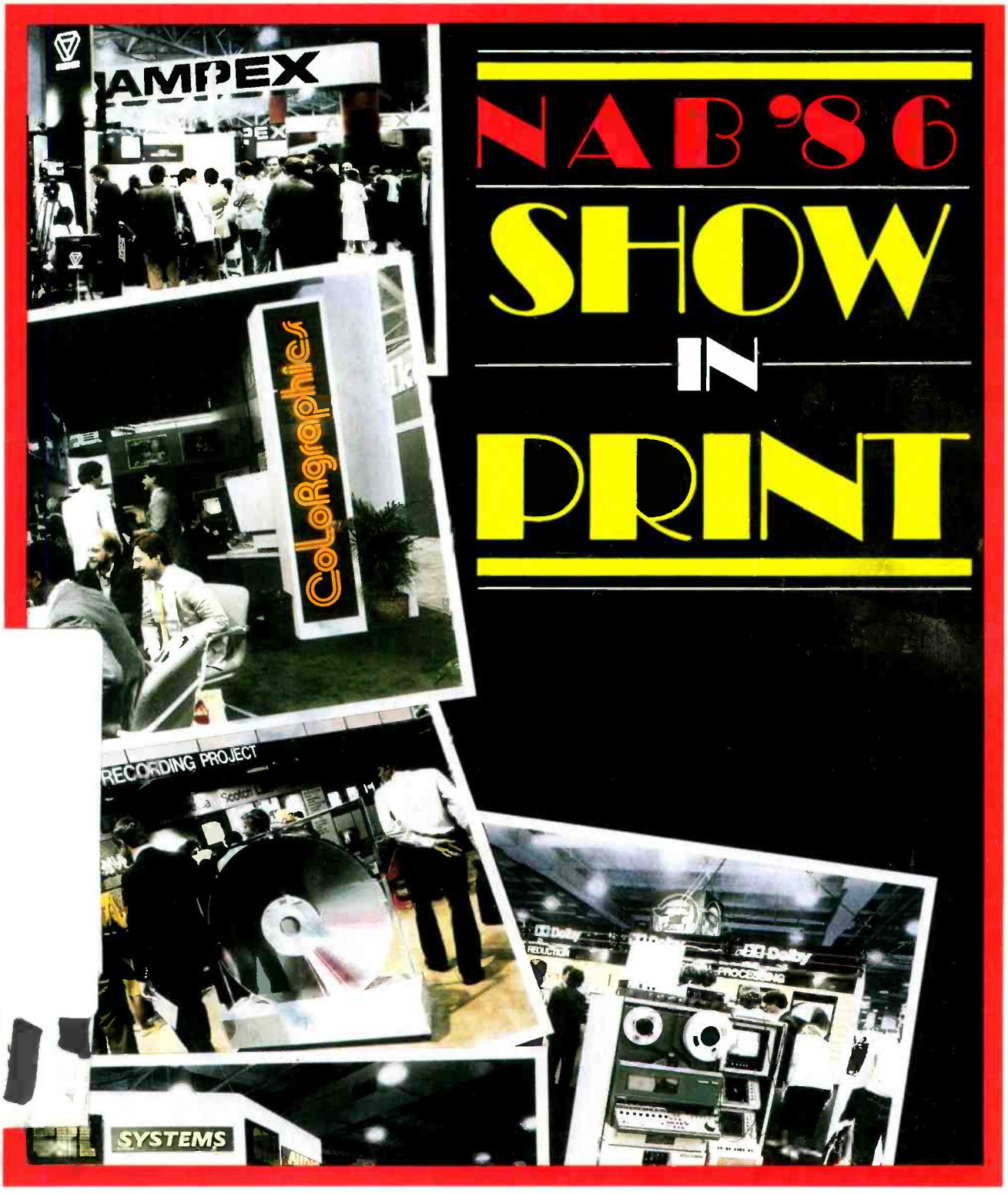
JUNE 1986 $3.00

BM/E

BROADCAST MANAGEMENT/ENGINEERING



NAB '86 SHOW IN PRINT

TEN REASONS TO CHOOSE THE NEW WESTAR CONSOLES FOR VIDEO/TV/FILM:

1. NEW DESIGN. State-of-the-art design for stereo and multitrack production.

2. EXPANDABLE. Available from 16 inputs up to 80 inputs, now—or later. The Westar frame is even field-expandable.

3. AUTOMATION. IDF Intelligent Digital Faders with three levels of automation. Field retrofitable.

4. INTERFACING. Easy interface with video editing systems and TV facilities.

5. CHOICE. Easy interchange of three types of equalizers and three types of microphone preamplifiers, in the studio.

6. FLEXIBLE. Console layout and patch-bay location may be custom ordered without custom pricing.

7. COMPUTER CONTROL. Optional micro-processor controlled input/output stereo routing/mixing switcher.

8. SUPPORT. Regional service centers for quick and courteous support. New York City, Nashville, Los Angeles, and Toronto.

9. MADE IN USA. Engineered and manu-factured in the United States by Quad Eight as a member of the Mitsubishi Pro Audio Group in their new 45,000 square foot Los Angeles facilities.

10. DEPENDABLE. Under the $8 billion strong Mitsubishi Electric umbrella, Quad Eight is the most solidly backed of all pro-fessional console makers.

For more information, please call or write.

The Westar 8300 Series at Hanna-Barbera Productions, Hollywood

WESTAR 8000 SERIES

by quad eight

8100 Series • TV Stereo

8200 Series • Video Sound Post Production

8300 Series • Film Sound

MITSUBISHI PRO AUDIO GROUP

DIGITAL ENTERTAINMENT CORPORATION

Headquarters: 225 Parkside Drive, San Fernando, CA 91340 • Phone (818) 898-2341 • Telex 311786
New York: Suite 1530, 555 W. 57th Street, New York, NY 10019 • Phone (212) 713-1600 • Telex 703547
Nashville: 2200 Hillsboro Road, Nashville, TN 37212 • Phone (615) 298-6613
Canada: 363 Adelaide Street E., Toronto, ONT. M5A 1N3 • Phone (416) 865-1899
United Kingdom: 1 Fairway Drive, Greenford, MIDDX UB6 8PW • Phone (01) 578-0957 • Telex 923003

Circle 100 on Reader Service Card

Fidelipac introduces

6.9% Fixed rate lease purchase program

Finance Dynamax Cartridge Machine equipment below the prime rate with ownership after a lease of up to five years.

- Avoid delay in equipment acquisition
- Avoid capital budget restrictions
- Avoid increases in pricing and interest rates
- Avoid reduction of working capital or bank lines
- **Save money**

The following examples are computed at the 6.9% rate:

CTR10 SERIES PACKAGE	LIST PRICE*	3 YEAR TERM	5 YEAR TERM
CTR13 Mono Recorder	$ 1,890		
CTR11 Mono Reproducers (3 units)	3,525		
ESD10 Eraser/Splice Detector	1,050		
Total	$ 6,465	$197.12/mo	$126.26/mo
CTR30 SERIES PACKAGE			
CTR34 3-Deck Stereo Recorder/Reproducer (1 unit)	4,375		
Total	$ 4,375	$133.39/mo	$ 85.44/mo
CTR100 SERIES PACKAGE			
CTR124 Stereo Recorders (2 units)	$ 6,930		
CTR112 Stereo Reproducers (6 units)	12,360		
Total	$19,290	$588.15/mo	$376.73/mo

Credit approval requires only three days upon receipt of required references. Prepayment is limited to the first and last months' lease remittance. The user retains all benefits of depreciation and available investment tax credits, and may purchase the equipment at lease maturity for 10%. $5,000 minimum lease purchase. Fidelipac cartridges and other accessory items may be included in the total package.

CALL 800-HOT-TAPE TOLL FREE
FOR MORE INFORMATION

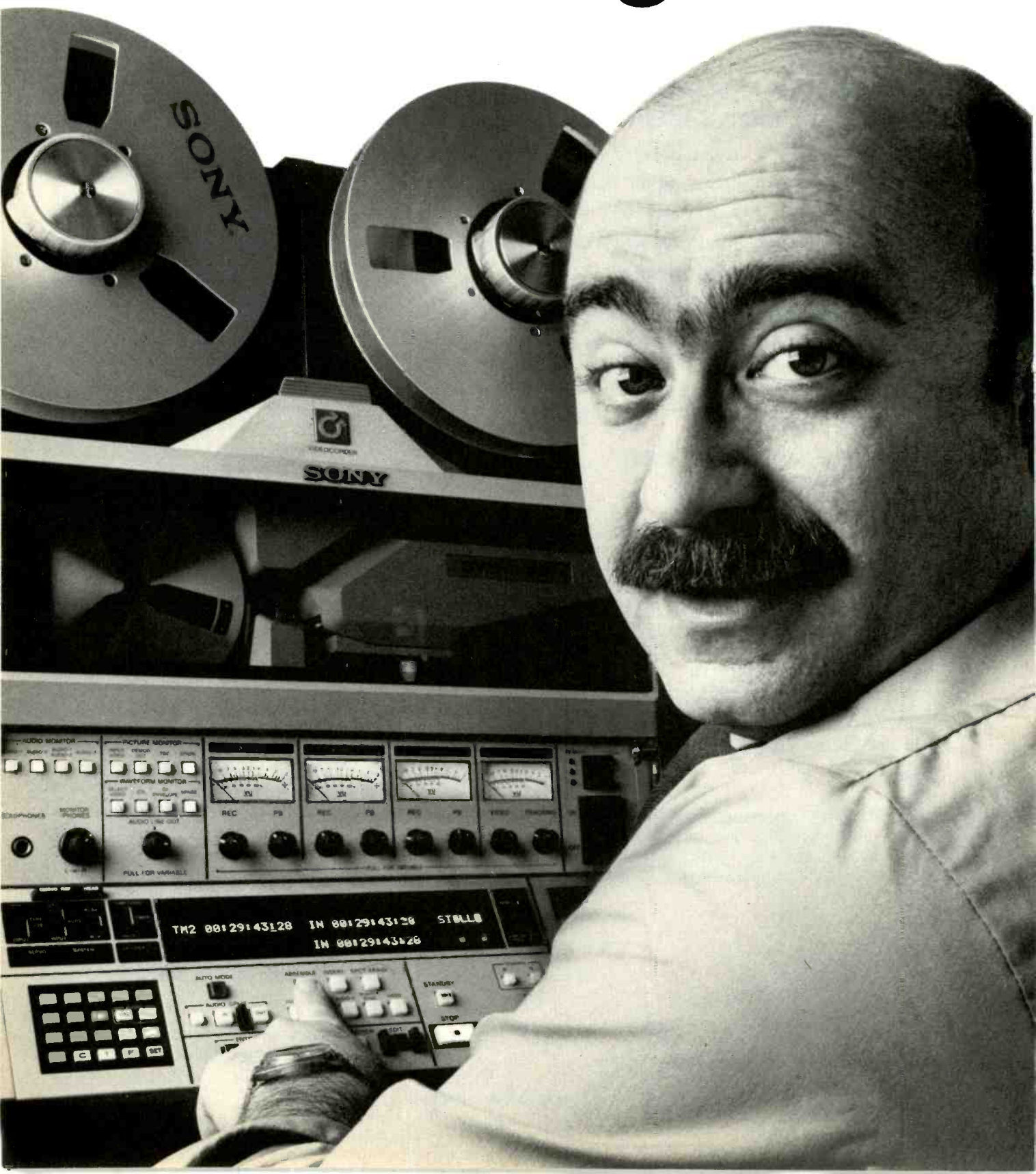
DYNAMAX™
BROADCAST PRODUCTS BY FIDELIPAC®

Fidelipac Corporation ☐ P.O. Box 808 ☐ Moorestown, NJ 08057 ☐ U.S.A.
609-235-3900 ☐ TELEX: 710-897-0254 ☐ Toll Free 800—HOT TAPE

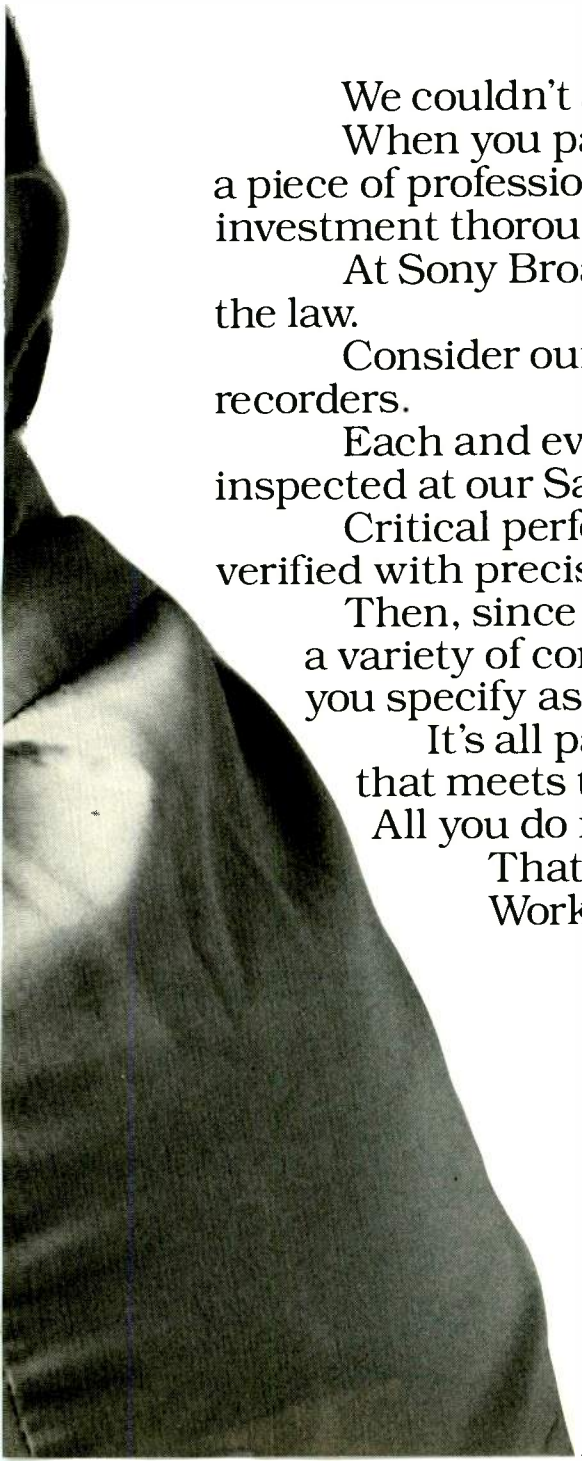
*Prices shown subject to change without notice.

Circle 101 on Reader Service Card

"It *better* work we're talking serious



right out of the box, money here."



We couldn't agree more.

When you pay tens of thousands of dollars for a piece of professional equipment, you deserve to have that investment thoroughly tested.

At Sony Broadcast, thorough testing is the law.

Consider our BVH series of one-inch recorders.

Each and every unit is unpacked and inspected at our San Jose testing facility.

Critical performance specs are carefully verified with precision test instruments.

Then, since you can order BVH recorders in a variety of configurations, we test the configuration you specify as a complete system.

It's all part of our commitment to deliver a product that meets the highest standards of professionalism.

All you do is plug in the cables, thread the tape and go.

That's the Sony Standard at work.

Working right from day one.

SONY.
BROADCAST

BM/E
BROADCAST MANAGEMENT/ENGINEERING

PUBLISHING DIRECTOR
Charles C. Lenz, Jr.
EDITOR EMERITUS
James A. Lippke

EDITORIAL BOARD CHAIRMAN
David Hawthorne

MANAGING EDITOR
Leslie A. Azia
TELEVISION EDITOR
Eva J. Blinder
RADIO/AUDIO EDITOR
Judith Gross
TECHNOLOGY/ENGINEERING EDITOR
Hugh Aldersey-Williams
NEWS EDITOR
Douglas Damoth
COPY EDITOR
Michael D. Espindle

FCC COUNSEL
Bechtel & Cole
BROADCAST FINANCIAL CONSULTANT
Mark E. Battersby
SPECIAL PROJECTS EDITOR
C. Robert Paulson

CREATIVE DIRECTOR
Mark Rogan
ASSOCIATE ART DIRECTOR
Andra Douglas
ASSISTANT ART DIRECTOR
Raymond Wong

PUBLISHER
William C. McGorry
ASSISTANT TO PUBLISHER
Sharon Porges

PRODUCTION DIRECTOR
Nick Tartaglia
PRODUCTION ASSISTANT
Barbara Mendelsohn

MARKETING SERVICES MANAGER
Arlene M. Peters
MARKETING SERVICES ASSISTANT
Shannon M. Riley

CONTROLLER
John Alinovi
OFFICE MANAGER
Donald Cooke

READER SERVICE
Marla Cipollone

Broadband Information Services Inc.
295 Madison Ave., New York, N.Y. 10017
(212) 685-5320, Telex: 64-4001
Also publishers of:
BM/E's **World Broadcast News**
E-ITV Educational-Industrial Television

ABP BPA

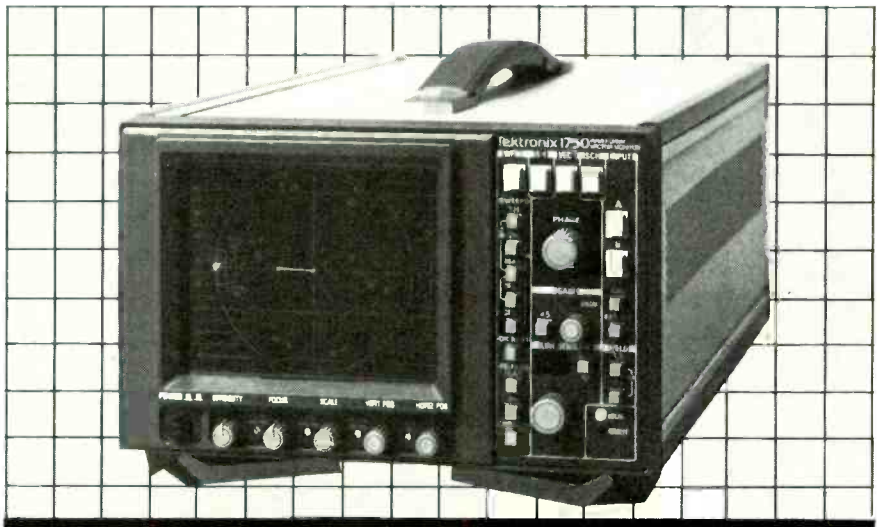
BM/E BROADCAST MANAGEMENT ENGINEERING (ISSN 0005-3201) is published monthly by Broadband Information Services Inc. BM/E is circulated without charge to those responsible for station operation and for specifying and authorizing the purchase of equipment used in broadcast facilities in the U.S. and Canada. These facilities include AM, FM and TV broadcast stations, CATV systems, ETV stations, networks and studios, audio and video recording studios, telecine facilities, consultants, etc. Subscription prices to others $24.00 one year, $36.00 two years. Foreign $36.00 one year, $60.00 two years. Air Mail rates on request.

Second class postage paid New York, NY, and additional mailing offices.
POSTMASTER: send address changes to BM/E Broadcast Management/Engineering, P.O. Box 6056, Duluth, MN 55806.

Circle 102 on Reader Service Card

A monitor to keep an eye on your video equipment.

At Camera Mart.



Tektronix 1750 Series Waveform Vector Monitor

No matter how versatile or advanced video equipment is, it must operate reliably and up to specs.

That's why we at Camera Mart are so impressed with the Tektronix 1750 Series Waveform/Vector Monitor, a brand new, compact unit that monitors all your other video equipment to make sure everything is working perfectly.

The 1750 Series combines all the conventional monitoring capabilities plus the ability to perform SCH phasing tasks.

SCH phase and color frame matching is measured directly using the new SCH MODE. This makes it ideal for production and editing applications where the maintenance of SCH phase and color frame relationships is critical.

It's new, and, as you'd expect, it's available right now from Camera Mart.

The more you know about video, the more you can rely on Camera Mart.

The Camera Mart, Inc.

456 West 55th Street, New York 10019 • (212) 757-6977
Telex: 275619/FAX (212) 582-2498
305 Vine St., Liverpool, NY 13088 • (315) 457-3703
Sales • Service • Rental

The Camera Mart Inc. 50 Years 1936-1986

Circle 103 on Reader Service Card

We know that one basic VTR, modified many ways to fit many recording applications, is the most cost-effective way for a manufacturer to *build* a line of VTRs. But we also know that this approach may result in compromised performance and concessions on the part of the user — concessions that at first seem small, but add up quickly in terms of inefficient operation and lost business.

Ampex, video recording, and the business of video have been synonymous since 1956. And though we've seen the "expedient approach" come and go over the years, the professionals in the video business have repeatedly assured us that their standards leave no room for compromise.

For these professionals, we build a complete line of the very best video tape recorders in the world.

The VPR-3: 500 ips^2 acceleration/deceleration profile and 20 milli-second single field lockup make it the fastest and most precise video tape recorder ever designed. With its multitude of sophisticated features, the VPR-3 is ideal for demanding post-production applications.

The VPR-6: Superb video and audio performance, along with the features most users ask for, make the VPR-6 the choice of video professionals for a wide range of applications. Its price, performance and reliability offer a package that makes good business sense for broadcast, production and

post-production users.

The VPR-80: Low cost, but high quality. Ampex brought decades of VTR experience to bear on this most difficult of design tasks. We know that every video facility at some time or other needs a "workhorse" — a VTR that can produce high quality video and audio, and at the same time not strain the budget. The VPR-80 is that machine.

The VPR-5: The video quality and features of a Type C VTR in a package no larger than a briefcase, allow you to record tapes in the field and edit the same format in the studio. When your productions begin in the field, where rugged and reliable performance is demanded, you need the VPR-5.

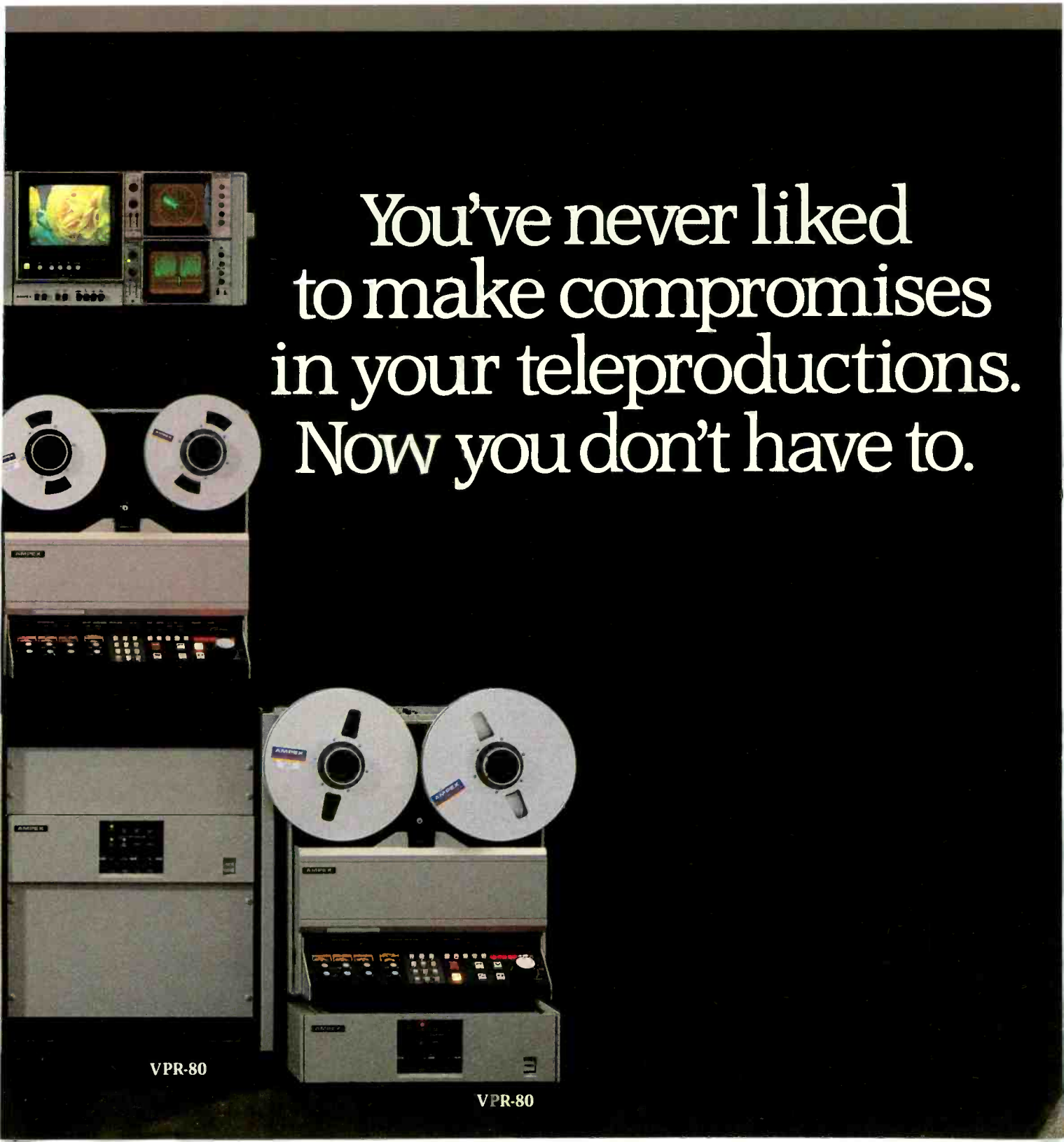
Call your nearest Ampex field office for a demo of *the* VTR that fits your needs. We know that one will be a *perfect* fit, either as a stand-alone performer, or teamed with an ACE editor, AVC switcher and an ADO™ in an Ampex Creative Command Center™. And remember, you can count on Ampex product support, worldwide.

Atlanta (404) 491-7112 Chicago (312) 593-6000
Dallas (214) 960-1162 Los Angeles (818) 240-5000
New Jersey (201) 825-9600
(In New York (212) 947-8633)
San Francisco (415) 367-2296
Washington, D.C. (301) 530-8800
Canada (416) 821-8840

AMPEX

Ampex Corporation • One of The Signal Companies

Circle 104 on Reader Service Card



Kaleidoscope.™

For those whose desires exceed reality.

You create digital effects all day. But at home, images still dance through your mind: effects far more spectacular than anything you saw on the monitor.

Now your most outrageous dreams can be fulfilled. Now there's Kaleidoscope.™

If you can imagine it, Kaleidoscope DPM-1 Digital Effects Systems can help you create it — with tremendous flexibility for effects creation and tremendous ease for on-line operation.

Yet when the monitor is off and the images fade, what remains is equally extraordinary: the quality, reliability and service of Grass Valley Group.

For years, you've been dreaming . . . and now reality is catching up with you.

Call or write to learn more.

Grass Valley Group®

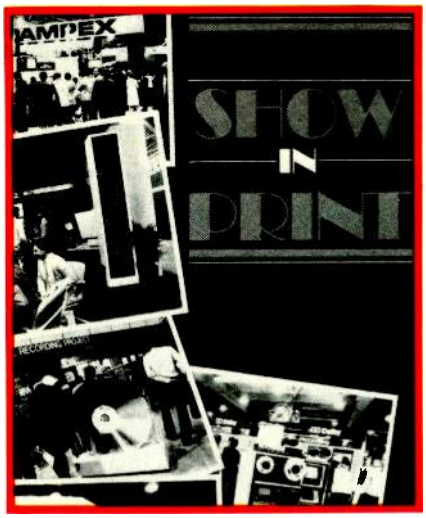
A TEKTRONIX COMPANY

KALEIDOSCOPE™

DPM-1 DIGITAL EFFECTS SYSTEM

THE GRASS VALLEY GROUP, INC.® — P.O. Box 1114 — Grass Valley, CA 95945 USA — Telephone (916) 273-8421 — TRT; 160482
OFFICES: Edison, NJ (201) 549-9600; Atlanta, GA (404) 321-4318; Elkhart, IN (219) 264-0931; Arden Hills, MN (612) 483-2594; Fort Worth, TX (817) 871-9111;
Woodland Hills, CA (818) 999-2303; Palo Alto, CA (415) 968-6680.

Circle 105 on Reader Service Card



BM/E
BROADCAST MANAGEMENT/ENGINEERING

JUNE 1986 VOLUME 22/NUMBER 6

17

85

Features

Departments

Cover:

There was action aplenty on the NAB floor this year, as over 600 exhibitors "showed their stuff." Controversy, drama, and a few surprises highlighted the Dallas convention, which, according to many, was one of the best in recent years.

Ikegami Wins Major NBC Camera Contract

While NBC's announcement that it had chosen Matsushita's M-II format for all of its videotape needs stole much of the business-side thunder at NAB '86, the $50 million half-inch video deal was not the only significant contract NBC signed at the show.

NBC also chose NAB as the site for closing a major camera order with Ikegami, part of a two-year contract that will provide NBC Sports with new, state-of-the-art studio and portable video cameras.

The first chapter of the contract, negotiated before the show but inked on the floor, calls for Ikegami to supply NBC Sports with 26 of its just-introduced HK-323 ⅔-inch, computerized studio/field cameras and six HL-79F portables.

Also included in the deal will be additional cameras to be used for NBC's coverage of the 1988 summer Olympic games in Seoul, Korea. These cameras initially will be used in new sports vans recently purchased by the network.

According to an Ikegami spokesperson, the total value of the deal is yet to be determined. The spokesperson indicated that the entire contract could include 40 to 50 cameras, perhaps including cameras for NBC's owned and operated television stations.

Studio A at Omega Studios' brand-new Rockville, MD, recording facility measures 50 by 40 feet, with an 18-foot ceiling—large enough to house orchestras and choirs, even at the same time. The control room, pictured here, features a 56-input, 48-output API console with FADEX. Other equipment includes Dolby and dbx noise reduction, Studer ATRs, Q-Lock synchronizer, Sony VTRs, and reverb and signal processing gear, as well as an array of traditional and electronic musical instruments. Omega plans conversion to digital audio in the near future for Studio A as well as its Studio B.

Networks Firm Up SNG Purchase Plans

The major news networks, NBC, ABC, CBS, and CNN, are firming up their purchase plans for satellite news-gathering equipment, based on what they saw at the NAB in Dallas. Some have issued their affiliates lists of approved SNG vendors, and the others are expected to follow suit shortly.

The networks tend not to be instructing affiliates to go with just one vendor, but are leaving them a choice of several. CNN, however, is taking a different tack. Paul Amos, vice president of Headline News, says: "We'll work with any vehicle out there." This approach has so far naturally favored low-cost systems, such as those from Dalsat and Midwest.

The shopping-list approach has angered some SNG vendors who see themselves being shut out of a lucrative affiliate market because of a network directive. Such instructions from a network, based on a judgement of equipment design and technology, may not be shared by affiliates who need to make decisions based on local demands and conditions, SNG manufacturers feel.

Dalsat, meanwhile, has announced that its SNG systems have already been approved by ABC and CNN, with NBC and CBS approval expected shortly. An NBC spokesperson said that so far only Centro and Hubcom have been approved as vendors for the network's national SNG purchasing program. NBC is still looking at the Dalsat system, as well as those from Midwest, Harris, Gray, and BAF.

ABC's director of audio/video systems engineering, Ben Greenberg, says that the network is still evaluating its requirements before listing officially approved SNG suppliers. ABC has discussed its needs with Centro, Midwest, ENG Corp., Hubcom, and Dalsat, says Greenberg. The third network, CBS, has so far held off naming its approved vendors for SNG equipment.

AKG Acquires Ursa Major

AKG Acoustics has acquired all of the assets and trademarks of Ursa Major, Inc. The acquisition establishes a new Digital Products Division within AKG, and the Boston-based Ursa Major will also become AKG's second R&D center.

Two digital products developed by Ursa Major were shown by AKG at this year's NAB show. The AKG MSP 126 used to carry the Ursa Major name. It's a digital stereo processor with two channels in and two channels out, which digitally turns a mono signal into stereo for either TV or radio. A brand new product developed by Ursa Major, being mar-

If you're looking for a new routing switcher...

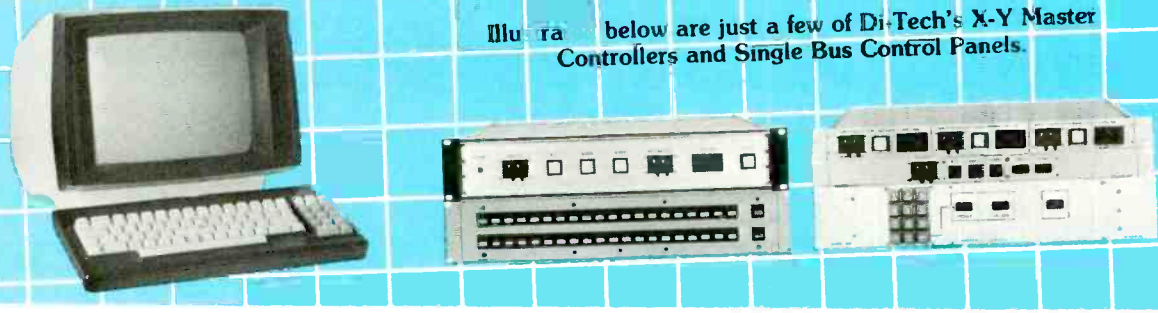
...try Di-Tech's Expandable · In-The-Field · Output Oriented 5850 Series!

More and more industry leaders have been switching to Di-Tech's expanding selection of routing switchers. We design the most reliable switchers to meet every need, every budget and every application. Our newest, the Model #5850 series, features:

- 40x20 Expandable AFV MATRIX with up to 3 levels of audio per input (within the same frame)
- No special IC's or Hybrids
- Serial RS422, RS 232, Coax or Parallel BCD Control
- Numerical and/or alpha numerical single b[illegible]ntrol panels
- Numerical and/or CRT X-Y Controllers
- The 5850 can be used to expand Di-tech's current in-the-field 5840 series switcher

Call, write or telex for more information on the 5850 series, or request our free catalog today. Whether it be for radio, television, mobile vans or production studios, Di-Tech has the high quality, reliable, easy-to-operate answer to your present and future needs!

Illu[illegible]ra[illegible] below are just a few of Di-Tech's X-Y Master Controllers and Single Bus Control Panels.



di-tech

48 JEFRYN BOULEVARD DEER PARK, N.Y. 11729
TEL. #(516) 667-6300 TELEX #971806

Circle 107 on Reader Service Card

keted with the AKG name, is the ADR 68K, a digital reverb effects unit that has two inputs and four outputs and can produce two programs—such as reverb and effects—at the same time.

Previous products marketed by Ursa Major, such as the Stargate, will be supported by AKG but will no longer be produced or marketed.

"We wanted to start off with the latest technology," said Richard Ravich, VP and GM of AKG Acoustics.

CBS and APR in Co-Venture

CBS and American Public Radio have formed a joint partnership to provide radio programming. The first cooperative effort will be a program called *Business Update,* which CBS News will produce and APR will distribute to its 313 affiliates in this country.

The program will consist of a 30-minute afternoon broadcast and a 10-minute morning business capsule airing weekdays. It will be a mix of hard news and in-depth features on the financial and business world, including stock market information. *Business Update* will draw on the resources of CBS News and use CBS correspondents.

CompuSonics to Offer Digital Video System

CompuSonics Video Corp., a 30-percent-owned affiliate of CompuSonics Corp., has announced plans to demonstrate a prototype of a digital video recording and playback system based on removeable computer disks.

The new CSX digital video recording technology, expected to have applications in the professional and consumer areas, will make its debut this summer. As presently described, it utilizes floppy computer disks as a storage medium for video information.

The basis of the system is a patented digital encoding process, called CSX, that the company claims significantly increases the image and sound storage capacity of digital memories, while reducing the bandwidth required to transmit or broadcast digital video.

The company emphasizes that the device to be introduced is a prototype, not a product, and that actual product development will take time. In the future, the company hopes to develop a CSX product family that could include a digital video recorder, video database computer, and digital encoder.

Correction: PYE TVT Marketing Transmitters

Contrary to information reported in the Television Engineering and Production section of *BM/E*'s May 1986 issue, PYE TVT is not defunct and, in fact, is currently marketing its transmitters in the U.S through Philips Television Systems, Inc., of Mahwah, NJ.

The Midwest Edge

Advanced Satellite News Vehicles from The Leader in Mobile Television Communications

From 4-wheel-drive ENG units to 45-foot mobile production vans – Midwest has built more broadcast vehicles than anyone. And as a leader in the RF industry, we've supplied hundreds of satellite systems across the country. Midwest is using this experience to produce the most efficient, versatile Satellite News Vehicles available. All engineering and construction are done under one roof, allowing the fastest delivery in the industry. And with over 30 offices, Midwest has the most complete service network offered by any Satellite News Vehicle supplier.

The S-25 is equipped to handle any situation, with onboard power, editing and microwave communications capabilities. The 2.4M antenna's deployment system is in full compliance with the latest FCC radiation regulations. And the unique antenna stowage system virtually eliminates snow and ice accumulation. The SCR-25 communications package, developed by Midwest, utilizes Bandedge digital carriers which allows encrypted communications between a remote or base station and the ability to access any satellite, any transponder, any frequency. Stay on the leading edge of competition, with a Satellite News Vehicle from the leader in broadcast communications – Midwest.

Unique Antenna Deployment System Reduces Radiation Hazard

Antenna stowage system virtually eliminates snow and ice accumulation.

Contact Midwest for information on our complete line of Satellite News Vehicles

Cincinnati OH 606-331-8990	Toledo, OH 419-382-6860	Grand Rapids, MI 616-796-5238	Nashville, TN 615-255-2801	Kansas City, KS 913-469-6810	Roanoke, VA 703-980-2584	Washington, D.C. 301-577-4903	Tampa, FL 813-885-9308
Columbus, OH 614-846-5552	Pittsburgh PA 412-364-6780	Louisville, KY 502-491-2888	Knoxville, TN 615 687-9515	Atlanta, GA 404-875-3755	Charlotte, NC 704-399-5336	Baltimore, MD 301-665-9323	Orlando, FL 305-898-1885
Dayton, OH 513-435-3246	Indianapolis, IN 317-872-2327	Lexington, KY 606-277-4994	Bristol, TN 615-968-2289	Virginia Beach, VA 804-464-6256	Raleigh, N.C. 919-850-3811	Miami, FL 305-592-5355	New Orleans, LA 504-542-5040
Cleveland OH 216-447-9745	Detroit, MI 313-689-9730	Charleston, WV 304-768-1252	St. Louis, MO 314-569-2240	Richmond, VA 804-262-5788	Greenville, S.C 803-226-9259	Jacksonville, Fl 904-272-8832	

MIDWEST
Communications Corp.

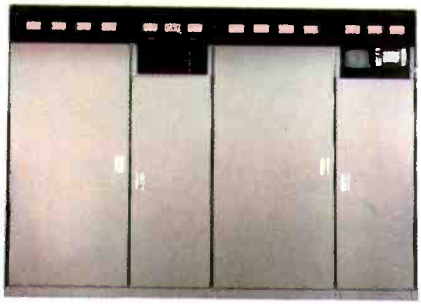
One Sperti Drive
Edgewood, KY 41017
800-543-1584
(in KY 606-331-8990)

Circle 109 on Reader Service Card

Comark performance satisfies the most exacting customers...again and again.

Harry Pappas was so impressed with his first Comark "S" Series 220kW Transmitter, he bought a second.

You don't get to be a leader in the independent television broadcast industry by making the wrong decisions about TV transmitters. When Harry Pappas was ready to build his New Super-power station, WHNS-TV in Asheville, N.C., he chose the Comark "S" Series 220kW Transmitter. In Harry's own words: "The transmitter lived up to the promises made by the Comark people...and then some. In terms of performance, specifications and efficiency ratings, I couldn't have asked for more."



Naturally when it came to choosing the transmitter for his next station in Omaha, Nebraska, there was only one choice: Comark's "S" Series 240kW rig.

At Comark, we are especially proud to have gained the confidence of a knowledgeable industry leader like Mr. Pappas. But building superior transmitters is only a part of our story. We continue to work even harder at building a superior transmitter company.

Customer service backed by engineering in depth is Comark's formula for satisfying the needs of the most exacting user.

Services and Equipment that Comark supplies include:

- Klystron UHF Transmitters from 10kW to 240kW
- A complete line of Tetrode TV Transmitters from 1 to 10kW
- Turnkey Installations
- On-site Retrofit Programs
- 24-hour Field Engineering and Customer Service
- RF Transmission Line, Components and Hardware
- Site Surveys

Whether your requirements are simple or complex, Comark stands ready to professionally satisfy your needs. Call (215) 822-0777 or write Comark, P.O. Box 506, Route 309 and Advance Lane, Colmar, PA 18915.

COMARK

Circle 110 on Reader Service Card

NAB '86 SHOW IN PRINT

NAE '86 will not soon be forgotten. New technology burst forth on all fronts: in digital recording, in solid-state imaging and transmission, and in signal manipulation.

The NAB '86 exhibition offered drama, excitement, and adventure: Ampex/Sony cross licensed each other; a digital composite format arrived amidst a few hisses; Comark stuck its neck out with the Klystrode; NBC announced that the M-II half-inch video format would become its "universal format," replacing all others.

NAB '86 was also as much a software show as one of hardware. Software pushed 3D picture making and special effects to beyond tomorrow. Software will usher in the era of digital radio.

These are only some of the stories that follow in *BM/E*'s Show-In-Print, organized into four sections: Video (TV and teleproduction), Audio (radio and TV), Transmission (terrestrial and satellite), Test & Measurement (audio, video, and RF).

Bringing over 600 exhibits into focus is a formidable task. The table of contents zeros you in to the subject. Our approach is to report major trends first, followed by related advanced developments, while not ignoring the standard benchmark offerings.

This report is a "full press" effort. Our team included Hugh Aldersey-Williams, Eva Blinder, Judith Gross, Dave Hawthorne, Jim Lippke, Jerry Walker, and Tim Wetmore. Assisting were Caristina Potowski, show photographer, and Bob Paulson, special projects. Two-way radio communications equipment was provided by Mark Wiskoff, Motorola C&E.

Precision motion control... from start to finish.

Practice, learn, fine tune, recall and execute!

- MultiController operates the programmable high speed HS-100P head and will accurately and repeatedly execute your most creative camera shots... adding new artistic dimensions to your productions.
- The controls are carefully placed and designed to provide the proper feel and responsiveness. When a shot is recalled, the camera is positioned to its new location with all the skill and finesse of an experienced camera operator.
- Stored camera motions are "learned" through the manual controls which remain "live" so motions may be fine tuned (edited) in either the rehearse or recall modes.
- MultiController operates up to 4 cameras (from a single panel) and up to 5 miles from the HS-100P head.
- Discover how MultiController can expand your production capabilities. Call or write for complete details.

TSM

TOTAL SPECTRUM MANUFACTURING INC.
20 Virginia Avenue, West Nyack, NY 10994
(914) 358-8820

Circle 111 on Reader Service Card

VIDEO

TV & Teleproduction

Coming in a future issue: Newsroom Computers

From the moment the starting gun went off, attendees at NAB '86 found themselves in a high-speed technology marathon the likes of which the industry hasn't witnessed for several years. Broadcasters came in a buying mood, and prospective purchasers were not disappointed: in almost every product category, technological development leaped forward to match the buyers' ardor.

The razzle-dazzle world of electronic graphics, always an easy draw for the curious, was hotter than ever this year as high-end capabilities like three-dimensional modeling and animation came down to low-end (or nearly so) price ranges as more companies followed Cubicomp into the $40,000-and-under range. In mid- and high-priced 3D systems, too, development was fast and furious.

The excitement in graphics was matched by the introduction of several new, lower-priced 3D digital effects systems. In fact, all across the floor, increases in capabilities and drops in price made possible by state-of-the-art circuitry brought introductions of streamlined systems with full-sized capabilities. Editing systems and production switchers all offered more bang for the buck.

The talk on the floor, however, hardly was limited to graphics and electronics. The video format wars intensified with NBC's announcement, just a day before the exhibit floor opened, that it had chosen Matsushita's half-inch metal tape M-II recording system as a "universal format" to replace all videotape equipment in its operations by 1988. So much for those who thought Betacam's success spelled a death knell for Matsushita in half-inch recording! Sony quickly came back fighting, however, announcing an enhanced Betacam SP recording format, also using metal tape, plus Betacam licensing agreements with Ampex and Bosch.

Excitement heated up in digital video recording, too, with Ampex exhibiting its digital composite spot player and Sony showing the first-ever D-1 format component DTTR.

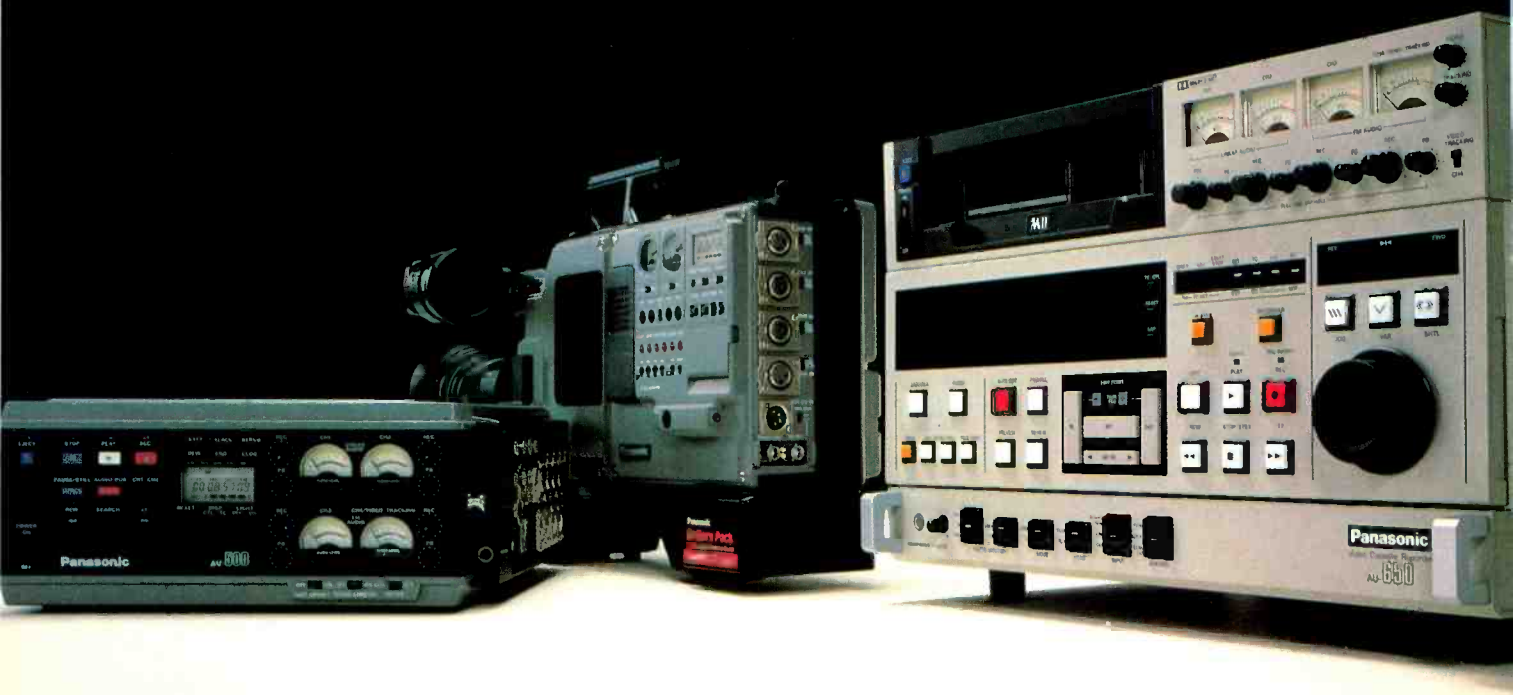
The broadcast-quality CCD camera, dealt a blow by RCA's recent withdrawal from the industry, came back in force this year with a new introduction by Sony and a Toshiba prototype. The ⅔-inch computerized studio camera is also coming into its own, with several manufacturers showing more complete lines.

Add to that the developments in image processing, routing, and all manner of support equipment, and you have the most exciting NAB in recent history.

WHY PANASONIC® M II STOLE THE SHOW AT NAB.

- A Complete, Single-Format System.
- Compact ½″ Cassette with 90 Minutes Recording Time.
- 1″ C Quality and Exceptional Multi-Generation Capability.
- High-Quality 4-Channel Audio.

Panasonic
Broadcast Systems



Circle 112 on Reader Service Card

VTRs: NAB's Biggest Player

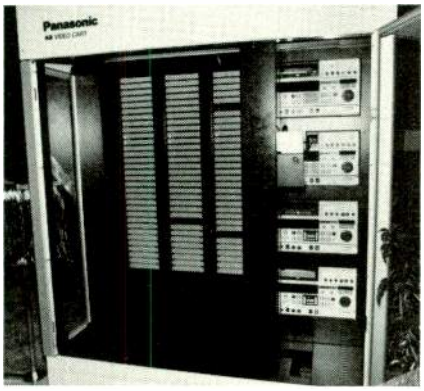
From Saturday morning on, VTRs and talk of VTRs had the convention floor reeling. Just prior to the convention, Ampex had announced its decision to manufacture and market a half-inch videotape component video recording system using Sony Betacam or Betacam SP technology under license. Given the strength of both companies, and the near washout of Matsushita's M-format, it looked like a *de facto* small-format standard had been established.

Of course, Matsushita would be again showing its new half-inch component M-II format introduced last year, but most observers felt it would be a case of too little, too late. Then, Saturday morning, NBC called a press conference and stunned everyone with their announcement that they had made a five-year, $50-million commitment to M-II.

Moreover, Michael J. Sherlock, executive vice president, operations and technical services, for NBC, articulated a position on "the new economics of network and station television," in support of the decision that promises to have far-reaching influence on the industry as a whole. Suddenly, M-II was not only "alive," but it had come off the ropes with a daunting aggressiveness.

It ain't over yet. What was left at the end of this round was the distinct impression that the character of the battle had shifted. Before the NBC announcement, without casting aspersions on any contestant, it looked as if the fight was about a *de facto* if not *de jure* standard for half-inch component video recorders. After the announcement, it was clear that what was at stake was not a segment of the VTR market but *the* VTR market—the whole ball of wax.

NBC's official announcement said: "(M-II is to be) employed by all of the company's operating divisions—NBC Television Network, NBC Television Stations, NBC News, NBC Sports, and NBC Operations and Technical Services—and it will be used at all levels—from news gathering in the field, to the 1988 Seoul Summer Olympics, to prime-time entertainment shows and commercial spots on all of NBC-TV."



Panasonic showed its M-II cart system, which with the other M-II recording systems, got NBC to commit $50 million over five years.

The apparent strategy for this fight was cast months ago. NBC, according to Sherlock, had reached a number of conclusions regarding its long-term technical position. One, the lease on its 30 Rockefeller Plaza broadcast headquarters will expire in 1990. NBC will build a new broadcast headquarters on Manhattan's West Side, and it does not want to make a monument to technological anachronisms. Third, in reviewing its existing use of videotape recording systems, it found that the cost of supporting three principal formats (¾-inch, one-inch, and two-inch) was enormous, and with half-inch component recording developing rapidly and the likelihood that NBC would ultimately want to move to all-digital component recording, the opportunities for waste seemed colossal unless they could come up with a "universal" videotape recording format.

NBC had approached all the major VTR manufacturers with its idea for a universal recorder. Only Matsushita's response, said Sherlock, met their basic requirements. Representatives of both Sony and Ampex expressed disappointment that their responses did not meet with NBC's approval, but maintained that they certainly gave it their best shot.

Speculation on why things turned out the way they did was rampant at the convention. The most plausible of these scenarios held that NBC's committment to a "universal recording format" was inherently awkward for both Sony and Ampex, each of whom have a major share of the market for Type-C recorders. Sony also has a virtual lock on the ¾-inch market in broadcast, and the adoption of a "universal recorder" would have required each of them to, in a sense, market against their own best and most successful products.

Moreover, both Ampex and Sony hold valuable patents on technology associated with Type-C recording, and, in Sony's case, valuable patents associated with U-matic recorders. A massive switchover to M-II could easily affect the direction of flow for licensing fees.

Matsushita, of course, with M-format a virtual washout, with no Type-C product, with a ¾-inch market in distant second, has few of the difficulties with a "universal recording concept" that its competitors have. Despite its triumph over Sony in the consumer market in the VHS versus Beta war, Matsushita has had little success in competing with Sony in the broadcast market. So, the story goes, Matsushita was anxious to take on the NBC challenge.

To the credit of the statesmanship of all concerned, various officials of Sony, Ampex, and Matsushita refute the scenario. Say they: We never worried about gaining market advantage. We all looked at the issues strictly on technical criteria and decided that the steps we were to take were in the best interest of our companies and our customers.

Ampex, for example, could have felt that its adopting M-II would cut into its Type-C sales. A direc-

tor of Matsushita, while disappointed in not locking up Ampex on its side, did not feel that issue was a factor.

For its part, Ampex said a deciding factor was the wider track width used for Betacam videorecording, which it felt would be inherently more reliable—especially in PAL environments. Matsushita counters that improvements in video head sensitivity and further improvements in the metal tape will yield a 1 db improvement in S/N and a 3 dB improvement in carrier/noise ratios for M-II; thus handling the major concerns regarding M-II performance in PAL environments. As for reliability, NHK of Japan has had no problem with the 170 units now operating (90 of 100 which have had 1,000 or more hours of use).

But the Sony/Ampex deal on Betacam technology certainly makes the Betacam format attractive. Also joining in is Bosch. This lineup outweighs JVC's signing up with M-II. According to Sony, about 25,000 Betacam systems have already been sold worldwide, with about 6000 sold in the U.S. An NBC survey of its own affiliates, however, found that only about 15 percent of NBC-affiliated stations had any Betacam equipment, and NBC's feeling was that the installed base for Betacams was not so large as to represent a major obstacle.

Betacam SP, of course, is not yet here, as we discuss later. And Ampex has not decided which it will begin manufacturing, standard Betacam or Betacam SP.

JVC Company of America vice president, Dan Roberts, offered no firm information on just when JVC would begin manufacture of M-II systems, nor just how many of the different types of models JVC would manufacture.

The M-II offerings. Four new M-II products were shown by the Broadcast Systems Division of Panasonic. These included the AU-650 Studio Recorder, AU-500 Field Recorder, and a portable Field Edit Package for ENG/SNG operations.

Basically, the M-II recorders use metal particle tape, which comes in 10; 20; 30; 60; and 90-minute lengths. The 10- and 20-minute cassettes are pocket-size. (In addition to Panasonic, Fuji and TDK will also manufacture the tapes).

A two-channel analog component recording system using an improved Chrominance Time Compression Multiplexing (CTCM) technique is employed. The luminance (Y) signal is FM recorded for the Y channel, and the two color-difference signals (R-Y and B-Y) are time compressed into a single serial signal that is FM recorded for the chrominance channel. A 2.25 MHz burst signal is inserted on each of the video channels (C and Y) during recording to serve as a reference for phase alignment and jitter correction during playback. Luminance bandwidth is 4.5 MHz at −3 dB, the K factor is 2 percent, and the chrominance signal-to-noise ratio is 50 dB. SMPTE Time Code is fully implemented with internal readers and generators. NBC News expects to use the time code user bits provision in the system to not only fully identify the equipment used in each recording (i.d. numbers) but to also "sign" the recordings for copyright protection.

Betacart is now in nearly 10 percent of stations. Sony believes its installed base of Betacam systems with recent second sources such as Ampex and Bosch will fend off the M-II challenge.

NBC News is also very high on the Field Edit Package. In its basic configuration, the edit package includes two AU-550 Field Edit/Recorders, the AU-A50 Field Edit Controller, the AU-MX50 Field Audio Mixer, and, for direct transmission, the AU-TB50 Time Base Corrector. The system operates with either ac or dc power sources. The design weight of the system is approximately 33 pounds.

The AU-550 field edit recorders have nearly all the features of the AU-650 Studio VCRs. Video and audio confidence heads are provided for real-time monitoring. There are two longitudinal audio channels and two high-quality FM audio channels (PCM digital audio recording will be retrofittable). The studio unit does include an internal 32-line correction window TBC, but the field unit can operate at 5X normal bidirectional search speed.

The AU-400 camcorder unit has a 20-minute record time and is designed to dock to several tube-type and CCD-type cameras.

The studio recorder, field recorder, and camera recorder will be available by this fall. The complete field edit package will be available later in 1987 to be followed by an M-II Automated Cart Playback system. Pricing for the various system components has not been worked out completely, but the studio recorder will come in at about $37,500.

