel off jacket & you're ready to crimp!

MODEL SELECTION		
Model	CANARE Cable	Others
TS-4C	LV-61S	RG-59B/U
TS-5C	LV-77S	8281

CANARE

511 5th ST., UNIT G SAN FERNANDO, CA 91340
PHONE: (818) 365-2446 FAX: (818) 365-0479

See us at NAB Booth #11118-22.

Circle (81) on Reply Card

NEW FROM CANARE

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 scrambling systems*. For transmission and recordable security in PAL or NTSC format, Macrovision has a VES product for you.

- VES-TX: **NEW!** Fully addressable, professional transmission system
- StarShaker: **NEW!** Fully addressable, low cost 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) 691-2999



Macrovision UK, Ltd.
Tel: +44 895 251602
Fax: +44 895 256951

Distributors in: Australia, Canada, Germany, Indonesia, Italy, Japan, Malaysia, Saudi Arabia, Singapore, Spain and Taiwan.

© Copyright Macrovision Corporation 1993.

Circle (82) on Reply Card

www.americanradiohistory.com

PCS Staging M 809
Information not available
Circle (866) on Reply Card

Peerless Industries Inc. 16438
Monitor/TV wall and ceiling mounts, the Jumbo and Designer series; floor stands for TVs and VCRs; speaker stands.
Circle (867) on Reply Card

Penn Fabrication 16084
Information not available
Circle (868) on Reply Card

Penny & Giles 4526
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 (869) on Reply Card

Penta Laboratories 5426
Information not available
Circle (870) on Reply Card

PEP 19101
Videotape editing products, Shotlist software; DigiSpot digital recorder, player cart replacement.
Circle (871) on Reply Card

Perrott - The Battery People 16339
Full line of alkaline, lead acid, Nicad, lithium, silver zinc and custom battery assemblies; BET-5001 battery pack energy tester.
Circle (872) on Reply Card

Pesa Chyron Group (M1114) 19401
Digital electronic graphic systems and character generators/titlers with serial CCIR 601 I/O; networking capability; MAX!>, MAXINE!, INFINIT!, CODI; CENTAUR, CINDY video adaptor boards. See also: Aurora Graphic Sys-

tems; Chyron Graphic Systems; CMX Editing Systems; Pesa Micro Communications; Pesa Switching Systems.
Circle (873) on Reply Card

PESA Micro Communications 19401
Transmission line; HDTV/HTSC UHF panel antennas; HDTV absorptive filters; HDTV feasibility program with interactive display.
Circle (874) on Reply Card

Pesa Switching Systems 19401
See also Pesa Chyron. SD5000 serial digital routing switchers supporting D1, D2, D3, 360Mbit/s compressed 16:9 HDTV; SDA5000 serial digital audio routing switchers; RM4000/5000 analog A/V routers; RC5500 system controller; Lynx II small scale analog, serial digital routers.
Circle (875) on Reply Card

Phasetek Inc. 5215
Manufacturers of AM antenna phasing equipment, antenna tuning units, RF components and RF inductors.
Circle (877) on Reply Card

Philips Business Inc. M1713
Information not available
Circle (878) on Reply Card

Phillips Components 16628
Video camera tubes, UHF klystrons, inductive output amplifiers; CCD chips, modules.
Circle (879) on Reply Card

Philips TV Test Equipment A/S 16630
Test and monitoring systems, PM5640 video signal generators; PM5686 NICAM modulator; PM5664 waveform, vector monitor.
Circle (880) on Reply Card

Phoenix ENG 10962
ENG vehicle construction, design; "One-man

band" ENG vehicles.
Circle (881) on Reply Card

Photomart Cine-Video 17275
Information not available
Circle (882) on Reply Card

Pinnacle Systems 17569
Integrated video production workstations, including Alladin video workstation with 3D effects, modeling, digital switching, paint, titling software.
Circle (883) on Reply Card

Pioneer New Media Technologies 17182
Optical rewritable disc video recording systems; new digital technologies.
Circle (884) on Reply Card

Pixel Power Ltd. 13941
Information not available
Circle (885) on Reply Card

Potomac Instruments 2310
RF test/measurement products, 1900 series directional antenna monitoring system and FIM series MF(AM)/VHF/UHF field intensity meters; AA-51 A automatic audio analyzer.
Circle (886) on Reply Card

Prime Image 17184
TBCs, synchronizers EXCELL 6.5 Model 600, TBC/FREEZE II, HR600II series; still store products, access Model 500; all-world TV standards converter for use with toaster/AMIGA 4000 computer.
Circle (888) on Reply Card

Pro Battery 18414
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 (889) on Reply Card

ALL BROADCAST ANTENNAS ARE NOT CREATED EQUAL

Ours are better.

*Our FM sidemount antennas have served more users for more years than any other brand.
Our UHF panel antennas have superior bandwidth and flexibility for all applications.
Our FM panel antennas are built with the most rigid specifications in the industry.
Our VHF panel antennas are the most versatile antennas available in their class.
Our UHF slot antennas can withstand the harshest environments known to man.
And our dual-mode antennas are already providing solutions for HDTV broadcast.*

Unrivalled engineering. Impeccable service. Affordable pricing.

BECAUSE EVERY INDUSTRY HAS TO HAVE A LEADER.

FM antennas, VHF and UHF antennas, combiners, directional arrays, and a complete line of RF components.



JAMPRO ANTENNAS, INC.
6340 Sky Creek Drive
Sacramento, California USA 95828
(916) 383-1177 phone
(916) 383-1182 fax

Circle (16) on Reply Card



You get the same CRT-type displays you're used to, with 10-bit internal resolution, so they're sharper than any other rasterized monitor available.



A red prompt on the bottom of the picture shows when your signal goes out of limit.



You can improve overall video signal quality while holding your expenses down.

**WHAT IF YOU COULD
AUTO-MEASURE VIDEO
SIGNALS BY REMOTE,
HAD A SYSTEM FOR
ADVISING OPERATORS
WHEN SOMETHING IS
OUT OF LIMIT, HAD AN
ASSISTANT TO ISOLATE
PROBLEMS AND PRINT
STATUS REPORTS, AND
YOU COULD AFFORD IT
TOO? IMPOSSIBLE? NO.**



That's right. Real time auto-measure. You can monitor studio signals constantly, without being there yourself. And since WVM-710 displays on your existing picture monitors, you can centrally route and control signals to and from remote points, even over phone lines.



Connect a printer to the WVM-710, and you can get hard copies of waveforms and auto-measure screens whenever you want. A big help in trouble-shooting.



THE WVM-710 VIDEO MONITORING SYSTEM FROM MAGNI.

See us at NAB. Booth #16684.

MAGNI

MAGNI SYSTEMS, INC.,
9500 S.W. Gemini Drive,
Beaverton, OR 97005 USA
PHONE: (503) 626-8400
1-(800) 237-5964
FACSIMILE: (503) 626-6225

 Pro-Bel Ltd.

Analog and digital video and audio HD series routers; signal processing and distribution equipment; distribution amplifiers for all signal formats; AES reference generator; TS16, TM24 routing switchers; MIDI digital audio routing switchers; 5023 sample rate converters.

Circle (890) on Reply Card

Production Garden Library 13743

Production music libraries, Broadcast 100 and AV/Video 200 series.

Circle (891) on Reply Card

Professional Label Inc. 13841

Videotape laser labels, Windows labeling software, videotape cases.

Circle (892) on Reply Card

Professional Sound Corp. 5124

Production audio equipment distributor; MilliMic lavalier mics; VDB boompoles; audio DAs; battery supplies; mic power supplies; RF antennas; PSC sound carts, custom cables; headset mics; omniplate mics; universal shock mount systems; solar panel/rechargeable power supplies.

Circle (893) on Reply Card

Progressive Image Technology 13829

Computer-to-video scan converters.

Circle (894) on Reply Card

Promusic 13148

Music and sound effects library products.

Circle (895) on Reply Card

Prophet Systems 5221

Radio automation systems.

Circle (896) on Reply Card

Q**Q-TV 18854**

Updated QCP ComputerPrompTer software for PC, laptop, desktop computers; communications protocol; high brightness, contrast monitors.

Circle (899) on Reply Card

QEI 4218

Digital remote pickup system; digital Transmitter-to-studio link; 675-B FM exciter; CAT-LINK digital STL/TSL system with Q-MAX cards; stereo generators; FM transmitters, exciters; FM AUTOMOD AGC.

Circle (900) on Reply Card

QSI Systems 16333

VDI signal, data products; 908 series multi-image inserter, including time/temperature option; 808 single image inserter.

Circle (901) on Reply Card

Quality Video Supply 13347

Kramer video processors, encoders, decoders, correctors; computer-to-video interface products; video/audio switchers, distribution amplifiers; broadcast quality digital TV standards converters.

Circle (902) on Reply Card

Quanta 18032

Video titling and graphics systems, including the Delta Concord and Delta Classic.

Circle (903) on Reply Card

Quantel 17126

Electronic paint, titling systems; image libraries; non-linear video editing systems; standards conversion products; CCIR 601 compatible; random-access, tapeless on-air presentation graphics for playout to news-room integration.

Circle (904) on Reply Card

Questar Systems (Farpoint Systems) 10061

AccuPrompt software for Macintosh desktop, PowerBook series computers; NTSC output.

Circle (905) on Reply Card

Quickset 12508

Camera support products; Huskey, Apollo,

Mercury fluid heads.

Circle (906) on Reply Card

R**R-Columbia Products 13145**

Wireless intercom products, IFB/ENG headphones; ENG/IFB pocket telephone; wireless IFB headset/receiver; mini dynamic headset; full-duplex intercom headphones; replacement intercom headphones/belt packs.

Circle (907) on Reply Card

Radamec EPO Ltd. 17353

Automated camera support equipment, ARC Advanced Robotic Control, Cue Computer for simultaneous multicamera movement with data tablet, touchscreen interfaces, RP2/RP2H free-roaming pedestals.

Circle (908) on Reply Card

Radiation Systems/Mark Antennas 15766

Microwave antenna products.

Circle (909) on Reply Card

Radio Computing Services 5202

Music library software; complete digital audio and data networks; live assist studio or full automation software for radio.

Circle (910) on Reply Card

Radio Daze 1710

Information not available

Circle (911) on Reply Card

Radio Design Labs 5406

Utility audio products, Stick-on amplifiers, mixers, relays; ACM-2 AM noise monitor; AMX-84 digital audio router; audio oscillators, switchers; ramp generators.

Circle (912) on Reply Card

Radio Express 4903

Information not available

Circle (913) on Reply Card

Radio Systems 3012

RS series audio mixers; RS-1000 DAT audio tape recorder; analog, digital master clock/timer systems; mono, stereo DAs; DDS Digital Delivery System for on-air, a multi-user operating system with user panels for access to various digital and analog sources.

Circle (914) on Reply Card

RAM Broadcast 3002

Audio products; SAS 32000 router, SX-18 audio on-air mixer; audio consoles; audio switchers; hard disc audio storage; hard disc news editors.

Circle (915) on Reply Card

Ramsa Audio/Panasonic 18001

Professional audio mixers, monitors; R-DAT systems, SV-3700, SV-3900 with RS-422 control.

Circle (916) on Reply Card

Rank Cintel 12441

Analog flying spot, all-digital and HDTV telecine systems, including Ursa Gold, Turbo 2 and Mk III HD.

Circle (917) on Reply Card

Raytheon Co. 11356

Specialized solid-state video processing devices; TMC22-series, including gen-locking video digitizer, encoder, mixer; triple amplifiers, subcarrier lock, etc.

Circle (918) on Reply Card

RCI M1135

Information not available

Circle (919) on Reply Card

RCI Systems Inc. 3702

CT-1B cable testers; BM30T broadcast media molt box; custom finishing for plates and panels.

Circle (920) on Reply Card

RE Electronics 3801

Test, measurement equipment for audio, RDS data transmission products.

Circle (921) on Reply Card

Rebo Studio 10353

HDTV production.

Circle (922) on Reply Card

Recognition Concepts 10556

Video disk recorders, including component, composite, switchable and HDTV video formats.

Circle (923) on Reply Card

Rees Associates 16631

Architectural services.

Circle (924) on Reply Card

Register Data Systems 4508

Complete business software packages for broadcast with sales, traffic, billing, accounting systems.

Circle (925) on Reply Card

Research Technology Int'l/RTI 13646

Videotape evaluation and cleaner systems, TapeChek; Lipsner Smith ultrasonic film cleaners.

Circle (926) on Reply Card

RF Industries 19481

Information not available

Circle (927) on Reply Card

RF Plante 11059

Radio transmission systems.

Circle (928) on Reply Card

RF Technology 11303

Fixed microwave systems for STL, TSL, ICR configuration; short-haul radios; wireless camera transmitters; satellite fly-away packages; D-series portables.

Circle (929) on Reply Card

RGB Computer & Video M1403

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 (930) on Reply Card

RGB Spectrum M1714

Videowalls; computer graphics to high-resolution videowall conversion.

Circle (931) on Reply Card

Richardson Electronics 12901

Power transmitting tubes, NL347 1kW UHF device, UL1057 power tetrode to 960MHz.

Circle (932) on Reply Card

Rohde & Schwarz 13107

RF, video and audio test equipment.

Circle (933) on Reply Card

Roland Corporation 3406

Hard disk recorder, production systems DM-80/80S 2.0 software and firmware; RSS SpaceSound effects; SN-550 digital noise eliminator.

Circle (934) on Reply Card

Rorke Data 11555

Computer hard drive products; tape, optical recording media.

Circle (935) on Reply Card

Ross Video 15704

Serial Box VTR and peripheral control for RVS 630 switcher; video DA power supplies; video production switcher systems, RVS 630, 424, 216A and 210A 30- to 10-input with multilevel effects; video DAs, equalizers, rack frames.

Circle (936) on Reply Card

Rules Service Company 4627

FCC rules, regulations publishers on disk, updated every other month.

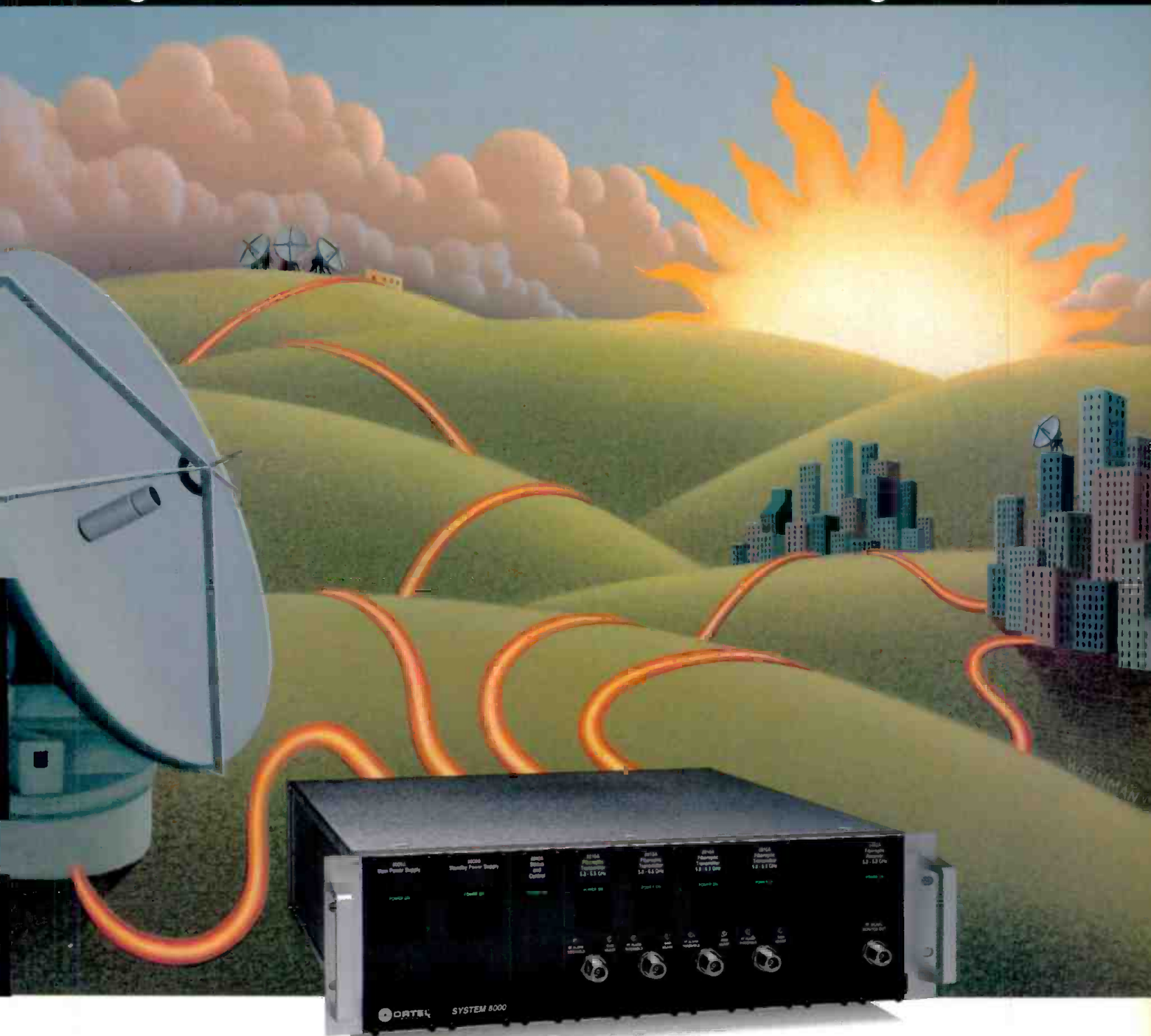
Circle (937) on Reply Card

The M S Russin Group, Ltd. 13413

Camrobotic Systems programmable, remote positioning equipment; manual desktop controllers; manual rack mount controllers; 18" wall mount to interface with RF-1000p/t pan & tilt.

Circle (938) on Reply Card

Light Links™. The new antenna linking solution.



- **Interfacility connectivity for Ku, C, L, IF signals**
- **Saves money on installation, operation and maintenance.**
- **Uplinks and downlinks.**
- **Unprecedented reach.***

* Single span: 65 km for IF bands, 40 km for L band, 30 km for C band, 15 km for Ku band.

Circle (85) on Reply Card

See us at NAB, Booth #18181

This new application of linear fiber optics offers you flexibility, performance and convenience simply not available with other technologies. We call it *Microwaves on Fiber™*. With System 8000 Light Links™ you get complete fiberoptic interfacility connectivity for satellite earth stations. With fully redundant paths. On all standard satellite frequency bands.

System 8000 is a complete, intelligent system solution. Connect remote antennas to control centers. Connect site to site. Our 22-page color brochure tells you what it does, how it works, and how you can use it. Full specifications and application information. Call us today for your copy. If you want to discuss your next project, our technical sales staff is ready to help you.

CALL TOLL FREE: 1 (800) 362-3891



Making Light Work For You

ORTEL
CORPORATION

2015 West Chestnut Street • Alhambra CA 91803 • Telephone: (818) 281-3636 • Facsimile: (818) 281-8231

Sachtler**18938**

Camera support, pan/tilt and tripod products; lighting equipment; electronic fluid heads, Video 10 and 20 sensor; Vario pedestals 1-90 and 2-75; reporter 200D daylight fixtures; suspension systems; teleclimbers; positioning controls; scenery hoists.

Circle (939) on Reply Card

Samson Technologies**12436**

Stage 33, install wireless mic systems; Behringer Combinator compressor; Soundtracs Solitaire consoles.

Circle (940) on Reply Card

San Francisco Satellite Center**13633**

Satellite signal relay services.

Circle (941) on Reply Card

Sandar Electronics**3703**

Audio recorders for film.

Circle (942) on Reply Card

Sanix Corporation**13646**

Bulk audio/video tape eraser systems.

Circle (943) on Reply Card

Sanken/Audio Intervisual Design**2002**

Lavalier, handheld and other microphone products.

Circle (944) on Reply Card

Satellite Communications**10857**

Information not available

Circle (945) on Reply Card

Savage Technology**M1701**

Information not available

Circle (946) on Reply Card

SCA Data Systems**4208**

Subcarrier transmission products; MUSIC 4 Personal ethnic broadcasting receiver; MU-

SIC 4 Plus 9600 high-speed data and audio system; RDS, phase-locked paging and super high-speed generators.

Circle (947) on Reply Card

Scala Electronic**15726**

Broadband VHF and UHF TV panel antennas; broadband UHF TV transmit antennas; MMDS transmission antennas.

Circle (948) on Reply Card

Schafer World Communications**4022**

CD automation system.

Circle (949) on Reply Card

ScheduALL by Vizuall Inc.**11662**

Information not available

Circle (950) on Reply Card

Schmid Telecommunication**1606**

Audio test, measurement systems, RESCO network monitoring, control system; SIAT audio test systems.

Circle (951) on Reply Card

Schwalm/Power Technologies**19562**

Information not available

Circle (952) on Reply Card

Scientific Atlanta**13825**

Satellite communications equipment, earth station antennas, video receivers, antenna controllers.

Circle (953) on Reply Card

Scott Studios**4020**

Radio automation systems.

Circle (954) on Reply Card

Selco Products**4618**

Equipment replacement components, R32AF VU meters and Collet Knobs.

Circle (955) on Reply Card

Sennheiser Electric**12136**

Headphone, microphone and wireless RF products; TLM 193 large diaphragm cardioid

condenser mic.

Circle (956) on Reply Card

SESCOM**13601**

Audio signal distribution products; ENG utility Field News Bridge.

Circle (957) on Reply Card

SG Communications**16627**

Tower design, engineering, fabrication; tower accessories, modification; turnkey site development and construction, antenna installation.

Circle (958) on Reply Card

Shereff Systems**15764**

PC-based titlers, Pro Video VGA-16.

Circle (959) on Reply Card

Shively Labs**4224**

Panel, side-mount FM broadcast antennas; branched, balanced multistation combiners, rigid transmission line, pressurization equipment; omnidirectional and formal FCC directional pattern studies.

Circle (960) on Reply Card

Shook Electronics

Field production vans, ENG/EFP vans; Ku-band satellite trailers.

Circle (961) on Reply Card

Shotmaker Dollies & Cranes**15177**

Camera support equipment, Super Panther, Mini Panther camera dollies, remote cranes; expandable sleepers.

Circle (962) on Reply Card

Shotmaker Dollies/Camera Platforms**15177**

Information not available

Circle (963) on Reply Card

Shure Brothers**11901**

Wired, wireless microphone products.

Circle (964) on Reply Card

Avoid Expensive SMD Repair Costs

Replace with low-cost ESDI Drives on:

Ampex ESS

Harris IRIS

Quantel

The BTI Adapter Assembly interfaces a reliable low-cost ESDI drive to your current Still Store SMD controller. Don't repair SMD drives; upgrade your system to ESDI drives.

