MAY 1979 $3.00

BM/E

BROADCAST MANAGEMENT/ENGINEERING

SHOW-IN-PRI

DALLAS

PHASER

e full Frame Store TBC/Synchronizer
Frame for less than $18,000.

ER, a Frame Store
he economy priced
too.

ology system that

ique advantages.

ve digital circuitry
tching.

chronous hetero-
ndwidth pro-

gnals

ed.

Add to these the best features offered on competitive models, which we consider as standard, and you've got the PHASER, the undisputed leader in its class.

The PHASER is backed up by a network of conveniently located service centres, the most comprehensive warranty in the business, and a unique "No-Tweak" board exchange program when the initial one year warranty period is over.

Talk to your nearest authorized Digital dealer. He'll prove there is no other choice. Or ask us for full details: Digital Video Systems, 716 Gordon Baker Road, Willowdale, Ontario, Canada M2H 3B4. (416) 499-4826

DIGITAL

The digital video experts.

Circle 100 on Reader Service Card

When it comes to quality quad-head refurbishing, Videomax doesn't take a back seat to anyone.

It is better to do one thing well than to do several things only satisfactorily.

The same principle that applies to building a classic car applies to quad-head refurbishing. At Videomax, it's been our guiding principle.

What this means for you is fast, reliable service and unexcelled quality.

When your [illegible] fails, call [illegible] ment [illegible] day—be[illegible] U.S. cities.

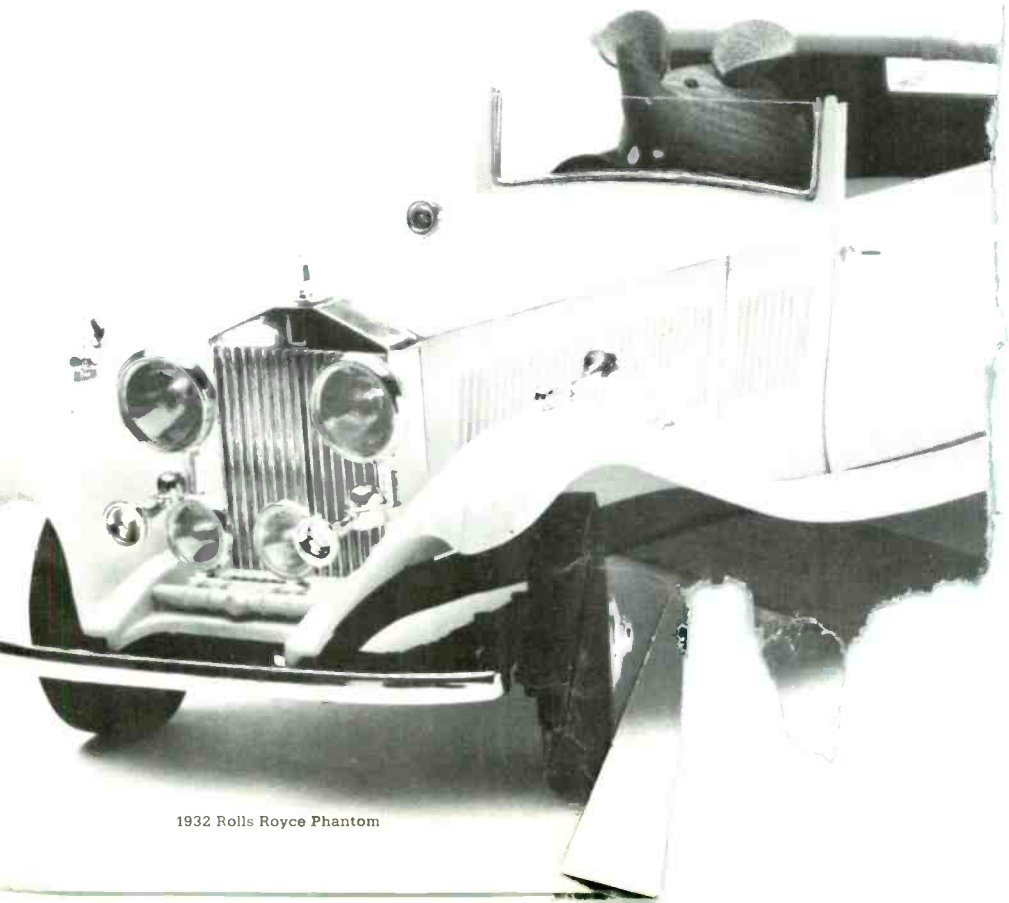
And when Videoma[illegible] your quad head, it will [illegible] to you "better than new."

We're quad-head refurbishing specialists, period. Because we do nothing else, we *have* [illegible] do it well.

[illegible]xt time your quad head [illegible]hing, call Videomax. [illegible]how very well we [illegible]ales & Service—[illegible]7-8031, [illegible]980-7927, [illegible].

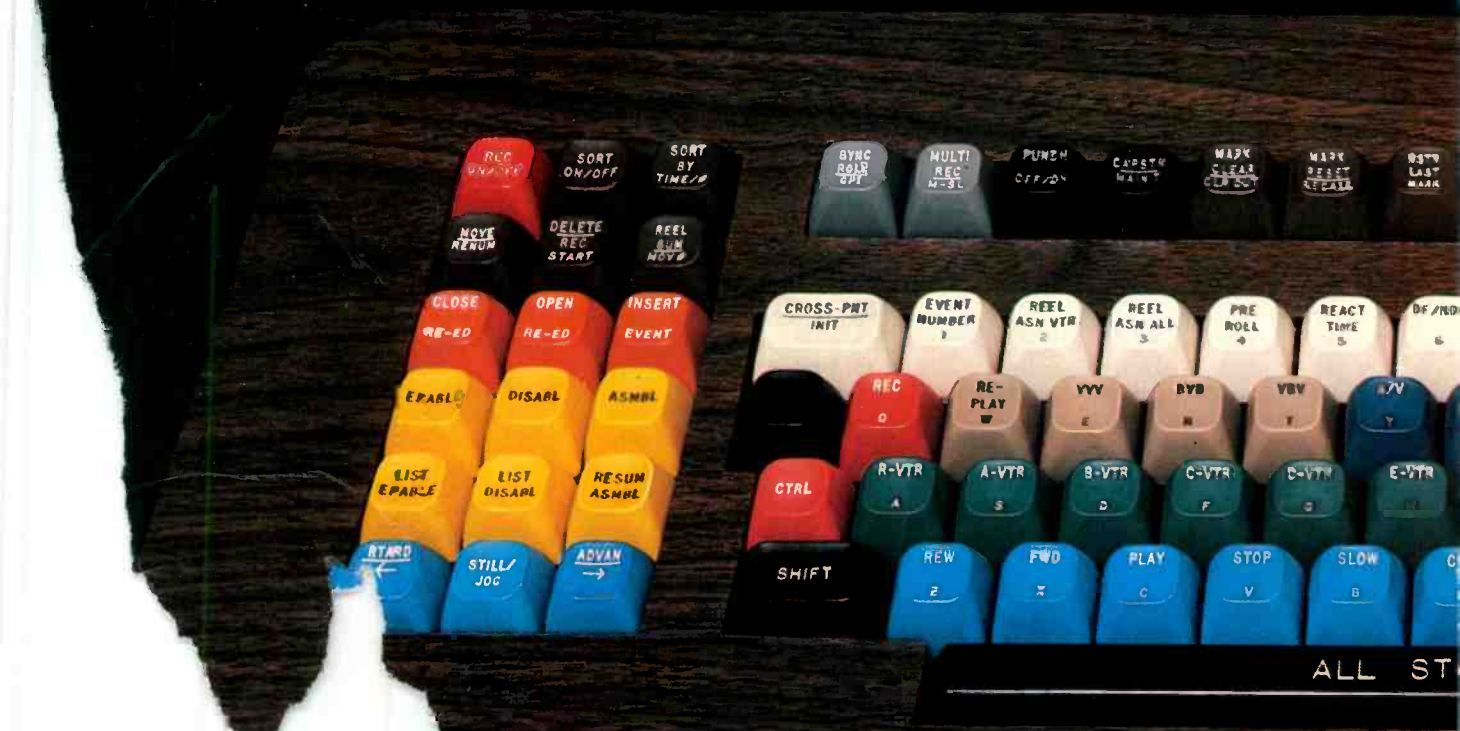
videomax®

Videomax
A Division of Orrox Corporation
3303 Scott Boulevard
Santa Clara, CA 95050
(408) 988-2000
Telex: 910-338-0554
Circle 101 on Reader Service Card



1932 Rolls Royce Phantom

State of



ee:

g
to
st

from it! Aesthetics are only possible in our industry when the cost is right. We also deal with matters such as dependability, expandability, ease of maintenance, and ease of operation during the long nights directors and schedules seem to favor.

Ideas flow.
This new CMX keyboard and in- ctive disp first such y of ou sign) is an tionar ent. Proc- rate date

mean no more waiting. Ideas flow. Dedicated keys for all necessary functions, and the implementation of an active list concept mean re-edit tasks are simple and easily managed.

It's beautiful.
This new television industry standard keyboard is the state of the art you expect from CMX, and what your operating partners expect from engineering.

It's truly beautiful.

the art.

CMX makes dollars and sense.

No obsolescense.
The 340X is today's editing system for professionals, and if history is a guide to the future, CMX is tomorrow's editing tool as well. Obsolescence is not a CMX problem. Micro-processors used in a distributive processing system is not a method likely to suffer obsolescence. As a matter of fact, even our older-designed systems are still in current use—all of them. That's good to know.

Return on investment.
Industrial, educational, and governmental usage of video editing has grown as rapidly as top management has appreciated the cost savings of video presentations. The pace has quickened. But the job isn't easy for professional production/post-production managers who must establish the R.O.I. of a complex editing system to the boss who is as interested in throughput per dollar invested as he is any of the aesthetic values CMX brings to bear.

You can bank on it.
In many cases, CMX is the only system available which not only does the necessary creative job, but also is the one system with the least overall cost—that's effective! You can bank on it! Smart facility managers realized long ago that the idea of CMX being too expensive was a myth.

We hope you'll agree: The CMX340X makes dollars and sense.

Circle 102 on Reader Service Card

CMX ORROX

Orrox Corporation, 3303 Scott Boulevard, Santa Clara, California 95050 (408) 988-2000 Los Angeles (213) 980-7927 New York (212) 371-1122

BM/E
BROADCAST MANAGEMENT/ENGINEERING

The thousands of broadcasters who went to Dallas had an unprecedented opportunity to rope in the latest technology for radio and television. This month's issue is devoted to bringing all of you the show as it happened, in perspective, and complete – the first full report on NAB.

Publisher
Charles C. Lenz, Jr.
Editorial Director
James A. Lippke

Editor
David Hawthorne
Senior Editor
Robin Lanier
Senior Editor
Robert Rivlin
Assistant Editor
Eva J. Blinder
Creative Director
Gus Sauter
Director
Marketing Services
Richard N. Jones
Manager
Publication Services
Djuna Van Vort
Production Manager
David Rose

Advertising Production Assistant
Aetna Dowst
Editorial Production Assistant
Charles Ames

Comptroller
Joseph W. Kutner
Reader Service
Ann Llewellyn
FCC Counsel
Lovett Ford and Hennessey, P.C.

MAY 1979/VOLUME 15/NUMBER 5

8 **Broadcast Industry News**
FCC approves satellite news delivery; Satellite distribution of TV spots tested; Two rewrite versions introduced in Senate

25 **Radio Programming & Production For Profit**
Music series from Billboard; humor from O'Connor; public affairs commentary from the ETC Network

26 **BM/E's Program Marketplace**
Profile of Toby Arnold and Associates

28 **Television Programming & Production For Profit**
Technology and the future are main concerns of programmers at NATPE meet in Vegas

36 **Show-In-Print '79: A Texas-Size Roundup Of Broadcast Equipment**

38 **Getting The Image Down: VTRs And Cameras Show Major Improvements**
One-inch VTRs dominate but digital recorders cause a stir; cameras offer more flexibility and more models to choose from, ⅔-inch diode gun tubes on the way; lenses and camera accessories keep pace

65 **Production And Post-Production Equipment More Creative**
Digital effects dazzle; production switchers; another expansion of editing systems; a new generation of character generators; still store and slow mo action

101 **TV Signal Control and Processing — Digital Leads The Way**
Digital processors borrow from each other; routing switchers; master control switchers and technical automation; sync and processing; video monitors; telecines; teleprompters; lighting; film and videotape

120 **Radio: Building Blocks For The Great Upgrade**
AM stereo: still the big wait; tape recorders and cart machines; consoles; audio processors; telco quality improved; microphones; loudspeakers; remote pickup, control, and STL; new breed of intercoms; program automation; turntables and disc preamps

139 **Satellite Fever**
Industry announcements spark television enthusiasm; weather radar picture clears

143 **Trends In Radio And Television RF**
Radio transmitters, TV transmitters; ATS on back burner; antennas; microwave for ENG

164 **Automatics Lead The Trend In Test And Measurement**
Bonanza of new test equipment for television; new level of accuracy for radio

170 **FCC Rules & Regulations**
Section 315 expanded – again

175 **Great Idea Contest**
Win a calculator – enter the Great Idea Contest

BROADBAND INFORMATION SERVICES, INC.
295 Madison Ave., New York, N.Y. 10017, 212-685-5320, Telex: 644-001
Publishers of: **BM/E—Broadcast Management/Engineering**
BM/E's World Broadcast News

ABP
BPA BM/E BROADCAST MANAGEMENT ENGINEERING is published monthly by Broadband Information Services Inc. (USPS 059280) All notices pertaining to undeliverable mail or subscriptions should be addressed to 295 Madison Ave., New York, NY 10017. 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. These facilities include AM, FM and TV broadcast stations, CATV systems, ETV stations, networks and studios, audio and video recording studios consultants, etc. Subscription prices to others $24.00 one year, $36.00 two years, Foreign $30.00 one year, $48.00 two years. Air Mail rates on request. Copyright 1979 by Broadband Information Services, Inc., New York City. Controlled circulation postage paid at East Stroudsburg, PA.

Send for GVG product news you may have missed at NAB

The all-new 300 Series production switcher, with its integral Effects Memory (E-MEM) system and tremendous flexibility...

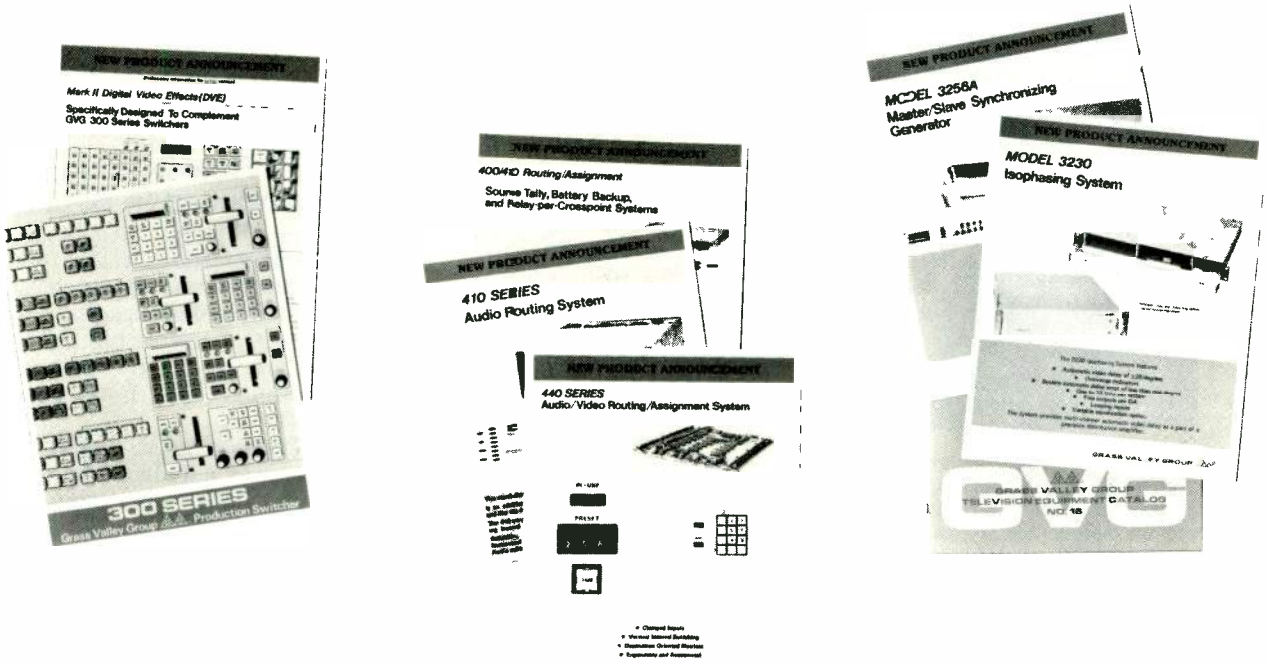
Mark II Digital Video Effects (DVE), especially designed to complement the new 300 Series...

New Line and terminal equipment including the Model 3230 Isophasing Amplifier, with Equipment Application notes to bring you up to date on new GVG terminal products usefulness, and...

The 440 Series Routing/Assignment Systems, which introduces new size and cost economies into the choices of routing switcher systems available today.

Circle the reader service number for our new literature pack on the 300 Series, Mk II DVE, the 3230 and 3256A, the 440 Routing/Assignment Systems and new developments of the 400/410 Routing lineup also.

Call or write us directly for literature on the 1600 Series production switchers from 1600-1A to 1600-7K, the 3240 Video Processing System and other current quality GVG products.



THE GRASS VALLEY GROUP, INC.

P.O. BOX 1114 GRASS VALLEY CALIFORNIA 95945 USA • TEL: (916) 273-8421 TWX: 910-530-8280

A TEKTRONIX COMPANY

Grass Valley Group Field Offices: WEST: 4419 Van Nuys Blvd Ste 307, Sherman Oaks, CA 91403 (213) 990-6172 • SOUTHEAST: 1644 Tullie Cir NE, Atlanta, GA 33029 (404) 321-4318 • NORTH CENTRAL: 810 W Bristol St, Elkhart, IN 46514 (219) 264-0931 • NEW ENGLAND & MID ATLANTIC: Station Plaza East, Great Neck, NY 11021 (516) 487-1311 • SOUTHWEST: 2639 Walnut Hill Ln Ste 143, Dallas, TX 75229 (214) 358-4229 • MIDWEST: 3585 N Lexington Ave Ste 374, Arden Hills, MN 55112 (612) 483-2594

BROADCAST INDUSTRY NEWS

FCC Approves Satellite News Delivery

The Associated Press has received permission from the FCC to test a system of distributing news reports to its affiliates by satellite.

AP plans to utilize existing Western Union and RCA satellites in the experimental transmission of news to APRadio stations and data signals to newspapers. The test, expected to last approximately a year, will include 25 APRadio stations, selected to provide "worst case" conditions. The stations presently receive transmissions via leased land lines.

In a similar move, RCA American Communications has filed with the FCC for permission to provide end-to-end satellite service for broadcast news and newswire distribution to United Press International and other users. The plan is part of RCA's proposal to install, maintain, and provide satellite transmission service to over 600 earth stations nationwide (see *BM/E*, April, 1979, p. 6). The National Black Network (NBN) has already made a commitment to RCA to use the service, ordering two full-time 15 kHz satellite channels, including two uplinks to the spacecraft from the RCA Vernon Valley earth station. NBN service facilities will feed audio programming to RCA Americom's New York City operations center, which is linked to Vernon Valley via dedicated microwave. NBN's affiliates will be provided with small receive-only earth stations by RCA.

Carter Promises Regulatory Reform In NAB Speech

Speaking to broadcasters at the NAB Convention in Dallas on March 25, President Jimmy Carter declared, "It is time we take control of Federal regulations in America." He then outlined proposals "to reduce, to rationalize, and to streamline the regulatory burden throughout American life."

In response to a question about the exact timing of broadcast deregulation, Carter indicated that a timetable had yet to be established. He cited the successful elimination of unnecessary regulations in other federal agencies, such as HEW and OSHA, but added, "I might point out that many of the regulations that presently are burdensome have been proposed and supported and are still supported by the broadcasting industry itself, so we've got to be very careful as we remove regulations not to interfere with orderly processes of your industry. But I can assure you that my own direct Presidential influence and interest is in it . . ."

The President called the movement for regulatory reform "a call for common sense," and said that his proposals would constitute the first comprehensive regulatory reform in 30 years. His plans include requiring cost-benefit analysis of new regulations, reviewing standing regulations each decade, and reducing paperwork requirements.

Asked if broadcasters were, in his opinion, entitled to the same First Amendment privileges as newspapers, the President said, "That's a hard question for me to answer because it has so many ramifications." He cited spectrum allocation as one factor which greatly differentiates broadcasting from the print media, which are not licensed by the government. Carter explained that there are "so many wide differences between the newspaper industry and the broadcasting industry — spectrum is just one example — that I can't say that I would give the same identical freedom to the broadcasting industry as newspapers. I think we'll have less restraint on your industry when I go out of office by far than existed when I came into office."

Satellite Distribution Of TV Spots Tested

A 13-week test of direct-to-station satellite transmission of television spot commercials has been launched by John Blair & Company, New York. The distribution system, under development by Blair for more than a year, sends the spots from uplink facilities in New York City simultaneously to every commercial station in Kansas City, Seattle, and Sacramento.

According to Blair, each downlink station receives the equivalent of a master print of each commercial, insuring high quality. Transmission takes only seconds, in sharp contrast with current practices of mailing film or tape dubs from agencies to stations.

If the experiment proves successful, Blair plans to expand it nationally. The satellite commercial forwarding service will be offered to all advertising agencies through a separate operating unit.

The ad agency of Ogilvy & Mather, on behalf of General Foods, is participating in the distribution system test. Hughes Television Network is coordinating all technical facilities required for satellite transmission.

Two Rewrite Versions Introduced In Senate

Two proposed bills amending the Communications Act of 1934 were introduced in the Senate in late March. Both are milder than the controversial HR 13015 rewrite bill, introduced last summer by Congressmen Lionel Van Deerlin (D-Calif.) and Lou Frey (R-Fla.).

The first Senate rewrite proposal, S 611, was introduced by Senate Communications Subcommittee chairman Ernest Hollings (D-S.C.) and cosponsored by Senators Cannon (D-Nev.) and Stevens (R-Alaska). Both S 611 and S 622, proposed by Senators Goldwater (R-Ariz.), Schmitt (R-N.M.), and Pressler (R-S.CD.), emphasize telecommunications, but each contains several provisions of prime interest to broadcasters. Among those provisions are:

Spectrum fees: S 611's proposed "public resource fee" is designed to "reasonably reflect the value of the license," according to the bill's authors. Formulas for VHF, UHF, and

continued on page 10

If you think their character generator is easy to operate, just go ahead and exawkm.

Before you invest in a top of the line character generator, you should know more than just what it can do. That's why the versatile new 3M D-8800 character generator could be just the one for you. You see, all instructions are in English, not in code. And we've put them on a convenient L.E.D. panel above the keyboard for less wasted eye motion. So even a beginner can soon be composing in all kinds of fonts and colors. See your 3M representative right away for the character generator any of your people can run, or call 612-736-1032 for more information. Unless of course, you'd rather exawkm.

3M

Circle 103 on Reader Service Card

radio fees are included. TV fees are not to exceed 10 percent of pretax profits; radio fees are 20 times the highest single one-minute spot rate for fulltimers and 10 times the highest spot rate for daytimers. S 622 would impose fees to cover costs of FCC regulation. The fees would extend to non-broadcast users, including telephone companies, CB operators, and others. Exempt from the fee would be government users, public broadcasters, and non-commercial users operating in the "public interest."

License terms: S 611 proposes indefinite terms for radio and increases TV licenses to five years. It retains the requirement that stations operate in the "public interest, convenience, and necessity." S 622 also provides for indefinite radio licenses. TV licenses would be for three years in the top 25 markets, four years in the next 75, and five years in the remaining markets. AM clear channel stations would be continued and a lottery system would be used in competition for new licenses.

Deregulation: S 622 eliminates ascertainment requirements, the reasonable access rule, and non-entertainment programming requirements. It would establish an FCC Office of Deregulation and permit either house of Congress to veto any FCC rule within 60 days of promulgation.

Fairness Doctrine: S 611 retains it; S 622 abolishes it, but retains the personal attack rule.

The Hollings bill, S 611, would leave the determination of whether cable operators could carry distant or local broadcast signals with the FCC. Local broadcasters would have the burden of proving harm, however, before the Commission would impose restrictions.

Neither bill provides funding for public broadcasting.

"TAILOR" YOUR SOUND TO YOUR STATION'S FORMAT

The advanced concepts of Harris MSP-90 audio processor permits "tailoring" your sound to the station's format.

Beautiful music to hard rock, Harris MSP-90 allows you to customize audio processing with a choice of controls.

Increases average modulation...improves coverage area.

MSP-90
Audio Processor

- For AM, FM, or TV
- With discrete adjustments
- Includes program director's guide

Call or write Harris Corporation, Broadcast Products Division, Quincy, Illinois 62301 217/222-8200

HARRIS
COMMUNICATIONS AND INFORMATION HANDLING

Circle 104 on Reader Service Card

CATV Access Rules Struck Down By Supreme Court

The FCC's authority over cable TV was severely restricted by a Supreme Court decision rejecting the Commission's regulation requiring cable system operators to maintain public access channels. The Court affirmed, by a six to three vote, a U.S. Court of Appeals ruling in a suit brought by Midwest Video, Little Rock, Ark., against the FCC.

The majority opinion, written by Associate Justice Byron R. White, was based on a strict construction of the 1934 Communications Act, which forbids the FCC to treat broadcasters as common carriers. The rules requiring cable operators to maintain public access channels did just that, according to the opinion, and were therefore illegal.

In the original decision, the U.S. Court of Appeals had ruled that the public access regulations not only violated the Communications Act, but could also pose a threat to cable's First Amendment rights. The Supreme Court, however, did not comment on the constitutional issue.

Joining the FCC in the appeal were the American Civil Liberties Union, the National Black Media Coalition, Citizens for Cable Awareness, and the Philadelphia Community Cable Coalition. The two last organizations are community groups based in Pennslyvania.

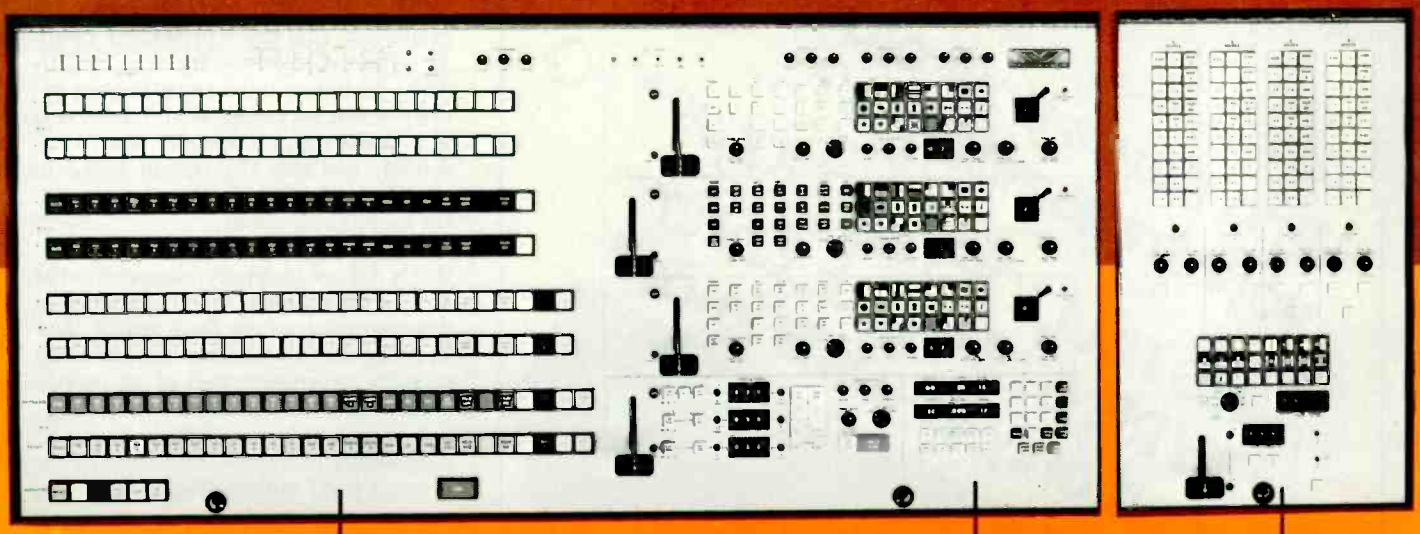
A dissenting opinion was given by Justice John Paul Stevens, with Associate Justices William J. Brennan, Jr., and Thurgood Marshall concurring. The dissenters pointed to earlier decisions in which the courts had interpreted Congressional silence on the question as investing the FCC with broad discretion.

The decision does not necessarily

continued on page 12

No Second Best with the Vital Production Package

Get it all together or one at a time!



Patented

VIX-114 VIDEO SWITCHER

- 12 to 24 Inputs and 4 to 10 bus systems
- Multiple keys on each Mix/Effect
- Auto Transition Control programmable in frames
- Interface for Editor and Computer control
- RGB or Encoded Shadow Chroma Key
- Varikey for Soft, Hard, or See-thru keys
- Digital controlled
- Many more advanced features fully described in the 114 Series brochure

PSAS
Production Switching Automation System

- Controls the VIX-114 Series Switching Systems and SqueeZoom with smart microprocessor systems
- Autolearn or Endpoint Plotting with no time restrictions
- Unlimited floppy disk storage with 1875 events per diskette
- Editor Interfaceable
- Output controls for character generators, frame stores, camera shot box, and other TV devices
- Human engineered control panel fits in switcher control panel

SQUEEZOOM® is...

- Frame Syncronizer
- Frame Freezer
- Video Compressor
- Electronic Zoom
- Very special Optical type effects
- Avoid FCC violations with Blanking correction
- Up to 4 channels on one screen
- CHROMAZOOM
- Ask to see Demo Tape

NTSC or PAL

ERIC KING Southeast
Fox Hill Road
Lynchburg, Va. 24503
Phone 804/384-7001

MORRELL BEAVERS Midwest
2644 North Seventh St.
Terre Haute, Indiana 47804
Phone 812/466-3212

BARRY HOLLAND West Coast
7960 West Beverly Blvd.
Los Angeles, California 90048
Phone 714/497-4516

GORDON PETERS Southwest
P. O. Box 912
Arlington, Texas 76010
Phone 817/467-0051

ROBERT McALL or BARRY ENDERS Northeast
34 Autumn Lane, Hicksville, N. Y. 11801
Phone 516/735-0055

HI TECHNOLOGY PRODUCT INNOVATORS

VITAL INDUSTRIES, INC.