Betacam and son-of-Betacam. In a special "Future Technology" portion of its booth, Sony showed an early version of Betacam SP recording technology. The SP designation stands for Superior Performance, which it achieves by widening the luminance bandwidth and improving the signal-to-noise ratio. Betacam SP will also provide up to 90 minutes of recording time. The audio portion of the SP system uses both longitudinal tracks and two AFM tracks that record both the audio and video signal simultaneously with one recording head. The SP system will use a new metal particle tape developed by Sony Magnetic Products Company.

Most important to current and future users, SP will be compatible both forward and backwards to existing Betacam systems. What that means is: Any tape recorded on the current Betacam system

can be played back on an SP system. A tape recorded on SP can, likewise, be played back on an existing Betacam player. However, a Betacam recorder cannot record on the new SP metal tape.

Sony is looking ahead by positioning the SP system as an "ideal field acquisition unit" for the Sony Broadcast 4:2:2 DVTR. The company also sees the SP format as appropriate for post-production applications, especially those that use component recording for graphics generation and animation.

To its existing Betacam line, Sony added a new portable player, the BVW-21, a new component color corrector, the BVX-10, a new 30-minute cassette, and new software for its Betacart system.

The BVW-21 is basically designed to offer field and office playback requirements, with such features as high-speed search (up to 3.5 times normal) and auto stop-and-rewind. The unit weighs just 17.4 pounds and uses either ac or dc power.

The 30-minute, BCT-30K cassette for Betacam uses a new Sony-developed Vivax magnetic particle combined with a special binder.

FOR MORE INFORMATION

Ampex	250		
Matsushita	251	Bosch	253
Sony	252	JVC	254

Digital VTR Debut 'Fragged' by Small-Format Bombshell

Both Sony and Ampex came to Dallas prepared to steal the show with the official debuts of their DVTR systems—a 4:2:2 component DVTR from Sony meeting international CCIR 601 digital interface standards and a nonconforming composite DVTR from Ampex.

Considering how long talk of digital video recording has been going on and generating rising expectations, the appearance on the market of the first two commercially available DVTRs was remarkably low-key. Whether 10 years of being "just around the corner" has made the market blasé to the DVTR or whether these early machines are so "specialized" in their design intentions as to render them esoteric is hard to determine. What is clear is that both Sony and Ampex are being somewhat conservative and cautious in the positioning of the machines. Sony's component DVR-1000 is, of course, a studio recorder. Ampex's initial composite digital unit, the ACR-225, is essentially a multiple event spot player. But Ampex's announcement prior to NAB of its intention of making a studio composite digital recorder as well clouds the picture.

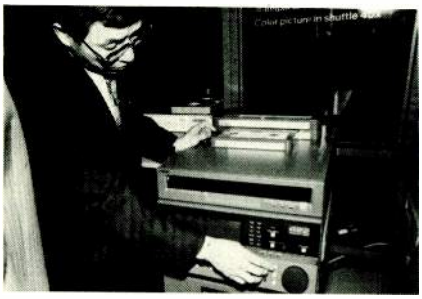
Sony reportedly sold 12 and took orders for 60 more DVR 1000s during the show, offering some evidence that the market is ready to apply the new technology. The DVR-1000 and its accompanying DVPC-1000 digital signal processor comes in a package about the size of one of those small office-type refrigerators—three feet high and, of course, 19 inches wide. It uses 19 mm videotape cassettes from the SMPTE-specified D-1 family. The package is priced at $120,000.

Clearly, the first applications of the DVR-1000 will be in post-production and other specialized applications where the machine's superb multigeneration recording quality can be exploited. The practice of using digital recording for video processes requiring many recording passes is well established. Specialized digital recorders like Abekas' A62 and Quantel's Harry system are already employed for short sequences requiring such digital recording characteristics.

Besides the absolutely transparent multigenerational recording quality of the DVR-1000, its other features include four channels of digital audio, no picture shift in editing, and color playback in shuttle up to ± 40 times normal speed. The Sony system is 525/625 switchable with both digital and analog inputs/outputs for video and audio. Fade-in/fade-out audio mixing, 100/240V selectable power, RS-422 remote control, M and L cassette handling, and insert/assemble editing capability are all included in the system.

Sony sources say that the DVR-1000 will be deliverable in early 1987 with some preproduction models available in 1986.

Ampex's ACR-225 Digital Cart Spot Player, which offers on-line storage of up to 256 cassettes and a library database for another 10,000, is a horse of a different color altogether. ACR-225 is clearly intended to make a quantum leap from the technology of the analog ACR-25, which it is to replace.



Sony's DVR-1000, a 4:2:2 digital component video recorder, scored big. Some sources say as many as 60 orders were taken for the new type recorders.

The choice of a composite digital signal approach, claims Ampex, allows the system to be much less expensive than component recorders, which require much more electronics to process the three component signals than required to process a single composite channel. Nevertheless, the sophisticated error correction and error concealment techniques employed and the virtue of digital signals gives the system a superb picture quality superior to one-inch in every way, with the added advantage of being able to produce in-system dubs with no generational loss.

Moreover, the digital processing techniques allow the system to be relatively insensitive to the types of errors caused by heavy repeated replay. Broadcast quality replay would be possible even with the loss of two heads on any of the transports.

Canon Quality. Canon Value.

Now available in a full line of camera support products.

MC-200/MC-300 PEDESTALS

Featuring Canon's sophisticated Modular Cassette Counterbalance (MCC) system that makes them far lighter and more mobile, Canon pedestals also feature a very short mounting height, making them ideal for low-angle shooting.

MC-200
Maximum Mounting Weight: 286 lbs.
Elevation: 24-49 inches

MC-300
Maximum Mounting Weight: 242 lbs.
Elevation: 23-60 inches

TR-60/TR-90 TRIPODS

Featuring collapsible tubular leg construction, integral spreaders, flip-tip legs with spikes and rubber padding.

TR-60
Maximum Mounting Weight: 132 lbs.
Elevation: 20-45 inches

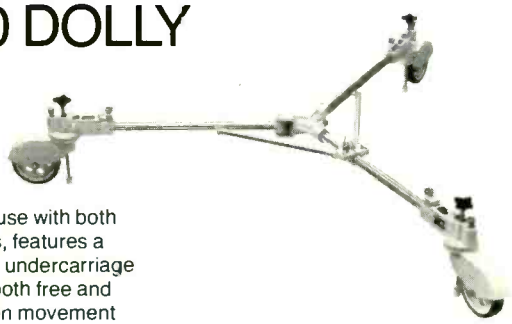
TR-90
Maximum Mounting Weight: 198 lbs.
Elevation: 26-48 inches

SC-15 CAM HEAD

Designed for use with all pedestals and tripods, it features a convenient "V" wedge mounting system and center-of-gravity adjustment control. The modular panning rod may be used on both sides.

Maximum Mounting Weight: 330 lbs.
Tilting: ±50°, Panning: 360°

CD-10 DOLLY



Designed for use with both Canon tripods, features a tricycle caster undercarriage that enables both free and single-direction movement

Maximum Mounting Weight: 198 lbs.

For years, broadcasters have made Canon lenses a top choice for studio, field and news production because they know and trust Canon's proven commitment to quality and value.

Now Canon is proud to introduce a complete, full-featured, high-quality camera support system, built to the same high standards and backed by the Canon service network.

Canon®

Optics Division
Canon USA, Inc., Head Office: One Canon Plaza, Lake Success, NY 11042 (516) 488-6700
Dallas Office: 3200 Regent Blvd., Irving, TX 75063 (214) 830-9600. Chicago Office: 100 Park Blvd., Itasca, IL 60143 (312) 250-6200
West Coast Office: 123 Paularino Avenue East, Costa Mesa, CA 92626 (714) 979-6000
Canon Canada, Inc., 6390 Dixie Road, Mississauga, Ontario L5T1P7, Canada (416) 678-2730

Circle 109 on Reader Service Card

The system also features four independently editable 16-bit digital audio channels. The D-1 cassettes used in the system will offer up to 13 minutes of play time.

But what is behind the ACR-225? Although only an ACR-225 was shown at NAB, conversations with various Ampex representatives clearly suggest that the ACR-225 will not be the only composite DVTR model that Ampex will make. One company official explained Ampex's view of the VTR market this way: There are five types of VTR applications—program acquisition (ENG/EFP), program production (studio), post-production, on-air playback, and utility (all those VTRS spread around so that people can view tapes). Of the five applications, only the post-production application has criteria that would suggest a superior performance for component digital recorders. In all the other applications, composite digital would be just as good, and more important, a lot cheaper.

But such a view is not popular with proponents of CCIR 601, who have voiced their displeasure since the first announcement of the ACR-225 last January.

To partially offset this negative feedback, Ampex came to the show with an agreement by Sony in its pocket to jointly submit the Ampex-developed 4fsc composite digital recording format to world television standards committees for adoption as a standard. Further, Sony has stated that it will design and manufacture a composite digital videotape recorder complying with the Ampex 4fsc format, though it provided no time frame for this action.

Both Sony and Ampex officials bravely stated that they believe there is enough room in the market for both companies and component digital recorders. Nevertheless, others—mostly representing European interests or manufacturers of post-production systems like digital effects systems, art systems, and other peripherals—expressed concern if not outright resentment toward the "nonstandard" composite digital VTR, thus making it an interesting NAB to say the least.

One critic from the U.K. said: "We worked long and hard for the 4:2:2 agreement and made a lot of compromise with you Americans and the Japanese to arrive at CCIR 601. If Ampex is right about the American desire for cheaper composite DVTRs, it will undercut the economic support needed for 4:2:2."

Ampex is no doubt right about the cost of composite versus component, and that's what threatens the CCIR proponents who see money being sucked out of the digital component marketplace.

Among those who need a component 4:2:2 digital recorder are those companies who manufacture the post-production devices like art/paint systems, effects devices, and other digital component processing gadgets. Already these people carry the expensive burden of converting from analog composite to digital component and have greeted with some joy the movement to analog component, which reduces somewhat the complexity of their problems.

A movement to digital component videotape recorders would make their lives much simpler, their equipment cheaper, and, they say, ultimately the whole system much more reliable and better. With a digital composite recorder, however, life would be much more difficult for them. Said one manufacturer of digital production equipment: "Going from analog to digital is not hard, from analog composite to digital composite is even easier, but from composite digital to component digital . . . Oh, boy!"

FOR MORE INFORMATION

Sony . . . . . 25S Ampex 256

One-inch Reigns

Despite the drama of half-inch component developments, one-inch remains upon the VTR format throne. For the time being, new one-inch Type-C and Type-B machines were seen from the principal manufacturers.

Bosch, which will manufacture Betacam systems, pushed Type-B ahead with the BCN-52.

Sony showed two new one-inch machines designed for special production applications: the BVH-2000/10 and BVH-2000/12. The 2000/10 is designed for tape duplication applications and basic real-time recording and playback; it's priced at $29,950. The 2000/12 is designed for standard production, post-production, and on-air playback. It features Dynamic Tracking and reverse play in real-time to three-times normal. It is priced at $39,950.

Sony also showed the new BVH-2800 and BVH-2830. From a video standpoint, these machines are like other VTRs in the BVH-2000 series but feature two PCM digital audio channels for stereo recording in addition to the two analog channels. The digital channels feature 16-bit linear quantization and phase-error correction. Both units have a dynamic range of 90 dB with 20 dB headroom and frequency response from 20 Hz to 20 kHz.

Ampex introduced no wholly new one-inch machines but did show its advanced video processor, Zeus 1, working with the VPR-6 for the first time. Giving attention to stereo, Ampex showed a new stereo upgrade kit—developed by Kudelski SA of Switzerland—for its VPR-2 recorders. It can be installed by the user.

Bosch added a new BCN-52 recorder to its line of Type-B segmented-scan one-inch VTR systems. The new recorder is able to show a continuous slow motion range from 0.25 reverse-to-normal playback speed forwards without

When the Hitachi HR-230's real-time diagnostic system spots a potential problem during operation, it tells you what happened, and exactly where it happened. And it tells you in plain English.

The HR-230's computer controlled self-diagnostics continually monitors 49 different operational, maintenance, and troubleshooting parameters during both playback and recording. And it gives you the whole story up front on a console display and on the monitor.

Plus you don't have to keep your eyes glued to the machine. Because the HR-230 stores it all in memory—along with the exact location—so you can go back and check later on.

But the HR-230 has a lot more going for it than just a great memory. Our retracting tape guides and tension arms—along with a non-contact air scanner system dramatically reduce head and tape wear. It's compatible with all major editing systems. And such features as master/slave operation of up to 48 VTRs through its built-in editor, complete autosetup, pre-aligned replacement scanner, and a built-in TBC save you a lot of time and trouble.

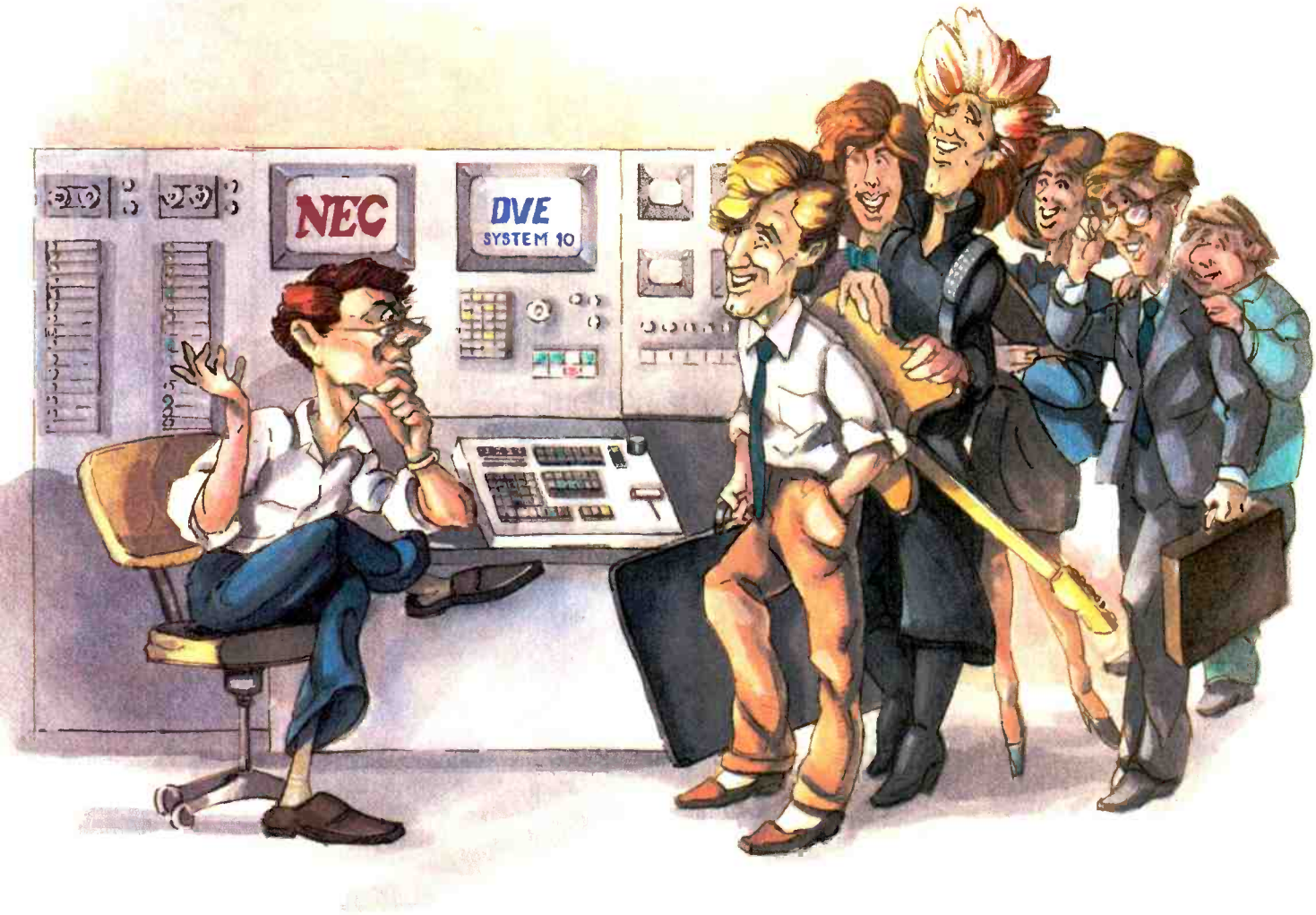
And the HR-230 will save you money. Because nobody offers you so complete a machine for so modest a price.

For a demonstration in your studio, contact Hitachi Denshi America Ltd., Broadcast and Professional Division, 175 Crossways Park West, Woodbury, NY 11797. Or phone (516) 921-7200 or (800) 645-7510. In Canada, contact Hitachi Denshi Ltd. (Canada), 65 Melford Drive, Scarborough, Ontario M1B 2G6; (416) 299-5900.

HITACHI

Circle 115 on Reader Service Card

THE FIRST 1-INCH VTR THAT TELLS YOU WHERE TO GO.

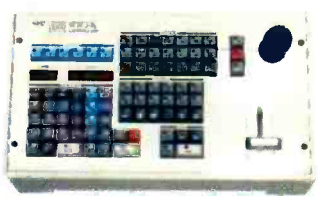


THE PERFORMER

The DVE® System 10 from NEC is one of the hottest selling digital video effects systems on the market today. For good reason: it performs. To find out for yourself, just spend a little time behind the controls. Get a feel for 3-D rotation, infinite perspective, cube making, tearing, A/B switching, key masking an ease of use that will make you feel like an expert in no time.

The word is that the DVE System 10 is quickly becoming the choice for TV stations, production, and post-production facilities throughout the country.

So take yourself on an adventure in creativity with the system backed up by one of the biggest names in the industry. The DVE System 10 from NEC.



NEC

IMAGINE WHAT WE'LL DO FOR YOU

C&C COMPUTERS AND COMMUNICATIONS • *DVE® is a registered trademark of NEC Corporation.*

NEC America, Inc., Broadcast Equipment Division • 1255 Michael Drive, Wood Dale, IL 60191 • Toll free 1-800-323-6656 • In Illinois phone 312-860-7600

Circle 116 on Reader Service Card

Tape to Follow

The half-inch video format wars and the arrival of digital VTRs and ATRs have caused shock waves in the tape market as well. At NAB, tape suppliers lined up new metal tape to support the Beta SP and M-II formats.

There were also promises to support the digital machines. And it would not be a tape market without price erosion. (The recent oil price collapse has had little effect on tape and cartridge prices, they say, although the oil increase a few years ago was given as the reason for price increases. Curious economics, that.) Incidently, if you have heard about the tape from Turkey, it has been labeled either a good thing or a bad thing or of no importance, depending on who you ask. Turkish tape has had more impact on the volatile consumer audio and videotape market to date.

For the record, here's what the tape suppliers featured:

The Magnetic Tape Division of Agfa-Gevaert reported that it will support both Beta SP and M-II formats. New was an improved formulation for half-inch VHS tape as well as a newly designed carton for half-inch duplicator videocassettes.

For audio, Agfa had PEM 297D digital mastering tape in one-inch width and PEM 469 studio mastering tape in 5000-foot lengths.

Ampex Magnetic Tape Division has already set plans to supply M-II format tape when the time comes. And the company will also be ready with Beta SP metal particle tape when those machines reach the market. New at NAB were the 198 for Betacam and 199 for M-format. Also new were a user friendly labeling system.

On the audio side, Ampex put out a new three-minute "audio-for-video" demo to emphasize its part in another of the NAB's themes—better sound for TV.

The big news at Fuji Magnetic Products Division was introduction and production of M-II videocassettes, the result of a joint project with Matsushita. Fuji calls its formulation "Super Metallix," a metal particle tape with about four times the magnetic energy of conventional cobalt ferrite oxide tapes.

Kodak introduced the Eastman EVT-2000 one-inch tape that will be available in C and B formats. As for 8 mm, Kodak now has a video duplicator system, the MVS-5660P audio-video recorder and MVS-670 duplicator controller.

Celebrating the thirtieth anniversary of the development of the VTR, 3M announced that it would be ready to supply digital videotape when the market develops. 3M introduced a 60-minute version of one-inch Master Broadcast Videocassette, MBR50, and its latest half-inch tape, PB20, as well as the 480 and 479 one-inch reel-to-reel tape.

Also on hand was the Scotch 275 digital audio mastering tape for use on both PD and DASH format recorders.

Maxell P/I Division came out with a reformulated BQ line for Beta and VHS and a new PI+ epitaxial Beta videocassettes for industrial users.

With the big NBC order on its books, Panasonic also introduced an M-II format, 90-minute half-inch cas-

sette with four audio tracks—two FM, two longitudinal.

Sony Magnetic Products Company introduced a new superior performance (SP) U-matic cassette, KSP. To support its DVTR, Sony showed a 19 mm tape with an optimized magnetic particle formulation, D1M-34 and D1L-76. Also added was the BCT Betacam half-inch cassette with 30-minute record time.

Zonal's specialty is audio including the 610, 611 long play and 846 double play professional audio tapes.

FOR MORE INFORMATION

Agfa-Gevaert	258		
Ampex	259	Maxell	263
Fuji	260	Panasonic	264
Kodak	261	Sony	265
3M	262	Zonal	266

HDTV Rolls up Successes at NAB

Delegates to industry conventions have now become accustomed to the oohs and aaahs as people leave demos of HDTV systems. NAB was no exception. But at this gathering, one delegate left the convention as the proud owner of North America's first HDTV system.

Barry Rebo, of New York-based Rebo Associates, purchased a system from Sony valued at over $1-million. The system Rebo purchased includes an HDVS camera, three HDVS VTRs for recording and editing, and an HDVS Ultimatte system for blue-screen processing.

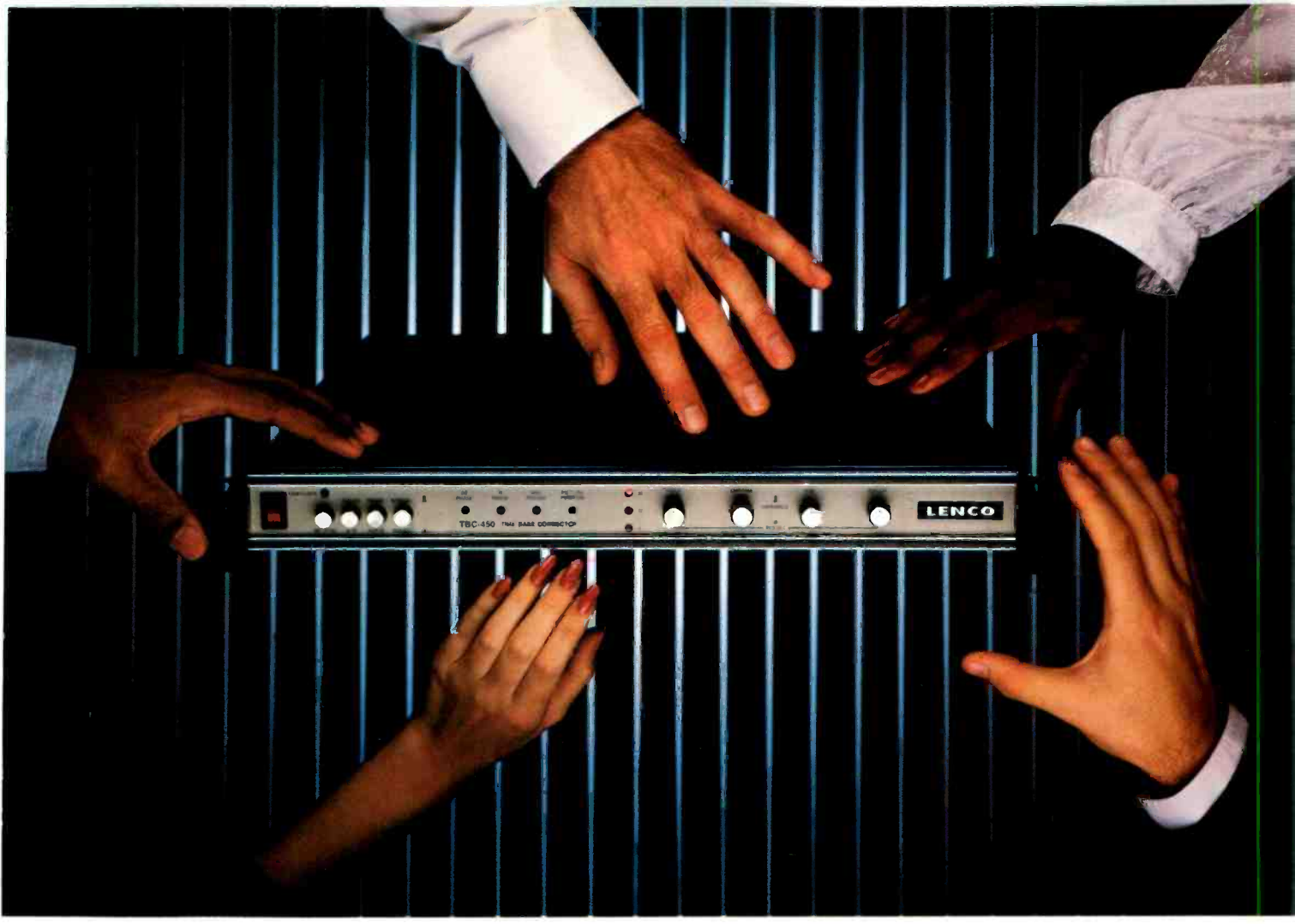
Rebo plans to use the system for feature length productions, including a project called "Clubland," which he is producing with Mark Levin. Further, Rebo believes that commercial clients working with film on high-priced projects will find savings in both time and money as a result of using HDVS technology.

The twenty-four manufacturers who provided HDTV equipment for the demonstration showed convincingly, that a total system—accounting for production, post-production, graphics, effects, etc.—can be built to the 1125/60 standard proposed by the ATSC.

Teletext Lives: Data Usage is Secret Weapon

Keeping a breath of hope alive that teletext might still have a future in U.S. television broadcasting were three developments: inclusion of World Systems Teletext decoders in certain Zenith sets by mid-86, availability of an NABTS terminal for $250 from Samsung, and systems for inserting business data in the vertical interval by Norpak. The Zenith set may spur new (and needed) interest in the WST system, currently supported only by Taft Broadcast.

Of special interest to advertisers is an under-$100 coupon printer attachment shown in prototype form by Zenith. The Samsung terminal, offered at about one-third the price of earlier units, makes the advanced-graphics NABTS approach more viable. However, consumer interest may no longer be the deciding factor. Norpak says broadcasters such as Bonneville and CBS have found profitable ways of using teletext systems to transmit business data—for themselves and others. If consumers aren't in the market, businesses may well be.



NO COMPROMISE

When you reach for Lenco's 400 Series Digital TBC you don't have to trade quality for a competitive price.

The new Lenco 400 Series TBC. It sets new standards of quality and dependability in time base correction for Heterodyne VTRs. At a price far below what you'd expect to pay for a TBC with a fraction of the 400 Series' features.

Extraordinary features, transparent operation
Feature for state-of-the-art feature, the Lenco 400 Series TBC is the most astonishing bargain on the market. Features such as constant H phase for matched frame edit, 4-times subcarrier sampling with 8-bit resolution, 16 line window, and adjustable horizontal and vertical blanking.

The 400 Series TBC also offers full processing amplifier control, high speed search handling and versatile operation, with or without VTR 3.58 MHz feedback. And it's digital pixel-by-pixel dropout compensation is absolutely transparent to your system.

Small size, enduring quality
The Lenco 400 Series TBC is just 1-3/4 inches tall and 15 pounds light. But it's engineered to the very highest standards in the industry. And backed with an "industry first" two year warranty, it's built to provide year after year of trouble-free operation.

The 400 Series TBC is a triumph of space age electronics. Like other Lenco video and audio equipment, it represents one of the greatest values in broadcasting. While the price may be the best on the market, when it comes to quality and performance there can be no compromise.

For complete technical information on Lenco's 400 Series TBC and the full line of quality Lenco components
Call toll-free: 1-800-325-8494

LENCO

300 N. Maryland St.
P.O. Box 348
Jackson, MO 63755
1-314-243-3147
TWX 910-760-1382

Circle 114 on Reader Service Card

reducing head life. This is achieved by using the latest buffer storage technology with very high bandwidth so no loss of definition occurs during the speed transition.

Hitachi, the other major one-inch Type-C manufacturer, showed no new VTR models in its one-inch line, but did show a new Compact Console: the CN-230C.

FOR MORE INFORMATION

Sony ..... 268 Bosch 270
Ampex ..... 269 Hitachi 271

¾-inch: Fully Alive

This much-maligned format continues to be treated by the television industry the way gluttons treat bonbons: Roundly condemned, while consumed in prodigious quantities.

Sony has continued to push the quality of ¾-inch color-under recording far beyond where anyone thought it could go. New to the popular BVU-800 series of recorders is BVU-850 and -870 and a new portable unit, the BVU-150—all featuring SP-Mode. SP is chiefly a new electronics package within the machines that give them increased horizontal resolution from 260 lines to 340 lines. Chrominance signal-to-noise is increased by 2 dB over conventional U-matic recorders for both amplitude and phase modulation, while gain and phase distortion are reduced.

Editing performance has been improved, and the 870 features Dynamic Tracking. The portable, BVU-150 is only 20 pounds

In the industrial strength class, Sony introduced a new VP-5020 U-matic recorder designed specifically for field and office playback requirements. The unit is just 7⅝ inches high; slightly larger than a VHS tabletop player. A linear tape timer, working off the control track, gives accurate tape time on an LED display in minutes and seconds. The unit's functions, including search up to five times normal speed, can be remote controlled through the RM-690. The unit is priced at $1550.

Broadcast Mites

In the small-format broadcast battle, Bosch continues to manufacture and market the Quartercam system, expecting that some users who want its quality (superior to ¾-inch) and its compactness (smaller than ½-inch) will not be caught up in the whirl of the ½-inch component battle.

Hitachi struck a blow for 8 mm as a production format by showing a model of it CV-ONE system. Not yet on the market, this 8 mm VTR/Cam combo utilizes a metal tape for recording times of 11 minutes and 15 minutes. The cassettes are Maxell P6-90 (normal running time: 90 minutes) and P6-120 (120 minutes at normal speed).

Hitachi's new compact console for its Type-C one-inch systems was shown at NAB, but its contribution to format wars was a "one-inch quality" 8 mm recording system.

The system consists of a camera (either the Hitachi SK-88 or the NEC CCD camera SP-3A). The camera's recorder unit, HR-1, has a bandwidth of 4.5 MHz, which gives Hitachi justification for claiming "one-inch recording quality."

This system was developed by Hitachi in cooperation with Nippon Television Network Corporation. A company spokesman said that the NAB exhibition was primarily to obtain feedback from the U.S. market prior to any decision to go forward with a full-fledged marketing and manufacturing plan.

FOR MORE INFORMATION

Sony 272
Bosch ..... 273 Hitachi 274

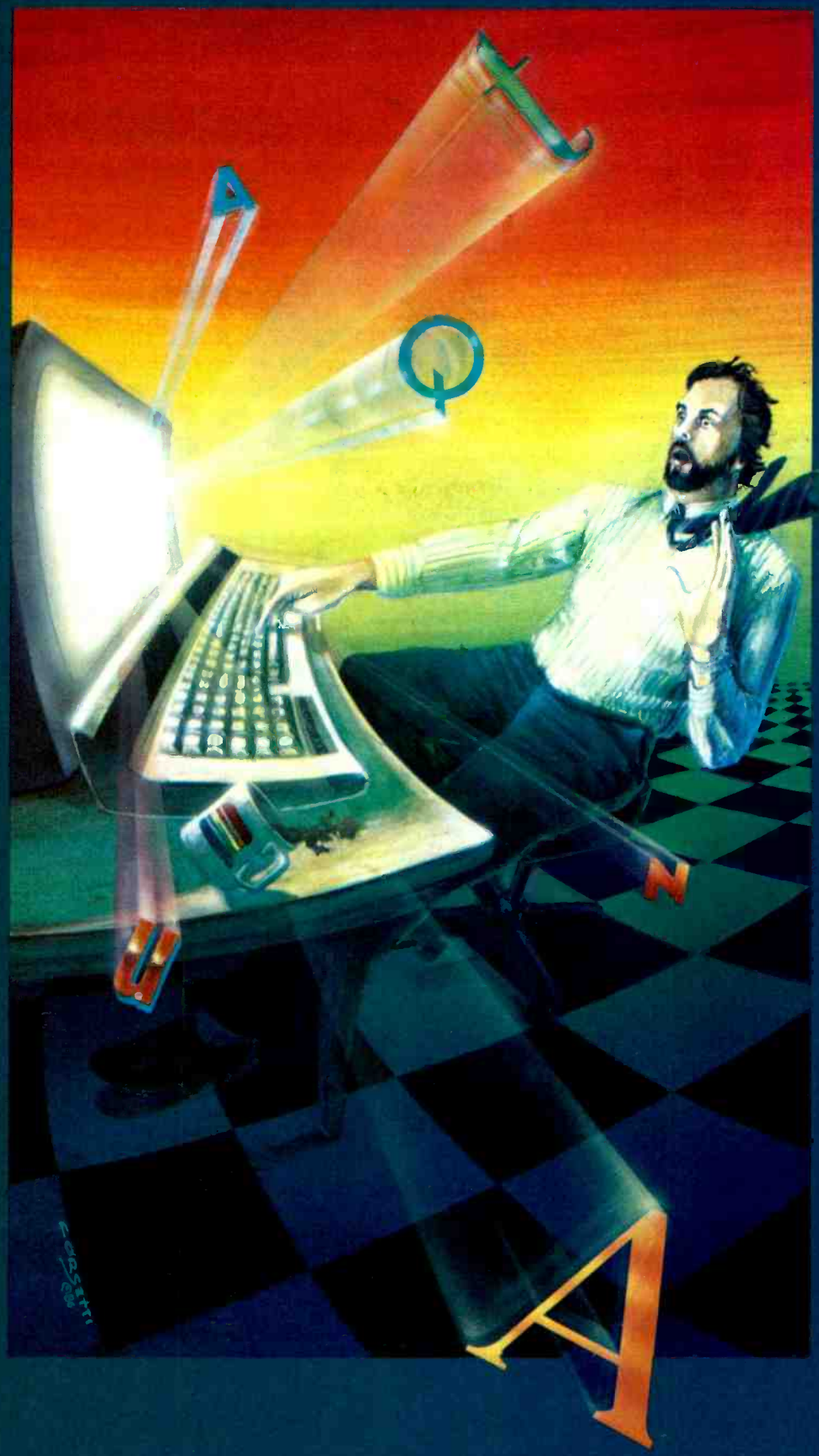
Revolution in the Third Dimension

NAB '86 witnessed an explosion in three-dimensional television graphics equipment unparalleled in the history of broadcasting. The breakthrough of 3D modeling and animation to price levels affordable by many stations, pioneered last year by Cubicomp, gathered momentum this year with the entry of several significant systems in the $40,000 to $60,000 range.

In full-blown, real-time 3D animation systems as well, several companies lowered their sights at industry leader Bosch, hoping to win a share of the high-end production house market.

One surprising entry into 3D modeling was Quanta Corp., known in the past primarily for character generation and now part of the Dynatech group that owns ColorGraphics and Utah Scientific. Quanta first strode into the electronic paint arena last with the introduction of Quantapaint (which reappeared this year in a new 32-bit version). But the most exciting development was Dimension, a 3D modeler that, at $54,995, incorporates almost all of the features of much more expensive systems.

Using solid modeling primitives and object construction tools, Dimension will construct wire-frame models and render them in antialiased, surface-shaded forms. It can also take inputs from a camera or from a Quantapaint system. The hierarchical software defines the relationships of different parts of an object during movement. The system is capable of texture mapping and can define virtually unlimited light sources, transpar-



Hang on.

But let your imagination go.

Quanta introduces three new products. Plus a new concept, all guaranteed to launch your imagination into new realms of creativity.

In keeping with our progressive product philosophy, Quanta has introduced . . .

DIMENSION, a computer graphics system for solid 3D modeling and animation.

QUANTAPAINT 32, a 32-bit full color graphics paint system.

QUANTAFEX, a digital graphics effects system.

And the new Concept? We call it "GRAPHIC SYSTEM INTEGRATION." In other words, Quanta is on the leading edge of integrated graphics, effects and animation systems.

For an integrated graphics system there's just one manufacturer. Quanta.

So go ahead. Let your imagination go. Ask us today about our new products and integration possibilities.

Call or write Quanta Corporation
2440 So. Progress Drive
Salt Lake City, Utah 84119
(801) 974-0992, TWX 910-925-5684.

We liberate the imagination.

QUANTA®

DYNATECH Broadcast Group

Circle 120 on Reader Service Card

ency, and reflections. By the projected December shipping date, it will incorporate antialiased key outputs, allowing one antialiased image to be matted over another with no quality loss.

Another unexpected entry in the 3D field was Integrated Technologies, Inc., previously known for its weather graphics systems. ITI made news with a family of IBM PC/AT–based animation systems. At the top of the line is the Image-Maker, a $59,500 system that includes a master workstation and slave edit station. With the Ani-Net local area network, up to four workstations may be linked. (Workstations are identical to ITI's Ani-Maker system.) Even at under $60,000, the Image-Maker allows the user to define wireframe sketches, position, offset, rotation, viewpoint, unlimited light sources, textures, object priority, and transparency. It offers 3D rotation, translation, and perspective, as well as 3D animation over video or backgrounds and automatic "tweening." Up to two seconds of animation may be previewed in real time.

The Ani-Maker Plus, at $44,500, features 3D paint, 3D animation, and 3D rendering and can operate in a standalone mode or as a workstation for the Image-Maker, many of whose capabilities it incorporates. The Ani-Maker is an economical $37,500 system designed for ¾-inch production of two- and three-dimensional animation.

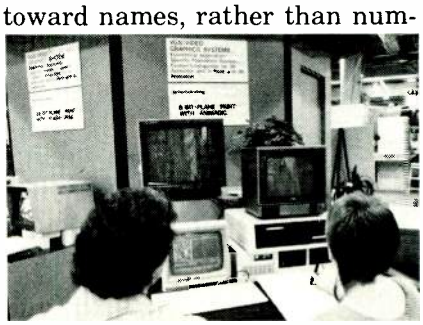
In a similar price range (although prices have not yet been set) is the new Prisma graphic animation system from Digital Services Corp. Shown in prototype form, Prisma is expected to undergo further software development before its projected end-of-year delivery date. It is designed for single-frame animation in the component domain, with inputs and outputs for RGB or R-Y, B-Y, Y video. Advanced features of this economical system include creation and animation of three-dimensional objects, antialiasing with color tints, motion with effects, metamorphosing, tweening, rotation, color shading, and more.

Quanta Corp. entered the 3D modeling arena with its new Dimension system.

Artronics, which appeared at last year's NAB under the aegis of 3M, left the nest this year to exhibit some brand-new gear on its own. Unlike the Studio Computer, which was geared primarily toward the slide-making industry, the new line is expressly designed for video. It consists of three products: the VGA-3D Video Graphics Animator, the VPL Video Paint Library, and the VGS Video Graphics System.

The VGS is a "foundation" graphics box that can operate in several standalone configurations or as a workstation for the VGA-3D. "Building blocks" of the system include 3D and 2D animation and the Model Shop model builder. Artronics took an aggressive marketing stance with the VGS, which has a base price of $29,000.

The VPL, a high-resolution paint system, offers 24 color planes plus a four-bit antialiased key output for high-quality animation. NTSC, component, and RGB inputs and outputs are provided for maximum flexibility. Features reflect the recent trend toward names, rather than numbers: Pablo is the 24-bit/8-bit paint system, Marian and Mycroft comprise the 1200-image library/still store, Muybridge is a real-time frame and field grab, Dave is a digital effects program, and Watson is a diagnostics program.



Artronics designed its VGS paint system expressly for the video market.

At the top of the line is the VGA-3D, with 25 ns effective pixel resolution, full two- and three-dimensional model building and animation capabilities, and four integrated 32-bit plane frame buffers for quick, high-quality rendering. Both Gouraud and Phong shading are selectable on an object-by-object basis. Features include universal antialiasing, 16 animatable light sources, transparency, texture mapping (both painted and live), and everything else expected of a 3D animation system. Prices range from $90,000 to $140,000, depending on configuration.

One complaint with many lower-priced modeling and animation systems is their slow rendering speed. According to Artronics, the systems incorporate a high-speed accelerator box that cuts rendering speed while increasing resolution.

One source of the Artronics' impressive capabilities is a Berkeley, CA–based company called Diaquest, which provides hardware and software for PC-based video graphics systems. Diaquest's products—the DQ-VFG video frame grabber, DQ-VAD video action digitizer, DQ-422 videographic interface, and DQ-ER electronic rotoscoper—appeared more prominently at the Cubicomp booth, where the two companies announced an OEM agreement under which Cubicomp will market the first three products for its PictureMaker animation system.

The products expand the PictureMaker's capabilities in video image capture, video control, and digital matting, allowing it to integrate live video with 3D computer graphics in the absence of multiple VTRs or editing systems. Texture mapping, superimposition of 3D images on live video, and sequential editing and tape positioning are all included.

The Abekas A53-D Digital Special Effects System

The innovative tradition of Abekas continues with the A53-D—the most cost-effective, high-quality three-dimensional effects system available today.

In single or dual channel configuration, the A53-D gives you a full array of three-dimensional features. These include: perspective and 3D rotation, variable rotation axes and 3D locate, field/frame freeze and full manipulation of frozen pictures, variable border and background, crop and aspect change, A/B switching and GPI control, and smooth linear motion and trajectory with variable tension.

The A53-D makes good sense for both live broadcast and post-production applications. For broadcasting, the A53-D offers a simple-to-use control panel with fast access to 24 on-line effects. For post-production, the system's extensive programming features and precise control let you create intricate effects limited only by your imagination.

You can digitally interface the A53-D to the highly acclaimed Abekas A62 digital disk recorder. This unique duo gives you the ability to composite unlimited layers of manipulated video without generation loss.

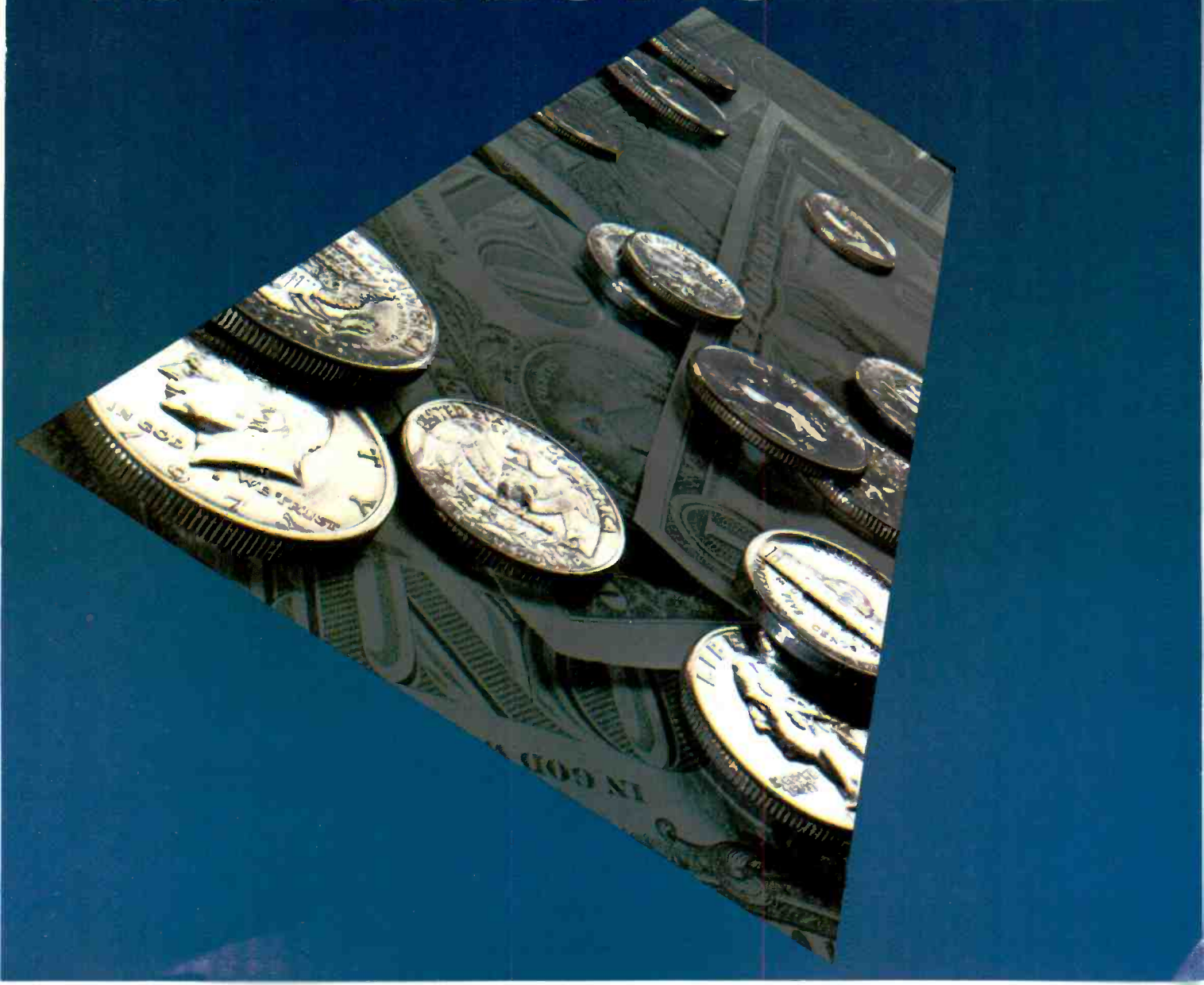
Let the A53-D add a whole new dimension to your bottom line, with unmatched price and performance. For details, contact: Abekas Video Systems, Inc., 353A Vintage Park Drive, Foster City, CA 94404 (415) 571-1711.

Abekas
Video Systems, Inc

Now Anything is Possible

Circle 121 on Reader Service Card

ADD NEW DIMENSION TO YOUR BOTTOM LINE



THE FIRST INTELLIGENT BROADCAST COLOR MONITOR

BARCO INDUSTRIES' new CVS professional broadcast monitor is microprocessor-based to make it intelligent in operation and easy to use.

It has both a digital and an analog bus for maximum flexibility. Plus four "open" slots that let you plug in today's options and those yet to come. As new features do come along, you'll be able to add them through software - no hardware changes !

All CVS functions are controlled from the front of the monitor or from a remote keyboard. An optional master remote permits control of a series of monitors.

WE PUT THE FUTURE IN THE PICTURE.

BARCO INDUSTRIES

You can also store, and automatically call up, either calibrated presets or your own preferred presets.

Like our best master control monitors, the CVS has Automatic Kinescope Biasing (AKB) to maintain color and black level stability.

The CVS also generates more internal test patterns than any other monitor. They include white field, cross hatch and color bars.

The CVS is available in both 14 inch and 20 inch versions, and provides outstanding picture quality in any TV standard.

For complete specifications, contact your local BARCO INDUSTRIES Dealer or BARCO INDUSTRIES, 170 Knowles Drive, Suite 212, Los Gatos, CA 95030. Phone : (408) 370-3721.

BARCO INDUSTRIES is a member of the ACEC-group.

Circle 122 on Reader Service Card

IMS 7/29

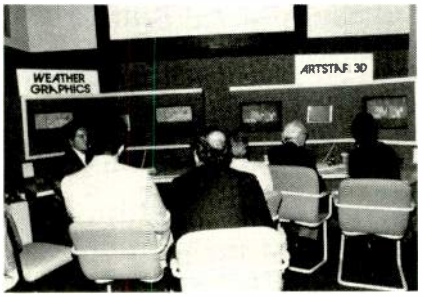
True Color Paint, developed in cooperation with Island Graphics of Sausalito, CA, allows the PictureMaker to display more than 65,000 colors within a single image. It has full 2D paint capabilities, including air brush, watercolor, and custom brushes. It will be standard equipment on Cubicomp's high-end PictureMaker/30 and will also be available separately for $3950.

Cubicomp's other news was an even lower-cost 3D modeling system, the PictureMaker/20, a $19,500 off-line system designed to be a companion to the $31,950 PictureMaker/30. Its main difference is that it is incapable of video transfers, which must be performed on a PictureMaker/30. New software for the PictureMaker system included improved user interface features, cross-sectional modeling, curve smoothing, and 20 new fonts.

At a somewhat higher price level than Cubicomp, ITI, or Quanta is ColorGraphics, which leaped significantly forward with the introduction of ArtStar 3D (previewed first at last fall's SMPTE convention). ArtStar 3D has everything a 3D graphics system should have: 3D modeling with wire-frame sketches, a 3D cursor that moves in real time, full library of animation moves, interface to Betacam recorders for cel-by-cel animation, and automatic tweening. An unusual aspect is the combination of raster and vector graphics capabilities. Raster processing, which addresses each pixel individually, is used for almost all functions, allowing maximum creativity and color choice. For type, however, where smooth lines are essential, vector processing is used for fully antialiased characters.

ArtStar 3D builds on ColorGraphics' two-dimensional ArtStar II and features 24-bit paint capabilities with eight-bit overlay. Based on a Chromemco host computer, the complete system (with 3D modeling, paint, VTR interface, and five vector fonts) costs $99,900.

Dubner showed the latest model



ColorGraphics' ArtStar 3D combines 24-bit and eight-bit graphics.

in its CBG line, the CBG-2LX, with full 3D modeling and manipulation capabilities along with high-quality NTSC paint and The Third Plane, a high-resolution still store. The full system costs $115,000. Also featured was Dubner's DPS-1 full-color paint system, a $20,000 unit first displayed last year and now in full production.

Three-dimensional modeling is an option on Aurora's new AU/200 Series 32-bit paint systems, the AU/220 and AU/280. The former runs its software on an IBM PC/AT, while the 280 uses a Motorola 68020 chip and the Unix operating system. It also features full-color frame/field grab and multiplane real-time animation.

The 220 and 280 have similar lists of features, such as transparency, separate full-color graphical menu, two full picture buffers, antialiasing, and full-color video input. Besides the 3D modeling package, options include frame-by-frame animation control, WSI weather and sports data compatibility, Ethernet-based intersystem communications, and high-res hard copy output.

Harris, which is distributing

Alias Research demonstrated its 3D modeling software on a Silicon Graphics workstation.

the AU/220 under a marketing agreement with Aurora, also announced a software-based control interface that connects Aurora systems to Harris IRIS II still stores.

In high-end animation systems, two new exhibitors took aim at the market served by Bosch: Wavefront Technologies and Alias. While both write software designed for the Silicon Graphics IRIS workstation, Wavefront also uses other hardware and announced an interface with the Aurora AU/200 Series at NAB '86.

Wavefront's software, written for the Unix operating system, is composed of three modules: Model, PreView, and Image. Model uses a database of two-dimensional polygons to define and model a 3D object, with no limits on the number of elements the object may contain. User interface is via screen menus; a graphics tablet can also be used to input drawings. PreView allows the user to create or modify a 3D animation and quickly play back the results for review, with full control of objects and light sources and a variety of editing functions. With Image, the completed animation is rendered with variable resolution and variable antialiasing in NTSC or PAL. Features include texture mapping in one, two, or three dimensions; interpenetrating objects; geometric smoothing; color interpolation; transparency; reflection mapping; and ray tracing.

Alias specializes in software for the Silicon Graphics, which it feels provides the ultimate in speed. Software is written in machine code, so it addresses the hardware in real time. A complete system, including hardware, ranges in price from $150,000 to $280,000; by the end of the first day of the show, the company already had two purchase orders.

Full 3D animation and rendering capabilities are the system's forte. The Alias software is designed to allow extremely rapid modeling of 3D objects and full animation control. Many image parameters can be controlled and animated; light color, diffusion,

specularity, and motion; surface shading with Lambert, Phong, or Blinn techniques; and textures are just a few. A "Quick Render" routine allows rapid previewing of images and scenes using simple shading.

The system also has an electronic paint system, new this year, with ultra-high resolution and full color.

Bosch, however, appears unfazed by the competition, from whatever price range. "Our system is high on productivity and interactivity," says Jeff Davis, product manager for the $200,000 FGS-4000. "No other system can make a solid, fully colored, and antialiased raster version of a model and show a preview of the movement so quickly and easily." The FGS, he points out, was designed for video and accepts videotape inputs, unlike some others. Software options include paint, 3D modeling, fractals, and two- and three-dimensional image manipulation. In addition, rendering speed is much faster than with many of the lower-priced systems.

The newest option for the FGS, introduced at the show, was an off-line graphics modeler with all the modeling capabilities of the FGS and then some. It includes a 2D editor and a 3D editor that calculates surface of revolution, surface extrusion, and lofting. The last, not found on the full FGS system, quickly connects the cross-sections of a model under construction for a rough look at how the final object is shaping up.

Intended for use as an off-line workstation for the FGS, the modeler was shown on a Sun Model 2 host computer. It will be shipped, however, with the Sun Model 3, which Bosch estimates will be four to 10 times faster for both construction and rendering. The Unix-based Sun is a multitasking computer that allows several jobs to be performed simultaneously through the same terminal. Communication with the FGS is through an Ethernet LAN. The modeler is priced at $36,995.

Bosch also featured its 3D Illustrator paint package for the FGS, first shown at SMPTE, a full-color system designed to function in the FGS's three-dimensional environment.

FOR MORE INFORMATION

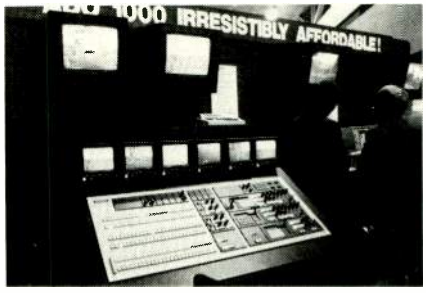
Quanta	276		
ITI	277	Dubner	283
DSC	278	Aurora	284
Artronics	279	Harris	285
Diaquest	280	Wavefront	286
Cubicomp	281	Alias	287
ColorGraphics	282	Bosch	288

Image Manipulation is Hot and Affordable

The intense activity in 3D graphics at NAB '86 was mirrored by the excitement in image manipulation and digital effects systems. Prices came down, capabilities rose, and broadcaster interest shot through the roof.

In high-end digital effects, Quantel reinforced its reputation as the industry leader by showing the prototypes of two new enhancements for its Mirage 3D effects box. The first, Starlight, is a hardware and software package that offers an unlimited number of real-time light sources for use with all Mirage shapes. Light sources can be set up and moved in real time via Mirage's Floating Viewpoint Control trackball. Included as well are real-time three-dimensional shading and variable spectrum highlighting and positioning. The intention is to bring realistic modeling into the domain of real-time processing.

The other new enhancement,



Ampex broke the $40,000 mark with its new ADO 1000 effects system.

Contour, is a versatile shape-making package designed to allow video to be wrapped around almost any three-dimensional shape. The user defines the shape's cross-sections on a graphics tablet, Contour, then constructs the shape, and Mirage wraps the video around the new shape. One obvious use for this feature would be recreating the shape of a product container for a commercial.

All Quantel's products, of course, are based on the CCIR 601 digital composite video standard. Quantel exploited the possibilities of that standard to show digital interconnection of up seven Encores and two Mirages, all controlled from one Floating Viewpoint Control unit. The full capacity of the Digital Effects Network, first shown last year, is 14 Encore/Mirage machines. It can also connect Harry to Encore or to the Paintbox via 4:2:2. A further example of the power of 4:2:2 was found at the Sony booth, where an Encore was digitally interfaced to the new Sony D-1 standard DTTR.

Another high-end system, Grass Valley's Kaleidoscope component digital effects unit, is now in full bloom after its SMPTE introduction last fall. Like Quantel, GVG has been working toward greater system integration among its various editing, control, and production products. This year, the company introduced fledgling edit system control of the Kaleidoscope.

A basic, single-channel system is $160,000; maximum configuration is four channels with multiple control stations.

Much of the excitement in effects systems, however, was for economical systems with many sophisticated features. One of the hottest items in this category was the new ADO 1000 from Ampex. Imagine—an ADO for under $40,000! The ADO 1000 is designed for on-air use as well as on- or off-line production. It has 30 preset effects, including flips, tumbles, rolls, mosaics, mirror, blur, posterization, solarization, luminance reversal, and A/B inputs. Effects may run forward and backward. Up to four ADO 1000 channels can be integrated through a production switcher without a combiner.

WE BUILT IT TO TAKE MORE THAN GREAT SHOTS.

Foul weather. The hard knocks of a hard day's work. The Schneider 14 × ENG/EFP lens can take just about anything—including great shots.

Light enough to take anywhere. The 14x is no lightweight when it comes to standing up to the rigors of the real world.

Its rugged weather-resistant housing protects the 14 × like a tortoise shell. While its unique zoom grip and ergonomic design protect you from fatigue and unsteadiness. No matter how long you shoot.

All lens controls are conveniently located, too. So you don't have to fumble around when making adjustments or confidence checks.