- Increase your system reliability
- Decrease your repair costs & power consumption
- No hardware changes to SMD controller required
- Drive conversion is transparent to operating software



BTI COMPUTER SYSTEMS (800) 628-5147

840 Del Rey Ave, Sunnyvale, CA 94086

EUROPE: BTI Computer Systems U.K. Ltd., Pimaston, Moor Green Lane

Moseley, Birmingham, England B13 8NG (021) 449-8000

Circle (86) on Reply Card

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 (87) on Reply Card

www.americanradiohistory.com

Siel Sistemi Elettronici 4206
RF transmission equipment.
Circle (965) on Reply Card

Siemens Audio Inc. 16623
Neve audio mixing systems; Mitsubishi digital audio recorders; AMS mics, automated mixers, workstations; Siemens analog, digital routers.
Circle (966) on Reply Card

Sierra Video Systems 17443
Audio/video signal distribution products; BetaKey chroma keyer demonstration.
Circle (967) on Reply Card

Sigma Electronics 16260
Series SLX 16- and 32-source selection switchers; Series 32 router control software; series 1000 encoders, decoders, transcoders; STX-1095 Y/C to CAV to Y/C "Supercoder"
Circle (968) on Reply Card

Signal Technology Corp. 19435
Digital signal filters.
Circle (969) on Reply Card

Silicon Graphics M1102
Graphics computer platforms; 601/D-1 option for Galileo video; Cosmo Compress for Indy, Indigo and Indigo²; Silicon Studio Solutions; interactive video and broadcast.
Circle (970) on Reply Card

Sinar Bron 16365
Lighting products.
Circle (971) on Reply Card

Sira Sistemi Radio s.r.l. 16258
FM, TV transmission antennas, UTV-01 and 3VTV panel antenna designs.
Circle (972) on Reply Card

Skaggs Communications 19125
Information not available
Circle (973) on Reply Card

SKB Case Company 18681
Equipment transport cases.
Circle (974) on Reply Card

Smarts Broadcast Systems 5224
Radio automation systems.
Circle (975) on Reply Card

Smith Systems M1515
Information not available
Circle (976) on Reply Card

SMPTE 12906
Professional organization.
Circle (977) on Reply Card

Snell & Wilcox (See also CEI) 19746
Standards and format conversion systems; film-to-tape converters; encoders, decoders; HDTV converters; slow-motion systems; TBC/synchronizers; digital switchers; digital video interface products; videowalls/large screen display enhancers median filtering noise reducers; HDTV cross-converters incorporating Ph.C; 4:2:2 vision mixers with integral routing switchers; real time picture creating slow-motion systems; precision digital decoding systems.
Circle (978) on Reply Card

Softech Systems Inc. 18483
Computerized newsroom systems.
Circle (979) on Reply Card

Softimage 16675
Computer graphics software; Digital Studio; Mental Ray; Eddie 3.0; Creative Animator; Creative Designer.
Circle (980) on Reply Card

SoftTouch 16943
Closed-captioning encoders, decoders for IBM and compatible PCs; caption data recovery, generation and display; timecode reader/

generators; portable caption encoders.
Circle (981) on Reply Card

Solid State Logic 19158
Audio production, post-production equipment, ScreenSound digital and SL 5000M analog audio systems; SoundScreen V5 with VisionTrack option; Scenaria digital audio video production system; Scenaria OmniMix, SL 8000 GB on-air production console, SL 8000 multiformat console, G Plus console systems.
Circle (982) on Reply Card

Solidyne 1615
Information not available
Circle (983) on Reply Card

SONEX Acoustical Products 2103
Acoustical material, treatments, SONEX acoustical foam, ProSPEC barriers and composites; Fabrix.
Circle (984) on Reply Card

Sonic Science 10057
Sound effects and music libraries; effects retrieval systems.
Circle (985) on Reply Card

Sonic Solutions 1700
Digital audio workstation and CD recording equipment, SS-105 premastering system; audio utility NN-100 NoNoise sound restoration system.
Circle (986) on Reply Card

Sono-Mag 1324
Radio automation equipment.
Circle (987) on Reply Card

Sony Electronics/Business & Prof. 11711
CCD cameras; DVW digital Betacam format camcorder, Betacam SP digital processing camcorder; Interactive Status Report VTR



See HP at Booth 117 Multimedia Hall in the Hilton Pavilion



HP VidJet Pro Video Printer

A Whole New Family of Video Servers

- Broadcast Video Server
- Video-on-Demand
- Interactive TV Server
- Still-Store Server
- Digital Video Disk Recorder

Studio Equipment

- The Remarkable VidJet Pro Video Printer
- HP Workstation with 2D Animation
- Test & Measurement for Serial Digital
- Format Conversion

Hewlett-Packard . . .
Changing the Way You Communicate With Video



Circle (88) on Reply Card

Scientific-Atlanta Answers the Call of the Wild.

Introducing TerraStar-M™, the satcom terminal you can take to extremes.

When business calls you into the wild anywhere on earth, now you can call back. The Scientific-Atlanta TerraStar-M Model 9826 Inmarsat Satellite Terminal gives you two-way communication with any telephone in the world from any site in the world, and it's as easy to take with you as a carry-on bag.

It weighs under 30 pounds. The antenna can be remoted to let you dial conveniently and comfortably sheltered from the elements. For high quality, private voice communications just dial direct on a standard telephone. Fax transmission is just as easy. And the digital "M" service is available at about half the cost of previous analog satcom tariffs.

Some TerraStar-M features and options are shown here. For the full story call us today.

These days the world moves too fast for anything but Scientific-Atlanta.

Built-in telescoping handle and ball bearing wheels.

Rugged standard soft case weighs under 30 pounds.

Global 2-way telephone, fax and data.



**Scientific
Atlanta**

Circle (89) on Reply Card

www.americanradiohistory.com

Remotable antenna allows calls to be made from 100 feet + away.

Optional fax/data communications at 2400 b/s.

Available with soft case which fits airline overhead compartments or under-seat storage.

Optional hard case for shipment or check-in baggage.

For full information call us:
Telephone 404-903-6001
Telex 4611804
Fax 404-903-5346

Scientific-Atlanta, Inc.,
Mobile Satellite Systems
4291 Communications
Drive, Norcross, GA
30093, USA

maintenance software; digital peripherals; **Destiny** non-linear video editor; analog, digital audio products; video effects systems; **LMS Automation** products; **PVM** series video monitors; projectors; **DVS** serial digital routers; frame synchronizers, encoders; mics; **DAE-D5000** digital audio workstation and frame converter; audio effects processors.

Circle (988) on Reply Card

Sony Recording Media 11711

Video recording media, **BCT-D** Digital Betacam cassettes; **HMPX** Hi8 metal particle; **HMAX** Hi8 evaporated metal; **UVWT-MA** Betacam SP; Pro DAT Plus PDP digital audio tape.

Circle (989) on Reply Card

Sound Ideas 11703

Production music, effects products, libraries.

Circle (990) on Reply Card

Soundcraft 15713

Audio mixer systems, **SAC 200** production and on-air consoles, **Delta** series consoles.

Circle (991) on Reply Card

Soundtrack

Production music; **ADS UP!**

Circle (992) on Reply Card

Specialized Communications 13062

Information not available

Circle (993) on Reply Card

Specialty Connector 15484

Information not available

Circle (994) on Reply Card

Spectral Synthesis 2801

Digital audio workstations.

Circle (995) on Reply Card

Sports Network 2206

Information not available.

Circle (996) on Reply Card

Sprague Magnetics 1612

Replacement audio heads; record head ser-

vices.

Circle (997) on Reply Card

Sprint Video Group

Video conferencing and satellite services.

Circle (998) on Reply Card

Sprocket Video Technologies 20016

Utility devices, serializers, deserializers.

Circle (999) on Reply Card

Staco Energy Products 1713

Information not available

Circle (1000) on Reply Card

Stagecraft Industries

Information not available

Circle (1001) on Reply Card

Standard Communication 16075

Satellite TV products, **Agile Omni Broadcast MT-830**; **Intl MT-830I** satellite TV receivers.

Circle (1002) on Reply Card

Stanton Magnetics

Phono pickups, **890AL DJ Pro**; headphones.

Circle (1003) on Reply Card

Stanton-Video Services Unltd. 19739

Camera support products.

Circle (1004) on Reply Card

Star Case 13624

Transport cases for equipment, components, rack-mount types.

Circle (1005) on Reply Card

Steenbeck 18814

Video, film editing, transfer systems.

Circle (1006) on Reply Card

Stereographics M1710

Information not available

Circle (1007) on Reply Card

Storage Dimensions M1529

Information not available

Circle (1008) on Reply Card

Storeel 17612

Videotape storage systems, **Room Stretcher**

Hi-Roller small format storage with pull-out trackless feature; **Room Stretcher Express**.

Circle (1009) on Reply Card

Strand Lighting 13818

Lighting fixtures, control products.

Circle (1010) on Reply Card

Strassner Editing Systems 19978

Video editing control equipment, **Version 6.0**; **EdiQit** Windows-based edit controller kit.

Circle (1011) on Reply Card

Studer Digitec 1213

Numisys cart systems, editing systems.

Circle (1012) on Reply Card

Studer ReVox 1213

Mixers; CD players/recorders, **D740**; audio-tape recorders, **A807A** 4-track; telephone hybrids; **R-DAT** recorders; digital, analog switchers, **DAWs**; automation systems.

Circle (1013) on Reply Card

Studio Audio Digital Equipment 5525

Professional digital audio workstations.

Circle (1014) on Reply Card

Studio Spectrum Inc. 19986

Information not available

Circle (1015) on Reply Card

Studio Technologies 13618

Mic pre-amps; audio processors, stereo simulators; **DAW** accessories; **Model 80** stereo analog audio **DAs**; **AES/EBU** digital audio **DA**.

Circle (1016) on Reply Card

Studio Technology

Custom broadcast furniture.

Circle (1017) on Reply Card

Sumitomo Electric 10060

Split screen displays, **VIEWPLEX-2000** shows up to 16 different channels on one monitor.

Circle (1018) on Reply Card

Summit Software Systems

Information not available

Circle (1019) on Reply Card

Sun Micro Systems M 612

Graphics computer platforms.

Circle (1020) on Reply Card

Sundance Technology Group 19105

Editing products with **MAC** software control, **Q-CUT** editing, **Q-BASE** logging database.

Circle (1021) on Reply Card

Superior Electric 4914

Electronic and electrical control equipment; **STABILINE** series power protection equipment; **UPSY** uninterruptible power supplies, power conditioners, transient suppressors, **RFI** filters; **WHR** series voltage regulators; **AC** disturbance monitors.

Circle (1022) on Reply Card

Sure Shot Teleproductions 16624

Ku-/C-band transportable earth stations; production facilities, transportable equipment.

Circle (1023) on Reply Card

SVS M1434

Information not available

Circle (1024) on Reply Card

Swintek Enterprises 11705

Wireless mic, intercom products, **Mark 200** intercoms, **Mark Q/ENG** microphone; **Mark IL** UHF wireless microphones.

Circle (1025) on Reply Card

Switchcraft 4909

Shell-less, **Weather** tight and **QG** connectors; solderless plugs; video patch panels, cords; cable assemblies; jacks, plugs, switches.

Circle (1026) on Reply Card

SWR Inc. 16043

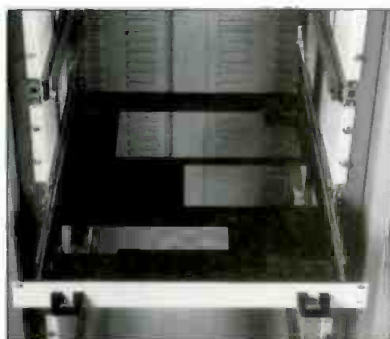
RF feedline products; broadband **TV** antennas, **FM** antennas, **Field Engineer Service**, 5-year limited parts, labor warranty; **MMDS** antennas.

Circle (1027) on Reply Card

Symetrix 4622

Audio processors, **528** Voice processor, **511A** single-ended noise reduction system.

Circle (1028) on Reply Card



No more jammin' the ball bearings or dancin' with 100 lbs of heavy metal. Stop breakin' your back trying to align the rack slides when mounting your VTR's. Simply place the VTR feet in the cutouts on the **RMA Mounting Shelf** and slide it on home.

Available for most broadcast and professional VTR's.



AVITEL ELECTRONICS CORP.
3678 West 2100 South
Salt Lake City, Utah
(801) 977-9553



No More Twist and Shout, Just Roll. Rack and Roll.



Circle (90) on Reply Card



ntroducing MAESTROworks

Orchestrate your digital future

Work in perfect harmony with our multimedia newsroom. And, to bridge the analog and digital worlds, our integrated Media Library strikes just the right chord.

For total media management, our video servers offer non-stop commercial and program delivery.

With a scalable, networked architecture, MAESTROworks can fit your needs and budget, and even protect your existing investments. Meet MAESTROworks.

Call 1-800-869-7009

See Us At NAB Booth #19247



AUTOMATION SYSTEMS

A Digital Equipment Corporation Company

Circle (91) on Reply Card

Synelec M 201
PRISM graphic workstation display walls, 72" retroprojectors.

Circle (1029) on Reply Card

SYSTEK 16383

Information not available

Circle (1030) on Reply Card

System Associates 13432

Used broadcast and TV production equipment brokers.

Circle (1031) on Reply Card

Systems Wireless 13636

Wireless microphone systems, HME series 800 UHF wireless intercom system; field production wireless equipment from Vega, Lectrosanics.

Circle (1032) on Reply Card

T

Tally Display Corp. 13162

Indicators using matrix-type characters to identify and indicate status of equipment; red, green, yellow colors; senses router configurations, etc.

Circle (1033) on Reply Card

TAO/Tech.Aesthetics Operations 19438

Edit controller and editing systems, including Editizer Macintosh versions.

Circle (1034) on Reply Card

Tapscan 1325

Marketing research systems, QualiTAP, TargetONE.

Circle (1035) on Reply Card

Target Vision M 101

TVOs 5.4 multimedia networks for employee communications; TVI DeskTop V2 PC-based text and graphics message system.

Circle (1036) on Reply Card

TASCAM 15669

Audio recorders, BR-20T with center time code track; CD-301, CD-601 CD players; M-1500 series audio mixers.

Circle (1037) on Reply Card

Taurus Communications Inc. 19728

Full service telecommunications services.

Circle (1038) on Reply Card

TCS-Tripp Communications 15380

Videocassette, CD organizer/storage cabinets; double-density mobile or static cabinets fit room space limitations; Roll-Around trucks for videocassette applications.

Circle (1039) on Reply Card

Tecom 20024

Information not available

Circle (1040) on Reply Card

Tech Electronics 18881

Information not available

Circle (1041) on Reply Card

Techflex 17784

FLEXO sleeving, braided monofilament cable, wiring harness management and protection products.

Circle (1042) on Reply Card

Techni-Tool 13143

Special purpose tools.

Circle (1043) on Reply Card

Technical Necessities 11129

Information not available

Circle (1044) on Reply Card

Technidisc M1123

Information not available

Circle (1045) on Reply Card

Technosystem SpA 19575

Microwave links; modulators, converters, solid-state translators, transmitters; tube translators; RF transmission accessories;

turnkey transmitter station, network designs, construction; field maintenance service.

Circle (1046) on Reply Card

Tecnologie Elettroniche Milano/TEM 4906

Radio/TV transmitters, translators.

Circle (1047) on Reply Card

Tekskil Industries 18272

Videoprompting systems, Companion and 14" Easy View studio prompter.

Circle (1048) on Reply Card

Tektronix 17119

TV, audio test, measurement and monitoring equipment for broadcast, cable production, manufacturing, audio, telecommunications environments; waveform/vector monitors, signal generators, synchronizers; Profile disk recorder; ECO422 synchronous changeover instruments; ASW-100 audio switchers; DS1200 demodulator systems.

Circle (1049) on Reply Card

Tel-test 11908

Automation products, MCx2SS master control switcher; ACC air channel control automation.

Circle (1050) on Reply Card

Telecast Fiber Systems 12747

Cable utility products, reels.

Circle (1051) on Reply Card

Telemetrics 18951

Camera support, control products, robotic pan/tilt systems and ENG camera triax adapters; camera CCU; video switcher; PC notebook control panel/software.

Circle (1052) on Reply Card

Telepak San Diego 19107

Equipment transport products; convenience items, T-Brief Producer/Director briefcase; full line of soft-sided carrying cases for portable video equipment.

Circle (1053) on Reply Card

Telescript 19442

Studio and portable monitor prompting systems; computer prompting software for IBM-compatible PCs; computer prompting delivery systems for desktop, laptop, notebook and newsroom.

Circle (1054) on Reply Card

Television Engineering 13117

Mobile TV production, ENG vehicles; system design, construction; IFB controller.

Circle (1055) on Reply Card

Television Equipment Associates 13411

Video filters, baseband video switched box delay lines; delay lines and filters for end-users and OEMs; subcarrier filters; boxed noise elimination filters; Matthey HDTV filters and delay products.

Circle (1056) on Reply Card

Telex Communications/Pro A-V 17115

Audio tape duplication units, Model 6120 high speed system; wired, wireless mic, ENG-4 portable wireless receiver; headsets.

Circle (1057) on Reply Card

Telos Systems 5200

Telephone hybrid products, Telos LINK telco-intercom interface, Telos ONE hybrid.

Circle (1058) on Reply Card

Tennaplex Systems 15726

Broadcast antenna products for FM, TV, HDTV offering omnidirectional and custom patterns.

Circle (1059) on Reply Card

Tentel 13408

Videorecorder repair and maintenance equipment; Tentelometer dynamic tape tension meter; TQ-Dial torque, TSH reference plane, head protrusion and drum eccentricity gauges.

Circle (1060) on Reply Card

RF POWER

Measurement for the broadcast industry.

Bird Electronic Corp. continues its lead in RF power measurement with two new products for the broadcast industry—the MODULOAD Series RF load resistor and the Model 6085 broadband high power RF calorimeter.

MODULOAD

- Self-cooled transmission line termination.
- Ideal for CW, AM, FM, SSB, TV and pulsed transmission systems.
- Designed for reliability and longevity.
- Maximum heat transfer.

MODEL 6085

- Fast, accurate and easy-to-operate power measurement.
- Measurement uncertainties of better than $\pm 3\%$ of readings.
- Optional interface board available for automated testing applications.

Call or write today for more details on how Bird equipment measures up to the broadcast industry.

BIRD

Electronic Corporation

30303 Aurora Rd., Cleveland, OH 44139 U.S.A. • (216) 248-1200
TLX: 706898 Bird Elec UD • FAX: (216) 248-5426
WESTERN REGION OFFICE: Ojai, CA • (805) 646-7255



Circle (92) on Reply Card

Only TSM gives you a surprise in every package...



...a lifetime of free software upgrades!

When you purchase a TSM Autocam™ system, you're making an intelligent investment in camera automation guaranteed not to become obsolete.

TSM's architectural design of the ACP-8000S is the only completely software-based camera automation system allowing major feature enhancements to be easily upgraded. A claim no other

manufacturer can make.

Real-time collision avoidance, set mapping, network LAN operation with multiple station assignment mode and 100% fault-tolerant back up, real-time CCU interface, and more...are just some examples of prior upgrades.

And with ongoing market challenges, TSM's system enhancements are unlimited. Best of all, our upgrades are

gifts to you for the lifetime of our product.

To learn more about Autocam™ and how it will improve your financial future, call 914-268-0100.



**AUTOMATION FOR THE
NEXT GENERATION**

See us at NAB Booth #17107

Circle (93) on Reply Card

www.americanradiohistory.com

Texscan MSI 17985
Information display, digital insertion systems.

Circle (1061) on Reply Card

TFT Inc. 1908
STL systems, EIS 911 EBS system, low cost, easy add-on; EIS 912 encoder; DSS92 digital subcarrier system for video STL and satellite applications.

Circle (1062) on Reply Card

Theatre Service & Supply 13638
Studio furnishings, studio cyclorama curtains, track systems; scenic supplies, grip equipment.

Circle (1063) on Reply Card

Thermodyne International 13127
Equipment transport cases.

Circle (1064) on Reply Card

Thomcast 16113
VHF and UHF TV transmitters; AM and FM radio transmitters; TV and radio antenna systems, digital video processing products, Colorado color manipulation; 4:2:2 keyer for mixing, keying; TTV series CCD cameras, TTV1250 HDTV portable camera.

Circle (1066) on Reply Card

Thomcast France 16113
Broadcast systems engineering of complete stations and networks worldwide; wide range of solid-state and tube transmitters for TV from 1W to 40kW (2x20kW) in Bands 1 to 5, FM from 1W to 10kW.

Circle (1067) on Reply Card

Thomson Tubes Electroniques 12208
RF power devices for terrestrial broadcast applications; HPA, TWT devices for satellite, microwave communications; Inductive Output device using Pyrobloc Technology; new

concept in power-grid tubes for UHF TV.

Circle (1068) on Reply Card

Thomson-LGT (see Thomcast) 16113

Information not available

Circle (1069) on Reply Card

3M Pro A/V Product 16605

Audio, video recording media.

Circle (1070) on Reply Card

360 Systems 5420

Audio routing switchers, audio recording equipment.

Circle (1071) on Reply Card

Tiffen Manufacturing 16636

Lighting modification gels; FILTERFLEX matte boxes; David & Sanford tripods.

Circle (1072) on Reply Card

Time Logic Inc. 16374

Editing systems; tape control automation.

Circle (1073) on Reply Card

TimeLine 1702

Time-code products; transport synchronizing systems; LYNX digital audio workstations.

Circle (1074) on Reply Card

TM Century 1526

Radio station automation, Digital Commercial System with hard disk storage.

Circle (1075) on Reply Card

TMT electronics AG 19841

Information not available

Circle (1076) on Reply Card

TOA Electronics/Digital Mixing Sys. 19471

Sound reinforcement, recording consoles.

Circle (1077) on Reply Card

Torpey Controls & Engineering 13415

Utility timing products, analog/digital time displays, STW-5 digital timer.

Circle (1078) on Reply Card

Torque Systems M 821

Information not available

Circle (1079) on Reply Card

Toshiba Corporation 11841

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 (1080) on Reply Card

TouchVision Systems 16066

Videotape editing controllers, D/Vision multimedia and Pro professional systems; full-motion, broadcast video from PC platform.

Circle (1081) on Reply Card

TRF Production Music Libraries 14044

Production music libraries.

Circle (1082) on Reply Card

Trident Audio 5106

Audio consoles for broadcast, tele-/post production, Vector 432.

Circle (1083) on Reply Card

Troll Technology 13801

Remote control facilities for ENG, camera systems, including TS-1400AVd, TS-1900AVd, TS-210, TS-940SL; UCC1000R communication hub; Troll Cam; Skypod live airborne news gathering system.

Circle (1084) on Reply Card

Trompeter Electronics 12801

BNC connectors; patching, distribution products.

Circle (1085) on Reply Card

TrueVision/RasterOps (M1415) 11559

Electronic graphics cards; TrueVista Pro; Targa 2000; computer products, graphics boards, test equipment and video editing systems.

Circle (1087) on Reply Card

TSM/Total Spectrum Manufacturing 17107

Studio camera automation equipment; robotic camera support products, SportsFocuser and ACP AutoCam series.

Circle (1088) on Reply Card

TTC (Larcan-TTC) 15708

HDR (High Definition Ready) IOT Series UHF Transmitters; solid state UHF transmitters for TV in various power levels; plus FMS-4000 4kW transmitter, Model X Exciter and FMS-100 transmitter all for FM radio.

Circle (1089) on Reply Card

TWR Lighting 2704

Tower lighting products.

Circle (1091) on Reply Card

U

Ultimate Corporation 16869

Video compositing systems, the Ultimate 300, FORMATTE, SYSTEM 6, Ultimate 45 for mid-sized facilities; Matte Shading; Memory Head motion control; Ultimate 7 digital.

Circle (1092) on Reply Card

Union Connector 16435

Power distribution equipment, Polybox company switches, CS connector strips.

Circle (1093) on Reply Card

Unique Business Systems 16473

Productivity, business software; RentTrace rental equipment availability tracking.

Circle (1094) on Reply Card

UniSet Corporation 11701

Studio furnishings, sets.

Circle (1095) on Reply Card

United Ad Label 19119

Blank, custom printed format labels for laser, tractor-feed printers for audio, video formats; mailing, shipping labels; Windows labeling software; tape management, status labels; label adhesive remover; cable mark-

You asked for it.

DTR-313 Time Code Reader /Generator

LTC Generator • VITC Generator • Wide Band LTC Reader

VITC Reader • Character inserter • Slave • Slave to time code in user bits

Auto Sync Sense SMPTE/EBU/655-24 • User bit manipulation • Color Frame

Full Front Panel Control • Serial Remote Control • Local Display

Upgradable • All in one rack unit



GRAY built it.

Introducing the DTR-313. Eight fully upgradable standard configurations available. Custom configurations including component video available by special order. The DTR-313 is available NOW. Prices start at \$2805.00 list, including five-year parts and labor warranty.



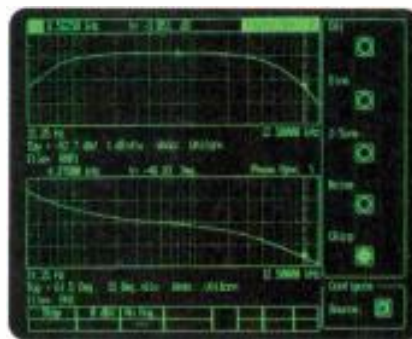
504 W. Chapman Ave., Suite P
Orange, CA 92668 • 714/997-4151

© 1991 Gray Engineering Laboratories, Inc.

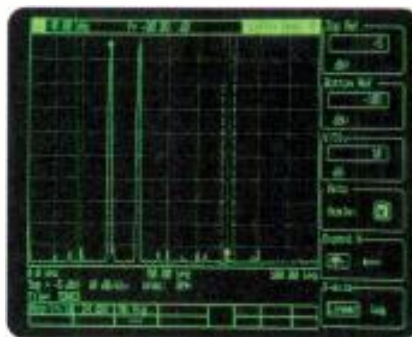
Circle (94) on Reply Card

Are you looking for an audio frequency FFT spectrum analyzer with ...