MAIN OFFICE: 3700 N.E. 53rd Ave., Gainesville, Fla. 32601 U.S.A.
Tel.: Area 904—378-1581 • TWX 810-825-2370

Circle 105 on Reader Service Card

sound the death knell for public access, however. State and local governments can still pass legislation requiring cable operators to maintain public access channels. Currently, 11 states have regulatory bodies for cable which could decide to require public access.

License Challenges Fail In Charlotte And Rochester

The FCC has dismissed as defective a petition to deny the license renewals of 16 Charlotte, N.C., broadcast stations filed by the Southeastern Regional Directorate of the NAACP Legal Defense Fund on behalf of the Charlotte Broadcast Coalition. The petition alleged that the station violated equal employment opportunity rules by excluding blacks from nearly all responsible positions and asked the Commission to deny the 1978 renewals, issue cease and desist orders, and hold hearings in Charlotte.

According to the FCC, the petition lacked the necessary specificity. Only six of the 16 stations were referred to in the body of the document, and only two licensees received copies. The Commission also noted that while there might be merit to the petioners' arguments, it would be prejudicial to apply the suggested standards to the licensees without prior notice.

The stations involved were WBCY-FM, WROO-FM, WSOC-FM, WSOC-TV, WRET-TV, WBTV-TV, WTVI-TV, and AM stations WAME, WAYS, WBT, WEZC, WGIV, WHVN, WIST, WRPL, AND WSOC.

In another action, the FCC has renewed the license of WEZO-FM in Rochester, N.Y., and denied a petition by Metro-Act of Rochester, Inc., for denial. Metro-Act contended that WEZO broadcast an unacceptably small amount of nonentertainment programming, that much of WEZO's public affairs programming was improperly double-counted since the one locally produced public affairs show was also broadcast on another Rochester station, and that the station failed to specify proposed program responses for ascertained needs.

In denying the petition, the FCC said that it did not generally intervene in the area of the amount, kind, and times of programming unless there was a clear showing that the licensee had ignored a strongly expressed need of its service area. It pointed out that a licensee was not required to program to meet all community problems, but could determine in good faith those problems that merited treatment. The Commission further stated that Metro-Act had not presented sufficient data to establish WEZO's failure to meet community needs.

Employment Of Women And Minorities Gained In 1978

Fifty-two percent of full-time women employees in the broadcasting industry held jobs in the "higher pay categories" in 1978, according to a report released by the FCC. In 1977, only 48 percent held such jobs, defined as all official and manager, professional, technician, and sales worker positions.

Minority groups also gained in high-level employment, with 65.4 percent of male and female minorities in those positions, compared to 64 percent in 1977.

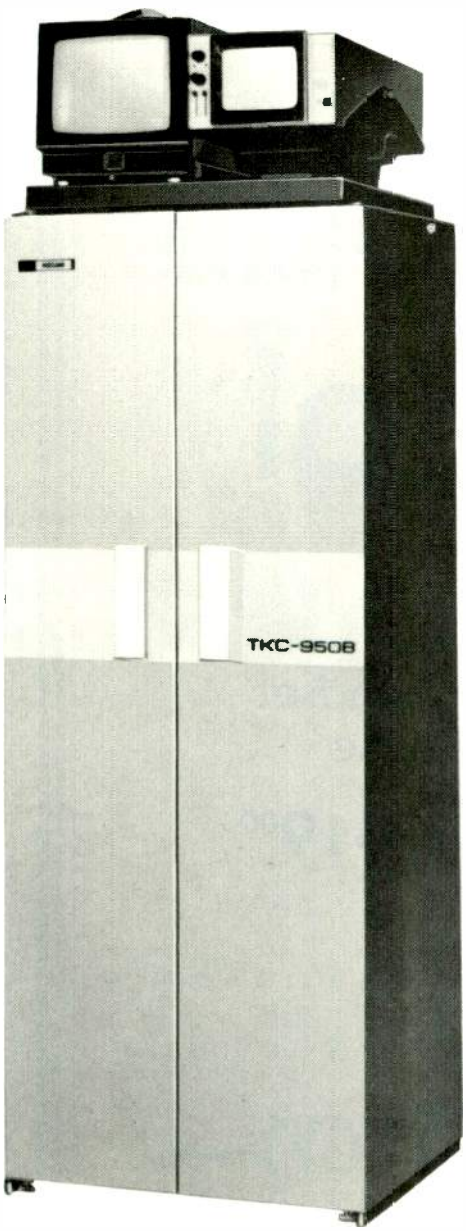
In 1978, women held 21.6 percent of the official and manager positions, 22.3 percent of the professional jobs, 27.3 percent of the sales posts, 7.2 percent of the technicians' jobs, and 90.3 percent of the office and clerical posts. Despite gains, women are still disproportionately represented in the last category, traditionally viewed as "women's work."

Members of minority groups, de-

continued on page 14

Circle 106 on Reader Service Card

No more dirty movies.



The reason: the Ikegami TKC-950B film chain camera's unique optical system removes the correcting field lens from the focal plane where the aerial image is located. Thus, any dust that collects on the field lens is out-of-focus. When you run movies on the large-image field lens of the TKC-950B, the viewer receives a clean, sharp, dust-free picture on his home TV screen.

The TKC-950B system is dedicated to produce the highest color quality and picture stability. For example, a prism beam-splitter separates the images to its three one-inch vidicons.

The TKC-950B takes into consideration the tight quarters in which most film chains must be installed and operated. Remarkably small, it can accept an external multiplexer on either the left or right side of the unit for additional installation flexibility. Compatible with your existing equipment, it is easy to replace obsolete cameras.

Because film chain cameras must run with minimum supervision, we've built a lot of self-control into the Ikegami TKC-950B. A servo-controlled neutral-density filter disc, built into the optical system — along with fast-acting video gain control — respond so quickly, there is no need for individual light compensators with your projectors. A very stable color encoder provides precise color reproduction. Three types of test pulses with six functions, built into the unit, are provided to facilitate set-ups, daily checks and calibration of the gamma-correction circuit.

The TKC-950B is highly stable and any variations in the source material can be compensated for manually or with an optional new automatic color balance accessory which balances white, black and gamma automatically. And each function is available for local or remote control.

For a complete picture of the Ikegami TKC-950B or a demonstration, contact: Ikegami Electronics (USA) Inc., 37 Brook Avenue, Maywood, N.J. 07607; phone: (201) 368-9171.

Ikegami

Circle 107 on Reader Service Card

fined by the FCC as blacks, Asians, native Americans, and Spanish-surnamed Americans, held 7.8 percent of official and manager positions, 12.5 percent of the professional jobs, 7.8 percent of the sales posts, 14.6 percent of the technicians jobs, and 23.8 percent of the office and clerical posts. Of clerical and office workers, 20.5 percent were minority females and 3.3 percent were minority males.

Other traditionally male job categories showed less impressive gains. Ninety-two percent of craftsmen, for example, were men in 1978, while only eight percent were women. Minority group members, male and female, constituted 16.6 percent of this category. This represents a drop from 1977, when women were 8.3 percent of craftsmen and minorities were 16.7 percent. Employment of women in this category has been steadily declining since 1974, despite equal opportunity regulations.

Circle 108 on Reader Service Card

UHF TV Committee Announced By NAB

The National Association of Broadcasters has announced the names of the seven broadcasters who will serve on the association's recently formed UHF Television Committee. The members are: Don B. Curran, president of Field Communications, San Francisco (chairman); Reid G. Chapman, VP and general manager of WANE-TV, Fort Wayne, Ind.; James C. Dowdle, VP and general manager of WTOG-TV, St. Petersburg, Fla.; Milton D. Friedland, VP and general manager of WICS-TV, Springfield, Ill.; Cyril E. Vetter, president and general manager of WRBT-TV, Baton Rouge, La.; Paul Blue, president and general manager of WLKY-TV, Louisville, Ky.; and Kathryn Broman, president, Springfield Television Broadcasting Corp., Springfield, Mass.

According to NAB president Vincent T. Wasilewski, the new committee "reflects NAB's continuing and expanding involvement in UHF matters." He cited increases in the number of UHF stations and new station applications and the FCC's recent interest in the UHF question as other reasons for the establishment of the committee, which was approved in January at a meeting of the NAB board of directors.

NAB TV Code Board Adopts Bumpers For Children's Shows

The National Association of Broadcasters' Television Control Board has adopted the use of "bumpers," separator devices in both audio and video, to be used before and after commercials aired during programs aimed at children. The guidelines will take effect on September 1, 1979.

The purpose of the bumpers is to increase children's perceptions of the differences between program material and commercials. A message stating, "We will return after these messages," will be aired in both audio and video before each commercial. After the spot, another bumper, this time saying, "Now back to the program," or words to that effect, will mark the transition. The bumpers may include artwork, animation, and the station or network logo, and must remain on the air at least five but no more than 10 seconds.

Armstrong Awards To Include AMs

The annual Armstrong Awards for excellence and originality in radio broadcasting have been expanded to include AM stations. Now in their fifteenth year, the awards were previously lim-

continued on page 16

"The TDF-1 makes all our signals studio quality."

"The TDF-1 Digital Noise Filter has made a major difference in how our news feed looks...

"As a member of ITNA, we receive co-op news feeds from all over the world, and sometimes they are 6th or 7th generation converted from PAL by the time we receive them. The TDF-1 absolutely dramatically cleans up even the worst feeds. It makes us look live . . .

"Commercials shot with ENG/EFP equipment look better. It cleans up shots under existing light to the point where the client is happy with them . . .

"Overall, our day-to-day operations look significantly better."

– Hal Protter
Vice President and General Manager
KPLR-TV, St. Louis, Missouri

"The TDF-1 has given us a consistent air look and higher overall quality - better than network...

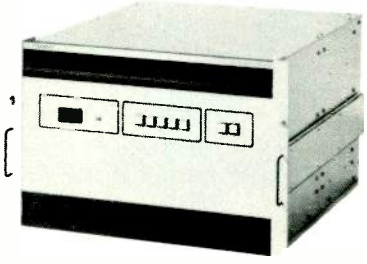
"It really makes life easier – it improves the signals that need improving and leaves the rest alone . . .

"We did a side-by-side test with a competitive unit, which we thought was pretty good, but when we brought the TDF-1 in – well, somebody had sure done their homework on it! It especially handles film grain better . . .

"It's fabulous on cartoons! By the time you run the TDF-1 up to its top correction, you end up with a signal that has no grain . . .

"I haven't seen anything it doesn't handle well."

– Jim Gonsey
Chief Engineer
KPLR-TV, St. Louis, Missouri



TeleMation
A Division of Bell & Howell
P.O. Box 15068, Salt Lake City, Utah 84115
(801) 972-8000, Telex: 388-352

© 1978 Bell & Howell Company. All rights reserved. TeleMation and Bell & Howell are trademarks of Bell & Howell Company.

ited to FM stations. In addition, the Armstrong Foundation will be joined by the NRBA in sponsoring and administering the awards.

AM and FM stations will compete on an equal basis in the six major categories: news, news documentary, music, education, community service, and creative use of the medium. Three new categories will be awarded if merited: technical achievement in broadcasting, innovative station programming, and outstanding contributions to the radio industry.

Deadline for entries is June 11. Awards will be presented at the NRBA convention in Washington, D.C., in October.

Wometco Seeks To Bring STV Operation To Chicago

Wometco Enterprises is making plans to bring its over-the-air subscription television operation, Wometco Home Theatre, to the Chicago area. It would operate STV programming at a proposed UHF station in nearby Joliet, applied for by Focus Broadcasting Co., if the FCC approves the license. The station's transmitter would be located in Chicago, and the signal would cover the Chicago metropolitan area as well as Joliet.

Wometco is also negotiating with potential STV operators in other cities for the purpose of expanding Wometco Home Theatre.

Boom Predicted In U.S. Microwave Market

The total U.S. market for microwave equipment will nearly double by 1982, predicts a study by market research specialists Frost & Sullivan, Inc., New York City. Valued at $1.17 billion in 1977, the microwave market will increase to $2 billion by 1983 and to $2.9 billion by 1987.

The study, which defines microwave as 1 GHz and above, cites microwave ovens as the single largest growth area. Communications satellite earth stations are second; the market for earth stations is expected to increase 23 percent each year for the next five years, with contract awards to cover some 8676 earth stations. Wireline and news transmissions are cited as likely new markets in this category; the FCC's recent elimination of its rule requiring dishes to be at least nine meters long is expected to have "tremendous impact" on CATV and other markets as smaller, lower cost systems are developed.

Public Is Satisfied With Commercial TV, Study Finds

The eleventh annual study by the Roper Organization, Inc., for the Television Information Office in New York City, shows the American viewing public to be largely satisfied with commercial television as an entertainment and news medium. Among the findings of the report was that median daily viewing time has reached a peak of three hours and eight minutes for all respondents. Viewing by college-educated and upper-economic groups has also reached a new high.

Respondents voted strongly for individual viewer control over what the public will watch, as opposed to government control or control by networks and independent broadcasters. Seventy-eight percent of those questioned called commercials "a fair price to pay" for television.

Television also ranked as the number one source of news for two-thirds of the respondents, beating out newspapers by a wide margin. Television also continues to be the most believable news medium among the public.

Parents who participated in the survey reported that nine out of 10 of their children aged three to 10 years are able

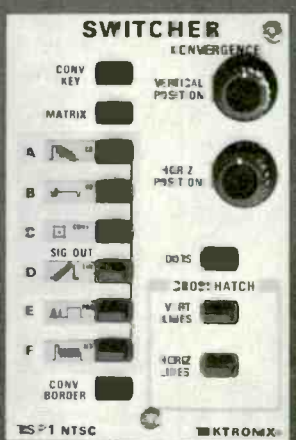
continued on page 18

Circle 110 on Reader Service Card

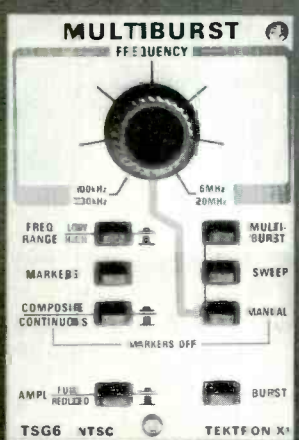
THE TOTAL TEST SIGNAL GENERATOR

We've added important capabilities to our 1410 Series Generators. With the new TSP1 Switcher/Convergence Generator and TSG6 Multiburst/Video Sweep Generator, the 1410 is a complete, all-purpose sync and test signal generator. The 1410 mainframe accommodates any combination of five or six test signal generators driven by one sync pulse generator. Select the exact generator package you want without paying for more than you need. You can choose from genlock or non-genlock sync pulse and black-burst generators, and test signal generators for color bars, convergence, linearity, pulse and bar, or multiburst/video sweep.

For more information on the 1410 Series or on the new TSP1 Switcher/Convergence and TSG6 Multiburst/Video Sweep Generators, write Tektronix, Inc., P.O. Box 500, Beaverton, OR 97077. Or call our toll-free automated answering service at 1-800-547-1512. In Oregon, 1-644-9051.



The TSP1's single switchable output gives access to all the test signals generated by your 1410. Select a single signal for full-field display, or use the signal matrixing capability to evaluate several performance parameters at once.



The TSG6 provides 20 MHz sweep signals and high/low frequency range multiburst signals for frequency response testing in TV studios and on manufacturers' production lines. Markers are available for amplitude and frequency reference.

Circle 111 on Reader Service Card

Tektronix®

COMMITTED TO EXCELLENCE

The AUTOMATIC Audio Test System That Measures. . .

- Harmonic Distortion
- Intermodulation Distortion
- Volts
- dB
- Signal + Noise / Noise Ratio
- Wow and Flutter
- Stereo Phasing
- Differential Gain in Stereo Channels

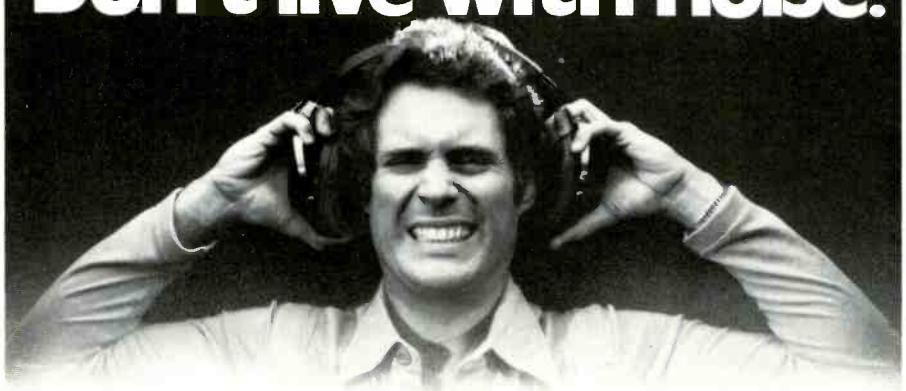
MODEL AT-51
AUDIO TEST SYSTEM

Contact Us Now For Complete Details And Descriptive Literature.

POTOMAC INSTRUMENTS
932 PHILADELPHIA AVE.
SILVER SPRING, MD. 20910
(301) 589-2662

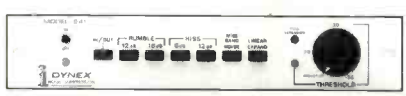
Circle 112 on Reader Service Card

Don't live with noise.



The DYNEX Noise Suppressor helps get rid of electronic and environmental background noise without sacrificing program clarity.

Choose low-frequency, high-frequency or wideband noise suppression. As legitimate program energy in the suppressed band increases, suppression is progressively reduced. The result is a cleaner sound for broadcasting, location filming or studio recording and production.



You don't have to live with noise. Find out more about the DYNEX. Call or write us today. Model 241, DYNEX —$300.

Inovonics Inc.

503-B Vandell Way
Campbell, CA 95008

Telephone
(408) 374-8300

Circle 113 on Reader Service Card

News

to differentiate between commercials and programs. They further said that of those who know the difference, eight out of 10 know the purpose of commercials.

A booklet detailing all questions and data is available from the Television Information Office, 745 Fifth Avenue, New York, N.Y. 10022 for 50 cents.

A nationwide survey commissioned by *Advertising Age* came up with conflicting results for the public's tolerance of advertising. Sixty percent of those surveyed consider television ads offensive, according to a report on the survey by the NRBA, while only six percent complained about radio advertising.

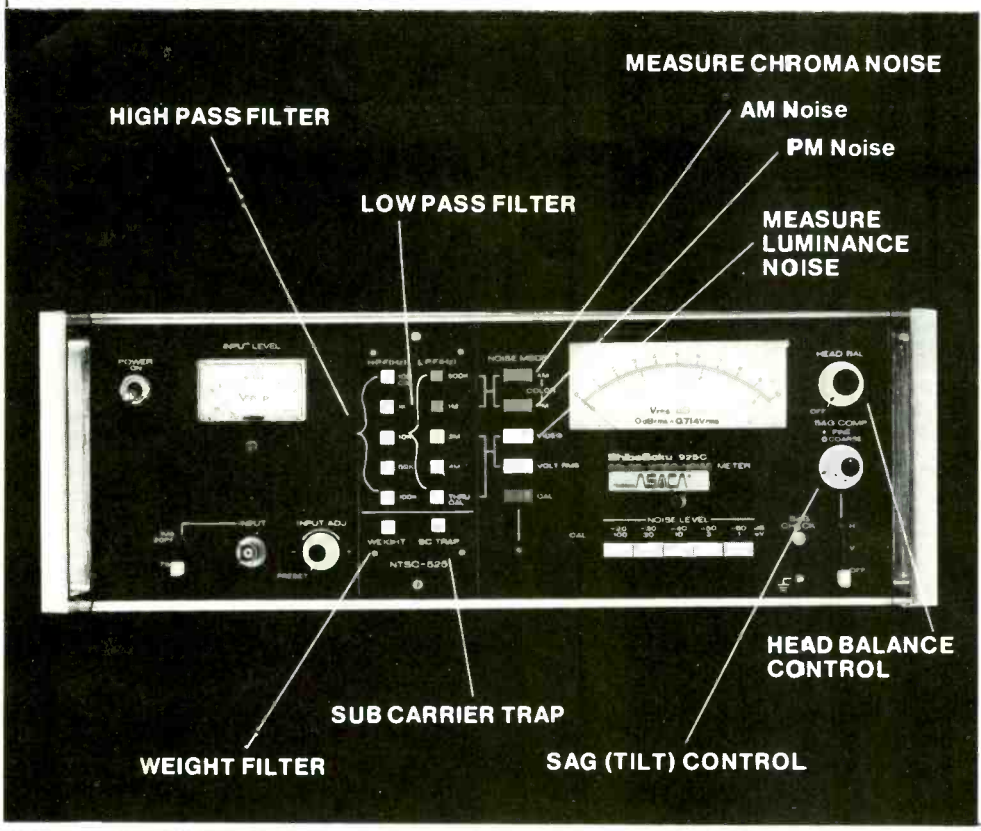
News Briefs

The National Radio Broadcasters Association has urged the FCC to **deregulate time brokerage arrangements** in order to encourage part-time specialized audience programming and to increase the involvement of minorities in broadcasting. Regulation of part-time operations would cause "burdensome" expenses that would be detrimental to "thinly capitalized minority entrepreneurs," said NRBA. The association recommended that the FCC issue a policy statement openly encouraging part-time brokerage arrangements to increase minority participation . . . . **The National Association of Broadcasters,** complaining that the FCC's revised form 395 covering **equal employment opportunity rules** "may actually make the employment task more difficult for broadcasters," **has asked the Commission to modify and clarify the form.** NAB claims that some common job titles have been omitted while others uncommon to the industry have been included . . . . James J. Popham, NAB assistant general counsel, told a conference on off-air taping for educational purposes that **more attention should be paid to local stations,** who are affected by this issue. Local stations "maintain a vital and constantly growing interest in protecting their works from unauthorized duplication and re-use," said Popham. If the value of broadcast product is diluted by unauthorized use, Popham continued, "the station as well as the producer will suffer."

The National Cable Television Association has named maximum television service to consumers and efficient use of spectrum space as top priorities in **developing national policy on TV translators** and low-power broadcast stations in comments filed with the

continued on page 20

MEASURES CHROMA NOISE AND LUMINANCE NOISE



World's first Instrument to Measure Chroma Noise Generated In Color and Black and White Television Transmission Equipment, TV Cameras, VTRs, Video Disc Units, Digital Image Processors.

Measure the value of this unique instrument*, Model 925C Video Noise Meter, and you'll see why it has been purchased by a major USA network. It measures chrome band noise with a single color signal of desired level that contains both a sync signal and a color burst signal. Chroma noise can even be split into AM and PM components which can be measured separately. Unbalanced 2 head of VTR can be corrected for proper measurement.

A must for every station and production house in TV. Write for information.

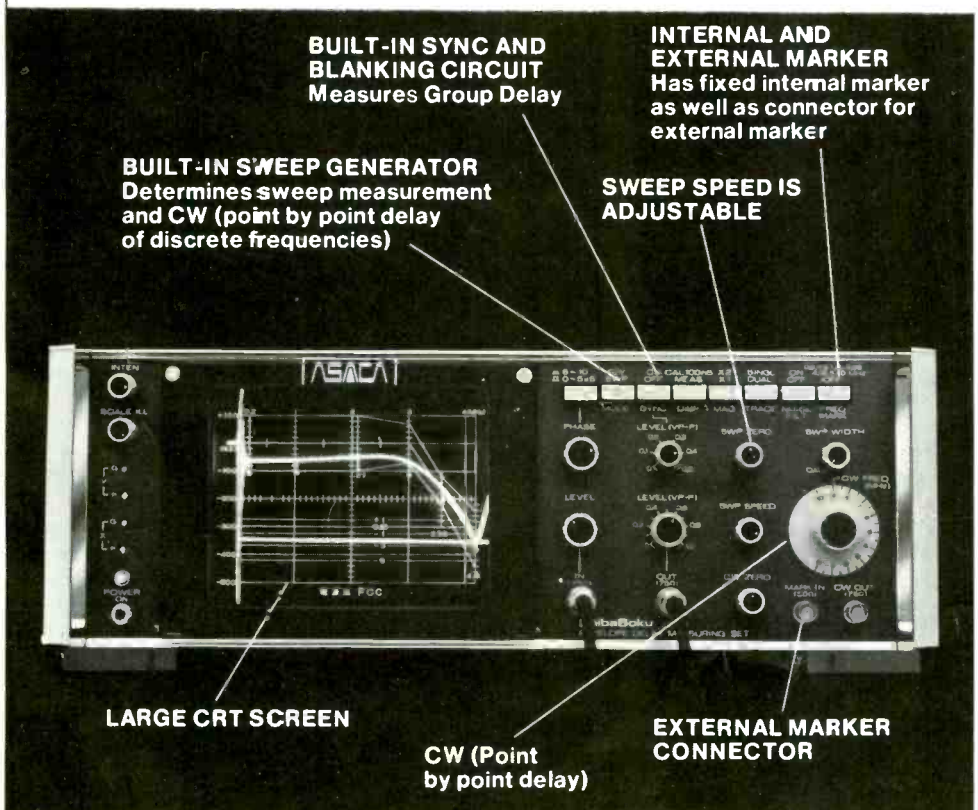
We create change

ASACA®

ASACA CORPORATION OF AMERICA
1289 Rand Road, Des Plaines, Ill. 60016
Phone (312) 298-4380

*Product of SHIBASOKU—sister company of ASACA

MEASURES GROUP DELAY IN TRANSMISSION SYSTEMS & LINES



At last! The Envelope Delay Measuring Set You've Always Wanted—But Which Technology Couldn't Develop Until now! Compare Performance With Equipment Selling For $14,000.00. Our Price—Only $6,500.00!

Our envelope Delay Measuring Instruments* feature large CRT screens, built-in sweep generators and allow spot frequency delay measurements from 200 KHz to 10 MHz. Check out Models 763 NA and the new 201-1. Both are NTSC or PAL compatible. The 201-1 adds a built-in sync generator and blanking mixer.

Don't you delay in getting full information. Write.

We create change

ASACA®

ASACA CORPORATION OF AMERICA
1289 Rand Road, Des Plaines, Ill. 60016
Phone (312) 298-4380

*Product of SHIBASOKU—sister company of ASACA

Circle 114 on Reader Service Card

The Mod One Is The Flexible One

Start With The Console Format You Need Now, Expand Later.

Modular design lets you select a wide range of input modules and plug-in amplifier cards as you grow. 10 mixing positions with up to 30 inputs. Modern vertical faders; silent operating switches; state-of-the-art circuitry.

Custom features and options with off-the-shelf availability. Monaural, stereo, or quad. Meets all FCC - AM and FM standards. UREI quality, of course.

Available through your UREI dealer.

UREI "Instrumental in Audio"

8460 San Fernando Road, Sun Valley, California 91352 (213) 767-1000

Exclusive export agent: Gotham Export Corporation, New York

Circle 115 on Reader Service Card

News Briefs

FCC, now conducting an inquiry into the role of translators and low-power stations in telecommunications. According to NCTA president Robert L. Schmidt, communications policy should allow "all technologies to provide maximum quality and variety in their services to consumers" . . . . The Association of Maximum Service Telecasters, Inc., has submitted comments to the FCC in response to the recent Notice of Inquiry pertaining to **CB radio interference to home television reception.** The problem lies not with inadequate TV sets, says MST, but rather with the generation of harmonic signals at the CB transmitter. "These harmonics fall on frequencies which television receivers are *supposed* to pick up," according to MST's comments. MST calls for adoption of at least a 100 dB suppression requirement for new CB transmitters.

Oak Communications, Inc., has announced **plans to license its proprietary over-the-air subscription TV** equipment and technology to UHF stations throughout the U.S. and overseas. The service will be offered in cities where Oak does not plan to operate an STV business . . . . Television News Research, Inc., New York, N.Y., has established a **Local Newscaster Talent Bank** as a service to TV news management. The syndicated service will offer subscribers professionally edited videotapes of actual broadcasts of local television newscasters in the top 75 markets. Syndication is available to networks, station groups, individual stations and other interested parties . . . . Richard F. O'Brion, executive VP of U.S. JVC Corp., predicts that **1979 will be a year of "uninterrupted growth"** and "maturity" in the professional video industry. With maturity will come less technology for the sake of technology and more emphasis on tailoring innovation to specific functional requirements, O'Brion claims.

The 121st Technical Conference and Equipment of the SMPTE will be held October 21 to 26 at the Century Plaza Hotel in Los Angeles. For further information contact SMPTE Conference, 862 Scarsdale Ave., Scarsdale, N.Y. 10583 . . . . **SMPTE has announced publication** of *Digital Video, Volume 2*. None of the 13 papers in the book have been previously published. The book is available through SMPTE . . . . **Video Expo will appear at the Chicago Expocenter** May 22 to 24. Over 100 manufacturers will exhibit hardware, software, and programming. For information contact Sheila Frank, Knowledge Industry Publications, 2 Corporate Park Drive, White Plains, N.Y. 10604.

SHOW STOPPER

CDL's NAB '79 Show was created live with the CD-480 video production switcher equipped with standard options and optical quality digital effects.

Standard CD-480 features including two chroma keys, created within the same effects amplifier, and soft-colored modulated wipes used as background visuals added a subtle touch of difference to each presentation.

The CD-480 is field proven in over 100 installations worldwide. You can capitalize on its competitive advantage now!

Tom Hladik, creator of the CDL NAB '79 show, played the CD-480 switcher like a virtuoso, demonstrating sensational new visual effects in each of the 50 live presentations.

Actual monitor shot from NAB '79

CENTRAL DYNAMICS LTD

Chicago
331 West Northwest Hwy.
Palatine, IL 60067
(312) 991-4720
TWX—910 693 4805

New York
(914) 592-5440

Los Angeles
(213) 789-0574

Atlanta
(404) 491-9037

Dallas
(214) 741-3332

Denver
(303) 623-7603

CANADA—Montreal
(514) 697-0810

Circle 116 on Reader Service Card

MICROCAM®...

because life is a contact sport.

Cover it close. Right where it lives. In the political arena or on the fifty yard line. In the heart of the city, or miles from nowhere. On location, or in studio A, Microcam covers it all.

Microcam, developed by Thomson-CSF Laboratories. The first shoulder-mount color TV camera to offer the combined benefits of studio-quality broadcasting with lightweight portability. In fact, Microcam weighs just 12.4 pounds for a total of 22 pounds, complete with motorized lens and a 5 pound silver cell battery which operates the camera for 6 hours on a single charge. Microcam provides all the essential features for superior pictures from the field or in the studio.

- Automatic beam optimizer prevents comet-tailing
- Low power consumption of 20 watts
- High index f/1.4 prism assembly
- Three position gain switch 0, +9, +18 dB
- Automatic color balance, automatic iris, and black level
- Built-in masking, split-field color bar generator and 2-line enhancer
- Color genlock included as standard
- Superior light sensitivity to allow clear, sharp pictures with only two footcandles of available light
- Variable H & V Blanking to meet the latest production requirements
- Available with optional 4½" Viewfinder and Remote Control System for EFP or studio operation.

Plus complete VTR Control, including start-stop, VTR standby and return video. And a complete set of operating indicators, including VTR status, located in the viewfinder.