But that's just the beginning of what makes the Schneider 14 × outstanding in the field.

It has a built-in 2 × range extender, macro focus, servo zoom, and iris. Three integrated zoom ranges: 9-126mm, 18-252mm telephoto (with flip-in extender), and 6.3-9mm ultrawide (with add-on aspheric attachment). And a remote manual iris control built into the zoom grip.

The 14 × also fits just about any major broadcast or industrial-grade camera.

And it's priced...Well, let's just say the Schneider 14 × lens can be as easy on your budget as it is tough in the field.

Also, if your 14 × ever needs repair, our factory-trained technicians will fix it in a flash. We'll even provide a loaner. So you're not out of action while it is.

The Schneider 14 × ENG/EFP lens. We built it to take a lot, but give even more. For a free demonstration, contact: Schneider Corp. of America, 400 Crossways Park Drive, Woodbury, New York 11797 (516) 496-8500.

Western U.S.A. Service: 861 Production Pl., Newport Beach CA 92663. (714) 631-7430

Schneider
KREUZNACH

SHOOT FOR THE BEST.

Circle 123 on Reader Service Card

Base price for the 2D ADO 1000 is $39,500; a 3D system with full perspective and three-axis rotation is $67,000. A 2D system can easily be upgraded to full 3D capabilities. Ampex's Digi-Matte key processor is available optionally, as are a component input and output kit and AVC Series switcher interface.

A new entry into the 3D picture manipulation market was Abekas, already known for 2D efx and its A62 digital hard disk video recorder. The new A53-D is a full-bandwidth digital system offering perspective, 3D rotation and location, and variable rotation axis capabilities. Effects include expansion, compression, variable inside and outside borders, field and frame freeze with full manipulation of frozen pictures, cropping, solarization, and more. The A53-D also has built-in A/B switching and off-line storage on microfloppy disk.

Coupled with the A62, the A53-D allows extremely complex manipulations to be performed with no picture degradation. (This, of course, is a potent reason disk-based devices like the A62 and Quantel's Harry are gaining acceptance in post-production facilities.) Abekas is positioning the $47,500 A53-D against such competitors as the Ampex ADO, NEC DVE System 10, GVG Kaleidoscope, and Quantel Encore.

Abekas also showed a new component version of its A52 digital special effects system, already seen in a composite configuration.

NEC America aimed at the live news and corporate/industrial markets with its brand-new DVE System 100, seen previously only at Video Expo San Francisco. This $29,500 system is designed for both real-time and programmed playback applications. It combines many of the effects of NEC's popular E-Flex with features and 16-bit system architecture of the newer DVE System 10. Unlike the high-end System 10, which must be programmed, the System 100 contains 16 preset pattern effects that can be called up at the touch of a button. It also lacks the 10's function control keys and 3D and perspective/rotation effects.

Nevertheless, the System 100 has many capabilities impressive in an under $30,000 unit, including forced monochrome, negative Y and C, 100-event on-board memory, three temporary scratchpad memories, two-system control, and built-in combiner.

NEC's System 10 also added new features, especially a combiner option that allows existing E-Flex or E-Flex/Optiflex systems to be combined with a DVE System 10 for a dual-channel output from the System 10. (The option is also available with the System 100.) Other new System 10 features include a new 16-bit microprocessor and unlimited key frames for extra-smooth transitions.

NEC's new DVE System 100 is a streamlined version of the System 10.

Quanta Corp. went all-out for 3D this year, introducing not only a 3D modeling and animation system (described in the previous section) but a 3D image manipulation system. The new Quantafex digital efx system is based on a 32-bit processor and performs full XYZ rotations and XYZ positioning with infinite sizing, aspect ratios, skews, and fully adjustable center of rotation. The system also includes wipes and splits, last effect recall, 20 preprogrammed effects, adjustable borders, eight-color video capture, freeze frame, four switchable RGB inputs, plus adjustable keyframe pause and strobe rate.

According to a spokesperson, Quanta is aiming for "total system integration" with its graphics and effects product lines. The Quantafex will be available this fall for $26,995.

Digital Services Corp. introduced a new 3D optical digital effects system called Eclipse that features optional curved effects, such as concave or convex curved wall effects with perspective and barrel effects—all in a package that runs $55,000 to $70,000, depending on options.

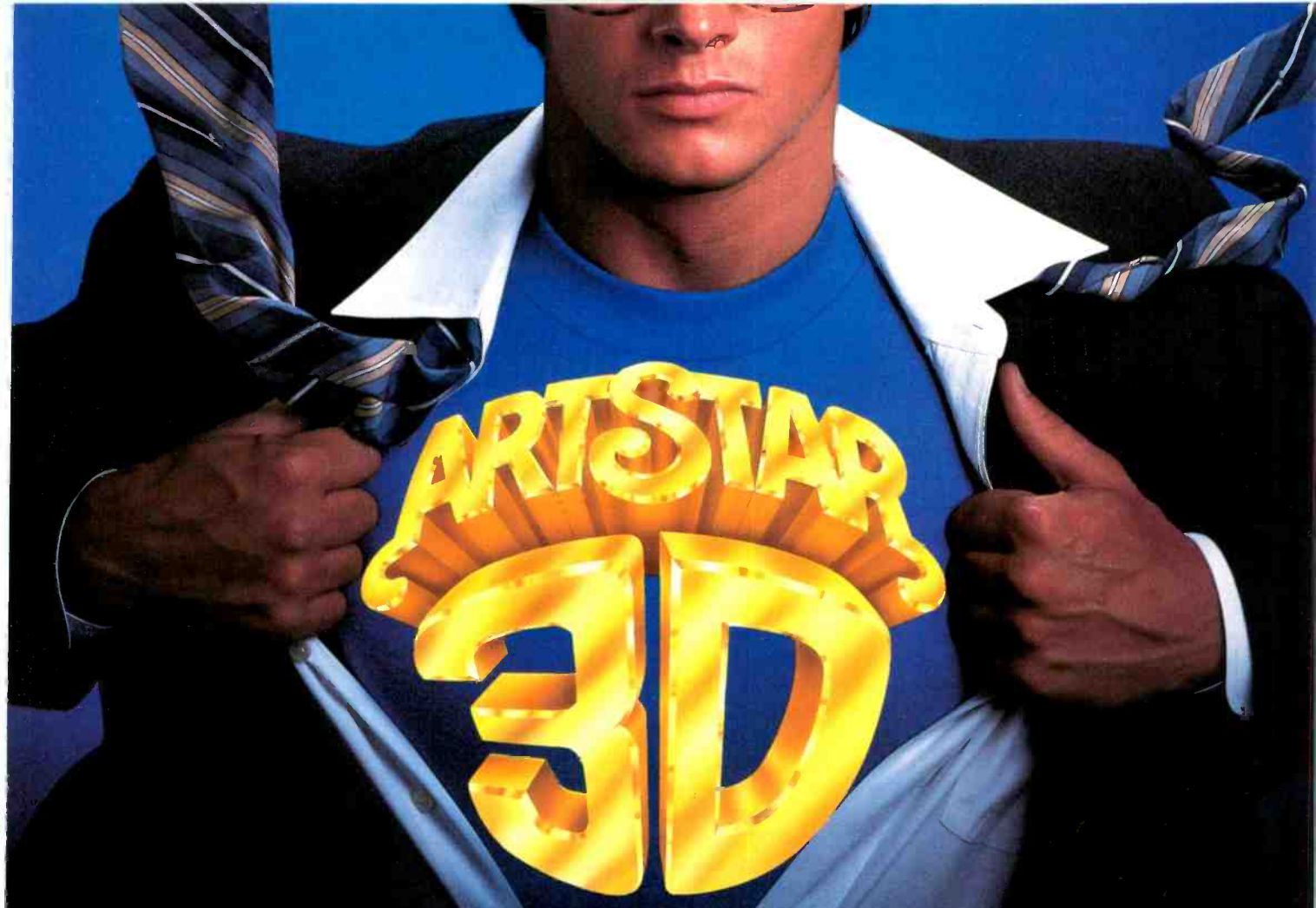
DSC also featured its Illusion system and the SX-2000D programmable effects system.

Another entry in the under-$50,000 effects arena was GML America's new X-Calibre dual-channel, multiple input digital effects system, which has component inputs and outputs as standard. The two-channel X-Calibre features continuous compression, expansion, trajectory effects, tumbles, flips, and spins. It has a built-in events memory, along with time base correction and synchronization and GPI closures or RS-422 ports for switcher interface. The full system is expected to cost under $50,000, with 60-day availability. GML also featured its $30,000 Proteus dual-channel effects unit, with fixed compression and optional downstream keyer.

Microtime's economical Genesis 1/Act 1 digital effects system featured a new, continuously variable filter/interpolator that provides increased picture performance over last year's hardware. In addition, new software updates give the system improved programming flexibility.

Among the most innovative—and difficult to classify—offerings at last year's NAB was the Pyxis digital production device from ALTA Group, shown at the Convergence Corp. booth. This year ALTA was on its own, and the Pyxis, which packs two 16-line-window TBCs, over 20 production effects (including digital efx), a sync generator, four video inputs, and five stereo audio inputs into a single $6995 box, showed up all over the floor interfaced with a variety of equipment. It is also now available in PAL.

Not content to rest on its laurels, ALTA introduced a new single-channel video manipulator



It's a Paint ... It's a 3D Character Generator ... It's Full Animation & Effects ... It's ARTSTAR 3D!

The most powerful paint and animation combination, ARTSTAR 3D is the "Super-Box" answer to high resolution professional graphics production. Check out these features:

- True Color — 16.7 Million Simultaneously Displayable Colors
- The Best Paint Functions of any System
- 3D Anti-Aliased Vector Type Character Generation — 100-Font On-Line Capability
- 3D Modeling — Extensive Choreography Controls, Texture Mapping and Smooth Shading. Full Rotation, Perspective and Multiple Light Sources — Faster Rendering
- 3D "Animation Automation" — Full Animation including Multiple Plane and Frame-by-Frame VTR Control in Component Video
- Flash Frame Grab — Full Color Digital Frame Store — Rolling/Live Video — NTSC or RGB
- Digital Laser Disc Storage/Recall with Perfect Resolution

Nothing on the market today can compare with the price/performance of ARTSTAR 3D!

See it at BPME/BDA-Booth 26-27 and NATPE- Booth 129 & 131

ARTSTAR

COLORGRAPHICS SYSTEMS INC.

DYNATECH Broadcast Group

5725 Tokay Boulevard • Madison, Wisconsin 53719 • (608) 274-5786

Circle 124 on Reader Service Card

called Cygnus. Essentially, Cygnus is an infinite window TBC/synchronizer with built-in horizontal and vertical image enhancement. Effects include freeze, strobing, colorization, posterization, and mosaic. A 4x1 audio and video routing switcher is built into the front end, allowing the Cygnus to take tape, camera, or satellite feeds. Price is only $4995.

The Cel Electronics digital effects family put in an appearance at the James Grunder & Assoc. booth. New this year was the Maurice touchscreen controller for the EFX II system. A basic EFX II system, including the P147-30 framestore synchronizer/TBC, the P148 digital effects controller, and the P152 Maurice touchscreen, is under $17,000. Also shown was the EFX III two-channel, A/B roll effects system. Both are upgradeable to the EFX IV, a two-channel system with multichannel combiner.

Fairlight Instruments returned to NAB with its CVI low-cost digital effects processor, a $7945 unit that really shines in its real-time, creative applications.

FOR MORE INFORMATION

Quantel	290	DSC	296
GVG	291	GML America	297
Ampex	292	Microtime	298
Abekas	293	ALTA	299
NEC	294	Cel/Grunder	300
Quanta	295	Fairlight	301

Paint and Graphics Systems

Quantel's innovative Harry digital graphics system performs so many graphic functions that it almost defies definition. For 1986, Quantel announced several important new facilities for Harry, which has now been delivered to several major U.S. post-production facilities.

First, Harry can now operate independently of the Paintbox with a choice of freestanding control stations. Paintbox users will certainly feel comfortable with the first, a graphics tablet and stylus similar to that of the Paintbox and offering the same rapid, precise control. The second consists of a keyboard, with soft keys to retain the flexibility of Harry's menu-driven software and a trackball for cursor movement. Harry also has two remote control ports, one that accepts an external contact closure to trigger a number of preset Harry functions and another that accepts SMPTE high-level commands for external computer control.

Harry was shown digitally interfaced with Quantel's Encore effects system via CCIR 601. Quantel has taken further advantage of 601 by developing a high-quality digital chromakeyer, now a standard feature of Harry. The search for top-quality matting won't end with that, however; just before the show, Quantel announced a licensing agreement with Ultimatte under which the two companies will jointly develop a digital Ultimatte system for Harry.

Also drawing crowds to the Quantel booth was the new Pro 4 fourth-generation software package for the Paintbox, with redesigned menu geography and a Paste Stat routine for accurate positioning and sizing of cutouts. The High Definition Paintbox was demonstrated in an advanced version with new features.

Computer Graphics Labs introduced Instamation, a low-cost, real-time animation system, plus new Animate! software for its Images II+ paint system and increased systems networking capability.

Quanta's new Quantapaint 32 is a full-color, 32-bit graphics/paint system incorporating Bitstream type fonts, antialiased brushes, and frame-by-frame animation capabilities with tweening. An exclusive "priority" feature allows multiple levels of keying when using Quanta QCG-500 or Q8 character generators.

ITI unveiled the News-Maker, a full-color paint system designed especially for news graphics and upwardly compatible with the new Ani-Maker and Image-Maker systems. It has two- and three-dimensional paint capabilities with perspective and shading.

Chyron has been delivering its new Chameleon paint system since November and claims over 70 already in the field, including European users. The high-resolution (768x482 pixels) system is priced at $11,900.

Inovion featured its PGS II professional graphics system, a $7995 package with 2.1 million colors, full-color frame grabber, genlock capability, optional graphics tablet, and paint package.

FOR MORE INFORMATION

Quantel	302	ITI	305
CGL	303	Chyron	306
Quanta	304	Inovion	307

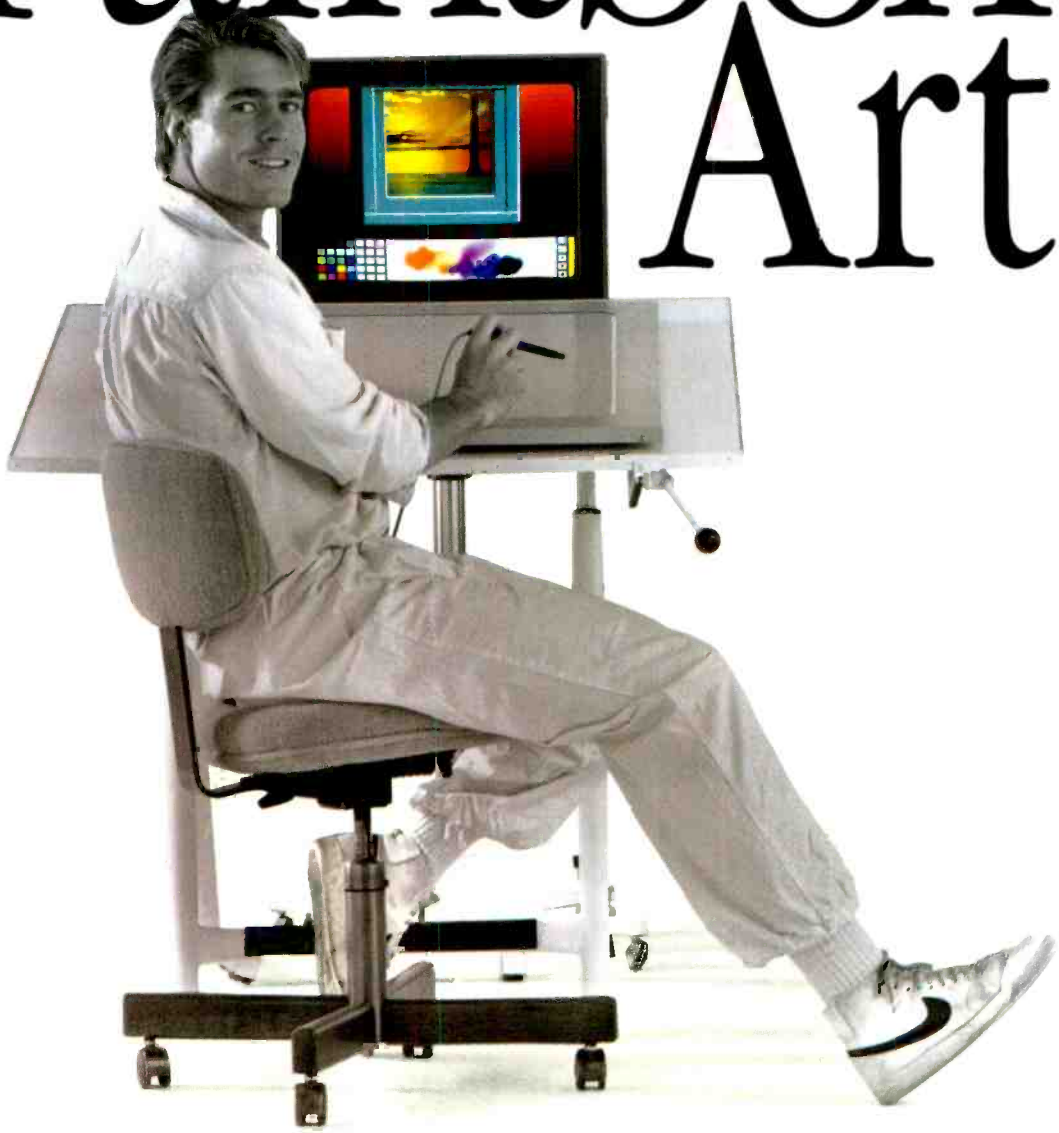
Character-Based Systems, CGs

Thomson-CSF's powerful Vidifont V graphics and animation system now comes equipped with a 5 ¼-inch Winchester disk for expanded memory with extremely fast access. Other new features are variable vertical leading (the space between lines of type) and direct dial-up access to WSI, ESD, and Accu-Weather weather and sports databases.

Viditext II, Thomson's mid-priced CG, also boosted its capabilities with a second channel, the Vidivote election package and GraphicStore paint and library system (both previously limited to the Graphics V), and font, message, and animation memory expanded to one megabyte. The GraphicStore, which can have up to eight 140 megabyte Winchester drives, now offers color cycling and the Vidifex 3D effects program.

Chyron brought its Scribe super-high-quality text generator, now being delivered to production houses. Also new was the 4200 character/graphics system, the latest model in the 4 Series 4200. It incorporates the "Motion" high-resolution digital graphics efx generator as an integral part of the system at no increase in price.

Paintbox Art



For the designer and the art director the satisfaction of producing an original television graphic *perfectly* is everything. With the Quantel Paintbox™ you can create images with smoothly rounded curves and natural color mixing—at the same time choosing from a large selection of mediums and brush sizes. You'll never have to live with the "computer" look.

Artists love the response time of the Paintbox. Its easy-to-follow menu helps produce lively, original images with extraordinary speed. And management loves it for its fast payback.

Stimulate your creativity with these special features:

☐ Stencil and paste-up functions.
☐ Paste over live video.
☐ By adding Quantel's new Harry Animation/Editing System, the already extensive animation capabilities of Paintbox can now include full cel animation.

The Paintbox has become the world standard for creativity in television graphics. All three major U.S. networks as well as most broadcast and post-production facilities design with the Paintbox.

Quantel's worldwide sales and service has been expanded to ensure prompt, friendly and expert support. It's always there if you need it.

To put the Paintbox creative art system to work for you, write today to Quantel, 3290 W. Bayshore Rd., Palo Alto, CA 94303. For the phone number of your nearest sales office call 415 856-6226.

Step closer to the digital studio

QUANTEL

Circle 125 on Reader Service Card

IT'S HERE!
THE FIRST GRAPHICS GENERATOR

with **MOTION!**

As shown at the **NAB** in Dallas

CHYRON with MOTION
MODEL 4200

for only

$54,400

Introducing CHYRON 4200, the first graphics generator with MOTION.

Create and display multiple effects and text instantly—flip, spin, zoom, split images and more. CHYRON 4200 does it all, while maintaining ultra-high resolution. At a price this low, it's sure to be the FASTEST MOVING graphics generator. Find out about it—call CHYRON today.

CHYRON TELESYSTEMS / A MEMBER OF THE CHYRON GROUP

265 Spagnoli Road, Melville, NY 11747 • 516-249-3296 • Telex: 144522 Chyron Melv
West Coast Office: 221 W. Alameda Avenue, Suite 103, Burbank CA 91502 • 818-842-3244

Circle 126 on Reader Service Card

Motion performs zooms, wipes, quad splits, matrix wipes, etc., to Chyron-generated video. In addition, the VP-2 Videofex, first seen last year, is now deliverable.

New features of Quantel's Cypher caption generator include a flexible roll and crawl facility that allows simultaneous mixing of rolls-and-crawls in any combination, even moving in opposite directions or diagonally. Also new is expanded three-dimensional animation capability, allowing titles to be wrapped around the surface of an invisible shape, such as a helix or cylinder.

Another leader in high-quality electronic text, Aston Electronics, has begun deliveries of its Aston 4 character generator to production facilities in the U.S. The $41,500 single-channel system incorporates a background plane plus two high-resolution, antialiased character planes, with variable speed roll and crawl. The dual-channel version is $56,500.

New from 3M was the D-6000 Panther graphic system, a character generator with 35 ns resolution, 15 built-in fonts that can be sized and manipulated, and a camera input for loading flat art. The Panther also includes paint capabilities and sells for less than $17,000.

ICM Video's new, economical CG-7000P character generator, designed for simple operator interface, contains 80 pages of built-in memory and genlocks to any video source. The $1995 unit uses plug-in modules to generate fonts and is capable of an unlimited number of character and background colors.

Quanta Corp. remembered the CG market with new features on the Quantafont Q8 and QCG-500. The Q8 now offers reverse rolls and crawls, more than 24 standard face styles, optional 20 megabyte hard disk, a recall-only control panel, and disk compatibility with the QCG-500. Price has been lowered to $27,995 for a single-channel version and $42,995 for a dual-channel unit. The QCG-500 now has instant sizing in single scan-line increments, 16 million colors, increased per-page color

3M highlighted its D-3600 character generator.

availability, color menu with RGB value key-in, and optional RGB out with RGB key out. Prices were also lowered for the QCG-400.

Compu-Cable unveiled the Star, a $1999 CG/titler with built-in genlock and superimpose, three character sizes, multiple fonts, and 16 colors.

Mycro-Tek featured its Ernie CG/titler, with about 125 pages of memory and audio tape storage of messages. Also shown were the Max and Supra Star One CGs, the latter repackaged and discounted a hefty $4000 to a new price of $6000.

Laird Telemedia showed new add-ons for its 1500 CG, including a data tablet ($1495), camera entry system ($1995), and font developer ($495).

Knox Video showed a prototype of its K40 Microfont CG/titler, a $2395 unit with 32 colors and up to 64 pages of memory. Deliveries should start next month. The K100 Chromafont character/graphics systems were also shown.

Symtec introduced the Chargen 200 and 400 Integrated Graphic Computer Systems, based on the Sperry personal computer. The 200, with four resident fonts and a PC with two floppy disk drives, is $6495; the 400, with a 20-megabyte hard disk and one floppy drive, is $8495. Options include 18-font software package, font create package, paint package with bit pad, and color monitor.

Mark Electronics featured the MK85 video titler, designed for the IBM PC/XT and compatibles, with multiple font selection, 19 pages of text in real time, two independent lines of crawl, roll, and special effects. The full system is $2495.

Also for IBM or compatible PCs was the MicroKey titler system from Video Associates Labs. The Model 1300 NTSC unit lists for $1995; models for RGB over NTSC or RGB only are less expensive.

A surprise entry into the titler market is JVC, whose Professional Video Communications Division is marketing the Titler from Mindset. Designed for the VHS professional video and videophile markets, the keyboard-controlled Titler uses cartridge-based software to create and edit up to 20 pages of titles. At a more advanced level is the Mindset II titling, graphics, and animation system with 640x400 pixel character resolution and up to 40 pages of memory. It includes a graphics tablet for image creation and allows image modification and animation effects.

For-A Corp. also introduced a new character generator for the corporate/industrial and cable markets. The VTW-220 features four character sizes, 512 colors with 14 available at one time, character-by-character underline, nine-speed roll and crawl, adjustable matte for edge and shadows, and extensive text editing. The 32-page memory is expandable to 64. Price is $3540.

FOR MORE INFORMATION

Thomson-CSF	310	Mycro-Tek	318
Chyron	311	Laird	319
Quantel	312	Knox	320
Aston	313	Symtec	321
3M	314	Mark Electronics	322
ICM Video	315	Video Assoc. Labs	323
Quanta	316	JVC	324
Compu-Cable	317	For-A	325

Weather Systems

Despite its move into 3D animation, Integrated Technologies did not neglect the important weather market. It introduced the new

Weather-Maker graphics system, compatible with Accu-Weather, ESD, and WSI weather data and containing a base map library.

Alden's Model C200R has five new features: 64-picture memory (up from 16); two-color background (land and water) for all sites; four operator-selectable radar ranges from 25 to 200 miles; a built-in auto dialer that can be preprogrammed to call at timed intervals; and a new full cue mode for preprogramming of on-air presentations.

Kavouras featured high-speed animation of high-resolution images on the TritonX weather graphics system, with improved art/paint capabilities. RAM animation allows much greater on-air manipulation of high-resolution satellite imagery and multicolor graphics, according to Kavouras. The system will preload graphics images and animate at 30 fps.

ESD highlighted its new clutter-free radar display that employs high-powered NWS radars and gives the good clutter effects of Doppler radar at less than half the price.

WSI's satellite delivery system is now up and operational. Also new from WSI was the ASTRO-graphics 24-hour weather graphics service, compatible with any weather graphics system and shown with a ColorGraphics LiveLine III.

New from Accu-Weather is the Accu-Data real-time database, featuring the Advanced Map Plotting System (AMPS), which can plot any kind of weather information on any kind of map in real time. The graphics service is now available via satellite.

Advanced Designs showed its Doprad II Doppler radar system and RCD-1000 remote color weather display system.

Weatherbank described its satellite-delivered weather information services....R*Scan featured its LPATS lighting position and tracking data service....Highlighted by Sea-Tex was the CR-1011 color weather radar system, designed for radio stations.

FOR MORE INFORMATION

ITI	327	Accu-Weather	332
Alden	328	Advanced Designs	333
Kavouras	329	Weatherbank	334
ESD	330	R*Scan	335
WSI	331	Sea-Tex	336

TBCs, Video Frame Synchronizers, and Other Processors...

Fortel introduced its Turbo 2 timebase corrector for ¾-inch processing of video signals with features including infinite window range, drop-out compensation, dynamic tracking, freeze field and frame, horizontal enhancement and luma noise reduction. The company also reintroduced its CC-1 color corrector following agreement of a licensing arrangement with Corporate Communications Consultants....Nova Systems has added three new TBCs to its line since last year, one with a full frame of memory to freeze a field or frame for special effects and the other two with 32-line memory, one with heterodyne half- or ¾-inch or direct operation and the other with subcarrier feedback direct operation.

Amherst Electronic Instruments introduced its new Amicon video signal processing workstation built around a 32-line TBC and using software control for functions such as remote signal parameter monitoring and control, timecode reading, and machine control for off-line editing....Microtime introduced the T-300 series of TBCs, three units designed for half- and ¾-inch nonsegmented heterodyne VTRs, offering wide correction window, and genlock or standalone sync generator operation....Lenco showed a "virtually transparent" TBC-450 with a correction range of 16 lines and eight-bit resolution claiming a S/N ratio of 58 dB.

Harris exhibited its new 560 digital TBC with advanced sync and optional dynamic tracking using an eight-bit component architecture with separate chroma and luminance processing also with a 16-line correction window. Also new from Harris were the VW-3 and the 640 TBC/frame synchronizers, the former an addition to the Harris line with the company's acquisition of the product rights of Adda Corp., as well as the compatible AC-20AS dual channel video signal processor.

Hotronic showed its 4x subcarrier, eight-bit resolution AF71 TBC/frame synchronizer with more than two frame memories and constant H phase for matched frame edit....NEC America displayed its FS-19 frame synchronizer with 10-bit quantization for greater signal output transparency....For-A expanded its product line in component signal processing with a number of announcements at this NAB, among them the 500 series production video mixer and component video switcher with associated color corrector, color bar generator, and NTSC color decoder as well as a component transcoder, an effects memory option, and other graphics related electronics....Ampex announced its Zeus 1 advanced video processor, designed to integrate with the company's type C studio VTRs. Picture bounce and blur are eliminated, says Ampex, allowing broadcasters to adjust their program-to-commercial ratios with little video degradation....Scientific-Atlanta Digital Video Systems showed its new low-cost TBC, frame synchronizer, and combined TBC/framestore line, originally premiered at SMPTE.

Converters, encoders, etc. Among new product introductions from Quantel was Satin, a bidirectional TV standards converter handling PAL and NTSC via its component RGB input and output, using digital encoding and decoding and the SMPTE/EBU recommended video processing format. The unit features interpolated field freeze, overscan to compensate for input blanking errors, manual or automatic input standard selection, and internal test signal and genlock SPG.

NEW FROM SACHTLER

From now on, including parts and labor, (except for damage due to physical abuse), our Warranty is extended from one-year to...

3 Full Years on everything in the system*, except the fluid modules, which are leakproof by design and continue to be guaranteed against malfunction for 5 years.

Sachtler quality starts in the factory and is guaranteed to keep working for you in the studio or on location.

Quality is our top priority! Ask anyone who is already using a Sachtler camera supporting system.

*Applies to new systems delivered from Sachtler in the U.S. For more details, call or write:

sachtler

Sachtler Corporation of America

400 Oser Avenue, Hauppauge, N.Y. 11788
Phone: (516) 231-0033
Telex: 140107 SACHAUP TWX: 510-221-1884

3316 W. Victory Blvd., Suite A, Burbank, CA 91505
Phone: (818) 845-4446

Circle 127 on Reader Service Card

Video

Faroudja Laboratories announced a licensing agreement with Sony covering various Faroudja developments including that of its NTSC encoder used to generate signals free of cross-color and cross-luminance components using prefiltered luminance and chrominance information prior to mixing. Used with Faroudja's companion decoder, the signal result is claimed to be virtually indistinguishable from true RGB; and with a home receiver, picture quality will be improved....In other developments, Thomson-CSF showed its model 5700 NTSC color processor and TTV-4400 automatic contrast corrector available in PAL, SECAM, or NTSC versions....Shintron announced its MC-1 intermatrix converter for RGB, M, and Betacam formats....Video International displayed the DTC2500 standards converter as well as a new digital adaptive comb filter, DAC4000, giving better resolution for composite video to digital RGB conversion....Broadcast Video Systems showed the Michael Cox Electronics 203 NTSC encoder and ACC200 component-RGB converter as well as its 660 component color correctors.... Television Equipment Associates introduced the Matthey Electronics "very sharp cut" low-pass video filter and showed the company's video dealy lines....Apert-Herzog announced its new Satsync, a one-second video delay and digital still store with 32 memory frames and showed new Chentel stereo audio/video switchers as well as its own line of video processing equipment....Omicron Video featured its model 501 video switchers, a ten-input unit and a ten inputs of three-component video unit designed for use with a digital effects generator such as the Microtime Genesis 1.

Microsonics showed its 1H/2H digital border generator delay as well as video delay lines and filters from BAL Components....QSI Systems demonstrated its STAR-1600 video source identification system using a field-programmable single-line 16-character encoder and decoder as well as a cable system channel identifier and a combined color bar generator and identifier.... Allen Avionics announced a new high frequency noise eliminator and showed its video delay lines.... Graham-Patten Systems showed its model 1200 range of video and audio distribution amplifiers offering features such as differential input, cable equalization, and remote control of signal input levels.

FOR MORE INFORMATION

More CCD and ⅔-inch Studio/Field Cameras

Toshiba's micromini CCD unit provides camera closeups.

TV cameras took a back seat at the 1986 NAB Convention behind such developments as new VTR tape formats and 3-D graphics generators. Nonetheless, two or three advances are noteworthy. The emergence of more solid-state imaging cameras and the evolvement of top quality ⅔-inch tube cameras as part of a computer setup family were most obvious. If we were to add a third, it would be to acknowledge the emphasis put on HDTV. Several manufacturers, such as JVC and Sharp, would no doubt suggest that higher quality cameras at ever lower prices is a trend. Possibly, but such progress is more a fact of life than a trend.

Both Sony and Toshiba joined the ranks of producers of professional quality CCD cameras that eliminate lag, blooming, and comet tails. The Sony BVW-105 Betacam camrecorder was introduced as a second-generation camrecorder as a result of its three-chip CCD camera. Rated at 2000 lux at f 5.6, the camera puts out full video level with only 15 lux illumination (18 dB gain). It's thus good for night recording.

Each sensor offers 510 horizontal and 492 vertical pixels for high-quality imaging. Luminance resolution is increased to 550 TV lines through spatial offset, in which the green sensor is offset one-half pixel in relation to the red and blue sensors to effectively sample the luminance signal almost 1020 times per horizontal scan.

Sony says the sensors are accurately registered to within .05 percent, eliminating the need of registration adjustments. The camera boasts a S/N ratio of 58 dB. Dynamic contrast compression, a Sony exclusive, automatically adjusts the contrast handling range depending on scene content. The BVW 105 camrecorder (which boasts additional advanced operating features) will be available in July at a list price of $24,500.

The new Sony DXC-3000 (out of the Video Communications Products Division) is another new three sensor CCD camera. Resolution is slightly less rated at 520 lines of luminance. S/N is 56 dB. Price is $6,700 without lens. It's available now.

CCD chips make possible microminiature color cameras "opening up new worlds of imaging" to quote Toshiba. Toshiba demonstrated some of these possibilities at NAB by placing an 18 gram camera head (about the size of your little finger) inside a vase of flowers,

The Outperformer!

IKEGAMI'S HL-79E IS MORE VERSATILE THAN EVER

Ikegami's HL-79E has lived up to its billing as the greatest achievement in hand-held camera technology, a claim supported by an increasing number of 79 series purchasers, presently in excess of 5000.

And yet, today, the engineers at Ikegami have found a way to improve the camera. Now, when equipped with the new VBA-1 adapter, the HL-79E is totally compatible with the Sony Beta recorder.

On your shoulder, the HL-79E is still unmatched in performance with features that include Dynamic Detail Correction, Chroma Aperture Correction, Highlight Aperture Correction and Auto Contrast Compression. Plus the HL-79E offers superior contrast range, S/N ratio, registration accuracy, resolution and more.

On a tripod, the HL-79E becomes the premier EFP camera which can be used in various systems configurations and controlled remotely by the MA-79 Multicore Adapter, through multi-core cable (up to 300 meters) or by the TA-79E triax adapter through triax cable (up to 2000 meters).

The camera can be set up using conventional manual techniques or an optional microprocessor assist.

For a complete demonstration of the HL-79E and other Ikegami cameras and monitors, contact us or visit your local Ikegami dealer.

Adapts to Sony Beta Recorder

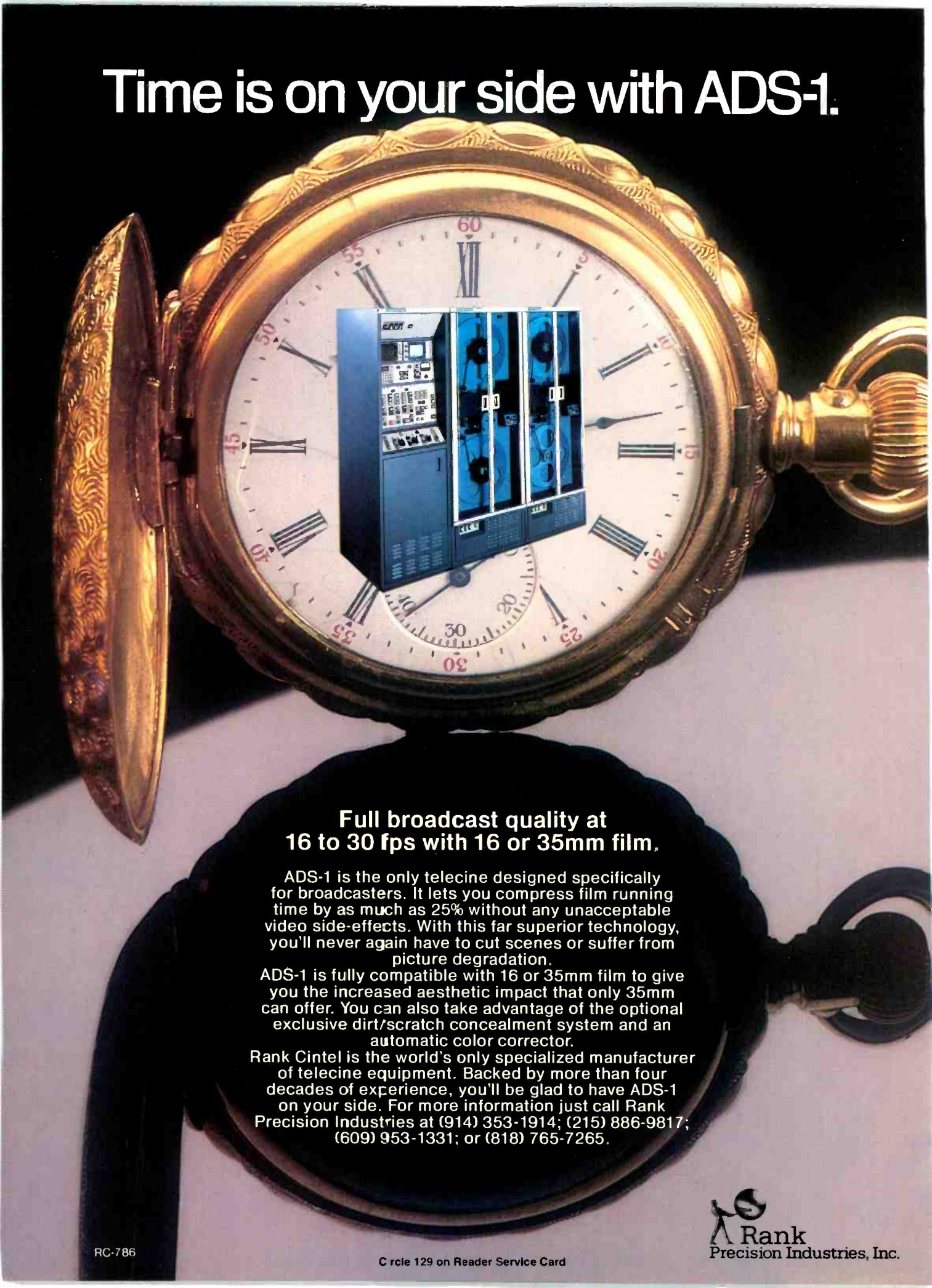
Ikegami®

Ikegami Electronics (USA), Inc. 37 Brook Avenue Maywood, NJ 07607

East Coast: (201) 368-9171 West Coast: (213) 534-0050 Southeast: (813) 884-2046 Southwest: (214) 233-2844 Midwest: (312) 834-9774

Circle 128 on Reader Service Card

Time is on your side with ADS-1.



Full broadcast quality at 16 to 30 fps with 16 or 35mm film.

ADS-1 is the only telecine designed specifically for broadcasters. It lets you compress film running time by as much as 25% without any unacceptable video side-effects. With this far superior technology, you'll never again have to cut scenes or suffer from picture degradation.

ADS-1 is fully compatible with 16 or 35mm film to give you the increased aesthetic impact that only 35mm can offer. You can also take advantage of the optional exclusive dirt/scratch concealment system and an automatic color corrector.

Rank Cintel is the world's only specialized manufacturer of telecine equipment. Backed by more than four decades of experience, you'll be glad to have ADS-1 on your side. For more information just call Rank Precision Industries at (914) 353-1914; (215) 886-9817; (609) 953-1331; or (818) 765-7265.

Rank
Precision Industries, Inc.

RC-786

Circle 129 on Reader Service Card

within a kitten's playpen, and the like. The CCU itself was no bigger than a micro-sized voice recorder. Sensitivity is rated at 200 lux, f 1.6; S/N is 46 dB. Horizontal resolution is over 250 TV lines. Toshiba also showed a threee-chip prototype CCD ENG camera, the model Tokyo.

Toshiba was not the only exhibitor to show a microminature camera. Canon also demonstrated such a unit, although it was not packaged as a product for sale.

As further evidence of the coming age of CCD cameras, Panasonic's Industrial Company showed a nonbroadcast CCD camrecorder, the AG-155. It uses a half-inch CCD pickup element. Standard illumination is 1400 lux at f 4.5. The camrecorder features a Piezo Focusing System. Portends of further announcements in this area were hinted at by Amperex (which showed some chips) and Hitachi, which has at earlier NABs showed solid-state sensors using MOS technology. In fact, Hitachi said a professional camera would be introduced later this year (a single-chip consumer model is currently on the market).

Ikegami's new computer controlled camera offers fast setup.

Meanwhile, NEC, the preeminent broadcast quality CCD maker,which introduced the first broadcast usable CCD camera back in 1983, was displaying several advances. Foremost was the new SP-3AES camera, which features an electronic shutter. Speeds are from 1/60th through 1/1500th of a second, variable in 16 steps. NEC says the electronic shutter approach is more reliable and stable than the mechanical shutters used by RCA. The SP-3A camera interfaces with any videorecorder including the latest M-II and 8 mm formats. Another NEC enhancement is a RCU-3 remote control unit for the SP-3A. Compatible with RTS intercom systems, range is 1000 ft, standard cable, and 1 ½ miles, triax.

Continuing a trend set earlier by Philips and Hitachi with the LDK 26 and SK-970 respectively, two more computer-controlled TV cameras using ⅔-inch tubes for field or studio use were unveiled at NAB '86—the Ikegami HK-323 and the Thomson TTV 1530. Both of the new cameras can be automatically set up using integral microprocessors as well as a central engineering control panel. Both can be separated from their CCUs and used in self-contained applications (with 12 v power packs). Both are compatible (interchangeable) with other families of cameras from the same manufacturer. Both are multicore or triax operated. Spec sheets indicate rough equivalence—the HK-323 camera head does seem to have a slight weight advantage and will take 1-inch tubes, if desired. The optical prism system for ⅔-inch tubes is rated at f 1.2 for the Ikegami and f 1.4 for the Thomson.

During the past year, Hitachi has added two new features to the studio SK-970—a new optional f 1.2 prism for lower light level operation and a built-in shutter to catch slow motion sports action. Philips has not stood still. All cameras in the LDK family this year have an "A" appended to them.

The A means full plug compatibility with the LDK 54A portable, updated software and a wider range of control options. An A also means that the cameras can be interfaced with Philips' Coach system, which permits both remote control and remote monitoring of cameras. The latter feature facilitates preventative maintenance since critical data is stored over the lifetime of the camera. Comparisons with earlier readings can reveal deterioration. Coach can remotely interrogate cameras through a modem.

Last year, Sony announced the availablility of a complete HDTV system. This year it was Ikegami's turn. The camera in the Ikegami lineup is the HDK-1125P, which incorporates three special high-resolution one-inch tubes. Automatic setup is a feature, including a digital registration correction circuit. Saticon technology for HDTV was was exhibited by Hitachi. Coming are higher sensitivity tubes resulting from improved electon guns using barium-impregnated cathodes, along with high resolution as a result of the uniform structure of the Saticon target. Resolution of more than 2000 lines is possible.

FOR MORE INFORMATION

Toshiba 365
Panasonic 366
NEC 367
Ikegami 368

Other Camera Advances. . .

While most camera progress came in the CCD or ⅔-inch computer-controlled area, advances were scored on many fronts. Bosch, for example, which has rather belatedly joined the ranks of those making computer-controlled cameras, showed for the first time in North America its one-inch tube model, the KCM-125. Among its features is an integrated automatic dynamic lens error correction system.

Bosch also announced intentions of marketing in the U.S. its KCF-1B portable (popular in other parts of the world). Toshiba is returning to the U.S. market it says offering —in addition to CCD cameras— the sophisticated computer controlled PK-50 line. (The 501 uses ⅔-inch tubes.) Hitachi said it would be modularizing its SK-97/970 line to increase its flexibility. The company also showed a revitalized CV-One, the cam/recorder using an 8 mm metal tape format, "to test broadcaster reaction." The revamped unit is full bandwidth (4.5 MHz luminance and 1.4 color difference). Recording times are 11 minutes and 15 minutes. Camera head is the SK-88.

JVC expanded it line of cameras by announcing the Procam KY320U, a three-tube Plumbicon type with many automatic features. Horizontal resolution measures

A TOUGH ACT TO FOLLOW

Genesis 1™ With ACT 1™ $27,990

Genesis 1 ACT 1, Microtime's high quality, low-cost digital effects system increases creative capabilities to your imagination's limit. Create through self-prompting, icon-driven menus and instructions for sequences involving moves, freeze, flips, tumbles, posterize, shadow, variable aspect ratio, XY mosaic, strobe, and source change.

Genesis 1 ACT 1 offers:

- ☐ 3-Axis joystick control
- ☐ Keyframe creation of sequences
- ☐ Smooth curvilinear movement
- ☐ Frame accurate duration of a sequence
- ☐ Routing switcher interface for dual input switching when flipping and tumbling
- ☐ Three levels of sequence storage: RAM, internal and portable

Genesis 1 ACT 1...A user-friendly digital effects system for your video productions. An ACT not to be missed at $27,990.

MICROTIME

A Subsidiary of ANDERSEN GROUP

Microtime, Inc.
1280 Blue Hills Avenue
Bloomfield, CT 06002 USA
Tel: (203) 242-4242
TWX: 710-425-1165

Northeast, Ray Bouchard (609) 896-3716
Central, David Everett (312) 934-9191
Southcentral, Steve Krant (214) 644-0232
Southeast, Jerry Rankin (404) 979-4437
Western, Chuck Bocan (714) 989-4433

more than 650 lines at center. At the high end of the Procam line is the 900 series, which includes low-capacitance diode gun pickup tubes and f 1.4 prism optics. Another new camera is the single-tube GX-N8PCU camera designed as a input source for computer graphics systems. Sharp showed a three camera remote control capability designed for its XC A1 line.

Philips stressed that its A version of the LDK54 is truly a multirole camera operable as a standalone camera, a cam/recorder combo, or connectable to any of the larger LDK cameras. It's available in a triax mode . Panasonic introduced a triax cable system for its AK-30 hand-held ENG/EFP camera.

Ikegami's popular HL-95 Unicam was at the show configured this year to connect with the new Panasonic M-II metal particle tape recorder—the NBC choice. The HL-95B boasted new ⅔-inch Plumbicon pickup tubes (with diode electron guns and electrostatic focus) for high sensitivity and high resolution. A video camera for night time use was shown by Pag of America. Produced in Israel, the Nitecam uses an infra-red laser combined with a image intesifier tube. Clear pictures at distances of 300 feet can be obtained in total darkness.

FOR MORE INFORMATION

Bosch	369	Sharp	373
Toshiba	370	Philips	374
Hitachi	371	Panasonic	375
JVC	372	Pag of Am	376

Latest Lens Developments

New Schneider TV lenses at NAB 86 reflected recent camera trends—a new 14 X zoom for CCD cameras (the TV-56) and a new high resolution 17 X low weight compact lens for ⅔-inch tube field cameras, the TV-80. The TV-56 14 X is called the APO-Varon. It features true Apochromatic design in which all colors are focused on precisely the same image plane, necessary for CCD cameras. The TV 80 is a brand-new lens offering high resolution and low chromatic aberrations. New servo modules incorporate digital feedback and auto alignment. With a 8.5 to 150mm focal length, f 1.4 aperature it is wide angle. It has 2x built-in extenders. Schneider also introduced a new group of wide angle 14.5 X lenses: type TV-64, 65, and 66, for studio applications covering all three major tube diameters.

Angenieux introduced a major change in that it has replaced gears with belts in its EFP lenses to reduce noise and weight. This new feature is a "new generation" of 18 X lenses for studio use. Innovations include recessed hood handles and a digital readout for iris position, diascope location, etc. Among many new entries, it debuted a 15X9 f 1.2 EFP zoom for ⅔-inch format cameras making it the fastest 15X in the industry. It offers a wide angle of 53 degrees. Zoom rod construction replaces internal pins to withstand shock damage.

Three other new lenses were a 14 X 7 ENG/EFP boasting an angle of 64 degrees, a 14 X 8 ENG type, and a 14 X 9 ENG type, all with an aperture of f 1.6. lens. All of these lenses had a center of gravity closer to the cameraman for better balance.

Fujinon brought out a new A18X8.5ERM zoom as a "new standard" for ENG applications. It not only has the range, but it is smaller and lighter, weighing but 1 ½ kg. At the 8.5 wide position, the angle is over 65 degrees, making the lens suitable for studio use, too. Aperture is f 1.7 flat to 116 mm dropping to f 2.3 full telephoto...To assure its claim as a source for the very widest angle ENG lenses, the company added this year the A8.5X5.5RM. Field of view exceeds 77 degrees.

Fujinon's modular construction advantages were demonstrated in new P17X16.5ESM, P20X14ESM and P44X18ESM zooms. These include easier serviceability, operability—and improved performance. They are also shorter and narrower than most lenses.

Canon's principal new lens this year was the HDTV PV14X12.5B HD. Its performance was demonstrated in the special HDTV area mounted on a Sony camera. Its focal length is 12.5 to 175 mm. Minimum object distance from the focal plane is 0.7 m. Aperture is f 1.6...Schwem introduced at wide angle attachment for its image stabilizing Gyrozoom 60/300 lens.

FOR MORE INFORMATION

Schneider	377		
Angenieux	378	Canon	380
Fujinon	379	Schwem	381

Video Editing: Expanding Capabilites, Shrinking Costs

In a technology-dependent industry, it's expensive to be in the vanguard. The very latest top-of-the-line computer-based equipment, while impressive, is almost by definition the most expensive.

Its benefits, however, trickle down to the general population with a speed and reliability that can almost make one believe in supply-side economics. Yesterday's state-of-the-art equipment often becomes the basis for today's workhorse as components become less expensive to produce.

It was no surprise, then, that the major editing system activity at NAB '86 was from companies showing streamlined editors with reduced pricetags and augmented capabilities. An excellent example of this trend was the new ECS-1000 from Convergence Corp., designed to control up to six serial VTRs of any format via RS-422 interfaces. One of the exciting features of this new system is that it has no rack-mounted

electronics at all—all its features are contained in a single compact box.

Those features include multiple assignable record, 1000 lines of edit decision list, sequential and checkerboard auto assemble, and 409 and Cleanit list management routines—virtually all the capabilities of Convergence's 200 Series editors, in a more compact and less costly package. Prices for the 1000 range from $17,500 to $25,000, depending on list management capabilities and number of VTR interfaces.

Things are cooking at CMX, which has pulled itself out of the doldrums to reassert its leadership in high-end editing. According to VP and director of marketing Larry Weiland, CMX has committed itself to building a reputation for not showing any product that can't be delivered within a reasonable time frame.

Its brand-new product for NAB '86 was the 336XL editor, a mid-range system designed as a "big brother" to the 330XL, with six ports as opposed to the 330's five. Along with the extra control port, the 336XL also adds shift/retard slow forward and reverse; jog forward and reverse; retard jog rate; advance job rate; dedicated keys for video, audio one, and audio two edit mode selection; short cut dissolve (with last dissolve rate); and short cut wipe (with last code and rate). It also has a raft of additional time code functions and stores multiple EDL files on floppy disk.

CMX has long featured complete upgradeability, and the 330XL is upgradable to a 336XL, which, in turn, is upgradable all the way to a 3400A. A basic 336XL system, including a Multi-I^2 chassis with interfaces for a switcher and three VTRs, is about $30,000. Deliveries should begin this month.

CMX editors have long controlled ATRs as well as VTRs, but this year, CMX expanded its audio capabilities with an audio console interface, an option for the Multi-I^2 that allows CMX editing systems to control Graham-Patten audio mixers and the Harrison PRO-7 audio board.

Another new software product from CMX is the EDL Optimizer, an edit list management tool available in versions for IBM PC–compatible formats and for CMX systems.

Sony, whose BVE-3000 and BVE-5000 editors are well-known in the middle- and high-end ranges, also showed a trimmed-down editor. The new BVE-900 is a four-machine controller that will interface to any combination of U-matic, one-inch, and Betacam recorders. Source selection and control can be performed even during another automatic event.

The 900 features serial or parallel switcher control of crosspoints,

Convergence's new ECS-1000 is a self-contained editor with 1000-line EDL.

main fader, keyer, wipes, and dissolves, along with audio mixer controls for automatic audio switching and crossfades. It also has three assignable GPIs and dynamic motion control, both stored in the edit decision list.

Other BVE-900 features include a menu-driven display, effect mode display, reading of longitudinal and control track time code plus VITC and user bits, and color framed or matched frame edits. The system lists for an economical $11,595.

The EMME system from EECO was shown in four new versions, all built around the new Computerized Editing Workstation, a computer-style keyboard interchangeable with EMME's two other workstations. The new entry-level EMME is the Model 395, a $13,500 A/B roll system with time code and basic list management. The Model 595 adds intermediate list management and sequential auto assembly; it sells for $17,500. Next up is the Model 795, with an eight-inch floppy disk drive and $19,950 pricetag. Top of the new line is the Model 995, with full list management and a longitudinal time code generator. It is priced at $24,950. All four models complement the existing 3000 Series of EMME, which starts at $26,950.

EECO also added a new model to its IVES line with the introduction of the IVES PRO, a three-machine, A/B controller with remote electronics and detachable keyboard. IVES PRO will intermix half-inch, ¾-inch, and one-inch VTRs and also controls a special effects generator and splits audio and video for editing.

United Media celebrated its tenth anniversary by introducing the Comm-Ette, a low-cost A/B roll editor with list management, 250-event memory, standard GPI switcher control, and optional auto switcher control. Other advanced features include frame-by-frame VTR control for animation rendering and checkerboard auto assemble. The "industry-compatible" EDL output can be paper tape, disk, or printer.

Its keyboard includes one user-definable key capable of 120 decisions. The three-machine controller also controls Pyxis and other serial machines. It is frame-accurate and can be upgraded to other UM products. Prices range from $6500 to under $10,000; auto switcher control ups the top price to $12,000.

Calaway Engineering introduced an enhanced CED editing system called the CED+. The CED+ has all the capabilities of the CED, plus an expanded keyboard, increased error/help messages, and additional macro functions. It also has expanded GPI functions for E-MEM control, variable speed control, and emulation of the Quanta Q8 CG keyboard. The fully loaded CED+, with control ports for six machines (the CED controls four), is

$20,500; basic systems start at $10,500.

Videomedia introduced a pair of extremely low-cost editors, the Mickey 1 and Mickey 2, so named because of their mouse controllers. The Mickey 1 is a two-machine, cuts-only editor with distributed intelligent VTR interfaces, printer output, mouse control input, 50-event memory, and GPSI for control of external devices such as ATRs or character generators. Not bad for $3500!

It is upgradable to the Mickey 2, a full A/B roll system with Auto-Match, Auto-Tag, extend edits, and internal video dissolve switcher and stereo two-channel AFV mixer, both with full auto drive. Mickey 2 lists for $4500.

FOR MORE INFORMATION

Convergence	384		
CMX	385	United Media	388
Sony	386	Calaway	389
EECO	387	Videomedia	390

Ultimatte, Faroudja Stretch Limits of NTSC

With all the current talk of component video, NTSC sometimes seems like a neglected child. Its pervasiveness in television, however, makes it perilous to ignore.

One company no one can accuse of giving NTSC short shrift is Faroudja Laboratories, whose innovative CTE-N NTSC encoder is designed to eliminate many of the artifacts considered inherent in the NTSC signal. Combined with the CFD-N decoder, the system makes possible manipulation and storing of NTSC computer graphics, and high-quality NTSC matting.

The latter capability was quickly seized upon by Ultimatte Corp., which demonstrated exceptional matting quality using one-inch videotaped foreground material —never before possible.

Other Editing Systems...

Editing system advances were not, of course, confined to the midrange. In large-scale systems, Grass Valley Group announced an upgrading of its Series 51 editor to the new 51E. New features include version 3.0 software (scheduled for July 1 release) and advanced diagnostics that test hardware on the system computer. Trace and 409 software are standard. In addition, a new display format maximizes clarity and efficiency of use, and the screen display has been "tremendously" speeded up, according to a GVG spokesperson.

Two timely enhancements for the 51E are interfaces for Matsushita M-II format recorders and for the Abekas A62 digital disk recorder. Even more exciting is a

brand-new "effects jog" feature that lets the user move GVG's Kaleidoscope component digital effects unit through an effect with the editor's jogger wheel. In the future, the company aims for even greater control of the Kaleidoscope. System 51 editors now in the field are upgradable to the 51E.