- ✓ 90 dB dynamic range?
- ✓ Frequency response measurements (Bode plots) to 100 kHz with 0.05 dB accuracy?
- ✓ THD, 1/3 octave, band and sideband analysis?
- ✓ A clean source that does sine waves, white and pink noise, frequency chirps and two-tone signals?
- ✓ 476 μ Hz to 100 kHz measurement range?
- ✓ An input range of -60 dBV to +30 dBV?
- ✓ Limit tables for GO/NO GO testing?
- ✓ Math functions, selectable windows and direct hard copy outputs?
- ✓ RS-232 & GPIB computer interfaces and a 3.5" DOS disk drive?



Using the SR770's low distortion (-80 dBc) synthesized source, Bode plots of amplitude, phase and group delay are quickly generated.



Intermodulation products as small as -90 dBc are easily measured with the outstanding dynamic range of the SR770.



1/3 octave, THD, band, sideband analysis and GO/NO GO testing bring power and flexibility to audio measurements.

Do you really need to spend \$15,000 for your next spectrum analyzer?

Not if it's the SR770.



SR770...\$6500 (U.S. list)



STANFORD RESEARCH SYSTEMS

1290 D Reamwood Avenue • Sunnyvale, CA 94089
TEL (408)744-9040 • FAX 4087449049

Circle (95) on Reply Card

The F. J. Westcott Company 15481
Illuminator reflectors; portable, collapsible
scrims & mags in customized kits; portable,
collapsible chroma key illuminator back-
grounds in green and blue.

Circle (1149) on Reply Card

Westinghouse

SURESINE active power line conditioner.

Circle (1167) on Reply Card

Wheatstone Broadcast Group

5108

Audio mixing consoles, A-6000 Air Master,
TV-600 master audio control console; signal
processing equipment; modular studio fur-
niture; digital audio hard disk system.

Circle (1150) on Reply Card

Whirlwind/US Audio

11627

Audio mixers, MIX5-SB 4-channel mixer; au-
dio, video cabling, distribution products;
transformers.

Circle (1151) on Reply Card

Will-Burt

19203

Telescoping masts, TMD-7-42-367 microwave
antenna support; 25' Hurry Up; AC Alert live
power line detectors for telescoping masts.

Circle (1152) on Reply Card

Winsted Corporation (M1715)

11927

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; re-
cessed monitor consoles; WELS software
program for designing modular Winsted fur-
niture.

Circle (1154) on Reply Card

Wireworks

13607

Audio, video utility products, T series indi-
vidual transformer isolated mic splitters;

System 502 A/V cabling components.

Circle (1155) on Reply Card

Wohler Technologies

19539

MSM multisource meters, ARS routers and
AMP series monitors; surround sound moni-
tor, digital VTR (AES/EBU) audio monitor.

Circle (1156) on Reply Card

Wolf Coach

16106

Mobile production vehicles.

Circle (1157) on Reply Card

World Broadcast News magazine (M706)

10359

WSI

13343

Weather data services, display products,
WEATHERSpectrum 9000 workstation.

Circle (1158) on Reply Card

X

Xaos Tools

M1329

Video graphics and digital effects software
for Silicon Graphics and Macintosh platforms.

Circle (1159) on Reply Card

Y

Y/C Plus

M1814

Solutions for Amiga/toaster users; Y/C Plus
S-VHS adaptor for toaster.

Circle (1160) on Reply Card

Yale Electronics

1714

Distributor; components; racks; panel, cable
connectors.

Circle (1161) on Reply Card

Yamaha Music

13840

Audio mixers; DMC 1000 digital automated
recording console; YPDR 601 compact disc
recorder.

Circle (1162) on Reply Card

Yamashita Engineering Mfg/YEM

17744

Video processing equipment, scan convert-
ers; digital EDTV decoder, sync generators;
distribution amplifiers; CG switchers.

Circle (1163) on Reply Card

Z

Zaxcom

19742

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-pro-
duction, broadcast; digital proc-amp;

Circle (1164) on Reply Card

Zero Stantron

13115

Modular equipment racks, consoles and cabi-
nets.

Circle (1165) on Reply Card

Zonal

16325

Audio recording tape and film.

Circle (1166) on Reply Card

Booth numbers shown are based on
information from NAB and the manufac-
turers as of Feb. 1, 1994. It is possible
that some numbers will have changed
by show time. We have no control over
such changes and regret any inconve-
nience it may cause.

iNFiNiT!, MAX & MAXINE TRAINING

*Basic class covers character generator functions
emphasizing on-line operations.*

*Advanced class includes TRANSFORM plus Image
Tools, Logo Compose, Advance Font Create and
Intelligent Interface.*

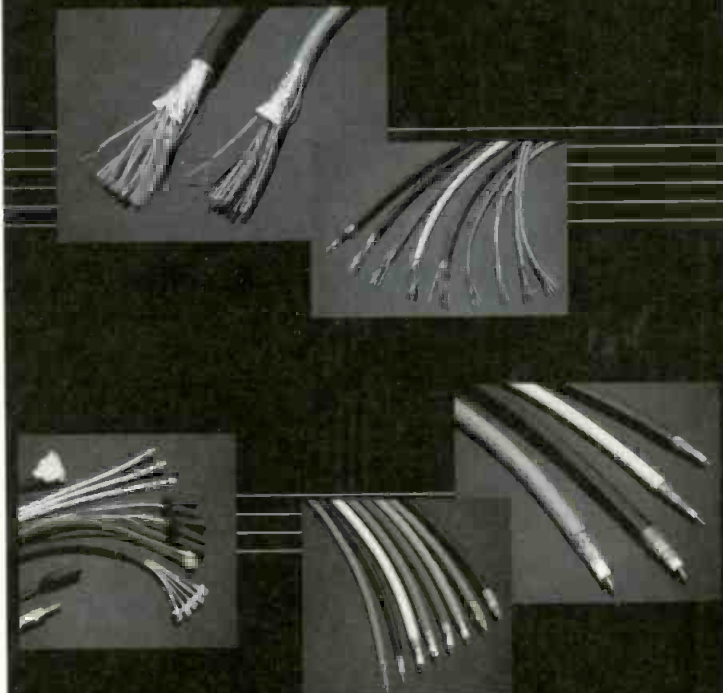
Clients include: Television New Zealand Network
WLS - Chicago
WKRC - Cincinnati
Citgo Petroleum - Tulsa

Driver Software Design

For more information ☎ 918/252-5640

Circle (98) on Reply Card

GEPCO INTERNATIONAL



Audio, Video & Broadcast Cable Products

2225 W. HUBBARD ST., CHICAGO IL 60612-1613
(312)733-9555 FAX (312)733-6416 (800)966-0069

Circle (99) on Reply Card

In broadcasting, Image and Power are everything.



BURLE is committed to providing a full range of camera and power broadcast tubes.

As television celebrates its Golden Anniversary, BURLE continues a 50 year tradition of broadcast technology leadership. We've supplied you with Vistacon, Saticon and Vidicon camera tubes since their introduction. And our power tubes are the industry standard for VHF TV.



BURLE supplies a wide variety of camera and power tubes for the broadcast industry.

It takes a domestic source like BURLE to maintain a half century commitment to producing and supplying a full line of broadcast electron tubes. From camera to transmitter, BURLE provides the tubes that keep the broadcasting industry on the air. Count on us to keep you supplied with the full range of broadcast camera and power tubes you need. Today and tomorrow. Contact your local BURLE broadcast tube distributor, or call us at **1-800-827-8823.**

Experience counts.

BURLE Electron
Tubes

Circle (101) on Reply Card

www.americanradiohistory.com

Field Report

Fujinon S16X lens

By Dick Hogg

KJRH, a Scripps/Howard station located in Tulsa, OK, firmly believes that in order to make television work, you must invest in your future. A project was just completed that revitalized the entire ENG department in hopes of winning broadcasting ground at the local news level.

An NBC news affiliate, KJRH TV-News Channel 2 travels throughout northeast Oklahoma reporting on local news stories. Though not a norm, photographers do travel into outlying areas for major news stories like the recent floods in St. Louis. An extensive sports department covers national sporting events, such as the Super Bowl and also supplies coverage of home games for the Kansas City Chiefs and the Dallas Cowboys.

In an area where traditionally, little money is invested by small stations, KJRH decided it was time to make a bold move.

Time for new equipment

To keep up with the station's demanding schedule, it was decided that older equipment could no longer suffice. This led to the discussions of new ENG camera acquisitions, which began in October of 1992. Through normal attrition, many of the station's cameras and lenses were no longer functioning properly. In an area where, traditionally, little money is invested by small stations, KJRH decided it was time to make a bold move.

The project was led by Vic Turner, director of engineering, and myself, and consisted of extensive evaluations of every camera available in the United States. The station had not bought a new camera in quite a while, so we felt that it was important that the cameras be used on assignment and then assessed.

Hogg is assistant chief photographer, KJRH-TV, Tulsa, OK.



Performance at a glance:

- Economical hand-held zoom lens
- Quality optics
- Uses aspheric technology
- Rugged, lightweight construction
- Smooth, quiet operation
- Designed for ease of use

Lens evaluation

It was decided the evaluation would consist of actual field use of the equipment. This would not only demonstrate functions and features of each camera, but would allow the user to experiment with handling and maneuverability — both of which are equally important.

With lenses playing such a major role in today's camera purchase, a number of decisions had to be made in the final stages of the evaluation. With cameras available in chip sizes of either 1/2-inch or 2/3-inch, it became important for the station to understand the differences between lenses. The station soon discovered that not every manufacturer made lenses attachable to every camera. By determining the lenses and cameras that did work together, the station was then able to choose the combination that would best suit its needs.

In the summer of 1993, KJRH decided that it wanted to continue using the M2 format and chose 1/2-inch chip Panasonic cameras. Lens evaluations began in October of 1993 and were recently completed. Although price was a concern, the station was also intent on finding a lens to provide the features and capabilities for which it was looking. After many hours of testing, the station decided that its lens of choice would be Fujinon's S16X6.7ERM.

Lens evaluation has become almost equally as exhausting as that of evaluating the camera. With technology bringing lenses to a new plateau, there are many considerations other than price to

be made when purchasing a lens. Most educated buyers understand that the image the camera is going to capture first comes through the lens, and thus, lens features and performance are of vital importance.

Lens evaluation has become almost equally as exhausting as that of evaluating the camera.

Evaluations of all products were extensive because this was a major project for us in expanding our ENG capabilities. We feel we have found the camera/lens combination that best fulfills the needs of our busy station. Service played a major role in our decision. When our equipment goes down, we need to know that we have the support system behind us to get it back in operating order. We had problems with that in the past and wanted to make sure that it would not be an issue.

This is one of the first stations that I have worked for that has truly invested in its ENG field equipment. Tulsa is the second largest city in Oklahoma and gets a good amount of national publicity. The station made an aggressive, proactive decision in making this idea a reality. We hope that others follow suit to get local news broadcasting back on the map.

Editors note: Field Reports are an exclusive BE feature for broadcasters. Each report is prepared by the staff of a broadcast 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 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 Fujinon S16X lens, circle (317) on Reply Card.



Not just a console... *a solution!*

Winsted consoles are designed to solve problems...to accommodate the specified electronics equipment, within space limitations, and within budget. This requires **design flexibility**.

Most manufacturers of electronics equipment racks just offer standard console designs. But Winsted's modular concept offers **greater flexibility**, both in the initial design, and later when new electronics require expansion of the system. And Winsted consoles are compatible with all major brands of video equipment.

Fast, easy assembly. Our exclusive interlocking tie-bar allows instant frame assembly, quickly and easily.

Strength, safety. Front and rear frames of extra heavy gauge welded steel hold valuable electronics securely.

Cost savings. Because we ship our products "flat-pak", freight costs are substantially reduced. This means flexibility with affordability.

Attractive options. We offer a wide range of custom consoles trimmed in real wood or custom color laminates to complement your facility.

An extraordinary GUARANTEE! All Winsted products are 100% unconditionally guaranteed for ten years.



FREE!
CABINET
DESIGN
KIT WRITE
OR CALL
TOLL-FREE

1-800-447-2257

Winsted®

THE WINSTED CORPORATION

10901 Hampshire Avenue So. • Minneapolis, MN 55438

TEL: 612-944-9050 • FAX: 612-944-1546

Preferred by Professionals Worldwide

Circle (30) on Reply Card

www.americanradiohistory.com

Field Report

Dorrough Model 1200 stereo signal test set

By Dennis R. Ciapura

Stereo audio signal monitoring at radio and TV stations is one of the more subjective areas of broadcast engineering. Some engineers prefer oscilloscope monitoring, some like comprehensive metering and some insist on both. A scope display of a Lissajous pattern yields an instantaneous overview of signal status, while a metered display provides quantified data. For those who want easily interpreted metering, the Model 1200 stereo signal test set is probably the ultimate utility.

Figure 1 shows a block diagram of the Model 1200. The inputs can be accessed either through rear panel screw terminal strip connections or via loop-through XLR connectors. This loop-through feature is convenient because it allows for easy insertion of the instrument in an existing rack-mounted system. The input circuitry is active balanced with 40k input impedance, which ensures negligible loading and ease of interface. When properly installed, the test set should be an electrically transparent addition to the system.

Ciapura is executive vice president of Noble Broadcast Group, San Diego.



Circuit description

After the input buffering, sum and difference audio signals are derived from the left and right inputs. The input amplifiers have 30dB of gain, but unity gain can be selected using the "high" position of the range control. The function selector then feeds either left and right or L+R and L-R to the attenuators and meter drivers. Audio monitoring is available from stereo phone jacks located on the front and rear panels. The front-panel jacks are fed from an additional booster stage to provide a full 1W output to drive headphones or small speakers.

The main attenuator is a high-quality, ganged, 1dB per step unit, calibrated in dBV. With 40dB of meter scale resolution, 30dB of step attenuation and 30dB of ranging, the test set provides 100dB of test and measurement scaling. This makes noise and crosstalk measurements easy to perform and ensures that enough attenuation is available to handle even the most monstrous levels.

Unique metering capability

The meters are a combination of true

peak and average indicators in the same display. A solid LED bar arc traces the average level, while peak amplitudes are indicated by a single higher LED segment whenever the peak value exceeds the average amplitude. With pure tone inputs, the displays merge and the peak response is fast enough to show a 3dB peak-to-average differential with a triangular input. The LED scale is green up to -10dB. From -10dB to -1dB, it's yellow, and from 0 to +3dB it's red. This correlates well to typical broadcast audio, which normally exhibits peak levels approximately 10dB above the average level.

With the test set, the peak-to-average ratio is immediately apparent. Although Dorrough labels the meters "Relative Loudness to Peak Modulation," and peak-to-average ratio is certainly a key component of loudness, there is no frequency-dependent weighting. In fact, the metering response is flat from 50Hz to 15,000Hz, with -3dB points at approximately 10Hz and 50,000Hz. The difficulty in arriving at response weightings for loudness representation lies with the response of a listener's reproducer and acoustic environ-

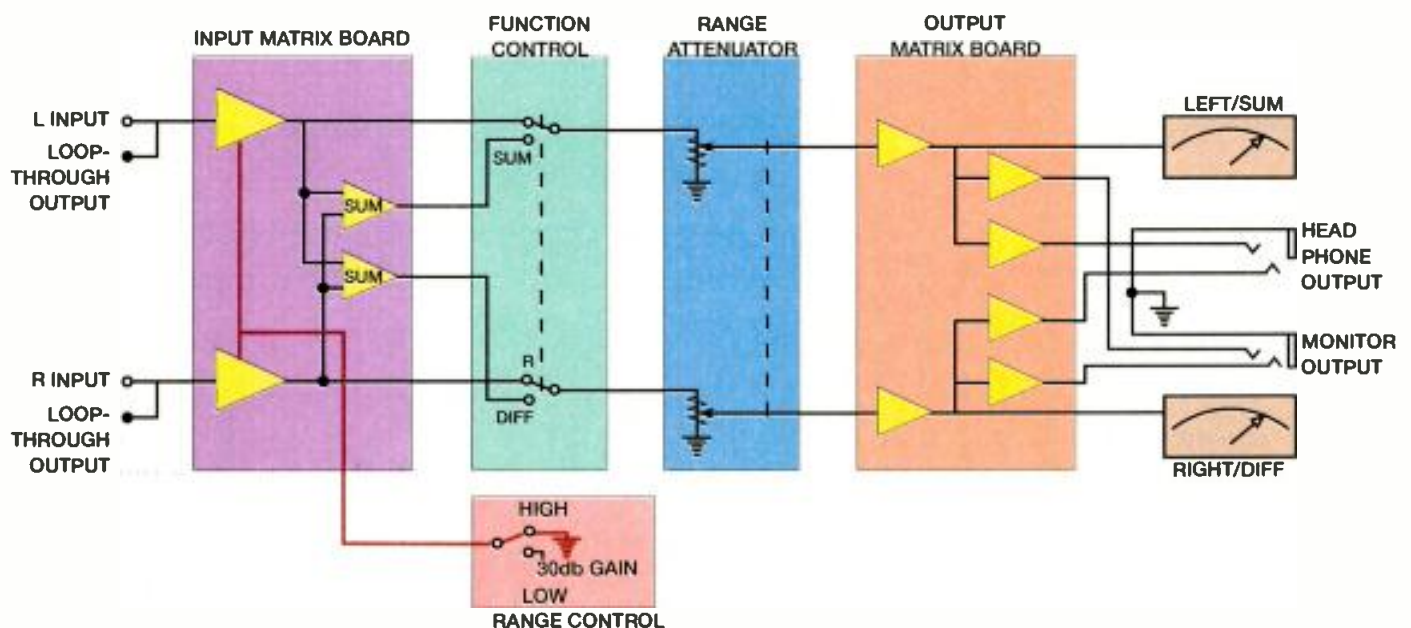
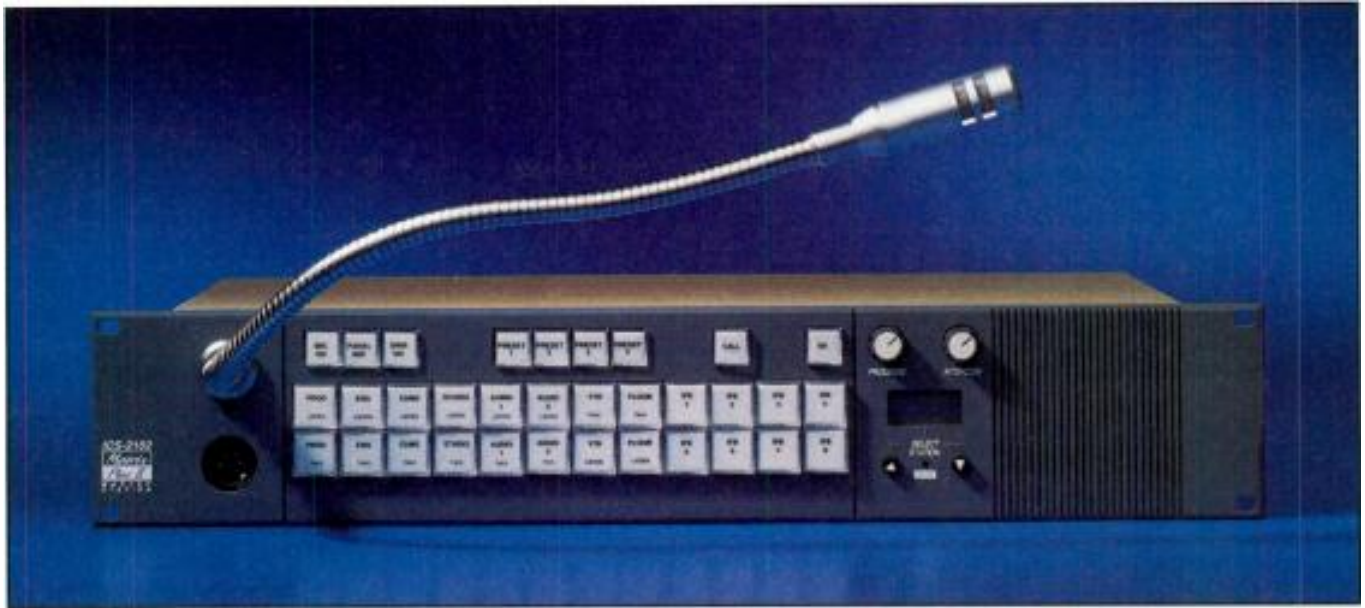


Figure 1. A block diagram of the Dorrough Model 1200 stereo signal test set.



The new ICS-2102 push-button master station.

Matrix Plus™ II... Absolutely the best in television intercom systems.

Our system continues to expand with new stations, interfaces, and software features to further broaden your ability to communicate under a wide range of



The Matrix Plus II interface modules.

situations. Matrix Plus II—a truly integrated, **100 x 100 digitally-controlled** intercom with stations for every application, a comprehensive modular interface system, and simplified PC pull-down menu programming. Exclusive features include



The Matrix Plus II connects to a variety of intercom stations.

"Intelligent System Linking", paging, call-signalling, IFB, ISO, DTMF dialing, **DTMF inward access**, variable crosspoint levels and many other sophisticated features. There's also **versatile station communications**.

Long line remote capability. Fully-digitized **single pair wiring** plus much more, including the highest level of service and support in the industry. Want all the details? Call us at 510-527-6666.

Matrix Plus™ II
FROM CLEAR-COM INTERCOM SYSTEMS

See Us at NAB!
Booth #18015

WHEN QUALITY COUNTS



**It has to be apt-X100 -
the only true single chip
audio compression
solution - adopted by
the world's leading
manufacturers of
broadcast equipment.**

In professional broadcast, telecommunications and recording applications, the benefits of APT's predictive audio compression system are clear. Higher resistance to tandem coding errors, lower coding delay and a higher immunity to data errors mean less noise - so if you need to exploit the advantages of compression without risk - you'll be using the most appropriate solution. For details of both single chip and board level solutions - call APT.

Audio Processing
Technology
Edgewater Road
Belfast BT3 9JQ
Northern Ireland
Tel 0232 371110
Fax 0232 371137

Audio
Processing
Technology



Audio Processing
Technology
6255 Sunset Boulevard
Suite 1026
Los Angeles
CA 90028 USA
Tel 213 463 2963
Fax 213 463 6568

apt-X and  are registered trademarks of APT

Circle (104) on Reply Card

ment, which must be known for true loudness data to be accurate. Thus, most broadcasters are better served with an unweighted peak-to-average indication. Users with specialized applications in mind can apply the desired weighting to the input audio.

Scale accuracy of the test sample was better than 1dB over the 40dB range. That may not seem exceptional until you consider trying to resolve a standard VU meter reading within 1dB below the -20dB mark on the scale. The persistence time constant of the LED average level bar arc is slower than standard VU ballistics, but most program material produces average level indications within about 1dB of a VU indication for the same peak value.

Typical applications

Best uses for the test set fall into two broad categories: studio audio path monitoring and off-air evaluation. In each application, use of the test set potentially yields better audio, but in different ways: For studio applications, this improvement comes from minimizing the likelihood of audible channel balance and phasing problems, while with off-air monitoring it is useful for maximizing audio processing efficiency. Stereo TV and radio studio audio chains are subject to numerous aberrations that can easily go undetected. Mono sources should stay mono without interchannel phase and amplitude variations as they pass through the system.

It is difficult to provide a scope display that is useful to typical operating personnel. This is where the test set's ability to provide easily interpreted quantitative data is of value. For example, in a typical stereo TV application, using the device in the L+R/L-R mode can provide extremely useful information about what's happening with the audio as the control room switches through the array of mono, stereo and synthesized sources that are so much a part of today's program schedules. If a synthesizer that is supposed to switch out during real stereo programs gets stuck in the synth mode, the L-R display will show significant level during dialog when it should be near zero. It is easy to instruct the operators to notify engineering if the L-R meter is jumping into the yellow during a sitcom's dialog. It's another to hope that they will pick it up from a scope pattern. Channel phase inversions also are simple to spot because the L+R display goes nearly dead and the L-R jumps up.

One interesting radio application of the Model 1200 is for adjusting signal processing gear. As compression is increased, the average level will increase up to a point and then level off. More processing produces more artifacts and only slightly more loudness. One reason that so many stations sound over-processed is that they have never found this "sweet spot." The peak-to-average ratio for the station's actual program material is easily monitored with the test set, and it is obvious when the point of diminishing processing returns is reached. It also can be used to quantify what is happening with levels in a market, and its display is easy for non-engineering staff to interpret.

Overall, the Dorrough Model 1200 stereo signal test set is a pleasure to work with. It easily performs some functions that are awkward with other test equipment. It is fast and simple to use, and straightforward in design.

Editor's note: Field Reports are an exclusive *BE* feature for broadcasters. Each report is prepared by the staff of a broadcast 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 disapproval by *Broadcast Engineering* magazine.

➡ **For more information on the Dorrough
Model 1200, circle (315) on Reply Card.**

ENERGY SAVING EEV IOTs

...the tubes with the proven track record!