Only Thomson-CSF gives you a choice between the monoblock MC-601 Model and the two-piece MC-602. Both cameras bring broadcast quality and ease of operation to Electronic News Gathering, field production, as well as studio applications.

Microcam. For close-up coverage. Because life is a contact sport.

For more information about the remarkable Microcams, call or write.

THOMSON-CSF

Thomson-CSF Laboratories, Inc.
37 Brownhouse Road
Stamford, CT 06902
Tel. (203) 327-7700
TWX (710) 474-3346

Circle 117 on Reader Service Card

Why do ABC, CBS, JVC, Hitachi, Ikegami, Philips and Canon choose *SHOK-STOP*™ for shipping expensive video equipment ?

because they know *SHOK-STOP*™ cases keep equipment SAFE!

And because they know SHOK-STOP cases provide better shock protection than metal or fiberglass cases in the real world of trucks and fork lifts.

SHOK-STOP.™ Perhaps the best case in the world for shipping expensive equipment. Comes in 81 standard sizes at better prices than comparable metal or fiberglass cases.

THERMODYNE INTERNATIONAL LTD

12600 Yukon Avenue, Hawthorne, California 90250 (213) 679-0411

Circle 118 on Reader Service Card

RADIO

PROGRAMMING & PRODUCTION FOR PROFIT

Music Series From Billboard; Humor From O'Connor; Public Affairs Commentary From The etc. Network

HERE ARE THREE programming sources that cover a variety of needs.

Billboard's expertise on the line

The long-term producer of "that chart," for years a prime source of weekly information on what popular records were outselling others, has lately been turning knowledge of programming into programming for radio. One of them is a yearly five-hour special, *"Billboard's* Yearbook 197X," which is built of superstar performances, interviews, movie sound clips, news actualities, and special reports from *Billboard* editors.

Another is a weekly three-hour program, *Billboard, U.S.A., Soul Countdown,* a recap of the week's top Soul singles, hosted by Spider Harrison. A third is *Vis'tin,* interviews with personalities on the country music scene. All these programs have begun to move smartly. *Billboard,* in fact, expects to sell about 500 sets of the year-end special this year.

Coming up just now is "Discoplex," a three-hour program with a self-explanatory title. *Billboard* will try it out; if there is a worthwhile demand this program, too, will become a series available on a regular basis.

Another part of the *Billboard* service for radio stations, "Broadcast Programming," consists of lists of records, assembled according to format, which a station can order to be sent week by week or in a large batch. All the main formats are covered, including a good list of classical records. The records cost considerably less than they would if bought in the open market.

For info: Barbara Stones, Billboard Publications, 1515 Broadway, New York, N.Y. 10036.

O'Connor keeps adding to the mix

One of the most varied assortments of series programs has been coming for some time from O'Connor Creative Services in Universal City, Calif. Political commentary, science, health, and various kinds of entertainment have grabbed about 1500 stations for one or more of the O'Connor series.

A recent addition is a series of humor programs that look excellent, and thus should be highly useful in helping fill the humor void that has long afflicted radio. Definitely attractive is a collection of 260 segments, each three minutes long, by Bob and Ray, who have been extremely funny radio men for years and years. Other humor series described by O'Connor are *Superfun,* nearly 600 10 - to 30-second humor sketches; *The Story Lady,* a "wacky" series, 260 segments 1½ minutes long (12 years on KMPC, Hollywood), called "fractured fairy tales"; and *Hang Glider Traffic Reports,* aimed at amusing motorists, each one minute long. All the series have room for commercials or can take billboards. For info: O'Connor Creative Services, Box 8888, Universal City, Calif. 91608.

Serious talk from the etc.

If a station wants authorities and "names" to talk to listeners on serious subjects (but with maximum interest and excitement) a fairly new outfit called the etc. Network will try to answer. Among the talkers offered are: Gore Vidal, novelist and talk-show star; the Rev. Jesse Jackson, dynamic black leader; Cleveland Amory, newspaper and lecture champion of the animals, the family under terrible pressure from man; Mildred Newman and Bernard Berkowitz, professionals in psychology and psychoanalysis; and a number of others of like weight and interest. For info: The etc. Network, 6363 Sunset Blvd., Suite 520, Hollywood, Calif. 90028. **BM/E**

PROFESSIONAL

WUHY-FM, Philadelphia, rates Stanton's 881S superior in every aspect!

Disc Jockey, Stephen Brooks at the mike

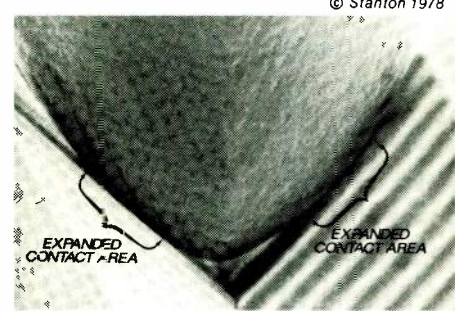
The Stanton 881S cartridge, with its Stereohedron stylus, has been rated, worldwide, as the outstanding stereo cartridge of its time. So, it ought to be a rather delicate pick-up. Not so, says WUHY...outstanding National Public Radio FM Station in Philadelphia. Mr. Ajit George, Director of Development and Awareness, quotes his Engineering Staff in this way:

1) "We back cue the 881S with no damage to the stylus.
2) It has excellent flat frequency response.
3) It handles high level complex music passages with complete freedom from mistracking.
4) The 881S has the highest output compared to average high quality magnetic cartridges, plus the fact that it gives superior signal-to-noise ratio from the phono preamp."

We are in total agreement with all of the above except, honestly, the 881S was not designed for back cueing.

Stanton guarantees each 881S to meet the specifications within exacting limits. The most meaningful warranty possible, individual calibration test results, come packed with each unit. Whether your usage involves recording, broadcasting or home entertainment, your choice should be the choice of the professionals...the Stanton 881S.

© Stanton 1978



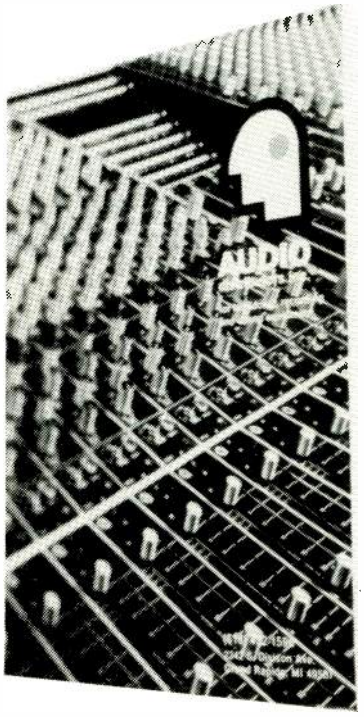
Scanning Electron Beam Microscope photo of Stereohedron® stylus, 2000 times magnification, brackets point out wider contact area

For further information write: Stanton Magnetics, Terminal Drive, Plainview, N.Y. 11803

STANTON

STANTON!

Visit us at Booth 59/60 at the AES
Circle 119 on Reader Service Card



the AUDIO catalog...

Broadcasting's Best Seller!

And it's FREE! 168 pages of broadcast, recording, and sound equipment by the names you trust. Ampex, Auditronics, Autogram, Broadcast Electronics, Crown, Electro-Voice, Nagra, Neumann, Orban, Otari, Russco, Sennheiser, Shure, Technics, and UREI to name a few. And most important, it's brought to you by AUDIO! For 18 years now, broadcasters like yourself, from California to Maine, have been discovering that for total product value, fast quality service, and top notch people you can rely on AUDIO.

For your FREE copy of the AUDIO Catalog, just write to us on your company letterhead and we'll fire back your copy of Broadcasting's Best Seller! AUDIO for the Real Pro!

AUDIO distributors inc.

2342 S. Division, Grand Rapids, MI 49507

Circle 120 on Reader Service Card

Syndicators For Radio

Toby Arnold and Associates, Inc.
Two Summers Square, 4255 LBJ
Dallas, Texas 75234
Tel: (214) 661-8201

THE TERM "SYNDICATION" is by industry habit usually assigned to the provision of complete music programming, but the company up for notice this month makes that seem too restrictive. While Toby Arnold does not — at least so far — supply 24-hour programs on tape or disc, the firm is involved in creating music for radio stations to an extent beyond that of many standard syndicators.

What Toby Arnold does supply is, first of all, custom IDs for many radio stations around the country. These ordinarily involve music background. The same applies to commercials made by Arnold for a long list of national advertisers. To get music that is completely tailored to the need, Arnold has gone into making their own recordings, with a studio big enough to hold a medium-sized orchestra and elaborate multi-track recording equipment.

This same recording capability, plus extensive use of prerecorded material, serves well in the making of a syndicated program called "Production Master," which is a full-service production library of background music for IDs, commercials, jingles, etc. Toby Arnold, president of the firm, told *BM/E* that it is harder and harder for a radio station bent on making commercials to get just the right background music. Arnold has assembled a library of special-effects and music discs calculated to cover just about any music "bed" needed for IDs and commercials. Supplied to each subscriber to the service is a total of about 40 discs; these are updated to the tune of 35 to 40 additional discs over the life of the three-year contract. Arnold told *BM/E* that about 130 stations are signed up for "Production Master." Using the series saves a program director from the difficulties of profit-directed use of commercial recordings; the copyright holders have the legal right to a fee for every use of the recording in an income-producing venture.

There is more in Arnold's market basket of music. "Back Spin" is a daily five-minute program devoted to the number one song of the day, with comment plus nostalgia supplied by Charlie Van Dyke, a long-experienced DJ of popular music. The program is used by several hundred stations. A similar daily five-minute program is "Back Track," with Larry Scott providing a highly personalized showcase for the top Country tune of the day.

Yet another music series is "Studio Disco," four hours a week of disco music. Each program in the series is produced with a voice track made especially for the subscribing station. The voice track aims to create the illusion of a "make-believe ballroom" somewhere in the station's own city, where the music is being played for the usual hall-full of disco devotees. This program, too, is turning into a success.

The biggest single program of music is "Opus," a year-end special produced by Dick Clark. A 12-hour celebration of the preceding year's music, it has been distributed on tape for airing right at the end of each year; some 600 to 700 stations have subscribed in recent years. The Opus this year is called "Opus Of The Seventies," and will include top music numbers of the whole decade, with interviews, comment, and evaluations.

Arnold told *BM/E* that he believes a large part of his success rests on the way he gets the right music for each assignment. Traditionally in Dallas a producer of radio commercials would build the operation around a single-talent music writer. But music composers, no matter how talented, tend to have individual styles, each of which is right for some jobs and not so good for others.

Toby Arnold draws on the entire pool of musicians in Dallas working in the commercials industry, selecting the writer that seems best for each job. Arnold noted that this is possible because Dallas has become the largest center for production of broadcast commercials in the country, and the pool of creative personnel in the city is very large.

In sum: as a producer of music for radio, Toby Arnold and his associates rank as a major operation. **BM/E**

- Over 20,000 ITC cartridge machines purchased since 1969.
- Since 1975, ITC has outsold all other cart machines combined.
- One of every two radio stations uses ITC machines.
- Three of five stations planning to buy cartridge machines will buy ITC.
- ITC Premium cartridge machines have been improved continuously and now share advanced features with ITC's exotic new Series 99 machines.

For information on our no-risk 30-day trial order
CALL TOLL FREE
800-447-0414
In Alaska, Hawaii or Illinois,
Call Collect: (309) 828-1381

INTERNATIONAL TAPETRONICS CORPORATION
2425 South Main St., Bloomington, Illinois 61701
Marketed exclusively in Canada by
McCurdy Radio Industries Ltd., Toronto

Broadcasters' No. 1 Choice:

it Premium Line Cartridge Machines

© 1979 ITC

Circle 121 on Reader Service Card

Technology And The Future Are Main Concerns Of Programmers At NATPE Meet In Vegas

FCC Chairman Charles Ferris (above) and Post Newsweek Stations' president Joel Chaseman addressed the challenges presented to television programming through new technology. Two very different visions of the future emerged

FOR A CONFERENCE which has traditionally concerned itself with big money deals for programs the buzz words in Las Vegas were technological — satellites, electronic field production, and alternative distribution systems. From the keynote address to the last clink of a silver dollar in an airport slot machine more than 3000 television programmers talked about the impact of technology on their industry. Technological change, like most other changes, made some people optimistic and others uneasy. RCA American Communications' announcement of SMARTS (a program to provide earth stations to any commercial broadcaster who asks for one) cropped up in nearly every panel discussion and speech. The reaction was optimistic. Electronic field production (or ELP — Electronic Location Production — as programmers call it) was cited in panel discussions and in general as a major tool for facing the "Challenge of the 80s," the conference theme. But mentions of home VCRs, video discs, super stations, and CATV sparked reactions that ran the gamut from handwringing to anger. The topic of new technology from the lips of FCC Chairman Charles Ferris sounded like a death knell for the broadcast structure as we know it. Said Ferris, "It is clear to me that America's honeymoon with the one-eyed beauty is coming to an end."

The keynoter, Joel Chaseman, president of Post Newsweek Stations, was far more optimistic about the vista opening to broadcasters through new technology, however. Said Chaseman, "Where technology and the marketplace join, all sorts of futures become possible."

The times, they are a-changing

Regulator, legislator, and broadcaster alike sounded the call of new technology, new markets, new needs. But the vision of the future, like beauty, was very much in the eyes of the beholder. If there was an emotional low point in the convention it was during Chair-

continued on page 30

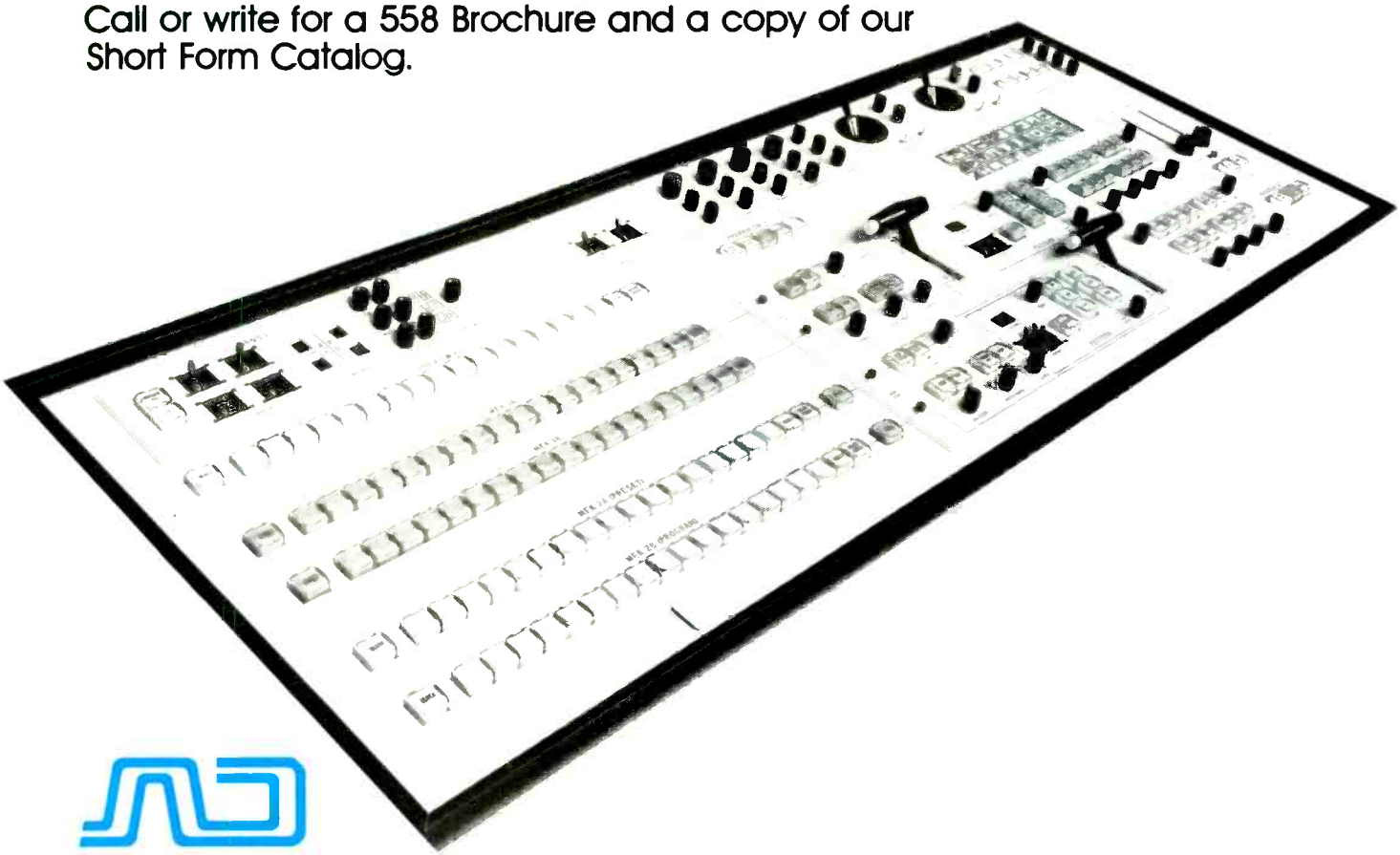
A GENERATION AHEAD OF ITS TIME

We demonstrated our Four-Channel Video Processor at the 1974 NAB Convention – five years ago! At this year's Dallas NAB, a number of other manufacturers showed prototypes of similar multiple channel mix amplifiers. So, while they're playing catch-up to American Data Technology, we'll be expanding the versatility of our 558 Series Video Production Systems.

Imagine being able to mix or wipe to a masked title key, over a chroma key, over a quad split on just TWO BUSES – ONE MIX/EFFECTS SYSTEM!

WE TOLD YOU THE 558 WAS STATE OF THE ART FIVE YEARS AGO, NOW OUR COMPETITION HAS PROVED IT!

Call or write for a 558 Brochure and a copy of our Short Form Catalog.



American Data
A North American Philips Company
Research Park • P.O. Box 5228
Huntsville, Alabama 35805
Telephone [205] 837-5180
TWX 810 726-2125

ADC NORTHEAST
P.O. Box 452
New Hartford, CT 06057
(203) 379-7840

ADC WEST
3760 Cahuenga Blvd.
North Hollywood, CA 91604
(213) 760-3221

ADC MIDWEST
P.O. Box 27324
Indianapolis, IN 46227
(317) 784-3000

ADC MID-ATLANTIC
5504 Waterway
Rockville, MD 20853
(301) 460-1454

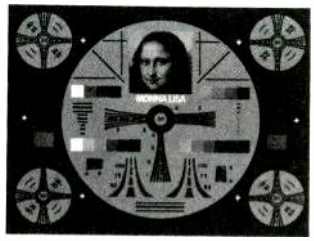
ADC SOUTHEAST
2219 Oakawana Rd., N.E.
Atlanta, GA 30345
(404) 633-2100

ADC N. CENTRAL
10700 Lyndale Avenue South
Minneapolis, MN 55420
(612) 881-1118

Circle 122 on Reader Service Card

NTIA MODEL 535 DIGITAL COLOR MONOSCOPE SIGNAL GENERATOR

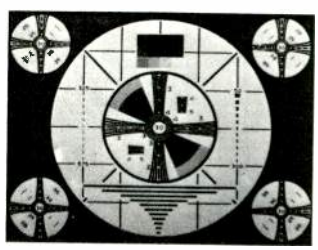
WORLD'S FIRST



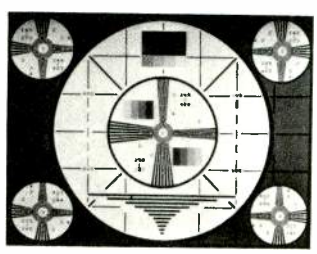
- Simple, perfect measurement signal.
- Mona Lisa face eliminates the need for the conventional flying spot, and eliminates erroneous color and permits unchanging correct evaluation. This picture does not contain the noise generated by the camera and flying spot.
- Y, I, and Q channel characteristics can be measured at once. (Model 535N)
- Color resolution can be measured by wedge-shape color signal.
- Built-in I, Q system broadcasting standards encoder. (Model 535N)
- Perfect broadcasting standards encoder at ohter color systems is also available.
- Since the signals are generated electronically, there is no deflection distortion and unstability such as that of the conventional camera.
- DRC (Digital Rise time Controller) system generates pictures of the same quality as the camera. (Applicable to circle, 300 circle, vertical resolution, letters)
- One source generation system assures accurate horizontal resolution.
- APC system with constant picture size generates a perfect measurement signal.
- Masterpiece that will remain unchanged in the future. This pattern can be selected with confidence.
- Plug-in system is extremely easy to service.
- The excellence of the conventional digital monoscope signal generator (MODEL 525 series)
- Built-in sync signal generator.
- Gen-lock and color lock possible when "L" is appended to the end of the model number.
- Grating, flashing-dot and dot are also displayed.
- Overscan scale can be turned ON and OFF.
- Mona Lisa face can be changed to the desired reflection. (Option 1)
- The Letters "MONA LISA" can be changed to the desired letters. (Option 2)

NTIA 525 SERIES DIGITAL MONOSCOPE SIGNAL GENERATOR

▪ **Models 525A12 and 525C12 picture**



▪ **Model 525A11 Picture** (Models 525A11H, and 525C11H picture is the same, except for the resolution.)



- Since the signal is generated electronically, there is no deflection distortion or unstablility such as that of the conventional monoscope camera.
- DRC (Digital Risa time Control) system generates the same picture quality as a camera.
- One-source generation system assure accurate horizontal resolution.
- APC system in the same, constant picture size generates a perfect measurement signal.
- Masterpiece that will not change in the future. You can select this pattern with confidence.
- Simple maintenance plug-in unit system.
- Same Picture as a conventional monoscope up to letters. DRC system picture. (Applicable to Models A12, C12)
- Checkered contrast pattern which is in good reputation.
- Built-in sync signal generator.
- Grating and overscan scale can be turned ON and OFF.

NTIA NTI America, Inc.
1680 North Vine Street LOS ANGELES, California 90028
Phone 213 462 8945

Circle 123 on Reader Service Card

TV Programming

man Ferris' luncheon address. Before an audience of program executives from television stations around the country, Ferris said, "Americans' love affair with television is entering a waning phase. Viewers are growing restless and disenchanted."

Ferris, at numerous points in his address, pointed to a *Washington Post* survey to support his contention that the American public is unhappy with what television is offering it. Though he indicated that "gadgets" which enlarge the screen or shrink it to pocket size provide some evidence that the public has not given up entirely on television, he said, "More people are thinking about simply turning off the set and walking away." Despite these signs, Ferris said, "the basic programming remains unchanged."

Ferris focused on children's programming as an example. He believes that the current state of children's programming (it's bad, in his judgement) exists because of an industry structure that permits three networks to dominate and a financial structure that demands a nose count assessment of the audience rather than an assessment of audience satisfaction. Said Ferris, "You should no longer accept all the traditional ground rules of the three-network, over-the-air broadcasting system as limitations on your horizons for profit."

"The game," said Ferris, "is going to change." Ferris indicated that he sees technology, society, the creative community, and regulators moving in the direction of more product, more suppliers, more specialized opportunities, "and more risks. It will be a faster-paced track," said Ferris, "and the race will go to those who are alert to all new possibilities."

Ferris tried to tell broadcasters that the future was full of new possibilities through "alternative distribution systems" such as cable TV, video discs, home VCRs," and technologies yet to come, and that broadcasters were wasting their time opposing these new technologies rather than looking for ways to exploit them as program producers, not just as broadcasters. The problem with Ferris's speech for much of the audience was that he seemed to have given up on broadcasting and assumed that the newer technologies are destined to do a better job of satisfying the public's demand for television programming. Since Ferris seemed to have so much faith in as yet untested and untried successors to broadcasting, what troubled the audience was that FCC chairman Ferris has no control over these new technologies that do not use the spectrum, but he does affect broadcasters. The fear of many broadcasters is that if the new technologies are perceived as a "greater good," the only way in which Ferris and the Commission can foster their development is to place the interests of broadcasters on a regulatory ice floe and let them drift out to sea like the proverbial old Eskimo.

The "sea" in Ferris's estimation is the "free" marketplace. "A fundamental principle with me," said Ferris ". . . is that many independent media voices are preferable to a few. At the Commission we are charged with implementing this principle. I think we can best do so by creating and maintaining conditions in the communications marketplace that will enable alternate forms of program distribution to emerge naturally in response to viewer and advertiser demand."

Of course, under that "principle" with which the Commission has been charged, some 8000 independent media voices have been established for radio and nearly 1000 independent media voices for television have developed — all licensed to serve local communities. What scares broadcasters is that just as the enactment of the Prime Time Access Rule failed to encourage the wonderful diversity of programs the FCC envisioned, there is no guarantee that the supplanting of broadcasting by new technologies will produce any greater diversity of programming. Whether a mature home video industry or cable industry is any less likely to be dominated by a few large corporate interests is unknown. It is clear that large corporate interests already dominate the pay TV market in the form of Viacom and Time-Life, neither of which are licensed to serve any community in particular.

Joel Chaseman's keynote address, on the other hand, placed new technologies in a light somewhat more attractive to broadcasters. The new technologies, said Chaseman, "have the power to enrich communications and complement our present broadcast system." Broadcasters should welcome the new technologies, including the "competitive development of cable," said Chaseman. It is on the definition of a "free marketplace" that Chaseman's speech and Ferris's seemed to diverge.

The eighties

"The '80s can be a decade of energy, of choice, of multiple marketplaces, of encouragement to programmers and producers," said Chaseman, "but only if the regulators and legislators truly believe in the vitality of system and do not try to protect emerging technologies at the broadcaster's expense. It is not necessary or desirable for broadcasting to fail in order for others to succeed."

continued on page 32

Get the LIVE LOOK

Now available with pre-programming system for color correction, panning, and machine control.

Why settle for less than brilliant fidelity in film-to-video transfer?

With the Digiscan Flying Spot MK3B Telecine, you can expect and get superb reproduction from color or mono, positive or negative, 16 or 35 mm film or slides—all on the same transport.

Here's a film chain with no camera, no lag, no complex optics, no intermittent projectors—not even a lamp house. It has a silent capstan drive with shuttle forward and reverse. Electronic Cinemascope panning handles 16 or 35 mm, full frame.

It is designed to deliver what you have always wanted in film reproduction—the immediate look of live video from film and all the quality, color, definition and contrast that you shot, or bought, with the film, positive or negative.

Send for details and literature. Call Neil Kempt (213) 670-6366 or write:

Rank Precision Industries, Inc.
5432 West 102nd Street
Los Angeles, CA 90045

MK3B Flying spot TELECINE by RANK CINTEL

Circle 124 on Reader Service Card

PORTABLE AC/DC COLOR MONITORS

CP 8000 8" AC-DC

FEATURES

- HV REGULATION
- PULSE CROSS
- UNDERSCAN
- A-B INPUTS
- MODULAR CIRCUITRY and MUCH MORE
- RACK MOUNTING AVAILABLE

WORLD VIDEO, INC.

P.O. BOX 117 • BOYERTOWN, PA 19512
PHONE 215-367-6055

Blanking Problems?

Two new instruments from World Video, Inc. will enable you to check your blanking and measure it quickly and accurately.

1. The Beta 710 provides a quick, accurate check of H & V blanking. With the use of an underscan monitor, your tape operator can quickly verify whether blanking exceeds FCC allowable limits.
2. The PWI/H provides a quick and accurate measurement (within 0.05%) of any pulse on the H line, easily read in microseconds on the LED display on the front panel. The PWI/H can be used with a waveform or pulse-cross monitor.

WORLD VIDEO, INC.

P.O. BOX 117 • BOYERTOWN, PA 19512
PHONE 215-367-6055

Circle 228 on Reader Service Card

TV Programming

Said Chaseman, "Cable pirates the great bulk of its programming from local stations and pays minimal fees for compulsory licenses. Cable is a billion-dollar business with $400 million in profits, and yet it spends just $25 million for all its programming."

In general, Chaseman's point is that broadcasters want the free ride for cable to stop, and then broadcasters will be happy to compete with the cable industry to see what types of needs each technology can best satisfy. Chaseman also blasted legislators and regulators for permitting super stations to effectively circumvent the seven-station limit on ownership. "Right now," said Chaseman, "the regulators seem to be encouraging 700 cable systems in 500 communities over 45 states to pick up an independent station or two which carry a lot of movies and ball games.." Asked Chaseman, "What public gets ascertained by these homeless outfits on their ego trips to satellite and back? What diverse new programming has resulted, and what service at all to their community of license?"

Chaseman termed these distant stations "anti-creative and anti-competitive." Said Chaseman, "these bootleg backdoor operators should not be allowed by the regulators or the legislators to do indirectly what they are legally prevented from doing directly."

So while Ferris sees the Southern Satellite network of WTCG as proof that "any station can be a network," Chaseman sees such stations as anathema to the principle of locally responsive and responsible broadcasting. While Ferris lamented the resistance to change he finds in broadcasters, Chaseman applauded the RCA Americom experiment that could place a satellite earth station in the back yard of every commercial broadcaster within the next two years.

While Ferris seemed ready to live without the three networks, Chaseman said, "We'll still need the networks, but we'll need them less." Networks, said Chaseman, will continue as "the most powerful mass marketers and distributors of video programs."

Affiliate meetings reveal rancor over schedule changes

While Chaseman in his keynote address showed continued confidence in the network structure, station managers and program executives in attendance at various affiliate meetings doggedly questioned network executives on continually changing lineups.

Both at the CBS and NBC affiliate meetings, numerous questions from the floor dealt angrily with schedule shuffling. CBS's Jim Rosenfield responded

NATPE president Van Cantfort (left) presents Bill Hilliard, originator of the KPIX Evening Magazine program with a special Iris. Evening, which is now syndicated as PM Magazine is one of the first locally originated shows that used new technology and new ideas to prove that local programming can be attractive to wide audiences

to one questioner: "Each network is trying to out strategize the other . . . . The only people more confused than you or we is the public." The only hope held out for a solution to this dilemma is a change in the ratings system, implied Rosenfield. Apparently, CBS has had talks with the other two networks on developing some form of continuous audience measurement, but, said Rosenfield, "It's very difficult to get all the parties to agree."

Nevertheless, CBS has discussed different approaches to audience measurement with both Nielsen and Arbitron, and Rosenfield seemed confident that some alternative — probably a 47-week measurement plan — would be achieved within the next 18 months to two years.

All three networks discussed new programs and plans for the May sweeps and the 1979 fall season, but though many new program titles and concepts were discussed there were no earth-shattering changes. Instead, the trend to sitcoms, adventure drama, and specials will continue.

The ABC affiliate meeting remained happy and cordial with the weightiest question asked: "What night will *Monday Night Baseball* be aired?" Those in attendance were happy to learn that ABC's last quarter was its third highest money-maker in history and that its second quarter has already sold out its prime-time schedule and most of its daytime schedule. Some 35 pilots for new programs have been produced for consideration and 18 to 20 of them are comedies.