According to CMX, over 100 top-of-the-line 3400A editing systems have been delivered since the onset of shipments last summer. The 3400A is an all-out system for the serious post-production facility. It features Dynamic Motion Memory, a routine that allows the machine to learn or program a sequence of motion changes on up to six playback VTRs simultaneously.

CMX's 3100, the recently introduced replacement for the 340XL, made its first NAB appearance. This advanced system features control of eight devices (out of 24 assignable), GOTO machine control functions displayed in-time for individual devices, and sophisticated match cut calculation.

Ampex's ACE editing system was shown with new Version 3.0 software that greatly expands its capability to control production switchers.

The new software, which is being shipped as a free update to ACE users, applies not only to the standard ACE system but also to the ACE Micro, which differs from its larger sibling only in number of control ports.

Version 3.0 controls effects involving up to three M/E banks on the AVC switcher, with most of the control from the ACE keyboard. All information goes directly into the edit decision list. The editor can loop through M/Es to add ADO efx and keys, taking the ACE far beyond static GPI closure.

An important facet of the multiple M/E feature cluster is the Add Program Mode, which allows control of non-AVC switchers.

Paltex expanded the top of its line with the new Esprit Plus, with control of three to six machines and a price range of

GVG's System 51E features expanded control of the Kaleidoscope.

$50,000 to $60,000, depending on configuration. Paltex is particularly proud of its editors' ability to control VTRs of any format and manufacturer, including the new M-II machines and the Abekas A62.

A new feature of the Esprit Plus is multiple assignable record, allowing any number of VTRs to be selected as main record or slave VTRs for sync roll editing. In addition, the Learn Mode control system has been enhanced with a user-programmable "slow play" and "speed set" key that lets the editor "learn" VTRs at different speeds, forward or reverse. A new Data Store system provides flexible switcher memory storage and interfaces with any switcher, according to Paltex.

Convergence's top-of-the-line ECS-205, introduced last year, is now in full production. Its advanced features include control of up to eight VTRs with multiple assignable record; interformat capability; 1000-line edit memory; automatic switcher crosspoint selection for designated "active"

CMX's 3400A is the top of the line.

source VTRs; and sophisticated list management. At the other end of the scale, the recently introduced ECS-195 was also shown in a variety of configurations.

Editron, the Australian editing manufacturer that attended last October's SMPTE convention, came to its first NAB with its 100A, 500A, and 500V editing systems. The 100A, which controls up to four machines, now has an improved keyboard with a detachable panel that allows the keyboard to be positioned remotely.

The 500A, capable of actively synchronizing up to 15 machines, has been upgraded with 99 addressable interfaces, subframe capability for ATRs, soft keys, and jam sync record. New features for the 500V are six-machine capability, soft keys, and chase mode operation.

Videomedia's editing system line, including the Eagle XR, I, and II, and the recently introduced Magnum, were also on view. Also featured was the Eagle III, an A/B editing system designed for interformat editing of half-inch, ¾-inch, and one-inch material. The Echolab SE-3 computerized production switcher with custom software is a standard feature of the package, allowing multilevel transitions to be defined in the edit list and executed by the editing system.

BHP's EnVision touchscreen-controlled video editing system is now being delivered. A search mode and CRT status screen are now standard features with the system. This off-line system will produce either a CMX-compatible floppy disk for on-line auto assembly, or a conforming log in film edge numbers for film conforming using standard techniques.

United Media featured its eight-machine Commander II, along with the Mini-Comm A/B roll editor, upgradable all the way to the Commander II.

PEP featured its direct edit interface designed to allow VHS source video to be edited directly to ¾-inch via a Sony edit controller, with no equipment modifications necessary.

Covering All the Bases

Meet the team of innovative Time Base Correctors from FOR-A. These high performance systems combine the latest advances in digital and component signal processing with the versatility to handle every professional broadcast and post-production application.

- *FA-410 Time Base Corrector*—The full-feature "Workhorse" TBC with Dynamic Tracking™ for the Sony BVU-820 and Panasonic NV-8950 VTRs.
- *FA-400/FA-420 TBCs with Frame/Field Picture Freeze* plus processing of Non-Synchronous signals from remote locations or Non-V-Locked VTRs.
- *FA-430 TBC with Image Processor*—Providing the ultimate in color correction, image enhancement and noise reduction with Y/C Dub, Dynamic Tracking and DOC.
- *FA-440 TBC with Video Production Effects*—An exciting array of multiple digital effects including Compression, Inversion, Mosaics, Posterization and Multi-Move.
- *FA-800 AUTOCOR Frame Synchronizer with Automatic Level Control*—Now with capability for correcting 1" (Type C) VTRs, including Velocity Correction, DOC and VTR SC mode.
- *FA-450 Component Interfacing TBC*—Handles any component, Y/C Dub or Composite Signal and provides Full Transcoding Interface capabilities including decoding and encoding functions. Employing 4:2:2 sampling and 8-bit encoding for each component, the FA-450 provides Full-Frame Correction, Color Picture Freeze, DOC and Dynamic Tracking. Designed with future video technology in mind, the FA-450 updates existing systems and insures against format obsolescence.

So cover all the bases and join the winning team. FOR-A is ready to review its versatile line-up with you. Call your FOR-A dealer . . . and ask about our new 2-year warranty.

U-matic and Dynamic Tracking are registered trademarks of Sony Corporation.

FOR-A®
INNOVATIONS IN VIDEO and AUDIO TECHNOLOGY

FOR-A CORPORATION OF AMERICA Nonantum Office Park, 320 Nevada Street, Newton, MA 02160
East Coast: (617) 244-3223 West Coast: (213) 402-5391

Circle 131 on Reader Service Card

FOR MORE INFORMATION

GVG	392	Editron	397
CMX	393	Videomedia	398
Ampex	394	BHP	399
Paltex	395	United Media	400
Convergence	396	PEP	401

Time Code

EECO introduced six new models in its Eeconoline family of SMPTE time code equipment. Included are the PTG-56 portable reader/generator ($1995), the MTG-57 master generator/reader ($1795), the TCR-66 mini time code reader ($1295), the TCR-67 desktop reader ($1495), the VCG-76 miniature reader/inserter ($1595), and the VCG-77 reader/inserter with front-panel display ($1795).

Skotel expanded its time code line with the introduction of the TCR Series time code readers in two models. The TCR-111 is a compact SMPTE/EBU reader that operates at tape speeds from 40x reverse to 80x forward. It has optional RS-422 control port, microprocessor control, and power backup. The TCR-112 has all the 111's features, plus simultaneous, independently controllable display of time and user bits, selectable character heights, characters positionable anywhere in the raster, and legible black or white characters with or without contrasting window.

New from Cipher Digital was the CDI-750, a combined reader, generator, character inserter, and event controller. The microprocessor-based time code system offers programmable jam sync mode, built-in time-of-day clock, RS-232 computer interface, and 16-event controller.

Development continues on Gray Engineering's DT-213 SMPTE time code generator and dual character generator, introduced last year....Datum featured its full line of time code products, including the 5350 generator, 5360 reader, and 5300 intelligent time processor....Comprehensive Video featured its $345 Log-It 100 portable time code reader and logging system, based on the Radio Shack Model 100 lap-top computer.

FOR MORE INFORMATION

EECO	402	Gray	405
Skotel	403	Datum	406
Cipher	404	Comprehensive	407

More Competition in Post-Production Telecines

The high-end, post-production telecine business, long dominated in this country by Rank Cintel, may begin seeing some genuine competition as Marconi and Bosch strengthen their marketing stances here.

Marconi, whose CCD telecine was again showed by A.F. Associates, has added features designed to increase the product's appeal to U.S. post-production houses. One of the most important additions is variable speed transfer, which Rank and Bosch have already shown. The Marconi system allows the user to calculate the percentage of compression or expansion or to let the machine perform the calculations itself.

Marconi showed the telecine with its Prefix programmable control system, which also has a significant new feature: color correction during still frame. Previously, the system could color correct moving pictures only, forcing the user to jog back and forth while performing color corrections.

Also new is an XY postioner for the telecine. In all, Marconi has added features now demanded for high-quality film transfers.

Meanwhile, both Bosch and Rank showed their established telecine and film transfer products. Bosch's FDL-60 CCD telecine was shown with its full range of features, including slow motion playback, programmable freeze or defreeze, variable speedes of 16 to 30 film frames per second, preselection of negative film stock type, and full-format playback of CinemaScope films (PanScan). The FDL has built-in manual color correction and an optional grain reducer, plus options such as computer-controlled film reproduction programmer, A/B interface, wet gate, secondary color correction, and negative matching.

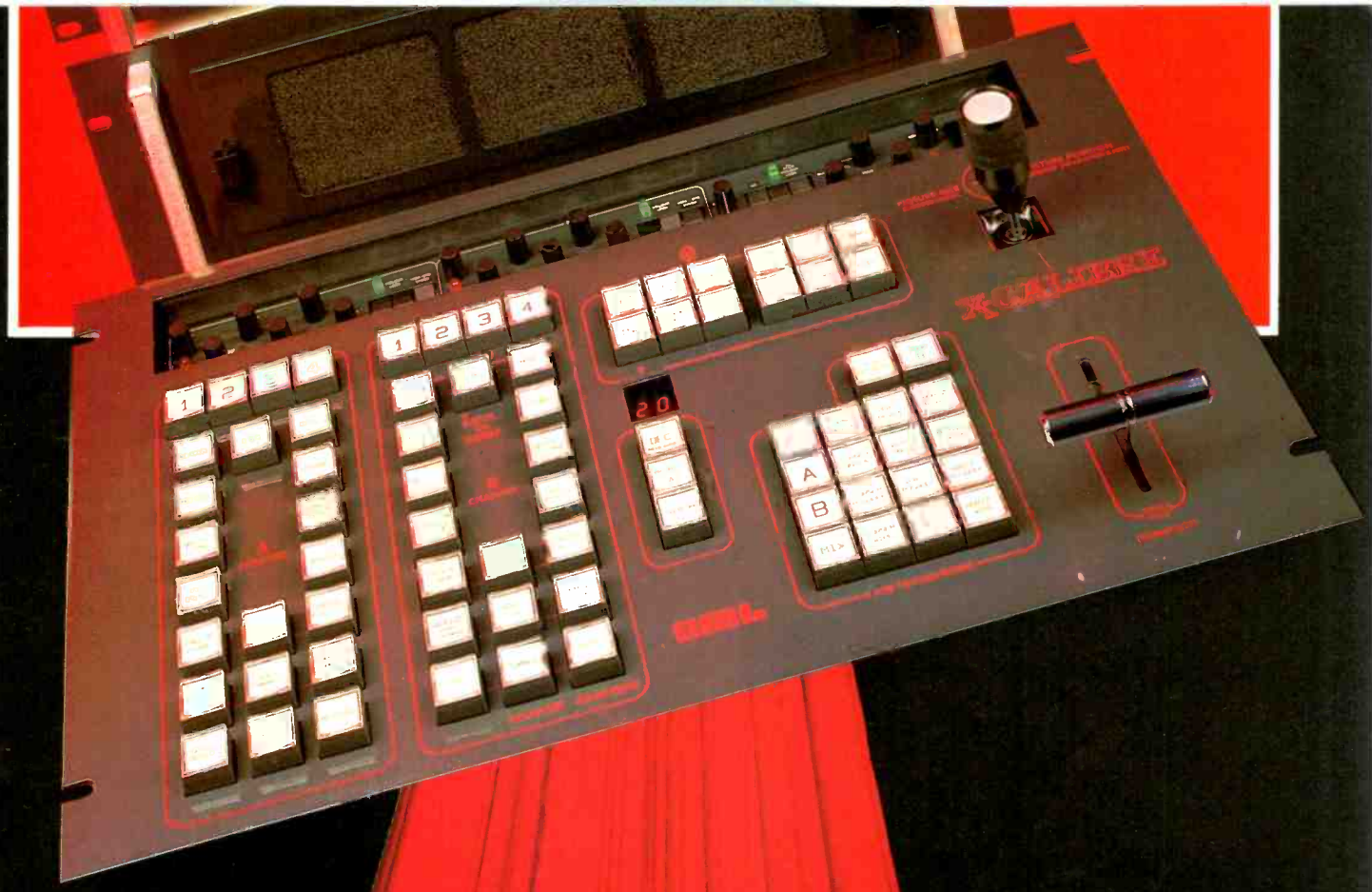
Rank's booth featured the MK3C flying spot telecine, latest version in Rank's popular MK3 line, in its standard broadcast-resolution version and also in the new MK3HDTV high-definition version, designed for mastering on the 1125-line, 60 Hz HDTV standard. Options for the MK3 include the Amigo preprogramming control computer, which offers advanced control and color correction facilities for MK3 series telecines, and the X-Y Zoom unit with mini-joystick positioner, 6:1 zoom range, and preprogrammable zoom and position. Rank's solid-state ADS1 multiplexed on-air telecine was also featured.

Rank was not the only manufacturer showing an HDTV telecine this year—understandable since 35 mm film offers a mass of ready-made product for the fledgling HDTV market. Ikegami, which has shown telecine cameras for many years, introduced an 1125-line format high-definition telecine system to complement its high-definition camera and projection system. The basis of the telecine is an HDTV telecine camera with three one-inch diode gun, low capacitance Saticon tubes and featuring 1200 TV lines of resolution, 30 MHz video bandwidth, and auto setup with a diascope slide.

The 35 mm projector for the telecine is pin-registered to eliminate vertical jitter.

FOR MORE INFORMATION

AFA/Marconi	408	Rank	410
Bosch	409	Ikegami	411



X-CALIBRE

zooms into view...

Announcing X-Calibre from GML. The new dual channel, multiple input digital video effects unit that gives you a brilliant, highly versatile zoom and trajectory capability with infinite size increase . . . instantly, at the touch of a button.

A cursor can be positioned anywhere on the screen for zoom starting point and for any required trajectory. With further zoom variations such as slide and tumble, spin rotation . . . all the flexibility you need.

Plus a vast repertoire of other effects – including vertical inversion, horizontal and vertical compression, segmented reveals and conceals between channels, full re-entrant capability – and full digital signal processing, in one superbly designed complete package.

With two TBC's, full frame and field capability and a host of advanced features, X-Calibre is way out in front, with nothing to touch it for anything like the price.

Ask for a demonstration of the X-Calibre DVE now. And see for yourself what high performance, versatility and ease of operation are all about.

GML

GML, 143/145 CARDIFF ROAD, READING, BERKS RG1 8JF, ENGLAND TELEPHONE: (0734) 584948 TELEX: 847109 GUNML G

■ GML France, 50 Bis, Rue Maurice Arnoux, 92120 Montrouge, France ■ GML America Inc, 8150 Leesburg Pike, Suite 910, Vienna, Virginia 22180

Circle 132 on Reader Service Card

Compact Switchers Gain Full-Sized Features

Amid the glitter of graphics and the glamour of effects, it takes a thoughtful eye to discern developments in less "sexy" product areas. Fortunately, broadcasters understand that no matter how much pizazz the picture has, it won't get to air without solid control equipment.

That requirement was answered in abundance at NAB '86 with a host of new, compact production switchers packing many of the features of their larger siblings. These versatile switchers are at home in a variety of applications, from on-air control room to edit suite, and often feature extensive special effects. Many are designed to allow control from an editing system. Their only remaining limitation is number of inputs.

The Bosch RME Series production switchers aren't really new—hundreds are in operation around the world—but Bosch has not actively sought the U.S. market and has sold almost none on this side of the ocean. That can be expected to change now, according to the company, as Bosch mounts a serious attempt to crack the U.S. broadcast facilities market with the compact switcher line.

To further that aim, Bosch showed new features and capabilities for its R102ME switcher, designed for both production and on-air use. For example, the switcher has a mix key stage that gives each mixer level operational combinations previously limited to multiple, cascaded M/Es. Also featured are separate preview and key buses, RGB chromakey, borderline key, flip-flop program/preset buses, NTSC pulse processing, and an extensive wipe selection including 19 modifiable rotating patterns.

Options include dual or single downstream keyer, tech preview bus, encoded chroma keyer, digital effects processor control, and a sophisticated digital memory system called CFM (control function memory) that memorizes as many as 10 sequences of up to 100 takes each. CFM is also available on the R51ME, smallest member of the RME family.

Intergroup Video Systems introduced the 9420 20-input production switcher.

While Grass Valley Group's popular 100 and 1680 production switchers were basically unchanged from last year, the company made news—and even a sale—with an HDTV version of the Model 100, shown as part of the Sony HDTV exhibit.

According to a GVG spokesperson, the HDTV switcher was essentially a standard Model 100CV component production switcher with the video bandwidth and pulse processing systems adjusted to accommodate the higher line rate and wider bandwidth required for high-definition video. The ease with which GVG reconfigured the switcher for HDTV use can be seen as another indication of the value of component processing in easing the transition from today's studios to those of tomorrow.

Intergroup Video's new production switcher line spans the distance from midrange to large. The 9000 Series, an update of Intergroup's previous 900 Series, consists of two groups. The first, the 9400, comes in three models, two with 10 inputs and one with 20. All include two independent M/Es, a program/preview mixer, and a downstream keyer/edger. The 9410S has LED shadow switches; the 9410E and 9420 have illuminated switches. The second group, the 9300, consists of two 10-input models with LED shadow switches and illuminated switches, respectively, each with two M/Es with shared pattern generator.

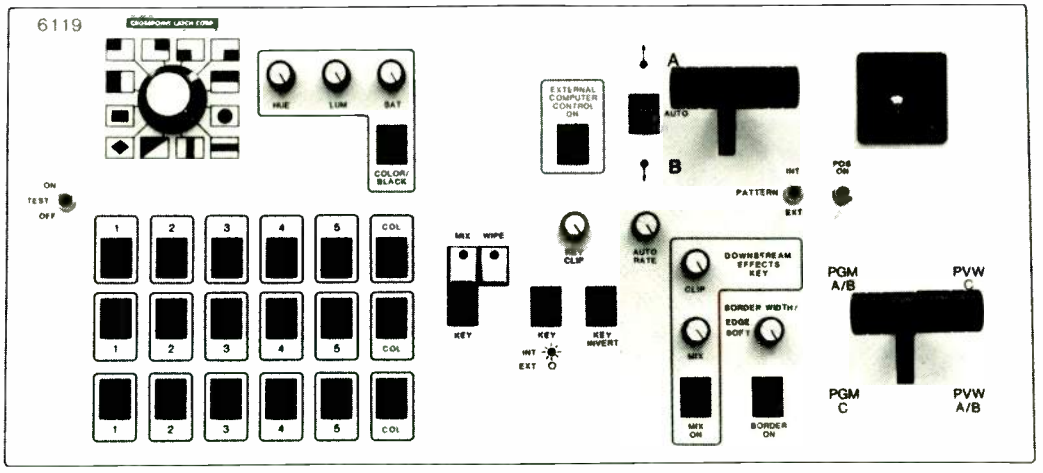
An intriguing new product from Crosspoint Latch recalls ALTA Group's successful Pyxis, described in the story on editing systems. The 8200 Excalibur is a mini-switcher that incorporates two 16-line-window digital TBCs, with independent posterization for each TBC. Digital effects include push on, push off, pull on, posterization, and mosaic. Excalibur also features two levels of keys, colored borders, full colorizer, joystick positional, 12 wipe patterns including circle, two-channel audio mixer with breakaway, genlockable RS-170A sync generator, four black burst outputs, GPI, and master fade to black. Quite a bundle for $8995! Options include serial and parallel control from editors, seven-input stereo audio mixer, and RGB chromakeyer/color bars.

Crosspoint Latch also introduced a compact post-production switcher, the 6129 AHK, with two M/Es with shared or optional second pattern generator; up to five levels of keys (two chromakeyers, one optional); and two downstream keyers (one optional). With all the standard features and options, this adds up to a very capable machine. Two modes of automation—independent ramp mode and sequence mode—are standard, as are 32 patterns with borders, soft edges, symmetry, and preset limits. Stereo AFV and auto disk are available as options. Prices start at $10,995.

Central Dynamics' CD1080 production switcher now has a built-in isokeyer that allows multiple inputs to be put onto a single channel. The switcher also now incorporates a routing switcher control panel, reflecting the trend toward

SWITCHER WITH FULL SERIAL EDITOR CONTROL FOR $5540

OR A POWERFUL PRODUCTION SWITCHER FOR $2690



The **6119** accepts ***ALL*** Standard Editor Commands and executes them with Frame Accurate Transitions, such as Wipes, Mixes and Keys. A range of three Audio Mixers is available for Automated Post-Production.

Even without the Serial Option, the **6119** can be triggered with an External GPI Pulse.

An increasing number of **6119** Switchers are being used for VCR Input Selectors and small Master Control Switchers.

STANDARD FEATURES

SYNC GENERATOR	FADE TO BLACK
GENLOCK	BORDERED WIPES
AUTO TRANSITIONS	AUTO PREVIEW
12 PATTERNS	VARIABLE SOFT EDGE

TEST MODE FOR SYSTEMS TIMING
DOWNSTREAM MIXING

GPI TRIGGER

$2690.

FULL RANGE OF ACCESSORIES

6045	RGB Chroma Keyer/Color Bar/Tone Generator
6055	Parallel To Serial Converter For Convergence Editors
6053	BUE 800 Trigger Box
6404	Intercom Unit
6800	Stereo Follow/Breakaway Mixer
6803	Stereo Follow Only Mixer
6806	Mono Follow Only Mixer
6065	Encoded Chroma Keyer Model

CROSSPOINT LATCH CORP.

95 PROGRESS STREET • UNION, N.J. 07083 USA
Country Code 1 • (201) 688-1510 • TELEX 132850

Circle 133 on Reader Service Card

increasing the power of the routing system; each switcher now has inputs selected from the router, so the router drives the plant.

Echolab introduced a powerful compact switcher, the DV-5, designed for teleproduction and post-production applications. The 12-input switcher has three keyers and two mix/effects systems, along with three digital color generators and front-panel programmability.

In the Programming mode, the DV-5 stores control sequences for later playback via a keypad. Sequences may be stored and recalled later in Production mode, which allows switcher control of both wipe patterns and digital effects. The switcher has more than 40 wipe patterns. Options include RGB or composite chromakeyer, SMPTE editing interface, audio switcher/fader for AFV, drop shadow generator, NTSC or PAL operation, quad splits, and rotary wipes.

Ross Video introduced the Model 216 production switcher, a 16-input version of its compact 210, introduced last year. The 216 features the Ross Multi-Level Effects system, along with full transition preview, downstream key tie, built-in memory, analog key border generator, and serial interface to editing systems.

While Convergence Corp. is a name that hasn't been associated with production switchers (despite its recent association with ALTA Group), the company's introduction of the SE-100 switcher/effects unit seemed natural. The SE-100 is an off-line system expressly designed to operate under control of Convergence's ECS-200 and ECS-100 editors. Designed primarily for industrial use, it allows special effects transitions between two of five video/audio sources when controlled by 203 or 204 editing systems. Transitions are programmable through the editor's keyboard and include 23 wipe patterns, cuts, dissolves, and external keys.

Shintron introduced no brand-new switchers, but again featured its Model 390 component switcher/editor interface and its Empress 2000 production/post-production switcher. The latter is a heavily software-oriented machine controlled by twin Z-80 microprocessors and based on RS-422. The A/B switcher has program and preview buses, dynamic transition memory, a wide range of effects, built-in SMPTE time code generator/reader, and flexible editor interface. The Model 390 is a smaller version of the Empress designed to handle three separate component video channels at one time and to interface with editing systems for complete post-production of component video.

Beaveronics featured its full line of midrange switchers, including the J&D 712, the BI-154, and the BI-156. All incorporate sync/nonsync detection and modular construction. The smallest, the 712, is a 12-input unit with, among other features, a key invert switch that allows keying to be accomplished from either black or white video. The 15-input BI-156 has two identical mix/effects/key systems, each with 32 wipe patterns, positioner, and matte color generator.

Large switchers. Grass Valley had a significant development for its large Model 300 production switcher: a key extender that increases the number of external key inputs from six to 32. According to a spokesperson, the proliferation of digital effects boxes, character generators, and other devices that produce key signals as well as video has created a key input crunch for many switcher users. With the new key extenders, the need to patch extra key signals is virtually eliminated.

Grass Valley Group's Model 300 had a versatile new key extender.

The key extender has other advantages, too. It increases the switcher's split keying capability, allowing a key signal to be used as a "hole-cutter" to create an object-shaped hole in the background video that can be filled with video from a third source. Shipments of the key extender should be under way by now.

Ampex's midrange 4100 and high-end AVC switcher series, both basically unchanged since last year, showed up in several locations within and without the Ampex booth. The AVC Series especially was in evidence, demonstrating increased capability for editing system control. In Ampex's own Creative Command Center, the AVC was tied in to the ACE editor; elsewhere in the booth it was closely interfaced to the ADO 1000 digital effects system and demonstrated in an audio application. AVC switchers were controlled by CMX editing systems at the CMX booth and in Fuji Tape's NAB edit suite.

DSC featured its SX-2000D programmable effects system, a switcher designed both for on-air and post-production work. Two Z-80 microprocessors are used to control and digitize all panel functions and to allow automatic event programming by the user or full control from a video editing system. Transitions may be performed manually or under computer control, with automatic transitions, and the control panel is designed to provide easy access to all M/E, keying, and digital effects functions.

Vital's new 3000 Series large production switcher, introduced last October at the SMPTE show, made its NAB debut. The 3000 is designed for keying power and ease of operation. It incorporates four video keys (or a chromakey and four video keys) in each M/E. Each M/E also has a separate key input with discrete filling signal, for a total of 16 self-filled keys in a four-M/E system, the largest available. There are no "hidden extras" with the 3000; all features are standard. A three-M/E unit is $175,000.

FOR MORE INFORMATION

Bosch	415		
Grass Valley	416	Convergence	422
Intergroup	417	Shintron	423
Crosspoint Latch	418	Beaveronics	424
Central Dynamics	419	Ampex	425
Echolab	420	DSC	426
Ross	421	Vital	427

Keyers and Accessories...

Graham-Patten Systems featured a new line of video keying systems, the 1230 Series, designed for standalone or integrated operation. Features include multiple key inputs, internal or external keying, internal matte and masking generators, and optional analog bordering.

Among the new items from Broadcast Video Systems were the CDK-1000 component downstream keyer and the CBG-1 component color bar generator. The CDK-1000, designed for use in component editing suites, allows mixing between two component sources with internal or external key modes.

BVS also showed zero loss delay line, a delay device for timing video into a switcher that guarantees no loss in gain. The Cox component color corrector and prototype DS-600 digital scene storer for Cox component or encoded color correctors were also on view.

Central Dynamics introduced the DMK 2180 downstream multikeyer, a spinoff of its Series 80 production switchers. This standalone unit can add up to four video keys to any composite signal. The 2180 features four key selectors that can be selected independently or simultaneously; four key sources with separate key and fill inputs; composite or noncomposite key source inputs; nonsync key inhibit and indicator; built-in color black generator; automatic color black output; selectable sync and burst replacement with automatic nonsynchronous defeat; and on-air tally system.

Any key or combination of keys can be bordered in a variety of styles and widths. In addition, nonsync program material can be keyed by using a sync output derieved from the program material to synchronize the key sources.

Shintron showed its DK3/CK3 component downstream keyer and RGB chromakeyer, which can operate as a standalone unit or integrated into a component switcher. A special feature is SLEW (superlinear extra wideband) technology, which allows the keyer to perform key fades and program/preset fades with almost no degradation in differential phase, differential gain, or frequency response.

Mark Electronics introduced the Osar M324 matrix wipe generator, a microprocessor-based key

signal generator that also functions as a three-input key selector. The self-contained system includes 20 matrix wipe patterns, three auxiliary key inputs, RS-232 port for remote control, and remote transition start for editor interface.

FOR MORE INFORMATION

Graham-Patten.... 429
Broadcast Video... 430
Central Dynamics.. 431
Shintron.....432
Mark 433

Wide Choice of Video Spot Players

Although the broadcast industry moved away from quad five years ago, there really hasn't been anything on the market as an exact replacement for the ACR-25 or TCR-100. NAB '86 saw that gap filled with Ampex announcing the ACR-225. It's a 19 mm cassette random-access player offering full-bandwidth video and four channels of audio. The cassette size is in conformance with the new international standard set by the CCIR for digital television tape recorders, but Ampex records the signal using a digital composite footprint rather than the digital component format.

The composite format is more cost effective, at the same time offering unlimited dubbing without degradation. The ACR-225 can handle 256 cassettes on line. The associated library managment package can identify over 10,000. But coming with a price tag of over $250,000 (no official price has been set) and delivery of production units 18 months away, the ACR-225 does not have the field to itself.

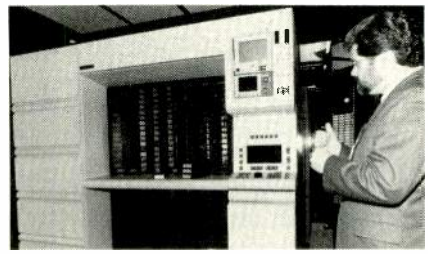
Competing with it are over a dozen automated video multi-event players ranging from full-robotic systems to relatively simple machine control sequencers. The cart players embodied in these systems are Betas, M-I, M-II, or U-matics. Alternately, Type-C decks can be operated by some. All are under some sort of computer control offering differing software capabilities—some are more extensions of machine control systems than MERPs systems.

The sorting-out task is not easy, but systems slot into one of the following categories: the robotics or elevator systems, which move individual cassettes about; hand-loaded segmented-tape systems in which several individual spots are recorded with cue-coding on a length of tape; hand-loaded single-spot but multideck systems; and the machine sequencer systems that do not require program coding.

Some, which found their genesis in the cable TV industry, play a fairly simple repertoire of commericals and program insertions, sequentially obviating the need for random access. On the other hand, such units control several channels simultaneously, each with different ads. Others are designed to handle heavy spot loads, which might consist of news, IDs, and ads, each on their own cassette. A touted feature is the ability to make a last-minute spot change.

Sophisticated systems can program themselves, taking a data dump from a traffic computer. Simpler ones require rekeyboarding. Some give you a verified log of what was played by reading codes; others do not.

In the robotics class at NAB, in addition to the newly unveiled ACR-225, were Sony's Betacart system, currently something of a best seller; Asaca's 6000, which offers both considerable capacity and flexibility; Odetics, scrambling to pick up the pieces dropped by RCA; and Panasonic showing a prototype MERPs system for the M-II format. Odetics has managed to make several sales and proved that it was ready to take on Sony by showing a Betacart version.



Ampex's ACR-225 digital spot player is unveiled.

Lake Systems, which has established itself well as a reliable multicassette playback systems supplier, seemingly assured its future by announcing La-Kart II as a "next-generation automatic programmer." It's all in the software. But Broadcast System Inc. also announced a second-generation automatic video cart machine, the DC-80. Falling more or less into this same category is a new company, On-Air Management Inc. On-Air is an amalgam of hardware and software vendors (including Mark Electronics) prepared to offer integrated service. Its CCS-100 is a software-intensive computer-based automation system.

Looking at station mishap problems from a total machine control perspective is Alamar. Its MC 1050 automated controller provides a user friendly display to indicate the status of the plant and details of upcoming events. The SC 2000 controller interfaces with all equipment, including cart machine players. Alamar can handle several independently scheduled programs such as those required by cable operators, but does not tend to focus on tape editing .

Coming out of a tradition of serving multichannel cable operators are Channelmatic (since 1974) and Solutec of Canada. Channelmatic offers a variety of random access ad insertion systems, including an automatic videocassette changer, thus putting it in the robotics class to a degree. Solutec's SOL-6800 system is a machine control system.

Offering sequencing systems were Commercial Cable Inc. and Matco.

But we are not yet finished. Two other companies are major contenders in this field, each offering a specific perspective—AF Associates and Grumman Electronics Systems. And at NAB, a third source threw its hat in the ring: Video-

NEVER HAS ONE INCH BEEN TAKEN SO FAR.

We could tell you that Fuji's H621E 1" videotape has a video and chroma S/N rating 2dB higher than even our best 1" tape.

And we could tell you that now we've made H621E even better with an audio rating that's 3dB higher.

But why tell you when we can show you? We'll do it right before your eyes, in your own facility. Just call your Fuji representative. He'll introduce you to a tape that will give you clear, crisp audio and unsurpassed picture quality after more generations than you'll probably ever need.

Of course, good news travels fast. So before all these extra dBs wind up in someone else's studio, call the nearest regional office listed below toll-free and ask them for a demonstration of Fuji H621E. Because when it comes to great audio and video reproduction, why look any further?

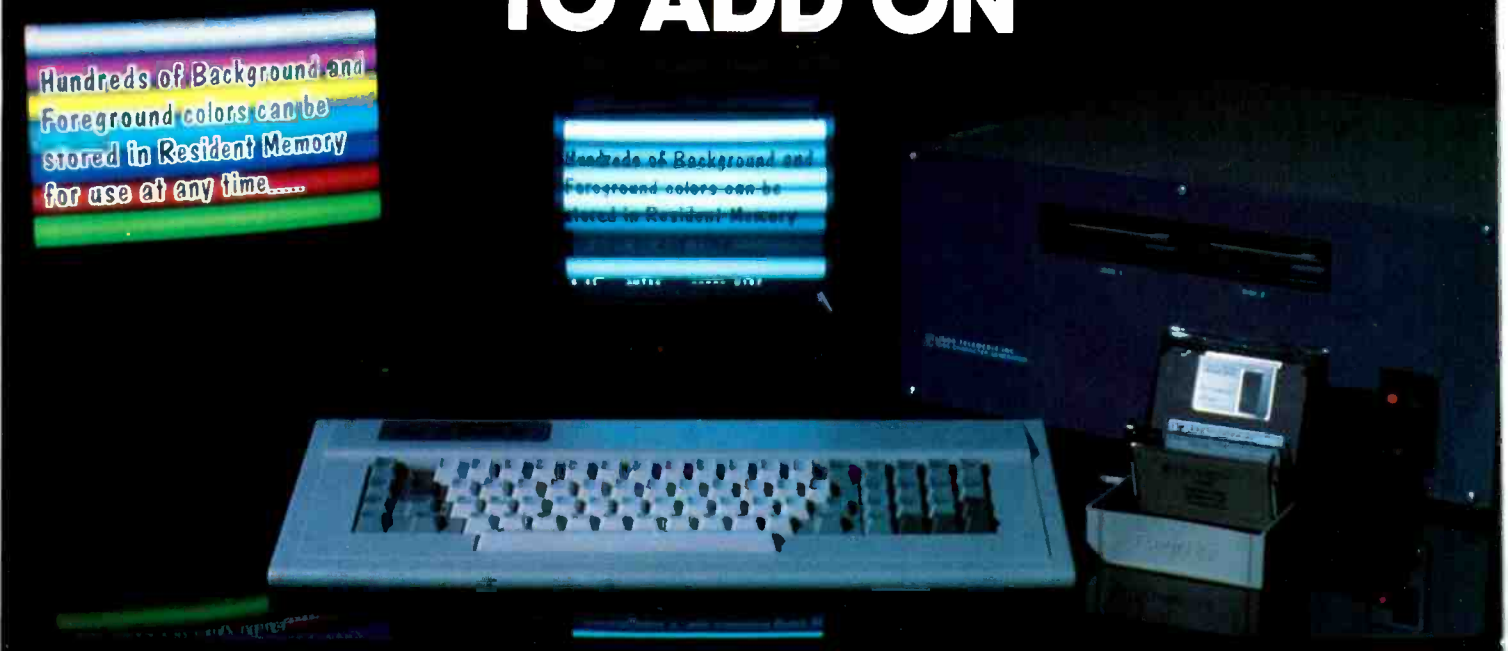
FUJI PROFESSIONAL VIDEOTAPE

FUJI PROFESSIONAL VIDEOTAPE PRODUCTS:

Northeast Region 1-800-526-9030 (In NJ 201-935-6022) Southeast Region 1-800-241-6005 (in GA 404-441-2222) Midwest Region 1-800-323-4826 (In IL 312-569-3500) Southwest Region 1-800-527-0804 (in TX 214-243-2537) Western Region 1-800-241-7695 (in CA 213-636-0101)

Circle 134 on Reader Service Card

YOU DON'T HAVE TO REMODEL TO ADD ON



With some character generators the cost for additional features is the cost of a new character generator. The Laird 1500 is expanded through software updates. The operating system and 70 fonts are loaded by two 3½" disk drives. This unique feature allows you to add options anytime, without having to scrap your entire system. Priced at $7,695 the Laird 1500 is designed to expand with your horizons.

NEW ADD ON FEATURES

FONT COMPOSE

Creates new fonts by resizing and editing any of the existing 70 fonts. **$495**

DATA TABLET

Logos, drawings and fonts can be traced into the 1500 with an electronic stylus. Speeds the editing process when used in conjunction with Font Compose. **$1,495**

CAMERA ENTRY

Digitises art work and graphics instantaneously for editing and colorizing. (Requires separate B&W video camera and copy stand) **$1,995**

STANDARD FEATURES

- ☐ 16 resident fonts
- ☐ 70 font library
- ☐ High resolution characters (35ns, 1508 pixel x 485 scans)
- ☐ Proportional spacing
- ☐ 16 tab stops
- ☐ Vertical and horizontal flip
- ☐ Selectable roll and crawl rate
- ☐ Multiple angle italics
- ☐ Title Mode
- ☐ Flash and underline
- ☐ Up to 100 pages of internal memory
- ☐ Dual channel operation
- ☐ Four quadrants of drop shadow
- ☐ Center, right and left justify
- ☐ Character tuck and overlap
- ☐ 65,536 resident colors
- ☐ Insert and delete editing
- ☐ Eight edge intensities
- ☐ Character Attributes

*User's choice of broadcast or industrial encoder required for *color* operation.

LAIRD TELEMEDIA INC.®

WEST
2424 South 2570 West
Salt Lake City, Utah 84119
(801) 972-5900

MIDWEST
Three Dallas Communications Complex
6311 N. O'Connor Suite N38 LB160
Irving, Texas 75039-3510
(214) 869-7693

EAST
#1 Perimeter Park South
Suite 100 North
Birmingham, Alabama 35243
(205) 870-0967

Circle 135 on Reader Service Card

media. AFA's approach is to offer an off-line commercial compilation system to efficiently make up a daily reel for a one-inch tape player (or other deck). Videomedia's Q-Star II is of this genre. Grumman offers an ad insertion system but wants to integrate this capability with sales and traffic control automation, including billing, right on through to complete machine control.

Bearing these major distinctions in mind, each boasts a variety of features designed to appeal to broadcaster's needs—a "world waiting for a more sophisticated automation and control system," to use Sony's words as it discussed library management needs under the heading of future technology.

Sony sees this need as the ability to communicate with traffic management computers, automation systems, and library managment computers pretty much all at the same time without creating conflict. The library management system Sony envisions would store 1200 cassettes (sufficient for the busiest station or network) but would have an instant access port for inserting a cassette for one or two plays.

Odetic's robotized cart player includes redundancy.

The Odetics TCS-2000, which holds 280 carts on line, tracks 65,000 in its database, and downloads from a traffic system, simplifies to a great extent programming concerns. The TCS-2000's 1000-event look ahead gives you a printed list of needed carts. It also gives you an "as seen" log. Saturation spot carts never need leave the machine. The Odetics robotics offers considerable redundancy. Run from an IBM AT, requirements are not onerus. Presently, the system operates Betacarts and M-I players.

Asaca's ACL-6000C, which stores 600 cassettes all under computer control, is one of the most flexible program control systems available today. Barcodes are used to locate the correct cassette, and deliver and preroll it. The delivery system performs load and unload in 15 second. In conjunction with a record VTR, editing can be accomplished. A complete software package has been designed by Dubner Computer Systems. The ACL-6000C is run by a host com-

puter that interfaces with a traffic computer. At NAB, Asaca was offering systems for either Betacam or M-II cassettes.

The "next generation" of automatic machine control programming, heralded by Lake Systems and Broadcast Systems, relies on software control to expand flexibility yet keep operations simple. These systems do not require automatic cassette loading. At present, Lake's La-Kart II goes further than BSI in that it extends to routing switcher control, master control, and production switcher control in one direction and to a traffic computer in the the other (Columbine).

Lake uses a 68000 32-bit computer to achieve its broad interface capability (28 mixed format VTRs can be handled simultaneously) and its multichannel capability. It can also be used by several departments at the same time: library (catalog) management, program log, and execution log.

Through the use of SMPTE/EBU time code, longitudinal and vertical, frame accurate cueing is possible and identification, simple. A look-ahead window identifies what is ready and needs attention. Over 130,000-event storage is possible.

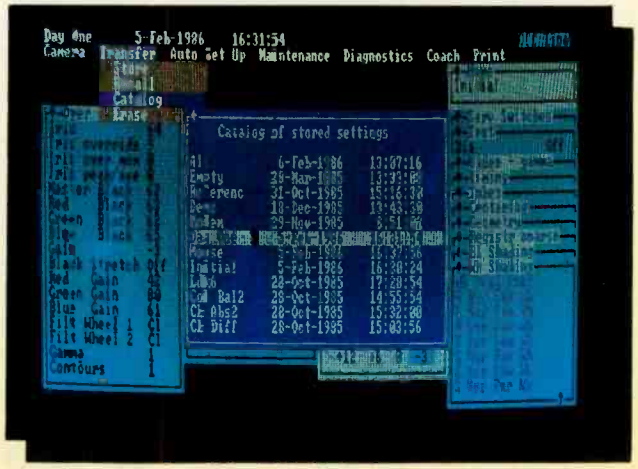
In contrast to Lake and Alamar, BSI does not use SMPTE timecode in its DC-80 but instead enters spot ID numbers through an FSK header cue tone placed on the tape ahead of program material. The transport automatically cues up and reads the spot name. The new unit differs from the earlier DC-8 in that multiple segments per tape are manageable. The DC-80 matches the spot ID number with the programmed event and displays the spot name on the CRT. A logger prints details of runs. The DC-80 can program 500 events. The load list gives the sequence in which spot IDs are to be loaded, but they can be put in any available transport. Program editing permits late changes. A lot of control is executed by single button entries.

A description of On-Air Management's CCS-100 reads something like that for the BSI DC-80. A combination of tone and control track cueing is used to achieve frame accurate starts. Spots can be stored one to a cassette or indexed at one minute intervals and cued in the fast forward mode. Like the BSI, each tape deck has its own controller. A separate system is available for both BSI and On-Air for off-line tape identification and editing.

The Alamar approach relies on two primary units: the MC-1050 (or ALA-CART) automated controller and the SC2000 machine interface unit interconnected by an SMPTE/EBU bus controller. The SC2000 operates various combinations of parallel connected and serial connected devices. To assist in spot management, Alamar offers what it calls the Media Manager (a cataloger of programming materi-

Would you like . . . the assurance of your top maintenance engineer wherever your camera goes?

With COACH you can have it. COACH – the new Philips remote control and monitoring system for the LDK 6 family of automatic cameras. A system devised to give double assurance of the perfect performance provided by total computer control . . . in the studio or field . . . with your top engineer on-line supporting your production staff.



COACH display

LDK 6A and LDK 26A television cameras already have the industry's most extensive diagnostics.

The new Philips COACH is a tool for centralised maintenance and monitoring of the LDK 6 family of cameras. It consists of 2 components – an interface and an IBM compatible personal computer. Simple to use, COACH provides –

- remote control and monitoring of LDK 6 family camera systems
- flexible retrieval, storage and control of camera data with greatly expanded and highly protected memories to warn of approaching end of range and unusual changes in camera set-up
- in depth diagnostics monitoring including surveillance
- remote access via standard modems over telephone lines.

LDK 6A
LDK 26A

COACH, therefore, helps make more efficient and cost effective use of high grade engineering staff. It also allows them to give on-line technical support and advice whenever and wherever it is needed.

COACH is just another example of the developments that ensure Philips LDK 6A and LDK 26A cameras remain the fastest selling cameras in their class with over 400 sold worldwide.

Users from networks, stations, production facilities and institutions are discovering for themselves the benefits that come from *total* computer control. It is available from Philips in all tube formats . . . the ⅔" (18mm) LDK 26A and the choice of 1" (25mm) or 1¼" (30mm) LDK 6A.

Prove the total computer difference for yourself.

A demonstration will prove why these cameras are years ahead in design, performance and cost effectiveness. Call or write for demonstration or request the descriptive LDK 6A, LDK 26A and COACH technical brochures.

PHILIPS TELEVISION SYSTEMS, INC.
900 Corporate Drive
PO Box 618
Mahwah, New Jersey 07430
Tel: 201-529-1550 Telex: 37-62558

LDK 6 – the total computer control camera.

LD 15

PHILIPS **Broadcast Equipment**

PHILIPS
Reliability through Quality

Circle 140 on Reader Service Card

al) and a Traffic Manager, which interfaces with the stations' traffic system.

The AFA Pegasus System 5100 commerical compilation system uses computer techniques to compile off-line commerical and promotional break material. Schedules are inputed into the system (through a direct data dump) and three different schedule types are generated: transfer, compilation, and deletion. The transfer schedule essentially creates an edit list for transferring material from master tapes to a bank tape. The compilation schedule produces an edit list to produce the daily tape from the compiled banks. When the compilation edit list is produced, an exception report is prepared to inform the operator of materials not yet entered into the system. The deletion schedule removes entries from the bank tape directories.

Realizing that traffic control and editing are important factors in establishing automated playback systems, Videomedia has developed the Q-Star II/A playback automation system. Using high-level programming languages, many subroutines can be called up. Using a modular approach, the system consists of VSIO microprocessor input/output ports, a tape encoding (cue tones) station, and a controller. A commerical verification unit is also part of the system.

Both Channelmatic and Grumman systems, designed primarily for cable systems, include sales and billing software. Grumman also includes a traffic control system. Channelmatic, a pioneer in the cable field, has a wide variety of equipment and software options available. Solutec, which also caters to the cable world, promotes the SOL-6800 as a multiple (8) VTR controller.

FOR MORE INFORMATION

Ampex	434	Alamar	442
Sony	435	Channelmatic	443
Odetics	436	Solutec	444
Asaca	437	AFA	445
Panasonics	438	Grumman	446
Lake	439	Videomedia	447
BSI	440	CCI	448
On-Air	441	Matco	449

Bus Tours: Routing, Distribution, Control

For some years now there has been an undercurrent, if not a full-fledged tidal wave, of increasing dependency on routing and control automation. Due to this pressure to automate and gain a more thorough control over an astoundingly complex television plant, all in the

interest of better performance, both technically and economically, many manufacturers have entered the routing switcher, distribution, and master control waters. To the consternation of many, this has resulted in several different kinds of systems, often not willing to talk to each other, causing a reluctance on the part of buyers to dive in and take their chances.

In the interest of stemming the tide of incompatible control systems, the European Broadcasting Union Specialist Group for Remote Control and the SMPTE Subcommittee for Remote Control have "produced a complete basic architecture for a television control system," now known as the EBU/SMPTE bus (ESbus).

To no one's surprise, the topic of control standards exploded at the 1986 NAB as one of the most discussed obstacles for modern TV and involved, to some extent, a little controversy over not only future direction of systems architecture but where we really are right now, even with a standard. An exhibit at the show demonstrated the equipment of various manufacturers working together, communicating over the ESbus.

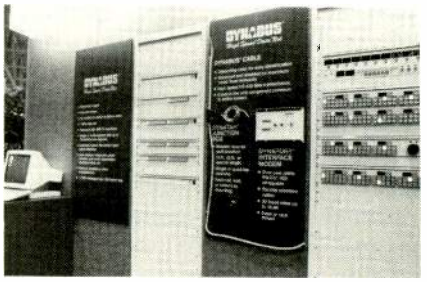
The equipment involved in the demonstration obviously includes endorsers of the ESbus including an Ampex VPR-3, a Sony BVH-2000, a Sony remote control panel, a Bosch control panel, a control panel from the Institut Fur Rundfunktechnik, Gmbh, a bus controller from the BBC, two bus controllers from Dynair, and a Tektronix bus analyzer. Convincingly, all the various control panels, regardless of whether the BBC bus controller or the Dynair bus controller was in use, worked flawlessy on all of the VTRs in all functions no matter what mix of equipment was used. According to Tom Meyer, who chaired the joint EBU/SMPTE effort, and Mike Stickler of the BBC, who represented the EBU, all of the equipment was received from the manufacturers just hours before the demonstration, and was simply unpacked, plugged in and, from the moment the bus controller was turned on, it worked.

In addition, the Tektronix Data Bus Analyzer not only monitored all the various equipment, ran diagnostics, and performed several other functions, it was also capable, should the bus controller fail, of being used to control the bus as a backup to the controller.

Tom Meyer, commenting on the standard, maintained that "you can build a system that's better and faster than a standard, which is, by definition a compromise, but we needed to develop an open control architecture that anyone can put pieces into, hook up, and have it work." The system had to be simple, effective, economical, and

easy to implement. Thus the com promise should become, to a certain extent, the strength, i.e. the versatility of the system.

The counter-flow in this tide of cooperation came with Utah Scientific's surprising announcement of its new distribution system based on its own "universal control bus," the Dynabus. The Dynabus, developed by Utah Scientific engineers, is intended to address many of the same issues as the ESbus but, according to Lyle Keyes, president of Utah Scientific, accomplishes its task at up to 50 times faster than the ESbus. Indeed, rate of data transfer was the impetus behind the development of the Dynabus Data Network, which currently operates at 1 Mb but, pending incorporation of a new chip, the speed will jump to 2 Mb.



Utah Scientific's Dynabus distribution and master control system introduced new technology in routing.

The bus itself is a bright yellow twinax whose outside diameter is 0.35 inches (8.89 mm) and characteristic impedance is 150 ohms. All connections to the cable are made with a Dynatap or similar buffered and protected tap-off to minimize discontinuities that could create data-destroying reflections.

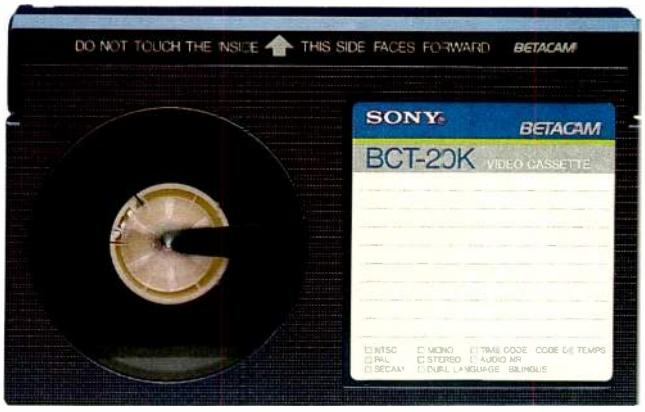
At maximum capacity, a Dynabus system would have a backbone to which as many as 14 subnetworks would connect by means of node controllers. Each subnetwork could support up to 14 segments. If each segment is limited to 100 stations, the maximum number of stations would then be 19,600, with the maximum separation of any two stations being 5000 feet. Control systems are multilevel so that audio/video/SAP and other functions can all be separated from the same panel. Uniform crosspoints provide a 60 MHz bandwidth.

The technology at work in this system is referred to as "Carrier Sense Multiple Access/Collision Detection" (CSMA/CD) in which each station tests the line before transmitting (carrier sense) in order to avoid colliding with another signal. If a collision takes place, the affected stations each sense the collision and back off for a random period of time before again testing the line and transmitting. The back-off time, though random, has a maximum limit that is software assigned in accordance with one of eight priority levels. The highest priority station has the shortest wait time.

Thus, a high-priority station will likely seize the line first upon recovering from a collision. Broad-

THIS IS THE ONE.

THIS IS THE ONLY.



The nature of ENG and EFP business demands that you have one and only one chance to capture an event the moment it happens.

And when you're talking one and only, you're thinking Sony.

The Sony Betacam system is the one to record with, and Sony's Betacam BCT series cassette is the only one to record on. Our exclusive VIVAX™ magnetic particles, special binder system, new surface treatment and anti-static shell are all specifically designed to ensure the highest level of durability and reliability. And most of all, the best audio and video signal performance possible.

Your Sony Professional Tape Dealer will be glad to give you all the impressive facts and figures on Betacam BCT series cassettes. But the most important fact is: No Sony recorder should have to tape on anything less than Sony tape.

MOSCOW '86 GOODWILL GAMES

Proud supplier of tape for the Goodwill Games

SONY®
THE ONE AND ONLY™

Circle 138 on Reader Service Card

cast Systems of Spokane, WA, also uses collision detection in its routing systems, but without priority levels since each station will have a different random number generator, almost nullifying possibilities of a second identical collision.

While using RS-422 electrical standards, the Utah Scientific Dynabus has a protocol essentially conforming to the IEEE 802.3 standard. Each transmission contains six address bytes. Three bytes identify the station being addressed and three identify the transmitting station. The remainder of the message packet is formed by eight additional bytes, including a two-byte cyclic redundancy check (CRC). The CRC provides an extremely high degree of protection against message errors.

Reportedly, Utah took this divergent (from the ESbus standard) approach because there was a feeling the standards committees were not making rapid enough progress, in addition to settling for slower transmission speeds. Given all of this, the Dynabus will talk to an ESbus machine through an EBU/SMPTE interface.

On the other hand, Meyer and others within the committee structure claim the ESbus standard was designed to eliminate the need for interface devices and also that it is currently fast enough to handle all master control situations, except editing, and that the Dynabus will have to upgrade its speed to handle that function as well.

Provisions, therefore, have been made for future transmission rate increases in the ESbus system. Also, the committee is looking toward incorporation of the production switcher into the overall scheme of routing and master control. In addition, with ESbus work having been completed for VTRs, further preparation of control messages for the following equipment is under way: audio tape recorders, cart tape (MERPS) equipment, other production switcher, routing switcher, and master control functions.

Feeling that they have completed 98 percent of what should be in the standard, including a specific provision for a high-speed bus, the EBU/SMPTE committee has assured users that even old machines without the bus can be hooked in for approximately $700. Dynair and Alamar have built boxes for this purpose.

Routing approaches for future. Alamar also incorporates into its overall routing/control system the Central Dynamics MC-990 master control switcher, basically using the CD-480 electronic hardware to match its own software. The philosophy behind its software revolves around the belief that stations are heading more toward complete computer control, even as far as including the traffic, billing, administrative, and account-

ing terminals as integral parts of the control spectrum.

Some of the features of the Alamar system include as-aired station logs, auto spot cueing, control of up to 32 VTRs, VTR/telecine interfaces, random access to multiple spots on tape, and six-channel capability. Also provided for are multi-user CRTs, on-line event editing, and on-screen operator prompting.

Grass Valley Group, a proponent of the ESbus, has, to some extent, already designed the production switcher into the control system. With new control panels, or operating through the M-200 master control switcher in addition to the possibility of control with the 300 Series production switchers, Grass Valley has attempted to integrate systems control. Under the current configuration, the company can store machine control parameters on the 300 Series E-MEM, bringing the possibilities of production/post-production control within reach.

The routing system is called the Horizon family of equipment, offering various size configurations from small to large, culminating in the 128 x 128 system with redundant power supplies and controller modules, plus output monitoring. All Horizon switchers have an ASCII terminal interface, which communicates with most available computer terminals, making the system user programmable through three groups of terminal commands: system installation; system modification; system maintenance. Employment of the terminal enables the user to define the matrix input and output size and the number of levels (i.e. video, audio 1, audio 2, time code, etc.).

In addition, one can write or change the input transcode table, the input exclusion table, and the programmable panel tables as well as set and read the system real-time clock. Integrated machine control allows the Horizon switchers to step beyond simple routing functions and to provide reliable parallel machine interfaces to transmit bus commands and report back machine status.

Dynair, too, believes modern stations are heading toward total computer control of all switching and control functions and that we are now in the beginning stages of that transition. In response to this trend, and in conjunction with the company's direct involvement with the ESbus committee, Dynair has employed CPUs to be the basis of its control functions with different keys, panels, and the exchanging of proms effecting the necessary custom touches required by the individual stations.

The PCA-910 for example is a computer control interface to the Series 10 switchers allowing any RS-232 port to communicate through the interface; the Series 10 switchers have a 30 MHz bandwidth and can be supplied with the PCA-904A programmable remote

Attendees looked over Dynair's vast array of routing units, including new Series 10 computerized controllers.

control. The Series 1600 RGB switcher, designed for chromakeyers, as well as other switchers, will be available with a bandwidth of 100 MHz due to a demand from computer graphics users.

Reflecting the trend in quality switching toward compactness is Di-Tech's series of routing systems. Here, dense packaging and flexibility of control are the order of the day. These goals are achieved through the use of software to provide greater custom options on command, all displayed on a color monitor. The 9001 controller offers breakaway, and the configurations of input assignments in its switchers are important features since not all stations of operation need access to all the inputs, all the time.