EEV has been a prime mover in energy efficiency improvements throughout its involvement in the US UHF television industry. One of the most recent technologically advanced products added to the EEV range is the high power UHF TV IOT. In addition to its energy saving features, the EEV IOT has shown that it is ideally suited to combined amplification transmitters for conventional NTSC service, together with the requirements of digital HDTV transmission.

EEV IOTs follow the Company's established philosophy of providing customers with products that are user friendly, while satisfying their technical requirements. This, together with applications engineering support and a reputation for service second to none, has established EEV as the market leader.

Why not contact EEV today to find out how you can save up to 50% on your electric power bills.



IOTs are presently available for 40kW and 60kW visual service and combined amplification powers of up to 42/4.2kW.

EEV Power Tubes

USA: EEV Inc, 4 Westchester Plaza, Elmsford, NY 10523
Telephone: (914) 592 6050 or 'Toll Free' 1-800-DIAL-EEV
Fax: (914) 682 8922

UK: EEV Ltd, Waterhouse Lane, Chelmsford, Essex CM1 2QU, England
Telephone: (0245) 493493 Fax: (0245) 492492

CANADA: EEV Canada Ltd., 67 Westmore Drive, Rexdale, Ontario M9V 3Y6
Telephone: (416) 745 9494 Fax: (416) 745 0618

FRANCE: EEV France, Division Tubes Electroniques et Optronique de GEC France s.a,
2 Rue Henri Bergson, 92665 Asnières, Cedex
Telephone: (331) 4080 5400 Fax: Paris (331) 4733 1131

Subsidiary of the General Electric Company plc of England **SBC**

See us at NAB Booth # 16663.

Circle (105) on Reply Card

Applied Technology

KUB Systems DANCE



By Mark Lapin

Short-form compositing and editing systems are approaching strategic crossroads, and potential purchasers are questioning which way to go. On the one hand, dedicated boxes designed to perform video processing tasks with a high degree of efficiency have dominated the market for the last 10 years. On the other hand, general-purpose platforms have

DANCE breaks new ground between dedicated boxes and general-purpose platforms.

been growing steadily more powerful. The new generation of Silicon Graphics and Macintosh Quadra platforms are now capable of running animation and compositing software offering many of the features once reserved for dedicated machines.

The future clearly belongs to general-purpose systems, which are creating a downward price pressure that will eventually drive more expensive dedicated equipment out of the market. As things now stand, however, there are advantages to both sides. Dedicated solutions still hold a significant edge in speed and power, while general-purpose, software-driven platforms offer benefits in price, flexibility and user-friendliness.

The viewing audience, meanwhile, has become sophisticated and demanding in terms of effects quality. Lower production budgets no longer justify amateurish output, at least not in the eyes of the beholder. Even corporate and industrial videos must compete with the video gymnastics seen in high-profile commercials and network IDs.

In this complex situation, KUB Systems of Foster City, CA, has developed a digital animation and compositing system designed to give users the best of both worlds. The company's objective was not to produce a middle-of-the-road compromise, but to offer a genuine middle ground — the speed and power of dedicated processing with the economy and convenience of general-purpose platforms, integrated in both a philosophical and technological sense.

A dedicated/general-purpose hybrid

The KUB product is called *DANCE, the Smart Choreographer*. DANCE stands for Digital Animation Compositing and Effects. The system manipulates and composites multiple static images and live video inputs simultaneously in 3-D space at full resolution and in real time. Its operation is designed to give the user a previously unattainable degree of spontaneity and freedom in the creation of effects.

The system offers two flagship features: object-oriented compositing without layers using z-depth management and hierarchical global control. Unavailable even on top-end dedicated systems, these features allow the operator to freely move images in 3-dimensional space without

KUB Systems has developed a digital animation and compositing system that give users the best of both worlds.

regard to the sequence of layers.

The DANCE system is a hybrid that uses a dedicated box to perform video processing in real time and a general-purpose platform (the Macintosh Quadra) to provide a mouse-driven, graphical environment for operators. Real-time digital

animation and multi-image compositing thus become Mac-resident applications; a fact that will appeal to many operators who see themselves as artists first and computer-jocks second.

The DVE engine

On a hardware level, a fully-configured turn-key DANCE system consists of a Macintosh Quadra (with keyboard, mouse and 20-inch display), a dedicated box (or *object-oriented digital video effects [DVE] engine*) that handles all video processing functions, plus one background and three foreground live video inputs with their associated keys.

Full 10-bit, D-1 quality is used for both input and output. External devices, such as VTRs and digital disk recorders (DDRs)

Full 10-bit, D-1 quality is used for both input and output.

are controlled by a V-LAN network, RS-422 slave or GPI trigger. The full system has five framestores — two for static images and three for live video. Images are loaded into the framestores from live input channels or from Adobe Photoshop files. All framestores can be used to hold a single full-screen graphic, or they can be segmented to hold as many smaller images as can fit in the total buffer space. The DVE engine looks at the framestores in an object-oriented fashion, which means that you can select one, all, or any combination of objects (live or stored) for manipulation.

During manipulation, the image elements are simultaneously composited and layered over the background. A lower-quality RGB signal is fed into the Mac, so that a representation of the video effect can be displayed on the screen at computer resolution with an overlay of appropriate handles and icons related to specific control functions. An ethernet

Lapin is a technical writer and editor based in San Francisco. Respond via the BE FAXback line at 913-967-1905.

"And now back to live coverage of..."

Imadeos: images on demand.



OPERATING

Imadeos. New world, new solutions.

Keep the competitive edge !

In an industry led by rating points and so-called viewer loyalty, being able to broadcast events live from anywhere in the world is no longer a luxury, it's a necessity !

To keep a competitive edge, depend on Imadeos global broadcast services from France Telecom.

Imadeos links you to the world in ways you never dreamed possible.

We operate globally to bring you fast and flexible coverage of news and special programming events. For remote and mobile broadcasts, we give you access to our fleet of transportable and fly-away stations, in addition to permanent uplink facilities. We also provide full-time, permanent network management services.

Our goal is to give you access to images, 24 hours a day, anywhere in the world.

Contact us today

to discuss your business needs

Tel. : (33) (1) 43 42 97 99

Tel. : (33) (1) 44 61 47 00 (Booking)

Fax : (33) (1) 42 71 07 89

Circle (106) on Reply Card



France Telecom

link sends commands from the Mac to control the dedicated hardware.

The developers of the system felt there were two traditional approaches to video compositing — the editor's approach and the artist's approach.

Editing the artistic way

The developers of the system felt there were two traditional approaches to video compositing — the editor's approach and the artist's approach. Both aim at creative results, but the methods of getting there are extremely different. The editor's approach uses dedicated keyboards, buttons, switches and numerical controls. The artistic approach is more graphic, more intuitive, and less number-oriented. The major problem in either case is staff training. Each facility has its own way of doing things, which operators have to master more or less from scratch. Training time is scarce, however, because owners need to keep equipment constantly in use to maximize their investment.

DANCE offers a synthesis of competing approaches on a hardware level, but in terms of user interface, the developers have come down squarely on the artistic side. The goal was to make an interface similar to popular programs like Photoshop so that users who know Macgraphics can get up and running on DANCE within hours. Full compatibility with Photoshop also allows clients to bring images developed for print ads or brochures into their video effects.

The system's interface is designed to show all relevant information on one screen without overloading the operator. In all compositing, the user is constantly dealing with two domains — space and time. The user-interface for DANCE essentially lets you stick your hand into the time or space domain, grab the object you want and manipulate it at will. If you want to rotate an image, you reach into the animation window and turn it. If you

want to move an object in time, you point to the desired position on the time-line and double-click the mouse.

Dancing through layers

Compositing without layers is the prime example of how DANCE takes the difficulty out of a once-complex process. Video compositing began approximately 10 years ago with the advent of DDRs. The great advantage of digital was that it allowed compositors to add layers without losing resolution. The great limitation of disk recording was that you were stuck with the layers you added. If you were going to do something with 50 layers, you had to plan them, build them and respect their priority. If you wanted to get some-



DANCE from KUB Systems includes a Macintosh Quadra with 20-inch display and a dedicated digital video processing box.

thing done quickly and economically, objects tended to stay in the layers to

The system's interface is designed to show all relevant information on one screen without overloading the operator.

which they were first assigned. DANCE not only gives you the ability to mimic the way a DDR layers, but also provides advanced 2-deep compositing capabilities.

DANCE is designed with a hardware engine that looks at all images at once in an object-oriented, time-shared fashion. Nothing is being recorded or re-recorded. It's all done on the fly. The software/hardware interplay gives users the ability to grab an image and move it forward or backward in 3-D space. This Z-depth

capability allows you to change the priority of objects on the fly without worrying about which layer they are on.

Meanwhile, the system's global control feature simplifies difficult animation

The system's global control feature simplifies difficult animation moves.

moves. It allows the user to join multiple objects together and manipulate them as a group, without altering the movements of individual objects within the group.

Straddling the fence

One way to measure DANCE against other compositing and animation effects systems is to evoke the familiar Mac-to-DOS comparison. Dedicated systems fall into the DOS category, not because they give you less capability and power, but because they require you to issue specific, non-intuitive commands. DANCE has taken the "friendliness" of the Mac and applied it to a new realm. The concepts

incorporated in the system are not revolutionary, but their application in the video industry is new.

Every system has its limitations, of course. DANCE is offered as a turn-key product. The user-interface software is highly expandable, offering access to current and future Mac applications, but the system's dedicated video processing hardware has certain built-in limitations in terms of processing power, layers, objects and inputs. Nevertheless, for the majority of users who have been weighing the advantages of today's dedicated vs. general-purpose platforms, DANCE provides a welcome compromise. Designed to provide advanced real-time compositing, animation and effects, DANCE systems sell for under \$70,000.

➡ For more information on KUB Systems DANCE, circle (320) on Reply Card.

Compact UHF wireless...



...by the best in the business.

The new 195 Series introduces a transparent audio quality that has never been available from any wireless manufacturer, in studio or field production wireless systems.

A revolutionary dual-band compandor system eliminates pumping and breathing and keeps envelope distortion at incredibly low levels.

Wide deviation ($\pm 75\text{kHz}$) with the dual-band compandor eliminates the need for conventional pre-emphasis/de-emphasis, producing a wide, perfectly flat frequency response.

Surface mount technology is integrated with precision mechanical assemblies to keep the overall size to a minimum. This preserves the overall ruggedness which is our hallmark.

We urge you to directly compare this new UHF system with any other wireless system, compact or full size, at any price, from any manufacturer. Compare RF selectivity and IM rejection, operating range or thermal stability. Compare overall audio quality. When you do, be prepared to experience something clearly superior to what you have been using.

This is a wireless system that doesn't sound like a wireless system. Isn't that what you'd expect from the best in the business?

Call for more information:

800-821-1121

Made with Pride in the USA



LECTROSONICS, INC.

581 Laser Road, Rio Rancho, NM 87124
FAX (505) 892-6243
USA

Circle (80) on Reply Card

There Is No Substitute For ShibaSoku Accuracy



*Make no mistake. Superior test instruments are built
by the creator of the finest video monitors — ShibaSoku*



TG76AX—High Stability, Modular Multi-Format Digital Video Test Generator. Ideal for R&D and Broadcast quality Digital equipment evaluation.

- + Primary oscillator fsc accurate to ± 1 Hz
- + Standard Analog Formats (12 bit D/A converter)
NTSC-M/PAL-B,G,D,I and 525/60 & 625/50 video
- + Provides optional Digital Video/Audio signal outputs
(CCIR601, SMPTE 244M & 259M)
- + Optional Digital Video/Audio Generation, 10 bit 4:2:2
Component Digital Signal output, 4fsc NTSC Composite
Digital Signal output, AES/EBU Digital Audio output
- + All optional signals can be generated simultaneously



TG21A1—Modular NTSC TV Signal Generator.
Perfect in TV or VCR plants and R&D.

- + 12 signal waveforms
- + High stability, 10 bit/word digital signal data
- + Optional PAL module and monoscope pattern, component
video, Y/C separate video, and black burst output
- + Each optional signal can be generated simultaneously
- + GENLOCK performance and GP-IB interface is standard



TX20AX—Multi-Standard Video Signal Analyzer
affordably accommodates 4 video formats; Composite (VBS) & Component (Y, R-Y, B-Y) video, RGB and a separate Y/C video signal.

- + NTSC/PAL automatic selection
- + 15 measurement functions available — signal level, chroma
phase, frequency response, DG/DP, Y/C delay, S/N etc.
- + Measuring points are variable — 36 pattern memory
- + Easily computes sum, average, max/min point output

*Building acute accuracy for the true professional
in broadcasting, electronics manufacturing and
leading production houses worldwide has been our
#1 priority through 40 years. ShibaSoku's straight-
forward, rugged engineering is why so many users
keep our instruments On-Line for over a decade.*

*Know the equipment that gives Lasting Accuracy.
Circle the reply card number below.*

See You At NAB '94 — Booth #16619



Asaca/ShibaSoku Corporation of America
12509 Beatrice Street, Los Angeles, CA 90066
(310) 827-7144 Fax (310) 306-1382

Circle (174) on Reply Card

New Products

Digital non-linear editing system

By AVID Technology

• **Media Composer 1000:** now includes a draft-image resolution option, Avid Video Resolution (AVR) 2, that allows users to digitize large amounts of material into the system and edit at a storage-efficient image resolution; users can batch-digitize completed programs at the system's on-line image quality for output directly from disk; features time-line editing, a large trim mode, a customizable user interface, real-time programmable transitions, digital video effects, 24 tracks of 44.1kHz CD-quality audio, eight video tracks for layering, and MediaLog (allows logging to be done off-line on a Macintosh or PC); exports standard EDL formats and supports the Open Media Framework Interchange for seamless exchange of digital media.

Circle (243) on Reply Card

TV graphics system

By BTS

• **Rio Quattro:** a compact A/B/C roll edit-controller, and the basic Rio editing system, a fully assembled A/B roll edit-controller with control over a broad range of VTRs, including S-VHS, MII, Betacam 2000 Pro, Betacam SP, D-1, D-2 and D-3.

Circle (240) on Reply Card

Communications packages

By Advent

• **Integrated communications equipment:** a range of equipment including modems, framing units, multiplexers, codecs, up-and-down frequency converters, SSAs, TWTAs, couplers, combiners, splitters, remote controllers or any other specified equipment; all 19-inch rack-mountable or packaged in rugged flight cases for protection against shock, vibration and harsh conditions.

Circle (244) on Reply Card

Degausser

By RTI

• **M110:** belt-assisted, table-top eraser for metal and oxide magnetic media; removes time code, audio, video and digital information; performance exceeds -75dB erasure of high-energy metal tapes; -90dB erasure of standard oxide tapes; has a high/low control that conserves power; current and thermal protection, low-voltage control circuitry and focused cooling.



Circle (245) on Reply Card

Linear editing systems

By BTS

• **Video Gallery:** a broadcast-level TV graphics system geared for the production of 3D animation, modeling, painting and image retouching, digital layering, character generation, high-speed rendering and high-capacity storage; mounted on a Macintosh Quadra platform; offers more than 1Gbyte of on-board disk storage and open architecture; comes with Adobe Photoshop 2.5 and Fractal Design Painter 2.0; includes outputs to composite, S-Video, RGB, YUV (Betacam), D-1 and HDTV.

Circle (250) on Reply Card

Change your tune, transmit in Digital.

Without having to change your old analog aural STL.

- 4 high quality audio channels.
- 1 data channel.
- 1 RDS channel.
- 2 SCA channels.
- Direct AES/EBU connection.
- Multiple hops.
- Reduction of interferences thanks to the exclusive CDB™ system.

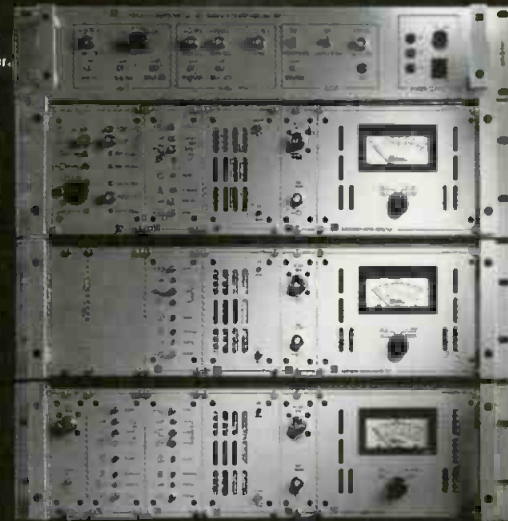


Install the new DB Elettronica TD4/16 and RD4/16 digital Coders-Decoders, totally compatible with any analog FM aural STL. Without having to replace already existing equipment, you will be able to transmit a practically perfect digital signal devoid of interferences. In fact, the stereo separation, the S/N ratio and the distortion of TD4/16 and RD4/16 are just like those of CD players and remain unchanged regardless of the number of STL hops. Furthermore, you will have up to 4 high quality audio channels, together with a data channel and an RDS one.

With DB Elettronica the technology of STL really changes your tune.

A World of Quality Behind your Image.

- VAM C1
High performances
Stereo TV Modulator.
- MTU / 5"
Wideband modulator
TV transmitter
Band I-III-IV-V.
- IFU / 5"
Modular IF-CH
TV converter
Band I-III-IV-V.
- CCU / 5"
Modular TV
Transposer
Band I-III-IV-V.



DB Elettronica product line is designed in compliance with the most strict international standards employing an advanced technology of modular construction. The result is equipment of very high reliability and simple maintenance. DB Elettronica is a world of quality behind your image.

Circle (134) on Reply Card



DB Elettronica Telecomunicazioni S.p.A. - Via Lisbona, 38 - Zona Industriale Sud - I 35026 Camin - Padova - Italy
Tel. + 39 - 49 - 8700588 (3 line) - Fax + 39 - 49 - 8700747 - Telex 431683 DBE I

A LOT GOES INTO BUILDING THE BEST... *LIKE QUALITY*

100% Solid State YES

For High Reliability and
Economical Operation

Modular Configuration .. YES

Accessibility, Soft
Failure Capability
Ease of Maintenance

Separate Visual Aural Amplification YES

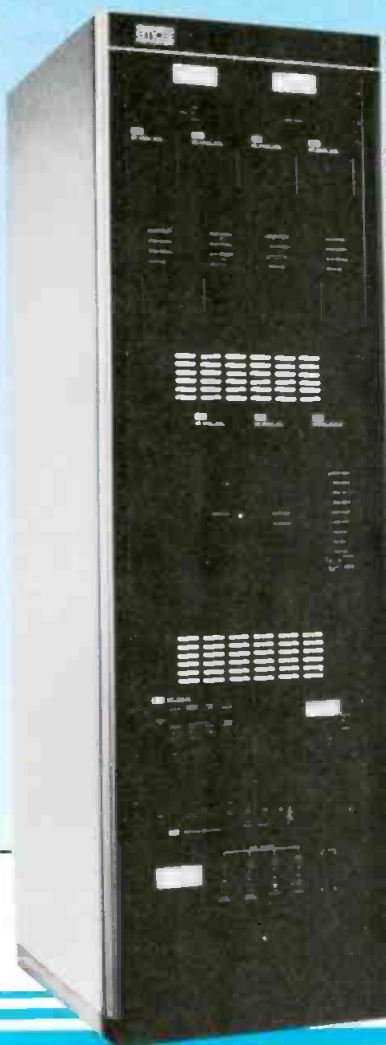
Eliminates In-Band and
Out-of-Band Intermodulation

Superior Cooling YES

Redundant Fans in each
Amplifier Module to extend
service life

Full Power YES

The only Transmitter with
Individual Power Supplies in
Every Amplifier Drawer



Have you ever calculated the cost of NOT having high quality? The cost of breakdowns, the high cost of repairs, lost ad revenues, extra phone calls, headaches, and frustration because of dead air time! Since 1960 EMCEE has supplied the world with durable, reliable, low and medium power UHF and VHF transmitters and transposers from 1 watt to 5000 Watts.

SAY YES TO QUALITY.

Model TTU1000ES
1000 Watt UHF
Transmitter



EMCEE

EMCEE Broadcast Products P.O. Box 68, White Haven, PA 18661
800-233-6193 or 717-443-9575 FAX 717-443-9257

New Products

Large-diaphragm condenser mic

By AKG Acoustics

• **C3000:** the mic offers switchable polar patterns, cardioid and hypercardioid; features include an internal windscreen, a rugged housing with an internal shock mount, a switchable -10dB pre-attenuation pad for extra headroom and a bass rolloff switch.



Circle (251) on Reply Card

Lens software/Brochures

By Fujinon

• **Select-a-Lens software:** the user plugs in coordinate and the software computes field-of-view, depth-of-field and more, then indicates the best lens for the applica-

tion; disk is free to Fujinon lens owners (have model number and serial number available).

Circle (249) on Reply Card

• **ENG lens brochures:** two brochures; one has six pages of photos and specifications on 11 lenses, lens accessories and comprehensive configuration drawings demonstrating which accessories are needed for specific systems; second brochure has three pages focusing on Fujinon's ENG lenses, includes color photos of lens with complete specifications on each, plus a page of lens accessories

Circle (236) on Reply Card

Software

By EDX Engineering, Inc.

• **Version 1.2 of MCS:** an IBM-PC compatible program to predict multipath degradation of digital broadcast signals.

Circle (291) on Reply Card

Acoustical Foam

By illbruck



• **Sonex 1:** a flame-resistant alternative for noise reduction and acoustic control; based on an anechoic-wedge design that traps and deflects noise; meets all class-1 building requirements and can withstand constant temperatures up to 302°F; available with hypalon coating to repel oil, acid and solvents.

Circle (258) on Reply Card

MPEG 2 - The rumours are true NTL has done it again!

After leading the field in the design and development of video compression with the world renowned System 2000, NTL has done it again!

We will be demonstrating our MPEG 2 capability at NAB '94 and describing the features and specification of this new generation of compression products which will bring even greater economy to the distribution of video, audio and data services.

Find out more on stand **17346**, NAB '94

NTL Crawley Court Winchester Hampshire United Kingdom Tel: +44 962-822243

Circle (136) on Reply Card



New Products

Multiple video windowing system

By RGB Spectrum



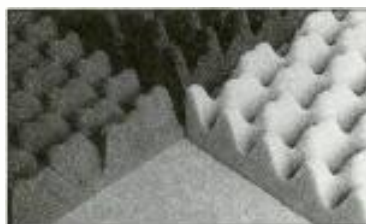
• **SuperView:** displays up to four real-time video windows on a single high-resolution monitor; each window can be positioned,

scaled to full screen, overlaid with computer graphics or overlapped with other windows; accepts NTSC or PAL composite video and Y/C signal from up to four cameras, tape recorders, videodisc or teleconferencing systems simultaneously; accepts high-line rate video signals from FLIR and medical imagers; optional X.TV software provides full integral under X Windows.

Circle (255) on Reply Card

Foam panels

By NetWell Noise Control



• **Acoustical wedge foam panels:** absorb unwanted sound reverberation; 24"x48" panels are available in a variety of thicknesses; AW4 panels offer an NRC value of 1.25; also available in other sizes, with different facial convolutes.

Circle (256) on Reply Card

Product catalog

By Tektronix

• **1994 test and measurement product catalog:** provides test and measurement product specification information, including a 4-color section that introduces new instruments, accessories and enhancements and an applications spotlights section that profiles unique features.

Circle (257) on Reply Card

Videodisc

By Optical Disc Corp.

• **Recordable digital videodisc:** makes possible the permanent storage of for hours of broadcast-quality (8-bit, 4.5MHz bandwidth) digital video or one hour of digital HDTV on a single side of a 12-inch recordable disc; suited for mass-storage requirements of video servers or for program delivery for satellite uplink, video-on-demand, interactive television and commercial video displays.

Circle (260) on Reply Card

Image-processing animation

By Xaos Tools

• **Pandemonium 2.0:** improves the performance of Pandemonium, providing increased speed and efficiency for video production and post-production professionals, broadcast designers, animators and artists, and desktop video producers; provides users with a sketch mode for preview and rendering of images and animations faster at lower resolutions; has an enhanced function tool for greater control through precise spline path editing of the parameters of effects.

Circle (259) on Reply Card

9.5" x 2.5" x 1"

Remote Control By Telephone

Control 10 latching relays and check 10 logic-level inputs from any touch-tone phone. User determined access code. **Just \$339.00**

CONEX ELECTRO SYSTEMS
P.O. Box 1342 Bellingham, WA 98227

1-800-645-1061

Circle (160) on Reply Card

For AM, FM, SCA and TV modulation monitors.

WHEN ACCURACY COUNTS...COUNT ON...