The independent station meeting also held out few surprises. Bob Wormington of KBMA-TV, Kansas City, continued his call to independent broadcasters to "get off your duffs" and start using satellite technology. Satellite earth stations were held up by Levit Pope of WPIX-TV, New York, as the key to a successful ITNA news operation.

Pope reflected the general confidence of the independent broadcasters when he said that they had learned to compete successfully with network affiliates for children's audiences in the 1960s and fringe audiences in the 1970s, and that they will learn to compete effectively with network prime-time programming in the 1980s. Operation Prime Time has new programs planned for this year and is considering producing a daytime soap for use by independents.

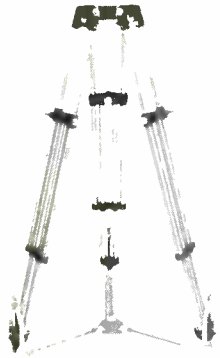
From all that was said at the affiliate meetings, in the speeches, and in most of the panel discussions, programmers expect the 1980s to see an explosion of program sources. The key will be the ability to distribute these programs economically, and this seems to be at the root of the excitement caused by the RCA American Communications/ Viacom/Post Newsweek Stations' announcement (see *BM/E*, April, 1979.)

Viacom believes that it is only the first of many program distributors that will use the new RCA SMARTS system to distribute programs via satellite. RCA plans call for each earth station to use four receivers, so local stations could have access to as many as four programs simultaneously. Since the local station and distributor will have the option of recording the programs or going live, special events and sports programming produced by non-network sources is likely.

Moreover, there is a growing trend on the part of group broadcasters to produce their own programs, thus forming mini-networks. Add to this the growing list of program consortiums among independent stations, group stations, and advertising agencies, and special programs produced for a single sponsor such as Mobil Oil, and it begins to appear that the traditional networks are facing some serious competition.

In future editions of this column, *BM/E* will look at not only the program material that broadcasters will be able to get off the bird, but will also look at some of the locally produced programs that broadcasters may be able to put on the bird. Post Newsweek Stations is likely to be the first broadcaster to distribute one of its own programs, *Agronsky and Company*, via satellite but others may follow. A glance at the winners of this year's NATPE Iris Awards is just the first glimmer of programs that are produced locally, yet have potential, perhaps, to do more. Each year, locally produced programs find their way to larger audiences, whether through syndication like a Phil Donohue show, or through new concepts like *PM Magazine*, which began at San Francisco's KPIX. This year's local Cinderella is *The Baxters* from WCVB, Boston which we will examine in next month's column. **BM/E**

RONFORD. BETTER SUPPORT.



Working with a Ronford is like getting behind the wheel of a Rolls: the equ pment responds precisely and unvarying y to your directions. Professionalism demands nothing less.

RONFORD FLUID HEADS: Fit any camera/lens combination, adjust for "neutral" balance. Patented ultra-smooth fluid-damped action with repeatable multi-step adjustment. Mate with bowl fittings on all standard tripods, 360° pan, wide-range tilt.

RONFORD LOW-ANGLE AND SUCTION-MOUNT ACCESSORIES: Versatile, eliminates need for hi-hat. Creates new shooting possibilities. Rapid, positive setup. Compatible with other standard fittings.

RONFORD STANDARD LEGS: Available in light, medium and heavy duty models. Absolutely rigid in all positions. Positive, quick-action lock. Exclusive "no-stoop" height adjustment.

Ronford products are available for sale, rental or long-term lease at Camera Mart. The Headquarters for professional equipment...with the personal attention and factory-authorized service professionals appreciate.

SUSTAINING SMPTE MEMBER

Member Professional Motion Picture Equipment Association

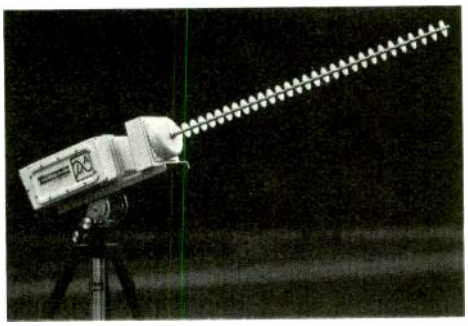
Camera Mart

THE CAMERA MART, INC.
456 West 55th Street, New York 10019
(212) 757-6977 / Telex: 1-2078
Sales • Service • Rental

Circle 125 on Reader Service Card

SONY
Microwave Associates

OUR MICROWAVE ASSOCIATES SYSTEM GIVES US TOTAL CONTROL FOR INTERFERENCE-FREE LIVE ENG COVERAGE.



We have better control of our ENG feed quality than we ever had before... thanks to our complete Microwave Associates system.

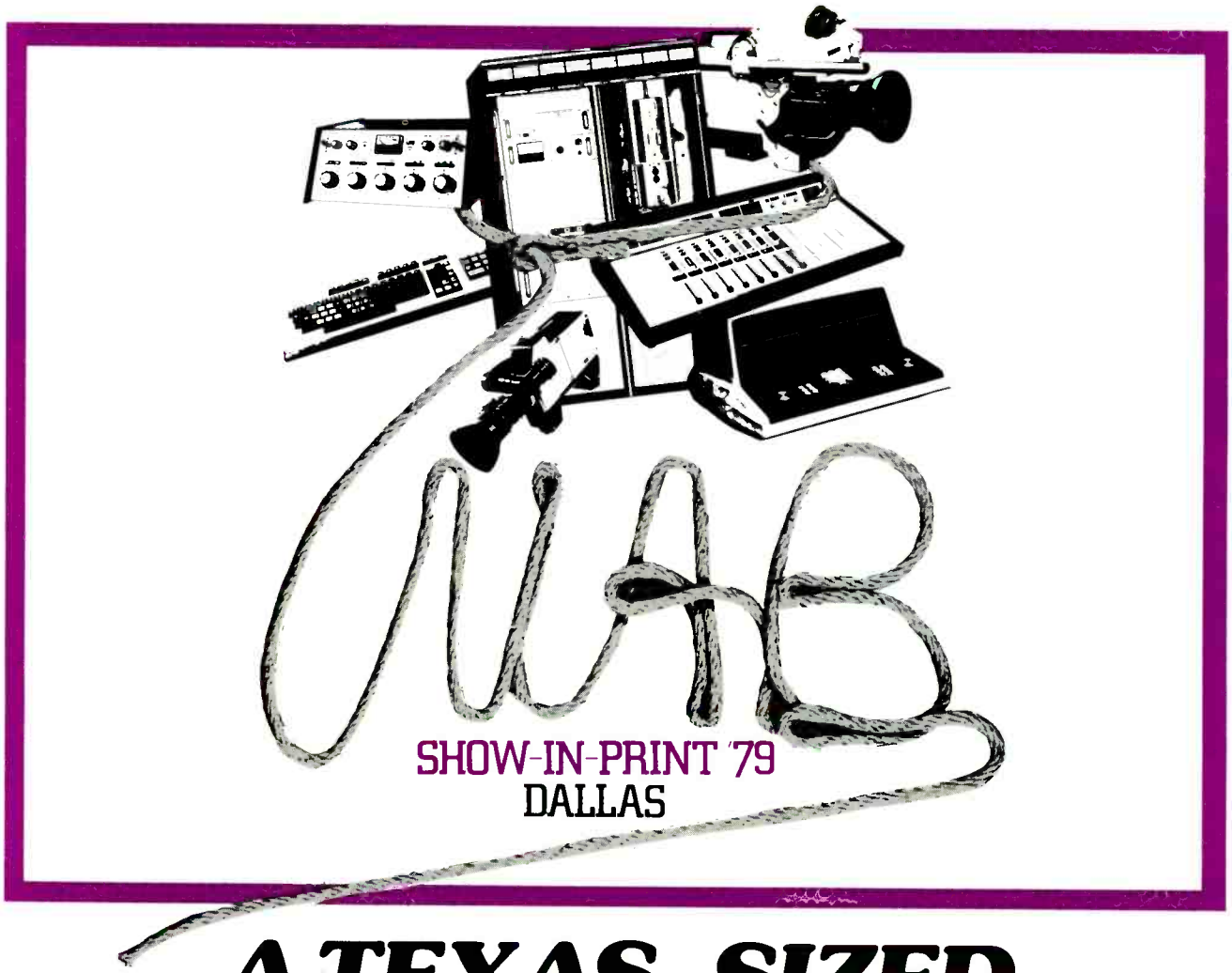
Everybody around here breathes easier now because Microwave gives us a big competitive edge with such things as the new Adjustable Polarizer. With this unique feature we can continuously adjust our antennas by remote control to help overcome multipath reflection, low signal level, adjacent channel rejection and other types of interference. Now we can put our news teams where the action is and get the story on the air live, first and fast.

The new high gain Disc-Array™ and Disc-Rod™ antennas have also helped us increase our coverage range. The equipment is lightweight and rugged, built to take it in the real world of ENG. And we know we can rely on Microwave. They've been in ENG since the beginning and have more equipment in use than anybody else. Dependability is a major factor in this business. That's why we went with a Microwave Associates system. If you're interested in a system solution to your ENG requirements, contact Microwave Associates, Communications Equipment Group, 63 Third Ave., Burlington, MA 01803 (617) 272-3000.

Field Sales Offices: Atlanta, GA (404) 455-3815, Dallas, TX (214) 234-3522, Kansas City, MO (816) 891-8538, Sunnyvale, CA (408) 734-8777, Seattle, WA (206) 232-3550, Honolulu, HI (808) 537-3991, Edina, MN (612) 831-3920, Columbus, OH (614) 451-9844.

Microwave Associates
A M/A-COM COMPANY

Circle 126 on Reader Service Card



A TEXAS-SIZED ROUNDUP OF BROADCAST EQUIPMENT

There was more of everything in Dallas this year. More technology for radio and television broadcasters. More improvements to existing equipment lines. More new approaches to getting the best out of what the creative media of radio and television have to offer. And, there were more broadcasters to take it all in.

- ☐ Getting The Image Down: VTRs and Cameras Show Major Improvements, page 38.
- ☐ TV Production and Post Production Equipment, More Creative, page 65.
- ☐ TV Signal Control and Processing — Digital Leads The Way, page 101.
- ☐ Radio: Building Blocks For The Great Upgrade, page 120.
- ☐ Satellite Fever, page 139.
- ☐ Trends In Radio and Television RF, page 143.
- ☐ Automatics Lead The Trend In Test and Measurement, page 163.

BY THE TIME the doors of the convention hall closed on the 57th Annual Convention of the National Association of Broadcasters, more than 7000 broadcasters and 6000 exhibitors' guests had witnessed one of the largest displays of modern broadcast equipment ever assembled.

Some 330 manufacturers' exhibits, staffed by more than 6300 personnel, presented a pretty clear picture of where broadcasting technology is and where it is going. The 1979 convention laid out a display of those systems that broadcasters will depend on into the 1980s.

Today's technology — what to do with it?

There was a general acceptance of microprocessor-controlled equipment in radio and television and people ceased calling ENG new. Instead, broadcasters gazed upon equipment like pieces of a jigsaw puzzle and asked how these various equipments could be put together as effective broadcast systems.

For AM broadcasters, the pieces of equipment they looked at fit into the AM stereo picture. For TV broadcasters, their big picture was made up of equipment for local programming and satellites for bringing in alternative programs. For FM, the picture was continued development of their audio quality.

At the radio engineering sessions these issues were discussed. Of primary concern was AM stereo and its impact on equipment choices. Here, broadcasters were told, "Equip your station for stereo now and don't worry too much about the RF section." According to a paper presented by Cliff Leitch and David Hershberger of Harris Corp., most current AM transmitters can be adapted to AM stereo with a few modifications and additions of stereo exciters.

Perhaps more serious questions for the radio broadcaster are several proposals for the expansion of AM radio. Such issues as 9 kHz spacing, expansion of the AM band into the 1800 kHz range as is likely to be proposed by the U.S. at the upcoming WARC, and the dismantling of clear channel stations were all discussed at NAB sessions. Whereas there is a uniform desire for some kind of AM stereo system, there is no consensus on these other issues and battle lines are already being drawn.

For the television broadcaster, technological issues clearly relate to further exploitation of production capacity and the role that satellites might play in the future of television. The sessions that dealt with television at NAB, by and large, dealt with market challenges from cable TV, home video equipment, superstations, and other potential HUT stealers. From what was said at the sessions and shown in the exhibits, it is clear that television broadcasters will turn to technology to meet these future challenges.

The tools of the trade for radio

Radio broadcasters who looked for new tools to meet the coming years were not disappointed. The first major improvements in cart player/recorders for some time were seen in the ITC and 3M exhibits. ITC's new Series 99 tape cart player/recorder has made ingenious use of microprocessor control to bring a new level of performance to the cart format. 3M's Centracart system, still in development, held out the promise of an entirely new approach to player/recorder design.

New designs for better quality were everywhere. MCI's JH-32 tape recorder, for instance, is the first of its kind to use three-inch tape. Turntables continued to move into designs using dc servo drives and the boom in audio consoles continued to hold out greater choices for broadcasters. Audio processors also improved, reaching even lower distortion levels.

The ubiquitous microprocessor continued to expand the capabilities of radio program automation systems. More and more, such systems are providing an ease and flexibility of operation that will cause many broadcasters to consider automation a quality alternative to live operation.

In transmitters, FMers got to see a bevy of new 25 kW units and AM transmitters, "ready for stereo conversion," began to appear.

Television's tools for today

For the first time in years, it was impossible to pick a star product at an NAB. Instead of a product or products, it was ideas for using equipment that motivated the television exhibits.

The RCA Americom plan to install earth stations for the asking had broadcasters talking openly about alternatives to network fare. The booths that showed earth station equipment and services got good traffic. Even small market television broadcasters seemed anxious to take advantage of the new distribution systems.

For immediate interest, however, the laurels were once again placed on ENG/EFP cameras and videotape recorders. One-inch videotape recorders were clearly the fastest-selling items on the floor. Broadcasters looked at them as solutions to problems of cost, space, and quality. For commercial and studio production, few broadcasters considered other recording formats. For news, however, the momentum remained with the U-type VCRs.

If there was a population explosion for a class of equipment, it was easily videotape editors. The big new sophisticated systems from several manufacturers and even the traditional leader in this field, CMX, expanded and improved their systems. The midrange multi-format editors became more flexible and the small ENG two-VTR systems have made extensive use of microprocessor control to improve speed, efficiency, and flexibility. In each category of editor, new firms appeared.

The color television camera area continued to expand. The trend in studio cameras was clearly to automatics with RCA, Ikegami, Hitachi, Toshiba, and others drawing attention to their systems. The most significant trend in cameras, however, was the proliferation of EFP/studio type cameras. Cameras that were once considered studio models have been redesigned for lighter weight so that they can easily be used in the field, and cameras that were exclusively ENG cameras have been redesigned to include larger monitors, better cabling and more flexible lens system.

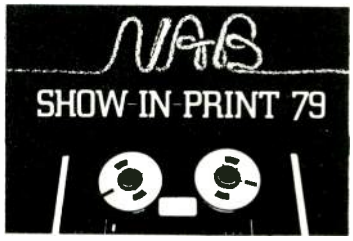
Another trend that reflected the acceptance of ENG was the enormous attention given to microwave systems. Broadcasters showed little doubt in their ability to work in the field and broadcast live. Helicopters, all-terrain vehicles, vans, and Suburban four-wheel drive vehicles were all around the show and many received more attention from broadcasters than did the equipment they carried. Broadcasters seemed convinced that the microwave systems could deliver the pictures provided they could get the microwave systems to where the action was.

Again, digital special effects dazzled broadcasters. Grass Valley, MCI/Quantel, and Vital Industries all showed magnificent displays of digital

effects. NEC, whose participation with GVG has placed it among the leaders in digital effects, showed the Digital Strobe Action unit with spectacular results.

Production switcher manufacturers stole a good deal of the attention by incorporating these digital effects devices with their top-of-the-line switchers. Marvelous demonstrations were commonplace. A side-trend in the production switcher field is microprocessor control. GVG showed its new 300 Series, which is entirely built around the concept of automated control of effects. CDL joined the ranks of those manufacturers who have turned to the microprocessor to help bring the creative potential of the new breed of switchers under the control of a human operator through automation.

The following pages constitute a nearly complete look into the arsenal of technology with which broadcasters will face the challenges of today and tomorrow.



GETTING THE IMAGE DOWN- VTR's AND CAMERAS SHOW MAJOR IMPROVEMENTS

With new one-inch Type C machines coming from NEC and Hitachi, the one-inch format is the undisputed pretender to the title of "King of Recorders." The supply situation looks good with Ampex, Sony, RCA, Marconi, and Philips taking orders for and delivering Type C systems. Bosch Fernseh's Type B BCN system remains a factor in the marketplace though Sony and Ampex seem to have an edge in manufacturing capacity, especially when their respective marketing arrangements are considered. The addition of NEC and Hitachi to the list of Type C VTR manufacturers will give this format a strong boost.

Off the convention floor, Sony demonstrated an engineering prototype of its digital videotape recorder. Anxious to point out that the digital VTR was not yet a practical alternative to current technologies, Sony's managing director, Masahiko Morizano said, "The final production of a working digital VTR can only be justifed when it has been developed with convenience and economy that are superior to current products."

The transport was a BVH-1000 Type C VTR. Tape and head speed remained identical to current Type C characteristics.

The quality of the Sony DVR recording was impeccable, providing a 58 dB signal-to-noise ratio; the theoretical limit for the eight-bit, 3 fsc sampling system used. The scanning system is a two-track parallel format using block coding techniques. The data rate is 115 megabits per second, providing a rock stable picture with little or no apparent artifacts from the digital process.

According to Morizano, the Sony DVR provides eight times the information packing density of the experimental DVR shown by Ampex at the recent SMPTE Winter Conference.

Though the Sony DVR uses the Type C BVH tape transport, the electronics which govern the sampling, error concealment, and other data processing reside in several large rack-mounted enclosures measuring 19 inches wide by nearly six feet high. Needless to say, the Sony DVR is not "portable," and this is one area in which Morizano indicated much room for development. "In fact," said Morizano, "the ultimate digital VTR will eventually be more compact . . . perhaps as small and compact as the current U-Matic."

Morizano would not comment on a possible time frame for the advance of the DVR from prototype status to product but recommended the establishment in the near future of a SMPTE Working Group, similar to the Type C Working Group, to develop and solve some of the standardization issues which are certain to retard work on a practical DVR unless reconciled.

Speculation remained intense over when a practical DVR might enter the marketplace. Most manufacturers continued to suggest that a practical DVR is still three to five years down the road, with the earlier introduction of some special-purpose DVRs for mastering, duplication, or editing, and the later date for practical first-echelon recorders. Users, as well as manufacturers, are none too eager for the introduction of yet another video recording format. Manufacturers are a long way from recovering their investments in the development of one-inch machines and users are not interested, by and large, in a format that may not be compatible with a system that is still largely analog or one which takes a step backward in terms of size, weight, or operational ease.

Nevertheless, competitive pressures create a situation where manufacturers are reluctant to take a "go slow" attitude. Since Ampex and Sony have introduced working models of DVRs and since the IBA DVR was based around the Bosch Fernseh one-inch tape transport, the potential to take the technology into the market exists. The matters of size, weight, and operational efficiency are hallmarks of digital's

continued on page 41

Recortec's HBU-9400, a high-band portable, will be available later this year.

Hitachi's portable one-inch Type C recorder HR-100 has very low power consumption.

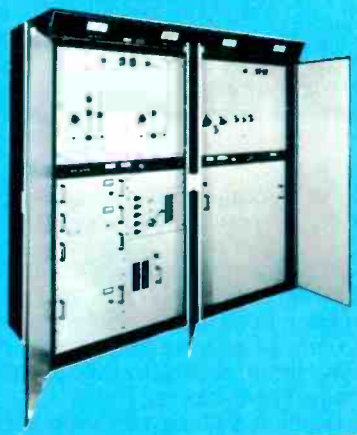
The Hitachi HR-200 studio recorder is the first to use air guide to position tape.

The NRU-10 will bring Dolby noise reduction to the audio sections of VTRs. Bob Peterson of Dolby holds one of the nosie reduction boards.

PHILIPS®

IN FOCUS at NAB '79

LDK-14
.. Newest technological breakthrough. ⅔-inch broadcast camera for ENG/EFP with full Studio performance and capability.



I.F. Transmitters
...Philips, the recognized leader in transmitter technology world-wide, now has the fastest growing transmitter line in North America.

PLUS. New dynamic Automatic Noise Reducer; innovative Tape Synchronizer and a host of cameras and broadcast equipment.

LDK-25
...the technological, state-of-the-art camera family. Now with 1" Diode-gun tubes to couple 30mm resolution with superior 1" tube lag performance.

Flexible VIDEO 80... Philips superior technology produced this unique convertible camera and production system for multi-use applications.

FOCUS ON TECHNOLOGY

PHILIPS® *Innovative Leader in World Television*

PHILIPS BROADCAST EQUIPMENT CORP.
A NORTH AMERICAN PHILIPS COMPANY
91 McKee Drive, Mahwah, N.J. 07430
Circle 127 on Reader Service Card

NOW EVERY STATION CAN AFFORD NETWORK QUALITY DIGITAL STILL STORAGE.

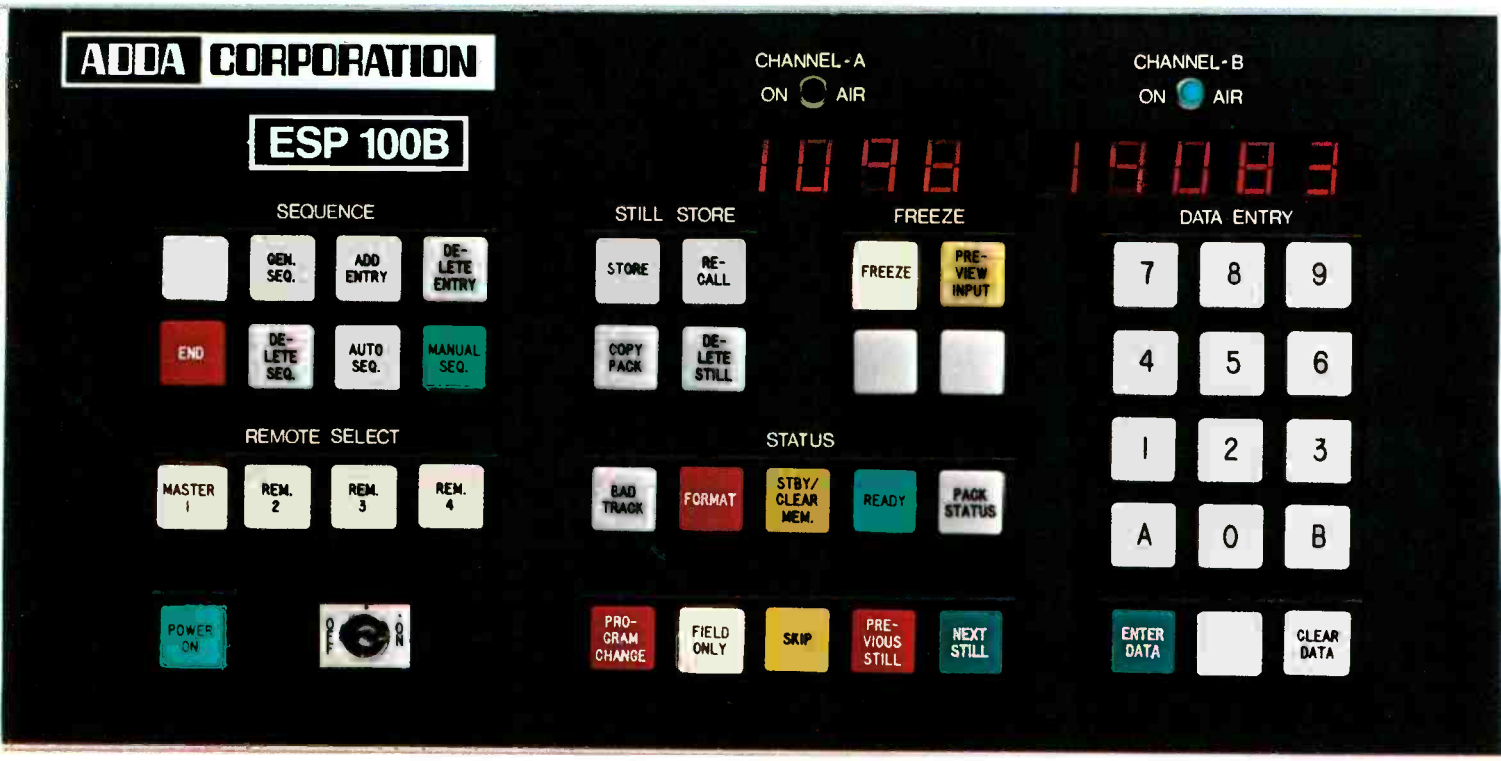
INTRODUCING THE ADDA ESP-100B. PROVEN DIGITAL TECHNOLOGY FOR UNDER $45,000.

Here's ADDA's latest digital still storage breakthrough—priced so every station can afford superior digital picture quality without slide handling problems. The ESP-100B offers performance similar to our higher cost systems, but with a smaller, rack mounted, fixed disk storage capacity of 200 frames. You can create high resolution stills from live camera, VTR, 16mm film, network, or satellite feeds. You can program still sequences in advance and change your mind while on the air—knowing a new still can be called up at random in less than one-half second. Unlike slides, electronic stills are always easily located and instantly available. Always right side up.

Now's the time to join the digital still frame storage revolution without putting the crunch on your budget. You can reduce your still handling and camera support time dramatically while saving thousands in film and processing costs. You'll love the enhanced picture quality, too!

Take a look at the ESP-100B for yourself. Call, write or check our reader service number for more information and a demonstration. 1671 Dell Avenue — Campbell, California 95008 (408) 379-1500.

ADDA CORPORATION



Circle 128 on Reader Service Card

traditional superiority and are likely to be solved as development continues. The pace of development is the unknown factor in this race and competitive pressure is one factor affecting the pace. But the barriers to a practical DVR remain enormous. The three to five year time frame seems reasonable (see box on DVRs: Straight Talk).

Practical activity at the NAB, however, remained focused on the one-inch VTRs. Sony showed its BVH-1100, a studio unit, with Dynamic Tracking. Dynamic Tracking, or D/T, is an important addition to the Sony Type C VTRs since Ampex has maintained a lead in this area with its AST (Automatic Scan Tracking). One key to the development of D/T was the creation of the new BVT-2000 Digital Time Base Corrector, designed by Sony to operate as a companion to the BVH-1100. The D/T option provides for guardband noise-free video playback with selectable speeds from quarter-speed reverse, through still, to twice normal forward speed. A Bimorph Dynamic Tracking head has been added to provide D/T. When coupled with the BVT-2000, the BVH-1100 permits stable video during search operations. A Bidirex control is used to determine tape speed and direction with stable color playback at speeds up to ten times normal forward speed and stable black and white playback at speeds up to 50 times normal in either direction.

Through the use of D/T speed changes can be programmed to occur during playback throughout the D/T speed range while maintaining on-air signal quality. The system also uses video and sync confidence heads to assure quality during recording and has full editing capabilities. The new BVH-1100 with D/T should be available for approximately $72,000 depending on options such as SMPTE time code and remote control of Bidirex. Earlier BVH-1000 machines can be updated to include D/T for approximately $5500.

While Ampex introduced no major changes to its VPR-2 Type C one-inch editor/recorder, it has added a time code reader/generator to the system. Its portable version, the VPR-20, has had a Color Stabilizer added to its list of options. The Ampex Color Stabilizer is a plug-in option to the VPR-20 and provides for stable color playback of the VPR-20's signal through any color television receiver on channels 3 or 4 in the NTSC format or any VHF TV channel below 100 MHz for international users. The new playback option will provide producers in the field with color playback confidence without requiring a special monitor.

While Sony's main pitch was based on the introduction of D/T, Ampex was boasting of the successes achieved by its VPR systems. By the end of March, Ampex claims that it will have shipped nearly 250 VPR-2s to U.S. and overseas customers. Chief among the VPR sales was a single order for 82 of the units from ABC for use in its New York and Los Angeles production operations, in its mobile units, and in its O&O stations. ABC is also using the VPR-2 systems for slow motion playback on many of its sports productions. This application, which is now possible with the Sony D/T systems too, has called into question the future of dedicated slow motion recorders. Later in this report, we'll take a closer look at this question.

One of the new entries in the Type C area is the TT-7000 from NEC. This studio recorder with editing capabilities will sell for about $38,000, but later this year when slow motion capabilities are added the price is likely to climb another $15,000, bringing the unit into the neighborhood of competitive machines.

Sony's BVH-1100 now has Dynamic Tracking for variable-speed playback.

Ampex's VPR-2 Type C one-inch studio VTR has Automatic Scan Tracking to lock color during variable-speed playback

The Bosch Fernseh BCN-5 portable cassette recorder is now in production.

The TT-7000 meets all Type C specifications and offers a full six-head drum including video, audio, and control track confidence heads. Complete production and editing functions are offered including jogging and variable shuttle to search editing and starting points. A number of features and options have been developed to enhance the VTR's editing functions. Some of the options include a three-second cue-up prior to program start effected by resetting one of the two built-in timers to zero (the other timer provides total program time from beginning to end of tape); a stop tone available at cue-up point; automatic cue-up through optional address search when address code is put on audio track three, and a SMPTE time code card through which the timer pulse may be calibrated to the control track. Video S/N is rated at 48 dB (p-p/rms) and audio S/N is rated at 56 dB for tracks one and two and 50 dB for audio track three. The TT-7000 is designed to use NEC's NTC-5000 TBC and an optional external edit interface card is available to put the TT-7000 on-line with popular console edit controllers.

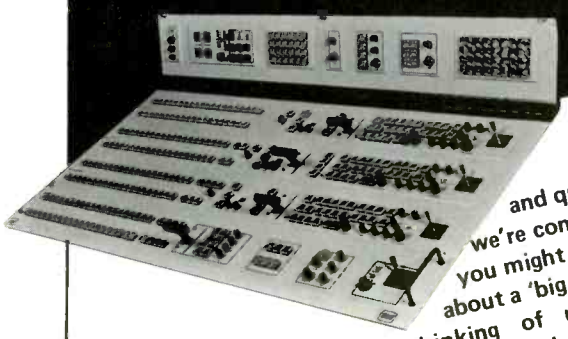
Hitachi brought two new entries into the Type C market, its HR-200 studio recorder and its HR-100 portable VTR. No prices have been set as yet for these units and production is expected to be limited through the end of 1979, though some units could be delivered as early as this July or August.

While both of the new Hitachi VTRs meet all Type C specifications, each contains a couple of new angles aimed at improving the overall performance of the units. The HR-200, for instance, which is a full-functioned editor/recorder, is the only Type C VTR to use an Air Tape Guide System. An internal pump provides a cushion of air to assure steady tape travel in spite of humidity and other environmental variations. Additionally, the time required to accelerate to twice normal speed in shuttle mode is reduced. DC motors drive drum, capstan, and reels; the tape reaches 50 times normal speed in just 10 seconds. Further, no tape drive parts, with the exception of the heads, come into contact with the tape, thereby reducing the occurrence of tape drop-outs.