The Model 5860 Series of switchers provides a two-channel audio assembly and a video assembly of card frames with a 64 x 32 matrix and dual power supplies. Routing switchers as large as 256 x 256 can be built using the 5860 Series.

In routing and automation of machine control, Bosch announced a new system designed around the Hewlett-Packard 9000 Series 300 hardware using UNIX operating systems and the 68020 CPU. Also new at the show was the programming system for distribution switcher control panels. The downloadable mnemonics system, designed to work on Apple II or IBM PC hardware, will enable the user to reprogram mnemonics in any or all of his control panels as the need arises and store all programming information on floppy disk. Retrofit kits exist for many older control panels, allowing existing facilities to use the system.

The full line of TVS and TAS video and audio switchers were on hand boasting upgraded bandwidth and other specifications. Bosch also showed a master control interface for the Sony Betacart video playback cart systems.

A proponent of the ESbus standard as a way of unifying the industry, 3M introduced two new Series H routing switcher matrices this year. The two matrices are 32 x 32 and 64 x 64 audio/video routing switchers with the 32 x 32, taking up 11 RUs vertically. It provides the capability of one video and one, two, or three audio switching levels in the same enclosure and represents 372 video and audio crosspoints per rack unit.

The unit is available as a video-

only or audio-only switcher with each audio level independently addressable. As the 64 x 64, one-video and one-audio switching system comes in a frame 22 ¾ inches high and is also available in a two unit audio-only Series H frame. Both new matrices are controlled by the 3M model 6600 microprocessor controller or a 6500 microprocessor-based control system.

FOR MORE INFORMATION

Bosch	461		
Dynair	462	Alamar	466
Tektronix	463	Central Dynamics	467
Utah Scientific	464	Grass Valley	468
Broadcast Systems	465	Di-Tech	469
		3M	470

Master Control Switches to Microprocessors

Other products shown by 3M include a 16 x 16/20 x 20 component video switching system and the 422 SMPTE-type control machine for remote control of all VTR and telecine functions. The Model 324 master control/on-air switcher was exhibited to perform external keys, dissolves and cuts, and transitions to and from programming.

Grass Valley's Model 1600-4S master control offers stereo and SAP capabilities, optional digital or analog borderline, and is expandable to M-200 automation, with dual power supplies and pulse regenerator for nonsync transitions. Similar to the Bosch control, Grass Valley M-200 modular automation offers Sony Betacart interface, and in addition, will handle still stores from Abekas, Adda, Harris, Quantel, and others.

Series 8000 master control switchers from InterGroup Video Systems were new with a two-bus design. This permits the operator to select and input on the preset bus and, by pressing the "take" button, transfers the desired source to the output of the switcher. A pre-roll machine control option is available, allowing the tape machine to lock the picture and stabilize before being aired. Individual programmed preroll times from 0.1 to 9.9 seconds may be stored for each input.

Datatek showed its D-2000 50 x 25 video matrix frame, expandable up to a very large size as was proved by its use at recent Olympics. A unique feature is that it is an output-oriented switcher wherein each output bus has its own microprocessor, so that if something fails, the whole switcher doesn't go down.

Image Video demonstrated an alternative to the use of EPROMs for systems architecture for locking video, audio, and relay systems, called the 10K routing switcher control system. Standard features of the 10K include four-channel alphanumeric represen-

tations, logical inputs and outputs, user-assignable input and output alphanumerics and dial-up, salvo bus switching, and crosspoint restrictions.

Field upgrades are possible by replacing or adding PC boards to control panels, routing switcher frames, frame managers, and by adding the 10 system controller. The basis for the system is either the 6200 routing switcher or the 9600 high-density routing switcher. Using the 9600, the frame managers are a remote extension of the system controller, and allow the controller to write new crosspoint data to, and read tallies back from, the switcher matrix over a serial coax line.

Ampex showed the 4100/MC4 audio-follow-video inputs, including three timetable entries and five separate breakaway audio sources. Stereo audio and metering are also features of the system, along with the ability to control nine VTRs and three film islands, as well as offering 12 prerollable inputs with four preroll times.

Involving the editing function in the automated machine control domain is Videomedia. The VMC-202A addresses and automates the editing process (when used with Videomedia editing systems) as well as actually commanding the automation portion of the VMC-200 system. It generates logs and sales tracking reports but also generates a cut list for the automatic editing of spot reels and incorporates a method of playback verification.

FOR MORE INFORMATION

3M	471		
Grass Valley	472	Image Video	475
InterGroup Video	473	Ampex	476
Datatek	474	Videomedia	477

Moderate Size Offers Big Versatility...

A two-wire machine control system from Auburn Instruments was revealed at the NAB, called the MC/1. Basic features include eight commands, eight return tallies, and dc power on a two-wire bus; two 4-button remote units to control eight functions; single pole switch delegation; master/slave and gang start capabilities; and opto-isolated machine interface.

In addition to a broad range of audio and video routing switchers, Broadcast Systems offers the Modula family of remote control and routing switchers. Its Mini Modula is aimed at the small-to-moderate sized user.

The 12X Series of routing switchers from Shintron is a group of microprocessor-based units aimed at medium-to-small facilities, both encoded and component.

Also meeting medium-volume needs with a cost-effective routing switcher was Hedco with its HD-12 system. This unit offers 12 x 12 video and audio in a two RU frame, 12 x 12 stereo audio in the same size, and includes in each frame a serial control card and RS-232 and -422 ports.

Omicron Video showed the Model 200/210 modular design video/data distribution amplifier for composite video, noncomposite video, RGB video, pulse, and subcarrier distribution. The system offers eight outputs per amplifier, is self powered, and has looped-through differential inputs. The Series 500 audio/video distribution switcher from Omicron features self-contained and optional remote control panels, vertical interval switching, two balanced 150/600 ohm audio outputs.

McCurdy brought its VAS-100 routing switcher, which can be configured as a video-only 10 x 1 switcher, with mono or stereo audio available, remote control capability, an optional relay tally board, and breakaway button feature for separating audio and video. Also with a 10 x 1 unit, Cox Electronics offered an RGB routing matrix with two outputs per bus and vertical interval field rate switching. Video inputs can accommodate three or four video signals, 1 V looping input connectors, while the output is one video from a 75 ohm source.

Showing in the Moseley booth, Integrated Media Systems demonstrated their audio routing system with video capability, the Smart Switcher, in the 200 and 400 Series configurations. The 400 offers audio routing expandable to 256 x 256, slavable AFV with multilevel breakaway and the capability of interfacing with other manufacturers.

FOR MORE INFORMATION

Auburn Instruments	478	Omicron Video	482
Broadcast Systems	479	McCurdy	483
Shintron	480	Cox Electronics	484
Hedco	481	Integrated Media Systems	485

Support Gets Lighter, More Versatile

Of particular note in this category (as well as many others) was the celebration by Camera Mart of its 50th anniversary. The company has been renting a complete array of broadcast qualtiy cameras, tripods, and lighting equipment as a service to the broadcast industry for a half century.

Introducing a new pair of dollies into the U.S. for the first time, Matthews announced the Unit 85 and Delta. Composed of two different units, the Unit 85 consists of the crabbing dolly and

Vinten showed its full line of pedestals and tripods along with new light, ENG-type camera heads.

the camera arm and can be fitted with various seat configurations. The Delta dolly is an all-terrain TV pedestal, weighing 118 pounds and can support a camera and its compliment weighing up to 220 pounds.

Having just opened its own U.S. offices, Vinten introduced its Vision ENG/EFP pan and tilt heads and tripods, expanding the company's interests to include light field equipment as well as full duty studio support gear. The Vision 10 is a six pound package with fully calibrated fluid drag controls, and can handle up to 25 pounds. The head also has 180 degree balance tilt, on/off pan and tilt brakes, and safety quick release plate. The Vision 20, with the same features as the Vision 10, is also an ENG unit but is able to handle up to 50 pounds. Vinten also exhibited a two-stage extended tripod, a Betacam plate, and the Microswift 200 digital remote camera control system.

Modifying last year's entry, Canon has taken its two large pedestals, the MC-200 and -300 (holding over 240 pounds each) and made a new version smaller and lighter and more appropriate for field work as well as studio applications.

Sachtler, too, demonstrated a tendency toward smaller support systems with the introduction of the Video 14, the little brother of the Video 20 and 25 units also on display. The video 14 offers a tripod and pneumatically supported center column, permitting proper adjustment to all small camera configurations with the same smooth movements.

O'Connor's fluid heads drew attention with its model 100C-HD for studio and field cameras up to 100 pounds. This unit offers a choice of three dynamic spring settings to support a wide variety of cameras and accessories, including prompters.

Arriflex showed a vast array of support gear including the Cine-Jib camera crane system and the Hot Dog dolly, with crab or two-wheel steering and special link rod.

Making its appearance with a full line of fluid head camera support systems was Innovative Television Equipment. Model ITE-H70 is a heavy duty unit designed for field and studio use and has application with cameras weighing up to 65 pounds. Similarly, the H90 is for studio and field but for heavier loads of up to 100 pounds and comes with Mitchell base adaptor, offers drag control with eight selections in pan and seven in tilt. The H60 for cameras up to 25 pounds was also shown.

Elicon's contribution to support equipment came in the form of a field computer motion control system with 2-63 axes of movement, real-time recording of operator's pan/tilt movements, and compatibility with several camera heads. Also in motion control, Elicon showed the Roger—Real-time Overhead Gantry Electric Robot — incorporating a synchronized computer controlled X/Y rotation, closed loop servo with encoder feedback to ensure accuracy, and multiple-axis synchronous contouring, all suitable for interface with most computer graphics systems to allow digitization of 3D objects.

Sony featured the TSM (Total Spectrum Manufacturing) camera precision multicontroller with HS-100P high speed programmable servo pan/tilt system. All CCU and motion control functions performed for technical setup and on-air operation can be remotely controlled from a base station.

Systemizing remote control functions of both cameras and camera tables was Telemetrics. The TM 8505 camera remote control was introduced as was a remote control pan/tilt table specially for use with miniaturized CCD cameras and small portable ENG units.

FOR MORE INFORMATION

Batteries Charge Forward...

Among the several products that drew attention at the Anton/Bauer booth was the Data-Tap, a battery testing and monitoring device that sandwiches between the company's existing Snap-On camera bracket and the Pro Pac battery. Equipped with a digital readout in ampere hours, the unit monitors power consumption giving the user exact information on the amount of power consumed from a fully charged battery. In conjunction with this announcement, the Automatic Discharge Module was unveiled, possessing a two position, switchable, automatic cut-off circuit, preventing overdischarge of a battery. In addition, the Power Strap, multi-purpose battery strap, was premiered for use with all portable video recorders and low voltage portable lighting equipment. The strap will run a VO-6800 recorder for three hours or a 25 watt Ultralight bulb for two hours.

Christie returned to the show with its CASP system: charger, two analyzers with reconditioner, sequencer, and programmable power supply. Key elements in the unit are a microcomputer, power modules using high-frequency switching, the ReFLEX charging principle, a four-way sensing system, and automatic battery recog nition. CASP automatically handles up to six batteries, can analyze any type of battery, and can store, recall, print, and graph such parameters as voltage, current, time, ampere hour, and other information.

Brand new from Frezzolini for 1986 is the Uninterruptable Power Interface, which provides auxiliary power to operate cameras during battery changes. The adapter interface is compatible with all current mounting brackets and offers up to three minutes of power while changing batteries. Weighing less than 1.5 pounds, the unit is automatically connect-battery change and automatically recharges from the main camera battery.

There's greater depth in Fujinon's ULTRA WIDES.

Now with the widest zoom in the world!

When productions call for scenes as wide as all outdoors, or wall-to-wall coverage inside a phone booth, Fujinon's ULTRA WIDES deliver. And they deliver greater depth as well.

The new A8.5x5.5RM is the widest zoom made. From 5.5mm to 47mm, you get a distortion-free zoom with all the brightness, contrast, and color accuracy that has made Fujinon famous.

A8.5x5.5RM

The new, lightweight A18x8.5ERM zooms from 8.5mm to 153mm...and, with its built-in 2X extender, can take you all the way out to 306mm. It's destined to become the standard lens for news cameramen throughout the world.

More than the ultra wide field angles you want, the ULTRA WIDES also provide the high MTF, low longitudinal chromatic aberration, fast F1.7 speed, and the minimal ramping you've come to expect from Fujinon. And for absolute production control, the lenses accept a full range of studio conversion accessories including shot boxes that deliver push-button operation with accuracy to a single millimeter and zooms at the precise speed you want. The A18x8.5ERM is even available with a built-in test pattern projector.

A18x8.5ERM

To learn more about Fujinon's ULTRA WIDES (including the A3.5x6.5RM and A7x7RM), you'll get more information or a demonstration by calling the Fujinon location nearest you.

FUJINON INC. 672 White Plains Road, Scarsdale, NY 10583 (914) 472-9800 Telex 6818115
SOUTH 2101 Midway, Suite 350, Carrollton, TX 75006 (214) 385-8902
MIDWEST 3 N. 125 Springvale, West Chicago, IL. 60185 (312) 231-7888
WEST 118 Savarona Way, Carson, CA 90746 (213) 532-2861 Telex 194978

FUJINON

Circle 142 on Reader Service Card

NAB Show-In-Print

Video

Perrott Engineering made several announcements, including new lights, batteries and the camera "Cozies."

Also new was the battery adapter, which will accommodate up to two battery packs, mounting directly to any Anton/Bauer or Frezzolini battery bracket.

Bringing a host of new products to the show was Perrott Engineering. The PE 868 multicharger is capable of overnight charges of up to 8 PE-90s, Sony BP-90s, or equivalent batteries, simultaneously and independently. Also on hand were the PE 138 battery dischargers for discharging and exercising NiCads, the Mini Charger, which is a compact charger for on-board batteries in either 115 or 230 volt operation, worldwide, and the PE 38 NP Mini Charger.

A new dichroic filter designed in pyrex for daylight color correction was unveiled as were the brand-new "Cozies," battery operated warming covers for protection of cameras and VTRs at temperatures lower than zero degrees.

Cine 60, who once again arrived with new product announcements, unleashed its new Hitch-Hiker battery as a direct replacement for any OEM camera battery, equipped with the OEM's mounting plate. It features a ventillated metal housing and precision temperature sensing system. Other new items included the Lunchbox Duo battery pack containing dual 12 volt, seven ampere hour batteries built into one housing providing a total of 14 ampere hours.

Alexander showed its charger/analyzer, the TA 3877, which cycles a battery through the charge/discharge/charge cycle after the analyzer provides a reading in milliamps of the exact battery capacity. This unit is adaptable to more than one type of battery and can charge three batteries at once. The three unit Smart Charger was demonstrated monitoring voltage and, once at full voltage, automatically switching to trickle charge.

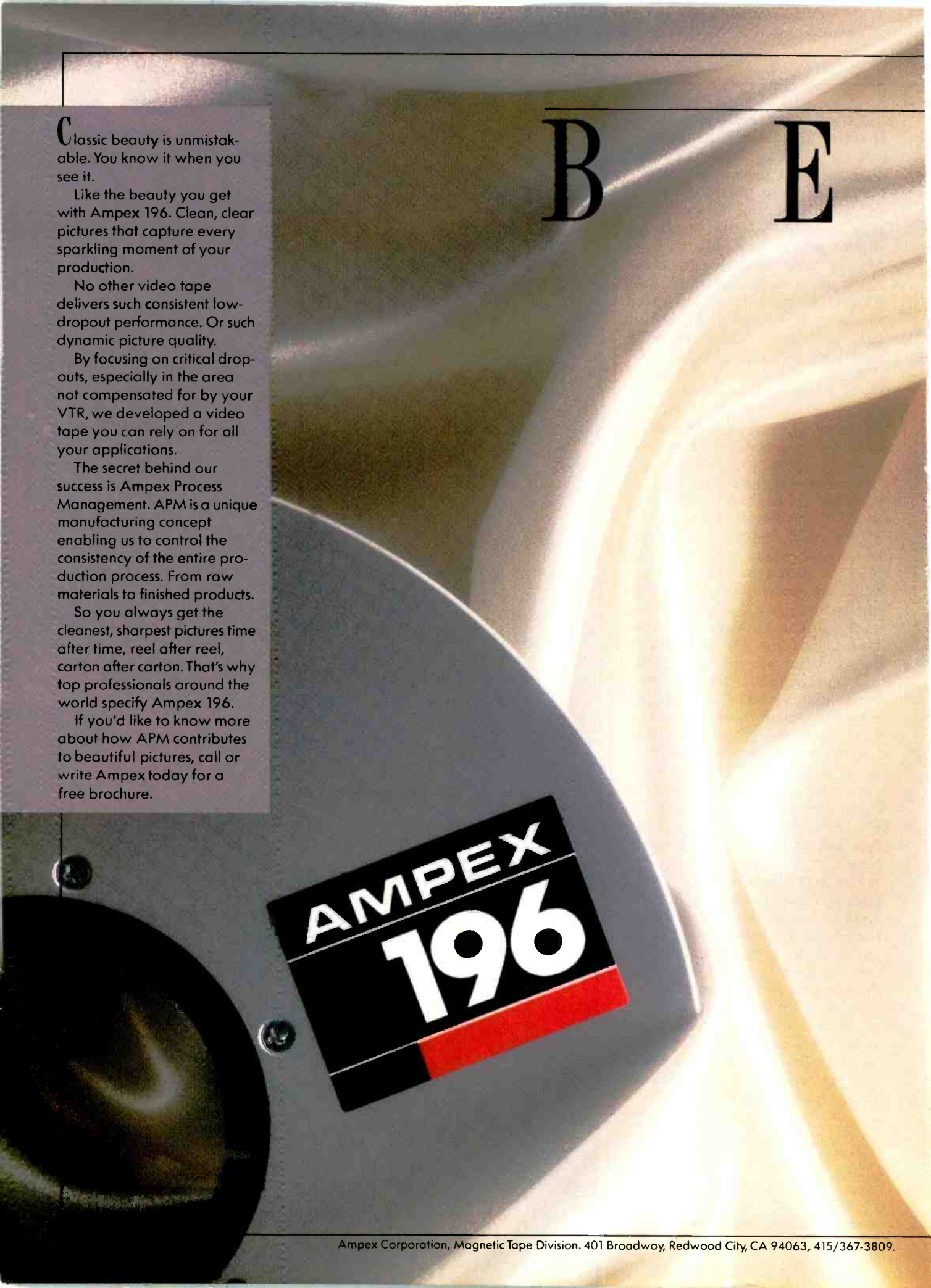
A new company on the scene, Paco Electronics U.S.A., the American division of the Japanese company, showed both new chargers and new batteries. Featured were the DP-11s, a 13.2 volt 1.7 AH battery for the replacement of Sony NP-1s. The DP-1240 battery pack is for ENG cameras and VTRs and contains a fiber-reinforced plastic exterior. The KD-220 quick battery charger made the scene offering simultaneous charging of two battery packs and matching for three types of batteries; the Paco battery dememorizer was also displayed.

One of the innovations PAG debuted at this year's NAB was the PAG-lok battery connector system. The system consists of a camera bracket with assortment of direct electrical fillings for various camera makes and models, the camera bracket plate, which is the PAG-lok portion of the camera bracket and the battery back plate.

Pro Battery, formerly Provisional Battery, revealed the Batt 13 and 14 camera batteries weighing four pounds and providing up to four hours of running time for a camera operating at 14 watts. The Prolite system at the convention is capable of converting to a 12, 30, or 120 volt light and is constructed of a metal casing with twist-off head for easy bulb replacement, and provides a flip-away dichroic filter and built-in heat sinks.

FOR MORE INFORMATION

Anton/Bauer	501		
Christie Electric	502	Alexander	
Frezzolini	503	Manufacturing	506
Perrott		Paco Electronics	507
Engineering	504	PAG America	508
Cine 60	505	Pro Battery	509



Classic beauty is unmistakable. You know it when you see it.

Like the beauty you get with Ampex 196. Clean, clear pictures that capture every sparkling moment of your production.

No other video tape delivers such consistent low-dropout performance. Or such dynamic picture quality.

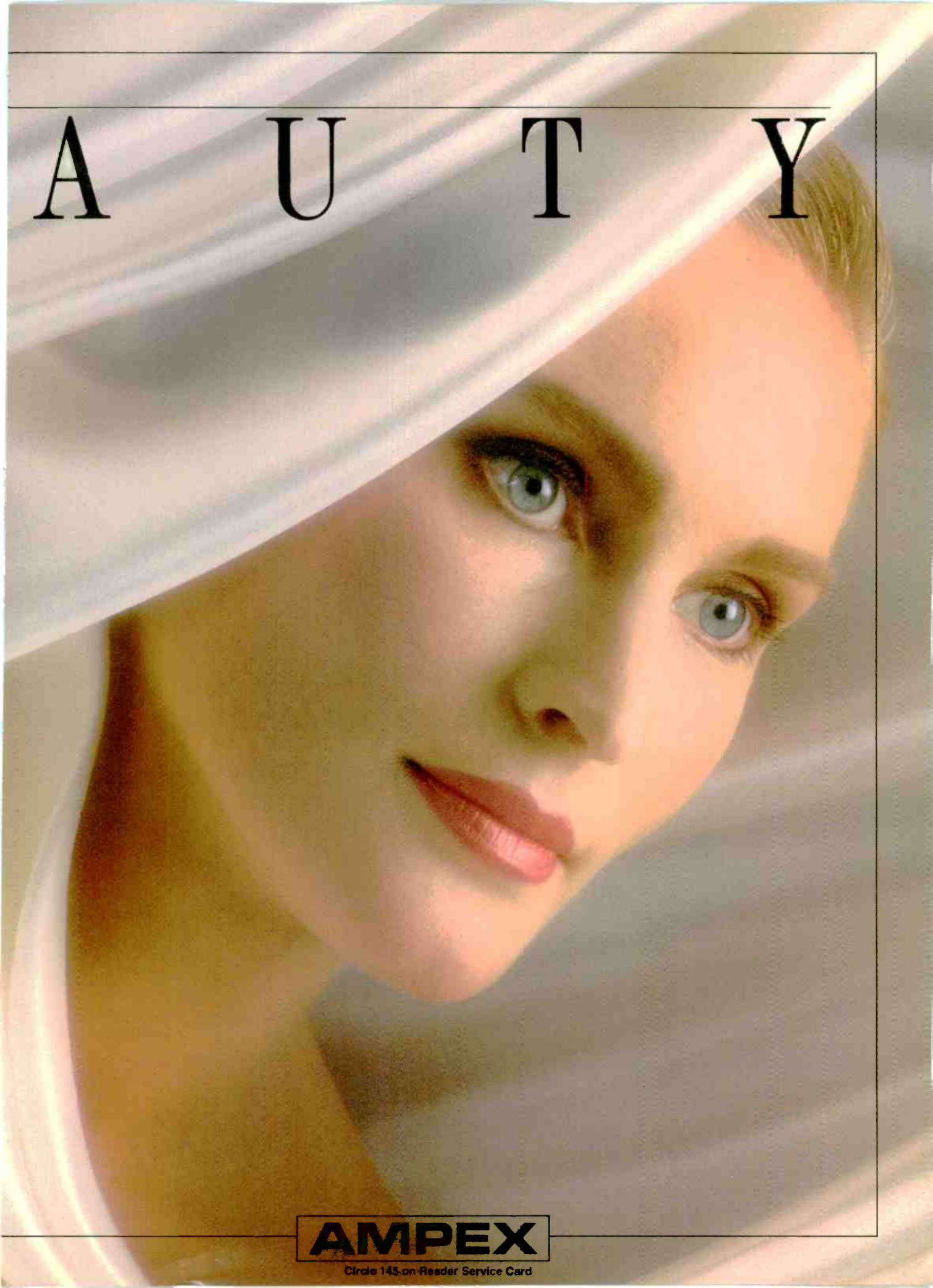
By focusing on critical drop-outs, especially in the area not compensated for by your VTR, we developed a video tape you can rely on for all your applications.

The secret behind our success is Ampex Process Management. APM is a unique manufacturing concept enabling us to control the consistency of the entire production process. From raw materials to finished products.

So you always get the cleanest, sharpest pictures time after time, reel after reel, carton after carton. That's why top professionals around the world specify Ampex 196.

If you'd like to know more about how APM contributes to beautiful pictures, call or write Ampex today for a free brochure.

Ampex Corporation, Magnetic Tape Division. 401 Broadway, Redwood City, CA 94063, 415/367-3809.



CRL makes your sound stand out from the crowd

You can't compete effectively for listeners if your station sounds just like everyone else's. And the way to stand out is with outstanding sound of the kind you get with CRL's outstanding FM-4 system.

CRL's FM-4 gives you the spectral shaping flexibility you need to sound different from other stations using the single unit processor. The CRL advantage comes from our intelligent building block approach. An approach that gives you the options you want.

Begin with our SPP 800 Stereo Preparation Processor and our SEP 800 Spectral Energy Processor for individually selectable four-band compression. Then add our SMP 800 Stereo Modulation Processor and our SG 800 Stereo Generator and you are equipped to stand out on the airwaves as never before.

If you haven't heard what CRL technology can do, you don't know what you're missing. For a *10-day free trial* at your station just call CRL toll-free at (800) 535-7648 and we'll make immediate arrangements for your local CRL dealer to give you a demonstration.

Call CRL today for sound that stands out tomorrow.

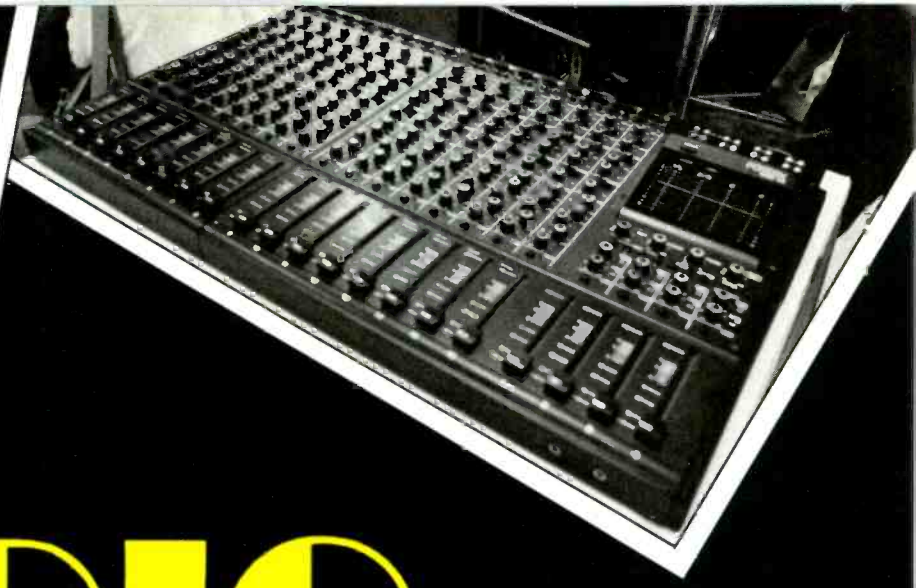
CRL SYSTEMS

CRL Systems

2522 W. Geneva Ave., Tempe, Arizona 85282
602-438-0888; Telex: 350464 CRL TMPE UD

10-day free trial call now toll-free (800) 535-7648

Circle 146 on Reader Service Card



AUDIO

Radio & TV

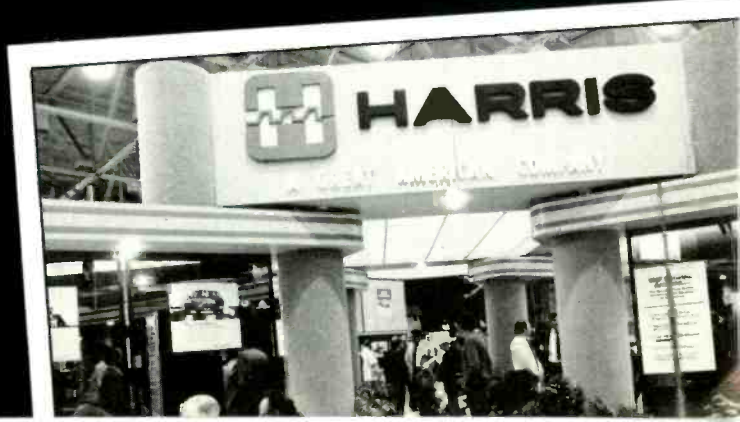
There are two catch words in audio advances these days digital and integration.

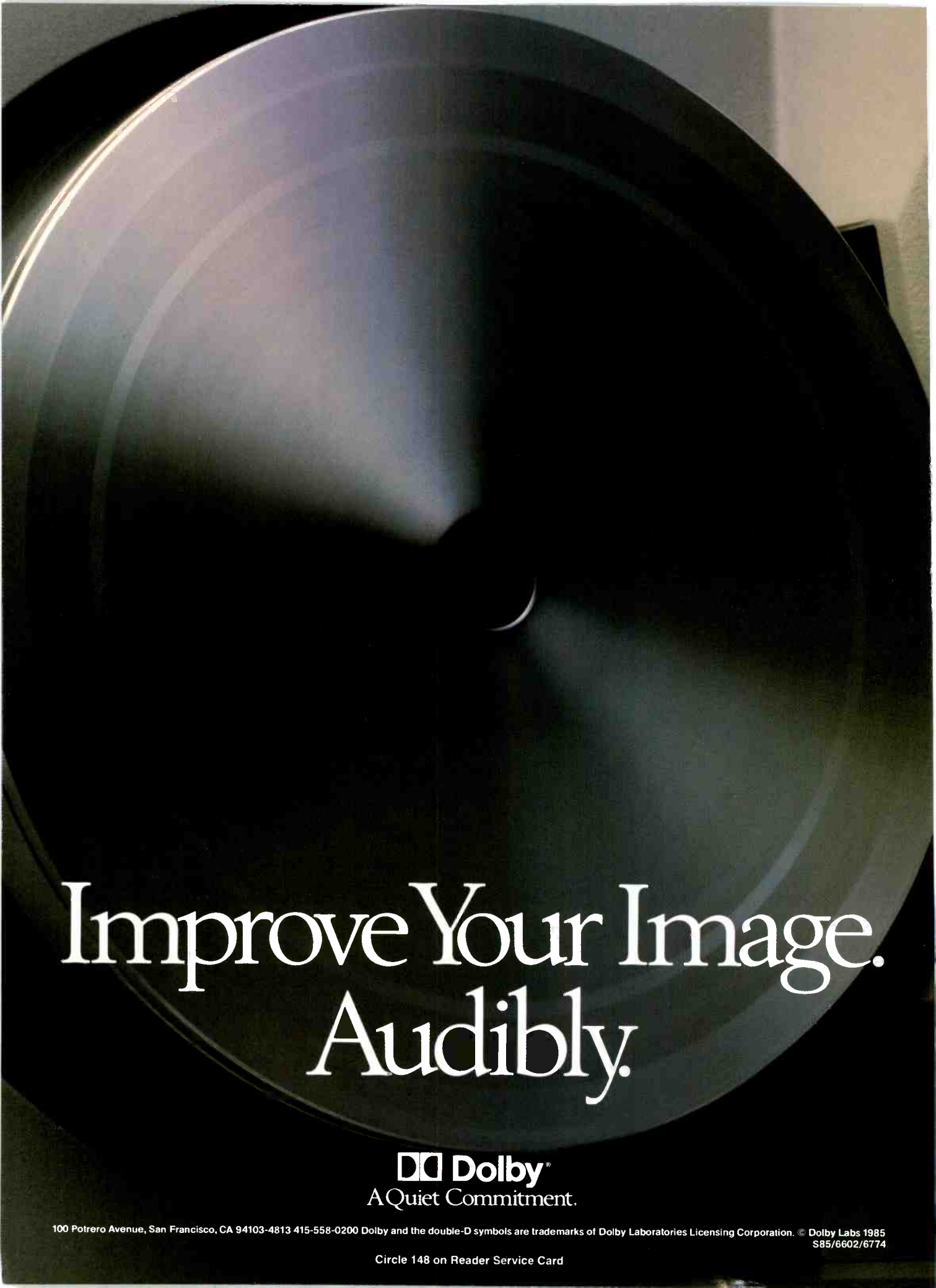
Digital audio has finally come into its own, and any product that is not directly offering digital audio in one form or another has the standards set by digital quality with which to contend.

Radio stations have digital offerings available to them in the form of CDs and digital record/playback systems, although the latter have yet to find full acceptance among broadcasters. Digital ATRs were present at the NAB, and there is a whole realm of other introductions that could only have come about in a post-digital environment. The new Spectral Recording process from Dolby is one example of striving towards digital perfection. Even speakers and studio design are starting to respond to the new focus on higher audio quality.

Integration is seen in efforts to marry audio systems to all other systems. Audio to audio in radio automation can now drive reel-to-reels, cart machines, cassette players, and CDs, as well as incorporate satellite networks and even live announcers into the chain for live assist. The marriage of different types of audio can also be seen in the symbiotic relationship that some companies are trying to foster between cart machines and CDs.

One other major trend taking place in audio today was begun two years ago. That is, of course, stereo TV. This year, the focus has shifted to support equipment rather than stereo transmission systems.





Dolby®
A Quiet Commitment.

Circle 148 on Reader Service Card

Digital Becomes a Force in Radio

Last year, the idea of the digital radio station began to look like more than a futuristic fantasy. For the first time, manufacturers were offering digital audio storage and retrieval systems to do the work now done by cart machines, and the idea of compact discs as a main source of music began to look good. Consumers were embracing the idea of CDs for home use, and while there were only a few professional players available, many stations began using consumer CD players to keep up with the demand for digital audio.

The problems keeping digital from full acceptance were a practical means of integrating CDs into automation or even live-assist stations and getting the desired music libraries and playlists available on discs. For the digital spot players, the problems were getting from prototype into production units, keeping costs reasonable, and achieving enough storage time.

This year's offerings at NAB showed that some of those problems have been solved.

One of the biggest leaps for digital audio has been the emergence of automation systems to accommodate both CDs and, in some cases, the digital spot players as well.

Digital Programming Inc. had a working model of its encoding/decoding system for CDs integrated into Broadcast Electronics' radio automation system, along with a cassette player, reel-to-reel, BE cart machines, and a Microprobe Electronics Inc. Digisound—the hard disk digital audio storage and retrieval system for spots and jingles.

DPI offers custom music libraries with the automation encoding on the CD, which also allows access to a database on the disc.

Digital Programming Inc.'s encoding process for custom compact disc libraries was featured in Broadcast Electronics' radio automation equipment.

DPI featured its disc at other booths as well. Sono-Mag Corp. was showing it as part of its radio automation system, and Studer Revox displayed it along with its professional CD player, the model A725.

Schafer World Communications Corp., which offered interfaces to CD players two years ago, also showed its automation system fully integrated to CDs and to MEI's Digisound. The company seems eager to meet the demands for digital technology, saying "if the technology is going to be there, Schafer will be ready."

In a private suite, Ron Schiller Associates showed its software package for control of CD players from an IBM PC/XT or compatible. It will work with Philips and Sony professional CD players and interfaces to the Studer player are being investigated. The CD Filer system, as it's called, can catalog, sort, and manage over 2000 CDs and operate up to 99 players. It works via a lite pen, touch screen, or regular keyboard and creates a database of CDs, showing information of the cuts on each, or other uses if needed.

Time of day and remaining time in the cut are displayed, and the system has cross-fade and prefade capability.

The system also interfaces to automated cart systems and to digital spot players. It's in beta test sites now and could settle a station's questions about CD automation and integration.

CD hardware. There were two major developments at NAB. The most interesting is an agreement announced at the show between Studer Revox and Philips to market the Studer A725 and the Philips LHH 2000 professional CD players together in the U.S.

That agreement leaves Sony off on its own with its professional CD player. Sony showed the CDP-3000 and CDS-3000, a CD modular system with two players and a controller, and introduced the CDK-006 Auto Disc Loader, which handles as many as 60 CDs. It changes discs in 16 seconds.

CD software. Availability of CD music has been a particular problem, especially in a form usable to most radio stations. But this situation is also being resolved with custom libraries, such as DPI's, being offered and with introductions by many music library companies.

Associated Production Music, DeWolfe Music Library, and Omnimusic offered music libraries on CD. Meanwhile, both music and sound effects on CD were introduced by Network Production Music, Sound Ideas Sound Effects Library, and Valentino Music Library. Music supplier Century 21 has committed itself to digital audio in many of its forms. The company markets libaries on CD and will also supply music on floppy disk if the Compusonics floppy-based player catches on.

Another intriguing idea for radio stations that want digital music is also being suggested by Century 21—music library via 8 mm video.

"As anyone who's been in this business a long time knows—if you don't move ahead, you're left behind.

"We've just upgraded WANN to a 50,000 watt, four-tower directional array. We now reach a potential market of six million people.

"That—along with a new urban contemporary sound—means that WANN is moving ahead, planning for the future . . . and sounding better than ever.

"And Of Course, We're In Stereo"

"AM Stereo is the most phenomenal sound I've heard in 40 years of owning this station.

"We sound absolutely great in stereo—a purer, cleaner high-quality signal. We even sound better in Mono.

"And you can be sure AM stereo receivers are coming. By next year, over 30% of all new cars will have AM Stereo. And we're ready to capture those listeners *right now.*

"Naturally, I Chose Delta Electronics"

"When I decided to upgrade to AM Stereo, I chose Delta Electronics. Why? Because Delta's been around a long time, providing precision equipment to the broadcast industry long before they came into AM Stereo. They know my business and they know what they're doing. They installed my C-QUAM® stereo system without a hitch.

"And Delta's C-QUAM system is rugged and reliable, built to work the way it should. Literally trouble-free. Plus, it's got the numbers to back it up: over 65 systems operating in the U.S. and worldwide.

"Even better, Delta stands behind it with full technical and service support. Any problems or questions—I just pick up the phone. They're always ready to help.

Delta's C-QUAM Stereo System: ASE-1 Exciter (top) and ASM-1 Modulation Monitor. FCC laboratory tested and type-accepted.

"Next Time You're In Annapolis . . ."

"Stop by and I'll personally give you the deluxe station tour.

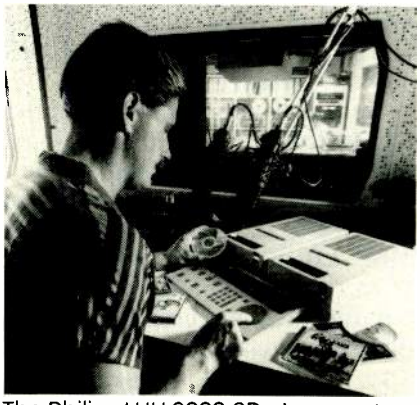
"Better yet, turn your dial to 1190 and hear for yourself the new sound of AM Stereo—and hear where your listeners are going to be."

Delta Electronics, Inc.
5730 General Washington Drive
P.O. Box 11268
Alexandria, Virginia 22312
(703) 354-3350
Telex: 90-1963

C-QUAM is a registered trademark of Motorola, Inc. Manufactured under license from Motorola, Inc.

DELTA ELECTRONICS

Circle 147 on Reader Service Card


The Philips LHH 2000 CD player system uses a flywheel for cueing.

Digital spot players. Many digital storage and retrieval systems were at the show in force. Compusonics did have working models of its DSP-1200 player and DSP-1500 recorder, the floppy disk systems. They feature up to 15 kHz response and four minutes of stereo storage with a 32 kHz, 16-bit linear sampling rate.

MEI, as mentioned, seemed to be everywhere there was radio automation at the show—at its own booth and with DPI and Schafer. The company's Digisound's rack mountability and membrane keypad with CTR screen fits in well with the automation gear. Digisound features a Winchester disk drive and offers up to 15 kHz frequency response for broadcast, up to 20 kHz for music recording, and 76 minutes of mono storage.

There were several new digital audio products introduced this year.

Digital Broadcast Systems, Inc., a new exhibitor, introduced the Astre, an integrated digital audio system that handles scheduling, production, on-air control that is schedule driven, manual control, and logging. It allows up to eight workstations to perform those function simultaneously.

Astre features varying frequency responses up to 20 kHz and a varying sampling rate up to 50 kHz. A system could have up to eight hard disk drives for a total storage of 2000 mono minutes, while one disk drive would accommodate up to 80 minutes of mono at the 15 kHz sampling rate. The system is especially suited to live assist stations, but can interface to automation systems with the addition of a switcher.

For-A unveiled the Sirius 100, a Winchester disk–based digital audio memory system. It also features frequency response to 15 kHz and can accommodate up to eight channels for simultaneous use. The Sirius-100 can record at 16-, 12-, or eight-bit rates and offers 1000 minutes of mono audio (more if other bit recording rates are used) with the use of eight disk drives.

Digital audio systems vary widely in price and climb over $100,000 for the larger systems with the greatest amount of storage and versatility of functions. It's not likely that the cart machine is doomed just yet. But at least one company exhibiting at the show was hoping to show that the capabilities of its cart machine are a match for digital audio. An ITC/3M demo compared the frequency response of a CD with that of a cart recorded from a CD, using a Fast Fourier Transform Analyzer from Bruel & Kjaer. The two patterns were virtually identical, leading ITC/3M to conclude that CDs are useful as source material for carts.

FOR MORE INFORMATION

Processing Incorporates New Realities

Some new factors are influencing the way audio is recorded, processed, transmitted, and heard these days. From a new push for higher quality brought about by digital, to a new emphasis on the marriage of sound to pictures spawned by stereo TV, audio processing is breaking new ground.

At the NAB this year, Dolby Laboratories introduced a master recording process that allows analog recording to compete realistically with digital audio. Dolby SR—or spectral recording—is a process that has been in development for six years, and, if initial reaction is any indication, it will be a hot topic for at least as many years to come.

The SR recording process uses a new coding algorithm, based on the continuous analysis of changes in the signal spectrum, to increase the information capacity of the recording. The SR encoding responds both to changes in signal spectrum and to level changes, whereas noise reduction systems, which have up to now been Dolby's specialty, respond mostly to level variations. The encoding at the recording end is teamed with a decoding at the playback.

Basically, the SR system takes into account certain aspects of magnetic recording and human hearing. The signal is analyzed by the circuit, and the minimal amount of signal processing necessary is applied. The SR circuit can be thought of as a complement of the audio signal, with enveloping protection at low levels and processing at high levels to reduce tape saturation and increase the headroom of analog recorders. Within the SR system, there is both fixed- and sliding-band processing applied separately for low-, mid-, and high-range parts of the signal.

The results of SR recording are a uniform operating level across the frequency range and, through signal protection, reduction of har-

monics and intermodulation products from tape overload. Plus, SR recording produces a dynamic range Dolby states as being equal to or greater than that obtained with 16-bit digital recording.

In the actual listening, Dolby SR results not only in a signal that is noise-free, but also with transients that are clear and distortion-free. Musical instruments, such as strings, which are typicaly hard to reproduce on magnetic recordings, are clear and accurate, and the overall clarity is such that a guitarist's fingers "squeaking" as they move up and down the frets or the breaths taken by a reed instrumentalist are clearly audible.

The SR process is available in single-channel plug-in modules that fit existing Dolby mainframes. The first one available, the Cat. No. 280 module, is for 360-Series and M-Series Dolby frames. The No.431 module is currently under development and will plug into Dolby SP and XP series units. Eventually, the process may be developed for video recorders.

The Dolby SR process was a hotly discussed topic at many audio industry booths at the NAB show. Otari has already seen fit to incorportate it as part of its noise reduction switching for the MX-80 recorder introduced this year.

MTS Synthesizers Come of Age

With stereo TV a reality among a fifth of the commercial stations in the U.S., but with the amount of stereo programs still limited, stereo synthesis has been embraced by TV stations as at least an interim necessity.

The two biggest problems facing TV stereo synthesizers are recognition of stereo material that already exists and what to do about dialog. Another problem, not just for synthesizers but for the whole of stereo transmission, is that of polarity reversal. The newest offerings from the three TV stereo

The new Kintek KT-960 Monoguard prevents loss of mono due to polarity reversal for MTS.

synthesis manufacturers present at this year's NAB show that these problems have been addressed.

Orban Associates, which is going strong with sales of its Optimod stereo TV and SAP generators, has a new stereo synthesizer developed especially for broadcast use. The 275A is a stereo in/out device with two forms of automatic recognition. These allow the unit to switch back and forth between synthesis and bypass. In addition, single-channel recognition looks for missing audio on one channel and will cross-fade to synthesis from the remaining channel. For dialog, there is a narrow mode that centers the sound, while the wide mode offers more dramatic spatial characteristics.

Kintek has dealt with the problem of polarity reversal by introducing the KT-960 Monoguard, an automatic correction system to prevent loss of mono when polarity reversal occurs. It monitors the channel-to-channel stereo signal correlation and corrects it if need be and allows longer time constraints for music. Kintek also featured its KT-903 Stereophonic Converter, a three-part automatic stereo synthesizer that doesn't alter the spectral density of mono material. It has a dialog centering control and a mono-stereo sense switch that lets stereo material pass through unaltered.

Studio Technologies featured its AN-2 Stereo Simulator Synthesizer and the RCU-1 recognition control unit. The latter is a real-time unit that determines the mono/stereo status of audio programming, displays it, and automatically switches the synthesis on when needed.

One other company with a product to create stereo from a mono signal is AKG Acoustics, which recently acquired the assets of Ursa Major and is now marketing the MSP 126 under the AKG name. It's a two-channel in, two-channel out digital stereo processor, which digitally creates stereo from mono and provides other stereo enhancements.

FOR MORE INFORMATION

Dolby	546		
Orban	547	Studio Tech.	549
Kintek	548	AKG Acoustics	550

Effects, Noise Reduction Abound

In the continuous striving towards higher quality audio recording and transmission, there were plentiful introductions of processors and audio effects.

There were upgrades and new offerings in digital reverb, effects, and delay, as well as time compression and musical interfaces.

Applied Research and Technology introduced its Performance MIDI software for the DR1 digital reverb unit. Also new is the PD3 Professional Delay System, a high-performance multitap delay system. Advanced Music Systems featured the DMX 15-80S dual-channel digital delay line/pitch changing system, RMX 16 digital reverb, and Timeflex stereo compression expansion. Audio Digital unveiled the TC-4 broadcast digital delay fixed at seven seconds, while Eventide introduced a new broadcast delay unit as well. Eventide's features improved audio: up to ten seconds of delay and 20 kHz frequency response in full stereo. Also new was the stereo synthesis monitor for the popular SP2016 Effects Processor.

Lexicon Inc. showed a production model of the 2400 stereo time compressor expander, designed for video, with optional time code

THE NEW GUIDE TO EASY STEREO TV INSTALLATION.

A free guide from the company with the broadest, most experienced customer base in the industry: 150 stereo TV stations on-the-air. A guide that's worth looking into.

Included are:

☐ **Application Notes:** Helpful installation and setup hints. How BTSC Stereo works. Connecting the stereo generator to exciters. Modifying RCA exciters. Monitors, demodulators, and stereo decoders. Feeding stereo over microwave—discrete or composite.

☐ **New Orban Stereo Television System brochure:** Details on the OPTIMOD-TV Audio Processor, Studio Chassis Accessory, TV Stereo Generator, SAP and Pro Generators.

☐ **Automatic Stereo Synthesizer:** How it can provide your station with a convincing sense of ambience and spaciousness from mono source material. Automatic recognition and switching between mono and stereo. Automatic correction of phase-reversal.

☐ **List of Orban Stereo TV Stations On-the-Air.**

☐ **Complete pricing and ordering guide.**

To get your own *free* **Orban Guide to Stereo TV,** send in the coupon, circle the reader service card, or call us direct: (800) 227-4498 or (415) 957-1067.

Orban Associates Inc.
645 Bryant Street, San Francisco, CA 94107

orban

Circle 149 on Reader Service Card

Please send me your free Orban Guide to TV Stereo:
Orban Associates Inc., 645 Bryant St., San Francisco, CA 94107

Name and Title _____

Station _____

Address _____

City _____ State _____ Zip _____

OPTIMOD® is a registered trademark of Orban Associates Inc.

NAB Show-In-Print

Audio

reader and also introduced the 480L digital effects including new reverb and new effects with 20 kHz response and a 44.1 or 48 kHz rate.

AKG Acoustics introduced the ADR 68K, an all-new digital reverb effects unit. It uses the same 68K CPU chip as a MacIntosh computer and has two inputs and four outputs. It can create two stereo programs, such as reverb and effects, at the same time and is MIDI interfaceable.

In noise reduction, Dolby had several product introductions. New are the Models 380i and 390. The 380i adds Dolby's new automatic noise reduction identification feature to its Model 380 A-type noise reduction for one inch VTRs. The 390 provides Dolby C-type noise reduction for ¾-inch video recorders.

ANT Telecommunications/Solway featured the Telcom C4E single channel noise reduction for mobile and line transmissions; ATRs and VTRs. Straight Wire Audio Inc. introduced the Humm Gobbler, which monitors a stereo audio line and automatically filters it to eliminate hum and buzz when present. Also new is the Stereo Sentinel accessory for the new Orban stereo synthesizer with voice recognition that supresses synthesis during dialog.

Advances in traditional processors. There was no shortage of traditional processing equipment at NAB. Aphex Systems, Ltd., introduced the Dominator, an intelligent triband peak processor-limiter with a proprietary circuit that varies the threshold for limiting. Also featured was the Aural Exciter, which enhances brightness, and the Compellor, which offers compression, leveling, and peak limiting. Audio & Design Calrec introduced Scamp 4-band processing with an optional transcoder to spread stereo beyond the speakers and the Filmex multiband expansion to eliminate noise in old movies, etc. Audio Developments/Portland Instruments featured its 066 compressor-limiter for use with portable mixers. New from Barcus Berry Electronics was the 401 BBE signal processor for musical instruments, which corrects phase and amplitude distortion from amplifier-speaker interface. CRL, staying on top of the need for processing in stereo TV signals, introduced the 300 series TV signal generator, which utilizes triband processing.

dbx Inc. had new product introductions as part of the 63X series, including the 163X Over Easy compressor/limiter/preamp, the 263X Automatic Deesser, and the 463X Noise Gate Expander. Also in prototype is the dbx FS 900 powered mainframe for 900 modular series signal processors. Gotham Audio Corp. introduced the EMT 227 DX mono AM limiter, which can link two units together for stereo and delays sound before the limit to determine how much limiting is needed. Harris introduced the Ultimate 91 compressor-limiter and also featured the Phase Fixer audio TBC, which

uses encoding and decoding to correct phasing problems. Howe Audio featured a new Phase Chaser, its audio phasing correction system that does not require encoding of program material. The 2300 New Phase Chaser is designed specially for problems unique to stereo TV and satellite reception, but is similar to the model 2100 Phase Chaser for radio.

Orban Associates introduced the FMX stereo generator SCA protector. New from Symetrix was the 528 voice track processor with FET mic preamp, frequency selectable de-esser, gated compressor-limiter, and three-band parametric EQ. Valley People Inc. had several introductions. The new Model 415 Dual DSP dynamic sibilance processor does not react to normal speech sounds, only to the sibilance or whistle present. The Model 815 DSP single-channel DSP is housed and powered by Valley People 800 series rack enclosures, and the Model 400 single-channel mic processor boosts low impedance mics from signal to line level for processing.

U.S. Audio Inc. introduced the Gatex model 904 single- channel noise gate/expander housed and powered by a dbx F-900 powered frame, and the Levellor, a two-channel audio signal processor. Pacific Recorders & Engineering introduced the IS-12, an insert switcher for up to four processing units and up to 12 channels of processing or multichannels through one processing unit.

FOR MORE INFORMATION

Consoles Stress Ease of Operation: Go Portable

Thanks to advances such as modular design and assignable functions, the work of the audio engineer in both radio and TV has become more simplified. It is now easier to be a creative audio mixer, and new consoles allow for complex productions in much less time. The end result is better quality audio products.

TV Audio Automation

As the production and post-production demands on audio consoles get more complicated, some of the major players in the field of TV consoles have responded by making the functions

TAKE YOUR BEST SHOT

Otari's ARS-1000 Automated Radio Station Reproducer has taken just about everything that broadcast operation has thrown at it. From continuous day after day operation in hot, dusty corners — to cigarette smoke and coffee spills, an ARS performs automation tasks flawlessly and faithfully.

Born from Otari's line of heavy duty industrial tape duplicating and loading equipment that moves tape at up to 480 ips, the ARS-1000 is engineered for continuous use, simple operation, and ease of maintenance.

Bulletproof? Of course not. But it *is* the kind of equipment that frees you to get involved in the real challenges of today's new, dynamic radio. Because you're not constantly fixing something that shouldn't have broken in the first place. From Otari: The Technology You Can Trust.

Contact your nearest Otari dealer for a demonstration, or call Otari Corporation, 2 Davis Drive, Belmont, CA 94002 (415) 592-8311 Telex: 910-376-4890

OTARI®

Circle 150 on Reader Service Card

easier to perform through automation. Such was the case at this year's NAB.

The area that has seen the biggest growth in console development is audio for video post-production. Part of this comes from a commitment to producing shows for stereo TV. NBC, with its commitment to stereo has been upgrading all of its audio equipment recently and is relying heavily on offerings from Solid State Logic.

Solid State Logic introduced new automation software for its 6000 series console.

The other big demand comes from the music industry, particularly in the production of music videos.

Automation adds a variety of benefits to audio mixing. It allows computer control and storage of preset mixes for later recall. Audio console automation can also sync audio mixes to video via SMPTE or EBU timecode and control other audio or video sources in the process. But the biggest benefit is the complexity of mixes it allows. Multitrack mixdowns that would take untold hours and precision efforts without automation capabilities are at times virtually a breeze, with functions such as equalization and compression settings stored for quick recall.

One added benefit is that sound mixers who have been used to relatively simple mixing of audio for video in the past can adapt themselves to the new emphasis on stereo audio for TV, including use of multitrack techniques, quickly and without apprehension. Automated boards also boast added flexibility. A single board in a TV audio booth can be used for a variety of different shows, with settings for the audio mix stored indefinitely and called up by each mixer as needed. Flexibility and versatility of another kind is achieved with assignable functions; it's possible to switch console assignments as needed and vary the virtual size or application of the the mixing board by programming entire sections to act separately or as a whole.

Computer automation is a key feature in offerings from Solid State Logic, one console manufacturer responding to the newest audio-for-video mixing needs. The SSL 6000 handles multitrack recording and can sync to VTRs and other audio sources. The SSL Studio Computer provides automated equalization and stereo panning, and its Total Recall feature stores settings on floppy disk and recalls them, complete with diagrams for precise matchup. New this year is Autoscan, which allows total recall matchup for a group of channels or one section of the board.

Other SSL features are the 611-V stereo I/O module and the special Stereo Image Width control, which allows the mixer to vary the width of the stereo image to the TV picture.

This year, SSL also showed a production version of the SL 5000 M series designed to serve the custom console marketplace. All switching in the 5000 M is electronic and can be put under the control of the SSL Instant Reset Computer, allowing reset of up to 48 combinations with the push of a button.

Rupert Neve is another console manufacturer incorporating automation into its offerings. This year, Neve introduced the V Series console, a 48-bus multitrack console available in varying frame sizes. Features include individual channel dynamics with external keying, facilities for in-line or separate monitoring, and a solo section with selectable reverb/effects return. The V Series also includes Neve's 4-band format spectrum equalization.

The Neve V Series also has Necam 96—the automation process introduced by the company last year. It allows for up to 128 fader position "scene sets," with automatic or manual cross-fade between sets, comprehensive muting, and labeling and events function switching. A color monitor and keyboard allows the mixer to keep track of the status of the mix. Necam 96 can control up to 96 moving faders. The V Series is also flexible.

Designed both for video post and with the music recording industry in mind, the Harrison Series X is billed by the company as "the world's first totally automated console." The Series X is a virtual console offering a variety of configurations. Standard equipment includes Penny & Giles motorized faders, and instead of VCAs (voltage controlled amplifiers), the Series X uses DCAs (digitally controlled attenuators).

The Harrison console has two automated signal paths, a Winchester disk for mix data storage, and archival storage on floppy disk. It features assignable and centrally controlled functions and can read timecode, but it does not directly control or sync to tape machines.

A new exhibitor to the NAB this year introduced automation capabilites to a modular audio console as well. Soundtracs' CM-4400 Digital Routing System is a console available in a variety of mainframe sizes. It features assignable functions,

Rupert Neve's new model 8232 audio production console is suited to audio for video post-production.

rapid setup, visual assignment indication and preprogrammed muting.

Sountracs' CMS2 hardware/software automation package interfaces to a Commodore 64 computer and adds several automated features to the CM-4400. For multitrack recording, most remix work can be automated for storage and recall, and there is automated noise gating, effects sends and returns, and storage on floppy disk, among other features. For video post-production, SMPTE/EBU synchronization is made possible.