Call (610) 687-5550 or write for more information on Belar Am, FM, Stereo, SCA and TV monitors.
FAX: 610-687-2686

BELAR
ELECTRONICS LABORATORY, INC.
LANCASTER AVE AT DORSET DEVON PA 19333

NAB Booth #2508

Circle (129) on Reply Card

Master Control Spot Playback

The way it is.

- Tape-based mechanical devices
- Thousands of moving parts
- Complex robotic arms
- Constant maintenance required
- High purchase price
- Reliable as a weather forecast

The way it should be.

- Digital Hard Disk Storage
- Random Access Spots/Bumpers/IDs/Stills
- Non-Linear Spot Playback
- Betacam Quality (or better...)
- Visually Lossless Compression
- **AFFORDABLE** (the bold type is significant)

Introducing

FASTBREAKTM DIGITAL SPOT PLAYBACK SYSTEM

Broadcast quality? Some disk-based systems claim it. We guarantee it. With a compression engine that supports high data throughput for visually transparent playback.

Construct breaks manually, or download playlists from mainframe or PC-based traffic systems. Adds and Kills can be automatic or manual. We even support simultaneous multiple channel playback for cable head-ends – and for the broadcast "Superhighway".

The screenshot shows the FASTBREAK DIGITAL software interface. At the top, there's a 'Cue Event' window with buttons for 'Play', 'Play All', '50:00', 'SET GO', and '1:50:00'. To the right is an 'Event List' table. Below that is a 'CONTRACTS/STATION' window with a table of events.

#	Event	Title	DIR	CLR
1	SPOT	Soft & Sri	30:00	
2	SPOT	Just for the Jasio	30:00	
3	PROMO	MTV Music Awards	15:00	
4	SPOT	THRILLER: The Cutting	30:00	
5	ID	News at 10:00	5:00	

STATION	EVENT	TITLE	IN	OUT	COMMENT
1	SPOT	Soft & Sri	1:50:00	30:00	Chills Robert to look-alike
2	SPOT	THRILLER: The Cutting Edge	1:30:00	30:00	announced cassette release
3	PROMO	Top 100 Countdown	2:10:00	15:00	video Top 21 countdown
4	PROMO	MTV Music Awards	2:15:00	15:00	Prize, red carpet on the red
5	SPOT	Just for the Jasio	2:30:00	30:00	Public Address/MTV
6	SPOT	MTV Music Awards	2:30:00	30:00	Yamaha Sports
7	PROMO	MTV Music Awards	2:30:00	15:00	MTV Music Awards
8	ID	News at 10:00	3:45:00	5:00	MTV Music Awards

Best of all, it's easy to integrate the technology with your current equipment as you make the "digital transition". Use FASTBREAK for redundancy, for creating Break Tapes, or as a buffer from your cart system to Air.

Oh yes... the bold type is significant (**AFFORDABLE**).

Prices for a two hour storage/playback system begin **under \$50,000**.

FASTBREAK DIGITAL. It should be in Master Control

NAB Booth #19105

New Products

Battery-pack tester

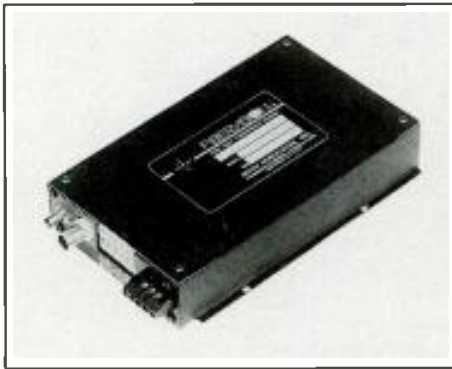
By K.P. Systems

- **BET-5001:** indicates energy-level percentage remaining using an LED display within 10s; a stand alone unit small enough to fit in a shirt pocket.

Circle (263) on Reply Card

Video/bi-coaxial control transmission system

By Math Associates



- **Fibervision FX/FR-5821:** compatible with all standard video formats, including NTSC, PAL and SECAM; offers a control channel fully compatible with all "up-the-coax" bicoax and virtually all of the control systems that use data transmission during the vertical retrace period; eliminates the timing problem that limits the overall transmission range of some control system — transmission distances of more than 40km are available with the single-mode version; operates at a single optical wavelength of 850nm or 1,300nm and can be used with fiber-optic cable; operating power is 14-18Vac and 24Vac.

Circle (262) on Reply Card

Layering and special-effects package

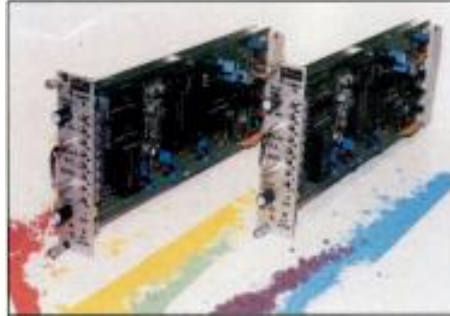
By Wavefront Technologies

- **Composer:** offers an improved user interface and expanded Macintosh file format support; brings high-end effects to the desktop by supporting the range of Silicon Graphics workstations; color icons, a programmable tool bar, new macros, and a digital video effect for moving 2D images in 3D have been added; provides Network Video Control and supports Targa, PICT, Vista and TIFF; animation clips, still images, special effects, transitions, titles and annotations can be assembled in layers and sequenced in time; supports all film and video formats.

Circle (264) on Reply Card

Distribution amplifier

By Matthey Electronics



- **2503A:** features a combined distribution amplifier and delay distribution amplifier on one circuit board; each signal module comprises two separate channels — an adjustable video delay of up to 2 μ s with cable EQ, and a channel that offers up to six outputs for video signal distribution; features include on-board selection, which allows the user to combine the channels, differential inputs, front-panel adjustment of delay, gain and cable equalization, and a video-presence indicator.

Circle (266) on Reply Card

Digital technology for post-production

By Laser-Pacific Media Corp.

- **SuperComputer Assembly:** an on-line editing service that delivers the highest-quality digital show master at less than the price for conventional on-line analog composite editing; fully compatible with all digital component and high-resolution HDTV standards; permits greater scheduling flexibility.

Circle (265) on Reply Card

Cable reels

By Clark Wire & Cable

- **C-1500, C-3200 Hannay cable reels:** reels are available to accommodate broadcast cables and composite cables; can be ordered with divider disks and custom drum dimensions and cable openings; C-1500 model for broadcast cables comes with a direct crank with adjustable spring drag or with an optional power chain and sprocket rewind; the heavy-duty C-3200 is available in a range of reel and crank dimensions and with a spring-actuated pin lock and removable direct crank rewind; portable models are also available.

Circle (269) on Reply Card

Video server

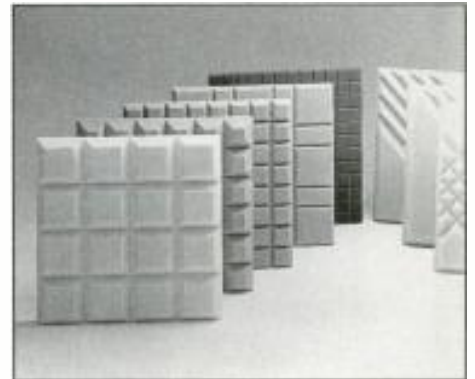
By Home Shopping Network

- **The Video Server:** provides flexible architecture allowing a variety of configurations; store digital video in compressed digital format, expands video in the NTSC format at the output or sends compressed data to expansion engine.

Circle (271) on Reply Card

Ceiling tiles

By illbruck



- **Sonex Classix:** fire-resistance, open-cell, melamine foam tiles that meet all class-I building requirements; available in five block patterns and thickness combinations and three color choices; tiles snap on to existing 2'x2' suspension grids and reduce excess noise.

Circle (267) on Reply Card

Compressor/limiter

By R/Audio



- **PS-3010:** a 2-channel, full-feature compressor/limiter that allows compression to be set anywhere from 1:1 to 1:infinity at threshold levels from +15dB to -70dB; distortion is less than 0.05%; frequency response is +/-1dB from 20Hz to 20kHz

Circle (261) on Reply Card

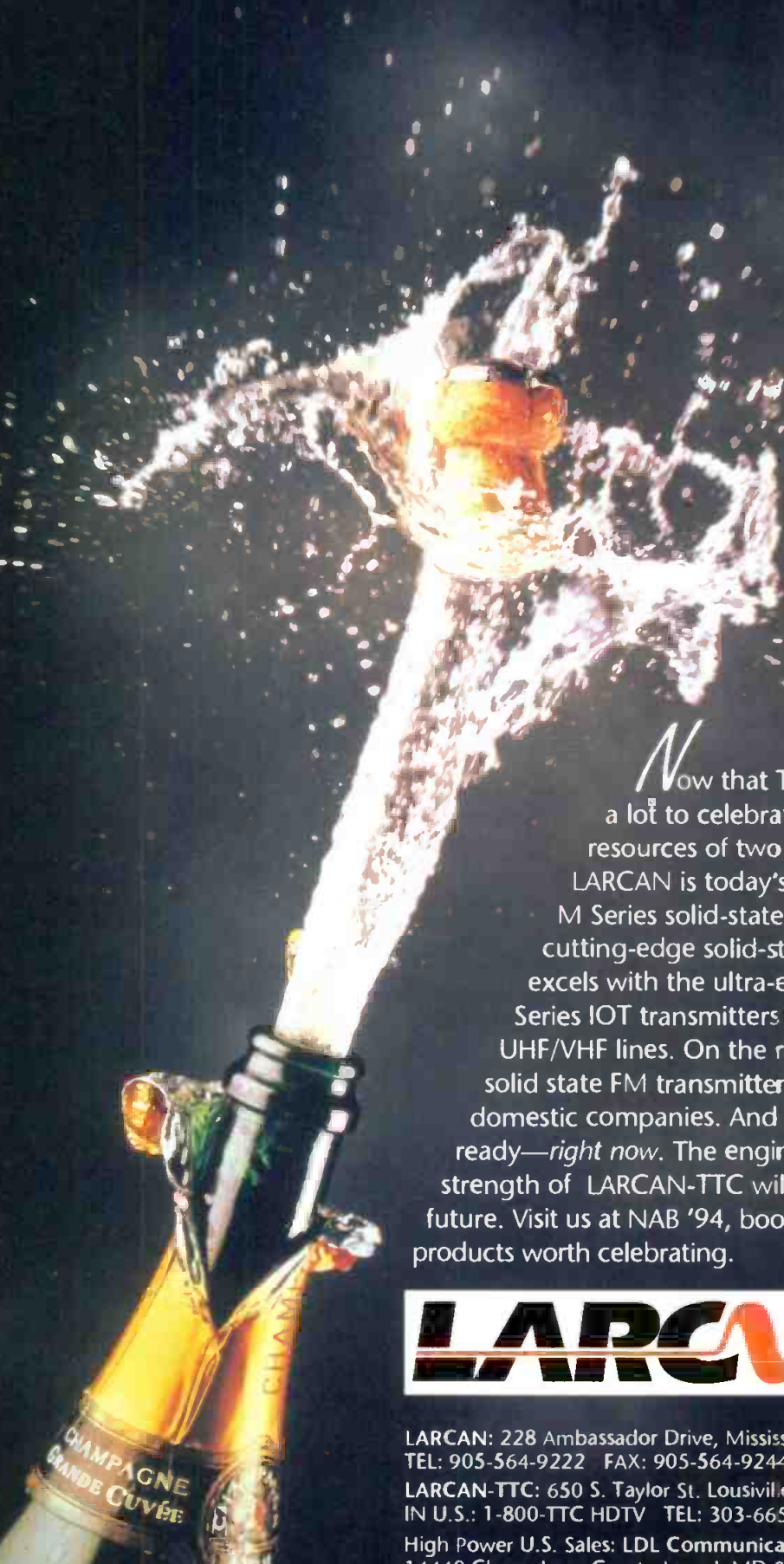
Transcoder/frame sync

By Nova Systems, Inc.

- **NovaMate XT:** transcoding time base corrector and frame synchronizer; features Y/R-Y/B-Y (Betacam or MII), Y/C (S-VHS and Hi8) and composite video inputs and outputs; available in NTSC, PAL and PAL-M versions; has RGB and U-matic dub input and output options.

Circle (292) on Reply Card

Here's To A Great Broadcast Future!



Now that TTC is part of LARCAN we've got a lot to celebrate, because we've combined the resources of two great transmitter companies. LARCAN is today's market leader with the popular M Series solid-state VHF transmitters and our new cutting-edge solid-state UHF line. LARCAN-TTC excels with the ultra-efficient, high power UHF HDR Series IOT transmitters and our complete low power UHF/VHF lines. On the radio side, we already have more solid state FM transmitters in the field than all other domestic companies. And LARCAN-TTC is definitely HDTV-ready—*right now*. The engineering resources and corporate strength of LARCAN-TTC will insure you a great broadcasting future. Visit us at NAB '94, booths 15758 and 15708 to see products worth celebrating.

LARCAN TTC

LARCAN: 228 Ambassador Drive, Mississauga, Ontario L5T 2J2
TEL: 905-564-9222 FAX: 905-564-9244

LARCAN-TTC: 650 S. Taylor St. Louisville, CO 80027
IN U.S.: 1-800-TTC HDTV TEL: 303-665-8000 FAX: 303-673-9900

High Power U.S. Sales: LDL Communications:
14440 Cherry Lane Court, Laurel, MD 20707
TEL: 301-498-2200 FAX: 301-498-7952

Circle (172) on Reply Card

www.americanradiohistory.com

New Products

ENG/EFP camera tripods By Miller Fluid Heads



- **Series II:** available in Lightweight (for use with small CCD and broadcast camcorders), Single Stage (for ENG/EFP cameras up to 25kg) and 2-Stage (for a range of ENG/EFP cameras) models; features the Pro-Lok torque-limited leg clamps, which provide a maintenance-free, single-turn clamp-and-release method of adjusting tripod leg height; has redesigned 75mm and 100mm tripod bowls suitable for attachment to most makes of heads, increase clamping strength and provide a torsion-free attachment; revised leg-angle lock system incorporates a "knock-proof" locking mechanism; available in alloy or high-strength, cross-laminated carbon fiber.

Circle (273) on Reply Card

Transmitter/receiver systems By Nucomm

- **FT4/FR4 Series:** operates from 90-260 VAC (40 to 400HZ) and +11-32 VDC; accommodates a 70MHz interface to other video and audio systems for transmit/receive terminals or baseband drop and insert functions; optional internal 70MHz modulator/demodulator with up to four programmable audio subcarriers via dip switches is available; equipped with fault alarm detection and system diagnostic circuits; features synthesized phase lock source and broad band solid state amplifier with up to 12 watts of output power;

radios covers the 2,2.5,6-7,12-13Ghz bands as well as military and international frequency bands; rack mountable.

Circle (280) on Reply Card

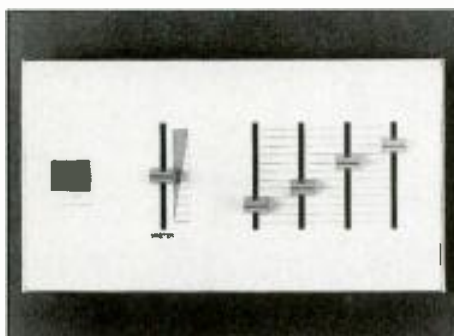
Digital D-2 keyer By HMA Video



- **Catalyst:** works in conjunction with the facility's Grass Valley 200 switchers; allows animation, graphics or DVE passes to be built-up with first-generation quality in successive pre-read passes on a D-2 edit master; each completed pass on the master remains in the digital domain as a new layer is added from the switcher

Circle (272) on Reply Card

Wall station By Colortran



- **DMX:** a self-contained unit with four independent faders, one master fader and a take-control/on-off button; provides control of one or two dimmers per channel; available as a standard wall-mount or portable unit; can operate independently of external DMX input or accept any existing DMX signal.

Circle (268) on Reply Card

Absorbent foams, sound barriers, and adhesives By USAFoam

- **USAFoam:** absorbent foam; \$6.99 per 2'x4' sheet of anechoic wedge foam, and NRCs up to 1.63, no other products can

compare — for effectiveness or value. For more information, to order, or for a free sample kit, call USAFoam toll free at 1-800-95-WEDGE.

Circle (278) on Reply Card

Phone/interface Eela Audio

- **S 24 Reportophone Plus:** supplements the S 20A and prepared for use with the Eela Audio ISDN Codec; suited for 2- and 4-wire connections; equipped with three mixable inputs.

- **S 24 ISDN Codec Interface:** an interface between the S 24 and an ISDN RJ45 (SO) Extension, complete with internal terminal adaptor; control is accomplished through the S 24; three algorithm modes.

Circle (281) on Reply Card

Digital video post-production workstation By ImMIX



- **VideoCube Version 1.2:** features, for NTSC and PAL, "build to disk," offers extensive compositing capabilities, variable-speed playback of clips, title rolls and continued enhancements to the editing model and user interface; capabilities include disk-based non-linear editing, true real-time digital video effects, high-resolution anti-aliased character generation and editing and mixing of CD-quality stereo audio; provides storage for one hour of on-line-quality video and two hours of CD-quality audio (additional storage modules can increase storage to six hours and 12 hours, respectively); includes all hardware, software, monitors, speakers and cables.

Circle (274) on Reply Card

"THE FAX WITH THE LOWEST COST-PER-COPY IS ONE PLAYER YOU CAN'T DO WITHOUT."

BILL WALSH, CHAMPIONSHIP COACH

To win, you've got to have the right players. In business, that means having a Sharp fax machine. Sharp's been #1 in fax for 7 straight years with products like the FO-5400T, the plain paper laser fax with the lowest cost-per-copy.

AMERICA'S
#1
FAX CHOICE
SINCE 1987

The FO-5400T produces crisp, clear, 400 dots-per-inch laser output. So you spend less time deciphering faxes and more time working. And its 15,000-copy toner cartridge can last years, not months. The result, increased productivity and lower operating costs.

See how the right Sharp fax can be your key player. Call for a free copy of Sharp's new Winning Game Plan Video. Or fax 1-800-3-SHARP-3.



FREE VIDEO

**YOU NEED A WINNING GAME PLAN.
CALL 1-800-BE-SHARP**



SHARP
FROM SHARP MINDS
COME SHARP PRODUCTS™

LCD

COPIERS • FACSIMILE • LASER PRINTERS • NOTEBOOK COMPUTERS • COLOR SCANNERS • VIDEO SYSTEMS • CALCULATORS • WIZARD® ORGANIZERS

© 1994 Sharp Electronics Corporation • Model Shown: FO-5400T

www.americanradiohistory.com

New Products

Routing Switcher

By Knox Video

- **RS16x16:** 16x16 audio/video matrix switcher in a streamlined 1 1/2" chassis, features easy front panel key-pad operation or may be controlled by terminal or software-based controllers via the RS232 input; a Windows (TM) driver is available for the RS16x16; front panel LED indicators display present routing pattern at all times and an internal battery holds and restores the current pattern in case of power failure; capable of storing and retrieving 16 preset cross-point patterns; includes an automatic sequencing feature.

Circle (277) on Reply Card

Camcorder

By Canon

- **Canovision 8TM L2:** incorporates date scan and search functions; permits editing from camcorder body; features VL mount system, RC Time Code, data and index code functions, high performance zoom lens, precision focus and exposure control, standard editing system and special digital effects including a new Wipe effect.

Circle (279) on Reply Card

Feedback controllers

By Sabine

- **ADF-1200 (single channel) and ADF-2400 (dual mono/stereo) Workstations:** functions include 12- or 24-band digital parametric filtering, digital shelving filters, digital delay, noise gate, multiple configurations storable in memory, password protection, and 31-band real-time analysis; automatically detect acoustical feedback and determines its frequency.
- **FBX-900 Feedback Extreminator:** a nine-filter feedback controller; automatically detects feedback and eliminates it in less than one second.

Circle (282) on Reply Card

Digital TV audio processor

Orban

- **Optimod-TV 8282 audio processor:** designed for both analog and digital TV audio; controls dynamic range and peak subjective loudness preventing highly-processed commercials from becoming objective; control peak modulation and bandwidth to prevent over modulation; both factory and custom presets available via remote control and programmable on a time/date basis.

Circle (293) on Reply Card

Audio/video equipment

By ESE

- **ES-2940:** single rack unit containing Dual 1 x 4 Audio, two Video Distribution Amplifiers and a five output RS-170AA Black Burst Sync Generator; features video gain and equalization controls, accepts balanced and unbalanced audio.
- **ES-180A:** new "A" version of WWV/WWVH Master Clock, enhancements include improved accuracy to +/- 2.5 ms of UTC when locked and <10ms/day drift when WWV is not present, ability to query RS-232 output as often as 20 times per second and a larger .56" front panel L.E.D. display; capable of driving more than 100 digital slave displays; features five frequency scanning, automatic "2:00 AM" DST correction, battery back-up, RS232C output, 1pps and AM/PM indication.

Circle (284) on Reply Card

Multipurpose Digital Voltmeter/Amplifier

By Ross Engineering Corp.

- **VMD2A Series Meter:** features include DC, Avg (RMS, true RMS, true positive or negative peak follow and store, positive or negative single pulse capture and store, Peak-to-Peak follow and pulse store, 40-hour rechargeable battery, and read-out hold switch.

Circle (285) on Reply Card

Switchers/Upgrades

Abekas Video Systems

- **ASWR8100:** uses full 10 bit CCIR 601 internal processing; offers uLine keying technology, mBoss key borders, and the TimeFrame effects editor; options include full-function reTouch color correctors and dual framestores.
- **ADDR6400:** multi-channel and multi-user system with up to six record or playback channels available to four users simultaneously; features 4:2:2 or 4:4:4 resolution record/playback and a disk-based on-line random access editing system; can import or export EDLS and features an optional Graphical User Interface for the editor.
- **A72 Digital Character Generator:** new upgrades include the Turbo option and the FontMaker and IconMaker programs.
- **A65/A66 Digital Disk Recorders:** Roto-Photo interface for Macintosh users is a new plug-in driver for Adobe Photoshop; accesses the A65/A66 Digital Disk Recorders from Photoshop using Ethernet.
- **A57 and A51+ Upgrade:** new anamorph feature allows process 16 x 9 images within the A57 or A51+; new "on-air" mode

allows rapid, single-button press access to effects.

- **A84+ Upgrade:** version 4.0 for the A84 upgrades this component digital switcher to an A84+; features 16 x 9 wipe pattern support, increased RAM, expanded timeline control, enhancements to the LINC integration software, extended SMPTE protocol support, and an intelligent interface to external routing systems.
- **A83 Component Digital Switcher:** features three Mix Effects Modules and exceptional keying quality; includes user-definable inputs, networking, internal digital disk recording, and LINC system integration software; Defocus/Color Correction option is new.

Circle (289) on Reply Card

Teleprompting delivery system

By Questar Systems, Inc.

- **AccuPrompt:** system designed for all Apple Macintosh systems for creating scripts, arranging them in order and scrolling them for live teleprompting; allows operator to monitor live scrolling text on screen with the option to edit instantly; offers unlimited fonts by size and style, variable scrolling sensitivity, auto underscan/overscan compensation, and dynamic time scales for elapsed and remaining times; supports XTND file translation; has direct import capabilities from many Macintosh and DOS formats.

Circle (286) on Reply Card

Wireless mic system

By Lectrasonics, Inc.

- **190 Series:** a narrow-band UHF wireless mic system intended for field production with a camera-mounted receiver; provides over twice as much operating range as earlier VHF systems; transmitters and receiver each operate from a 9-volt alkaline battery; produces a full 100mW of RF output with over seven hours of battery life; dual-band compandor reduces noise by about 10dB over conventional compandors; receiver operates with the UM190 belt-pack transmitter or the UH190 "plug-on" transmitter.

Circle (287) on Reply Card

Tape Eraser

Weircliffe Tape Erasers

- **BTE 101:** offers automatic, one-pass degaussing for range of tape formats; safety interlocks inhibit access to the media until erase cycle is complete; features automatic restart.

Circle (276) on Reply Card

Advanced Television:

Bit by Bit Into the Future

**A Critical New
Industry Conference
Sponsored by**

BROADCAST[®]
engineering

WORLD BROADCAST
News

HDTV NEWSLETTER

**September 26-28, 1994
Crystal Sands Resort
Hilton Head, SC**



Hilton Head Island, South Carolina

An Industry First

On September 26-28, the broadcast industry's top players will gather at beautiful Hilton Head to set the agenda for the high definition and digital future. Join us for what is sure to be big news—the first national forum to thoroughly air the views of everyone with a stake in HDTV, digital transmission, and our industry's place on the information highway.

Your Future is at Stake.