Another feature of the HR-200 is a built in microcomputer which controls tape timer operations, electronic editing functions, the automatic tape drive to start positioning, and other operational functions. The built-in microcomputer should make the HR-200 very convenient for interfacing with computer-assisted editing systems.

The portable Hitachi VTR, HR-100, has substantially the same signal specifications as the larger HR-200; it

MORE FOR LESS!



We're ISI and quite frankly we're concerned that you might be thinking about a 'big board' production switcher, without thinking of us — And that would be a shame. We've developed a common sense approach to production switching that gives you high powered performance at a surprising price.

Our 1200 series, for example, has all the effects, patterns, and features you'd expect to find on a top of the line switcher plus some things no one else offers, or offers only as extra cost options. Like fade through black. Or tandem keying that allows you to do primary key (luminance or chroma) then add a second downstream key with outline, shadow, or border; All on a single, standard 1200 series Mix Effects System.

Look at our board. It gives you the creative flexibility to use more of the 1200's features — more of the time. Because it's simple and straightforward; No tricks or special combinations to remember.

Service? With our full two-year warranty, on sight test and check out, and toll free technical support number. We won't hang you up by letting you down.

So, if you're thinking about production switchers, remember this: by keeping it simple, we'll give you more! And cost you less! Now that's worth thinking about.

For complete specifications, and the name of your nearest authorized ISI Professional Video Products Distributor call:
800-874-7590 (Toll Free) 904-373-6783 (Florida only)

Innovative Switching Ideas from the people at:

isi

INDUSTRIAL SCIENCES INC
P. O. BOX 1495
GAINESVILLE, FLORIDA 32602

Circle 232 on Reader Service Card

Digital VTRs: Straight Talk

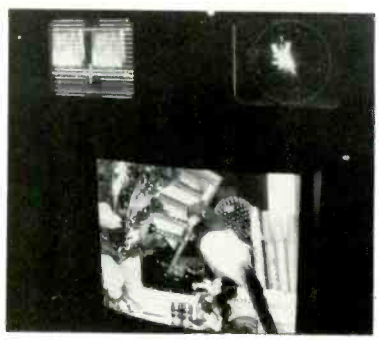
Will we have a digital VTR in five years? Here, briefly, are some of the problems that remain to be solved, as outlined by Donald V. Kleffman, vice president and general manager of Ampex's Audio/fiideo Division:

- The enormous number of digital components required for a DVR must be reduced. While 64K RAMs are now common, 128K RAMs are yet to come on the market and A/D-D/A converters on a chip are just now appearing. The market will not go for a DVR unless it is as small, lightweight, and as full-functioned in editing as are current machines.
- A compatible digital audio section of the machine has yet to be developed. The DVR must equal or surpass the level of versatility that current machines have in dealing with audio and video.
- Interface standards must be established between the DVR and other digital equipment. Standards for a digital plant are still far off.
- A tape recording format needs to be standardized. Each experimental DVR has used a different transport, and yet each manufacturer is convinced that his is not the ultimate solution. A panel, similar to the SMPTE Type C effort, will need to be organized. Manufacturers will be cool towards proceeding too far in development until the industry has established standards. Legally, the manufacturers cannot organize such an effort, so the industry has to do it. As seen in the current AES effort to develop digital audio standards, even industry groups are not immune to charges of antitrust violations.
- Where 3 fsc/8-bit sampling seems adequate for NTSC, PAL and SECAM color systems will probably need a different approach. Decisions on component or composite encoding, error concealment or correction, or what combinations of techniques are to be used must be made.

Even when these questions are answered, manufacturers must re-tool to produce these units. Retooling for Type C has already taken some manufacturers more than two years.

What the three prototype DVRs have proven is that pictures of very high quality can be recorded and reproduced in the digital domain. For this to be done in anything less than five years, major breakthroughs will have to become commonplace.

Sony's Digital Video Recorder. A standard BVH tape transport is used (right). Electronics are in racks at left.



Signal quality in the DVR is excellent as waveform and vectorscope patterns indicate.

Show-In-Print continues on page 44

Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability

A new standard in coax transmission line

For the Broadcasters who missed seeing us at Dallas, we'd like to introduce you to the best rigid coax line in the industry. Our C - **"K"** thermo-coupler sets a new standard for transmission line reliability, outperforming our Competitors from 2 to 1 to over 5 to 1. To achieve this we incorporated a thermo-probe within our watchband connector. This allows the heat to transfer from one section of line (or component) to the other with accelerated ease, relieving the R.F. contact surface from this burden. Thus hot spot build-up experienced in the old silver plated connectors is almost eliminated giving a more equal distribution of calories throughout your system. This also allows the line to dissipate calories through the diplexer and antenna short circuits at an accelerated rate, decreasing temperature build-up of the inner conductor and increasing reliability against breakdown.

The above photo shows a cut-away view of the female connector with its built-in thermo-probe prior to its assembly with the watchband male bullet. (Note: Both the male and female connections are an integral part of the inner conductor allowing only one contact joint per section of transmission line.)

After assembly as cut-away shows the thermo-probe remains in contact internally with a male wristband bullet. This allows maximum heat transfer from one section of line to the other. All dust generated due to differential expansion by the watchband spring and thermo-probe are captured within the inner conductor.

Broadcasting equipment has moved from vacuum tubes to solid state. S.W.R. provides the opportunity to bring your coax to the same state of the art. Remember you can pay more or less but you can't buy better. Whether you're planning a new system and wish to use our exciting new **"K"-Line** flange where the teflon and "O" ring cannot be damaged on assembly or wish to update your existing R.C.A., Andrews, Phelps Dodge, etc. rigid coax we have the answer. **S.W.R. is Systems With Reliability.**

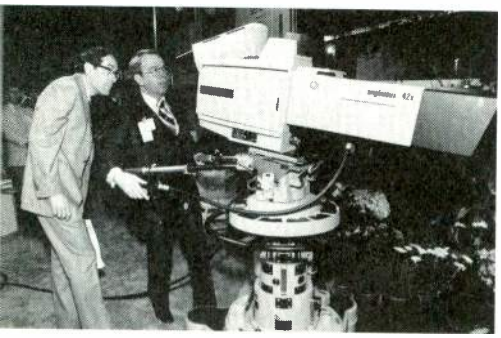
Available in 3 1/8, 4 1/16, 6 1/8 and 9 3/16 sizes.

SWR INC.

Systems with Reliability

P. O. Box 215 — Goffstown, N. H.
(603) 497-3000
Circle 129 on Reader Service Card

SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability — SWR — Systems With Reliability —



Harris shows off the TC-80 to an interested broadcaster

weighs just under 42 pounds and will take a normal one-hour reel of one-inch videotape. The HR-100 makes extensive use of C-MOS ICs to help reduce power consumption. Using its own built-in nickel-cadmium battery (12V, 6 AH), the HR-100 will provide 90 minutes of operation.

Other Type C activity took place in the booths of those companies licensed to market or manufacture either the Sony or Ampex machines. RCA showed its TH-200, which is the equivalent of the new Sony BVH-1100. RCA's TH-200 includes all the functions of the BVH-1100 including the new editing functions such as automatic preview, editing review of each segment, and prerolls. These new TH-200 units include the Dynamic Tracking features and are available with the TBC-200 time base corrector. Philips Broadcast Equipment Corp. showed both Ampex Type C VTRs and Bosch Fernseh Type B VTRs in keeping with its policy of "single source capability." Marconi also showed the Ampex Type C VTR under its own label.

Bosch Fernseh showed its complete line of BCN Type B VTRs which utilize the segmented helical scan recording format. Pursuing its policy of "systems" capability which envisions a specialized VTR or VTR configuration for all production needs, BCN machines were shown in editing configurations, on-air configurations, and special effects modes. The long-heralded BCN-5 portable one-inch cassette recorder made its debut as a production model. This 26½-pound, $40,000 field recorder will provide 40 minutes of operating time on an internal battery. The cassettes have a 20-minute tape capacity, though a fixed reel option could extend the capacity to 30 minutes. The cassettes are designed so that the tape reels can be removed and placed on the normal tape transport mechanism of the BCN-20 or BCN-50 for post-production or on-air work. A heterodyne playback board is an option to the BCN-5s adapter so that color playback can be achieved in the field. The unit is also designed to fit into a TBC-equipped console for direct on-air playback if so desired.

With Bosch Fernseh's 50th Anniversary Celebration coming up, the company's major new product introductions are scheduled to appear at the International Television Symposium and Exhibit next month in Montreux. Despite persistent rumors that among the new products exhibited will be a prototype digital VTR, the only confirmed introduction will be that of the BCN-100 Automatic Multicassette VTR. The BCN-100 will have random access to 32 cassettes, each with up to 30 minutes of record/playback time. Applications for the unit can be anything from providing up to 16 hours of continuous playback, internal editing from deck to deck (there are three head assemblies), cassette duplication, or a number of other applications.

For more information on VTRs: Sony BVH-1100, **240;** BVT-2000, **241;** Ampex time code reader/gen, **242;** color stabilizer, **243;** NEC, **244;** Hitachi HR-200, **245;** HR-100, **246;** RCA TH-200, **247;** TBC-200, **641;** Philips, **248;** Marconi, **249;** Bosch Fernseh BCN-5, **250.**

Other formats and innovations

Despite the attention that the Type C, and to a slightly lesser extent, Type B one-inch VTRs received, activity in the other formats remained strong, particularly the ¾-inch U-type machines. With their superior weight, cassette operation, and economy, it seems clear that the U-types will remain the fundamental ENG recording machine for some time to come.

Both NEC and Cinema Products, however, did show yet another one-inch format, the IEC Type D. The main attractions of these recorders, the TTR-7 portable and the slightly larger TTR-5, are their compact cassette format and light weight. In the Cinema Products exhibit both the TTR-7 and TTR-5 were shown. The TTR-5 weighs some 63 pounds and is intended for mobile van installation or some other semi-permanent field or studio configuration. It uses a 22-minute self-threading cassette, as does the TTR-7. Priced at $36,050, the unit operates on either 110/115 V ac or an external 12 V dc power supply. Full color playback is available with an ac/color adapter priced at $6,130. The TTR-5 has two audio tracks while the TTR-7 has one audio track with provisions for an optional second audio track. The base price for the TTR-7 is $35,000, though a color playback adapter is available for an additional $5,750.

Both of these units are targeted towards field production. At present, no editing system is provided for these Type D machines so that post-production, beyond a normal assembly type edit, would have to be executed after the material was transferred to some other format. The recommended TBC for these VTRs is the NEC NTC-5000, which lists for $15,200.

IVC (International Video Corp.) continues to reestablish itself among the leaders of the business. An ambitious retrenchment that began two years ago when IVC suffered serious setbacks in the financial area has brought the company through to a fairly stable condition. While avoiding major new products efforts until now, IVC has continued to enhance its existing product line. In the VTR field the IVC-9000 continues to gain acceptance in the mastering and teleproduction segments of the industry. This NAB, IVC showed its new IVC-1010 one-inch helical 10 MHz bandwidth video recorder. The new unit is intended primarily for medical, industrial, security, and military applications.

According to Dave Edmonds, VP of marketing for IVC, the company continues to enjoy considerable success in the international market, doing almost 50 percent of its business there. In this past year IVC reported a profit of $1 million on $11.5 million of sales. It can be expected that IVC will reenter the product development arena shortly as it reconciles its financial situation.

New U-type recorders from the major suppliers such as Sony, U.S. JVC, Panasonic, and others showed little in the way of radical changes in their U-type systems. Panasonic introduced several new U-type machines including an NV-9500A high performance editor with a 50 dB S/N. Also new were the NV9300A with tuner and auto search and the NV-9300A recorder/player.

Home-type ½-inch VCRs were apparent in several booths. Panasonic has upgraded its VHS system so that some professional applications become promising. The new NV-8200/8170 system, for instance, adds a competent editing capability to the format with the use of the NV-A820 Interface Adapter. With the machines' 45 dB S/N, DOC, and improved operation features, Panasonic is hoping that they will find a role in test commercial production and other related off-air applications.

Another growing trend among manufacturers is the electronic and mechanical redesign of U-type and ½-inch cassette machines to achieve high-band performance. Recortec's HBU-2860 recorder offers a seven to 10 MHz high-band color editing system in the U-type format. The only drawback to the system has been the need to dub up

continued on page 49

Fuji quality is now available in 1".

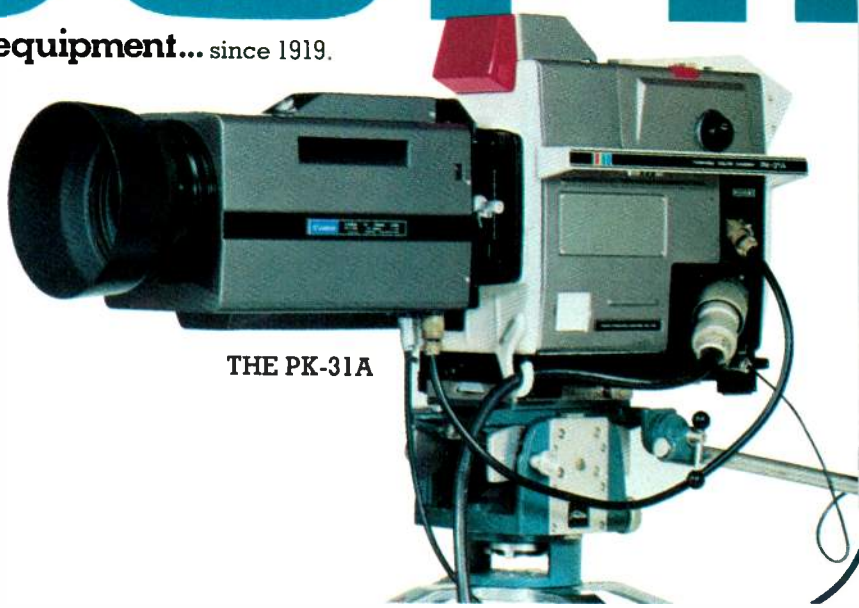
FUJI

Magnetic Tape Division of Fuji Photo Film U.S.A., Inc., 350 Fifth Avenue, New York, New York 10001

Circle 130 on Reader Service Card

TOSHI

A new name in broadcast equipment... since 1919.



THE PK-31A

You've probably heard of us. We make appliances, components, and industrial equipment. We're into power generation, transportation, radiology, computers, and lighting. We make hundreds of products. But you might not know that we've been building for broadcasters for over 50 years. We've been making color television cameras since the sixties when we introduced the world's smallest color camera. We also make quad VTR's, control equipment, and transmitting equipment. You'll find Toshiba cameras, VTR's, broadcast systems, and mobile units from Africa to the Middle East, from Australia to Latin America, from Spain to the Philippines.

Now it's time to introduce a superb camera product line to the world's most sophisticated broadcast television market.

THE PK-39—Perhaps the most versatile, flexible, portable ENG/EFP broadcast camera ever designed. Self-contained or two-piece. Auto beam control, auto white balance, and auto iris. Choice of Plumbicon* or Saticon** tubes.

THE PK-31A—A computerized studio color camera featuring automatic setup and 30 mm Plumbicon tube format.

*TM NV Philips
**TM Hitachi

THE PK-39

THE PK-40—A major advance in digitally controlled cameras. The next generation of digital cameras is coming from Toshiba. The PK-40, which includes a self-contained mini-computer, provides:

- computerized automatic setup and fault diagnosis
- superb stability and reliability
- one-inch diode gun with improved picture quality
- triax cable

Toshiba's half a century of broadcast experience means a corporate commitment not only to the way we introduce the company and its products to North American broadcasters, but to provide the customer support that must follow. It took us a while to get here. But we came well prepared.

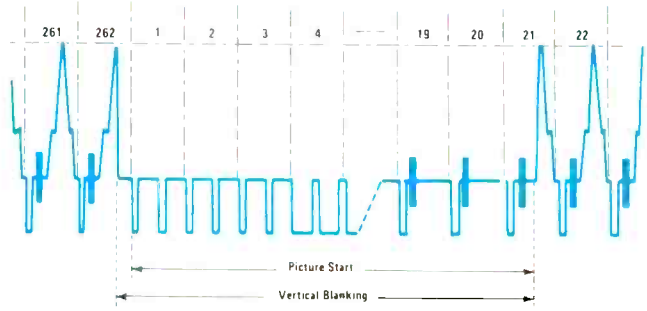
Toshiba Broadcast Electronic Systems, a division of Toshiba International Corporation. 292 Gibraltar Drive, Sunnyvale, California 94086. (408) 734-9172.

TOSHIBA... In Touch with Tomorrow

Circle 131 on Reader Service Card

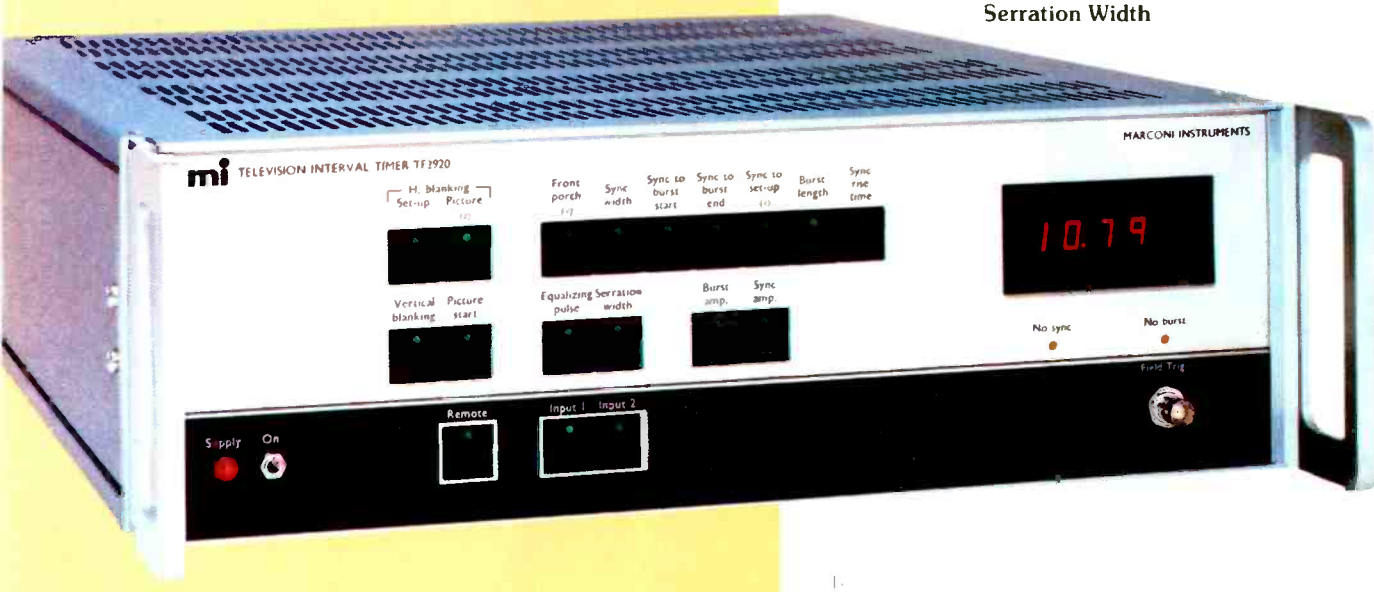
MARCONI has the proven answer to 'H' & 'V' Blanking Measurements

Marconi Television Interval Timer Model 2920 measures the following parameters

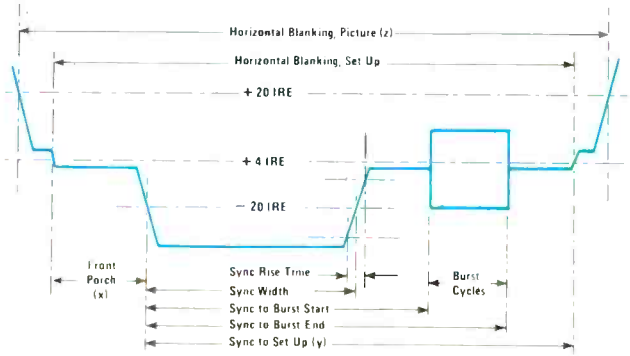


VERTICAL BLANKING MEASUREMENTS

Total Vertical Blanking Interval
Picture Start
Equalizing Pulse Width
Serration Width



- Fast accurate measurements at the touch of a button
- Results based on samples taken throughout the active field
- Blanking at set-up (+4 IRE) and picture (+20 IRE) measured independently to 10 nsec. resolution
- Vertical Blanking resolved to 1/10 line
- Printout from BCD output on command
- All functions may be remotely controlled for simple system integration
- Manufactured in U.S.A., domestic price $4500



HORIZONTAL BLANKING MEASUREMENTS

Set Up Blanking (+4 IRE)
Picture Blanking (+20 IRE), (z)
Front Porch, (x)
Sync Width
Sync to Burst Start
Sync to Burst End
Sync to Set-Up, (y)
Burst Length in cycles
Sync Rise Time

REFERENCE MEASUREMENTS

Burst Amplitude in IRE
Sync Amplitude in IRE

See How Easily Timing Measurements Can Now Be Made

MARCONI INSTRUMENTS
100 STONEHURST COURT, NORTHVALE, NEW JERSEY 07647
TELEPHONE: 201/767-7250 • TWX: 710-991-9752

Circle 132 on Reader Service Card

to it since no portable first echelon recorder of equal quality has heretofore existed. The 30-minute record time limit has been perceived as adequate. In late 1979, however, Recortec expects to introduce the HBU-9400 portable high-band recorder. Recortec expects to carry out the redesign of the machine, based on the Panasonic NV-9400, which involves tripling head speed and tape speed without increasing the physical size of the recorder.

Merlin Engineering showed a Betamax ½-inch recorder modified for high-band performance. Dubbed "Jupiter," the half-inch prototype system was shown in a studio configuration which utilized a signal system similar to that used in quad machines. A spokesman for the company said that the Merlin approach also involved a tripling of head and tape speed with the associated shortening of tape play time. Nevertheless, Merlin expects the system to play an important role in the home VCR tape production industry and expects to introduce a portable version of the machine in the coming months. It is also likely, said the spokesman, that Merlin will switch from the Beta format to the VHS format.

Upgrading packages for U-type machines were everywhere. Video Associate Labs showed its Pro-Pak modification package which updates current U-type tach lock to a full broadcast quality control and synchronizing system. Pro Pak 1 basically upgrades the servo system to the standards associated with the quad and one-inch formats. The advantage of this approach, besides improved framing accuracy, is that less expensive narrow window TBCs can be used to meet timing requirements.

For more information: NEC TTR-7, **251**; TTR-5, **252**; IVC, **253**; Panasonic NV-9500A, **254**; NV-9300A, **255**; NV-9200A, **256**; NV-8200/8170, **257**; Recortec HBU-2860, **258**; HBU-9400, **259**; Merlin Engineering, **260**; Video Associate Labs, **261**.

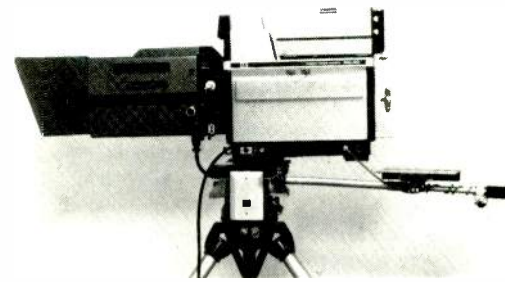
Some good additions to recording

Upgrading VTRs in all formats continues. Ampex has added a single-line dropout compensator that improves the digital dropout compensation scheme by narrowing the spatial displacement of the replaced signal. Now available for the AVR-3, the new D.O.C. will be available in kit form for the AVR-2 in the near future. RCA showed its new model TCR-100A cartridge recorder/player with an automation interface for technical automation systems and the new bar code cart identification system to permit programmable random play of individual carts.

Control panel and microprocessor for the RCA TK-47 camera's automatic setup

The RCA TK-47 camera, claimed to offer the most automatic setup features of any on the market

Control panel for Toshiba's brand new automatic setup PK-40



The Toshiba PK-40 camera. This was among a select number of products introduced by Toshiba to the U.S. market for the first time at the Dallas show

Videomagnetics showed its V-787 high-band color video duplicator. This austere quad duplicator provides a low-cost ($16,950) recorder that permits duplication to occur economically rather than tying up expensive full-blown quad VTRs. The machine has no complicated controls, allowing duplication to take place without a highly skilled technician present.

Computer Magnetics, Spin Physics, Videomax, AFA, and others devoted much of their exhibits to explaining new VTR head and recorder rebuilding and refurbishing. These companies have all managed to increase head life through various new manufacturing and processing techniques. Many of the refurbished heads appear to have better specifications than the originals they replace.

For more information: Ampex dropout compensator, **262**; RCA TCR-100A, **263**; Videomagnetics, **264**; Computer Magnetics, **265**; Spin Physics, **266**; Videomax, **642**; AFA, **267**.

Strides toward better VTR audio

The promise of improved audio in the videotape recording area is beginning to come to pass as several companies bring out equipment to enhance the audio section of their systems.

The multiple audio tracks that became available with the one-inch helical machines are of excellent quality and stereo production seems likely. Though stereo audio in video is still an uncommon practice, more and more producers are giving it serious thought. Regardless of how soon broadcast television converts to a stereo system, producers are thinking stereo as a hedge against future technological changes. Even though a program may be transmitted in monaural, the archival value of having the track in stereo gives today's program an extended life should home video, cable, discs, or some other technology capable of exploiting stereo find a viable marketplace.

Dolby Laboratories, Inc., widely known for its radio noise reduction systems, tape recorder noise reduction, and "Dolbyized" film soundtracks, introduced the Cat. No. 155 two-channel noise reduction system for use with the Sony BVH series of VTRs. The noise reduction system is mounted on a single PC board that fits into a currently unused card slot on the BVH. It provides 10 dB of noise reduction from 20 Hz upwards and 15 dB of noise reduction at 9 kHz and above. The improved audio should give current BVH VTRs audio performance equal to some of the best audio recorders on the market. The noise reduction unit is expected to be available in the third quarter of 1979 and a similar noise reducer for the Ampex VPR is being considered.

Dolby also introduced the NRU-10 two-channel audio noise reducer which brings Dolby Type A noise reduction to the VTR world. The new unit connects to the line-level inputs and outputs of any recorder so that signals going to and from the recorder are available for processing within the noise reduction unit. The unit calibration facilities include Dolby tone oscillators for matching levels between recorder and the noise reduction unit. Once matched,

the NRU's audio level controls and VU meters are used for recording and playback in place of those on the deck. The NRU is expected to be available in the last quarter of this year and will sell for approximately $3000.

Even quad machines are getting the stereo treatment. Taber Manufacturing showed its Taberamp unit as part of the stereo conversion of both Ampex and RCA quad recorders to stereo, and Merlin showed its stereo head stacks for quad recorders.

For more information: Dolby Cat. No. 155, **268;** NRU-10, **269;** Taber Manufacturing, **270;** Merlin, **271.**

TV camera designs continue to evolve

More computer-controlled automatic setup of cameras was the dominant news in the TV camera category at NAB. RCA, which introduced the TK-47 automatic camera last year, still claims it to be the world's most fully automatic camera — 89 functions completely microprocessor-controlled for totally automated setup, with 50 of these routinely checked for daily operation. But Toshiba International, entering the North American market in January of this year, said its brand new PK-40 goes even further in advancing the state-of-the-art in digitally controlled studio cameras.

Hitachi was another manufacturer to move to a computer system to preset a number of cameras automatically. Its new studio camera, the SK 100, includes as an option automatic setting by microcomputer. Ikegami, which was the first camera manufacturer to replace potentiometers with digital encoders (initially in the HK-312 and last year in the HK-357A) has applied the concept to another camera line; the HL-53 EFP portable.

Selected built-in automatic adjustments for operating convenience was a popular feature of many cameras last year at NAB, with the Philips LDK-14 being something of a pace setter in the ENG/EFP class. Representative studio cameras using built-in automatics were the Ampex BCC-10 and the Marconi Mark IX cameras. (The LDK-14 and the BCC-10, using digital memories, had auto centering as well as the usual rundown including auto black and white color balance and auto iris; the Mark IX, using analog circuits, included the above plus automatic registration using a diascope).

Automatic beam control was incorporated in many cameras last year after being shown by Hitachi in prototype form in 1977. This year, two years later, most all higher-line cameras and many ENG/EFP types boast such a feature. Harris, for example, redesigned the TC-80 to incorporate an exclusive highlight handling circuit that could reduce comet tailing 10:1. The new TC-80A also offered automatic horizontal and vertical centering, confirming the trend to more automatics. Several manufacturers implied that one doesn't need to go much further. Both Harris and Bosch Fernseh said that so much stability has been engineered into recent cameras that controls seldom need resetting.

There were several other noticeable trends at Dallas: Nearly every quality camera offered the new diode gun Plumbicon introduced last year as a choice, and there was a continuing movement to still more flexibility of operation in studio/field cameras. Several new field/studio cameras were shown. And while there were no major surprises in the ENG category, there were plenty of cameras to look at.

More competition in the quality studio line

Since 1978 was a premier year because of the introduction of the high resolution diode gun tube and flare-reducing circuits, one hardly expected to see any startling advances in studio cameras at Dallas. Indeed such majors as RCA, Philips, and Ampex had little new to talk about. RCA announcedthat the TK-47 automatic with Triax would be ready for delivery early next year and that more lens choices were forthcoming. But Philips and Ampex had to rest on last year's laurels.*

Bosch Fernseh's KCK camera remained unchaged, but the company did have a new studio/field camera to talk about (to be described later).

Marconi got mileage out of the fact that the Mark IX (introduced last year) was a family with six variants, and indeed Marconi's theme raised the real question: how easy is it to use this camera compared to that one? All top-of-the-line cameras technically can do the job. What becomes most important, is the capability of the camera in getting the picture compostion wanted both inside and outside the studio.

Determining just which studio camera (and camera lens package) might be best suited to the broadcast task is no easy matter. The job is made harder by the entry of not only more cameras but more camera manufacturers. Both were in evidence at NAB.

Both Hitachi and Toshiba came on strong with new studio cameras, with the latter threatening to be a new major competitor in the U.S. market. Toshiba showed two studio types: the already mentioned fully automatic PK-40, that will be available in late 1979 or early 1980, and the PK-31A, a camera ready for delivery now.