Soundtracs also introduced two other mixing consoles: the M Series modular consoles, which includes such features as Phase Reverse, and the T Series expander mixing modules available in groups of four-channel units to expand the 16-4-2 T Series master to any size up to 32-8-2.

Other new consoles featured some automation capabilities this year.

Amek Console Inc. had a working version of its APC 1000 production console configured for varying degrees of automation on the modular "building block" principle. It's available in frame sizes up to 88 inputs, with bus operations ranging up to 48 mono and six stereo. In the APC-1000, setups are stored as RAM pages.

Mitsubishi Pro Audio featured the Quad Eight Westar production and post-production console with 20 to 60 inputs, 24 mixing buses, and up to four stereo submasters. The Westar offers Compumix IV hard disk automation.

Another console maker offering storage and retrieval of setups via a PC is ADM Technology. The 3243 console can be operated via a PC with the addition of BCS 3243-PC software.

Autogram Corp. introduced the model 20 R/TV console, with 20 slide pots, featuring electronic switching and VCA level control. It too can be operated via a computer by adding new automation software.

Shure Brothers introduced the FP32 portable audio mixer.

Sony Pro Audio had two new console offerings, one with some automation capabilities and one with interfaces to video editing equipment. The MXP-2000 stereo audio mixing console is designed for both on-air and post-production and features an optional assignable dynamics processor module and automatic ATR start capability from the faders. An optional interface to video editors will also allow control of cross-fades and muting.

Portable consoles. Portable field production consoles for TV made their first showing at last year's show, and this year there were additions to the field. Portability is a direct response of increased emphasis on EFP and the desire for better audio quality in the field as well as in the studio. But it is not uncommon to find that radio stations will use these portable EFP consoles during remotes, as well.

Shure had its two portable mixers as first-time offerings at the NAB; they were introduced at last year's AES show. The FP32 stereo mixer is designed for ENG and features two outputs and three inputs switchable to mic or line level. There's also individual level control and stereo pan pots for true mixing capability. The FP42 is a stereo production mixer with two outputs and four balanced inputs and also features stereo pan pots. The FP42 also has cueing capabilities.

Sennheiser also entered the portable mixer arena with the M8, a studio-quality mixer featuring eight inputs, two outputs, parametric mid-EQ, and graphic high- and low-EQ. There is one auxiliary send with its own master, and the M8 has Penny & Giles faders and can be phantom or externally powered.

Connectronics Corp. introduced the SECK portable mixing console. It's has a larger design than the others, with 18 balanced inputs that can be switched between mic, line, and tape. Full in-line monitoring gives a stereo monitoring for multitrack mixes, and three extra effects buses can be swtiched in for the mixdown.

And a portable mixer for the Nagra field recorder was unveiled by Audio Developments/Portland Instruments. The AD 260 is a portable stereo ENG mixer; a 4x1 mixer that is powered off the Nagra. It sits on top of the recorder and has sliding faders on top. Together, the mixer and recorder form a compact duo.

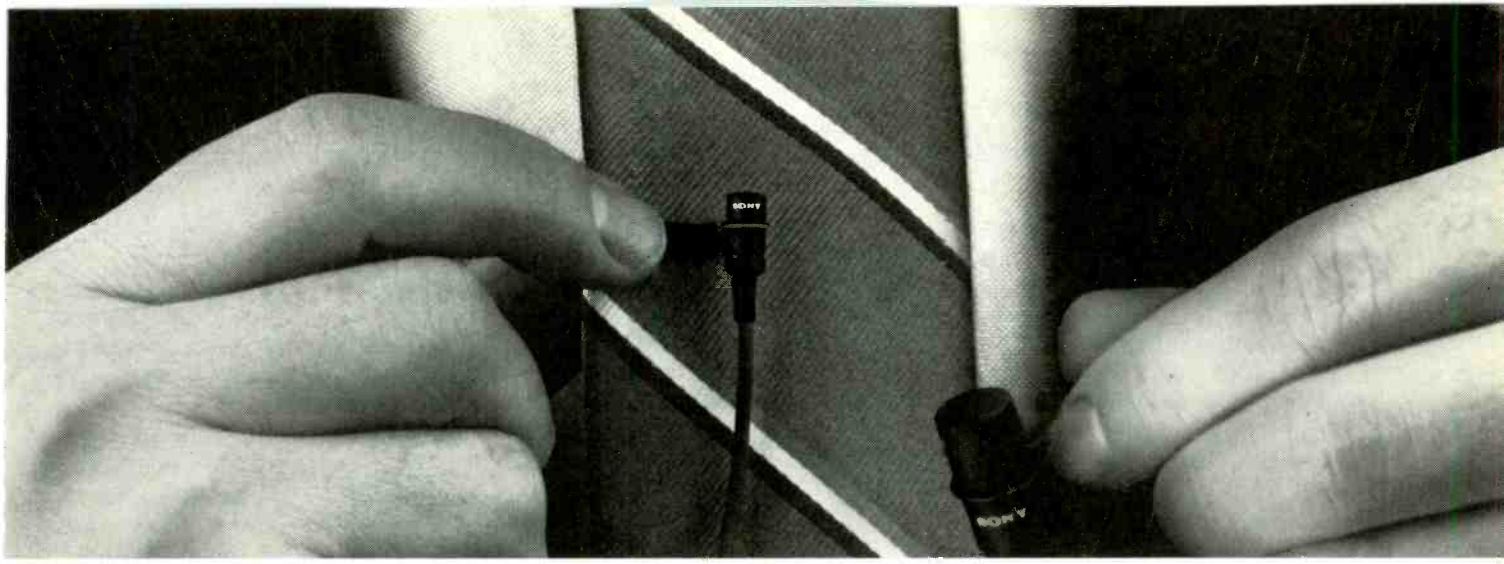
FOR MORE INFORMATION

Radio Boards Stress Variety...

Other on-air and production consoles introduced for radio had such features as modular design, or custom design, capabilities.

Wheatstone Corp. showed the AP500 on-air and production console, which includes on-board signal processing, total logic, and multistudio-to-control room interface, with remote controls for cart and tape machines available.

Howe Audio Productions unveiled the 8000 Series eight-channel and 10000 Series total custom design consoles for both radio and TV. The 8000 features precision rotary faders or pots. The 10000 is a modular console designed to the user's needs.



THE ONLY COMPANY THAT DIDN'T HAVE TO IMPROVE ITS LAVALIER MICS JUST DID.

As the world's leader in lavalier microphones, we've just taken some very important steps to ensure that we retain that distinction.

For one, we've taken our mics in a new direction with the addition of the Sony ECM-66 unidirectional. Its wide-angle cardioid pattern provides better off-axis frequency response than the classic pattern—while also providing an unprecedented level of isolation from ambient noise.

We've also made the least of a good thing: The new ECM-77 is the smallest microphone in Sony history. We've even made our new cable housing smaller—and more durable.

We've made more of some good things, too. The new ECM-55, for one: the latest refinement of our successful ECM-50 series.

And we've expanded our line of accessories—with new color windscreens; pencil-type, safety-pin and necklace-type clips; and a power supply holder that clips to your belt.

Sony lavalier microphones operate on either a single AA battery or phantom-power. You also have a choice between black or satin-nickel finishes; and XLR, pigtail or Sony wireless-compatible output configurations.

So to see (barely) and hear (very clearly) the results of Sony's refusal to rest upon its laurels, call your Sony representative: Eastern Region, (201) 368-5185; Southern Region, (615) 883-8140; Central Region, (312) 773-6000; Western Region, (213) 639-5370. Or write to Sony Professional Audio Products, Sony Drive, Park Ridge, NJ 07656.

SONY
Professional Audio

Audio

Ramsa (Panasonic Pro Audio) unveiled the WR-8428 post-production and recording console featuring four to 28 tracks, modular design, stereo line input, XLR mic jack, and 56 stereo inputs.

Studer Revox showed two new prototype mixing consoles, one for on-air and one for production. The 970 on-air is modular and can be configured in many standard versions, adaptable to different broadcast needs. Studer is seeking feedback on this console. The 963 features PCM-compatible performance and is a large-frame mixer in a compact design. It can be configured for 16 to 40 inputs and is fully modular.

ATI (Audio Technologies Inc.) featured its first NAB showing of the colorful Vanguard Series eight-channel mixer, with dual stereo, which is aimed at smaller applications. The 12 stereo outputs to eight mixers has an optional 5 x 2 expander and comes with rotary or linear faders.

Auditronics (Tapecaster) introduced the Auditronics 310 Series audio console, a second-generation replacement for the 300 Series, available with four or eight outputs, including submastering to stereo and mono mix. Also new is the Tapecaster 1000 series on-air console in six, eight, 10, or 12 mainframe sizes with stereo outputs.

Other radio consoles were abundant as well. Ward-Beck's new consoles, the Model R1400 and R2200 radio audio consoles, are updated, redesigned versions of previous 1200 and 2000 consoles. Broadcast Audio Corp. showed the System 6 modular console with six mixers and the same plug-in assemblies as larger consoles. LPB Inc. introduced the Alpha Series six, eight, and 10 mixer stereo on-air consoles, with audio circuits confined to circuit boards and DC control from panel. Audio & Design Calrec had an interesting addition, the Admix: a small audio mixer for use with the Sony 701 PCM digital recorder that can mix sound on sound.

Gotham Audio Corp. showed new EMT consoles for multitrack production in a compact, modular design featuring 10 to 30 input channels. Neotek Corp. introduced the Series I production consoles, configured to a variety of user options. EELA Audio had the new SBM broadcast console and S 100 B series audio consoles. Arrakis Systems Inc. introduced the Model 5000 16-channel modular console. Heie Engineering showed the Commander BC-1 broadcast on-air console with automatic sequencing and telehybrid interface.

The AP500 is Wheatstone Corp.'s new audio on-air and production console.

Soundcraft USA, Inc., introduced the Series 200B updated stereo recording console. Audio Developments/Portland Instruments introduced the AD067 six-input edit mixer, which is also available with four inputs. Harris Broadcast Group featured its Medalist audio consoles. Quantum Audio Labs showed the 22 Series on-air console. And Pacific Recorders and Engineering featured its Newsmixer, a modular, compact board introduced last year specifically for radio news.

Audio for video and post. Many of the same companies that specialize in automated or semi-automated consoles for TV and video post-production also featured less elaborate offerings in the field.

Rupert Neve also introduced the 8232 audio console featuring 32 mic/line input channels with 24 mixing buses and optional stereo reverb returns. Each channel features Neve's four-band format spectrum equalization.

Soundtracs unveiled the 8-12 Series console, for small studios and post-production, and T-Series for four- to eight-track recording, expandable to 32-8-2.

Autogram Corp. showed the LC-10 console with slide attenuators and the Microgram microprocessor-controlled console with up to 64 inputs.

Ward-Beck Systems introduced its ST Series, a "purebred" console for stereo TV. It's a microprocessor-controlled system with new circuitry and modular design, good for on-air or for post-production.

Other audio for video consoles introduced also incorporate editing functions. McCurdy Radio Industries featured the AMS 210 editing audio console, with 12-input, three-bus audio mixing and addressable RS-422 ports to interface to video production systems. Orion Research showed the AMU Series audio console with rackmount analog electronics and digital remote control panel, eight to 32 stereo inputs, and storage for 32 setups, plus a plug-in serial interface for video editors.

And Graham-Patten Systems showed the Model 608 eight-input edit suite audio mixer for post production.

Logitek introduced the Stereorack, a stereo, rack-mountable audio console featuring 11 balanced stereo inputs, two stereo output channels, and up to seven assignable mic inputs.

Not a console, but an essential component of consoles, are the ubiquitous Penny & Giles faders. The company also had product introductions: the T-Bar controller for smooth control in video and the motorized fader for automated audio consoles.

FOR MORE INFORMATION

Wheatstone	590		
Howe Audio	591	Quantum Audio Labs	606
Ramsa (Panasonic Pro Audio)	592	Pacific Recorders & Engineering	607
Studer Revox	593	Rupert Neve	608
(ATI)	594	Soundtracs	609
Auditronics	595	Autogram	610
Ward-Beck	596	Ward-Beck	611
Broadcast Audio	597	Audio Developments	612
LPB	598	McCurdy	613
Audio & Design	599	Orion Research	614
Gotham Audio	600	Graham-Patten Systems	615
Neotek	601	Logitek	616
EELA Audio	602	Penny & Giles	617
Arrakis Systems	603		
Heie Engineering	604		
Harris	605		

FIELD PRODUCTION

A special job demanding specialized products.

For your audio needs: a growing line of compact, easy-to-use FP amps and mixers.

Shure FP products are built specifically for ENG, EFP, film, and video work. They're not general audio products that "might" work on remotes. And no one offers as wide a selection with this kind of built-in ruggedness and reliability.

FP32

FP42

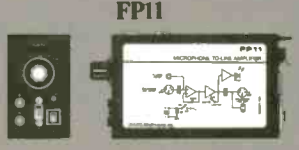
For Stereo Remotes. The FP32 Stereo Mixer is comparable in size and features to our famous FP31. Its stereo capability, light weight, easy-to-use controls and convenient shoulder harness make it the first choice of field crews. Our FP42 Stereo Mixer simplifies mic cueing, so important in situations like sports remotes. Plus it enables you to easily mix down stereo in your post production booth. It offers all the features of the popular M267 plus stereo capability and a stereo headphone amp.

FP31

FP16

The Industry Standards. The FP31 is Shure's original field production mixer. Thousands bet their audio on it worldwide. The FP16, a one-by-six distribution amp with transformer balancing and link jacks, outperforms all competition. It's also ideal as a portable press bridge.

FP11



FP12

For Long Yardage Situations. The FP11 Mic-to-Line Amp provides freedom from noise in long line situations, with up to 84 dB of gain in 15 6-dB steps. It converts any mic to line level and includes an invaluable limiter circuit. The FP12 Headphone Bridging Amp is a must for shotgun and boom operators. It keeps them on target without need for a return line. It's ideal for multiple headphone feeds, troubleshooting, and as an intercom.

For more information on the entire FP line, call or write Shure Brothers Inc., 222 Hartrey Avenue, Evanston, IL 60202-3696. (312) 866-2553.

SHURE®

Breaking Sound Barriers™

Circle 152 on Reader Service Card

More Products Than Ever Marry Audio to Video

Digital audio editing systems, mostly designed for audio for video post-production or music mastering, first came to light at last year's NAB with products such as The SoundDroid.

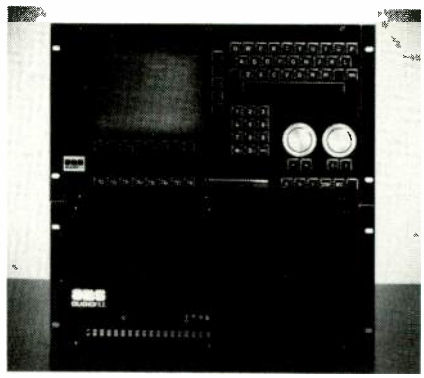
This year, there were new offerings, though it may be awhile before audio editors find their own place in the broadcast world. However, the increased emphasis on audio quality brought about by stereo TV works in their favor. This influence is felt mostly in the video post-production arena and has given rise to more complex editing procedures.

Another strong influence is the acceptance of digital audio, most widely in the form of compact discs that have been embraced by consumers. As better, cleaner audio becomes more commonplace, it drives the entire audio-producing industry towards perfection. Audio editors are a direct result of this trend.

Returning this year to the NAB was The Droid Works' SoundDroid, and it attracted a great deal of attention. The Droid Works' development team is readying the first systems for delivery. The units will include such features as automated mixing and digital recording. A primary feature is the audio signal processor for built-in digital sound storage.

SoundDroid performs a great deal of audio editing functions, including multitrack recording, mixing, equalizing, panning, and also add reverb and special effects. Control is through a touchscreen and mouse, and the digital audio is stored on magnetic discs. Faders on the system are motorized, and a CRT readout or printout gives a visual representation of the audio for precision edits.

For less complex editing, SoundDroid has also introduced its "spinoff"—the SoundDroid Spotter—at a lower cost. The SoundDroid Spotter is designed for cataloging, storing, transfering, or auditioning audio, or for laying-in sound effects. It utilizes a new interface to optical disc recorder/players for high-density, low-cost storage, and the Spotter can be used by itself or in conjunction with other SoundDroid systems.



Advanced Music System's Audiofile is a hard disk–based audio editing system designed with music applications in mind.

The Soundmaster system, shown by Amtel Systems, Inc., and developed by Master's Workshop Corp., was also present again this year. Combined with the new Soundmaster Syncro, it provides multiple timecode-based machine control. Soundmaster uses display screens to monitor the status of an edit and provide real-time montitoring of machines. A 2550-event list memory can be stored to disk. The software runs on an IBM PC. The new feature, Syncro, is controlled by the Soundmaster and communicates with the PC.

More than 400 events for automated control of Syncro's functions can be stored on RAM, and multiple Syncro units can be stacked together. In addition to console control, Syncro features a MIDI interface, edit list download, and random access editing.

Another returning product is the CMX CASS 1 (Computer-Aided Sound System). It integrates audio synching and editing with console fader automation. A color keyboard and monitor control the unit, and synchronization is achieved through the Adams-Smith 2600 system. The CASS 1 can control up to six video or audio machines simultaneously. In addition, the system's GPI (general purpose interface) will control 14 additional devices such as audio cart machines, CD players, or two-track ATRs.

The CASS 1 operates in two phases: an edit phase, which syncs up and lays down audio from various sources, and the mix automation phase, which interfaces to audio consoles via VCA faders. The mix automation system has the ability to store several hundred mix versions.

In addition, CMX has a new interface that uses the Editing Suite Audio Mixers (ESAM) Serial II protocol jointly developed by CMX and Graham-Patten Systems. The Interface is designed to be used with the CMX Multi-I² Switcher Interface for use with Graham-Patten audio mixers and the Harrison Systems Pro-7 console.

Graham-Patten introduced the Model 608, an eight-input edit suite audio mixer (esam) specifically for TV post-production. Each input has its own fader control. It's configured to operate like a video switcher, and offers edit control of source selection, preview functions, and transitions.

Cipher Digital also has an audio editor/controller system for video post-production. The Softouch system and Shadow II synchronizer/controller provide a "building block" approach to a variety of audio production applications. The Softouch keyboard provides for full multitransport control and monitoring. It works in conjunction with the Shadow II, which syncs and controls audio, video, and film transports; and the CD1-750 time code system.

New this year is an automated audio editing system from Alpha Automation called The Boss

OPTIMOD®-FM: BECAUSE MUSIC MATTERS.

Even though loudness was considered of vital importance in the design of OPTIMOD-FM Model 8100A/1, something else had even higher priority.

Music. Because music is what your listeners care about passionately.

OPTIMOD-FM was designed and built by people who have worked professionally in the recording industry. People with educated ears who *know* natural, musical sound—and who aren't satisfied with anything less. And people who are also skilled in the art of sophisticated, mathematical design techniques.

In OPTIMOD-FM, the math and the music come together in perfect harmony.

There are no bells and whistles. The few flashing lights are functional, not cosmetic. The sophistication is on the inside, where it belongs—assuring *listener satisfaction* by never mangling the music.

That's why OPTIMOD-FM is the best-selling FM processor ever. Use it alone, or adapt it to special needs with its optional Six-Band Limiter (for the more aggressive sound demanded by certain formats) and/or Studio Accessory Chassis (for dual STLs). OPTIMOD's versatility makes it the right choice for *your* station, regardless of format.

If you believe that music matters to your listeners, why wait any longer to bring them the best? Call your favorite Orban Broadcast Dealer, or contact us direct.

Orban Associates Inc.
645 Bryant Street, San Francisco, CA 94107
(800) 227-4498 or (415) 957-1067 Telex: 17-1480

orban

The ITC "Component System"

Listeners Will Love It!

Provide impressive on-air sound for even the most discriminating listener at an unbelievable price/performance relationship.

The Best of Both Worlds

The ITC "Component System" combines the quality of digital source material with *all* the operational flexibilities of an all-cart format. Simply record from a compact disc onto a ScotchCart®II broadcast cartridge using a 99B master recorder with ELSA, then play back on a DELTA reproducer!

Separately, These ITC Components are Impressive, Together They're Awesome!

Cartridge, tape and machines have been designed by a single manufacturer to compliment each other like never before and produce uncompromising audio quality.

1. 99B Master Recorder—Loaded with features
2. ELSA—A patented automatic cartridge preparation system
3. DELTA Reproducer—Outstanding audio performance in a reliable, mid-priced cartridge machine
4. ScotchCart®II Broadcast Cartridge—Capable of frequency response equalling professional reel-to-reel performance

Allow ITC's "Component System" to provide your facility with the operational flexibilities of an all-cart format while you offer your listeners impressive on-air sound they are sure to love.

When newer technology emerges, it will come from International Tapetronics Corporation/3M, "The Leader in Reliability and Service."

Call today to discuss financial options and the unbelievable price/performance benefits of the ITC "Component System." In the U.S., call toll-free **800-447-0414,** or collect from Alaska or Illinois **309-828-1381.** In Canada, call Maruno Electronics, Ltd. **416-255-9108.** In most countries outside the U.S. and Canada, information on ITC equipment can be obtained through local distributors.

International Tapetronics Corporation/3M
2425 South Main Street
P.O. Box 241
Bloomington, Illinois 61702-0241

3M

Circle 154 on Reader Service Card

8400/8410. It's a computer-based system to manage machines and accelerate audio production. The Boss can control up to five machines from 16 machines addressed. The color monitor contains machine descriptions, time code, and status information. A work area shows edit lists.

The keyboard allows for the insertion of sound effects, edit session recalls, and many other functions with a single touch. The controller, MPU (master processing unit), is a 16-bit central processing unit with two disk drives. Precise cueing for following a pre-planned script is possible, as is duplication of an entire editing session.

Audio editing for music. Two digital editing systems for music were introduced at NAB.

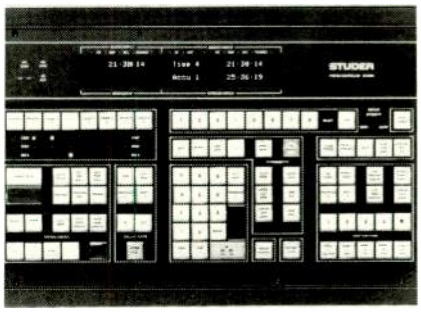
Advanced Music Systems featured the Audiofile in product form. It stores eight hours of mono audio on a Winchester hard disk at either a 44.1 or 48 kHz sampling rate. It's a 16-bit system that is designed for either music editing, audio, audio for video, or digital stereo editing.

New England Digital had a unique product introduction called the Synclavier. It's a modular system that is computer based and features an interface to a real-time keyboard, musical instruments, and digital tape storage. The Synclavier has a 32-track digital memory recorder and is being called "the tapeless studio." It includes audio effects, music and vocal synthesis, storage on Winchester or floppy disk, interfaces to computer options such as terminal, alpha-numberic keyboard, and printer, and features an option called Script: a musical memory-notation system.

The Synclavier would seem to be a synthesizer, sound effects machine, computerized audio editor, and it can be SMPTE-locked to a tape machine.

FOR MORE INFORMATION

The Droid Works	619	Advanced Music Systems Audiofile	623
Amtel Systems	620	New England Digital	624
CMX CASS 1	621		
Alpha Automation	622		



Studer introduced the SC 4008 SMPTE/EBU bus controller for audio/video post production.

A/V Synchronizers and Controllers

With or without the emergence of audio editors, the mainstay of audio for video production is still the audio/video synchronizer and/or controller. Most of the major players in this all-important field had product introductions, reflecting the increased focus on this field with the advent of production for TV stereo.

Two unique products in A/V editing allow for audio automation via video editors. Logitek introduced the Crossfire, a four-channel automated audio crossfader. Driven by GPI or ramp control, the Crossfire lets a video edit system run audio levels.

Mitsubishi Pro Audio announced a video interface to a digital audio fader. It allows communications from the recently introduced intelligent digital faders (IDFs) from a CMX or similar editing systems, providing software for the support of external audio-follow-video devices. It allows real-time automation control of fader levels and mute commands by the video editing system.

Other A/V synchronizers. The more familiar A/V synchronizers were out in force. Adams-Smith Inc. showed the Model 2600 CC, a compact version of its A/V tape synchronizing sytem controller with integrated multicontrols, all in a compact, lightweight package. Evertz Microsystems showed its line of transport synchronizers including the Phaser, which was introduced last year. It's a microprocessor-based capstan speed resolver and time code system for audio tape transports. Fostex Corp. showed the Model 4030 SMPTE-based A/V synchronizer and Model 4050 SMPTE-based synchronizer for MIDI-SMPTE lockup.

Editron introduced the Model 500 Audio Production System for computer-based control of up to 15 video or audio recorders and the Model 100A Timecode Synchronizer and optional Model 200A System Controller. Geise Electronic introduced the Lock-System 3 and 3/2 rackmount unit for SMPTE/EBU control of video, audio, and film machines. It's a modular designed central unit with remote control with one master and two slave interfaces. Studer Revox America featured the SC 4008 and SC 4016 SMPTE bus controllers for post-production. The SC 4008 controls up to eight synchronizers; the SC 4016 up to 16.

Timeline showed the Lynx Model VSI for full control of audio machines from external computers. It's compatible with CMX, Ampex, and GVG editing systems and also features the Lynx System Controller, a control keyboard/computer for production work. Audio Kinetics introduced the Eclipse editor-controller for Q. Lock 4.10 synchronizers, which offers four-machine editing. J&R Film introduced the Lok Box, a hard-lock synchronizer that attaches to film editing equipment or film transport and synchronizes the video deck to it.

FOR MORE INFORMATION

Logitek	625	Editron	630
Mitsubishi	626	Geise Electronic	631
Adams-Smith	627	Studer Revox	632
Evertz Microsystems	628	Timeline	633
Fostex	629	Audio Kinetics	634
		J & R Film	635

Digital ATRs Make a Showing

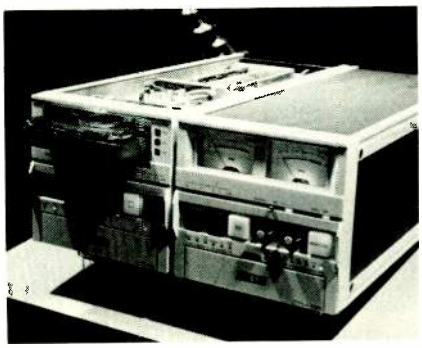
Even though digital audio is starting to be accepted among broadcasters in the form of CDs and digital storage and retrieval systems, there is yet to be any real movement toward digital ATRs. Digital recorders are now firmly divided into two camps: the DASH format on one side, supported by Sony, Studer, and Matsushita; and the PD or pro-digital format on the other side, with the support of Mitsubishi Pro Audio, AEG, and Otari.

Product introductions in this category came on the PD side of things this year, with new offerings from Mitsubishi and Otari, and AEG slating next year as the time for that company's first digital ATR product.

Mitsubishi introduced the X-86 two-track digital mastering recorder, the X-400 16-channel digital recorder, and the X-850 32-track digital. The X-86 is a second-generation X-80, Mitsubishi's first digital offering, but the two are not entirely compatible, although there is a playback option to the X-86 allowing the playback of X-80 tapes.

The X-850 offers second-generation design, cut and splice editing, RS-232 and RS-422 control ports, 48 kHz or 44.1 kHz sampling frequencies, and

Among new digital recorders introduced was the Mitsubishi X-86, a ¼-inch two-channel in the PD format.



Otari entered the cart machine market with the CTM-10.

SMPTE generator with drop frame. The company reports there have been orders for two-channel X-86 machines which have been slated for July or August deliveries.

Otari introduced the DTR-900 one-inch 32 track PD digital recorder, with 24/32 or 16/32 options. It too offers splice editing and 48 or 44.1 kHz sampling rates, plus a timecode generator and optional timecode sync.

In the DASH format, Sony showed its PCM 3102 and PCM 3202 digital recorders. The 3102 runs at 7.5 ips and features cut and splice editing; the 3202 runs at 15 ips and features electronic editing.

Sony also introduced the VSU-3310 Vari-Sync Controller for its PCM-3324 multitrack digital recorder. It enables users to vary the pitch of digital audio signals and provides switchable 44.056, 44.1, or 48 kHz frequencies. Also new is the DFX-2400, a 16-bit digital audio sampling rate converter, which allows conversion of the four most common digital audio sampling frequencies: 32, 44.056, 44.1, and 48 kHz.

Studer Revox also has a DASH format ATR. The D820 has 14-inch capacity, both 44.1 and 48 kHz sampling, electronic and splice editing, and digital and analog inputs and outputs.

In addition, one trend in the area of digital tape recording is the rise of support products. 3M and Mitsubishi announced the approval of Scotch 275 tape for use in Mitusbishi 32 and two-channel digital tape recorders. The approval is for one-inch and ¼-inch tape.

And Gotham Audio has developed a digital-to-digital interface between DASH and PD recorders, which may help foster acceptance of both. If that occurs, the world of digital ATRs may remain a double-format world, much like the situation that exists with ½-inch video recording formats.

FOR MORE INFORMATION

Mitsubishi .....637 Sony 639
Otari .....638 Studer Revox 640

Multitrack Recording and Other Tape Developments...

Following the recent industry trends toward more multitrack recording for both radio and audio-for-video, at least one company has been quick to respond with a multitrack product introduction.

Otari introduced the analog multitrack MX-80 two-inch, with 32 or 24 channels, similar to the MX-90, geared to post- production, with noise reduction switching for Dolby SR. It allows recording at a slower speed for high frequency.

Other analog recorders offer various conveniences, including timecode. AEG-Bayly showed the new M-20 ATR ¼-inch two-track in stereo with digitally controlled audio alignment and SMPTE Time Code. Fostex Corp. introduced the E-2 ¼-inch stereo mastering recorder with center track time code and the E-22 ½-inch two track with the same capabilities.

Studer Revox America Inc. also introduced the A812 analog broadcast recorder, featuring microprocessor-based electronics, 12.5-inch reel capacity, ¼-inch time code programmable functions, and also a timecode version of the A820 and a version of it for film audio. Also new from Studer was a prototype version of the new A807 two-channel rack-mountable recorder. Tascam Professional Products introduced several analog ATRs, all in the 60 series. The 60/2T ¼-inch two-channel has center-track time code; the 60/2N

¼-inch two-track features an NAB stereo head. Also new were the 60/2HS ½-inch 30 ips two-track; the 60/4HS ½-inch 30 ips four-track; and the 60/8 ½-inch eight-track with timecode. Soundcraft USA introduced the microprocessor-controlled two-track mastering machine in ¼- and ½-inch versions. And United Research Lab introduced the ASC reel-to-reel recorder.

News in cart machines. Cart machine developments included one new entry, accessory equipment, and also featured products previously introduced.

Otari entered the cart machine field with the CTM-10, which features Dolby HX Pro optimization. Otari plans to offer it with discrete or matrixed stereo, as a mono or stereo recorder, and mono/stereo playback, designed to compete with the medium/high- end cart machines available on the market today.

Fidelipac Corp. introduced the ESD 10 eraser/splice detector with two erase heads, similar to an open reel recorder, with a continuous duty cycle that avoids tape wear. Also new was the CTR 30 three-deck cart machine, first to incorporate the record unit in the player. It's also worth noting that Cipher Digital had a Fidelipac cart machine synched to its time code machine for TV sound effect applications.

ITC/3M also introduced an eraser, but the ESL V erase splice locator features an erase coil underneath. It's microprocessor-controlled and replaces the ESL IV. ITC/3M also had its 99 and Omega and Delta series cart machines.

Pacific Recorders & Engineering featured a final production version of the Micromax cart deck introduced last year and also featured the Tomcat cart machines. Broadcast Electronics displayed its cart decks as well. And Auditronics showed the Tapecaster X-700 Series cart machine.

In support, Capitol Magnetic Products showed its A-2 and AA-4 broadcast carts; while ITC/3M showed the new ScotchCart II broadcast cartridges, and Audi-Cord featured the "S" and "E" series family of cart equipment and the "TDS" twin-deck reproducers.

ITC/3M compared the frequency response of a CD and a cart recorded from CD using a Bruel & Kjaer Fast Fourier Transform Analyzer.

Schafer World Communications introduced the Ready Spot cart automation machine with 30 trays in increments of 10 per unit up to 90 trays. Also new was the 7000/7000 GLS software with super ROM, which upgrades the system to allow broadcasters to achieve more flexibility and quality control.

IGM Communications introduced a new IGM controller using the Commodore 128 computer, a new IGM-SC systems controller using the IBM-PC, and showed the IGM Instacart and Go-Cart cartridge automation systems.

Systemation unveiled its unique computerized automation system for cassette players. The Miracle X-7 software operates up to 63 Tascam 234 cassette decks, with cassettes that can hold up to 76 commercials or 60 songs. It offers the advantage of cassette quality fidelity, including stereo, and is geared especially towards the fully-automated or live assist radio station. It can also be custom-designed to interface to satellite networks.

Broadcast Automation, Inc., featured its remanufactured automation systems and broadcast equipment and also showed retrofits to cart automation systems and other broadcast equipment.

FOR MORE INFORMATION

Production Essentials Strive for Perfection

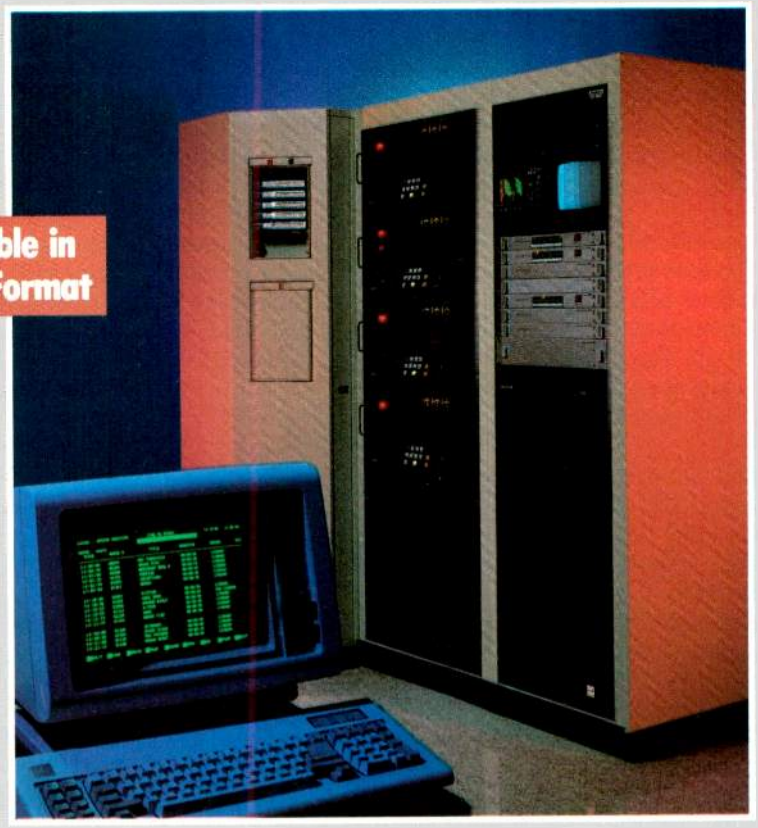
If there's any one trend that tied all of the audio product developments together at this year's show, it was the continuous striving toward higher audio quality; be it greater fidelity, lack of distortion, or a focus on digital. This reach extended even into the realm of speakers, microphones, headphones, amps, and preamps, with precision equipment, more powerful equipment, and better performance from even the most routine of equipment.

Speakers Become Precise Monitors

It was bound to happen. With a new emphasis on audio quality brought about by the emergence of digital recording and the push for stereo TV, it was only a matter of time before broadcasters began to pay more attention to the acoustic environment. Better audio has spawned the demand for more precision in monitoring and production, and recently, the broadcast studio has begun to borrow techniques from the music recording industry in order to improve the acoustics of the studio itself.

Terms such as *Live-End-Dead-End, time-aligned,* and *ergonomics* are now freely talked about in audio. Just this year, NBC employed precise acoustic design criteria when it began to upgrade its audio booths, making use of time-energy frequency tests and the like.

PAY LESS ATTENTION TO YOUR VIDEO CART MACHINE



Great idea! Now you can do just that with the TCS-2000.

The Cart Machine automatically manages, records and plays-to-air all forms of spots and programs, giving you much more uninterrupted time away from programming concerns.

The Cart Machine holds up to 280 carts on-line. Tracks 65,000 carts in the database. With its 1,000 event look ahead feature, you receive a printed list of needed carts and your saturation spot carts never have to leave the machine.

The Cart Machine's comprehensive software system interacts with your traffic system to download your logs and automatically preplans the spot play lists days in advance.

Now other station operations get your undivided attention—with The Cart Machine.

Odetics

We put *smarts* in The Cart Machine.

Odetics, Inc. 1515 S. Manchester Ave., Anaheim, CA 92802-2907. Call toll free 1-800-243-2001. In California call 714-774-5000.

Circle 162 on Reader Service Card

The new focus on precise monitoring has led to a change in speaker design. Whereas before the idea in building an audio studio was to create a pleasant listening environment, today, the main concern is getting the sound to be as accurate as possible so that when it is duplicated in other places the result is close to the original production.

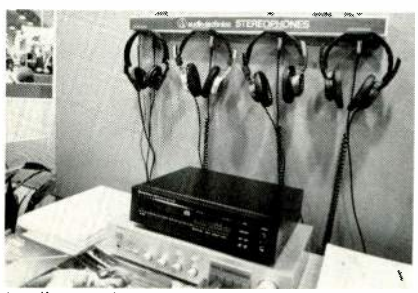
Several speaker manufacturers have met the need for greater precision in their NAB product offerings. JBL, in its recent association with Urei, has shifted its focus from merely making good speakers to creating accurate audio monitors as well.

JBL/Urei introduced several precision audio monitors, with titanium dome tweeters and features such as a tighter system response tolerance. The 4406 is a two-way with a 6 ½-inch woofer and 75 watt power capacity; the 4408 is a two-way with 8-inch woofer and 100 watt power capacity; the 4410 is a three-way with 10-inch woofer and 125 watt power capacity; and the 4412 is a three-way with 12-inch woofer and 150 watt power capacity. Also new was the 6215 rack mountable power amp.

Electro-Voice also introduced precision studio monitors. New are the Sentry 100 and Sentry 500 series.

Tannoy North America specializes in dual concentric monitors and introduced the NFM-8B rack mountable near-field audio monitor and the FSM studio monitor with two 15-inch drivers.

Cetec Gauss showed its new single-point source studio monitor, which does not need time compensation. The Model 7258 uses the company's 200 watt coaxial loudspeaker whose design parameters place both drivers in the same acoustic plane. The new coax monitor is designed with TV stereo applications in mind.



Audio-Technica featured a display of its stereo headphones.

Two other manufacturers introduced speakers specifically designed for the broadcast environment. Anchor Audio showed the AN-1000 and AN-1400, two new powered speakers for audio edits from video. Ramsa (Panasonic Pro Audio) introduced the WS 810K and WS 810 compact monitors for broadcast.

New Miking Techniques

The rise of TV stereo, and an increased emphasis on producing stereo audio for video, has caused audio engineers to begin thinking more carefully about miking techniques. Not only must they decide whether to use directional or omnidirectional, or what patterns of directional mics to use, but exact placement of mics to get the best stereo image must be considered, while at the same time avoiding phasing or time problems.

Generally, in stereo miking, coincident mics are the way to go, achieved with a pair of directional mics set at an angle between 60 and 120 degrees from each other. The mics are placed within the same plane. This technique is called X-Y miking.

But recently, another miking technique has been suggested for stereo TV: the placement of two mics in different planes at a 90 degree angle. This technique is called mid-side, or M-S, miking, and in addition to two mics facing in different directions, or a single mic with two mic elements, it involves feeding each mic path through a matrix decoder.

There are some benefits to be gained from the technique. The mid and side microphone channels are recorded directly without decoding to stereo L and R, then the stereo is created in post-production. The use of the matrix allows the mixer to alter the stereo spatial characteristics and perspective as desired.

Audio Engineering Associates is a proponent of M-S miking and presented a paper on it to the AES. At the NAB show, AEA featured the MS-38 Active Matrix Decoder for M-S mics. It's a transformerless, single-control decoder that matrixes the M and S signals into conventional stereo. The MS-38 has differential inputs that accept balanced line-level signals from the M and S mics or mic elements. It is designed to interface with the recording chain between the mic preamp and the input channel controls.

M-S miking is more involved and more expensive than X-Y miking. It is better suited to post-production applications.

FOR MORE INFORMATION

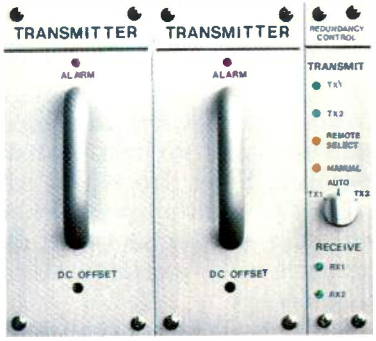
Other Production Essentials...

Microphones, amps, preamps, DAs, headphones, and other audio production tools were all plentiful at the show. Recent surveys of broadcasters show that these are the bread-and-butter products of the industry, and most engineers go to a show like the NAB fully intending to buy such items.

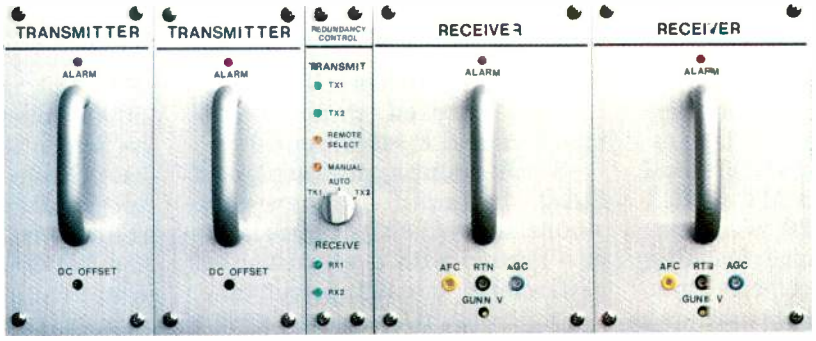
Microphones and headphones. These familiar products go through subtle design changes each year. Microphones get smaller, and headphones are aiming for greater comfort. There were introductions in both categories.

AKG Acoustics, Inc., introduced the C-460 condenser mic systems with CK-1X, -2X, and -3X mic capsules, plus CK-61 and -62 ULS Series cardioid and omnidirectional capsules for use with C-460B mics. Also new from AKG were the Q-34 headset/boom combinations and K-240DF flat response studio monitor headphones.

23 GHz? Simplex

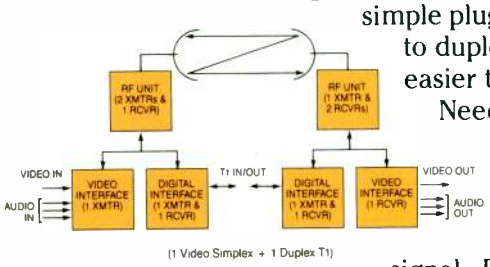


to Duplex



doesn't have to be Complex.

Meet our newest Microstar,™ an affordable, expandable 23 GHz STL. Planning to grow? Microstar's simple plug-in modules let you expand from simplex to duplex transmission, and add protection, much easier than any other radio.



(1 Video Simplex + 1 Duplex T1)

Need versatility? Microstar 23 lets you combine T1 communications with your video or aural transmission. And since Microstar is the only 23 GHz STL to meet EIA standard RS-250-B, it's the *only* radio that won't degrade your signal. Best of all, the Microstar 23, like the 2, 7, and 13 GHz Microstars, is competitively priced.

So if there's a 23 GHz STL in your future, take a good look at Microstar 23. There's really no comparison. Contact Harris Broadcast Microwave, 967 Stierlin Road, Mountain View, California 94043. (415) 969-9100 Telex 17-2584.

Circle 158 on Reader Service Card

FOR YOUR INFORMATION, OUR NAME IS

HARRIS

Harris Broadcast Microwave

HARRIS

Audio

Audio-Technica U.S. had two new mics. The ATM5R is a miniature unidirectional, fixed-charge condenser mic with a low impedance, making it ideal for vocal use. The ATM33R is a phantom-powered, unidirectional condenser mic, with a Lo-Z (150 ohms) and a frequency range of 30 Hz to 20 kHz. Beyer Dynamic had several new products. The MC 736 PV and MC 737 PV are short and long shotgun mics with new preamp designs, which accept 12-48V phantom powering. Beyer also introduced the M 380 announcer's mic, the M 740 large-diaphragm condenser mic, and the MCE 10, a cardioid lavalier mic.

Countryman Associates featured its Isomax headset-mounted mic. Crown International introduced the GLM 100 and 200 small condenser mics and MT 600LX power amp with 220 watts per channel. Electro-Voice featured the RE98 miniature electret mic. Sennheiser Electronics introduced the HD 540 top-of-the-line open air headphone and the MKH 40 P 48 low-noise transformerless cardiod and new transducer capsule designed for fast transient response. Sony Pro Audio introduced two multipurpose dynamic mics, the F-730 and F-720. Both feature a talk switch and streamlined design.

And Shure Brothers featured its entire line of mics. Stanton Magnetics Inc. introduced the 30M/SR, a single-cup, shoulder-rest headphone with a frequency response to 22 kHz; and also introduced the 310B stereo phono preamp for Stanton and selected other magnetic phono cartridges. TOA Electronics featured shielded A/V monitors and F series speakers.

In other amps, preamps, and DAs. In amplifiers, there were several new offerings. Lenco broke new ground with a very exacting professional monitor power amp, the MPA-2100. Lenco had the precision needed for digital audio in mind in the amp's design. The amp comes with a five-year warranty and has some unique features, such as an open-air design to allow for cooling. It's a 1 Hz to 100 kHz amp with a thermostat-controlled front end and a bipolar MOSFET amp. Its power output is 100 watts per channel at 8 ohms (stereo), but it can accommodate up to 500 watts at 8 ohms for mono.

Benchmark Media Systems, Inc., introduced the MIA-4 mic preamp card, which gives up to 200 kHz bandwidth and high output, and also the DA-102 stereo distribution amplifier. Bryston Mfg. Ltd. unveiled the 6B, a new 500 W mono amp with a 100 W switch on the back. Harris Broadcast Group showed a new turntable preamp, the PX-91. Ramsa (Panasonic Pro Audio) introduced the WP-9055 stereo 50-watt-per-channel-into-8-ohms power amp.

Russco Electronics Mfg. Inc. had a new dial-up remote amplifier and featured other studio products. ADM Technology showed a new line of resistive output stereo DAs. McCurdy Radio Industries unveiled its new line of audio DAs. Pacific Recorders & Engineering introduced the SDA-8A stereo DA and TX-990 phono preamp. Ward-Beck introduced the D8212 DA system, which fits into a 3 ½-inch rack space and includes redundant power supplies. And Audio Developments/Portland Instruments introduced the AD066/3 Port-A-Flex System DA and the AD066/2 Port-A-Flex System Power Supply Unit.

In other production and miscellaneous audio equipment, Radio Systems introduced the DCX line of studio low-cost modular studio products including turntable, mic, line, headphone, and power amps. Alpha Audio Acoustics featured its line of acoustic materials including Sonex, Soundtex, and Acoustilead sheet lead. Audio Broadcast Group showed its "human engineered" prewired turnkey studio system. RPG Diffusor Systems introduced the QRD-734, a new low-cost diffusor for production rooms, and also a new designer diffusor series.

Kinemetrics/True Time showed two new clocks, OM-DC Mega synchronized and SF-DC, which may be synchronized or free running. And ESE showed its line of digital clocks, timers, time code generators, readers, inserts, and other related products.

FOR MORE INFORMATION

AKG	668	Ramsa	683
Audio-Technica	669	Russco	684
Beyer	670	ADM	685
Countryman	671	McCurdy	686
Crown	672	Pacific Recorders	
Electro Voice	673	& Engineering	687
Sennheiser	674	Ward-Beck	688
Sony	675	Audio	
Shure	676	Developments	689
Stanton	677	Radio Systems	690
TOA	678	Alpha Audio	691
Lenco	679	Audio Broadcast	692
Benchmark Media	680	RPG	693
Bryston	681	Kinemetrics	694
Harris	682	ESE	695

Communications Gear: Diversify and Conquer

Communications gear, including wireless microphones, both wired and wireless intercoms, and the various types of headsets, has benefitted from recent developments in miniaturization of electronics as well as the use of sophisticated materials in the pro-

duction of this type of equipment. For example, diversity receivers for wireless mics have been around for quite some time now, yet each year—as '86 revealed—brings smaller, less expensive, and more efficient electronics.

Incorporating much of what recent devlopments have to offer, Telex improves the received signal in its new diversity receiver not by selecting the stronger signal from a capacitor circuit, but by putting the out-of-phase signal through a phase modifier (these units are designated by the term *Posi-Phase*), combining the two phase-related signals, obtaining what it claims to be a signal 3 dB stronger (or, from another perspective, increasing reception sensitivity by 3 dB).

On the other end of the spectrum, new belt-pack wireless transmitters (WT-50) from Telex enhanced the transmission end by including a miniaturized sensitivity selection circuit, allowing the user to switch the gain to achieve compatibility with all brands of lavalier mics.

Telex intercoms, wireless systems, and headsets drew attention at NAB.

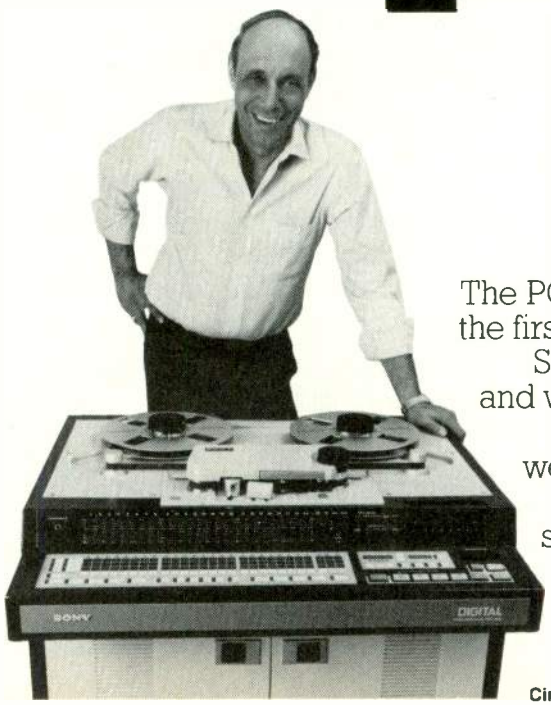
One component of increased sophistication in diversity receivers is the use of gallium arsenide field effect transistors for high sensitivity, low noise, and wide dynamic range. Cetec Vega's Pro Plus series of diversity receivers incorporates such devices. The receiver preselector, used in determining the value of the two incoming signals, is a two-pole, silver-plated helical resonator filter, while the power transformer is a high performance toroidal design for low-hum operation. This all adds up to a higher sensitivity and a more selective narrow front end with advanced circuit design.

Improvements in circuitry and materials have also occurred with transmission components. Glass epoxy PCBs are used for all of Cetec Vega's equipment. The hand-held units contain an internal dipole antenna that's "printed" onto the circuit board.

Miniaturization played a central role in Sony's development of its new VHF wireless system. Since the components are now small enough and reliable enough, Sony has announced the first wireless system with frequency synthesis in both the transmitters and receivers. Rather than use what it terms unstable crystals to

"The engineer, owner and president were very impressed."

Bob Liftin
Engineer, Owner, President
Regent Sound.



The PCM-3324 Digital Audio Multi-Channel Recorder is the first Sony product to incorporate the DASH format.

So it can interface with already existing equipment and will be compatible with future developments in audio.

And its reputation is spreading fast for being a well-built, well-designed piece of machinery.

Or, in the words of Mr. Liftin, "I took it out of the crate, set it up and got it running. And my coffee was still hot."

We couldn't have said it better ourselves.

SONY.
Professional Audio

Circle 156 on Reader Service Card

generate a signal at a certain frequency for wireless transmission, Sony has adopted frequency synthesis.

Each transmitter, such as the WRT-220 body pack, is capable of operating on any of 48 frequencies, while the system's receivers are equipped to handle all 168 channels in the VHF band.

Micron displayed its rack of multiple diversity receivers prior to this year's NAB, but has made advancements in its CNS 500 noise reduction processors.

New receiver packaging. Drawing as much attention as different methods of processing were the different methods of packaging specifically relating to receivers. Sennheiser, for example, has had a compact field design. This year, HM Electronics introduced the Field Pac receiver case, FR200, that will hold up to four RX752 receivers as well as the electronics for the AD-10A antenna diversity system. By adding three dipole antennas, full diversity reception is provided for all installed systems.

In addition, HME showed Systems 58-85-87 wireless mics incorporating Shure elements corresponding to those model numbers. The System 82 bodypack transmitter featuring their Dynamic Expansion system of compansion speaks to the RX722 receiver, which employs new squelch circuitry.

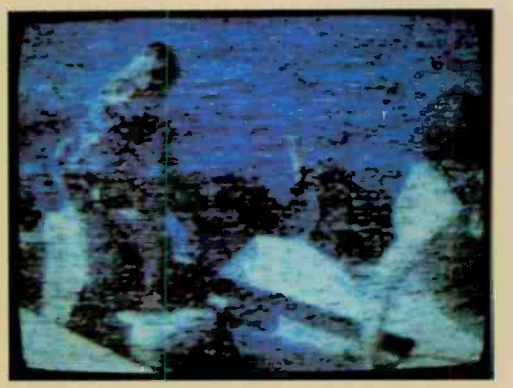
Nady, long known for its wireless technology, has a similar packaging called QuadPak, housing up to four of the company's 701 VHF diversity receivers. The unit contains the electronics to couple the four receivers together, while permitting the user to install or remove each receiver separately.

FOR MORE INFORMATION

Telex	697	Micron	700
CetecVega	698	HM Electronics	701
Sony	699	Nady	702

Wireless Mics Transform Intercoms

A system that makes the transition from wireless to intercom is the Swintek Mark QDC-H. This video camera wireless microphone system is configured to be mounted on a portable video camera. The receiver has an adjustable squelch control and a headset monitoring plug with an external level control allowing the receiver to be used for cueing, bilingual remote listening, or as a one-way communication link. The system operates in the VHF band to eliminate the possibility of hum bars being introduced into the video recorder. Also on hand was the Mark 200D radio headset demonstrating compatibility with all standard wireless headsets and with many of the wired systems. This VHF unit offers headphone-to-headphone



UNWANTED FRAME GRABBING STOPS HERE

DFS-3000N Digital Frame Synchronizer

If your video synchronizer lets you down on a noisy feed, you need the new Leitch DFS-3000N. This digital frame synchronizer incorporates input processing circuitry that uses the latest in digital auto-correlation techniques to prevent intermittent frame grabbing or switching to black. Only Leitch offers this capability.

Now you know one of the features of the Leitch DFS-3000N. But the advantages don't stop there. Neither should you. Write or call (toll free) for further information.

In U.S.A. 1-800-231-9673
In Canada 1-800-387-0233

LEITCH

Progressive Concepts in Television Technology

Leitch Video of America, Inc.
8255 Greenbrier Circle
Chesapeake, VA 23320
(804) 424-7920

Leitch Video International Inc.
10 Dyas Road, Don Mills
Ontario, Canada M3B 1V5
(416) 445-9640

NAB Targets AM Improvement

This is the year the NAB has focused on improving the technical quality of AM radio. There are several ongoing groups working on ideas for upgrading transmission and reception of AM. In some cases, giving AM broadcasters what they need to gain back their listeners and to compete with FM is more a matter of survival than merely a good idea.

Technical sessions. In its radio engineering sessions, the NAB and broadcasters summarized some of the ongoing efforts on behalf of AM.

The first deals with preemphasis and has broadcasters and receiver manufacturers sitting down to work out acceptable amounts of high frequency boost and the concomitant attenuation in AM radios. Receiver manufacturers have voiced a commitment to making higher fidelity AM radios, and work in this area is crucial to that end. A subgroup of the National Radio Systems Committee has been meeting regularly to consider preemphasis proposals. Their work has been zeroing in on several key points: first, the question of splatter and, second, methods to measure it in the field.

The NAB is also planning a study of second adjacency contours, to determine how much overlap there is and how it effects listening habits—in short, when do listeners tune out?

In the meantime, the study on overmodulation is being done by Harrison Klein and will be released this summer. Once the splatter and second adjacency questions are answered, the subgroup will begin field tests of proposed preemphasis curves.

Antenna design is another critical area for AM. Two new experimental AM antenna designs are ready for field tests, which will also be conducted this summer.