It's now absolutely critical to understand precisely how and when to incorporate advanced television and HDTV into your operation. Everyone who is responsible for planning, designing, engineering, budgeting and managing advanced television—or marketing its technologies and services—will benefit from this major event.

You'll learn how the industry's leaders are tackling the digital challenge. You'll discover new ways to build today for tomorrow's implementation. You'll learn how regulatory matters will impact your future, and that of our industry. And you'll find out how it is possible to survive in the new world of multimedia, DBS, cable and telco competition.

Plan now to attend. Mark it on your calendar. And fax us right away at 913/922-1408 to be included in all information mailings for this event.

Fax this page to 312/922-1408

Attn: Chris Lotesto

Or call Chris at 1-800-458-0479

I'm interested in this important event, "Advanced Television: Bit by Bit Into the Future." Please make sure I'm included in all the mailings.

Name

Title

Company

Division/Department

Address

City, State, Zip, Country

Phone

Fax

Organized by:
Intertec Publishing, publishers of Broadcast Engineering and World
Broadcast News and Advanced Television Publishing, publishers of
the HDTV Newsletter.

Broadcast Engineering/Intertec Publishing,
9800 Metcalf, Overland Park, KS 66212

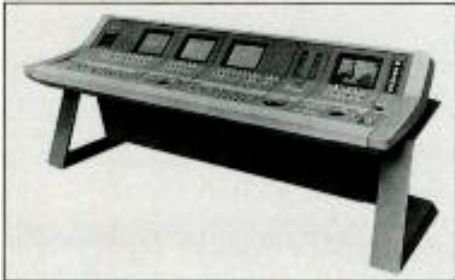
Circle (140) on Reply Card

www.americanradiohistory.com

New Products

Digital mixing system

By TOA



• **ix-11000**: consists of a compact console and free-standing processing rack; the largest system is equipped with 64 inputs, 48 multitrack returns, 48 multitrack send buses and 256 inputs and outputs for patching analog and digital signal within the digital domain; four bands of parametric EQ, high- and low-pass filters, delays and dynamics are offered on each input and output; functions can be accessed with the use of color touch-sensitive LDC screens and motorized faders; control windows within the system

provide high-resolution metering (80dB range) of up to 32 channels on a single screen, fade levels with gain, preset configurations, channel status and EQ curves.

Circle (254) on Reply Card

Expansion chassis

By Avid Technology, Inc.

• **NB4 4-slot expansion chassis**: a NuBus expansion chassis that expands range of Macintosh platforms capable of supporting Media Suite Pro 2.0 to include Quadra 800 and 650 systems.

Circle (294) on Reply Card

Wireless video system

TransVideo Systems, Inc.

• **ShotMaster 100**: uses microwave communications to link a 14-ounce transmitter with a handheld receiver for wireless monitoring of camera's video and audio output up to 100 yards; features time code window with on/off control, two channels on each system, and remote tally light to show camera is rolling; al-

lows instant window dubs; transmitter attaches to most ENG-style cameras and the receiver provides video, audio, and timecode outputs to any monitor or recorder.

Circle (288) on Reply Card

Lens adapter

By Century Precision Optics

• **Nikon-to-1/2-inch-bayonet adapter**: a universal Nikon that enables 3-chip video cameras to accept Nikon SLR lenses, from wide-angle to telephoto; optically compensated to ensure that each lens' focal length remains unchanged.



Circle (253) on Reply Card



Apply for a **FREE** subscription to the industry's leading information source, *Broadcast Engineering*.

Turn to the reader service card in this issue and fill out the subscription application section. Soon you could be receiving monthly issues of *Broadcast Engineering*... **FREE!**

Note: Sign and date the form to speed processing.

BROADCAST
engineering



"THE PROFESSIONAL'S SOURCE"

TOLL-FREE ORDERS: **1-800-947-9928**

INFORMATION:

TOLL FREE FAX:

FAX:

212 229-1306

800 947-7008

800 221-5743

119 WEST 17TH STREET • NEW YORK, N.Y. 10011



CLOSED FROM

MARCH 23 THRU APRIL 3

NRG

970 Power-MAX

The 970 Power-MAX is designed for power-hungry professionals who have high-current draw situations and long run times.



- Highest capacity quick-charge capable 12 Volt 14-AMP silvered nicad power pack (removable).
- Rugged high-grade, black leather belt case; chassis assembly with dual 3-pin XLR inputs for pack interchange without shutdown.
- 2,500-cycle cell life provides lowest cost per cycle.
- Microprocessor-controlled 5-step multi-colored power indicator display.
- Belt with cellpack weighs a comfortable 7.5 lbs.
- Charge in little over two hours with the optional 650-III Intelliquick Fast charger.
- Dual outputs allow simultaneous powering of two devices (eg. camera and light). Output configurations include cigarette lighter and 4-pin XLR in any combination.
- Includes Power-MAX belt and power chassis, 14-amp cell pack in 12V or 13.2 volt configuration, model 600 overnight charger, comprehensive owner's manual. Fits waist size 29-44".

VARI-LITE PRO
Professional DC On-Camera Light

Thanks to on-board control IC's using NRG's Light-Gate technology, light intensity can be infinitely adjusted by the user within a range of 10% to 100% of the lamp's rated power. You can instantly adjust light output to exactly meet changing light requirements, all without changing hot bulbs or fussing with power rabbit diffusion filters. Best of all, the Vari-Lite Pro virtually eliminates color shift and dramatically conserves precious battery power by using only the power required for the selected light level. Accommodates bulbs from 20W to 100W DC.



- Prismatic Pyrex dispersion grid provides smooth even light output and reduced glare without changing light intensity.
- Sturdy all-metal click tilt mounting bracket with unique ratchet action. Eliminates shake during action shooting.
- Front retainer assembly pops off for instant bulb access without the bother of screws.
- Rugged milled aluminum light head disperses heat and provides years of service under adverse conditions.

Power Station Series



Designed to replace expensive original-manufacture AC power supplies, the affordable Power Stations deliver precisely-regulated 12-volt DC power from AC sources worldwide. High-current capability allows for powering not only large camcorders, dockables, decks, and cameras, but lights, monitors, and other high draw 12-volt equipment as well. The stations provide up to 9 amps of precisely regulated DC power eliminating the need for battery power in stationary applications where an AC source is available. The Power Stations exceed all original manufacturer performance specifications.

- Available in different configurations: The 12550 features a single cigarette or 4-pin output and up to 5 amps of output current. The 12910 features dual outputs in any combination of cigarette or 4-pin and 9 amps of output current capability.

Features:

- High-current output
- Worldwide voltage selection
- Rugged steel case
- 4-pin or cigarette lighter outputs
- Lighted power switch

Power Station-2 Series

Just plug the PowerStation-2 into any AC outlet in the world and out comes perfectly regulated 12-volt DC power through four 4-pin XLR connectors and one cigarette lighter connector. It uses an advanced pulse-width-modulated power supply which allows for ultra-light weight and small size. It operates with little heat even at full output. The PowerStation-2 is the ultimate multiple-output professional power source for cameras, decks, lights, monitors, and a host of other video accessories.



- 85-264 volts worldwide auto-adjusting input (just plug in).
- Supply is fully protected from overcurrent.
- Ultra-light weight - under 3 lb.
- Outstanding 300,000 hour mean time between failure is far in excess of any other manufacturer.
- Ultra-efficient PWM regulation generates far less heat than linear type supplies.
- Provides the ultimate in performance and reliability in a universally compatible and compact package.

**See us at NAB in
Las Vegas
March 21-24
Booth #13428**

Panasonic
Broadcast & Television Systems

WV-F500
3-CCD Digital Processing Camera

- Three 1/2" high sensitivity 380,000 pixel CCDs with on-chip optics, plus precision 11.4 high resolution prism deliver 700 lines of horizontal resolution and excellent signal-to-noise ratio of 60dB.
- Achieves a sensitivity of 18.0 at 2000 lux and minimum object illumination is 4 lux at 11.4 with +24dB gain.
- Emmy Award-winning Digital Signal Processing DSP technology.
- Dark Detail Circuit enhances contours under varying lighting conditions. Uses luminance sensitive algorithms to determine the optimum degree of enhancement in dark areas of the picture without altering the brightness of other areas in the picture. Enhances contours of objects as fine as strands of human hair, even under challenging lighting conditions.
- Chroma Detail compensates for poor resolution in high chroma areas of the picture. Provides a wide dynamic range image with clear reproduction in the chroma area.
- 2-Dimensional Low Pass Filter reduces cross-color caused by high level brightness signals mixing into the sub-carrier. Reproduces fine stripes and lattice patterns with a minimum of color blur.
- Highlight compression circuit expands the dynamic range of highlighted areas and prevents halation. Produces detailed images when viewed against a bright backlight or daylight.
- The WV-F500 features detail enhancement through 5 stages of switching: Two levels of hand switching (High and Low) and two levels of details switching within each of the bands. And for further flexibility, the detail enhancement circuit can be turned off when shooting close-ups, special graphics or scenes in low light.
- Switchable R-Y, B-Y, or Y/C system allows direct docking to S-VHS and Mini VCRs.
- To further enhance operational speed and flexibility, a total of five easy to use Scene File modes are available.
- Scene File One is the Standard Mode which sets the WV-F500 to adjust to studio lighting.
- Scene File Two is the Illuminance Mode, which provides for different shades of black to be reproduced clearly in dark locations without requiring lighting alterations.
- Scene File Three is the Fluorescent Mode, because under fluorescent lighting conditions certain color hues tend to be reproduced slightly in the blue spectrum. When switching on Scene File Three, these hues are adjusted while using the white balance to provide natural tones.
- Scene Files Four and Five are the User Modes for flexible data setting. Twenty different digital adjustments can be set including gamma, knee-point, chroma detail, detail, matrix and shading. Individual settings are available for 11 of the 20 items at gains of 0dB, +9dB, +18dB and +24dB. These digital adjustments also allow the WV-F500 to be matched to other color cameras in a studio environment for quick set-ups.



DS5050
S-VHS Dockable Package:

- WV-F500 3-CCD color camera
- WV-VF40 1.5" viewfinder
- Canon 13:1 servo zoom lens
- WV-MH500 mic holder
- AG-7450A S-VHS Hi-Fi VCR
- WV-DKT700S Docking Kit
- WV-CC500 system case
- WV-Q1700 Tripod adapter

WJ-MX50 **Digital A/V Mixer**



- Four input switcher and any two sources can be routed to the program bus.
- Two-channel digital frame synchronization permits special effects in each of the A/B buses.
- Combination of 7 basic patterns and other effects creates 287 wipe patterns.
- Editorial edit control input for RS-232C or RS-422 serial controls. Also has GPI input.
- Wipe boundary effects: soft/border (bold, 8 back colors available).
- Digital effects including strobe, still, mosaic, negative/positive, paint, monochrome, strobe, trail, and AV synchro.
- Real-Time compression - the entire source image is compressed inside a wipe pattern.
- "Scene Grabber" makes it possible to move a pattern, upholding the initially trimmed-in picture integrity.
- Non Additive Mix (NAM): selects between A and B sources, passing only the signal with the highest luminance value.
- Fade-in and fade-out video, audio, titles individually or synchronously faded.
- Down Stream keyer with selectable sources from character generator or external camera.
- Incorporates 8 separate memories that enable virtually instant recall of frequently used effects.
- 8 preset effects including: Mosaic Mix, Position Stream, Corkscrew, Bounce, Flip, Shutter, Vibrate, and Satellite.
- Audio mixing capability of 5 sources with 5 audio level adjustments.

AG-7650H/AG-7750H

S-VHS Player / S-VHS Edit VCR

Editing machines truly designed for professionals

- Built-in Digital 3-Dimensional type full field (262.5 line) Time Base Corrector eliminates even small amounts of jitter, skew, head impact error, and color blurring. The precise time base correction is invaluable for A/B roll editing, maintaining high picture quality through multiple generations. Also provides full field drop-out compensation.
- Laminated amorphous video heads that provide higher magnetic coercivity than conventional ferrite heads. The expanded color signal frequency response from the amorphous heads minimizes color blurring and noticeably improves color reproduction.
- A "logical" comb filter featuring an advanced 3-line delay line system, enables a huge improvement in crosstalk cancellation during playback. The result is significantly higher picture quality, with reduced color and luminance blurring.
- High-precision aluminum die-cast chassis and extra large impedance roller assures exceptionally stable transport.
- Advanced Al capstan servo control provides for high speed search at 32x normal speed.
- Built-in RS-422A 9-pin serial interface - the standard control protocol for professional broadcast components.
- Both machines provide two Hi-Fi stereo audio channels with a dynamic range of 90dB plus two linear audio channels with Dolby NR (Noise Reduction). Each audio channel has its own input and output with separate individual channel level setting capability.
- Professional 7-pin dub output (AG-7650H) and 7-pin dub input and output (AG-7750H) help to keep the quality of your images during editing.
- The AG-7750H features manual adjustment of video recording level.
- Optional AG-7700 Time Code Reader/Generator Card lets you perform LTC/VITC (Longitudinal/Vertical Interval) recording and playback for high-precision time code editing. The AG-7750H edits with VITC on one of its audio channels.



LEADER
Model 5850C

Vectorscope

An ideal companion for the 5860C Waveform Monitor, the 5850C adds simultaneous slide-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 us/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 leads 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.



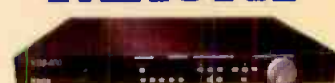
Model 5864A
Waveform Monitor

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.

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-1 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.

WE ARE AUTHORIZED PANASONIC INDUSTRIAL VIDEO DEALERS. ALL PANASONIC VIDEO INCLUDE ONE YEAR USA WARRANTY ON PARTS AND LABOR.

Circle (142) on Reply Card

www.americanradiohistory.com

FOR PHOTO & VIDEO"



TO INQUIRE ABOUT YOUR ORDER:

119 WEST 17TH STREET, NEW YORK, N.Y. 10011

800 221-5743 • 212 807-7479

Store & Mail Order Hours:

Sun 10-4:45 • Mon & Tues 9-6 • Wed & Thurs 9-7:30 • Fri 9-1 • Sat Closed

OR FAX 24 HOURS: 212 366-3738

RUSH OR OVERNIGHT SERVICE AVAILABLE (extra charge)

MILLER

Fluid Heads & Tripods

The silky, smooth action of each Miller Fluid Head is the product of the finest quality cast and machined parts functioning together in a fluid environment. They are engineering masterpieces, built to operate even under extreme conditions. They are engineered to exceptionally fine tolerances and their mechanisms are protected effectively against ambient moisture and dust.



Miller 20 - Series II Fluid Head

- Continuously adjustable fluid drag control
- Sliding/Quick Release camera platform
- Weights only 4 lbs., will handle cameras up to 22 lbs.
- Counterbalance system designed to compensate for nose heavy or tail heavy camera configurations, and permits fingertip control of the camera throughout the tilt range.
- Includes independent pan and tilt locks, bubble level, dual pan handle carriers and integrated 75mm ball leveling.

#440 - Lightweight Tripod

- Weights only 4.5 lbs., supports up to 30 lbs.
- Minimum height down to 24", maximum height to 57".
- Extremely portable, folds down to 33"
- Engineered from thermoplastic moldings, diecast alloy and hard anodized tubular alloy.
- Fast one turn, captive leg locks
- Includes 75mm (3") ball leveling bowl

#420 - 2-Stage Tripod

- Two extension sections on each leg. Operates at low levels as well as normal heights without the use of mini legs.
- High torsional rigidity, no pan backlash
- Weights 6.6 lbs., supports 50 lbs.
- Very portable, folds to 27"
- Includes 75mm (3") ball leveling bowl with model 420
- model 402 includes 100mm (4") ball leveling bowl

System 20 Catalog #338

- Miller 20 II fluid head • 440 Lightweight tripod
- 410 tripod spreader with foot pads.....\$1549.00

System 20 ENG Cat. #339

- Miller 20 II fluid head • 420 2-stage tripod
- 410 tripod spreader with foot pads.....\$1895.00

Vinten

Vision SD 12 and SD 22

Pan and Tilt Heads with Serial Drag

The Vision SD 12 and SD 22 are the first heads with the "Serial Drag" pan and tilt system. The system consists of a unique, permanently-sealed fluid drag and an advanced lubricated friction drag. So for the first time, one head gives you all the advantages of both fluid (viscous) and lubricated (LF) drag systems - and none of their disadvantages. Achieve the smoothest pans and tilts regardless of speed, drag setting and ambient temperature.

- Simple, easy-to-use external control for perfect balance.
- Patented spring-assisted counter-balance system permits perfect "hands-off" camera balance over full 180° of tilt.
- Instant drag system breakaway and recovery overcome inertia and friction for excellent "whip pans".
- Consistent drag levels in both pan and tilt axis.
- Flick on, flick off pan and tilt caliper disc brakes.
- Greater control, precision, flexibility and "touch" than any other head on the market.
- Touch activated, time delayed illuminated level bubble.
- Working conditions from as low as -40° up to +60°C.
- SD 12 weighs 6.6 lbs and supports up to 35 lbs.
- SD 22 weighs 12.7 lbs and supports up to 55 lbs.

Vision Two Stage ENG and LT Carbon Fibre ENG Tripods

- The ultimate in lightweight and innovative tripods, they are available with durable tubular alloy (Model #3513) or the stronger and lighter, axially and spirally wound carbon fibre construction (Model #3523). They incorporate torque safe clamps to provide fast, safe and self-adjusting leg clamps.
- "Torque Safe" requires no adjustment. Its unique design adjusts itself as and when required, eliminating the need for manual adjustment and maintenance and making for a much more reliable clamping system.
- New hip joint eliminates play and adds rigidity.
- They both feature 100mm levelling bowl, fold down to a compact 28", and support 45 lbs.
- The #3513 weighs 6.5 lbs and the #3523 CF (Carbon Fibre) weighs 5.2 lbs.

Vision 12 Systems

All Vision 12 systems include #33643 SD 12 dual fluid and lubricated friction drag pan/tilt head, single telescoping pan bar and clamp with 100mm ball base.

SD-12A System

- 3364-3 SD-12 Pan and tilt head
- 3518-3 Single stage ENG tripod with 100mm bowl
- 3363-3 Lightweight calibrated floor spreader.

SD-12B System

- 3364-3 SD-12 Pan and tilt head
- 3513-3 Two-stage ENG tripod with 100mm bowl
- 3314-3 Heavy-duty calibrated floor spreader

Vision 22 Systems

All Vision 22 systems include #3385-3 SD-22 dual fluid and lubricated friction drag pan/tilt head, single telescoping pan bar and clamp with dual 100mm/150mm ball base.

SD-22E System

- 3386-3 SD-22 Pan and tilt head
- 3319-52 Second telescoping pan bar and clamp
- 3516-3 Two-stage EFP tripod with 150mm bowl
- 3314-3 Heavy-duty calibrated floor spreader

SONY

EVW-300 Hi-8 3-CCD CAMCORDER



The EVW-300 is a complete one piece camcorder which includes a variety of innovative and advanced operational features. So, whether your shoots require basic recording capabilities or premier performance, the EVW-300 offers a wide range of features and remarkable recording quality to best suit your needs.

Features:

- Equipped with three high density 1/2" IT Hyper HAD image sensors. Has an excellent sensitivity of F8.0 at 2,000 lux, high S/N of 60 dB, and delivers over 700 lines of horizontal resolution.
- Provides high quality PCM digital stereo and single channel AFM Hi-Fi recording. Has XLR balanced audio connectors.
- Quick start 1.5" viewfinder with 550 lines of resolution plus Zebra pattern view indicator and color bar generator.
- Quick-start recording - takes only 0.5 seconds to go from REC PAUSE to REC MODE for immediate recording in the field.
- Built-in 8mm Time Code generator records absolute addresses. (Either non-drop frame or drop frame mode may be selected.) Furthermore the EVW-300 incorporates a variety of time code features such as Time Code PRESET/RESET, REC RUN/FREE RUN and User Bits.
- A variety of automatic adjustment functions for different lighting conditions are incorporated into the EVW-300:
 - ATW (Auto Trace White Balance) - when ATW is turned on optimum white balance is always ensured during recording, even for changes in color temperature. Conventional white balance adjustment is still provided with the Auto White Balance.
 - AGC (Automatic Gain Control) - in addition to manual Gain Up AGC provides linear gain up in the range of 0 dB to 18 dB.
 - Intelligent Auto Iris - for situations where the lighting between the scene and background is different (subject is underexposed) the Intelligent Auto Iris automatically examines the scene and adjusts the lens iris for proper exposure.
- Selectable Gain-up from 1 dB to 18 dB in 1 dB steps for Mid & High positions.
- Clear Scan function - provides a variety of selection of shutter speeds ranging from 60-200 Hz allowing recording of almost any computer display without flicker.
- Compact, lightweight (12 lbs with NP-18) ergonomic design provides well balanced and extremely comfortable operation.



JVC GY-X2 3-CCD S-VHS CAMCORDER

- Three 1/2" CCD image sensor delivers 650 lines of horizontal resolution
- New micro-lens technology provides exceptional sensitivity of F7.0 at 2000 lux and new LULUX mode lets you shoot with almost no light! Now you can shoot superb footage with excellent color balance at a mere 3 lux illumination
- Variable Scan View allows flicker-free shooting of a computer monitor.

- Quick Record Mode - when turned on the camera is set to the auto iris even if lens is set to manual. Also activated is (ALC) Automatic Level Control and EEL extended Electronic Iris which provides both variable gain and variable shutter. Now you can shoot continuously from dark room to bright outdoors without having to adjust gain, iris or ND filter.
- Full Time Auto White circuit lets you move from incandescent to fluorescent to outdoor lighting without changing white balance or the filter wheel.
- Genlock Input allow synchronization with other cameras.
- Dual output system allows camera output to be connected directly to an external recorder

TOSHIBA

TSC-200 3-CCD Hi-8 Camcorder



- Three 1/2" CCD chips mounted with spatial offset technology delivers superb resolution of 700 horizontal lines
- Low noise design provides extreme sensitivity of F8.0 at 2000 lux. Min. illumination 7.5 lux with excellent color reproduction
- New LNA (low noise amplifier) delivers a S/N (signal-to-noise) ratio of 62dB - the highest achieved for this type of camera
- 26-pin connector outputs Y/C or component video signal allowing hook up to a portable S-VHS, MII or Betacam recorder and simultaneously record with Hi-8.
- Quick-start 1.5" viewfinder needs no warm up time so you never miss a shot. Zebra pattern in the viewfinder alerts operator to excessive video levels.
- Genlock capability allows synchronization with other cameras. Also full calibration functions are built-in as well as color bar generator.
- Variable high speed shutter from 1/60 to 1/2000 second
- Built-in 8mm time code generator records an absolute address to every frame.
- High-performance back electret condenser mic records to all three audio tracks. Low cut filter eliminates wind noise.
- Sports very low power consumption. The TSC-200 draws only 16 watts per hour allowing 100 minutes of recording time with a single NP-18 battery.
- Camera body is made of magnesium alloy previously found only on broadcast cameras. Still, lightweight at only 13 pounds in standard configuration.



HITACHI Z•ONE•C

3-CCD Dockable Camera

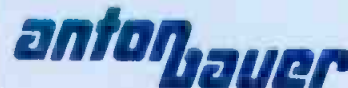
- Using three 2/3" CCD chips and high accuracy CCD technology the Z-One-C delivers 750 lines of horizontal resolution.
- The +24dB high gain mode and new Super High Sensitivity (SHS) function provide operation down to 1.5 lux at f1.8.
- Permits contrast control for better reproduction of dark areas when shooting high contrast scenes.
- Sox-memory auto white balance provides two memories for each optical filter position.
- Auto Knee circuitry compresses extreme highlights preventing white clipping of those areas.
- In addition to the standard 5-step electronic shutter, the new lockscan feature permits the continuous adjustment of the shutter speed in 1/4 steps to shoot a computer monitor without flicker.
- Four built-in scene files. Seven items memorized in these scene files including, white balance, master gain and detail level.
- Viewfinder display of self-diagnostics during auto white and STATUS display of operational control settings.
- Flare correction maintains black balance during changes in scene contrast.
- Very high resolution viewfinder (600 lines) allows easy, fast and accurate focusing.
- Displays "safe title" electronic markers which indicate the effective picture area of home televisions.
- Generates SMPTE color bars with ID numbers so that when recorded the camera can be later identified.
- Movable shoulder mount allows camera to be correctly balanced with different docking VCRs or portable VCRs.
- Can be genlocked even with VCR docked to it.
- Real-time auto white balance continuously adjusts white balance according to the surrounding light source.
- Four built-in scene files. Seven items memorized in these scene files for adapters.
- Directly docks to Betacam SP (BVX-1), Panasonic MII, Sony Hi-8 (EVW-3000) and S-VHS (JVC and Panasonic) with adaptor
- With CA-21 camera adaptor can be cabled to Betacam, MII, U-matic and S-VHS stand-alone portable VCRs.