The PK-31A, widely used in other parts of the world (over 300 sold), uses 30 mm lead oxide tubes. It is designed for both studio and remote applications.

continued on page 52

An inside view of the LSI circuitry in the RCA TK-760 EFP camera

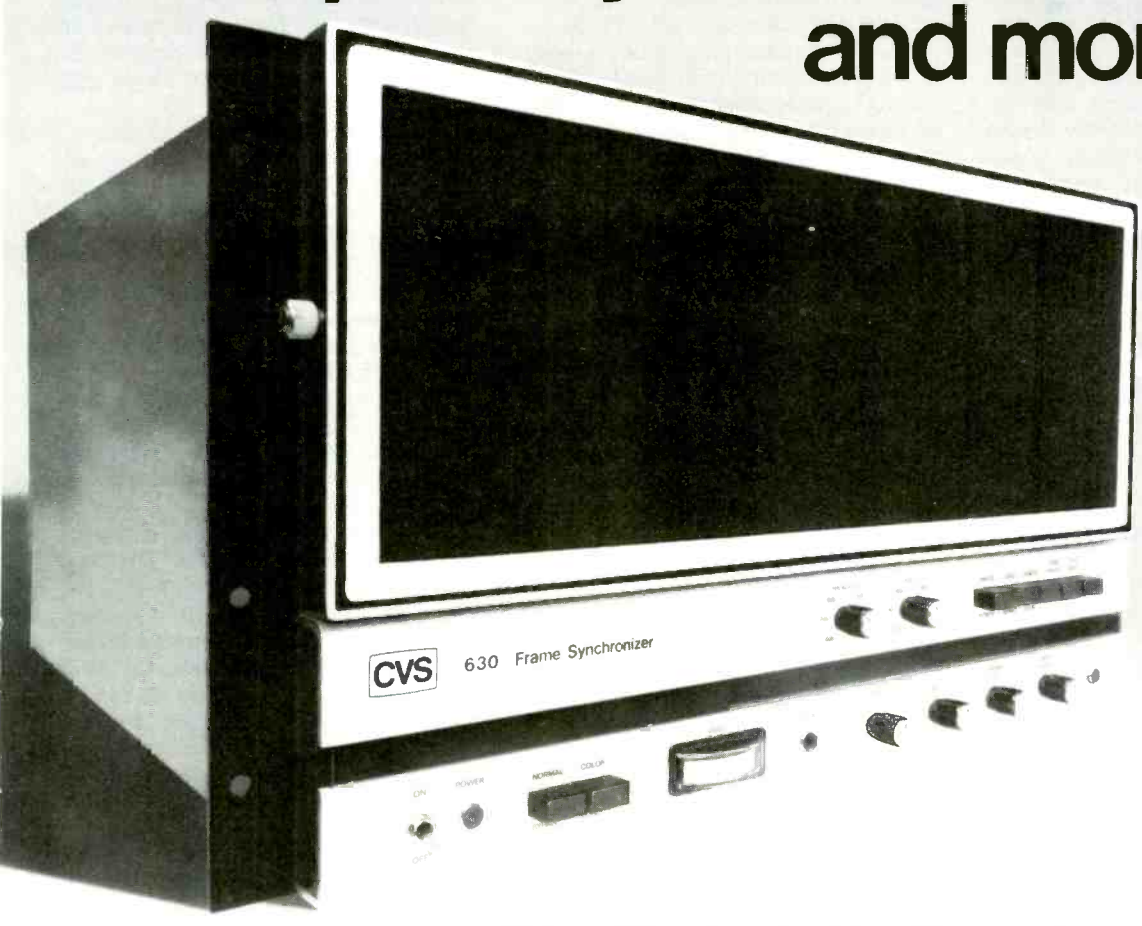
Philips' Video 80 camera system in studio (background), field (middle), and hand-held ENG configurations (foreground)

Hitachi's SK-100 studio camera picks up on the trend to automatics

Bosch Fernseh's KCP-60 is one of the latest studio/field convertible cameras

* Philips claimed continued leadership since it said it was in the forefront of four critical areas: pick-up tubes, prisms, yolks, and camera electronics. Ampex said the BCC-10's luminance S/N of 54 dB and depth of modulation spec in excess of 60 percent made it still the unsurpassed camera. Both claimed significant shipments in 1978.

Superb synchronizers... and more.



The CVS 630 Series

CVS 630 Series synchronizers are digital framestores . . . broadcast quality time base correctors . . . versatile effects generators . . . interfaces to new developments in digital video . . . and much more, for all T.V. standards. Yet, their prices compare favorably with those for synchronizer-only units and their performance is superior.

For example, they actually out-perform stand-alone TBCs. And, even under noisy, less than ideal conditions, they maintain multi-field color sequence (NTSC, PAL or SECAM) without H-position shift or "cycle jump." Odd field edits and "hot" switches are also easily handled.

CVS 630 Series synchronizers owe their versatility, in large part, to an exclusive "universal" memory that is compatible with all T.V. standards. This is made possible by processing the video signal in component, rather than composite, form—a technique already proven in over 1000 CVS digital TBCs.

Furthermore, for effects generation, picture freeze (field or frame) is a standard feature of the CVS 630 Series.

Fixed picture compression, horizontal and vertical positioning and joystick control are available as economical options.

Digital noise reduction (DNR) is also a low cost option. These plug-in cards allow you to achieve up to 15dB of noise reduction without the motion artifacts and resolution loss common to other noise-reducing devices.

Along with all of this, every model in the CVS 630 Series has a direct memory access (DMA) digital I/O interface. This opens up an almost unlimited range of potential applications: digital still store . . . digital graphics . . . real time picture analysis . . . multiple picture effects . . . and much more.

So, if you're thinking about buying a framestore synchronizer, get one that does more than just synchronize—from the CVS 630 Series. For a demonstration, contact your authorized CVS distributor or the CVS office nearest you.

CVS

Consolidated Video Systems, inc.

U.S. Headquarters
1255 E. Arques Avenue
Sunnyvale, California 94086
Phone: (408) 737-2100
Telex: 35-2028

European Office
293 Regent Street
London, W1V2HR England
Phone: 636 3850
Telex: 268316

Far East Office
P.O. Box 150, Crows Nest
N.S.W. 2065, Australia
Tel: 439-1651/439-3013

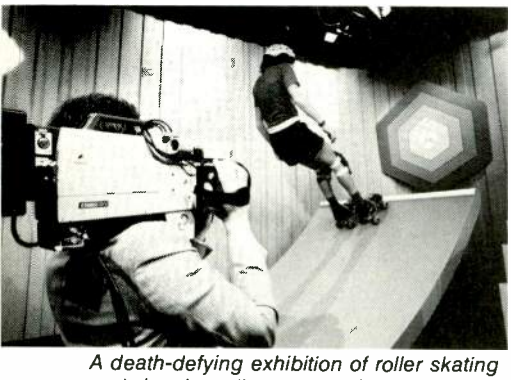
Circle 133 on Reader Service Card

An advanced camera, it employs a self-contained microcomputer to accomplish automatic centering, automatic white level and black level. It also automatically sets size and linearity and controls gamma and flare. Automatic setup and registration is performed within 50 seconds. The camera has integral bias light and many other features and is priced at $90,000 (less lens and tubes).

The PK-40 is described by Toshiba as a camera for today *and* tomorrow. It has a built-in microprocessor and a non-volatile memory to operate most controls. An instant picture can be obtained simply by pushing the Auto-Setup button. The microprocessor is located in a separate camera control panel. The PK-40 differs from the RCA TK-47 in that the digital camera control panel (CCP), the camera control unit (CCU), and the camera head are so compact in design that the system can be readily used in the field. All the controls are on the CCP. The CCU has no routine adjustment controls but is the interface and the video processing unit. The CCU includes the encoder and the digital memory units. The CCP controls are divided into two functions — 16 functions relate to primary setup (focus, beam alignment, beam and shading compensation, etc.) and 21 daily automatic setup functions (white balance, registration, etc). Picture rotation can be adjusted from the CCP. Potentiometers have been replaced in the camera by rotating digital encoders.

The PK-40 system provides for computerized diagnosis. The camera can be set up in a number of different ways and different configurations, according to the company. The PK-40 employs one-inch diode gun tubes. Triax cable running up to 4600 feet is an option. The camera is expected to cost about $140,000.

Hitachi demonstrated that it was a competitor in the advanced automatic camera arena by demonstrating the SK-100. This new camera is a quality unit using either one-inch or 1¼-inch tubes. As a result of a newly-developed f 1.4 prism system, a 53 dB S/N ratio is claimed (for a lens opening of f 5.6 and 200 fc). Resolution is in excess of 600 lines. The camera incorporates automatic beam control. Automatic setup by microcomputer is an option and a central control system can preset up to six cameras. (This option was not shown at NAB.)



A death-defying exhibition of roller skating and skateboarding made a fitting subject to test the maneuverability of Thomson-CSF's MC-601 one-piece Microcam

Ikegami came to the show with the HK-312D. Version D offers Triax as an option. Using 1¼-inch Plumbicons, this camera boasts a better than 56 dB S/N ratio. Other features: class A deflection amplifier that assures maximum linearity, automatic black level and balance correction to handle lens flare, and a special comb filter to minimize background noise in color channels.

As mentioned, a new studio camera at the show was the Harris TC-80A, which has evolved from the TC-80. The major improvements are the use of diode gun tubes and a highlight handling circuit that reduces comet tailing as much as 4 f-stops. An efficient switching power supply has been added to reduce power consumption. Super quiet preamps are now used. Camera convenience was an underlying philosophy in the camera redesign, Harris said. Triax is an add-on feature. When more than one camera is being used, the remote setup system provides a consistency across camera chains. Standard automatics include digital black and white balance, a three-speed automatic iris, and automatic timing. Automatic centering is an option.

A new studio camera using diode gun tubes has evolved at IVC: the 7005. For operating ease a seven-inch high brightness flat face view finder has been added. Two or four-wire intercom can be used and there is more flexibility in operation. Panasonic was another manufacturer showing a studio camera — the AK-920 — but it was unchanged from last year.

For more information on studio cameras: Toshiba PK-40, **272;** PK-31A, **273;** Hitachi, **274;** Ikegami, **275;** Harris,**276;** IVC, **277.**

More flexibility for field/studio cameras

Advances in the redesign of studio cameras to simplify operation — such as more automatics and more operating felxibility — can be found also in the new breed of field/studio cameras. We've already made direct reference to two Ikegami field cameras that feature automatics: the HK-357A all-in-the-head camera and the HL-53 EFP. Both these cameras introduce new degrees of flexibility. The HK-357, for example, has a built-in diascope in the lens to speed up alignment and for flexibility the camera head can be separated from its base station by nearly one mile using Triax. (For improved performance this camera can use the new diode gun tubes.)

The HL-53 three-piece camera — head, line pack, and back pack — offers unusual flexibility. The HL-53, for example, can use the CCU of Ikegami's HK-312 studio camera interchangeably.

In multicore cable operation the camera head can be as far as 250 feet from the pack. From that point on the system affords various options: either multicore or Triax cable can be run to HK-312 CCU. With mini multicore cable, the separation can be as long as 2000 feet; with Triax the distance can be as long as 5000 feet.

All components are scaled in weight and size for the EFP camera. The head weighs 15.4 pounds (less lens), the line pack 13.2 pounds, and the back pack CCU 18.5 pounds. Either a higher resolution 1.5-inch viewfinder or a large 4½-inch EFP viewfinder can be used. The camera uses three one-inch conventional or ACT Plumbicon pickup tubes. Resolution is more than 600 TV lines at center and the S/N ratio is better than 55 dB.

Ikegami provided yet another example of flexibility at the show by introducing a multi-core cable base station that could convert the ENG cameras, the HL-79A and 77A, into EFP or studio cameras.

The choice of new lighter-weight, extremely flexible studio cameras is expanding. Brand new this year was the Bosch Fernseh KCP-60. The KCP-60 was designed as a quality studio/outside broadcast camera using 2/3-inch tubes. A rugged optical system eliminates microphony. Excellent registration is achieved due to carefully matched tubes and deflection systems, along with a mechanically and internally stable prism system. Automatic beam control circuitry is used and low noise preamplifiers have been incorporated. Flexibility of operation dictated design aspects. All line-up controls can be accomplished from the main control panel (suited for desk or rack mounting). After line-up, operating functions can be switched to a remote control panel, which can be 500 feet away. An attractive feature of the camera is its price — in the vicinity of $50,000.

To increase both the flexibility and performance of the 7000P cameras, IVC introduced the 7005P. Lens options and viewfinder options have been increased. To give this camera all the latest features, automatic beam control circuitry has been added and the option of diode gun tubes is available. A new

continued on page 55

"Quad" Quality in ¾″ Format

HBU

is now available for delivery

HI-BAND U-format VTR

The model HBU-2860 (Hi-Band U-format video cassette recorder) is a modified SONY VO-2860 with Recortec electronics mounted on top of the unit. The modification provides direct hi-band video recording made possible by tripling the scanner speed and the linear tape speed. HBU is not a kit, but a complete VTR.

QUALITY—At the 1200 ips head-to-tape speed the HBU video quality is as good as the "quad" or the new one-inch format. Significantly improved audio quality is also obtained with this modification.

CONVENIENCE—Standard and widely available 3/4-inch video cassettes for the HBU allow for simple loading, handling and storage.

DEPENDABILITY—The HBU does not alter the U-type recording format and thus takes advantage of the established interchangeability of the U-type recorders.

ECONOMY—Lowest cost in equipment, media and operations for any Hi-Band VTR.

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086. TEL: (408) 735-8821

Circle 134 on Reader Service Card

YAMAHA'S NEWEST TOURING PROFESSIONAL.

Yamaha's new PM-2000 Mixer. Ideal for professional sound reinforcement, it's the kind of full production console pros have always had in mind, but never in hand.

The PM-2000. The touch is solid, smooth, consistent. It feels like the professional console that it is.

The knob, switch and slider placement anticipate where your hands will naturally fall.

With 5-position, 4-band equalization and six independent sends on all 32 inputs, plus a full function, 14x8 matrix, the PM-2000 has everything you would expect from the consummate professional console.

And if the PM-2000 looks and feels like a custom console, and seems to have read your mind, it is no accident. Because Yamaha spent two years on intensive research and prototypes based on input from professionals. One touch and you'll realize: the PM-2000 feels how you think.

Available early 1979, on a limited basis, through select Yamaha dealerships.

YAMAHA

P.O. Box 6600, Buena Park, CA 90622

Write for complete information on the PM-2000.

Circle 135 on Reader Service Card

preamp has been added to increase the signal-to-noise ratio.

In extending flexibility, CEI showed a new CEI-330 system. This camera is similar to the popular 310 field production unit but now the cable range between the head and the electronics unit can go to 2400 feet (a nice feature when following golf matches). R, G, and B video is carried from the head. Standard TV-81, mini TV-81, or a CEI microcable is used to avoid a drop in S/N or RF/AGC problems incurred with Triax on long cable runs. (Owners of 310s can convert to this new distance capability by making an addition to the camera head, adding an auxiliary power supply and changing one circuit board. The upgrade costs can be done for about $12,000.) The use of minicable in EFP is growing rapidly. Major cable supplier Boston Insulated Wire reports a "shrinking volume" despite an increased footage of product.

Hitachi's answer to a versatile multi-use camera was the SK-96. This camera, introduced last year as a prototype, is now in production. It can be configured as a complete studio camera or it can be converted to a two-piece hand-held camera with the camera head inside the hand-held housing. This camera comes with a digital control unit which means the CCU can be placed as far as one mile from the camera head, using Triax. This camera has the ability to send RGB, full remote control and power over either Triax or coax.

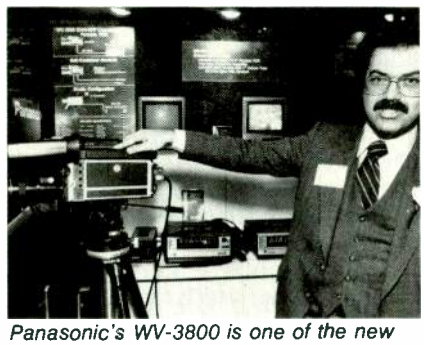
For more information on field/studio cameras: Ikegami HL-53, **643;** base station, **278;** Bosch Fernseh KCP-60, **279;** IVC, **280;** CEI, **281;** Hitachi, **282.**

Small refinements in the ENG category

In the ENG/EFP area, there were no startling developments. Everyone knew Ikegami's new top-of-the-line camera would be the HL-79A, shown as a pilot model last year. It is now being delivered. Not so well known is the fact that this camera can be purchased with some operating controls eliminated as a medium-priced ENG camera, the HL-78B.

The HL-79A is a state-of-the-art camera. With viewfinder it weighs only 11.2 pounds. Power consumption is 23 watts and up to six hours of operation are possible from a plug-in into-the-head silver-zinc battery. Less than 200 fc produces a S/N ratio of 54 dB at f 5. A usable signal can be obtained from 2 fc at f 1.4. It has adjustable horizontal/vertical blanking pulse width. Its features include an auto iris

Ikegami-s new HL-79A ENG camera is lighter and smaller than the popular HL-77



Panasonic's WV-3800 is one of the new generation of ENG/EFP convertible cameras

closure when the camera is off, auto white balance, automatic beam control, etc. The HL-78B is simpler mechanically (and slightly heavier) and it does not have the iris closure feature. It is priced at under $30,000.

In terms of weight, power consumption, and performance specs the HL-79A, along with the Thomson-CSF/Sony Microcam, represented the state of the art at Dallas. The Philips LDK-14 was nearly comparable, but consumes a few more watts of power.

Everyone knew Hitachi's top-of-the-line ENG/EFP camera would be the SK-90. The SK-90 was shown at Las Vegas, but this year several accessories were available making it more suitable to EFP applications. There's a remote control package for remote functions and another unit for studio integration. A digital control unit permits remote digital operation with the addition of a Triax adaptor control, and power can be introduced 5000 feet away from the camera head. An optional five-inch viewfinder can be mounted on top of the camera body for a studio/EFP application. The accessories can be quickly removed to produce a self-contained ENG camera.

There was one surprise camera in the Hitachi ENG lineup. The new FP-20S is a fully self-contained medium-priced camera. This camera features the Hitachi integrated pickup component, a mechanical assembly incorporating both color separating optics and the pickup tube assembly. (This is the same assembly that has made the Sharp XE-520 ENG under-$10,000 camera a very good seller.)

Sharp calls this pickup tube assembly a rugged, bonded optical housing and has incorporated it in a new self-contained ENG camera, the XC-530, priced at $9800 without lens. This camera features bias-lighted Saticon™ tubes and a range of accessories for news-gathering purposes (a carrying handle, electret microphone, 10x iris zoom lens, VTR start-stop switch, hand grip, etc.).

The XC-530 is but one option of several configurations that are possible with the XC-500 series. For example, a CCU can be affixed to the camera head to make a studio camera.

Although Toshiba's entry in the U.S. market places a new ENG camera in the line-up, the PK-39 was not totally foreign to NAB convention-goers. This same model was shown last year at Las Vegas when Toshiba came to the U.S. "to test the waters." Available as either a self-contained one-piece unit (23 pounds) or a camera head (17 pounds) plus separate CCU, the system also offered a remote panel for full production capability. A separate five-inch viewfinder can be added. The PK-39 has many features and is priced in the $37-45,000 range, depending on options.

Several broadcasters thought RCA might surprise the industry with a new generation ENG camera. No such event happened, but RCA did modify the TK-76B to lighten its weight and reduce its power consumption. The new camera is known as the TK-76C. Weight goes down 20 percent through use of a new magnesium alloy cover plate, and power consumption is cut to 34 watts. (These modifications can be made to existing TK-76Bs.) RCA is also using a narrow width blanking pulse to make it easier to meet FCC blanking requirements.

Sony's principal ENG camera was the BVP-300, introduced last year. To increase its versatility, Sony has added several options: Two different CCUs, a five-inch viewfinder and a rear-mounted battery pack.

Thomson-CSF made no basic changes in the Microcam since last year except to change the designation system. The one-piece camera, the MC-601, is the same camera as the Sony BVP-300. This camera can now be equipped with a large viewfinder to make it more suited for studio use. The two-piece Microcam is the MC-602.

Cinema Products' MNC-71CP portable video camera remained unchanged. Cinema Products was promoting the fact, however, that by adding an optional five-inch viewfinder and a portable CCU (with automatic cable compensation up to 155 feet) or a rack-mounted CCU (with cable compensation for more than 1000 feet) the MNC-71P could be used as a studio/field camera.

Other ENG cameras at NAB which were shown last year were the Philips LDK-14 and its twin the Ampex BCC-14. Bosch Fernseh showed the KC-90 again, which astute observers might recognize as similar to the Cinema Products MNC-71P. Both are made by NEC. Marconi displayed the 3295 ENG camera first introduced last year, which is in essence the Hitachi SK-90. The System 80 ENG/EFP camera from Philips was also shown again. JVC returned with the popularly-priced $23,000 CY-8800U portable.

At the Panasonic exhibit a number of portable cameras were shown. The ENG-type AK-750, introduced last year, was shown by the Professional Video Products Division. As part of the Omnivision II VHS recorder display, Panasonic showed several compact one-tube cameras: the WV-3800, the WV-3300, and the WV-3310.

The WV-3800 uses a one-inch stripe filter integrated vidicon tube that produces 250 lines of horizontal resolution. The unit is suited for ENG applications (47 dB S/N) and features automatic iris zoom lens, built-in color bars, built-in color temperature adjustment and a neutral density filter wheel. The camera has a genlock feature and a movable viewfinder. The ENG version is priced under $4000. A studio version is slightly under $5000.

Deliveries of Angenieux's new 25X lens for ⅔-inch cameras will begin in August. Weight of the f 1.4 to 2.8 lens is only 6.2 kg with servo zoom and iris

Jack Keyes of Canon demonstrates the P12X18B Diascope lens system with servo-activated extenders

The WV-3310 and WV-3300 are color cameras designed specifically for use with the VHS recorder. Both are one-inch vidicon types complete with electronic color-correction circuitry. The ac-powered WV-3310 is priced at $895. The WV-3300 can be dc-powered by the VCR and is priced at $1295.

For more information on ENG cameras: Ikegami HL-79A, **283;** HL-78B, **284;** Hitachi SK-90, **285;** FP-20S, **286;** Sharp XC-530, **287;** Toshiba PK-39, **288;** RCA TK-76C, **289;** Sony BVP-300, **290.**

2/3-inch diode gun tubes on the way

TV cameras cannot perform better than their tubes allow, and it was the introduction of the one-inch diode gun Plumbicon last year that has given studio camera manufacturers so much to talk about. The diode gun provides improved resolution and improved beam acceptance, which reduces lag. It also provides a high beam reserve which minimizes comet tailing and blooming, particularly when used with dynamic beam control.

Now a 2/3-inch diode gun tube for ENG/EFP cameras is on its way, according to Amperex. The new tube is designated the 74XQ and it is mechanically interchangeable with the XQ1427. The tubes are being sampled now and it is possible that they will be in full production by the end of the year. This early date is feasible, says Amperex, because much of what was learned in getting the one-inch diode gun into production will apply to the 2/3-inch line. (One-inch types will be in full production by mid-year, Amperex says.)

Although ENG/EFP camera manufacturers did not fully promote 2/3-inch diode gun tubes at Dallas, it is safe to assume the industry will hear more on the subject later.

Saticon developments were not exactly taking a back seat to diode guns. A new one-inch high performance Saticon was announced by RCA Electro Optics. The BC4395 features a new low-capacitance, low-lap photoconductor, a low-lag, low-resistance gun, and a face plate button for a proper optical path. All of the other desirable characteristics of Saticons are retained. The advanced BC4395 has been incorporated in Hitachi's new SK-100 studio camera.

Other news from RCA was the availability of a 2/3-inch Saticon, the BC4390, with a seven-pin base which makes it interchangeable with lead oxide types. The BC4390 sells for $1665.

English Electric Valve has moved into the 2/3-inch market with its rugged Leddicon. A new EEV P-8160 Leddicon for this application was shown at NAB, Dallas.

Another new EEV tube was a high resolution vidicon (1600 TV lines) for high performance cameras.

For more information on tubes: Amperex 47XQ, **291;** RCA Electro Optics BC4395, **292;** BC4390, **293;** EEV P-8160, **294;** vidicon, **295.**

Lenses for all cameras

For a brief moment at NAB, Dallas, it looked as if the battle of the biggest zooms in lenses was over. The record of 42x for studio types still held. In the strictly ENG area where activity has been most intense, Angenieux stood pat with its 15X9.5 system introduced last year and Canon seemed perfectly content with its very versatile J13X9B system, also introduced last year.

The fact that Angenieux has a 15x zoom didn't bother Canon since its system was slightly faster — f 1.6 compared to f 1.8 for Angenieux. Besides, the Canon accessory system could extend the focal length up to 1.5x with no light loss. This was possible with teleslide converters. Alternatively, a wide-angle adapter could be snapped on the front providing a short 6.75 mm focal length with no light loss, and maximum distance could be stretched even further with a 2x rear extender. The Canon basic lens weighed only 1.7 kg.

Angenieux had to concede nothing in flexibility, however: its 15x system offered seven lenses total. With retrozoom a 7 mm focal length was possible. With tele attachments and two range extenders, the maximum focal length was 615 mm with a respectable aperture of f 4.7 – f 6.7.

But Schneider and Fujinon were not content. Tele-Cine showed Schneider-Kreuznach's new 15X1 lens and claimed it to be the widest angle ENG lens now available. The 8.5 – 95 zoom had a horizontal angle of view of 53° maximum with an MOD of 0.8 m. With an aperture of f 1.7 it was faster than Angenieux's, although not as sensitive as Canon's f 1.6. At 2.2 kg it was not as light as Canon's and at present the 15X1 Schneider did not offer as many options as others, although a built-in 2x extender is part of the package.

It was Fujinon, however, that broke out of the pack by announcing a 17X9 zoom. Fujinon immodestly claimed the new lens to be the longest, widest and lightest ENG lens available. Because of the 17x zoom the normal range is 9mm x 153 mm. With the built-in 2x extender the range extends to 306, and an optional extender and adapter takes it to 560 mm. The claim of widest is based

continued on page 58

HITACHI SK-70

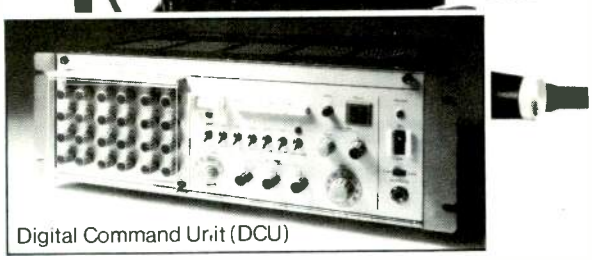
The One Camera That's Right for Both Field Production and the Studio!

The modular SK-70 converts easily from a fully equipped, self-contained color studio camera to a modified studio camera. In the field, the studio version of the SK-70 can be connected directly to a VTR with only a co-axial cable. And for hand-held portability, the camera head features a shoulder mount, an auto-iris portable zoom lens, and a 1.5" viewfinder, along with a DC and process pack. The Digital Command Unit (DCU) with up to 3000 feet of single co-axial cable strongly enhances the capability of the SK-70. Another striking option is a 22:1 zoom lens that can be used for the studio version of the SK-70 in the field.

No matter which configuration you choose from those shown in the photo and three diagrams, the Hitachi SK-70 offers the precision and reliability of three 2/3" Saticon tubes in the camera head to insure excellent picture quality, combined with all the latest advances in broadcast camera technology.

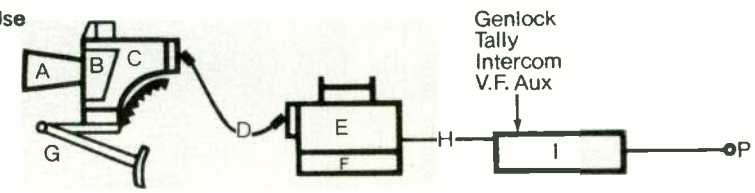
As you can see, our outstanding Hitachi SK-70 is a sound investment for broadcasters, production studios, and universities who need broadcast quality performance in a wide variety of assignments, all for the price of a single camera. We'd be pleased to arrange a demonstration of how the SK-70 can fit the following camera requirements inside or outside your TV studio, and more:

1. Fully studio-equipped

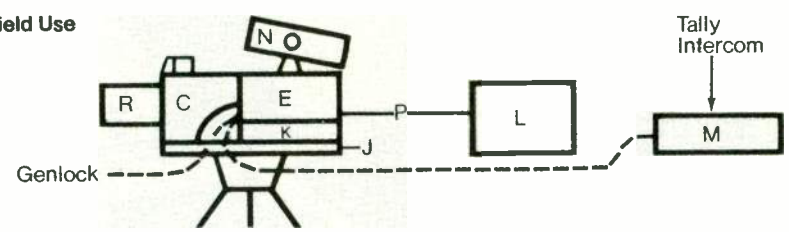


Digital Command Unit (DCU)

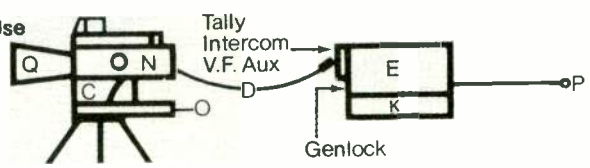
2. Portable Use



3. Field Use



4. Modified Studio Use



A)	Portable lens
B)	1.5" viewfinder
C)	Camera head pack
D)	Camera cable (300 ft.)
E)	Process pack
F)	D.C. pack
G)	Shoulder Mount
H)	Co-axial cable (3000 ft.)
I)	DCU
J)	Mount adapter
K)	A.C. pack
L)	VTR or FPU
M)	Operation panel
N)	5" viewfinder
O)	5" V.F. Mounting Plate
P)	Co-axial cable (video)
Q)	Portable lens w/conversion adapter
R)	Studio lens

HITACHI
Hitachi Denshi America, Ltd.

Executive Office: 175 Crossways Park West, Woodbury, N.Y. 11797. (516) 921-7200. Offices in: Chicago (312) 344-4020; Los Angeles (213) 328-2110, Dallas (214) 233-7623, Atlanta (404) 451-9453; Denver (303) 344-3156; Seattle (206) 575-1680.

Circle 136 on Reader Service Card

on 7 mm with an optional adapter. At a weight of 2.5 kg, Fujinon's claim to be the lightest was disputable.

As a brief comparison, Fujinon has the biggest zoom. *WITH* attachments Angenieux argues it has the longest focal length (615 mm). *WITHOUT* attachments Schneider can claim the widest angle (53°). And without splitting hairs on accessories, Canon's 1.7 kg weight is indisputably lighter. At an f 1.6 rating Canon is most sensitive. The moral of this specsmanship is not to be overwhelmed; the best lens for a broadcaster depends on performance under typical conditions.

In lenses for EFP cameras with 2/3-inch tubes, it was a different game. Lens manufacturers are quite selective in what areas they expand. In terms of new lenses Schneider, Angenieux, and Rank Cintel were most active.

Last year Tele-Cine exhibited 30x EFP Schneider lenses attached to the RCA TK-76 and TK-760 cameras through a special adaptor. Tele-Cine has stayed on that tack and this year showed three fast 30x lenses — the wide angle 1.4/8.7-260, the standard 1.4/11-330, and the telephoto 1.4/18.5-550. These lenses had a flat iris for at least a 13x zoom. The weight of the standard manual unit is 16 kg. Also shown were three different Scheider f 1.7 30x zoom lenses interchangeable between one-inch and 2/3-inch cameras through the use of adaptors. A sale of forty of these f 1.7 30x zooms to NBC Sports for use on TK-760s was recently announced.