The third area of concern regarding AM is electrical interference from RF lighting devices and other electronic technologies that use RF. The FCC set limits on interference in some cases last summer, but these did not take into account RF lighting devices. The NAB has now sent a report to the Commission requesting action on this type of interference.

FCC AM Report. Around the time the convention took place, the FCC's long-awaited report on AM improvement, developed by the Mass Media Bureau, was released. The report addressed some regulatory issues that can help AM become a more viable force, depending on their interpretation and how rule changes are implemented over the next few years.

One key issue is interference rights. The report looked at allowing AM stations to sell or lease their interference rights. Another possibility explored in the report is allowing a broadcaster to own more than one AM station in a market. Some AM owners are already contemplating future plans involving these rule changes. A broadcaster could theoretically buy an AM in a nearby or overlapping area and treat it as an extension of the currently owned station, perhaps with some local broadcasts of news or public affairs. In that way, the station would be increasing its coverage area and perhaps be better able to compete with FM stations in both coverage areas.

The report also looked at a possible restructuring of interference limits, station classifications, protection ratios, power limits, and antenna systems. A closer

Microprocessor control, amorphous metal core heads, and superior performance . . . technology that's typically AEG.

Chances are that the M-21 Professional Audio Tape Recorder from AEG will outperform whatever 2-Track you're currently using or considering for future purchase. No other machine is built to such exacting standards, no other machine handles tape as gently yet rapidly, and no other machine is presently available with Amorphous Metal Butterfly Core Heads. (Ours are standard equipment; ask about our exclusive head warranty.)

The M-21 is microprocessor controlled and user-programmable for any 2 of 4 speeds. It is a totally self-contained package with no external power supplies or cabling, and access to all components for maintenance and alignment is quick and easy. The performance specifications are unexcelled.

It's only natural that the M-21 should be such a fine machine. After all, we invented the modern tape recorder over 50 years ago. To arrange for a free demonstration at your facility, or for information on any of our other high technology products, please give us a call.

In Canada:
AEG BAYLY INC.
167 Hunt Street
Ajax, Ontario L1S 1P6
(416) 683-8200

In U.S.A.:
AEG Corporation
Route 22 — Orr Drive
P.O. Box 3800
Somerville, NJ
08876-1269
(201) 722-9800

AEG

Circle 166 on Reader Service Card

look at receiver characteristics and AM stereo developments are included in the report also.

The report has been made public, and the Commission is currently accepting public comment on it for three months, through July.

AM Stereo Battles Not Over

AM stereo remains a thorny issue, and some new thistles cropped up while the show was in progress. On the surface, it was business as usual, with Motorola displaying the popularity of the C-Quam system among receiver manufacturers and Kahn Communications reporting a commitment by Sanyo to begin marketing multisystem IC chips in massive amounts. But beneath the surface the battles raged on.

Just before the convention, Leonard Kahn filed a complaint with the FCC accusing the C-Quam system of causing splatter and showed spectrum analyzer photos to back up the allegations. Kahn contends that the C-Quam system was never tested under real broadcast conditions, that is, not past 75 percent modulation beyond 5 kHz, and then only with multitone tests, not the single-tone tests he says are needed to gain type acceptance. He says the C-Quam system violates the FCC's occupied bandwidth rule—the most basic of the Commission's broadcast rules.

The FCC's reply to Kahn, sent just as the convention opened, said that multitone tests were an acceptable way of determining type acceptance and that the Commission was aware that some AM stereo systems may not stay within occupied bandwidth limits when pushed beyond certain conditions.

But Kahn perservered. A second letter asked that the FCC look into all C-Quam licensees and insisted that single-tone tests are needed for type acceptance of AM stereo equipment, and that the occupied bandwidth rules must apply to all transmission systems "under all possible conditions" as stated in the rulebook. Kahn also alleged the submission of false information from one C-Quam licensee he would not publicly name.

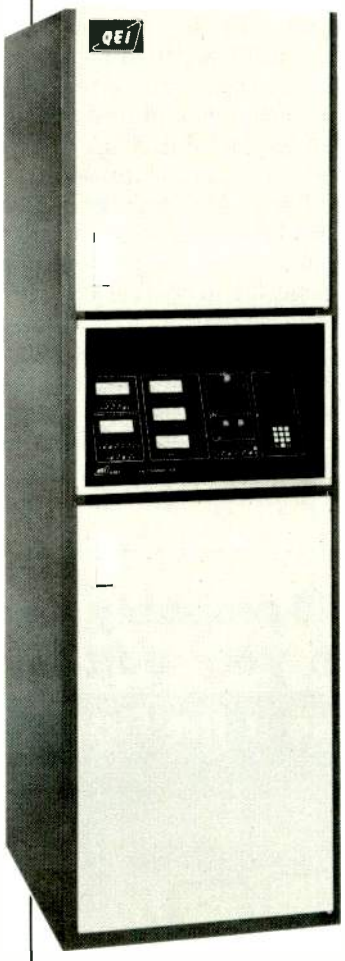
He received another letter from the Commission immediately, saying it would look into all matters pertaining to his complaint.

Where does the entire issue stand now? At press time, the FCC's Office of Science and Technology reported that it had looked at type acceptance submissions by the C-Quam licensee named privately by Kahn and was indeed questioning those submissions. The matter is still being investigated.

On the matter of the splatter alleged by Kahn in his complaint, the Office of Science Technology has said it is engaged in ongoing discussion with the Mass Media Bureau to determine, what constitutes splatter in AM stereo transmission systems. The Office has also said it intends to conduct actual tests, the field, of C-Quam stations to see if Kahn's accusations bear out.

Motorola maintains that the C-Quam system in no way violates occupied bandwidth rules and that Kahn's complaint will amount to nothing. For now, amidst some name-calling and a few "cheap swipes" on both sides, the AM stereo standards war goes on, and on, and on.

QEI OFFERS EVERYTHING YOU EXPECT IN A HIGH TECHNOLOGY FM TRANSMITTER WITHOUT THE HIGH PRICE TAG



With a QEI FM transmitter you won't have to compromise quality to meet your budget.

A one-kilowatt transmitter that is completely solid-state. Higher power models that have only one tube . . . a stable, reliable, efficient grounded grid triode.

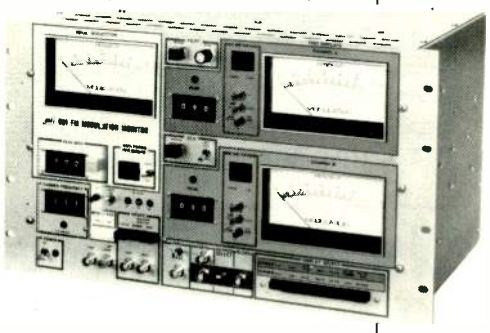
A full remote control system along with microprocessor-based diagnostics built into every transmitter.

A super-low distortion "transparent" exciter with automatic power and modulation control.

Advanced technology at a price you can afford. Why settle for anything else?

For more information contact John Tiedeck at 609-728-2020. He will describe the many features of these unique transmitters.

We make the famous 691 too! A stereo and SCA monitor that can give you accurate readings, even on clipped composite. Over 40 tests performed in minutes on your station, or the competition.



QEI Corporation
One Airport Drive
P.O. Box D
Williamstown, NJ 08094
Phone: 609-728-2020
Telex: 510-686-9402

QEI Corporation

Circle 188 on Reader Service Card

communication at distances exceeding 1000 feet.

Clear-Com has made advancements in receivers as well, exhibiting the TR-62, two channel talent receiver, which uniquely combines two receive channels on a single mic cable. The unit is compatible with many types of headsets and earphones with a preamp that has variable gain and balanced output. It is powered via two channel IFB line, no separate power needed. New for Clear-Com in the IFB department is a standalone system that is completely integrated for the first time. It incorporates a building-block principle allowing modules (four channels each) to accommodate up to 96 people .

RTS, one of the other companies in the forefront of standalone IFB technology, not only brought IFB gear and new lightweight headsets, but also introduced the Model 848 Matrix intercom station. This piece of equipment is the main component of a 24-bus intercom system. Each station in the system can talk to any one or combination of other stations, and all communications are dedicated-line so only the selected receiving station can hear the sending station. The 848 operates in a four-wire, full-duplex mode.

Showing a wireless intercom with added number of stations, Cetec Vega introduced the Q-Plus with up to six belt pack remotes for communication in full duplex, or push-to-talk if desired. HME exhibited both wireless and wired intercom systems, featuring the 700 series cabled system with advances in belt-packs. These stations are switchable for use with dynamic or electret headsets and provide audio limiting.

R-Columbia's announcements in intercoms revealed new, ultra -light headphones with internal amplifier and noise cancelling condenser microphone for improved performance. The convenient device plugs right into the camera unit. In wireless equipment, a new two-channel headphone was introduced with a range of up to 150 yards.

Large-scale intercoms for in-studio use demonstrated the solid return of several of the digital systems. Pesa introduced the SIM-4000, with full microprocessor control, four-wire operation, transformer balanced audio lines, and expandability up to a 32 x 32 matrix (custom matrices can go higher)....McCurdy's CS 9400 digital intercom also made a hit. The system uses an advanced microprocessor architecture and solid state switching to provide instant access to all stations. Keypanel assignments are locally programmable, or can be instituted from a central location. There is full redundancy in group and master microprocessor controllers, and the

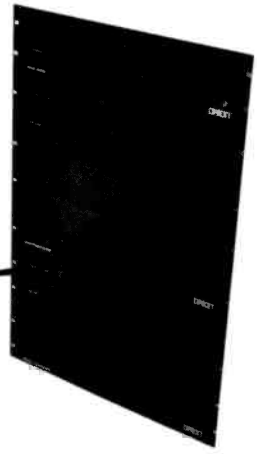
DIVIDE AND CONQUER.

By dividing the two main functions of the audio console (Processing and Control), we've conquered many of the problems inherent in a conventional console.

Separating the analog processing electronics from the all-digital control panel, for example, means a space saving, easy to install system that simplifies wiring and maintenance.

Next, from inputs to outputs (even aux sends, monitors and EQ) we made the AMU completely stereo to meet the rigorous demands found in today's television audio environment.

We didn't stop there, though. We added innovations like SoftMap™, electronic legends, and an interactive information display — features that greatly increase flexibility and speed in console set-up and operation. But we kept a traditional control panel layout so that even a first time operator would feel at home with the AMU.



Then, since the AMU is a true software based mixing system, we included automation in every model, which means on-demand storage, recall, and reset of up to 32 full panel set-ups. Couple that with our plug in serial interface for video editors and audio synchronizers and the possibilities are virtually unlimited.

Finally, like the 'icing on the cake', our advanced design, engineering, and manufacturing techniques have made the AMU surprisingly affordable. So, whether you're in broadcast, production, post, or remote, call us and we'll show you how the Orion AMU can conquer your audio problems.

Call toll-free **1-800-82-AUDIO**.
In Ohio and outside continental USA call 216-267-7700.

ORION™
RESEARCH INC.

4650 W. 160th St. • Cleveland, OH 44135 • TLX: 510-600-0034 • FAX: 216-267-5894

Circle 170 on Reader Service Card

entire system can be custom configured with up to a 480 x 480 matrix....Ward-Beck again showed its diversified Micro Com digital intercom system. Using a distributed form of control, the Micro Com has no central computer but employs microprocessor technology to give local control to each station, preventing a central computer breakdown from turning off the whole system.

FOR MORE INFORMATION

Swintek	704		
Clear-Com	705	Pesa	708
RTS	706	McCurdy	709
R-Columbia	707	Ward-Beck	710

Telco Interface Becomes Production Tool

Broadcast telephones and interfaces have metamorphosed from simple line couplers into the current, versatile systems extenders and transceivers. Now, more than ever, a higher level and broader spectrum of processing is included in these little boxes. Gentner Engineering, for example, introduced the EFT-900 extended-frequency transceiver for handling remotes, sports, and call-in shows. The unit has full-duplex capability, Aphex processing, internal coupler, and built-in mic preamp. Also displayed was the Teleprocessor with a built-in cue switch for muting receiver audio in IFB mode.

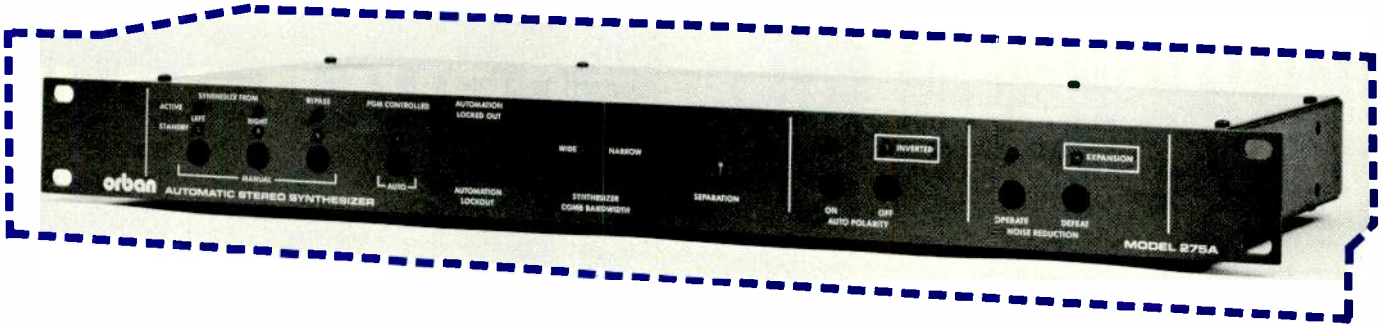
Long a staple of the remote broadcast scene in radio, Comrex frequency extenders expanded their line to include rack mounted decoders and the STLX two-line encoder console. This unit is a complete remote broadcast package when phone lines are chosen as the method of transmission. Offering four mixing channels, the unit provides switchable AGC on all mic channels, four headphone channels for monitoring and intercom, and PA feed out/external monitor in.

More along the lines of in-studio phones and listener call-in systems, Normex introduced the Telnox L-O, with a two-wire/four-wire separator, boasting the ability to handle up to 10 lines per phone console, auto redial, mute, and priority features with threshold adjustment. As an alternative to carts for phone service answering, Bradley Broadcast Sales showed the Telos Systems Echo unit. This digital voice storage/retrieval device has applications in concert, weather, movie, and ski report listener lines. It offers auto disconnect and remote control ability from production studios or newsrooms.

FOR MORE INFORMATION

Gentner	711	Normex	713
Comrex	712	Bradley	714

TV Stereo's Missing Link.



THE NEW ORBAN AUTOMATIC STEREO SYNTHESIZER

For years, Orban's popular 245F Stereo Synthesizer has proven its worth to broadcast professionals by generating compelling, dramatic pseudo-stereo from mono sources.

Now, Orban introduces the new Model 275A **Automatic Stereo Synthesizer**, precisely tailored to the needs of TV broadcasters. The unit will smoothly crossfade between true and synthesized stereo when triggered by internal automatic mono/stereo detection and/or single-channel recognition circuits; upon receipt of local or remote commands; or, upon commands from your automation system, tally, or vertical interval decoder.

Orban's switch-defeatable center-channel mono/stereo recognition circuit is carefully designed to eliminate many of the false-triggering problems of competitive units. However, because it is difficult for any electronic circuitry to distinguish between true mono and hard-center information in "stereo" sources, we offer a rational alternative—single-channel recognition. By recording or feeding mono material to **one track only**, you can use the single-channel recognition to automatically and **reliably** fade in synthesized stereo when this condition is detected. It also remains continuously alert to guard against dead channels.

The 275A employs Orban's patented, allpass-derived, complementary comb filter stereo synthesis technique. It's fully mono-compatible, and its logarithmically-spaced frequency bands avoid the disturbing and unnatural harmonic cancellation problems of delay-line-derived stereo simulators. **Two** synthesis modes are available to assure proper spatial perspective: "Wide" creates a dramatic sound similar to our 245F. The new "Narrow" mode creates a more subtle ambience which properly centers dialog. While the two modes are remote-selectable, "Narrow" can safely and effectively be used with all program material.

Single-ended Noise Reduction can be applied to the synthesized signal to reduce hiss and other noise by about 10dB without "pumping" or "breathing" while preserving low-level ambience and dialog intelligibility. This function is ideal for cleaning up older material and optical soundtracks because no encoding is required.

When not in a stereo mode, the 275A ordinarily routes its inputs directly to its outputs. In this mode ("Bypass") the 275A can detect and correct "out-of-phase" stereo material before your mono audience notices any degradation. Our sophisticated Auto Polarity detection circuitry is highly resistant to "falsing"—even with Dolby MP Matrix® material containing substantial out-of-phase surround information.

The 275A complements Orban's complete audio processing and baseband generation system for stereo TV, and provides the stability, reliability, and superb performance which have made Orban **the choice** for the TV broadcaster who is evolving to meet the needs of the contempory audience.

Contact your local Orban dealer for more information.

Orban Associates Inc.
645 Bryant St. San Francisco, CA 94107
(415) 957-1067 Telex: 17-1480

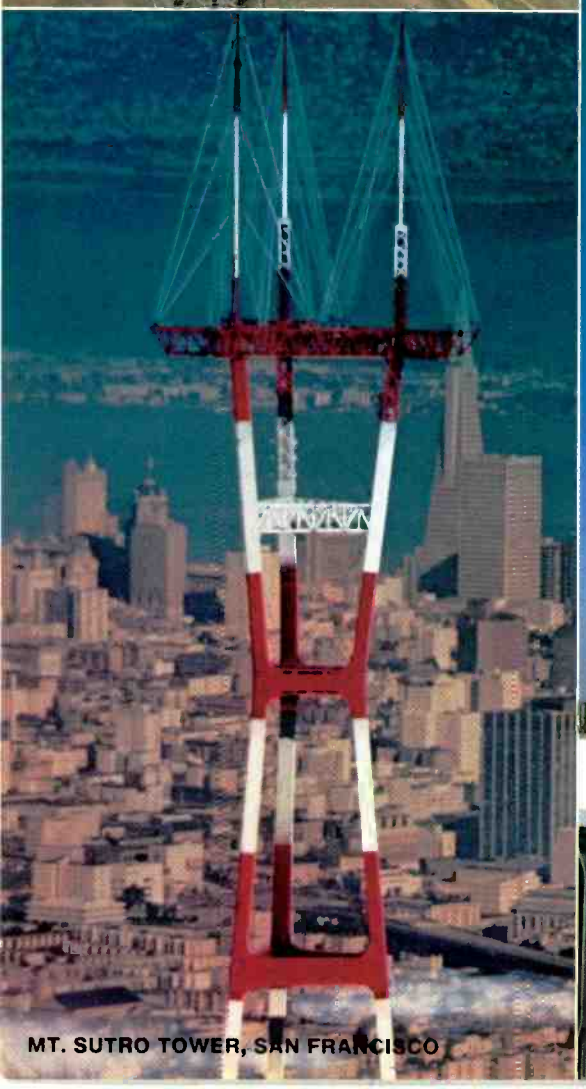
orban

Dolby is a registered trademark of Dolby Laboratories, Inc.

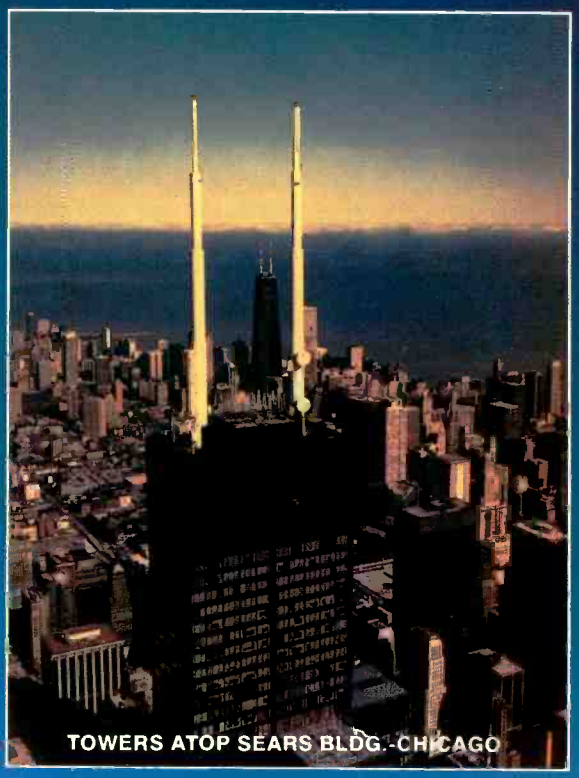
Circle 172 on Reader Service Card

UNMISTAKABLY KLINE TOWERS!
WHO BUT KLINE COULD DO IT?

KHTV-KPRC-TV, HOUSTON



MT. SUTRO TOWER, SAN FRANCISCO



TOWERS ATOP SEARS BLDG.-CHICAGO

ARRAY ATOP THE WORLD TRADE CENTER SUPERSEDING
ARRAY ATOP THE EMPIRE STATE BUILDING

Circle 173 on Reader Service Card

DESIGNED, FABRICATED, and ERECTED BY

KLINE IRON & STEEL CO.

P.O. BOX 1013, COLUMBIA, SOUTH CAROLINA 29202 803/779-7080

TOWERS, OIL DRILLING RIGS,
STRUCTURAL STEEL FOR BUILDINGS AND BRIDGES

TRANS MISSION

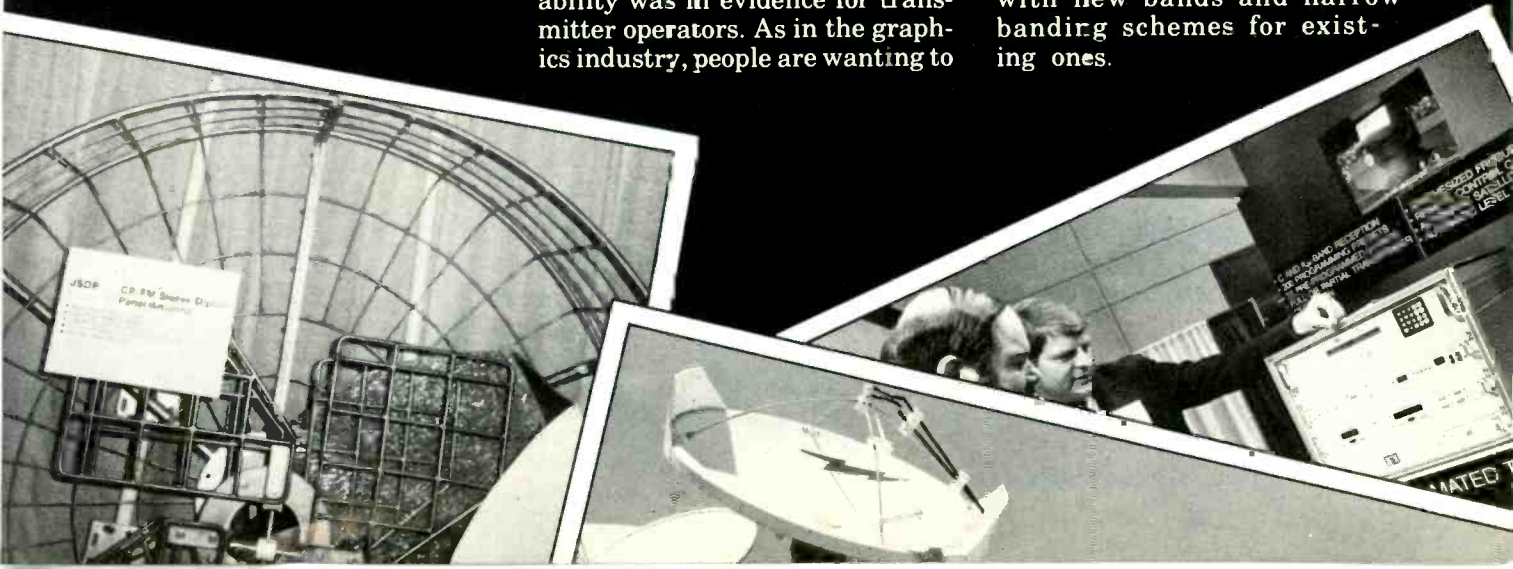
Radio, TV & Sats

The unsung hero of much of the technology that debuted at this year's National Association of Broadcasters convention in Dallas is the microprocessor. This is certainly the case in the move to digital audio and with graphics and special effects for television.

But it is no less true for some of the broadcast industry's less glamorous product introductions. Transmitters new at the show demonstrated increased confidence in high-power solid-state designs. Microprocessor remote-control systems and equipment with greater self-diagnostic capability was in evidence for transmitter operators. As in the graphics industry, people are wanting to use a conventional personal computer for these tasks, and the market is beginning to respond.

In satellite and microwave communications, development is less led by technology than by demand from broadcasters. Saturation of the C-band in satellite news-gathering has switched almost everyone's attention to Ku-band, with a welter of SNG product and service announcements at the NAB.

Microwave STLs are experiencing similar crowding at some of their operational frequencies, to which the FCC and equipment manufacturers are responding with new bands and narrow-banding schemes for existing ones.



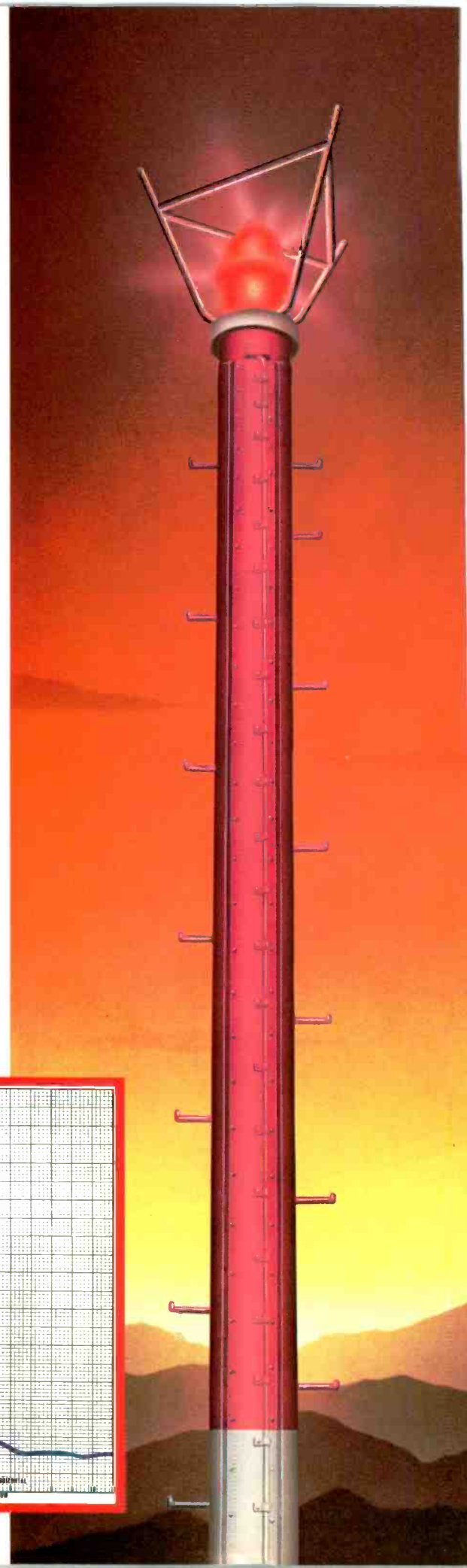
To a company whose name means quality, it was a natural step to take.

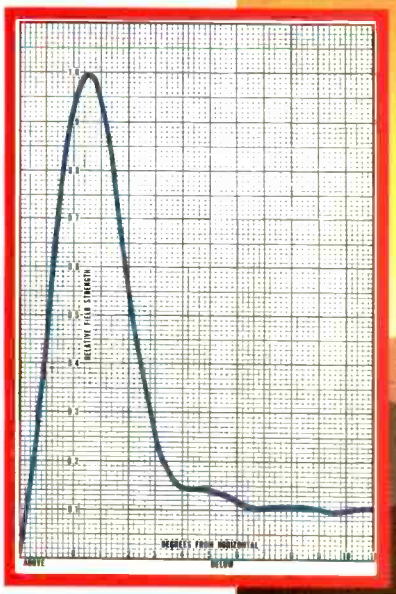
Dielectric Communications is now your single source for complete UHF RF systems due to our recent purchase of RCA's Antenna Division. Dielectric and RCA have had a long-term association, and are both known worldwide for highly reliable broadcasting equipment. It was only natural for Dielectric to begin offering these high quality antennas as part of our already extensive line of UHF components.

Over 600 UHF Pylon Antennas have been shipped from our Gibbsboro, NJ, assembly/test range and are providing years of trouble-free service with minimal maintenance. These ruggedly constructed antennas are designed for low relative windload and weight. All use a single feed point with high power input ratings. They are available in numerous vertical and horizontal pattern combinations to meet a wide range of broadcast coverage requirements.

Other broadcast products manufactured by Dielectric include: coaxial and waveguide diplexers; motorized waveguide and coaxial switches; rigid coax and waveguide transmission line and filter products; and custom RF systems with Magic Tee switching for UHF stations.

Dielectric's reliable equipment is backed by a full range of in-house services from design to field testing. Call us today for free specification brochures— ***1-800-341-9678.***





The Tradition Continues.

DIELECTRIC

GS

Raymond, Maine 04071
(207) 655-4555 • (800) 341-9678
TWX: 710-229-6890

Circle 174 on Reader Service Card

Signals Are Strong from Transmitter Manufacturers

Bullish attitudes found among the majority of transmitter manufacturers at the NAB are due in part to the obvious market opportunity posed by the closure of RCA's broadcast equipment division and, in part, to new technology now coming on-stream.

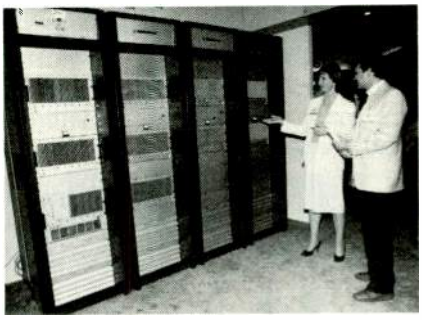
Further justification for transmitter manufacturers' optimism, if it were needed, is given in *BM/E*' s recent survey of stations' transmission equipment buying plans. Of the survey's respondents, the greatest number in any recent *BM/E* poll, 16.4 percent planned to make a main transmitter purchase this year, and 13.7 percent planned to buy exciter equipment.

Down the tubes. The trend away from vacuum tubes as more reliable and higher-power solid-state amplifying components become available continued at this NAB. The biggest surprise in new transmitter technology came from Thomson-LGT, demonstrating its aim to become a major U.S. equipment supplier.

It unveiled a fully solid-state 30 kW VHF transmitter using Thomson Mostek bipolar transistors and a low-capacitance transformer with transient surge protection. This achieves a lifetime claimed to exceed three million hours, according to U.S. regional sales manager, Paul Endelstein.

The transmitter is already for sale in Europe. In the U.S., Thomson expects to work with a major broadcast group to repackage the transmitter to gain FCC type acceptance before sales start later this year. Already, Endelstein reports, several U.S. broadcasters are considering a purchase.

Nautel president, David J. Grace, agrees there is a pronounced trend toward greater solid-state reliability. Interest in his company's 50 kW AM transmitter introduced at the 1985 NAB ran high at this year's show, he says.



Thomson-LGT's 30 kW solid-state VHF transmitter is preparing to take on the American market.

Larcan Communications Equipment showed its new TTC-50LH high-band VHF 50 kW transmitter. Booth interest ran high, according to U.S. sales manager Lew Page, in its features of a 2 kW solid-state driver and microprocessor control. Larcan is currently developing additional software for diagnostic functions, Page reports. Also supporting the trend toward solid-state implementation at Larcan was a new 3 kW aural transmitter for the company's existing 30 kW unit and a 1.2 kW VHF high-band/low-band device.

Skeptical. Transmitter companies, however, remain skeptical about the commercial prospects for fully solid-state equipment in America. For one, power levels of U.S. transmitters are often higher than in Europe or elsewhere, making tried and trusted high-power tubes a safer option in the opinion of some.

In addition, says Larry Cervon, president of Broadcast Electronics, the presence of government-backed broadcast stations abroad with the cash to invest in solid-state equipment affects the issue. The competitive environment here makes it pay to stay with the older technology, says Cervon.

Robert Kolts, product sales manager for Thomson's electron tube division, notes a shift away from solid-state and an increase in tube research in the defense field, a trend that might be felt in the broadcasting field in the future.

Nonetheless, transmitter companies are keeping a close watch on developments. "It's interesting to see the technology's got that far," says Joe Wozniak, national sales manager for Acrodyne Industries. Acrodyne's own announcement for the show was an expansion of its TRL and TRH series of high-power VHF transmitters with high- and low-band models at 20, 30, 40, 50, and 60 kW power levels. The 30 and 50 kW devices use three Thomson tubes. The 40 and 60 kW transmitters are doubled 20 and 30 kW units.

Wozniak estimates 30 VHF transmitters are replaced in the U.S. each year. Conversion to MTS and circular polarized antenna systems will add to the demand, Acrodyne says. Transmitter audio modulation has been broadbanded with improved linearity and flatness of the aural bandpass. The company hopes to claim a quarter of that market, and already reports a couple of likely orders from the show.

UHF advances. UHF transmission at higher power levels with solid-state technology is not yet feasible, although Tomson has hinted that its propriatary transistor technology could be applied here too. Instead, the principal advance reported at this NAB was the long-awaited commercial realization of the Klystrode tube design in a production transmitter from Comark. The Comark design uses a revised version of the Varian Klystrode shown at last year's NAB. The tube used has a power level doubled to 60 kW and has been made compatible with existing EEV and Amperex tube equipment, says Comark Communications' president Nat Ostroff.

Like the high-power solid-state developments in VHF transmis-

sion, the Klystrode transmitter is not regarded as practical by some other manufacturers, although its acceptance is being carefully monitored.

Undeterred, Ostroff expects to see the Klystrode operating in a broadcast tower within nine months. A paper presented by Comark at the NAB engineering conference gave cost of ownership comparisons for a Klystrode transmitter against a conventional klystron design. "The results," says Ostroff, "are quite staggering, indicating a potential savings of about $100,000 in the first five years over the Klystrode's closest rival."

Klystron improvements. The Klystrode is not the only improvement on the way for UHF transmission. EEV reported development work on a gridded klystron tube with a full-time modulation mode pulsing technique for increased efficiency. Another advance reported at the engineering conference that may appear in a product in NABs to come was a multiple depressed collector (MDC) klystron design.

The project has been undertaken by the NAB with sponsorship from Varian Associates and a number of transmitter manufacturers, including Harris and Townsend. According to Townsend's McClure, the company's TA range of transmitters would be "compatible and adaptable" to the MDC designs.

Townsend also plans expansion by acquisition as well as by backing new technologies. Undaunted by its recent setback in attempting to take over first the whole, and then only the transmission operation, of RCA's broadcast equipment division, the company expects to use its financial backing from Avenir Group to strengthen its market foothold.

RCA's Gibbsboro operations, except the antenna side, which was recently sold to Dielectric Communications, are still up for grabs. No RCA Gibbsboro staff were on duty at the NAB, however, and there was no word from other RCA divisions present on the likely future of the broadcast equipment side.

Radio transmitters. New in FM were transmitters from Elcom Bauer, Harris, and Broadcast Electronics. Elcom Bauer showed a 1 kW solid-state transmitter with "Fluorinert" liquid cooling. The company expects to expand its range with 2.5 and 5 kW units using the same technology later in the year, according to president Paul Gregg.

QEI draws KFAI-FM as winner of 695 FM exciter celebrating sales of over 1675 FM exciters.

Harris Corp.'s FM additions were at the 35 kW and 5 kW power levels. The lower power unit, FM-5K1, requires only single-phase AC power, saving broadcasters up to 50 percent of the cost of three-phase installation, Harris claims. The transmitter meets RF power requirements for Class A and reduced-power Class B operation with high antenna heights.

The 35 kW transmitter has built-in self-monitoring and diagnostic capabilities that can maintain power levels during icing and indicate problems on a front panel LED and meter array.

Another new transmitter at the 35 kW power level came from Broadcast Electronics. The company announced it in the form of an updated version of its 30 kW unit, both with single-tube designs. The company also showed its 10 kW FM transmitter. According to Broadcast Electronics president, Larry Cervon, trends toward higher towers with greater transmission line losses and antennas of wideband design and with reduced numbers of radiating elements are the reasoning behind the 35 kW arrivals.

FOR MORE INFORMATION

Thomson-LGT	730	Townsend	735
Nautel	731	Elcom Bauer	
Larcan	732	(FM transmitters)	736
Comark	733	Harris	737
Acrodyne	734	Broadcast Elect	738

Other Transmitters...

NEC America showed its PCN-1400 VHF transmitters in a full range of output powers from 1 to 35 kW, all solid-state up to 10 kW, and, in UHF, NEC exhibited its PCU-900 transmitter series ....Marconi Communications Systems at the Comark booth added the B7536-30 30 kW VHF unit to its 7500 series of high-band transmitters....Thomson-LGT also announced a new single-tube 30 kW VHF transmitter....Philips showed its 60 and 120 kW UHF transmitters with power supply and transmission line equipment, claiming sales of 18 units so far....Television Technology Corp showed its Silverline range of UHF transmitters from 10 to 220 kW.

As well as new FM transmitters, Harris Corp increased the power rating of its FM-3.5K ValuStar transmitter to 4 kW to allow broadcasters to meet coverage requirements more easily.... QEI Corp showed new compact 10 and 15 kW single-tube FM transmitters....Elcom Bauer demonstrated ET, a portable 300 W fully synthesized and broadband FM transmitter as well as solid-state transmitters at 100, 300, and 600 W....CCA Electronics Corp. unveiled a 20 kW two-tube FM transmitter with optional outboard exciter and a new control panel.

Continental Electronics introduced new FM transmitters at 4.3 and 35 kW and a new 500 kW AM-SW unit....CSI Electronics announced the new T-3-F 3.5 kW and 500 W solid-state FM transmitters ....Bernie Wise returned to the RF industry at this NAB with a range of FM transmitters from 40 W to 30 kW from Energy-Onix....AEG-

R-42 diversity receiver • Now with GaAsFET's.

Improved sensitivity and system range, with ultralow noise.

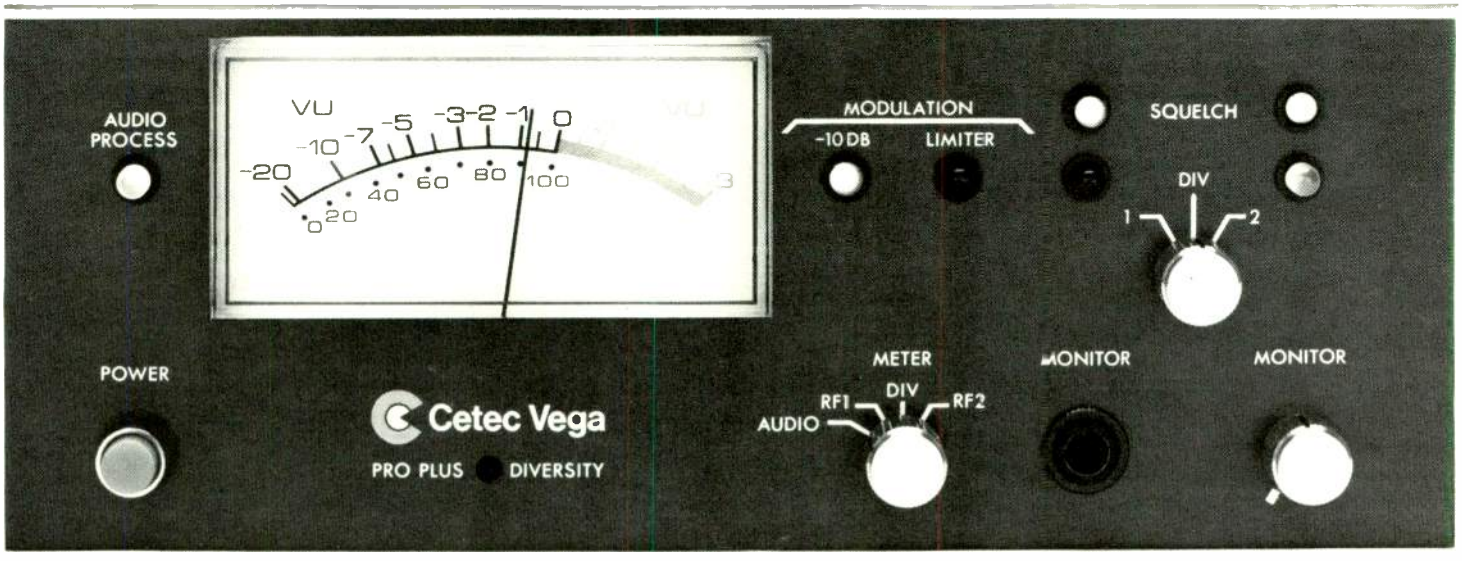
Cetec Vega's top-of-the-line PRO PLUS R-41 and R-42 wireless-microphone receivers have quickly become the worldwide standard of excellence. Overall quality of the PRO PLUS wireless system is equal to wired microphone systems, with respect to dynamic range, signal-to-noise ratio, distortion, etc. *We invite your comparisons.* Check these features of the new, improved PRO PLUS receivers:

- **GaAsFET front end.** Provides the highest achievable sensitivity for maximum system range. Also incorporates a high-performance helical filter.
- **Lowest distortion.** 0.25% maximum, 0.15% typical.
- **Measurably the highest signal-to-noise ratio and widest dynamic range.** Quiet as a wire. With DYNEX II (a new standard in audio processing), SNR is 101 dB (108 dB A-weighted). System dynamic range is 133 dB including transmitter adjustment range, from input for maximum nondistorting gain compression to noise floor.
- **"Infinite gain" receiver.** Improved performance in the critical threshold region, superior handling of multipath conditions, better SNR, and constant receiver audio output level.
- **Professional audio circuits.** Output is adjustable from +20 dBm to -60 dBm in four ranges. Also featured are selectable phasing and 0.2-watt independent headphone amplifier.
- **True dual-receiver diversity.** The R-42 diversity system is the most reliable method to avoid dropouts. The R-41 nondiversity receiver has all of the other features of the R-42.

PRO PLUS wireless-microphone systems achieve the highest performance possible with today's advanced technology.

Write or call for further information and location of your nearest dealer: Cetec Vega, P.O. Box 5348, El Monte, CA 91734. (818) 442-0782.

The best wireless gets even better.



Cetec Vega
...the professional's wireless

Circle 175 on Reader Service Card

Bayly showed its line of FM transmitters at 500 W, 1 kW,and 1.5 kW power levels....LEA Dynatech showed its line of transmitter protection equipment, and now plans to introduce its "Total Facility Protection Concept," integrating clean line electronic filter and surge and transient eliminators for primary protection outside a broadcast facility.

Other exciters and amplifiers. Emcee Broadcast Products announced the TSA100GA 100 W S-band amplifier and the TTU-100SR 100 W solid-state UHF transmitter-translator as well as new stereo modulation and cooling features in its 5 kW translator and a 10 W GaAs FET 2.5-2.7 GHz TV repeater....Acrian described a 120 W addition to its UHF amplifier module range.... Micro Communications displayed new MTS UHF TV diplexers and UHF switchless combiners as well as a new version of its VHF combiner.

Richardson Electronics showed its "Doomsday" RF power amplifiers, RF445UR and RF6100-UREDC....Philips described new VHF TV and FM power amplifiers with broadband input circuitry with new cavities to allow operation without tuning....ITS Corp announced the ITS-10 and ITS-15 VHF exciter-modulators intended to drive established RCA transmitters as well as a new VHF ICPM corrector for low-level precorrection of visual signals in RCA equipment.... Delta Electronics announced an improved ASE-1 C-Quam AM stereo exciter and ASM-1 modulation monitor.... Elcom Bauer showed the 690B and 6020 FM exciters.

More tubes. Thomson's electron tube division announced a 200 W addition to its TWT amplifier line as well as showing its tetrode range....Amperex showed its line of klystrons and tetrodes.... Varian Associates showed klystron designs for TV and satellite transmission as well as the Klystrode and other cavities.... EEV Broadcast Tubes offered a range of wideband UHF TV klystrons from 5 to 60 kW.

Remote control systems.

Comark shows 60 kW Klystrode transmitter—a first.

Gentner RF Products Division announced what it described as the world's first broadcast transmitter remote control system designed to function on a dial telephone system. Gentner says the adoption of the FCC's docket 84-110 releases the remote control industry from "the unrealistic requirements previously in force." The product, designated VCR-1000, uses synthesized voice or digital data to report transmitter site parameters and alarms to multiple locations....Moseley Associates also moved into standard telephone communication with the announcement of a dial-up option for its MRC-2 remote control system. Firmware allows control terminals to dial up remote terminals to a user-selected schedule....TFT updated its 7600 series by announcing its new 8610 series digital remote control system providing ten channels each of raise, lower, telemetry, and status monitoring, expandable to a total system capacity of 70 channels....Harris expanded its line of Sentinel remote control systems with the low-cost Sentinel 16 unit....CAT Systems reported high levels of interest in PC-controlled remote sites. Its new product in the area was the CAT9200 multisite remote control system built around the IBM PC and having 16 telemetry and 16 status inputs.... Nurad exhibited its established range of microwave remote control systems and accessories.

FOR MORE INFORMATION

NEC America	740		
Marconi Communications Systems	741	Richardson Elect	754
Philips	742	Philips	755
Television Tech.	743	ITS	756
QEI	744	Delta Electronics	757
CCA Electronics	745	Elcom Bauer	758
Continental Elect	746	Thomson ETD	759
CSI Electronics	747	Amperex	760
Energy-Onix	748	Varian	761
AEG-Bayly	749	EEV	762
LEA Dynatech	750	Gentner RF	763
Emcee Broadcast	751	Moseley	764
Acrian	752	TFT	765
Micro Comm	753	Harris	766
		CAT Systems	767
		Nurad	768

RF Rulings Buoy Antenna Industry

Corporate takeovers rather than product announcements made much of the NAB news in the antenna industry. Dielectric Communications has now completed its purchase of RCA's broadcast antenna business (*BM/E*, March 1986, p. 18). Dielectric describes the acquisition as providing "a logical, long-term growth opportunity. We are in a position to supply total systems, from RF output to the antenna."

On the technology front, the new RF radiation requirements from ANSI are leading to new antenna development approaches. The business is becoming one of systems design as opposed to just selling antennas, notes Gary Hatch, president of Antenna Technology Corp.

Circular polarization. Another technology trend is noted by O. Ben-Dov, Dielectric's manager of advanced development and special programs. After specializing in VHF circular polarized antenna design during his 16 years at RCA, he now says: "Acceptance of this new technology is now firm and growing." With the acquisition of RCA, Dielectric claims 64 percent of the U.S. CP antenna market. Just in the year since the 1985 NAB, says Ben-Dov, the number of VHF CP antennas in the field has increased from around a dozen to 60.

Dielectric Communications' ac-

Scientific Atlanta

THE ONLY FULL LINEUP THAT COVERS ALL THE BASES.

SCIENTIFIC-ATLANTA MAKES COMMUNICATION SYSTEMS TURNKEY AND TROUBLE FREE.

The need for reliable and trouble free systems for video, audio and data satellite transmission increases everyday. To meet this need, Scientific-Atlanta offers the most comprehensive line and has become one of the largest suppliers of high quality satellite products in the world.

Whether uplink or downlink, our earth stations are complete, offering: antennas, exciters, receivers, low-noise amplifiers, switching equipment, power amplifiers, plus every accessory.

Ku-Band electronics are now available with the same standard of performance that Scientific-Atlanta has set in its C-Band electronics. And, data communication is available from 56 Kb/s to T-1.

TURNKEY SYSTEM APPROACH.

Scientific-Atlanta can design and install a complete system. Or, we can provide specific components to stand alone or integrate perfectly with an existing system. Such flexibility results in cost-effectiveness because you choose only the features you need. And, once specified, you receive prompt system assembly and shipment.

SINGLE-SOURCE MANUFACTURER.

Scientific-Atlanta is in a unique position to offer responsive and continuous after-sales support. From comprehensive training programs to the fastest possible turnaround for maintenance, replacement parts and repairs.

Our full line of trouble-free products, turnkey system approach, flexibility and responsive customer service have gained the confidence of operators worldwide. That's the reason we've supplied more large earth stations than any other manufacturer in the world.

Scientific-Atlanta has been the leader in earth station technology, sales and performance from the beginning. For more information call Dan Landreth at (404) 449-2844. Or, send in the coupon below.

I want to know more about the Scientific-Atlanta full lineup of products.

Name_____

Company_____

Title_____

Address_____

City_____ State_____

Zip_____ Phone ( )_____

☐ Have a sales representative contact me

BM/E 6 86

Mail to: Scientific-Atlanta, Department AR, P.O. Box 105027, Atlanta, GA 30348

Circle 176 on Reader Service Card

Andrew Corp.'s booth displayed a range of antennas for SNG as well as regular broadcast use.

quisition of RCA's antenna center was not the only business move. In another takeover, Jampro Antennas made a surprise return to the broadcast industry with the purchase of Cetec Antenna from its parent corporation just a week before the NAB. Jampro has also been a leader in the development of CP antennas for both FM and TV broadcasting. The company will continue worldwide distribution of Cetec antennas and is retaining the same management.

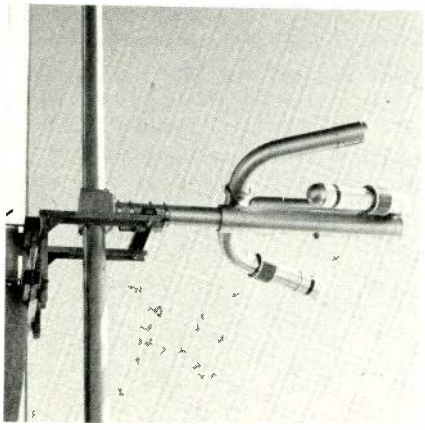
Jampro president James Olver sees the FCC's requirement that broadcasters comply with the ANSI RF radiation guidelines as a market opportunity. The company says its CP cupped spiral dipole broadband antennas require less tower space and give a broader main beam in the elevation plane, as well as providing the necessary reduction in low-angle radiation.

Meeting ANSI. Shively Laboratories announced a half-wave spaced antenna, also to reduce downward radiation to meet the ANSI standard, as well as a vertically polarized FM antenna to reduce channel 6 interference. The company's engineers also delivered a paper on combining networks for FM multiplexing, based on experience with branched and balanced bandpass filter systems. "People are taking a lot more sophisticated look at over and above the hardware as to what service and guarantees a manufacturer can provide," notes Charles Peabody, Shively's vice president of marketing.

Another CP antenna announcement came from Harris Corp. The company says its Skygain antenna's inherently low 90-degree downward radiation helps meet the new RF requirements. Horizontal circularity is typically ±2 dB when the antenna is pole-mounted for uniform signal coverage, with 5 MHz bandwidth per FM channel.

FOR MORE INFORMATION

Dielectric	770		
Antenna Tech	771	Shively Labs	773
Jampro/Cetec	772	Harris	774



Harris's circularly polarized FM Skygain antenna.

Other Antenna and RF Announcements on the NAB Floor...

Andrew Corp announced field installations of its Trasar CP VHF traveling-wave antennas as well as showing its Trasar UHF specifications....SWR demonstrated its Clarion high-power UHF waveguide antenna capability....Bogner Broadcast Equipment announced upgrades of its low-power antennas to 30 kW and greater radiation pattern availability to meet RF limits.

Conifer Corp (Comex) described a low-cost six-foot ITFS antenna with eight- and ten-foot versions to come.... LeBlanc and Dick demonstrated its custom antenna systems design capability....Tower companies, among them Stainless, Transmission Structures, Central, Fort Worth, Utility, and Allied, reported increased interest at this NAB, in part due to Docket 80/90 considerations....Flash Technology Corp said that reduced FAA beacon intensity requirements would boost its business and cut power consumption for antenna operators.

Dataworld offered a new FM interference study program, FMinter, designed to determine possible contour overlaps between existing and planned facilities as well as its FMTV6 program to predict interference areas to channel 6 reception....Holaday Industries offered its HI-5000-SX RF exposure measurement system with a new data logger feature to compute ANSI six-minute RF averages....Hipotronics showed its Peschel automatic voltage regulator.

FOR MORE INFORMATION

Andrew	776	Central Tower	783
SWR	777	Fort Worth Tower	784
Bogner	778	Utility Tower	785
Conifer/Comex	779	Allied Tower	786
LeBlanc and Dick	780	Flash Tech	787
Stainless	781	Dataworld	788
Transmission Structures	782	Holaday	789
		Hipotronics	790

New Techniques, Frequencies Relieve Crowding

Too much traffic in the existing bands and availability of new bands of the microwave spectrum for studio-transmitter link use has stimulated manufacturers to pursue two development routes. All of this was apparent at NAB '86.

Some are bringing out new links

YOU TALKED AND WE LISTENED

The **Centro** SNG Networker is the result of extensive research into your network news requirements.

- ☑ Vehicle chassis and suspension engineered to carry heavy SNG components.
- ☑ Unparralleled **Centro** quality in an attractive affordable package.
- ☑ Available in a rugged standard package with many options for your specific requirements.
- ☑ 2.3 meter dish with 49.5 Dbi gain and selectable-adjustable vertical and horizontal polarization from inside the vehicle.
- ☑ Three year unlimited mileage, limited chassis warranty and serviceable in over 4,500 locations throughout the United States.
- ☑ Engineered, designed and constructed to meet your most demanding SNG requirements.

Call us today and compare our services and prices.

Centro

CENTRO CORPORATION
9516 CHESAPEAKE DRIVE
SAN DIEGO, CALIFORNIA 92123

(619) 560-1578

See the Networker at RTNDA Booth #319

Circle 177 on Reader Service Card

HIGH EFFICIENCY UHF KLYSTRONS FOR NEW EQUIPMENT OR RETROFITTING

Whether you're installing a new transmitter or upgrading an existing transmitter, specify Amperex UHF klystrons with Annular Beam Control for best performance and economy.

Amperex klystrons:

- **Have efficiencies in excess of 65%.**
- **Cover the entire UHF band from 470MHz to 860MHz with a single tube.**
- **Have choices of output power up to 64kW.**
- **Have long life expectancy.**
- **Are easy to retrofit into existing equipment...and, have low replacement cost.**

Easy Retrofitting and Low Replacement Cost

The rugged simplicity of our design and assembly also makes it simple to upgrade an existing transmitter. Recently a UHF TV station, using its own engineering staff, was able to retrofit its output amplifier with an Amperex klystron and cavity within 72 hours*.

Amperex klystrons use external cavities. When a tube replacement is required only the tube is replaced. This can reduce costs by at least 40% when compared to internal cavity klystrons.

Rugged and Reliable Construction

With more than three decades of klystron manufacturing experience we have kept the broadcaster in mind by having a rugged mechanical design. By using alumina ceramic-to-metal seals we completely eliminate the use of toxic beryllium oxide. This advanced sealing technique has shown that it also adds significantly to the life of Amperex klystrons. User records show that the average lifetime of Amperex UHF klystrons exceed 32,000 hours with peak lifetimes recorded in excess of 80,000.

Reduce Cooling Costs

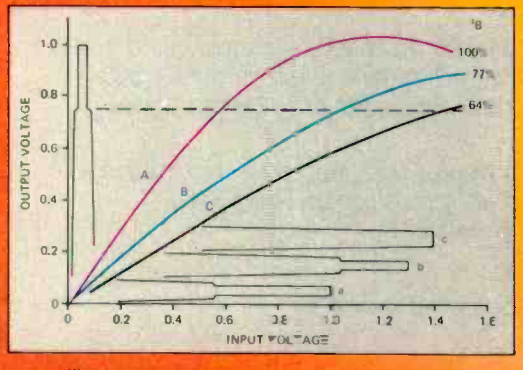
In addition to reducing your power consumption costs, with efficiencies in excess of 65%, Amperex klystrons are available with cooling systems designed to lower your operating costs further. You now have a choice of proven cooling modes using either vapor cooling, vapor condensation or water cooling with the same tube. With our more efficient collector design your water cooling costs can be reduced substantially.

*Station name supplied on request.

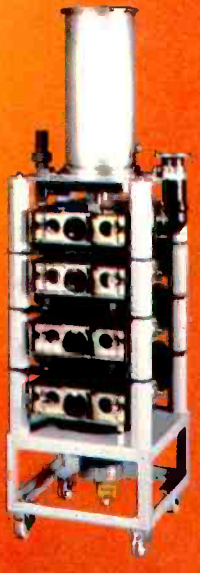
KLYSTRON HOTLINE

800-227-1613

Whether you're thinking of a new installation or retrofitting, call Peter Fochi, Power Tube and Rectifier Product Manager, at the above toll free number for information on improving your on-the-air performance and reducing your operating costs.