Quick-Draw Professional FOR CAMCORDERS OR STAND ALONE CAMERAS



- Designed for working from the back of a van or the trunk of your car. The top loading case has a wide open lid back top that stays neatly out of the way. It's lighter and more compact than shipping cases, thus saving valuable storage space. With other equipment crowded around it the sturdy built-in frame provides added protection.
- Heavy duty shoulder strap & comfortable leather hand grip.
- Carry it in crowds - crush proof aluminum guard protects viewfinder.
- Fits into back seat and fastens securely with seat belt.
- Holds camera with on-board battery attached.
- Lid closes with Velcro for quick-opening or secure with full-length zippers.
- Two trim exterior pockets and clip board pocket.
- Dual purpose rear pouch is an expandable battery chamber or all-purpose pocket.



Logic Series DIGITAL Gold Mount Batteries



The Logic Series DIGITAL batteries are acknowledged to be the most advanced in the rechargeable battery industry. In addition to the comprehensive sensors integral to all Logic Series batteries, each DIGITAL battery has a built-in microprocessor that communicates directly with Anton/Bauer InterActive chargers, creating significant new benchmarks for reliability, performance, and life. They also complete the communications network between battery, charger and camera. With the network in place, DIGITAL batteries deliver the feature most requested by cameramen: a reliable and accurate indication of remaining battery power.

DIGITAL PRO PACS

The Digital Pro Pac is the ultimate professional video battery and is recommended for all applications. The premium heavy duty Pro Pac cell is designed to deliver long life and high performance even under high current loads and adverse conditions. The size and weight of the Pro Pac creates perfect shoulder balance with all camcorders.

- DIGITAL PRO PAC 14 LOGIC SERIES NICAD BATTERY**
14.4v 60 Watt Hours, 5 1/8 lbs.
Run time: 2 hours @ 27 watts, 3 hrs. @ 18 watts
- DIGITAL PRO PAC 13 LOGIC SERIES NICAD BATTERY**
13.2v 55 Watt Hours, 4 3/4 lbs.
Run time: 2 hours @ 25 watts, 3 hours @ 17 watts

DIGITAL MAGNUM COMPACS

Extremely small and light weight (almost half the size and weight of a Digital Pro Pac), the powerful Compact Magnum still has more effective energy than two NP style slide-in batteries. The high voltage design and Logic Series technology eliminate all the problems that cripple conventional 12 volt slide-in type batteries. The Compact Magnum is the professional choice for applications drawing less than 24 watts. Not recommended when using an UltraLight.

- DIGITAL COMPACT MAGNUM 14 LOGIC SERIES NICAD BATTERY**
14.4v 43 Watt Hours, 2 3/4 lbs.
Run time: 2 hours @ 20 watts, 3 hours @ 13 watts
- DIGITAL COMPACT MAGNUM 13 LOGIC SERIES NICAD BATTERY**
13.2v 40 Watt Hours, 2 1/2 lbs.
Run time: 2 hours @ 18 watts, 3 hours @ 12 watts

digital switcher and an Axial 2020 editor with two Accom RTD (real-time) disk drives complete with RAVE software. The software caches segments in optimum positions on the disk drives during an auto conform, giving the editor some non-linear capabilities in a linear environment.

The suite also features three Ampex DCT component digital VTRs selected for their excellent motion-control capabilities and their ability to serve as robust editing machines, as opposed to D-1 machines, which are primarily used as component archive devices. Other equipment includes a Graham-Patten D/Esam mixer (twin to the Edit 4 system) and a Quanta Delta character generator. The spacious (28' x 17') room has a high ceiling and a living room atmosphere. It will enable Editel to produce high-end compositing and effects work as well as more straightforward projects where clients prefer to remain in the component domain.

Coming up for air (conditioning)

Above all this concentrated technological and physical renovation, Editel's entire roof was being replaced, and an outdated air-conditioning system was being supplanted by a modern one.

Over the past 20 years, 55 air-condition-

ing units had been stacked on the roof. It was an inefficient setup that required extensive maintenance and operating costs. Air-conditioning specialists Kimmel-Motz were asked for a solution. The company recommended a system that houses multiple compressors (up to eight), which cycle on and off to provide the cooling. Because of the new system, 39 individual units were removed from

The component digital suite houses an array of new technology.

the roof. The redundancy also serves as protection against a compressor failure causing a loss of air-conditioning.

The new compressors are sizeable, and finding a place to house them presented a considerable challenge. The solution was to build a porte cochere, which, in addition to housing the air-conditioning compressors in a 24-foot-high, 50-foot-long structure over the parking lot, also provides clients with protection from the elements.

As it turned out, the \$300,000 air-condi-

tioning investment is already proving cost-effective. The system works on 3-phase power, which is considerably less expensive than the single-phase power used for the original 55-unit setup. That savings, added to a dramatic reduction in maintenance and replacement costs, should pay back the entire investment within four to five years.

The downside

To Claudia Baker, Editel's vice president of operations, fell another essential position on the redesign team: keeping the facility running and putting out a quality product in the midst of heavy physical construction and rewiring. Clients have accepted the inconveniences and are really excited about the changes. The construction has caused some disruptions, but, in light of the improvements, they have been relatively minor.

Supervising full-time post-production projects and monitoring construction simultaneously can result in management and staff stress, but everyone is genuinely enthusiastic because of how much things have improved and will continue to improve. It hasn't been easy, but within a 2-year period, 80% of Editel will have been renovated or reconstructed. ■

Professional Services

JOHN H. BATTISON PE.
CONSULTING BROADCAST ENGINEER,
FCC APPLICATIONS AM, FM, TV, LPTV
Antenna Design, Proofs, Fieldwork
2684 State Route 60 RD #1
Londonville, OH 44842
419-994-3849

CHAN & ASSOCIATES
A Consulting Service for the Professional Audio / Video Industries
Business Development • Marketing • Public Relations • Writing
CURTIS J. CHAN
Principal
2217 Loma Verde Drive, Fullerton, CA 92633 USA
Phone: (714) 447-4993 Fax: (714) 578-0284

PATCHPRINTS® VIDEO TIE LINES In 1 2 3 4 Aux
Custom Patch Bay Labeling
By
PATCH BAY DESIGNATION COMPANY
Div. of Glendale Rubber Stamp & Printing Co., Inc.
P. O. Box 250278, Glendale, CA 91225 Telephone (818) 241-5585
4742 San Fernando Road Glendale, CA 91204 FAX (818) 507-5050

100-400 GHz
Bi-Directional Microwave Systems
3918 W. Clearwater Ave.
Kennewick, Washington 99336-2632
Two Year Warranty • Phone or FAX (509) 735-6812

NETCOM
STATE-OF-THE-ART ENGINEERING FOR AUDIO & VIDEO
**TURN-KEY SYSTEMS
DESIGN & DOCUMENTATION
EQUIPMENT SALES
CAD SERVICES**
1465 PALISADE AVE., TEANECK, NJ 07666 / (201) 837-8424

Radio Systems Engineering
FCC Applications
Systems Design • Installations
Property Evaluation
AM-FM
3031 Dogwood Lane
Florence, SC 29505 800-399-1501 24 Hr
803-661-2933 facsimile

East Coast Video Systems
ON-LINE • IN-TIME
A full service
Company providing...
• Consultation
• Engineering & Design
• Installations
• Training
Serving...
• Cable Systems
• Corporate Facilities
• Broadcast Facilities
• Teleproduction Facilities
52 Ralph Street, Belleville, NJ 07109 (201) 751-5655

Radio/Tv Engineering Company
"Serving Broadcasters over 35 Years"
Consultants Norwood J. Patterson, Pres.
1416 Hollister Lane Los Osos, Ca 93402
Ph. (805) 528-1996 & Fax: (805) 528-1982

Classified

FOR SALE

INTERFACE VIDEO EDITORS TO ATRs
Serial-to-parallel conversion makes ATRs compatible with Sony protocol. Use the Phantom II VTR Emulator to expand the audio capability of your video editor. Also controls BR-5811U and BR-5805U plus the VO-5850.

For information:
Call 1-800-331-9066
 cipher digital 30 W. PATRICK ST., SUITE 310
FREDERICK, MD 21701

Circle (175) on Reply Card

For Classified Advertising or Professional Services Information
Call Renée Hambleton at
(913) 967-1732 FAX (913) 967-1735

dPatch Machine Control Patching System
RS-422 NORMALLED PATCHING


919/435-6179

See us at NAB Booth #12849
Circle (176) on Reply Card

Classified

FOR SALE

"PRIORITY, PROFESSIONAL & QUALITY SERVICE"
CALL US TODAY!

BROADCAST VIDEO ENGINEERING, INC.

New & Used Broadcast/Production Video & Audio Equipment.
Sales, Service, Rental,
System Design & Maintenance.
2525 Wilson Blvd., Arlington, VA 22201
(703) 841-2406/(703) 841-2409 (Fax)

STUDIO EXCHANGE BURBANK (818) 840-1351 FAX (818) 840-1354

NEW & USED VIDEO EQPMT.

BUY, SELL, CONSIGN;
25 YRS. EXP.

RS422 VTR REMOTE CONTROL with TIMECODE DISPLAY & JOGWHEEL

SONY, AMPEX, JVC, BTS
PANASONIC, HITACHI

Low Cost — Lots of features

DNF INDUSTRIES

(213) 650-5256 • LA, CA 90069

PORTABLE, COMPACT AC/DC SCA RECEIVER with excellent crosstalk rejection. Fixed, tuned to only your frequency - \$50.00. Performance guaranteed. 800-944-0630/417-881-8401.

SONY BVW-75, Excellent condition - \$24,000. Call Elliot Porter, 415-243-8880 or fax 415-243-8882. Big Zig Video, San Francisco.

NEW

MATROX STUDIO

The Ultimate Desktop Video Production Suite

- All Digital Processing (4:2:2)
- Five Layers of Video/Graphic Mix Effects
- Tempura Pro (tm) Paint Software
- Inscrber/CG (tm) Titling Software
- Time Base Correctors
- Wave for Windows (tm) Audio Editing Software
- Matrox: MAT-Studio3 Studio AB Roll/NTSC
- Matrox: MAT-MMP12 Personal Producer/12 CH Audio
- 2-JVC BR-S622U S-VHS Recorder/Players & Time Code Generator/Reader
- 1-JVC BR-S822U S-VHS Recorder/Player & Time Code Generator/Reader
- 1-Pioneer: 486 DX2-66 EISA Motherboard, 256 Cache
- 1-12MB Memory-1M x 9 SIMMS 70ns
- 1-ANTEC: KS010B-Tower Super Server Black Case W/Fans
- 1-PC Power/Cooling: 450W TurboCool-Power Supply
- 1-ADAPTEC: AHA-1742A-SCSI & Floppy Drive
- 1-MICROPOLIS: MC2217-SCSI Disk Drive (1.8 GB)
- 1-TEAC: FD-235 (Black Front)-1.44MB 3.5" Floppy Drive
- 1-BDCA RESEARCH:IOAT55-Serial & Paralle I/O Card
- 1-MATROX: MGA Ultima Pro 2MB SVGA Video Card
- 1-Microsoft:Serial Mouse-OEM Bundle W/MS Dos & MS Windows
- 1-101 Key Keyboard
- 1-MAG: 17" MX17F Multisync Monitor
- 1-JVC: VM-R190SU 19" Broadcast Color Monitor
- 1-AMCO Engineering 4' Equipment Rack W/4-Sliding Shelves & Fans
- 1-Rubbermaid Computer Table
- 1-HON Office Chair

One Complete
Matrox Desktop Production Editing System List Price
\$40,000.00...Our Special Price to You \$29,950.00
Plus Shipping and Handling

Contact Jeff Raker
WAAY TV, 1000 Monte Sano Blvd.
Huntsville, AL 35801

or call (205) 534-0482 Ext. 267, Voice Mail Ext. 667

Circle (193) on Reply Card

TAPE ERASERS



garner

WHEN COST IS
IMPORTANT AND
QUALITY IS CRITICAL

1-800-228-0275

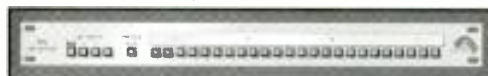
Erases all formats in
quantities of 1 to 1,000,000

SEE US AT
BOOTH 13622-
13623

garner industries

4200 North 48th Street • Lincoln, NE 68504

Circle (178) on Reply Card



THE 6X GPI MATRIX

- 3 GPI's, 24 Devices
- Opto-Isolated
- Lighted Switches
- Solid State Relays
- One Rack Unit High
- Easy to Gang

OEI ELECTRONIC SYSTEMS INC. • 908-735-0543
PO Box 285, Pittstown, NJ 08867

Circle (179) on Reply Card

Factory Direct Cases

Our
prices
can't
be
beat.



Custom
or Stock
Sizes

Call for
Catalogue or Quote
Roadie Products, Inc.

800-645-1707
In NY 516-563-1181
Fax: 516-563-1390

CALL US

For New and Rebuilt
Radio Broadcast Equipment

HALL
Electronics

(804) 974-6466

1305-F Seminole Trail • Charlottesville, Va. 22901

SONY . AMPEX . BTS . DUBNER GRASSVALLEY . PANASONIC

If You're Looking For the Best in Used Equipment
and You Want the BEST: • DEAL • VALUE • SERVICE
CALL MIDWEST: (708) 251-0001 • CANADA (604) 850-7969

midwest

AUDIO/VIDEO EXCHANGE, INC.

1131 Central Ave. Wilmette, Illinois 60091

International Brokers and Appraisers Serving the Audio / Video Industry

Circle (180) on Reply Card

Replace incandescent
indicator lamps with
high reliability LED
equivalents.



Eliminate the need to
relamp your control panels,
switches and indicators

Bright LED's

Standard Lamp Bases

- 100,000 hour (11 year) shockproof life
- 5, 6, 12, 14, 24, 28, 48, 60 and 120 volts
- Wedge, bayonet, midget flanged, grooved, telephone slide and other bases
- Red, green, yellow, specials -- warm white, blue

RIGHT BULB.
RIGHT PRICE.
RIGHT DELIVERY.

LAMP TECHNOLOGY, INC.

1645 Sycamore Ave.
Bohemia, NY 11716

516-567-1800

Fax: 516-567-1806

1-800-KEEP LIT

(Outside NY)

Circle (181) on Reply Card

ABEKAS A-53D

Special Effects Generator with warp effects option installed. Page turns, twists, bends, etc. Original cost \$60,000+...Sell \$25,000 or best offer. Mint Condition.

SONY DXC-325/EV-9000 Hi8 Camcorder

Deluxe dockable camera/recorder with Canon lens and hard case. Original cost \$8,000+, sell \$3,500 or best offer. Some optional accessories are available.

516-673-0777

PANASONIC/RAMSA/TECHNICS Broadcast, Professional, Industrial, CCVE Video & Audio Equipment. Wholesale Prices! Sealed New - Full Warranty. Expert Guaranteed Repairs Too! Sales & Service - (607) 687-0545.

No Sub-zero. No Aftershocks.

ABEKAS A-51 Sngl. Ch. DVE w/ warp, target framestore & key options \$28,000

GVG 110CV-525C Component Switcher with linear borderline \$12,000

GVG 151 Editing system with software version 5.0, monitor, keyboard/jogger \$14,000

SONY BVE-600 A/B Roll Editor w/ composite switcher option. \$3,800

SONY BVE-600 A/B Roll Editor w/ component switcher option. \$6,000

MICOR VIDEO EQUIPMENT
CHICAGO 312 334 4300

Classified

FOR SALE

STUDIOFOAM
SOUND ABSORBENT WEDGES
TESTS UP TO 40% BETTER THAN SONEX
★ COSTS LESS • BETTER COLORS • BETTER CUT ★

SONOMATT
4'X8'X2" Sheets • \$29.99 Ea. In Pairs • NRC.70 • Ships UPS

VENUS 12" x 2' x 4" • NRC 1.30 • Flat 10K-125Hz
Then They Really Kick In (125Hz NRC=
BASS TRAPS 1.63!) • Charcoal Gray • 2 For Just \$150!!

USA Foam • Box 20084 • Indianapolis IN 46220 (317) 251-2992
1-800-95-WEDGE

Advertising sales offices

NEW YORK, NEW YORK
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 Corp.
Unit 3, Farm Business Centre,
Clifton Road, Deddington,
Oxford OX15 4TP England
Telephone: (0869) 38794
FAX: (0869) 38040
Telex: 837469 BES G

AGOURA HILLS, CALIFORNIA
Duane Hefner
5236 Colodny Avenue, Suite 108
Agoura Hills, CA 91301
Telephone: (818) 707-6476
FAX: (818) 707-2313

SANTA MONICA, CALIFORNIA
MC² Magazine Communications Marketing Corp.
Jason Perlman
Telephone: (310) 458-9987
FAX: (818) 393-2381
Deborah Kern
Phone: 310-458-8080
FAX: 310-393-2381
501 Santa Monica Blvd., Ste. 401
Santa Monica, CA 90401

CHICAGO, ILLINOIS
Vytas Urbanas
55 East Jackson, Suite 1100
Chicago, IL 60604
Telephone: (312) 435-2361
FAX: (312) 922-1408

TOKYO, JAPAN
Orient Echo, Inc.
Masayoshi 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

FREWVILLE, SOUTH AUSTRALIA
Hastwell, Williamson, Rep. Pty. Ltd.
John Williamson
109 Conyngham Street
Frewville 5063, South Australia
Phone: 799-522, FAX: 08 79 9522
Telex: AA87113 HANDM

CLASSIFIED ADVERTISING
OVERLAND PARK, KANSAS
Renée Hambleton
P.O. Box 12901 Overland Park, KS 66282
(913) 967-1732 FAX: (913) 967-1735

"Intelligent" Automatic Default Video Switch

2 Inputs; 1 Output. Audio follows Video.

Active video sensor detects the absence of video. Rejects unacceptable video playback from clogged heads or damaged tape.

\$145.00 (plus \$5.00 S&H)

COMMERCIAL VIDEO Maintenance Corp.

(603) 742-4891 Fax (603) 743-0890

HAVE CABLES
ASSEMBLED • BULK • CUSTOM

HAVE INC.
THE SIGN OF QUALITY

HAVE PROFLEX™
BELDEN
CANARE
WEST PENN WIRE
MOGAMI

DEALER
INQUIRIES
WELCOMED

FREE CATALOG of Audio/Video Tape,
Cable, Equipment, Accessories, Supplies

518/828-2000
309 POWER AVE, HUDSON, NEW YORK 12534

BE CLASSIFIEDS



913-967-1732
Ask for Renée.

AUDIO TRANSFORMERS



- LOW DISTORTION < 2% THD @ 30 Hz
- BROAD FREQUENCY RESPONSE ±1 dB, 20-20 kHz
- MAGNETIC SHIELDING 10, 30, 60 dB
- VARIOUS MECHANICAL CONFIGURATIONS
- 60 TYPES STOCKED FOR DELIVERY

MODEL	IMPEDANCE (K)	MAX. POWER (W)	PRICE
1A-72	15000	15000	1.18
1A-80	15000	15000	1.30
1A-84	15000	15000	1.40
1A-85	15000	15000	1.50

20%
DISCOUNT
ON PREPAID
ORDERS
PLUS FREE
SECOND
DAY AIR

FREE CATALOG OF AUDIO ACCESSORIES

USA & CANADA ORDERS (800) 834-3457
FAX ORDERS (800) 551-2749
SESCOM, INC.
2100 WARD DR.
HENDERSON, NV 89015 USA
TECH LINE* (702) 585-3883 M-F 9 am to 6 pm (PST)
*Lines will be answered by our technicians. If no answer try at another time.

See us at NAB, Booth #13601 & 13602
Circle (182) on Reply Card

NEW FROM COMTRONIX SYSTEMS, INC.

HIGH PERFORMANCE VHF/UHF
SOLID STATE
AMPLIFIERS

UP TO 200 WATTS PLUS

SEND FOR INFORMATION

TEL 413/785-1313

FAX 413/739-1352

Circle (183) on Reply Card

IT'S HERE!

The All New 1994 BCS/NAB Catalogue

Packed with Thousands of pieces of
New & Used Video and Audio
Equipment!

Get Your Copy Now!

The Broadcast Store
Always changing. Always the same
LA-818-551-5858 — NY-212-268-8800



NAB
BOOTH
17112

See us at NAB, Booth #17112
Circle (184) on Reply Card

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.

TRAINING

FCC GENERAL CLASS LICENSE. Cassette recorded lessons for home study with seminars in Washington, Newark, Los Angeles. Bob Johnson Telecommunications. Phone (310) 379-4461

Classified

HELP WANTED

Regional Sales Representative

GEPCO INTERNATIONAL, INC., a growing manufacturer of wire and cable for the audio and video industry is seeking a western regional sales representative to join its highly successful team. The position is based in southern California and will require some travel. Interested candidates should have a college degree or technical disciplines with experience in the broadcast industry. Please forward your resume to:

Greg Hansen
Gepco International, Inc.
2225 West Hubbard
Chicago, Illinois 60612

TOO MANY ENGINEERING OPENINGS!!

We have too many openings in the engineering depts. of broadcast stations & not nearly enough personnel to fill them. Openings from coast to coast from entry level to seasoned chiefs needed in all aspects of broadcasting. Dozens of positions listed each week, all within a 4 week window. \$20 for 4 weeks, \$35 for 8. Call toll-free for info.

BROADCAST EMPLOYMENT WEEKLY
1125 W. Boone Ave., Nampa, ID 83651
1-800-922-JOBS • BBS 1-208-467-4110

TV NETWORK MAINTENANCE ENGINEER Oklahoma PBS affiliate has an opening for a microwave field engineer. Component level troubleshooting skills required. Must have UHF and VHF translator and transmitter experience. In state travel required. Benefits include paid leave, insurance, and retirement. Please send resume with salary history to the Personnel Department, Oklahoma Educational Television Authority, P.O. Box 14190, Oklahoma City, Oklahoma 73113. AA/EEO

MAJOR NEW YORK CITY RADIO STATION has an opening for a full time maintenance engineer. Candidates should have a minimum of 2 years experience maintaining broadcast studios and a desire to learn RF systems maintenance. General Class FCC license and/or SBE certification desirable. Send resumes to Chief Engineer, 1700 Broadway, 9th Floor, New York, NY 10019 or fax to 212-237-2685.

DIRECTOR OF ENGINEERING - Join KLAS-TV, the CBS affiliate for Las Vegas, the nation's fastest growing market. The successful candidate should have a minimum of five years experience as a chief or assistant chief engineer. Must have excellent hands on technical skills, solid leadership, team building, planning and organizational skills. Please send resume and salary requirements to Dick Fraim, GM, 3228 Channel 8 Drive, Las Vegas, NV, 89109. No phone calls please. EOE.

F/T ELECTRONIC MAINTENANCE ENGINEER for television station. Individual must have electronic repair experience, some building maintenance required. Salary commensurate with experience, full vacation/benefits package. Send resume to: WHSV-TV, P.O. Box TV3, Harrisonburg, VA 22801. EOE

CHIEF ENGINEER: WHNT-TV, Huntsville, Alabama, (UHF-CBS) has immediate opening for chief engineer. Must be proficient and experienced in maintaining studio and transmitting equipment, employee supervision and FCC rules. State of the art facility, owned by New York Times. Send letter and resume to Linda Spalla, GM, WHNT-TV, P.O. Box 19, Huntsville, AL 35804. EOE.

BROADCAST[®]
engineering

9800 Metcalf
 Overland Park, KS 66212
 (913) 967-1732 Fax (913) 967-1735
 Call Renée Hambleton for all your
 advertising needs

ODETICS INC., manufacturer of Broadcast Cart Machines has immediate opening for Director of Engineering. Responsibilities include managing the development of broadcast products, coordinating Electrical, Mechanical and Software engineering activities. Position requires BSEE or BSME, 5+ years experience managing a multi-functional engineering group and previous experience in commercial product design and manufacturing. Odetics offers a competitive salary and a comprehensive benefits package. Equal employment opportunity employer. Send resume and salary history to: Linda Krumme, Odetics Inc., 1515 S. Manchester, Anaheim, CA 92802.