By working with lenses designed initially for one-inch camera tubes, Schneider scored first with a large zoom EFP unit. Angenieux has taken a different approach. It started a fresh design specifically for 2/3-inch tube cameras and this year was able to show a flexible 25x system (which will begin delivery in August of this year). By designing a system expressly for the smaller tubes it has been able to reduce the weight of an f 1.4 – f 2.8 aperture 25X1 lense to only 6.2 kg (including servo iris, servo zoom, and mounting plate). The basic lens ranges from a wide horizontal angle of 46° to a tight narrow angle of 2°. With attachments the horizontal range goes from 60° to 314°. Tele attachments offer a focal range of 7.5 to 625 mm. At 250 mm the aperture is a surprising f 2.8.

The complete system includes a wide angle .75 retrozoom, a tele 1.66x front attachment and a 1.5x rear extended turret.

Rank Cintel has been busy extending its multi-role lens approach — MRL — to 2/3-inch EFP cameras and now offers a very flexible lens system to TV producers. Its readily interchangeable front unit accomodates large and small studio sets as well as outside broadcast applications. The range of angles is 52:1. The widest horizontal angle is 52°; the narrowest 0.7° at f 5.6.

The MRL approach starts with three front units (wide angle, standard, and narrow angle) which are modified by easily-operated turret range extenders — x1, x1.4, x2, x2.8, and an optional x4. (The corresponding aperture readings are f 1.8, f 2, f 2.8, f 4, and f 5.6). The range of focal lengths for the standard lens with an x1 extender is 11 to 110 mm; with an x2.8 it is 32 to 320 mm. An MRL lens system weighs very little. The standard unit weights 5 kg and the narrow-angle unit is 9 kg.

Several new lenses were shown for large diameter camera tubes. Last year Angenieux showed a 12x high resolution type. This year Fujinon unveiled ultra-high resolution lenses. The company said the P14XH.R. was capable of resolving 1300 TV lines. In more technical terms the modulation transfer function is over 90 percent. Using a new optical system, the ultra-high resolution zoom delivers precise color convergence at all focal lengths. Maximum

continued on page 60

When you design a custom tape system to record, to monitor or to play, specify reliable Telex tape components. You'll collect the compliments. With our complements. For detailed information please write.

PRODUCTS OF SOUND RESEARCH
TELEX®
COMMUNICATIONS, INC.

9600 ALDRICH AVE. SO. • MINNEAPOLIS, MINN. 55420 U.S.A.
Europe: 22, rue da la Legion-d'Honneur, 93200 St. Denis, France
Canada: Telak Electronics, Ltd., Scarborough, Ontario

Circle 137 on Reader Service Card

Looking for full camera mobility with "on the air" picture quality? Find it...in our Hitachi FP1020!

If you need professional performance from a hand-held color camera, Hitachi FP1020 is your answer.

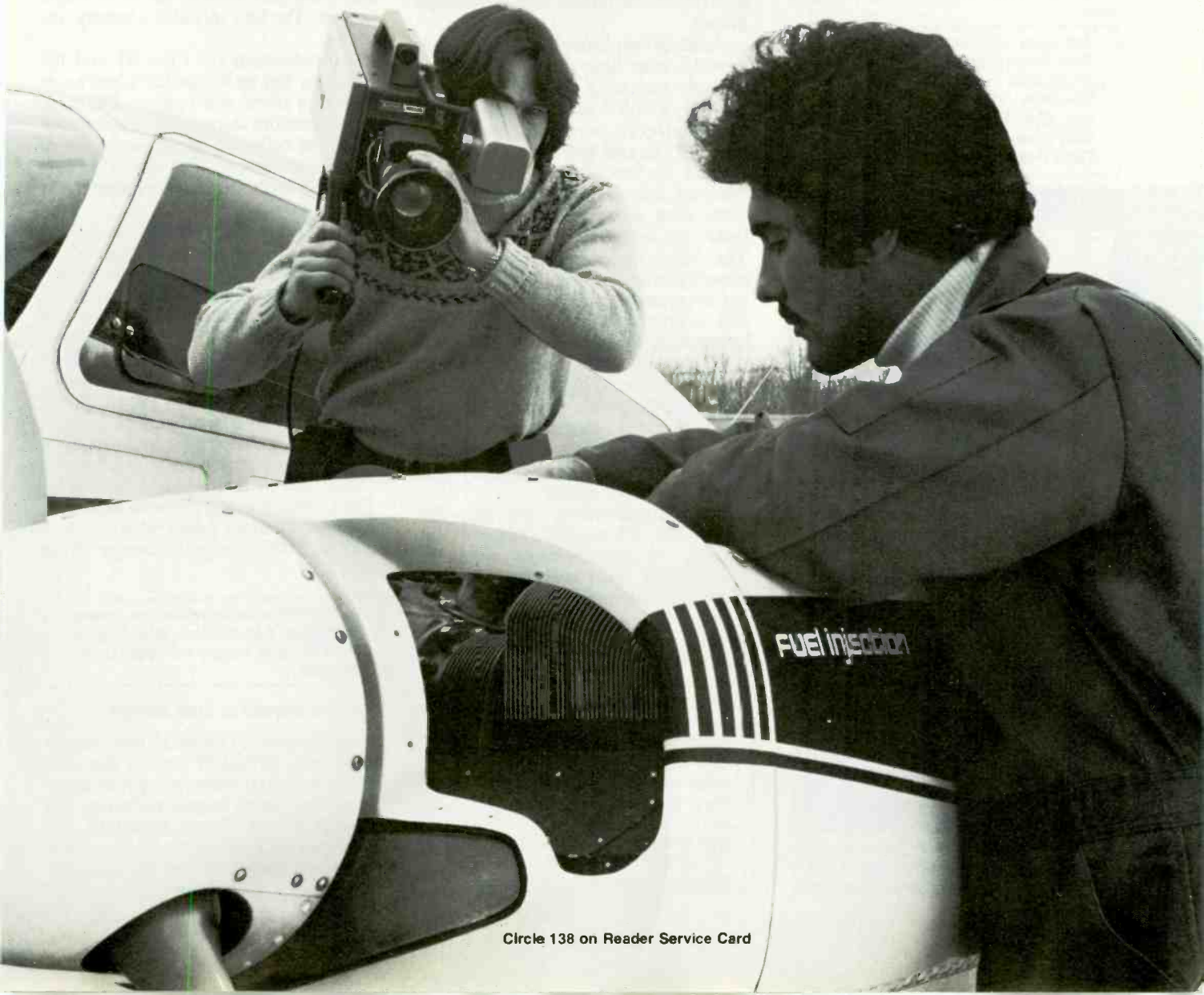
No matter what the assignment, the FP1020's three ⅔" Saticon® tubes deliver broadcast-worthy resolution and colorimetry. And like all Hitachi portables, the FP1020 combines lightweight handling with heavyweight performance features such as: auto white and black balance controlled by an 8-bit digital memory ...three-way power via 2-hour battery belt, AC, or 12V DC...built-in color bar generator...vertical enhancer...and a 5-position color temperature filter disc.

Two key options extend the versatility of the FP1020: built-in Gen-Lock for multi-camera system use and a remote Operation Panel which controls camera functions from up to 150 feet away.

For documentaries, for training programs, for any field production applications, see the Hitachi FP1020 first. At your Hitachi dealer.

HITACHI
Hitachi Denshi America, Ltd.

Executive Office: 175 Crossways Park West, Woodbury, N.Y. 11797, (516) 921-7200. Offices in: Chicago (312) 344-4020; Los Angeles (213) 328-2110; Dallas (214) 233-7623; Atlanta (404) 451-9453; Denver (303) 344-3156; Seattle (206) 575-1680.



Circle 138 on Reader Service Card

aperture can be maintained at all ranges of zoom. Two models are available: 14X12.5 with an aperture of f 1.6 for a one-inch format and 14X16.5 for a 1¼-inch format.

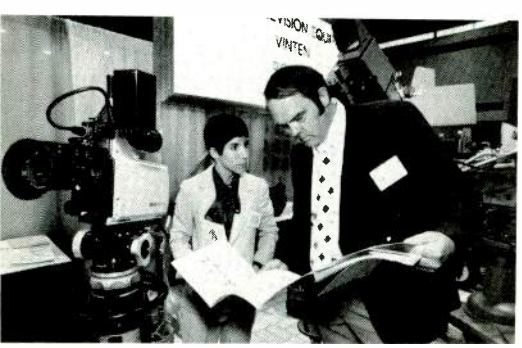
A built-in tri-color test generator is offered as a standard in this new lens for fast, accurate setup, particularly when used with the new computerized cameras.

Canon showed two new 12x zoom lenses for studio cameras, the PV12X14BIE with an aperture of f 1.6 for one-inch Plumbicons and the P12X18BIE with an aperture of 2.1 for 1¼-inch Plumbicons. The lenses are optionally available with the Canon diascope system.

In the category of specialty lenses, F & B Ceco showed the Hajna snorkel lens. The under-three-pound 12-inch snorkel accepts any prime lens in an Arriflex mount. The snorkel can be rotated from 45° to 360°. Tele-Cine had on display a Schneider ashperic lens, which, when mounted on an ENG/EFP camera, provided a 6 mm wide angle of view.

For more information on lenses: Tele-Cine (Schneider) 15x1 wide angle, **296;** Fujinon 17x9 zoom, **297;** P14XH.R., **298;** Angenieux 25x system, **299;** Rank Cintel MRL system, **300;** Canon 12x zooms, **301;** F & B Ceco (Hajna), **302.**

Listec displayed several new Vinten products, including this new steerable mini-crane



Available later this year from Listec will be a portable, 90-pound three-stage pedestal with detachable crabbing base from Vinten

Cinema Products' new director of marketing Don Dunbar goes over recent improvements in the Steadicam, such as a swivelable video monitor and rotates 180 degrees

Lightweight tripods, like this one at ITE, have kept pace with the increasing portability of ENG/EFP cameras

Power supplies keep pace with cameras

Batteries for ENG cameras, VTRs, and portable lighting units continue to grow in efficiency while shrinking in size and weight. Truly fast-charging models (full peak loads in less than an hour) are now becoming almost commonplace.

The really big news in power supplies is the refinement of the technology permitting use of silver-zinc rather than nickel-cadmium formulations.

Anton/Bauer brought to the NAB its new 12 amp hour silver-zinc battery system, including battery and quick charger. The SV is an extremely compact battery, weighing only 4.5 pounds. The real innovation in the system, is the fast-charger. Silver-based batteries, besides being far more efficient than nickel-cadmium formulations, are notoriously hard to charge. The Anton/Bauer system uses digital circuitry to insure that the battery does not overcharge, pulses the charge current so crystals do not form on the battery plates, insures that the cell is always charged while resting on its side, and makes certain that current stability is maintained within the battery during pulse charging. Fast charging is accomplished within four hours. Battery life is rated at approximately 100 charge/discharge cycles.

Perrot Engineering Labs also displayed its silver-zinc battery line which, in conjunction with its Minicharger, will deliver a 12 amp hour, 12 V charge in 16 hours.

Frezzolini continued to expand its growing line of Ni-cad battery packs and belts with its new Model FBP plug-in battery for the Panasonic and JVC 4400 VTRs. The 2.5 amp hour batteries can be fast-charged in four hours. Also new from Frezzi is a six-pound battery belt with built-in, ac line-isolated transformer charger. For the RCA TK-76 camera it provides 1.5 hours of continual running.

Cinema Products showed a new battery belt for its MNC-71CP and other 12– 14 V cameras. The 6.5-pound battery will charge in approximately 20 minutes with CP's NCQC-14 quick charger and will power the camera for approximately two hours on a single charge. The belt includes a battery test meter.

A spokesman for Cine 60 said the company has no immediate plans to introduce a silver-zinc battery. The company therefore showed its complete line of power belts and power packs which have the capacity for one-hour fast charging with currently available fast charge units.

The fastest charging unit on view at the show was Christie Electric's Relfex-20, which can re-charge a completely spent Ni-cad battery in 12 to 20 minutes. The secret of the system is a continuous injection of negative/discharge pulses during the charge cycle — a technique called "burping." This permits high-energy current charging without overheating. The charger contains a sophisticated battery voltage-sensing circuit and displays the charge rate with flashing LED lights. The system is designed to be used with Reflex-20 battery packs which have a 500 to 1000 charge/discharge cycle life.

For more information on power supplies: Anton/Bauer, **303;** Frezzolini FBP, **304;** battery belt, **305;** Christie, **306.**

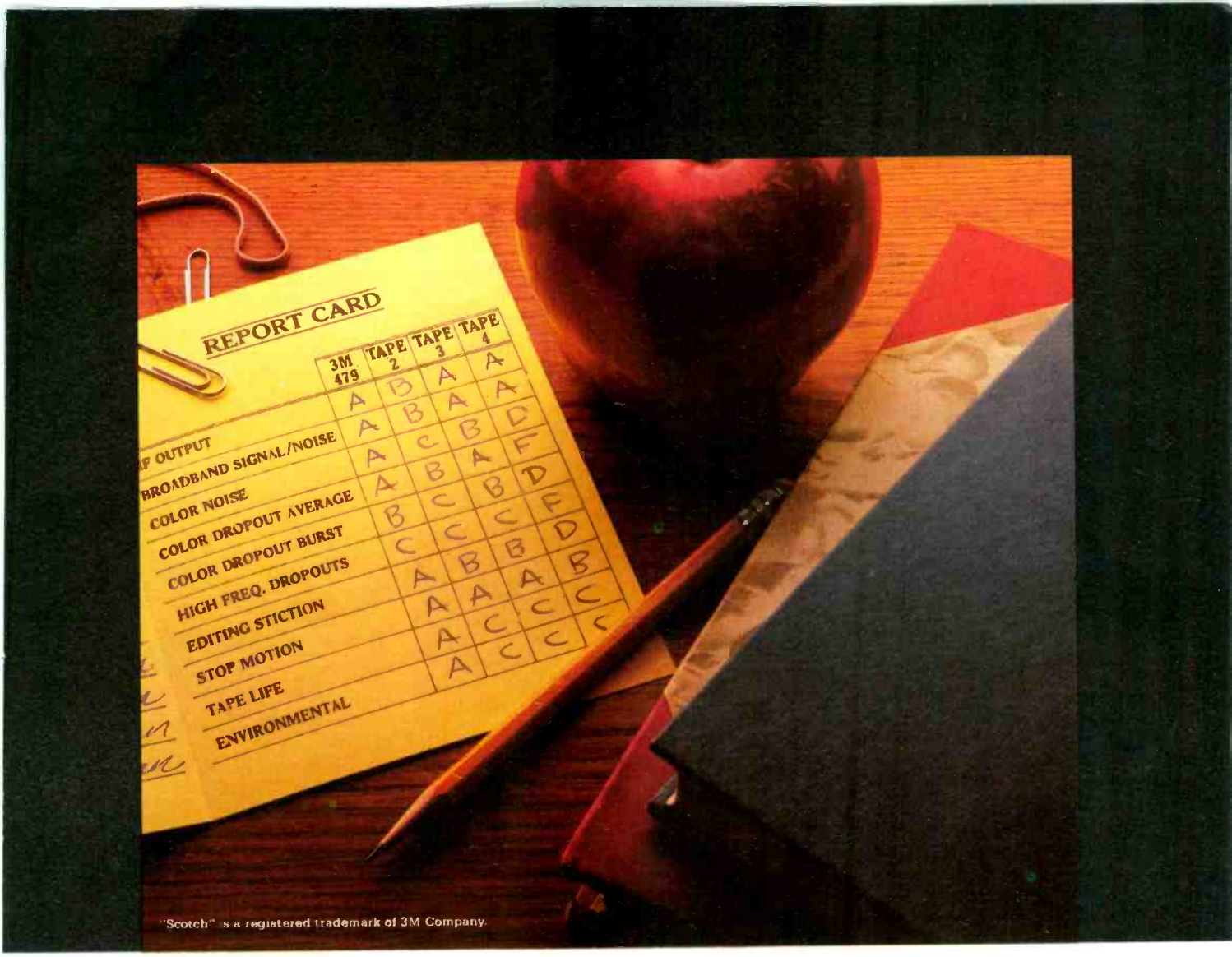
Canon Oversight

The March issue of *BM/E* inadvertently omitted Canon USA in the Listing of Exhibitors, page 139. Highlights at the Canon booth were the ENG 13x lens system plus two new 12x zooms for one-inch and 1¼-inch tube cameras, as described in this section.

Camera supports lose weight

As all types of cameras lose weight (especially ENG/EFP styles, but also studio models), camera support manufacturers have begun reducing the weights of their tripods, pedestals, etc. This makes them often less costly, sometimes more flexible, and certainly

continued on page 65



IN A TEST OF ONE-INCH VIDEO TAPES, WE ACED OUT THE COMPETITION.

When we tested the top four brands under strict lab conditions, the overwhelming performance leader was Scotch 479 Master Broadcast Video Tape. In fact, we came out on top in all ten performance categories.

If that isn't reason enough to make us your choice, maybe this is. We're the only one-inch supplier that winds your tape onto a special cushioned flange reel to protect against shipping and handling damage. And we pack and ship our tape in a flame-retardant case to give you even more protection.

We're the people who pioneered the development of video tape 25 years ago. And according to the pros who know video tape best, we're still the best video tape. Give or take an inch.

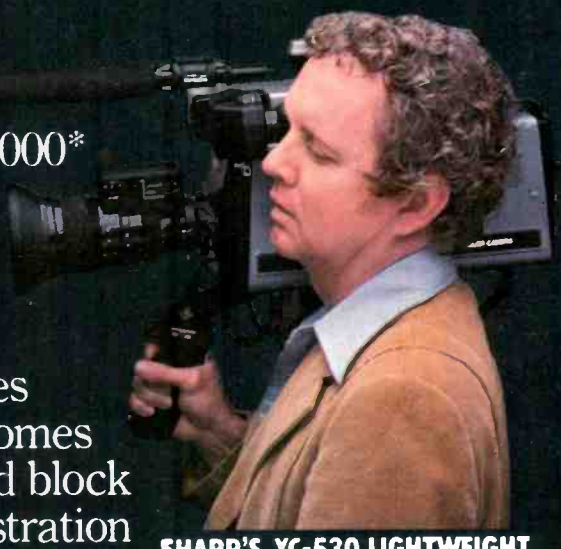
3M

THE $10,000 SATICON® THAT THINKS IT'S A $35,000 SATICON.

When you're the world's first $10,000* three tube saticon camera, it's hard not to get carried away.

But price alone isn't our only breakthrough.

The revolutionary XC-530 features remarkable reliability. Reliability that comes from our bias lighted three-tube bonded block design that eliminates mechanical registration adjustments. Which eliminates costly set-ups and down time—a problem common even to the most expensive cameras, especially after rough ENG/EFP assignments.



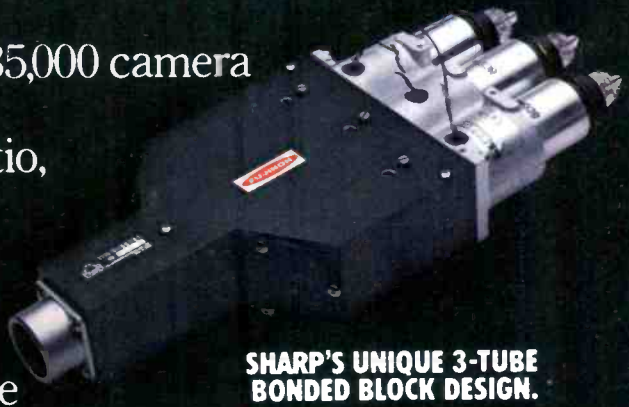
SHARP'S XC-530 LIGHTWEIGHT PORTABLE CAMERA.

Sharp's new XC-530 can be externally driven or used with our gen lock option, allowing you to lock up to any existing system. The XC-530 accepts standard C-mount lenses, including our optional 10:1 auto iris power zoom lens.

Why else would you want a $35,000 camera for $10,000?

For its sensitivity, high S/N ratio, excellent colorimetry and low power consumption.

The only way you could possibly tell the difference between this saticon camera and one costing three times its price would be on electronic test equipment. And our new saticon studio camera, complete with CCU (Sharp's XC-500) delivers the same high quality as our portable model.



SHARP'S UNIQUE 3-TUBE BONDED BLOCK DESIGN.

So take the Sharp challenge and see if the difference is worth the $25,000 difference. We're betting it isn't.

For the name of the authorized Sharp dealer nearest you, turn the page.

SHARP

Circle 139 on Reader Service Card

SHARP'S XC-530 STUDIO CAMERA IN REMOTE CCU CONFIGURATION.

*Mfg. suggested list price, lens not included.
®Saticon is a registered trademark of NHK.

SEE THE $10,000 SATICON THAT THINKS IT'S A $35,000 SATICON.

Only these authorized Sharp dealers can show it to you.

Alabama
Signal Engineering & Sales, Inc.
720 South 23rd St.
P.O. Box 10167
Birmingham, AL 35202
(205) 328-6431

Alaska
Northern Video Systems
4600 Business Park Blvd.
Anchorage, AK 99503
(907) 279-5571

Arizona
Zonar Corp.
2922 W. Weldon
Phoenix, AZ 85017
(602) 264-2100

Arkansas
Fairview Audio Visual Co.
3520 W. 69th
Suite 102
Little Rock, AR 72209
(501) 568-7446

California
Video Media
250 North Wolfe Rd.
Sunnyvale, CA 94086
(408) 733-6500

The Video Store
7738 Clairemont Blvd.
San Diego, CA 92111
(714) 560-4454

Video Systems Network
12530 Beatrice St.
Los Angeles, CA 90066
(213) 871-0677

Pacific Video Product, Inc.
2600 E. Katella
Anaheim, CA 92806
(714) 634-8585

Connecticut
Concord Communications
970 High Ridge Road
Stamford, CT 06905
(203) 322-9322

District of Columbia
Midwest Telecommunications
4700 "G" Boston Way
Lanham, MD 20801
(301) 577-4903

Peirce Phelps
10215 Fernwood Rd.
Bethesda, MD 20034
(301) 530-9580

Florida
Midwest Telecommunications
3331 N.W. 82nd Ave.
Miami, FL 33122
(305) 592-5355 (Domestic)
(305) 592-3938 (Foreign)

Hawaii
Audio Visual Co.
875 Waimanu St.
Honolulu, HI 96813
(808) 533-3848

Illinois
Columbia Video Systems
1805 St. Johns Avenue
Highland Park, IL 60035
(312) 432-0725

Kansas
Nichols Electronics
6370 East Central Avenue
Wichita, KS 67208
(316) 686-2131

Kentucky
Midwest Telecommunications
1804 Cargo Court
Louisville, KY 40299
(502) 491-2888

Maine
Maine Video Systems
468 Forest Ave.
Portland, ME 04103
(207) 773-2355

Maryland
Midwest Telecommunications
4700 "G" Boston Way
Lanham, MD 20801
(301) 577-4903

Peirce Phelps
10215 Fernwood Rd.
Bethesda, MD 20034
(301) 530-9580

Massachusetts
Lake Systems
55 Chapel St.
Newton, MA 02160
(617) 244-6881

MP Video, Inc.
45 Kenneth St.
Newton, MA 02161
(617) 965-5405

Michigan
Thalner Electronics Lab
7235 Jackson Rd.
Ann Arbor, MI 48103
(313) 761-4506

Cruse Communications
4903 B Dawn Ave.
East Lansing, MI 48823
(517) 332-3579

Minnesota
VCI
7601 Washington Ave.
Minneapolis, MN 55435
(612) 941-6596

Missouri
Hoover Bros.
1511 Baltimore Ave.
Kansas City, MO 62116
(816) 221-7663

Radonics Electronics
4445 Gustine
St. Louis, MO 62116
(314) 481-2222

Central Missouri A/V
1000 W. Broadway
Columbia, MO 65201
(314) 874-2111

Business Communications
20 W. 9th St.
Kansas City, MO 64152
(816) 474-8000

New Jersey
Modern Mass Media
315 Springfield Ave.
Summit, NJ 07901
(201) 277-6300

New Mexico
G.C. Video
Box 178
Ericson Road
Sandia Park, NM 87047
(505) 281-1303

New York
Camera Mart Inc.
456 W. 55th Street
New York, NY 10019
(212) 757-6977

Business Service Co.
131-135 No. Genesee St.
Utica, NY 13501
(315) 735-9296

Ashton Communications Systems
140 Glendale Drive
Endicott, NY 13760
(607) 748-3331

North Carolina
Cooper D. Cass Co.
So. Stratford Rd. at Oak Dr.
P.O. Drawer 5059
Winston-Salem, NC 27103
(919) 722-8121

Technical Video Systems
245 Executive Park Blvd.
Winston-Salem, NC 27101
(919) 968-9536

Ohio
B & J Video Systems
525 N. Main St.
Findlay, OH 45840
(419) 424-0903

Midwest Telecommunications
1150C W. Eighth Street
Cincinnati, OH 45203
(513) 651-1904

Video Concepts
1450 E 289th St.
Wickliffe, OH 44092
(216) 585-5453

Keyser Video, Inc.
2537 Wilmington Pike
Kettering, OH 45419
(513) 294-2786

Oklahoma
Fairview Audio Visual
4932 So. 83rd East Ave.
Tulsa, OK 74145
(918) 664-8020

Oregon
Videosonics, Inc.
1412 SE Morrison
Portland, OR 97214
(503) 232-4632

Pennsylvania
Alpha Video
28 E. Mall Plaza
Carnegie, PA 15106
(412) 279-6169

Peirce Phelps, Inc.
2000 Block N. 59th St.
Philadelphia, PA 19131
(215) 879-7171

Sound Systems
6 Bysher Ave.
Flourtown, PA 19031
(215) 242-3500

D & H Distributing
2525 N. Seventh St.
Harrisburg, PA 17105
(717) 236-8001

Texas
Astro AV
1336 W. Clay
Houston, TX 77019
(713) 528-1662

Texas Video Systems, Inc.
10209 Plano Rd. #3
Dallas, TX 75238
(214) 341-1771

Texas Video Systems, Inc.
433 Breesport
San Antonio, TX 78216
(512) 341-1317

Martin, Zienkosky & Browne
13731 Omega Road
Dallas, TX 75240
(214) 233-5535

Utah
Intermountain Video Systems
1225 South Main St.
Salt Lake City, UT 84101
(801) 355-6180

Virginia
Audio Fidelity
7217 W. Broad St.
Richmond, VA 23230
(804) 285-8781

Washington
Custom Video Systems
17521 15th Ave., NE
Seattle, WA 98155
(206) 365-5400

West Virginia
CRV Systems, Inc.
1901 Madison Ave.
Huntington, WV 25704
(304) 525-2633

Midwest Telecommunications
P.O. Box 385
Nitro, WV 25143
(304) 722-2921

Canada
Eastern:
Wackid Radio & TV Laboratories
312 Parkdale Ave.
Ottawa, Ontario K1Y 1G3
(613) 728-1821

Western:
Queale Electronics Ltd.
1004 North Park St.
Victoria, BC V8T 1C6
(604) 388-6111

Queale Electronics Ltd.
1611 Bowen Rd.
Nanaimo, BC V8T 1C6
(604) 753-1124

Queale Electronics Ltd.
2227 Quebec St.
Vancouver, BC V8T 1C6
(604) 873-3996

SHARP

Professional Products Department, Sharp Electronics Corporation, Headquarters Offices: 10 Keystone Place, Paramus, NJ 07652, (201) 265-5548; Western Regional Office: 1047 Carson Blvd., Torrance, CA 90502, (203) 830-4470.

easier to carry to remote locations.

A fine example of this approach was announced by Listec, though the product will not actually become available until next year. The three-stage pedestal is designed to be used either in the studio or transported to locations. It weighs 90 pounds (less base) and can support weights up to 185 pounds. Based on the popular Vinten 702 pedestal, its range is 23 to 60½ inches; it offers, however, an extra inch and a half of ground clearance — ideal for remotes. Another feature making it good for location work is the ability of the center column to be detached from the crabbing base.

Another new Vinten product to be delivered later this year in the U.S. by Listec is the Lubricated Friction camera head. Weighing 32 pounds, complete with a wedge adaptor, the head will support cameras up to 200 pounds. A full range of cams providing compensation from five to ten-inch center of gravity can be installed without dismantling the head.

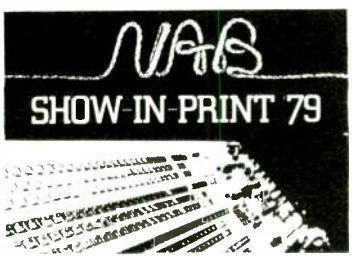
O'Connor demonstrated a new series of quick-release, adjustable balance mounting platforms for its Models 30, 50, 100, and 150 fluid heads. The adjustable balance feature allows for single-time mounting of the camera plate balanced to the camera's center of gravity. Shifting the camera slightly backwards or forwards compensates for different lenses, viewfinders, viewfinder positions, etc. The quick release, considered by most cameramen to be essential for ENG/EFP work, enables the camera to be removed from the tripod or remounted in only a few seconds.

Other companies displaying lightweight heads, tripods, etc. for the new generation of ENG/EFP/studio cameras included Innovative Television Equipment (ITE), and Quick-Set. Quick-Set also displayed a line of telescoping antenna masts from High-Lite. Designed for applications such as microwave transmitting from mobile vans, the masts come in a variety of configurations which include single and dual 28-foot extension towers powered by compressed air.

Power Optics, the American arm of the British-based Evershed Power-Optics, had a remarkable demonstration of one of EPO's automatic tracking systems. The slightest movement caused the unit to turn towards the subject and simultaneously display both a close-up and a wide angle view through two separate servo-driven cameras. Most of EPO's products, including this one, are designed for military and CCTV applications.

Jim Crawford of Frezzolini Electronics demonstrates its line of batteries and fast-chargers.

For more information: Listec, **307;** O'Connor,**308;** Innovative, **309;** Quick-Set, **310;** Power Optics, **311.**



TV PRODUCTION AND POST PRODUCTION EQUIPMENT MORE CREATIVE

Digital special effects have been with us just two years, yet in that short time they have reached a level of maturity in which the next generation can already be discussed. Two years ago, in Washington, the Grass Valley Group dazzled broadcasters at the NAB with a demonstration of its DVE package. At the same time, MCI/Quantel showed a powerful digital effects system privately in their suite. Vital Industries exhibited their prototype SqueeZoom and the first signs of the effects potential of such systems began to be comprehended.

Now, in network sports programming, variety shows, commercials, and promotions, the mastery of these devices over the video image is in evidence every day. The systems quickly found homes in networks and teleproduction houses, and now they are commonly finding themselves in use at local broadcast stations.