Klystron output voltage versus input voltage (relative values)



SEE US AT THE NAB SHOW
BOOTH #2600

Amperex® Electronic Corporation

A NORTH AMERICAN PHILIPS COMPANY

230 Duffy Avenue, Hicksville, NY 11802

Phone: 516/931-6200 TWX: 510/221-1833 WATTS: 1-800-227-1613

Circle 178 on Reader Service Card

for use at the 18 and 23 GHz bands recently approved by the FCC. Others are narrowbanding signals to squeeze additional life from the existing lower frequency bands, which are often saturated, especially in densely populated areas.

The lower frequency bands, at 950 MHz, 7, and 13 GHz, retain an advantage over the newly approved higher frequencies in that they experience less signal attenuation by adverse weather conditions and hence have greater transmission ranges. They also benefit by the greater range of equipment already on the market.

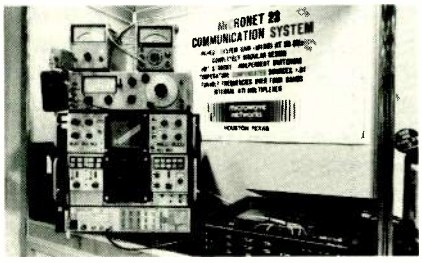
Recent technological developments and regulatory issues in microwave transmission, and the resulting options facing broadcasters in deciding which bands best suit their STL needs, will be addressed in more detail in a feature article in next month's *BM/E*.

Twenty-three today. In Dallas, several companies announced microwave links in the 23 GHz band. Harris Broadcast Microwave claimed the first 23 GHz microwave link to meet RS-250B standards for short-haul television signal relay with its Microstar 23 unit. The 23 GHz radio is made by Microwave Networks for Harris under the terms of a five-year exclusive marketing agreement between the two companies. The link joins the Harris 2, 7, and 13 GHz STLs. The modular design of the Microstar 23 allows units to be configured for simplex or duplex operation in unprotected or hot-standby modes, according to Harris.

Another new 23 GHz link came from M/A-Com MAC. It claims up to a 15-mile range and a dynamic range up to 110 dB. The MA-23 uses the dbx 700 digital audio processor to achieve this broadcast quality improvement for premium sound for major market stations. For other AM and FM stations, M/A-Com has configured a second system, using the Sony PCM701ES processor to give a 90 dB dynamic range without companding.

The MA-23 STL was designed for video transmission but is being used increasingly for audio with a stereo separation of better than 80 dB, says Erik Stromsted, manager of M/A-Com MAC's OEM and dealer sales.

Motorola also introduced a 23 GHz STL at this NAB. Its Starpoint 23 HPV FM video microwave radio is claimed to attain a ten-mile range in ideal conditions.



Microwave Networks was one of several companies unveiling STL equipment at the new 23 GHz band.

Rain attenuation. Other STL manufacturers are choosing not to announce 23 GHz links at this time. For cost and transmission distance limitations, says M.E. McClanahan, vice president at Marti Electronics, the existing 950 MHz band remains preferable. Higher frequency STLs, like Ku-band satellite systems, can be rendered effectively useless over longer ranges in adverse weather conditions. Nurad's Stephen Neuberth was also skeptical about the usefulness of the high-frequency STL bands. Nurad showed its existing microwave line at the lower frequencies as well as its ENG and remote control equipment.

Marti's narrow-band single channel per carrier STL system claims to be able to more than double the number of STL channels in this aural band. The system, designated STL-10, gained type authorization a month before the NAB, says McClanahan. It uses 75 kHz for AM mono, 175 kHz for AM stereo, 150 kHz for FM mono, and 250 kHz for FM stereo. The noise, distortion, response and channel separation is better than most 500 kHz channel systems, Marti claims. For FM operation a signal-to-noise ratio of 75 dB is achieved, with 72 dB for AM.

Moseley Associates is upgrading its PCL606 950 MHz band STL in response to the FCC's allowing stacking of narrower bands. Its new spectrum efficient 606SEC model carries 300 kHz channels in place of 500 kHz. According to Glenn Sanderson, Moseley's manager of RF engineering, the SEC link should gain type acceptance within three months.

Patrick Bradbury, vice president of sales and marketing for RF Technology, feels there are too many products catering to the 23 GHz band. RF Technology is continuing to manufacture its Series 700 and 1300 transmitters and receivers for the 7 and 13 GHz bands. In addition, there was new at the NAB data on a redesigned product line of 950 MHz wireless microphones.

FOR MORE INFORMATION

Harris 791	
M/A-Com MAC 792	Nurad 795
Motorola 793	Moseley Assoc 796
Marti Elect 794	RF Tech 797

Microwave and Miscellaneous Transmission Equipment...

TFT introduced the model 8303 composite STL receiver to accommodate a mono STL user between two existing composite STL channnels. The 8303 is optimized to work at 250 kHz spacing ....Rockwell International announced a 12 GHz narrowband microwave video relay system, mainly for cable TV relay....Micro Controls showed its wideband composite and a narrowband single and dual 950 MHz STL as well as its AM stereo STL and 950 MHz repeater....Ikegami announced a portable mini microwave link operating in bands B through E to complement its series of compact links....Itelco introduced its VL02FM video link, a lightweight unit allowing one cameraman to transmit one video and one audio signal to the studio.

Fiberoptic transmission. Catel showed its multichannel FM fiberoptic system for video, audio, and data for broadband transmission applications, giving repeaterless operation over 25 miles for up

Transmission

to 16 channels per fiber. The company also showed an FM stereo modulator and a color TV modulator....Artel described its fiberoptic transmission capability with a new duplex data system and an expansion of its SL3000 video fiberoptic product line as well as introducing a slimline 3270 multiplexer.

Leaming Industries showed its 813 SCPC program audio transmission system for terrestrial and satellite communications networks....Grass Valley Group announced preliminary data on its new model 4400 digital audio transmission system intended for use with standard telephone or fiberoptic systems, for which it is currently scheduling field trials.

FOR MORE INFORMATION

TFT	800	Catel	805
Rockwell	801	Artel	806
Micro Controls	802	Leaming Industries	807
Ikegami	803	Grass Valley	808
Itelco	804		

Satellite Equipment: Selling Space and Time in Dallas

Satellite news-gathering was undoubtedly one of the boom areas of this NAB. There is so much rapid growth in satellite transmitters for SNG, receivers, and satellite network services that it is hard to believe that some degree of shakeout won't hit the industry in the near future.

Most broadcast satellite equipment companies at the show agree that such a shakeout is bound to come sooner or later. Some companies will go bust after the boom, but for the moment, at least, they are saying that there are two or three years more expansion to be enjoyed before then.

Satellite services. A variety of satellite syndication and news-gathering services, national, international, and local as well as full- and part-time, made ground at the NAB. Cooperative SNG arrangements among affiliates of a network are most organized at NBC, and ABC has also announced plans for some SNG coordination. CBS is still discussing the idea, but will follow suit soon, according to John Frazee, news service executive producer for the network.

Among the new SNG services unveiled in Dallas was RCA Americom's offering of its Satcom K-2 transponder space. Announcing the service, Americom's president said: "The combination of Satcom K-2 and its existing network of earth stations for the first time allows the nation's television news desks an almost unlimited source of material from around the country." He pointed out that the service's Ku-band signals could be transmitted and received even in metropolitan areas of heavy microwave congestion.

News, programs, and commercials. Turner Broadcasting's Cable News Network will use the K-2 bird in launching what it calls the first full-service Ku-band satellite news-gathering operation, Newsbeam. Paul Amos, vice-president of headline news at CNN, says: "We think many stations will subscribe to more than one SNG service."

Brightstar Communications, meanwhile, is using the RCA K-2 bird for its television program and commercial syndication service, announced at the NAB. Its Syndistar system uses one K-2 transponder currently, with an option on a second.

The service gained its first customers last month with two programs from Gaylord scheduled to begin syndication in the fall. The

COMPLETE MICROWAVE SYSTEMS

CENTRAL ENG/EJ RECEIVE SYSTEMS

HELICOPTER ENG/EJ SYSTEMS

REMOTE TRANSMIT SYSTEMS

PORTABLE MICROWAVE SYSTEMS

Complete microwave systems for ENG/EJ live news coverage and STL/ICR applications. All manufactured by Nurad. All protected by our two year warranty.

NURAD

2165 Druid Park Drive Baltimore, MD 21211 Telephone (301)462-1700 TWX/Telex (710)234-1071

Circle 180 on Reader Service Card

programs will be the first to be distributed nationally by Ku-band satellite, says Brightstar.

Syndistar will also transmit programs outside the U.S., making use of Brightstar's Intelsat transponder allocation. In addition to the Ku-band service on K-2, the company offers a supplementary C-band service.

GTE Spacenet showed its News Express SNG service introduced at the last NAB. The occasional-use Ku-band service uses satellite telephone circuits on a separate transponder for direct communications link. News Express currently uses two hybrid C/Ku Spacenet birds and two Ku-band G-star satellites. Additional launches of both types are planned for the next year, says GTE.

New from GTE was a Turnaround Service to convert Ku- and C-band signals for downlink to otherwise incompatible earth stations. Signal conversion takes place at GTE's Woodbine, MD., earth station. The introduction is well timed to meet the rising SNG demand. According to Michael Caffarel, GTE Spacenet's industry services marketing director, stations "can expand the use of existing C-band earth stations by picking up feeds from a Ku-band transportable truck, which might be part of another network, station, or affiliate group." Smaller stations could use the service to cover events that would have been too expensive with transportable equipment, he adds.

The new services will find themselves in competition with Conus Communications. Conus has recently expanded its news center master control in Minneapolis to cope with the ever rising demand for SNG, allowing the company to monitor more satellites, effectively doubling its capacity for its present 34 member stations, according to Conus president Charles Dutcher.

Also in the SNG service marketplace were AT&T, Comsat General, and occasional-use local service vendors, Central Florida Teleport, using the RCA K-2 and its MC Ku master control and South Star Communcations, also based in Florida.

More portability. Comsat General's Skybridge service marks an expansion from its existing commitment to NBC. Comsat is also enhancing NBC's SNG involvement by providing 50 portable uplink packages to add transmit capabilities to sites that can currently only receive satellite signals.

Greater mobility was certainly an important factor contributing to the appeal of SNG equipment at this NAB. There was confusion in some areas of the new technology, however, with potential buyers unsure of the legality and efficacy of some of the smaller uplink

From fast-breaking news to on-location events, SkyBridge™ puts you on the air in minutes.

Nothing can land your story on the air faster.

News and special events don't always pick convenient places to happen. But somehow you have to get to those places, set up, and be on the air fast.

With COMSAT General's SkyBridge you can. SkyBridge is a transportable satellite broadcast service that enables you to transmit to your studio facility from remote locations anywhere in the continental U.S.

Live material can be transmitted instantly. Stories can be edited on the spot and then transmitted on the spot.

You can't do things any faster.

It puts your station in the driver's seat.

The cornerstone of SkyBridge is a compact, self-contained satellite broadcast vehicle. Its 2.4 meter antenna can be operated from inside the vehicle and folds down onto the top of the van when not in use. And since SkyBridge provides you with Ku-band satellite time, you can transmit from remote locations or the middle of a city regardless of the distance back to your studio. Wherever events are happening, you'll be there with SkyBridge.

For a very reasonable monthly lease, SkyBridge puts your station in the driver's seat.

For complete details on SkyBridge, call Judy Blake at (202) 863-7326.

COMSAT GENERAL CORPORATION
950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Circle 182 on Reader Service Card

dishes and disarray among the networks and their affiliates as to whose equipment was to be supported.

Comsat was only one of several companies with portable uplink announcements. The Comsat uplinks are actually manufactured by Harris Corp's Satellite Communications Division. The unit breaks down into six boxes, including the 1.8 meter antenna, with no box weighing more than 70 lbs., allowing them as checkable baggage on airlines.

Modulation Associates introduced its KU02 portable uplink, designed for 1.2 or 1.8 meter antennas. The unit has multichannel SCPC capability and packs into just three cases for air transportation, according to D.H. Haight, the company's president. Stereo, IFB, private, and digital data channels are available as options.

Midwest unveiled a range of transportable SNG equipment for vehicles of different sizes and for different applications. Principal among these were the S-18 and S-24 vans. The former uses a 1.8 meter antenna with dual redundant RF, including two phase-combined 200 W TWTs and a military-grade power supply for greater reliability.

The S-24 is a surprise addition to the range, a slightly smaller but more roomy version of the S-25 SNG van intended for the more elaborate on-location work with its own editing and microwave communication links. Here, too, improvements have been made to reduce the unwieldy and unreliable nature of RF equipment with an improved power supply from Harris and a new plate-mounted phase-combined system with 200 W TWTs as in the S-18.

Dalsat introduced its new SNV-6 satellite news van, a 10,000 lb vehicle with a 1.8 meter antenna. Now the company plans to unveil its big sister at the RTNDA in August. This will be the SNV-8, a 15,000 lb van with many shared features of the SNV-6 but with a 2.3 meter Andrew antenna with offset feed.

Flyaway combo. The Rover Flyaway SNG terminal introduced by Spectra Communications is also a Ku-band device with a 1.8 meter antenna. The same portable uplink has been incorporated by Spectra Communications and L.B. Telesystems into an Iveco 14,000 lb truck and into a Ford Econoline van, both new at this NAB.

The truck has its own 2.4 meter antenna,and the van has its own 1.8 meter antenna. Ordered as a combination, the truck and flyaway can share the same transmitting hardware. This combination package is proving of interest to stations that had come to the NAB just looking for the van, says

TTC

ANNOUNCES THE NEW
TTC WILKINSON MODEL X FM EXCITER

FOR A SOUND THAT SOARS ABOVE AND BEYOND

UNSURPASSED PERFORMANCE GIVES YOUR STATION A CLEARER, SHARPER, MORE POWERFUL SIGNAL.

New technology, high performance. TTC Wilkinson introduces the Model X FM Exciter. It achieves breakthrough performance to meet the challenge of digital audio broadcasting and multiple subcarrier opportunities.

Unparalleled loudness and clarity for a "Stand Out" sound. Flat frequency response and low distortion make the Model X virtually transparent. The result is outstanding signal integrity and clarity. Meticulous AFC design radically reduces modulation-robbing baseline shift. And broadband circuitry eliminates the need for any tweaking and tuning.

Digital audio compatibility. Now that compact discs, digital STL's, and other forms of digital audio are becoming commonplace, new performance capabilities are needed from exciters. Model X provides the ideal frequency response, distortion, and signal-to-noise characteristics to achieve superior digital audio reproduction.

Multiple subcarrier capacity. Since the FCC decision allowing multiple subcarriers, broadcasters have needed an exciter with enhanced capabilities. Model X is designed to handle up to five subcarriers with absolutely no loss in quality.

Unprecedented five-year warranty. With quality that truly excels, TTC offers Model X with the industry's only five-year warranty.

For a sound that soars... call or write us today for a free brochure about the new Model X Exciter:

Television Technology Corporation
Wilkinson Radio Division
2360 Industrial Lane
Broomfield, CO 80020 (303) 465-4141
TWX: 910-938-0396 TTC ARDA

TTC WILKINSON

Circle 134 on Reader Service Card

The Wait is Over!

IKEGAMI UNVEILS THE 2/3" FIELD/STUDIO CAMERA STANDARD

When Ikegami engineered the all new HK-323 field/studio camera, their first priority was to make this advanced technology camera available to all preferences.

The result: the HK-323 1" and the HK-323 ⅔"–two tube sizes to meet the broadest range of preference, application or budget.

Like the 1", the HK-323 ⅔" features self-contained operation, numerous auto set-ups in any mode, a built-in encoder and sync generator, high performance prism optics, self-diagnostic functions, a control panel that connects directly to the camera head, a S/N ratio of 60dB and more–all in a camera weighing only 55 lbs.

The HK-323 ⅔" is equipped with a 7" viewfinder featuring pan and tilt, and special functions that include Chroma Aperture for sharpest picture quality regardless of color or lighting; Highlight Compression Circuitry for broadest contrast range; Soft Detail to eliminate harsh or overwhelming presence; Auto Beam Control, and more.

A companion hand-held camera is also available, and is operational off the same base station.

Optional remote control is available in: triax, multicore and fiber optics.

Compare the HK-323 ⅔" to any camera in its class and find out why the lightest field/studio camera is also the biggest value.

Ikegami®

Ikegami Electronics (USA), Inc. 37 Brook Avenue Maywood, NJ 07607

East Coast: (201) 368-9171 West Coast: (213) 534-0050 Southeast: (813) 884-2046
Southwest: (214) 233-2844 Midwest: (312) 834-9774

Circle 185 on Reader Service Card

Spectra Communications' president, Vince Walisko.

Hubcom showed a Ku-band Video Flight Pack with a 1.8 or 2.2 meter antenna transportable in eight cases and with a total system weight of 450 lbs. Another innovation aimed at bringing greater transportability to SNG equipment was the company's new "Low boy" Ford E-350 van. The van is designed for rapid deployment and C130 aircraft cargo transport.

Microdyne debuted its MAT automated terminal for advance program scheduling for satellite transmission using either C- or Ku-band birds. The MAT allows 200 presets to be stored,with 32 as timed events.

ENG or SNG Mobiles: What's the Difference?

It is virtually impossible to separate the satellite news-gathering vehicles from the traditional ENG vans these days. The ENG-cum-SNG mobile units included ENG Corp., who introduced a Ku pack and 23-foot microwave mast.

The TMD Division of the Will-Burt Co. showed its telescoping, pneumatically raised support mast for SNG and ENG, available in heights from 20 to 134 feet.

Midwest, in addition to its line of studio production units, offered a parking lot full of SNG vehicles: S-18, S-19, S-23, S-24, and S-25. Wolf Coach showed the S-15, but it also featured the standard VC-201N ENG van. Centro showed the SNG Networker in Ku-band. Centro also had its 45-foot trailer on view—the one selected by NBC Sports. The network has ordered four of them, two expandable.

Remaining primarily in the full production mobile unit camp were Roscor and Shook. Roscor was there to discuss its TV-45 Performer. Shook showed plans for the No. 40-43 and No. 45-60 production trucks.

FOR MORE INFORMATION

ENG Corp.	823		
TMD	824	Centro	827
Midwest	825	Roscor	828
Wolf Coach	826	Shook	829

FOR MORE INFORMATION

RCA Americom	810	South Star Comm	816
Brightstar Comm	811	Comsat General	817
GTE Spacenet	812	Harris	818
Conus Comm	813	Modulation Assoc	819
AT&T	814	Midwest	820
Central Florida Teleport	815	Dalsat	821
		Hubcom	822

Other Satellite Developments. . .

Microdyne also announced its Quicklink transportable SNG unit with automatic satellite acquisition and peaking, flexibly designed for trailer or truck mounting with appropriate test, production, and editing equipment ....Also new from Microdyne was the 1100-TDC tracking downconverter for narrowband use of voice and data on Ku-band satellites.... Ethereum Scientific announced two transportable uplinks, one in C-band with a Ku-band option and one Ku-band only with a 2.8 m dish and 600 W TWT.

Broadcast Microwave Services unveiled a new Ku-band uplink truck with on-board Loran and magnetometer to compute the antenna orientation for the best signal from within a 3 x 4-degree window....RF Scientific showed a four-channel audio Ku-band flyaway unit with the Harris/Satcom exciter and upconverter available in single 300 W or redundant phase-combined 200 W versions ....BAF Communications unveiled its 340T larger SNG truck ....Centro announced its SNG Networker, a Ku-band transportable with a 2.3 meter antenna and 300 W TWT amplifier.

Modulation Associates introduced the T-Sat agile C-band SCPC receiver and the SR 23 frequency-agile subcarrier receiver designed for program transmission above video and preprogrammable for up to 100 specified frequencies....DX Communications announced its new DSA-654TM frequency-agile satellite receiver, a C/Ku-band compatible unit with front panel selectable

Opening up New Worlds of Imaging!

TOSHIBA MICROMINIATURE COLOR CAMERA

TOSHIBA's imaging technology has once again gone one better! With the new Micro-miniature Color Camera, we have introduced a new concept in TV/video camera systems. This system consists of a separate camera head that fits easily into even a child's hand, connected by a 4mm-thick cable to a Camera Control Unit (CCU) that is smaller than a thick paperback book and performs the imaging functions. The camera produces a fine clear picture on a color TV receiver, and can also be used in conjunction with a portable VCR by amateurs and professionals alike.

TOSHIBA

TOSHIBA CORPORATION TOKYO JAPAN

ELECTRONIC SYSTEMS DEPARTMENT

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO, 105, JAPAN TELEX: J22587 TOSHIBA CABLE: TOSHIBA TOKYO PHONE: 457-3246-8

Circle 206 on Reader Service Card

Transmission

transponder frequency and dual video output....Pinzone showed the 8250 receiver as well as a low-noise down-converter for both C- and Ku-band satellite use....Pesa Electronica showed its new SR-91785-A satellite receiver and a satellite line amplifier-equalizer, LAE-917N....Comtech's antenna division consolidated its move away from C-band equipment with a new 3.5 meter dual-axis Ku-band antenna.

Vertex Communications showed its 1.8 meter Ku-band earth station antennas, a dual, offset mobile unit and a flyaway, the dishes used in Midwest's SNG vans announced in Dallas.... Radiation Systems subsidiary, Satcom Technologies, demonstrated its antenna range from 5 and 5.5 meter dishes down to a 2.4 meter SNG dish being used by Comsat....Scientific-Atlanta introduced the series 304 low-noise cooled Ku-band amplifier, which allows more efficient use of transponder space.

Standard Communications, at its first NAB and hoping to increase its broadcast interests from their present level at 5 percent of sales, introduced a multiformat, multifrequency satellite reception system comprising the Agile Omni receiver and C- and Ku-band low-noise amplifier/block down-converters....Wegener Communications announced a system for distribution of multiplexed digital voice and data channels over SCPC satellite links....QSI Systems announced techniques using the vertical blanking interval for SNG transmission identification, one encoded and the other, which reportedly attracted much interest especially among transportable owners, in plain language. A 16-character version was showed at NAB, expected to be upgraded to 24 characters shortly.

FOR MORE INFORMATION

Microdyne	830	Pinzone	837
Ethereum		Pesa Elect	838
Scientific	831	Comtech	839
Broadcast Microwave		Vertex Comm	840
Services	832	Satcom Tech	841
RF Scientific	833	Scientific Atlanta	842
BAF Comm	834	Standard Comm	843
Centro	835	Wegener Comm	844
DX Comm	836	QSI Systems	845

PERFORMANCE AND ECONOMY. SIDE BY SIDE!

Now get more performance for the money in two new additions to Tek's 1700 Series family: the 1720 Vectorscope and 1730 Waveform Monitor. For years television facilities have looked to the Tek 528A and 1420 for reliable, consistent signal monitoring. Our two new monitors do the job faster, better—and at a substantial reduction in cost.

Even easier to use. Now four front panel setups can be stored—from the front panel—and recalled at the touch of a button. You get complete line select capabilities including field selection, 15-line display and CRT readout of field and line number. You can display Channel A and Channel B inputs simultaneously. The information you need is there at a glance.

Each monitor includes its own advanced feature set. There's an X Y input for stereo audio monitoring in the 1720. Dual filter operation in the 1730. Plus proven 1700 Series family advantages. Excellent viewability. Low power consumption. All in a compact package suited for stand alone use or rack-mounting and available in NTSC and PAL versions.

The new 1720 Vectorscope can also be combined with a 1710B Waveform Monitor—for even greater side-by-side economy!

Get the full story from your Tektronix representative. Ask for a demo and see what makes the 1720 and 1730 the leading price/performance values on the market today!

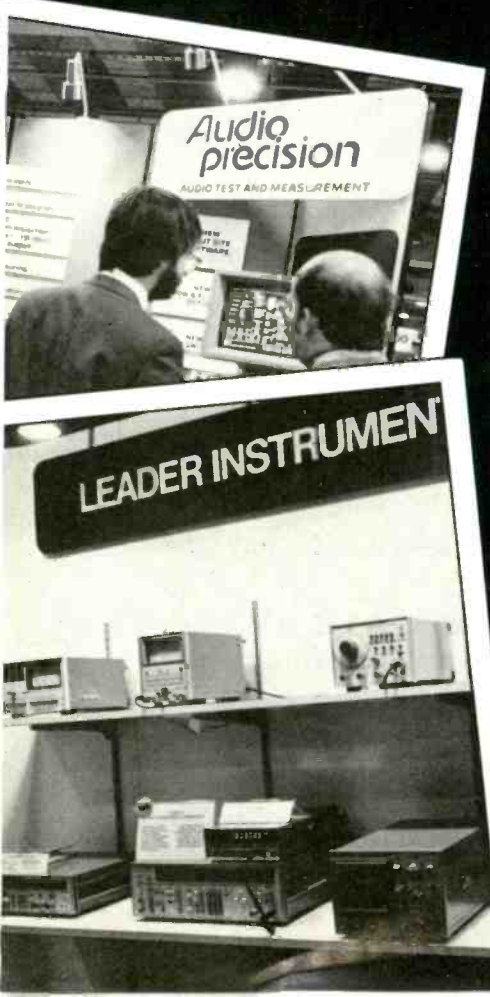
Behind the Scenes in Quality Television.

Tektronix
COMMITTED TO EXCELLENCE

Circle 190 on Reader Service Card

TEST & MEASUREMENT

Audio, Video & RF



Much of the excitement at the Dallas NAB came from the introduction and rising level of acceptance from broadcasters of new technologies for the creation and transmission of audio and video signals. Often, it is test and measurement equipment manufacturers who are fueling the move toward greater deployment of digital technology.

Over recent years, and at this year's show, they have been introducing simpler instruments, yet ones that have more intelligence built in to make them easier to operate as well as more powerful tools in the range of tasks they can perform. The availability of such equipment is seen as a prerequisite for the introduction of new techniques in a working broadcast station environment.

Testing Times for New Technologies

Successful implementation of new broadcast technologies by stations depends, among other things, upon the availability of appropriate new test equipment. Conscious of this, some manufacturers of test and measurement instrumentation are ahead of the game.

Interest in stereo for MTS and AM ran high at the NAB, for example. "But how do you measure it? That's what everyone's asking right now," reports Alan Perkins, sales manager for Modulation Sciences.

The advanced instrumentation has been developed in any case because researchers needed it, points out Dave Jurgensen, director of engineering at Magni Systems. "Why not bring it to the market?" he asks. Magni's principal new offering was the 1527 integrated measurement package with color frame and SCH phase capability as well as a TV test signal generator operating from an IBM PC or compatible.

The Dallas show saw new instruments for multichannel TV sound, AM stereo, as well as for component video signal test and measurement, despite the comparatively small numbers of stations that have so far made use of these new capabilities in their everyday broadcasting.

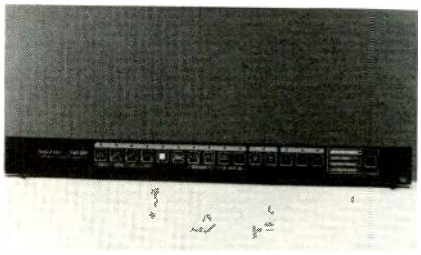
The fullest ranges of new test

equipment were those from Leader Instruments and Tektronix. The two companies introduced instruments that will be in direct competition in some instances.

Leader's additions included a 525-line-select waveform monitor and new TV stereo signal generator. The waveform monitor features controls to select any line of fields 1 or 2 and may be preset for up to three lines for checks addressing particular test pattern areas.

Implementing new technology. Leader's TV stereo signal generator illustrates how the new TV technology is advancing the state of the art in test equipment that will then put broadcasters in a position to implement that new technology. The LMS-237 signal generator was developed "at the request of several major television manufacturers," says Leader's director of marketing, Robert Sparks.

Other developments from Leader include a portable picture, waveform, and audio monitor for EFP work weighing 8 lbs; a semiautomatic audio distortion meter; an AM stereo signal generator designed to work with Motorola's C-Quam system; and an attache-case portable 60 MHz oscilloscope.



Tektronix's new component analog test signal generator avoids the need for transcoders.

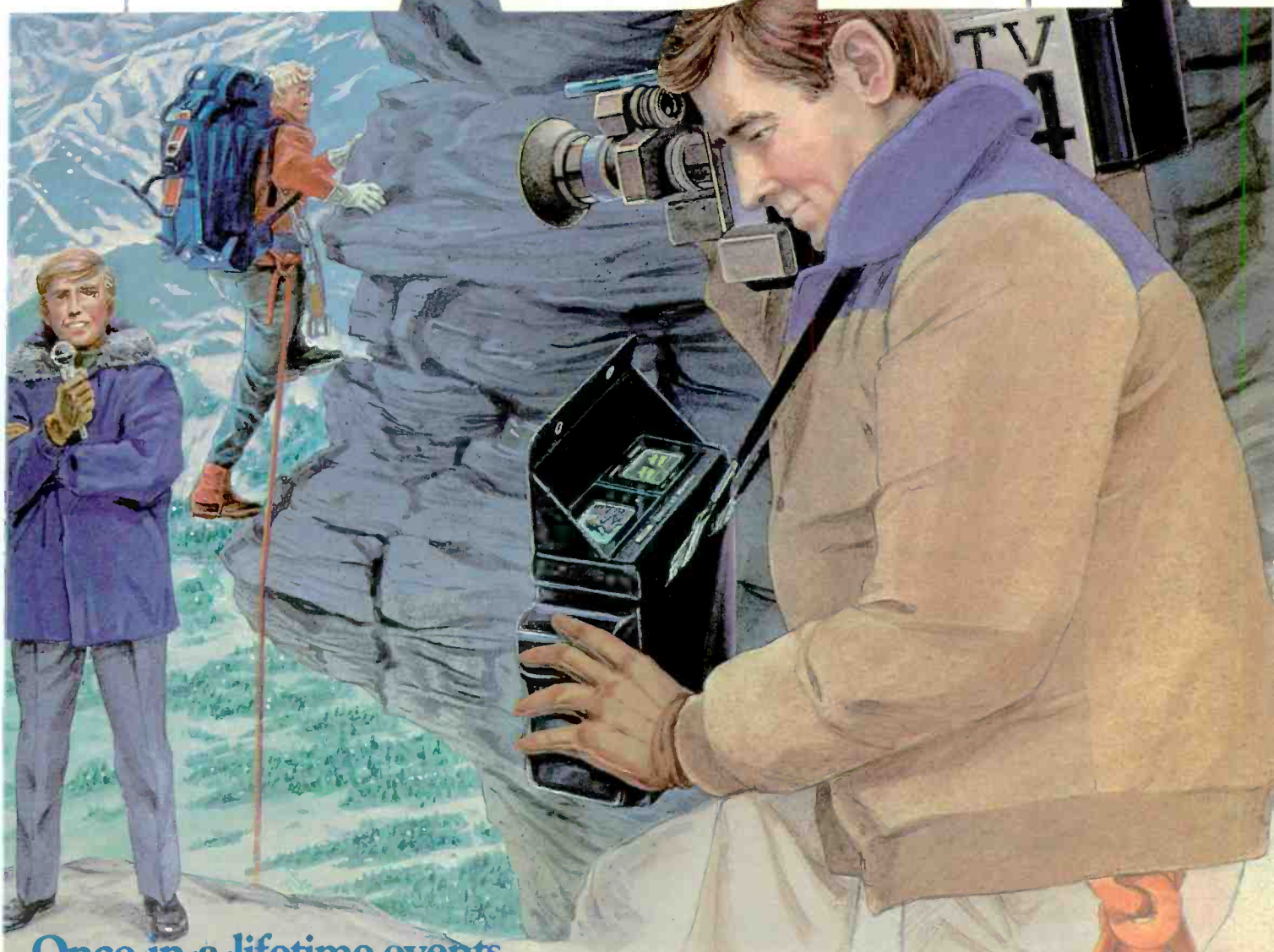
The principal announcement at this NAB for Tektronix was the replacement of its elderly 528 waveform monitor and 1420 vectorscope with a paired set of instruments, 1720 and 1730, available for less than the old units cost.

The 1720 and 1730 offer complete line select, front panel recall, x and y inputs for stereo phase measurement, simultaneous A and B channel display, and dual filter display. The 1730 waveform monitor can display any one, two, or 15 lines of a frame, or the same lines in both fields. The 15-line capability averages to eliminate noise when used with a resolution chart.

Also new to the NAB was the company's WFM-300 component video waveform monitor. Inequalities in component amplitude and timing and interchannel gain can be monitored and measured using the device's "Lightning" display, which shows the relationship between the luminance and color components. Looking at all three signals simultaneously, the WFM-300 can be used to monitor valid color gamut.

Completing Tektronix's additions in test and measurement were the TSG-300, providing digitally generated test signals for a variety

LEADER



Once-in-a-lifetime events don't happen twice!

This 8-lb EFP/ENG Monitor confirms your field productions are perfect, first time, every time!

The LVM-5863A Color/Audio/Waveform Monitor confidence tests camera and VCR performance anywhere. Shows you the overall production quality immediately...with full color (NTSC) and sound. LVM-5863A lets you be sure all your productions are technically and artistically correct *before* you leave the location. The LVM-5863A confirms white balance, sync and burst levels. Its **2H and 2V waveforms** show both line and field rate signals. A switchable **IRE filter** makes it easy to check peak video. And for accurate verification of setup and black balance, switch on the **4x magnifier**. With all this, the LVM-5863A is easy to use since controls are kept to a minimum.

LVM-5863A

It goes anywhere.

Lightweight and small, the LVM-5863A is easy to hand carry or to mount in trucks, vans or helicopters. Requiring only 12 Vdc, it can use a readily available, self-contained battery (Sony NP-1 or equivalent) or external power sources such as vehicles and EFP battery belts.

Quickly pays for itself.

The LVM-5863A eliminates the risk of time-wasting, cost-increasing, missed or poor-quality shots.

Call toll-free
(800) 645-5104
In NY State
(516) 231-6900

Request an evaluation sample, our latest Test Instrument Catalog with over 100 outstanding products, the name and address of your nearest "Select" Leader Distributor, or additional information.

For professionals who know the difference.

LEADER Instruments Corporation

380 Oser Avenue, Hauppauge, New York 11788
Regional Offices:
Chicago, Dallas, Los Angeles, Boston, Atlanta
In Canada call Omnitronix Ltd. (514) 337-9500

Circle 202 on Reader Service Card for information

Circle 203 on Reader Service Card for demonstration

of component formats; an audio vector converter for MTS monitoring and an audio monitor for multichannel mixing; and an NTSC sync generator with genlock to calculate sync and SCH phase for color framing identification.

Testing time for TV stereo. Tektronix was not the only test and measurement equipment manufacturer to show a commitment to stereo television broadcasting. Sound Technology introduced its model 1530 MTS/ stereo analyzer as well as a programmable multichannel switching system.

The 1530 can be used with the Sound Technology 3100 two-channel programmable generator, introduced at last year's NAB, or with other audio oscillators. The instrument measures phase error, voltage/power, frequency response, channel separation, noise, and harmonic distortion.

The new switching system allows up to 1536 channels of audio to be tested automatically.

Scip Electronic Systems chose to show its 3302 stereo signal manager for its first NAB. Designed to address the problems encountered in production, duplication, and transmission of stereo and MTS audio, the instrument has signal correction, formatting and monitoring sections. The 3302 can diagnose, reconfigure, correct, and calibrate discrete stereo, matrixed stereo, SAP, and time code signals.

Further activity in stereo measurement was seen at Belar Electronics. Adding to its baseband modulation monitor of last year, the company announced its TVM-210 BTSC aural reference monitor and TVM-220 aural program monitor.

Used together with the TVM-100 baseband unit, full-time monitoring of L + R and composite signal modulation levels is possible as well as BTSC stereo transmission setup, test, and measurement with accurately decoded left and right channel audio outputs.

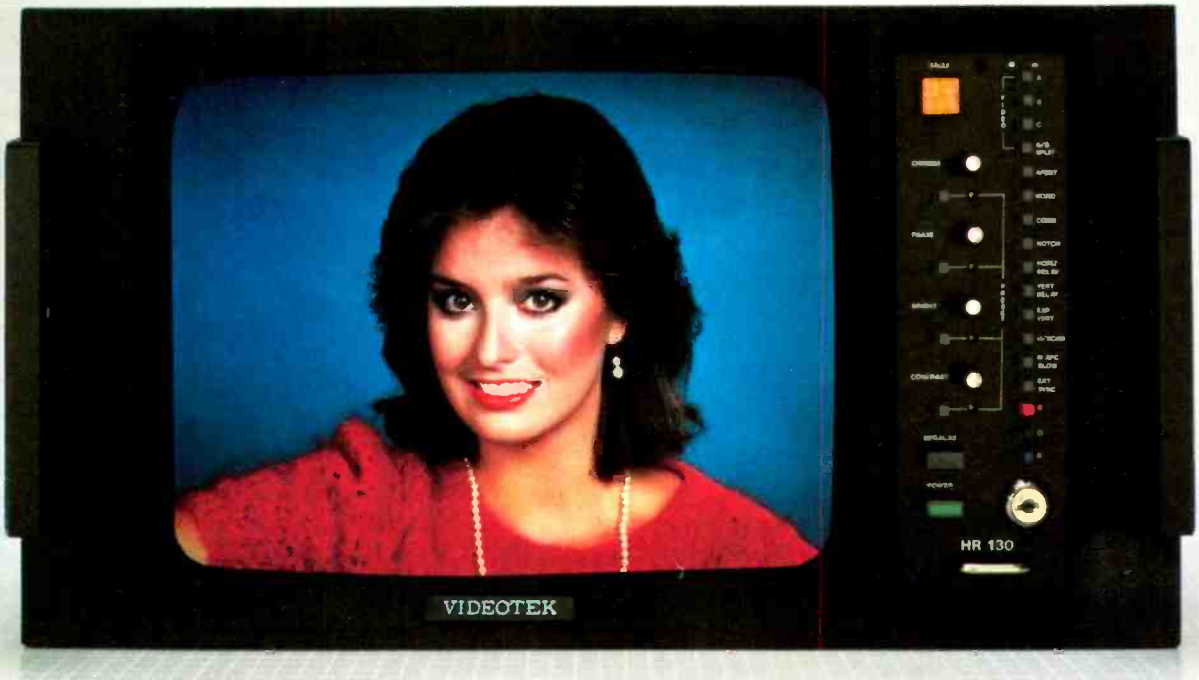
Shown in prototype at last year's NAB, the IM-1 Imagescope from B&B Systems is effectively a stereo audio vectorscope with the program signal displayed on a CRT.

Stereo generation. The news in new technology stereo equipment was not confined to the television broadcaster. Orban released preliminary information on a model 8150A Optimod FMX stereo generator. The unit promises up to a four-fold increase in stereo coverage area for FMX-equipped receivers, reduced stereo noise, overmodulation, and loudness loss. When available, in fall 1986, at the same time as Orban expects FMX receivers to begin hitting the marketplace, the generator will work with established Optimod-FM equipment as well as with some other audio processors. Also new from Orban was its 275A automatic stereo synthesizer with narrow and wide synthesis modes and two mono recognition methods.

Another FMX stereo generator announcement came from Inovonics with its model 700 X-tra. The X-tra has audio processing capability, normal FM and FMX stereo subcarrier generation, and a SCA generator option.

Among the stereo generators at the show, TFT offered its BTSC TV stereo model 850 aural modulation monitor and 8500 and 8501 generator and demodulator comprising its TV STL composite subcarrier MTS BTSC stereo system with provision for SAP/pro microwave transmission....Modulation Sciences showed its BTSC stereo generator as well as the TV Sidekick integrated SAP generator and Sidekick SCA generator and audio processor....Leaming Industries debuted at the NAB with, among other offerings, its MTS-1 stereo generator for transmission of BTSC formats in cable distribution systems....Marcom showed its model 710 TV stereo generator.

Telemet introduced a stereo demodulator with quadrature output and a built-in video response tester and a switchable output to



PHASE II: HIGH-RESOLUTION

For over a decade, critical customers have been using Videotek color monitors for a wide variety of applications. Join us now in Phase II: High Resolution.

The HR130 is perfect for use in studios, control rooms, engineering bays, and many other areas that require critical signal evaluation. Precision circuitry is based around a PIL-Delta CRT, with .31mm dot pitch, producing in excess of 600 lines of resolution.

Standard features include: three Composite Inputs, A-B Split Screen, Analog RGB Input, High Voltage Regulation, Linear Phase Aperature Correction, Switchable Comb Filter and Notch Filter, Horizontal and Vertical Delay with Switchable Expanded Vertical, Underscan, Selectable Time Constant, Presets, and Lockable Engineering Adjustment Drawer.

For a close-up look at the HR130, contact your local Videotek dealer.

A DECADE OF PROGRESS

A DESIGN FOR THE FUTURE

VIDEOTEK INC.

243 Shoemaker Road, Pottstown, PA 19464, (215) 327-2292, TWX 710-653-0125. 9625 North 21st Drive, Phoenix, AZ 85021, (602) 997-7523, TWX 910-951-0621.

Circle 197 on Reader Service Card

view both synchronous and envelope outputs together on a single trace monitor....Dorrough Electronics displayed its 80B FM stereo generator, loudness meters, level monitors, and audio processors.

In general test equipment, RE Instruments announced its RE201 dual-channel audio analyzer for automated testing using the IEEE488 bus intended to provide faster measurements and replace a range of manual test equipment.... Techron revised its System 10 acoustic analysis range with the TEF System 12 using time delay spectrometry techniques and complete with software and training programs....Schmid Telecommunication of Zurich announced the SZ340 sound program circuit analyzer for stereo channel transmission measurements with manual, program, or remote control....Lang Video Communications introduced an SNG test package, employed in the Hubcom video flight pack, and including color, waveform, and audio monitors.

Amber Electro Design showed a stereo phase addition to its audio measurement system and new application software....Audio Precision announced software enhancements for wow, flutter, and intermodulation measurement on its System One PC-based audio test equipment....Philips T&M unveiled its PM 5654 VITS test signal generator and inserter and showed its range of other test equipment.

Pesa Electronica introduced to the U.S. its ASC-4652-B sync watcher, analyzer, and timer, which aims to circumvent the errors of conventional test equipment in editing and quality control in the video engineering environment.... Panasonic announced an intelligent audio analyzer claiming a typical 0.0001 percent distortion factor, as well as an AM/FM signal generator and a hand-held oscilloscope with vertical and horizontal ranging.

Sigma Electronics announced its TSG-375 test signal and sync generator....Potomac Instruments showed its QuantAural QA-100 audio program analyzer as well as a series of subcarrier modems for STL remote control interface and other meters and test and control systems....Texar announced an AM monaural modulation controller and standalone limiter to be available soon.

In the category of monitors, Conrac's news for this NAB was its model 6545 Micromatch color monitor and 6550 photometer, which together are claimed to cut monitor set-up time to 20 seconds per monitor, the photometer "memorizing" the monitor alignment using Conrac's digital beam current feedback system with precision in-line guns for the first time....Barco Industries introduced a new menu-driven color monitor, CVS.

Sony announced a new 14-inch monitor with a built-in current feedback system capitalizing on component technology research to reduce color temperature drift.... Pesa showed two new color monitors, at nine- and 14- inch sizes....Videotek introduced a range of new test equipment, including a 13-inch monitor as well as a vectorscope and an stereo audio monitor.

In transmission monitoring, Itelco announced the 1002 TV test generator for switchable video, audio, and color checking and adjustment of TV transmitters....Bird Electronics displayed its new 4410 series Thruline RF directional wattmeters designed for transmitter tuning, especially at AM and low frequencies, and to work with increasingly sophisticated equipment and broadcasters' stereo broadbanding requirements.... Leitch Video brought its new 25000 series of digital test generators comprising a studio test generator and two transmitter test generators for sideband and link use.

FOR MORE INFORMATION

Magni	855		
Leader	856		
Tektronix	857	Lang Video	873
Sound Technology	858	Amber Electro Design	874
Scip	859	Audio Precision	875
Belar	860	Philips T&M	876
B&B	861	Pesa	877
Orban	862	Panasonic	878
Inovonics	863	Sigma	879
TFT	864	Potomac Intruments	880
Modulation Sciences	865	Texar	881
Leaming	866	Conrac	882
Marcom	867	Barco	883
Telemet	868	Sony	884
Dorrough	869	Videotek	885
RE Instruments	870	Itelco	886
Techron	871	Bird	887
Schmid Telecommunication	872	Leitch Video	888

PESA

The "SWAT"* The best engineers assistant.

automatic analysis of all sync parameters of the video signal * video monitor output * local liquid crystal display * two independent video inputs * manual/automatic testing modes * alarm indicators for parameters out of tolerance * self-test software * RS 232 output to feed printer or PC * PAL/NTSC version.

Standard Measurements

Watcher-Analyzer:

* sync and burst amplitude
* field period
* number of lines
* horizontal sync width
* number of cycles in burst
* breezeway
* number of vertical sync pulses
* equalizer width
* vertical pulse width
* SC/H phase up to two degrees
* SC frequency error up to 0.2 Hz

Timer:

* H and V lock
* PAL lock
* H delay and SC phase delay between inputs A and B

* Sync
* Watcher
* Analyzer
* Timer

PESA

Pesa Electrónica, S.A.

Albalá, 12 - 28037 Madrid (Spain) - Telex: 48449 PESAE E - Tel: 754 00 78
Pesa America Inc. 6073 NW 167th St. - Miami, FL 33015 (USA) - Telex: 6712435 PESAM - Tel: 305-556-9638 - Toll Free: 1-800-USA-PESA

INISEL Group

The affordable hi-tech.

Circle 200 on Reader Service Card

Business Briefs

Conus Communications, Minneapolis, MN, has just received delivery of a second communications system from **Gentner Engineering Co**. Member television stations will now be able to communicate with their SNG trucks on the new system. And the **Kansas State Network** has become the first local television station group to share such a truck. The van, a new "low-boy" jet-transportable version, will be shared among the network's principal stations....A new international organization, the **International Teleproduction Society (ITS)** has recently been formed from the union of the Videotape Facilities Association (VFA) and the Videotape Production Association (VPA). The new organization will be devoted to increasing industry recognition, setting standards and practices, publication of handbooks and directories, and developing a seal of approval.

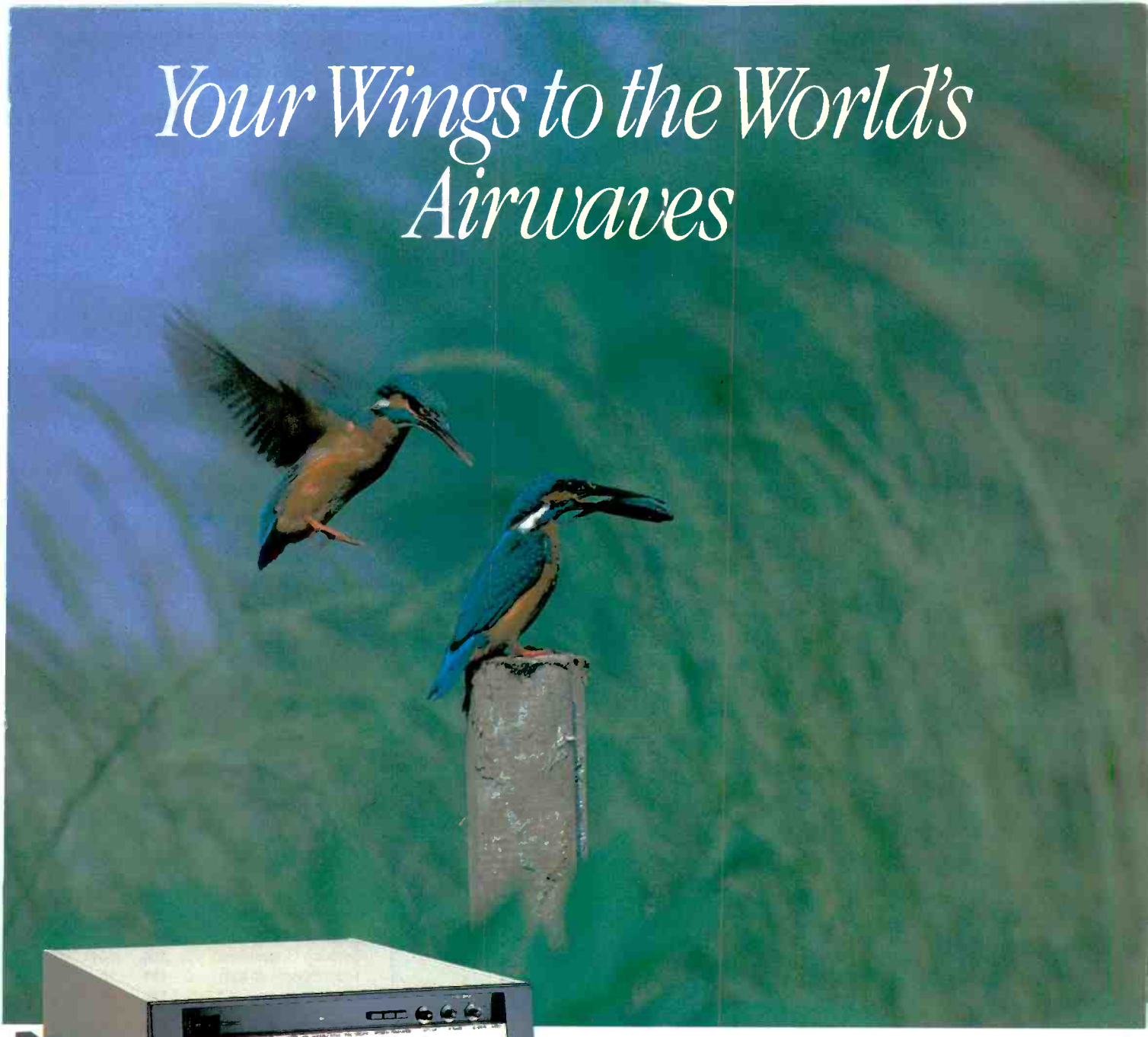
Provisional Battery Co., Inc., of Atlanta, has changed its name to **PRO Battery Co**. Company president Gene Sherry qualified the name change, stating that the success that was at one time "provisional" for the company had now been achieved....Broadcast Systems, Inc., of Austin, TX, has just announced a new television station that will service the Birmingham, AL, area—**WCAJ-TV68**....**Integrated Technologies Inc.**, has just relocated its marketing and sales headquarters from Greensboro, NC, to Falls Church, VA.

The architect of the U.S. Capitol has selected **Imero Fiorento Associates, Inc.** to design the lighting system for the Senate Chamber to allow the proceedings to be televised. IFA designed a similar system for the House of Representatives in 1979....**Cranston/Csuri**, Columbus, OH, has designed a promotional animation piece for **WJLA-TV** in Washington, DC. Designed by artist Rick McKee, the computer-generated animation displays a slick glass-and-chrome look....Director Zbigniew Rybcznicki, working at New York's **VCA/Teletronics' Center Stage** facility, simultaneously shot and edited a music video for the British rock group Simple Minds. The session was completed over two days and involved a new multilevel Ultimatte technique that layered together 117 levels of imagery....**Varitel Video** of Los Angeles has been chosen by Cinema Preview Channel to do post-production on its weekly *CinemAttractions* show. The half-hour program comprises film trailers, movie trivia, and a weekly list of the top seven grossing films....Capitol Satellite's **Starshooter** transportable uplink unit has been busy providing feeds for the NCAA Championships and the Liberty Bowl from Memphis, TN....PBS's *Cats and Dogs* series wrapped up post-production at the **Century III** facility in Boston....A camera with a snorkle lens pointing out a car's moonroof was among the techniques used by **Videocraft Productions** of Boston on a recent shoot for New England Ford Dealers.... **Soundcraft USA**, Santa Monica, CA, in conjunction with **Audiotek**, Burbank, CA, provided sound for the recent twenty-eighth Grammy Awards broadcast.

"A Silver Opportunity," a video presentation produced by Total Communications, Inc., Newton, MA, marked one of the highlights of the third annual "Experience Works" luncheon. Narrated by WNEV-TV anchorman Tom Ellis and produced by Total Communications' Nancy Elrick (both pictured above), the video portrayed the bottom-line value of rehiring and retraining older people to join the nation's workforce. More than 200 guests attended the luncheon, which was co-sponsored by Operation ABLE, The Greater Boston Chamber of Commerce, and various state and local agencies on elder affairs.

Personnel changes this month include Rita Scott as **Unitel/Hollywood's** new vice president of operations. Mark Miller will serve as that facility's VP of engineering....**Lake Systems Corp.**, of Newton, MA, has appointed Frank DeMayo, Jr., president and Bill Philips vice president of international marketing....**Harris Corp.** has appointed John T. Hartley president and CEO. Scott Martin is Harris' new district manager of radio sales for N. Carolina, and Mitchell Montgomery will be his counterpart in Texas. That company's vice president of domestic radio marketing is now Gary Thursby....Larry Silverman has been announced as the new national sales manager for **Shintron** of Cambridge, MA....**ITI, Inc.**, Falls Church, VA, has named Michael Gold president. Gold was previously one of the founding officers of the Vectrix Corp.

Your Wings to the World's Airwaves



The World's Leading Portable TV Standards Converter Bar None

Professionals demand an uncommon level of picture quality and smooth image reproduction in TV standards conversion. The LT1210 is the world's smallest converter able to handle NTSC, PAL and SECAM, with PAL-M conversion as an option. The image enhancement function ensures a high-definition picture with outstanding image clarity. This converter is also a totally integrated unit so no adaptor or changing of encoder/decoder modules is required for conversion between NTSC, PAL and SECAM. The cost-performance of the LT1210 is nothing less than outstanding. The LT1210. Check it out. Anywhere.

Oki also produces the high-end LT1015Σ Digital TV Standards Converter.

NTSC
PAL
SECAM
PAL-M

LT1210 Digital Television Standards Converter

In the U.S.A. and Canada, contact:
Oki America Inc. (Oki Telecom)
One University Plaza
Hackensack, New Jersey 07601
U.S.A.
Tel: (201) 646-0011-0015
Telex: (25) 710-990-5004 OKI ELEC HAK

In other areas, contact:
Head Office:
Overseas Marketing & Sales
10-3, Shibaura 4-chome,
Minato-ku, Tokyo 108, Japan
Tel: (03) 454-2111 Telex: J22627
Cable: OKIDENKI TOKYO

OKI

Oki Electric Industry Co., Ltd.
Tokyo 108, Japan

Circle 210 on Reader Service Card

Advertisers Index

SALES OFFICES

295 Madison Ave. New York, New York 10017 Telex: 64-4001
William McGorry, Publisher

Eastern States
295 Madison Avenue
New York, New York 10017
212-685-5320
Telex: 64-4001
James C. Maywalt
Tom Joyner

Central States
980 North Michigan Avenue
Suite 61, 14th Floor
Chicago, IL 60611
(312) 664-0572
Gene Kinsella

Western States
19411 Sierra Noche Road
Suite One
Irvine, CA 92715
(714) 854-1922
Wally Gilbert

Europe/United Kingdom
33A Station Road
North Harrow
Middlesex HA2 7SU England
(01) 427 9000
Telex: 21289
Ric Bessford

Japan/Far East
2-14-20, Minami-Aoyama,
Minato-ku, Tokyo 107 Japan
(03) 405 5118
Telex: 2427388
Fax: (03) 401-5864
K. Yamamoto
Y. Yozaki

McCURDY LISTENERS CROSS THE BOARD

McCurdy's audio consoles reach listeners of every music persuasion. From country to classical, jazz to contemporary. Rhythm and blues to rock 'n roll. Radio stations across the board rely on McCurdy equipment.

In particular, the SS8800 Series A and E Audio Consoles. These have defined a continuing evolution of one of the industry's most successful, critically acclaimed and widely imitated audio broadcasting consoles.

Here is a fully modular system which provides complete facilities for the mixing, monitoring and control of audio program material in broadcast or other professional applications.

The McCurdy SS8800 stereo consoles are available in 8, 10, 16, 20, and 24 channels with a wide range of features for on-air and production application.

McCurdy

McCurdy Radio Industries

108 Carnforth Road, Toronto, Ontario, Canada M4A 2L4 Tel: (416)751-6262 Telex: 06-963533
In U.S.A.: RAM Broadcast Inc.
346 West Colfax Street, Palatine, Illinois, U.S.A. 60067
Tel: (312)358-3339

Circle 205 on Reader Service Card

Network Multichannel TV Audio

To meet the demands of network stereo and multilingual TV programming, Ward-Beck and ABC-TV engineers teamed up to develop this impressive custom system based on new WBS Series ST technology.

It employs all-new stereo modules and circuitry, as well as the brand new ST profile. In keeping with every ST system, the console offers advanced ergonomic design for control accessibility and operational simplicity.

ABC Studio TV-1, in New York, is setting new standards for audio quality throughout the world.

WBS

First by Design.

Ward-Beck Systems Ltd.,
841 Progress Avenue, Scarborough,
Ontario, Canada M1H 2X4.
Tel: (416) 438-6550.
Tlx: 065-25399.