AGGRESSIVE AND GROWING Sunbelt affiliate needs an experienced engineer to maintain studio and transmitter equipment in a brand new facility. Equipment includes BTS and GVG switching and graphics, 3/4" video tape, fixed and mobile uplinks, fiber optic and microwave E.N.G. systems, redundant V.H.F. transmitters, as well as all the basics. Please mail or fax resume to: Chief Engineer, WCBI-TV, P.O. Box 271, Columbus, Mississippi 39703, FAX # 601-327-0020

ASSISTANT CHIEF ENGINEER: Need hands-on, take charge manager. Able to supervise and maintain transmitter, production, master control, and studio equipment, microwave truck, and post production facility. Will also supervise regular work scheduling as well as preventive maintenance, people skills are a must. Diploma type First Class radio telephone license required. Send resumes to General Manager, WFMJ-TV, 101 West Boardman Street, Youngstown, Ohio 44503-1305. EOE/No phone calls please.

SELF STARTING ASSISTANT CHIEF ENGINEER for transmitter supervision. Must be experienced in maintenance of RCA TTU-30 and TTU-110 UHF television transmitters. Maintenance of Sony cameras and Beta equipment, ENG van, along with personnel supervision will be required. Send resumes to: John Grdic, General Manager, WFMJ-TV, 101 West Boardman Street, Youngstown, Ohio 44503-1305. EOE/No phone calls please.

SOUTHWEST V.H.F. NETWORK AFFILIATE seeks "hands on" chief engineer. Responsibilities to include experience in maintenance and repair of R.F. and studio equipment. Computer skills a big plus. People skills a must. Reply in confidence to Broadcast Engineering, P.O. Box 12901, Dept 741, Overland Park, KS 66282-2901.

TV MAINTENANCE ENGINEER opening in Upstate New York. Large facility loaded with state of the art equipment. Must be capable of troubleshooting studio equipment to the component level. Experience in maintaining digital and microprocessor-based equipment required. UHF experience a plus. Send resume and salary history to: WXXI Human Resources, PO Box 21, Rochester, NY 14601. EOE.

BROADCAST OPERATIONS ENGINEER. The Univision Television Group, Inc. seeking self starter for Dallas station. Minimum 1 year experience operating/maintenance of Broadcast Television equipment. FCC General and SBE certified a plus. Basic Spanish a must. Good company benefits. Send Resume to: Richard Craig, Chief Engineer, KUVN-TV, 3720 Marquis, Garland, Texas 75042. EOE.

BROADCAST TELEVISION ENGINEER The Univision Television Group, Inc., Dallas station seeking self starter. Minimum 5 years experience repair/maintenance component level: Ampex 1", Sony 3/4", Sony cameras, Grass Valley switcher, and UHF transmitters. FCC General License, SBE Certified. Knowledge of Microwave and Spanish speaking a plus. Good company benefits. Send Resume to: Richard Craig, Chief Engineer, KUVN-TV, 3720 Marquis, Garland, Texas 75042. EOE.

MAINTENANCE ENGINEER. KUHT Television, an auxiliary enterprise of the University of Houston System, is seeking an experienced Studio Maintenance Engineer. Successful applicants will be able to install, calibrate, operate and repair analog and digital audio, video, and radio frequency equipment. A BSEE or BSEET is required (Equivalent professional experience and education may substitute.) as well as a General Class FCC Radio Telephone Certificate and knowledge of current FCC rules and regulations applicable to a network television broadcasting environment. Also required: SBE certification or equivalent professional recognition of technical accomplishment and three years demonstrated maintenance success to the component level, in a professional broadcast or production environment. This is a full time position with a good benefits package which is currently open. Minimum starting salary: \$38,000. Interested candidates should send a letter of application, including resume and three professional references, to: Ms. Flor Garcia, KUHT-TV, 4513 Cullen Boulevard, Houston, Texas 77004, postmarked by March 31, 1994. Minorities and women are encouraged to apply. The University of Houston is an Equal Opportunity Employer.

GROUP OWNED TV STATION in the Houston market looking for a Director of Engineering to join our Engineering team. 3-5 years broadcast television experience, appropriate education & general FCC license, UHF transmitter experience, strong maintenance skills, studio & computer knowledge essential. This is a hands-on managerial position. Send resume to: Station Manager, KHSH-TV, 2522 Highland Square Mall, Alvin, TX 77511. No Phone Calls. EOE. M/F.



TELEVISION
MEXICO

ON-LINE EDITORS, HARRY/HENRY ARTISTS/TELEVISION COLORISTS MEXICO CITY FACILITY

These positions are available in Virgin's new Digital post production company located in Mexico City. If you are the very best, with at least 5 years experience, you may be the person for us.

Please submit your resumé, in confidence to:

Denise Alvarado, Virgin Television
127 North Robertson Blvd.
Los Angeles, CA 90048

Virgin Television is an Equal Opportunity Employer.

SERVICES



Freeland Products, Inc.
Serving the world with quality
rebuild tubes since 1940.

CALL TODAY FOR A FREE INFORMATION PACKET

75412 Highway 25 • Covington, LA 70433
 800-624-7626 • 504-893-1243
 Fax 504-892-7323

CLASSIFIED ADVERTISING

CLASSIFIED ADVERTISING NOW AVAILABLE AS CLASSIFIED DISPLAY OR BY-THE-WORD.

Classified Display: \$119 per column inch, per insertion, with frequency discounts available. 1 inch minimum, 10 inches maximum per ad. Blind ads \$40 additional. Reader Service number \$50 additional or free to 4" or larger ads. Spot color available for \$95 (color determined by publisher).

By-The-Word: \$1.75 per word, per insertion. Initials and abbreviations count as full words. Blind ads \$40 additional. Minimum charge \$40 per insertion. No agency discounts allowed for classified ads.

Contact Renée Hambleton, at (913) 967-1732, for information on frequency and pre-payment discounts. To place your classified ad send your order and materials to Broadcast Engineering, Classified Ad Mgr., P.O. Box 12901, Overland Park, KS 66212-2215.

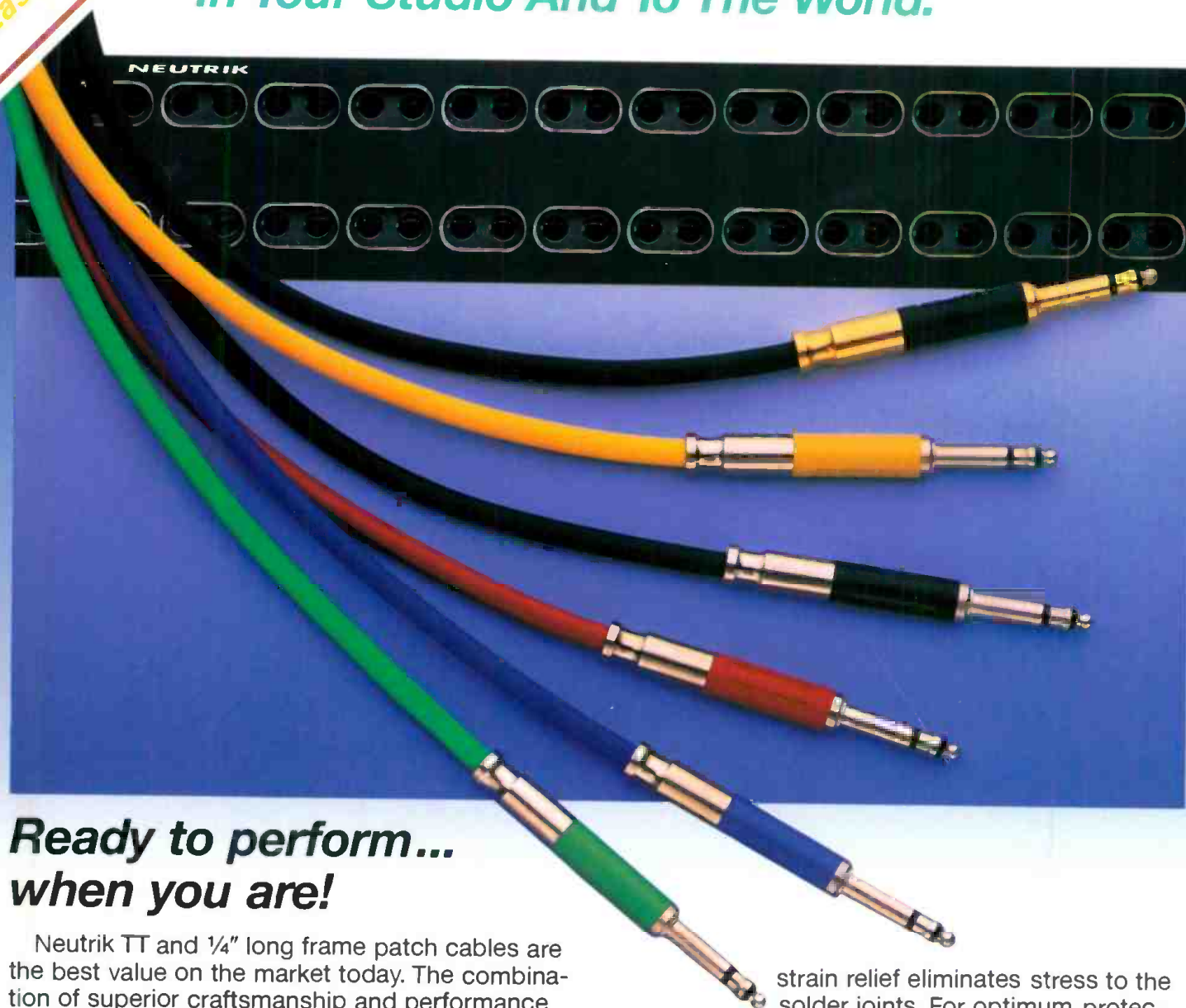
Ad Index

	Page Number	Reader Service Number	Advertiser Hotline		Page Number	Reader Service Number	Advertiser Hotline
AAVS/Div. of Sencore	74	31	800-769-AAVS	Lighthouse Digital Systems	187	116	916-272-8240
Abekas Video Systems	17	12	415-369-5111	LNR Communications, Inc.	137	143	516-273-7111
Acrodyne Industries, Inc.	121	53	800-523-2596	Logitek	106	41	713-782-4592
ADC Telecommunications	79	33	800-726-4266	Louth Automation	107	130	415-329-9498
Adrienne Electronics Corporation	194	171	800-782-2321	Macrovision	151	82	415-691-2909
A.F. Associates, Inc.	75,77	32,170	201-767-1200	Magni Systems, Inc.	153	84	800-237-5964
American Lightwave Systems	15	11	203-630-5770	Math Associates, Inc.	111	45	516-229-8950
Antex Electronics	116	96	213-532-3092	Matrox Electronic Systems	141	74	800-361-4903
Anthro Company	44		503-241-7113	Maxell Corp. Of America	11	9	800-533-2836
Aphex Systems Ltd.	84	35	818-767-2929	Midwest Audio/Video Exchange	217	180	708-251-0001
Asaca/Shibasoku Corporation	200	174	310-827-7144	Miller Fluid Heads	Map,188	117	201-473-9592
AT&T	109		800-248-3632	Miranda Technologies, Inc.	190	119	514-333-1772
Audio Precision	13	10	800-231-7350	NTL	46,203	136,138	962-822243
Audio Processing Tech. Ltd.	174	104	0232-371110	NEC Corp.	181	109	800-323-6656
Avitel Corporation	160	90	801-977-9553	Neutrik U.S.A.	IBC	2	908-901-9488
Barco, Inc.	81	22	404-590-7900	Nikon Electronic Imaging	191	121	800-NIKON-US
Basys	161	91	914-376-4800	North Hills Signal Processing	126	59	516-682-7708
Belar Electronics Laboratory	204	129	215-687-5550	Nova Systems, Inc.	196	148	203-693-0238
Belden Wire & Cable	115	49	800-235-3364	NVision, Inc.	72	29	916-265-1000
B&H Photo-Video	213-215	142	800-221-5662	Odetics, Inc.	83	36	800-243-2001
Bird Electronics Corp.	162	92	216-248-1200	OEI Electronic Systems, Inc.	217	179	908-735-0543
The Broadcast Store, Inc.	218	184	818-551-5858	Opamp Labs, Inc.	194	126	213-934-3566
Broadcast Microwave Services	198	131	619-560-8601	Orban, Div. of AKG Acoustics	7	7	510-351-3500
Broadcast Video Systems Ltd.	180	108	416-764-1584	Ortel	155	85	818-281-3636
BTI Computer Systems	156	86	408-733-1122	Otari Corp.	113	47	415-341-5900
BTS Broadcast TV Systems	193	124	800-962-4BTS	Panasonic Broadcast & TV	42-43,124		800-524-0864
BTS Broadcast TV Systems	132A-D	100	800-962-4BTS	RAMSA/Panasonic	59	24	714-373-7478
Burle Industries	169	101	717-295-6123	Pinnacle Systems, Inc.	34	146	408-970-9787
Cablewave Systems	145	77	203-239-3311	Pioneer New Media Tech	61,63	25	800-LASER-ON
Canare Cable, Inc.	150	81	818-365-2446	Pirot, Inc.	157	87	219-936-4221
Canon USA Broadcast Lens	125	58	201-816-2900	Polyphaser Corp.	146	78	800-325-7170
C-COR Electronics	195	127	814-231-4438	Preco, Inc.	196	165	602-483-0303
CCS Audio Products	190	57	908-946-3800	Pro-Bel Inc.	IFC	1	404-396-1971
Centennial Video Systems	66A-B		305-633-2200	QSI Systems, Inc.	124	56	603-893-7707
Cheetah Systems, Inc.	126	60	800-829-2287	Quantel	1	4	203-656-3100
Cipher Digital, Inc.	216	175	301-695-0200	Radiation Systems	114	48	708-298-9420
Clark Wire & Cable	128,130	62,65	800-CABLE-IT	Rane Corporation	184	113	206-355-6000
Clear-Com Intercom Systems	173	103	510-527-6666	Roland Corporation-U.S.	119	133	213-685-5141
Comark Communications, Inc.	185	114	215-822-0777	Sachtler AG	9	8	32-909-150
Comtronics Systems, Inc.	218	183	413-739-9691	Sachtler Corp. of America	47	17	516-867-4900
Conex Electro Systems	204	160	206-734-4323	Schmid Telecommunication	33	147	800-438-3953
Control Concepts	104	39	607-724-2484	Scientific Atlanta	159	89	404-903-6001
Datatek, Inc.	Map		800-882-9100	Sealevel Systems, Inc.	194	125	803-843-4343
DB Electronica Telecomunicazioni	201	134	049-870-0588	SESCOM, Inc.	218	182	702-565-3400
Dielectric	136	70	207-655-4555	Sharp Copier Div.	209		800-BE-SHARP
DigiStore/Dynatech Video Group	73	190	801-328-1839	Shure Brothers Inc.	149	150	800-25-SHURE
DPS	147	79	606-371-5533	Sierra Design Labs	Map,189	118	702-831-7837
Driver Software Design	168	98	918-252-5640	Snell & Wilcox Ltd.	23-30,50A-H	19,161-163	073-082-1188
Dynatech Spectrum	183	112	408-956-9570	Solid State Logic Ltd.	Map		800-343-0101
Dynatech Video Group	73,139		608-273-5828	Sony Business & Professional Products Group	Map,18-20		800-635-SONY
EEV, Inc.	175	105	800-DIAL-EEV	Sony Recording Media	68-69	27	201-930-7081
Electro-Voice	142	75	616-695-6831	Standard Communications	105	40	800-767-6695
EMCEE Broadcast Products	202	135	717-443-9575	Stanford Research Systems	165	95	408-744-9040
Enco Systems, Inc.	140	73	800-ENCO-SYS	Storeel	128	63	404-458-3280
ESE	133	68	310-322-2136	Studio Audio & Video Limited	127	61	353-648-888
Fiber Options	186	115	800-342-3748	Sumitomo Electric	129	64	310-782-0227
France Telecom	177	106	434-297-99	Sundance Technology Group	205	137	214-869-1002
Frezzolini Electronics, Inc.	123	55	201-427-1160	Switchcraft, Inc./Div. Raytheon	197	42	312-792-2700
Fujinon, Inc.	57	23	201-633-5600	Synergistic Technologies	122	54	800-659-7715
Garner Industries	217	178	800-228-0275	Tektronix, Inc.	Map,71	28	800-TEK-WIDE
Gentner Communications	130	66	801-975-7200	Telex Communications, Inc.	3,134-135	5,69	800-554-0716
Gepco	168	99	312-733-9555	The New Vision Group	136	71	407-951-0219
Grass Valley Group	36-37	14	800-343-1300	Thomson Broadcast	53	102	800-882-1824
Gray Engineering Laboratories	164	94	714-997-4151	Thomson Tubes Electroniques	143	76	201-812-9000
Harris Allied	55	34	800-622-0022	Total Spectrum Mfg., Inc.	163	93	914-268-0100
Henry Engineering	54	21	818-355-3656	Trompeter Electronics	56	141,145	818-707-2020
Hewlett Packard	158	88	800-452-4844	Television Technology Corp.	207	172	303-665-8000
Hitachi Denshi America	5	6	516-921-7200	Utah Scientific/Dynatech Video Group	139	72	800-453-8782
Horita	192	123	714-489-0240	Varian Microwave Equip. Prod.	131	67	415-424-5753
Hughes Communications, Inc.	101	37	213-607-4377	Vega, A Mark IV Company	41	15	818-442-0782
Ikegami Electronics, Inc.	103	38	201-368-9171	Video Design Pro	120	52	800-VID-CAD6
Illbruck	182	111	800-662-0032	Videotape Products, Inc.	66A-B		800-422-2444
ImMIX	Map		916-272-0800	Videotek, Inc.	167	97	800-800-5719
Intertec /HDTV Conference	211	140	800-458-0479	Videssence	116A-D	50	415-697-7033
Intertec Publishing	220A-B		913-341-1300	Vistek Electronics Limited	49	18	628-531-221
Jampro Antennas, Inc.	152	16	916-383-1177	WAAY-TV	217	193	205-553-3131
Japan Electronics Show Association	179	107		The Winsted Corporation	171	30	612-944-8556
Jem-Fab Corp.	216	176	516-867-8510	Wohler Technologies, Inc.	112	46	415-589-5676
JVC Professional Products Co.	64,65,67	26,191	800-JVC-5825	360 Systems	110	44	818-342-3127
Lamp Technology	217	181	516-567-1800				
Lectrosomics	199	80	800-821-1121				
Leitch Incorporated	BC	3	800-231-9673				

Color Coded For
Easy Identification

Patch Cables That Help You Communicate. In Your Studio And To The World.

NEUTRIK



Ready to perform... when you are!

Neutrik TT and 1/4" long frame patch cables are the best value on the market today. The combination of superior craftsmanship and performance gives you a cable that is virtually maintenance free, reduces intermittencies and eliminates frayed ends due to poor strain relief.

Each cable is color coded and made to be extremely flexible and durable. The plug is precision machined and incorporates a nickel finish as standard (a Neutrik innovation) thus eliminating tarnishing found on brass plugs. A Hex crimped

strain relief eliminates stress to the solder joints. For optimum protection and performance, a gold plated TT version is also available.

Together with the NEW Neutrik Easy Patch Panel System that uses gold contacts standard on the jacks, you can now have the ultimate in signal performance and protection.

For additional information call Neutrik USA or your nearest distributor.



NEUTRIK

CONNECTING THE WORLD

NEUTRIK AG
Liechtenstein
Tel 075 / 29666
Fax 075 / 25393

NEUTRIK USA INC.,
USA
Tel 908 / 901 9488
Fax 908 / 901 9608

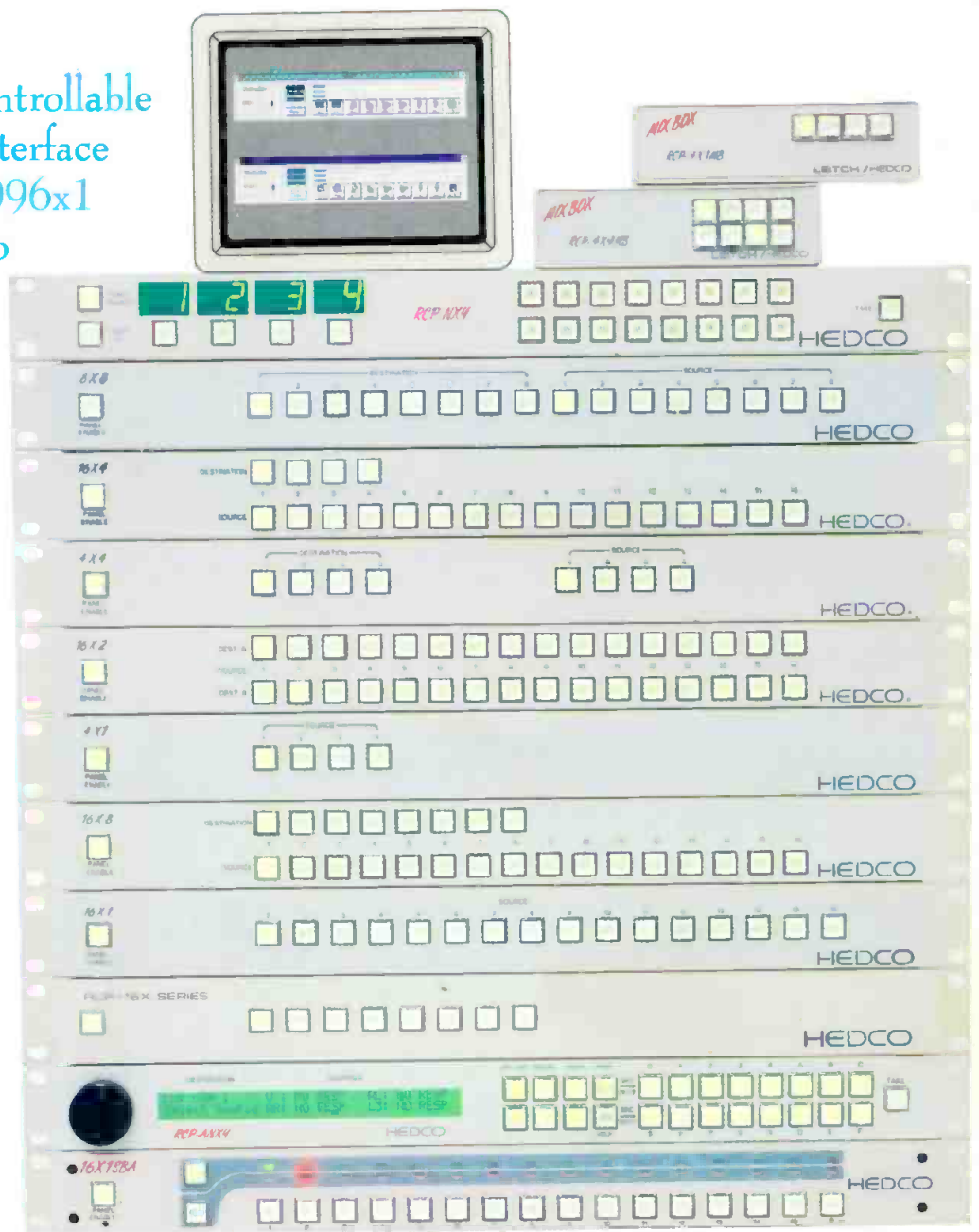
NEUTRIK Marketing Ltd.
United Kingdom
Tel 071 / 792 8188
Fax 071 / 792 8187

NEUTRIK Zürich AG
Switzerland
Tel 01 / 734 0400
Fax 01 / 734 3891

Circle (2) on Reply Card

Leitch puts a Powerful Control System in Every Router

- ✓ Fully Computer-controllable
- ✓ General Purpose Interface
- ✓ 4x1 to 32x32 or 4096x1
- ✓ Audio-Follow-Video
- ✓ Modem Interface
- ✓ Flexible Protocol
- ✓ Virtual Matrices
- ✓ X-Y Crosspoint
- ✓ Programmable
- ✓ Alphanumeric
- ✓ Salvo Buffers
- ✓ Serial Digital
- ✓ Stand-alone
- ✓ AES/EBU
- ✓ Breakaway
- ✓ Multi-level
- ✓ Single-bus
- ✓ Multi-bus
- ✓ Numeric
- ✓ Joystick
- ✓ Analog
- ✓ Audio
- ✓ Video
- ✓ Data



Don't let a router limit your systems' abilities today or in the future when, for no extra cost, you can get the Most Powerful Control System with the Largest Selection of Panels and Control Options available in small routing.

Push These Buttons 1 800 231 9673 For More Control

LEITCH®

Leitch Incorporated, 920 Corporate Lane, Chesapeake, VA 23320 - Tel: (800) 231-9673 or (804) 548-2300 Fax: (804) 548-4088
 Leitch Video International Inc., 220 Duncan Mill Rd. #301, North York, ON, Canada M3B 3J5 - 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) 256 880088 Fax: +44 (0) 256 880428

Circle (3) on Reply Card