In Dallas the aisles near any exhibit demonstrating digital effects systems periodically overflowed at each scheduled show. The most widely shown system was the Quantel DPE-5000, which made appearances in not only its own exhibit but also the Ampex exhibit where it was interfaced with the Duca-Richardson DRC-4000 production switcher, the American Data Corporation exhibit where it was interfaced to its top of the line production switcher, the Model 558-4, and in the Central Dynamics exhibit where it was interfaced to the SFX-480 production switcher. If an award were to go out for "crowd pleaser," CDL would probably be a major contender for its dynamic use of its SFX-480 system in conjunction with the DPE-5000.

Early on the afternoon of the exhibit's first day, broadcasters could be heard telling their friends to be sure to catch the CDL demonstration. Essentially, the demonstration involved the performance of an attractive female dancer "discoing" to the beat of the *Star Wars* theme. One camera focused on the dancer while two other cameras were focused on different backgrounds. As the dancer performed, the backgrounds were keyed under and over her image and the output of her camera was manipulated by the DPE, producing enormously striking images, multiple images with sequenced freeze frames, and hall-of-mirror effects.

Digital special effects systems are, at this point, about the closest things this industry has to a video computer. As such, these devices are likely to show continued change over the years, particularly where these changes result from newly written effects programs.

In the case of the DPE-5000, two new effects were developed over the past year. One new effect is Picture Reversal, which is somewhat analogous to being able to flip a photographic slide so that you see it backwards. In conjunction with the DPE's compression and positioning features, the picture reversal effect can tumble towards or away from the full raster at a programmable rate.

Perhaps the most sophisticated effect we've seen in the Quantel system yet is the new Autoflex™ effect option. This effect gives the impression of nonlinear shape changes, such as having a normal picture distorted into the shape of a teardrop or hourglass. There is a set of Autoflex effects consisting of 16 preselectable shapes, an invert switch to reverse the shapes, and Take and Ooze™ functions. The Take function causes the picture to immediately change to the selected shape while the Ooze function causes the picture to take on the new shape at a selectable rate, giving the image a "fluid" appearance.

continued on page 67

CINE 60 POWERBELTS

NewsHawk

Millions of hours of TV news and documentaries, shot by thousands of news teams, worldwide. That's the proven performance record of Cine 60 Powerbelts . . . the veteran "NewsHawk" in the tough, hard-nosed business of news gathering. What's more, you benefit from the unmatched experience of 18 years in portable power that only Cine 60 provides. So, tell us the make and model of your equipment. We'll send you complete data and information to cover your specific system. Cine 60 — the "NewsHawk" Powerbelt and Powerpak Battery Systems. 160 models, 4 to 14 Amp-hours.

CINE 60
INCORPORATED

630 Ninth Ave.
New York, N.Y. 10036
(212) 586-8782

6430 Sunset Blvd.
Hollywood, CA. 90028
(213) 461-3046

Circle 141 on Reader Service Card

Custom shapes can be programmed by the manufacturer, as was the shape of the State of Texas in honor of the Dallas site for the convention. Autoflex has its own control panel for these functions.

Another typical change likely to occur in these systems over the years borrows from the "time sharing" concepts employed in the computer business. Because these effects systems are expensive (exceeding the $125,000 mark, depending on options) and because users often wish to "distribute" the processing powers of the system, various approaches have been developed. Quantel explained two such approaches for their DPE-5000, Autolink, and Multilink. Autolink is a simple control routing switch that permits several DPE-5000 control panels to be used with one central DPE-5000 effects system. Multilink is a more sophisticated version of Autolink intended for users with more than one DPE-5000 system. It allows interlinking of up to four DPE-5000s with up to four control panels in any combination when multiple picture manipulation is required.

The Grass Valley/NEC combo that started off this revolution in effects introduced its second generation digital effects/switcher system, the Mark II DVE, specifically designed as a key component in GVG's new 300 series production switcher (see production switcher report for details on the 300).

The level of design integration between the Mark II, which utilizes NEC's new DVP-16 processor, and the GVG-300 series switcher with its E-MEM (Effects Memory) package seems to represent a significant step forward in bringing digital effects under the creative control of the operator.

Some of the new features of the Mark II include continuous expansion of the picture from zero to four times normal. The picture quality of this expansion process has been improved by sampling at 4 fsc and processing the signal within the system on a video (Y, I, Q) basis as opposed to a composite basis. Another advantage to component processing is that it is more suitable to the development of a PAL or SECAM version of the Mark II. Four frame memories are used to insure picture quality under all operating conditions.

Some of the new effects are multiple freeze (the ability to deposit four, nine, or 16 frozen images on the screen at preselected intervals), Auto Freeze, which delivers a silent picture or disco strobe lighting effect; Progressive Freeze, which freezes the area revealed by a moving wipe; simultaneous push-on/push-off, which pulls on a new picture as the former picture is pushed off screen; Special Defect, which provides a sort of "paint-by-numbers" effect by allowing the quantizing of the luminance and chromominance to be changed separately; and Strobe Action, which allows the path of a moving object to be tracked vis-a-vis a stroboscopic photographic technique.

Options for the Mark II user will permit the expansion of the system to four channels and Extended E-MEM, a method for storing and recalling unusual transitional effects. Extended E-MEM provides a serial interface port for interfacing the Mark II/Series 300 with peripheral devices such as computer-assisted editing systems. Bruce Raynor of Grass Valley explained that the enormous effects capacity of this system is most likely to be fully exploited in post-production, so an efficient interface capability was given a very high priority. Mark II as interfaced with the Series 300 switcher will sell for about $125,000.

Displayed in the NEC booth and available through the Grass Valley Group, is the new DVEC-1, standalone control system for the NEC DVE. Essentially, the DVEC-1 allows the NEC digital effects package, consisting of the FS15 Frame Synchronizer and DVP15 Digital Video Processor, to be interfaced with switchers of other manufacture than GVG. The capabilities of this system are identical to that of the Mark I version of DVE introduced two years ago by GVG, complete with subsequent enhancements and updates. A new option to the DVP15 is the Multi-Freeze effect employed in the Mark II. The option is contained on just two boards and a touchpad controller allows for control of sequence placement and timing. The touchpad controller is microprocessor-controlled.

Another new digital effects device shown by NEC is the DSA15 Digital Strobe Action unit. The DSA-15 is available as an add-on to the FS-15 Frame Synchronizer for approximately $41,000. The device operates as a standalone with its own control panel. Effects available through the DSA-15 provide the capability to selectively maintain the image of a moving object at multiple points in the television picture, creating a record of the image path. The user can select the repetition of image motion, retain that image indefinitely, or allow the retained image to "decay" at a selectable rate.

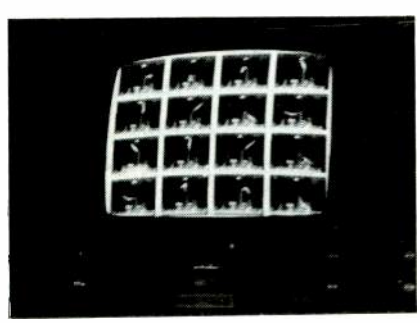
The horizontal or vertical position of the retained image may be shifted to emphasize slight movements or provide a more visually coherent analysis. Options for the system include masking, a technique that allows the operator to use a lightpen for blinding portions of the screen area from the strobe effect in order to reduce clutter; colorizing, which allows the operator to colorize selected retained images in order to enhance clarity; and Standard Image Memory, which allows the operator to dictate the start point of action while all other motion is ignored. This system too, is likely to be more effective in post-production.

The Vital SqueeZoom digital special effects system was shown in operation as a production model. Many improvements in the system have resulted from the past two years of development. The system, now in regular production, appears to provide excellent quality effects through its entire repertory. Like the other systems, the Vital SqueeZoom continues to add effects to its program list. This year, chroma zoom has been added.

Seven SqueeZoom units are now online or scheduled for delivery shortly. Combined Communications Stations in Denver, Atlanta, and Columbus, Ohio are each to receive a two-channel SqueeZoom shortly; a single-channel

MCI/Quantel added new effects and "time sharing" options to its DPE-5000

The GVG Series production switcher is designed to fully integrate with the Mark II Digital Video Effects package



Multi-Freeze is a new effect in the Mark II and available as an option to the Mark I

unit is going into WFSB-TV, Hartford, Conn., and a four-channel unit is going into KGO-TV, San Francisco.

Shortly after the show, ABC revealed that it signed an agreement with Vital Industries to purchase a VIX-114-4A switcher with four-channel SqueeZoom and PSAS. At the same time, ABC will purchase a four-channel SqueeZoom/PSAS system for interface with one of its Grass Valley 1600 switchers.

According to Jules Barnathan, ABC's president of broadcast operations and engineering, the full system will first travel to Lake Placid for ABC's coverage of the 1980 winter Olympics, then on to the national political convention. It will then be installed at one of ABC's facilities.

Commenting on ABC's decision to experiment with the interface of the Vital SqueeZoom with the GVG production switcher, Barnathan pointed out that this was a feasibility experiment which, if successful, would lead to further ABC purchases from Vital. "We already have several digital effects units capable of generating one or two channels, but SqueeZoom offers control of four simultaneously. I think that the SqueeZoom is finally ready for network use — the de-bugging period is over."

Dennis Fraser, vice president of NEC America, indicated that there are now about 40 of the GVG/NEC DVE units in use, and MCI/Quantel announced the recent sale of 15 DPE-5000 systems to NBC for use in their Olympic Coverage.

Gymnast begins his routine as part of Digital Strobe demonstration.

Effect shows all intermediate positions of gymnast. Colorizing of individual fields is possible.

NEC's Digital Strobe Action is controlled by panel (left).

For more information on digital video effects: MCI/Quantel DPE-5000 effects, **312;** Autolink, **313;** Multilink, **314;** GVG Mark II DVE, **315;** NEC/GVG DVEC-1, **316;** DVP-15 option, **317;** DSA-15, **318;** Vital SqueeZoom, **319.**

Production switchers both bigger and smaller

Two trends that emerged at last year's show — the increasing complexity of studio production switchers and the necessity for having some type of microprocessor to control them — were both in full evidence again this year.

As far as complex switchers are concerned, Grass Valley Group certainly stole the show with its 300 Series switcher, claimed to be the result of almost a decade of research and development. At a basic price of $95,000, the 300 has become the Rolls Royce of production switchers.

Several new design elements make it worth having waited for. For one thing, each of the three mix/effects (M/E) banks are provided with four input buses. In this way not only can two backgrounds be mixed, as in a wipe, but two separate key sources (a video key such as a chroma key appearing over the background transition and a title key appearing over or under the video key) can all be mixed together independently or in combination with the backgrounds.

The system also features unlimited re-entry of one M/E bank to another (the most previously available was triple re-entry). In this way, the outputs from M/E 1 and 2 can be selected as a background for M/E 3, and so on, in any order. Each M/E offers a fully integrated quad split along with an expanded rotary wipe control which permits setting of rotary magnitude and position. Most of the 100 wipe patterns available (up to 44 at once) have both rotary and standard modes, and include some exciting new matrix wipes. Also incorporated is a new rate-controlled positioner joystick, assignable to M/E 1, 2, 3 or any combination. With it, wipe positions can be changed smoothly, at a rate determined by how much the joystick is offset.

Vital Industries' president Nubar Donoyan (left) announced immediate availability of the Squeezoom four-channel digital video effects system.

Yet another useful feature of the 300 is an automatic preview function that, when the M/E is not on-air, will automatically display the effect achieved by the next lever movement and then revert back when the M/E is taken.

All of these features, it should be noted, are in addition to the effects capabilities offered by NEC's Mark II digital video effects system with which the 300 Series switcher is made to interface. For a full rundown on this latest digital effects system see the report on page 67.

Notwithstanding the fact that technical directors have been in the vanguard of those pushing for increasing complexity and versatility of switchers and effects systems, and that they have developed their skills accordingly, many now concede that these "super switchers" are simply too large to be handled by one person with only two hands. The first to respond to this problem was Vital Industries in 1977 when it introduced PSAS (Production Switcher Automation System), which memorized the control positions on its VIX-114 Series switchers. With the touch of a button, PSAS memorizes a series of up to 26 events in up to 78 sequences and then goes from one sequence to another at predetermined rates. At the 1978 show, Grass Valley followed suit with its E-MEM which, in conjunction with the new Series 300 switcher, will learn the complete crosspoint settings for up to 30 sequences with the touch of a single button. Like PSAS, it will run through them automatically at predetermined frame rates.

At the 1979 show, all waited expectantly for Central Dynamics' entry into the switcher automation field with its CAP (Computer Assisted Production) accessory, designed to be used with any of its CD480 production switchers. Few were disappointed, particularly since Central Dynamics once again displayed the switcher with MCI/Quantel's DPE-5000 digital effects package.

Basically, CAP is similar to E-MEM and PSAS which came before it, with

continued on page 70

SWITCHERS DON'T MAKE MISTAKES...PEOPLE DO

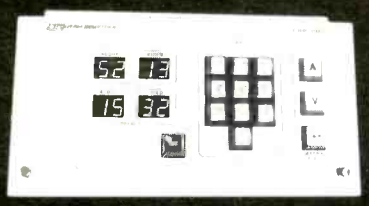
That's why we've designed a whole new series of human-engineered control panels that are setting new standards for goof-proof switching.

Once you've designed audio and video routing switcher matrices as transparent and reliable as ours, there's not much room for further improvement at that end. However, there has been a need for improvement in the control end--particularly where operators must make accurate, quick-decision scurce selections. The panels described below are designec to eliminate the confusion too often associated with routing switcher control, while providing the control flexibility so important to present-day signal routing requirements.

For installation simplicity, each of these new panels connects directly to the system party line via loop-through coax connections. They provide continuous status readout and can be encoded to permit each input (or output) to be addressed by its name (VTR-2, CAM-4, etc.) rather than by an arbitrary matrix number.

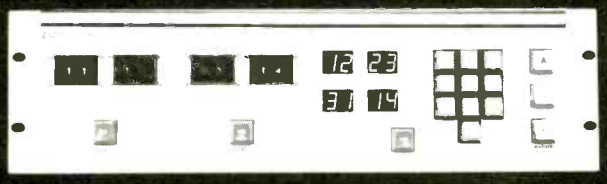
We are also prepared to supply custom variations of these panels to suit your exact requirements.

CSP-200



Permits audio and/or video selection--including simultaneous A/V switching from different sources--on a single output bus. Available in recessed mount, one unit per rack panel and two units per rack panel versions

CSP-200 Custom



Custom variation of the CSP-200 panel built for Opryland Productions permits single keystroke takes on two preselected audic/video sources as well as normal touchpad entry.

CSP-300/R

Full Matrix Control Panel. Permits audio and/or video switching on any selected bus. Encoded version can be restricted to switch only on specific pre-assigned busses. Available in either recessed or rackmount versions.

CSP-10

Controls ten randomly assigned busses providing continuous status readout on each bus. Touchpad data entry with numeric readout permits error-free switching on any of the ten busses. (Availability, February 1979.)

CSP-20/CX-20

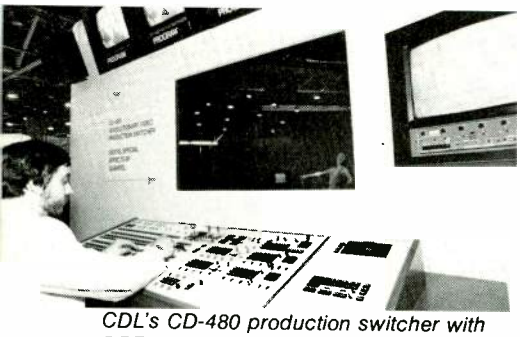
Permits buttor-per-source input selection on assigned bus. Basic panel accommodates 20 inputs. Expansion in 20-button increments is provided by adding slave pane s. Permits fast single-stroke selection of any input. Button lamps provide continuous status indication from refresh memory. (Availability, March 1979.)

See us at Montreux, Stand 527

UTAH SCIENTIFIC
2276 South 2700 West ▪ Salt Lake City, Utah 84119 ▪ Phone: 801-973-6840

Circle 150 on Reader Service Card for literature

Circle 151 on Reader Service Card for salesman's call



CDL's CD-480 production switcher with DPE-5000 effects put on an impressive display.

American Data's 558 Series production switcher can be interfaced with digital effects systems.

some important differences. Ten programmable recall registers organize a 50-event memory store; the memory is expandable. Most importantly, CAP offers complete random access to any event and can edit by deleting or changing event entries. CAP will then cycle through the events in sequence; alternatively, the operator can use random access to bring them up in any desired sequence. One major difference between CAP and the other systems, however, is that there is no automatic transition from one event to the other. Rather, dynamic transitions are left under full operator control so that the aesthetic demands of the moment can be catered to. A single movement of the lever is all that is required, with the operator left free to determine the rate.

Apart from Grass Valley's 300 Series switcher introduction, activity on new products in the "super switcher" category seems quiet for the time being; most companies are probably seeking to recoup some of the enormous R&D capital that has gone into the development of these systems. Ampex, for instance, again showed the Duca-Richardson DRC-4000 Series switcher, interfaced with MCI/Quantel's digital effects package. Ross Video, too, showed its popular MLE (Multi Level Effects) switcher which permits multiplexing of four signal sources in a single M/E bank, at the same time allowing preview of transitions with the effects amplifier on line. In general, the MLE switcher offers much of the sophistication of the new GVG 300 switcher. American Data Corporation showed several versions of its large-scale 558 Series switchers, interfaced with the MCI/Quantel DPE-5000 digital effects generator.

Real movement was noted, however, in the development of small to medium-size switchers, responding to the increased demands from smaller stations for more versatile switching systems. The rapid increase in the use of mobile vans may be another factor prompting this development.

One of the more interesting of these new systems is offered by 3M (Mincom Division). The Model 9000 is a microprocessor-controlled switcher with a rather different, far simpler control panel design. More than 20 effects are selected by a 10-key input bank in hard switch, soft switch, or border-wipe form. Twelve inputs, including built-in black burst and color backgrounds, are available. A chroma key feature is optional. Using the simplified keyboard entry for many transitions, complicated effects such as wipes behind key, dissolves or cuts to key, and dissolves behind chroma keys are programmed with relative ease. The Model 9000 also includes a built-in memory, somewhat similar to the systems on the "super switchers," which will store up to eight effects configurations.

Vitex, a newly created division of Vital Industries, displayed four brand new models in its 700 Series. According to a Vitex spokesman, the division is designed to fill some of the gaps in Vital's marketing plan with generally lower-cost units which will be offered through dealers. The top of the line is the Model 700, priced at just about the level of Vital's low-end switcher. The 700 has capacity for 16 inputs, including internal black burst and color backgrounds. Four buses are provided (two M/E, program, and preview) with mixer/fader between program and preview buses. A linear shadow keyer is standard, with shadow chroma key optional. Sixty patterns of wipes and mattes are standard, including soft and border wipes, while rotary and clock wipes are options. A joystick is used to position the patterns. Other options include a digital quad split and input selector and an automatic transition control with presettable frame rate.

Other models in the 700 Series contain the same features as the Model 700, differing only in the number of inputs and buses. Model 701 is a five-bus, two M/E system. Model 702 is a six-bus, two M/E system which can expand to accept 24 inputs. Model 703 is the smallest, with 10 inputs distributed to four buses (one M/E). With systems such as these, in addition to a master control switcher, routing switcher, and distribution system (see descriptions elsewhere), Vitex should prove a potent force in the years to come.

American Data has also added a new, compact switcher to its 558 Series line, Model 558-5. The switcher has provisions for 16 entries (including black burst and color backgrounds). A useful feature is a quad split entry for either sync or non-sync sources. Two M/E banks are available, along with program and preview switching. Optional features are either R,G,B or encoded chroma keyer, downstream keying, key edge generator, and auto fader. Another option, available on most 558 Series switchers, is ADC's one bus quad split, with which quad splits, vertical or horizontal displays, and diagonal splits can be created instantly and positioned in any configuration. An internal borderline generator helps emphasize the display. Standard on the 558-5 are 100 patterns of wipes and keys, with variable softness and borders.

Though Crosspoint Latch's new Model 6112 is small and inexpensive ($5790 base price), it offers features found on far larger systems. Two completely independent M/E banks are each provided with their own pattern generators and joystick positioners for 12 patterns. Further, each M/E features double re-entry. With this small switcher it is therefore possible to create relatively complex effects, such as having a diamond and circle insert on screen at the same time, each moving in a different direction. With the integral downstream keyer, complicated transitions behind matte keys are also easily accomplished. Other features include auto or manual fader, soft wipes, and variable borders. A single switch permits taking of a complex previewed effect.

Another extremely compact switcher (measuring 19 by 10.5 inches with an equally compact amount of rack-mounted electronics) is Beaveronics' new Model 712. twelve inputs (including black and color backgrounds) are fed to a four-bus one M/E switching system. A built-in chroma keyer, colorizer, adjustable soft wipe and border edges, and joystick control of 10 basic patterns (all available as normal, reverse, and normal/reverse), offer effects capabilities well suited to EFP applications. Inputs can be synchronous or non-synchronous. The basic price of the unit is $7400, with a downstream keyer/electronic edger available as an option.

A final round of applause in the new small production switcher category goes to Shintron, whose "SuperBus," under development since 1974, is finally available as a product. With a single M/E bank (four buses), the 12-

continued on page 73

IT STANDS ALONE

TV DEMODULATOR
The World's New Standard

Rohde & Schwarz's TV DEMODULATOR, Type EKF 2 reflects the same high quality and performance of the Type AMF – long recognized as the world's standard. The EKF 2 is designed specifically for the U.S. market – and is priced lower.

- Continuously Adjustable – Channels 2 – 74
- Use Off-Air or at Transmitter
- Envelope and Synchronous Detection
- Sensivitity: 250 μV – 150 mV
- Zero Ref. Pulse/AFC/AGC
- Ideally Suited for Fixed and Mobile Usage

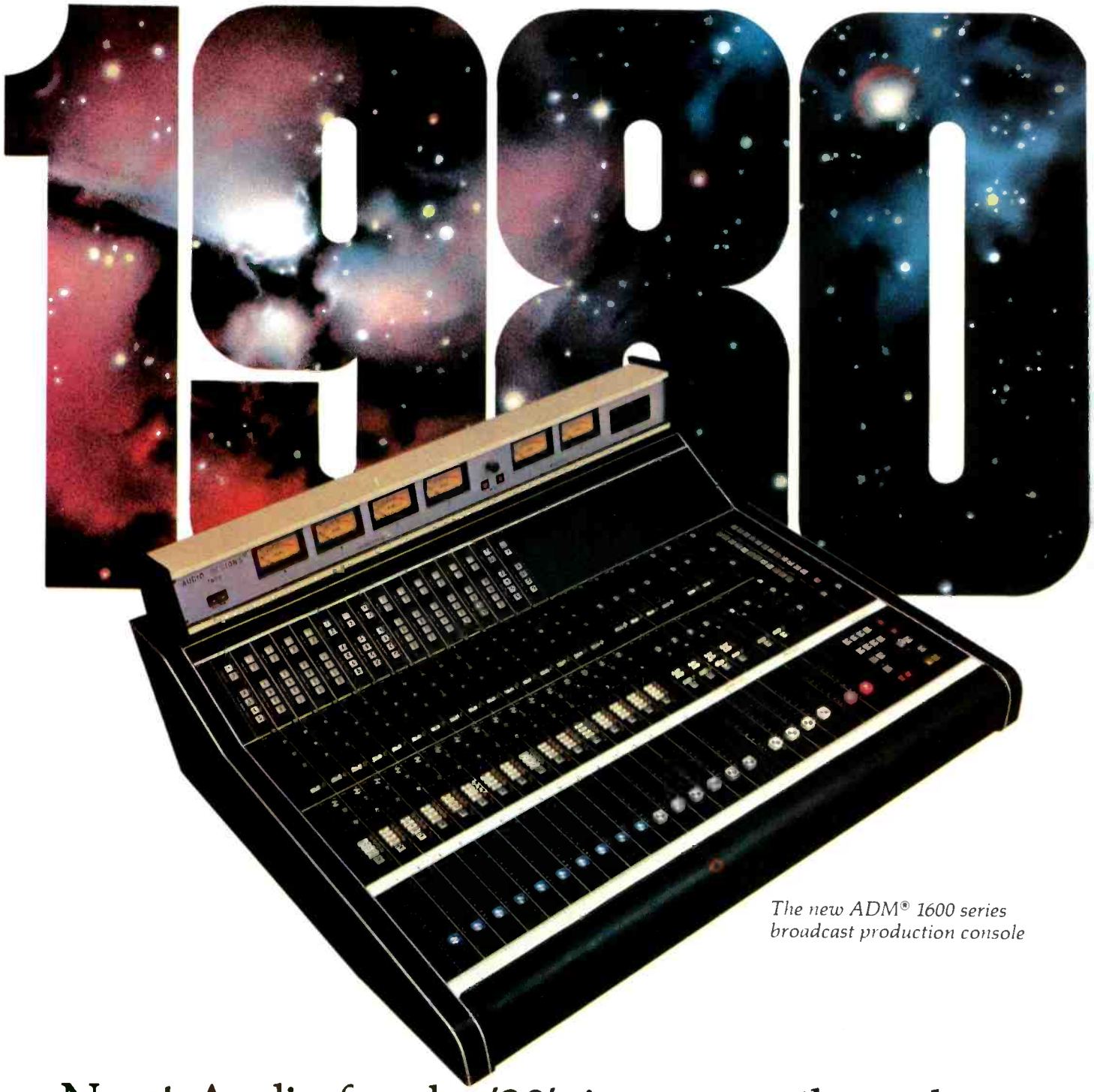
$6950

FROM STOCK!

ROHDE & SCHWARZ

14 Gloria Lane, Fairfield, N.J. 07006
(201) 575-0750 ■ Telex 133310

Circle 143 on Reader Service Card



The new ADM® 1600 series broadcast production console

New! Audio for the '80's in a versatile package

Years-ahead design doesn't have to mean big in size. Audio Designs has created an entirely new generation of broadcast production consoles — engineered to anticipate the medium-market audio needs of the '80's.

The new ADM 1600 incorporates a wide range of features most requested by chief engineers around the country for medium-market broadcast and production facilities. It provides the same ease of operation and quality components found in our 3200 series and custom consoles. The ADM 1600 offers an array of capabilities for now and well into the next decade.

Our complete in-house design and manufacturing put so much quality into our audio consoles that we can confidently offer an exclusive 5-year warranty — the most comprehensive in the industry.

To learn more about how ADM can increase your audio capabilities, please contact Audio Designs and Manufacturing, Inc., 16005 Sturgeon, Roseville, Michigan 48066. Phone (313) 778-8400. TLX-23-1114. Call The Audio Company now!

AMPEX Distributed outside the U.S.A. by Ampex International Operations, Inc.

ADM

The Audio Company

croprocessor which allows for expanded effects capabilities, especially with the two self-contained colorizers, downstream keyer, and chroma keyer. A joystick positioner offers control of three wipe effects (circle, square, and diamond), and all patterns have variable degrees of softness. Border edges are colorized separately, and will expand with the picture during a wipe.

Perhaps the most significant advance in the Shintron switcher is the microprocessor-controlled colorizers; with them it is literally impossible to create an "illegal" color. Luminance, chrominance, and hue controls are mutually dependent on each others' settings. Thus, if a yellow hue with minimal chrominance is selected, the range of luminance will be extremely limited. If, on the other hand, a blue with a good degree of chrominance is selected, the range of luminances will be far greater. Never will the colorizer for either the picture or the border permit a signal that exceeds FCC specs.

Some other switchers on view at the show, though not new, are worthy of note. ISI featured Models 1208 and 902, integrated with its new matrix effects generator (see description later). Dynasciences had its compact 12-input, four-bus Model 7400 with soft wipes, dissolve and cut to key, wipe behind key, and matte key with joystick positioning. Viscount Industries, a Canadian company, had its 14-input, four-bus Model 1150B. The compact switcher has separate rack-mounted electronics. Effects capabilities include 27 standard patterns, joystick control, soft wipes, integral chroma keyer, and as "isolate" function giving an effective five-bus operation.

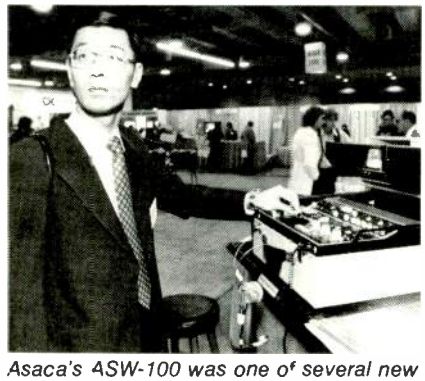
For more information on production switchers: Grass Valley 300 Series, **644**; Central Dynamics CAP, **320**; 3M, **321**; Vitex 700, **322**; 701, **323**; 702, **324**; 703, **325**; American Data, **326**; Crosspoint Latch, **327**; Beaveronics, **328**; Shintron, **329**.

Standalone SEGs expand range of many switchers

Several new standalone special effects generators went on view for the first time at the show. For those who bought switchers before rotary and matrix wipes became available as standard features, they can provide a mind-boggling array of new effects.

ISI's new matrix wipe generator, Model 2031, is a microprocessor-controlled system designed to feed through the external key input of any switcher. A basic matrix choice of 64 by 64 or 32 by 32 can be multiplied instantly so that the matrix pattern is split into the four quadrants and wiped simultaneously. A 90-degree rotation switch allows any of the 16 basic patterns to be turned on its side. Auto transition or manual lever movement controls the wipe speed. The price is $1850.

ISI production switchers were shown with a new stand-alone matrix effects generator.



Asaca's ASW-100 was one of several new "switchers in suitcases."

3M also introduced a new stand-alone matrix effects generator, Model 5130. The unit divides the raster into a 16 x 16 matrix of 256 rectangles. Each of the areas then becomes an independent picture element that can be digitally sequenced into one of the 16 matrix effects (including "random"). Dissolve rates are variable in five speeds from 0.2 to four seconds.

Central Dynamics, long known for its pioneering work with rotary and clock wipes on its production switchers, has now made them available to owners of any switcher with an external key input. The EEG-1980 offers not only a full complement of rotary wipes and clock wipes, but also matrix wipes and five-pointed star wipes. Soft edging and pattern limiting are available for all patterns. In addition, a separate arrow pointer with its own positioner can be fed through a second external key input or a switcher, offering simultaneous use of this feature with any of the wipe patterns. The price is $6500.

Another, smaller rotary wipe generator, manufactured by Michael Cox Electronics and distributed by Broadcast Video Systems, was shown to American broadcasters for the first time at the show. Any of four patterns are first positioned by the joystick, then wiped using split levers to give a wide variety of patterns. A new "Random Rectangle" matrix wipe is promised for later in the year.

Dynasciences' Model 7220 downstream linear chroma keyer, though previously introduced, is worth mentioning again. The unit incorporates a comb filter to minimize "chroma crawl" at the edges of the key.

For more information on special effects generators: ISI, **330**; Central Dynamics EEG-1980, **331**; Broadcast Video Systems, **332**; 3M Video, **333**.

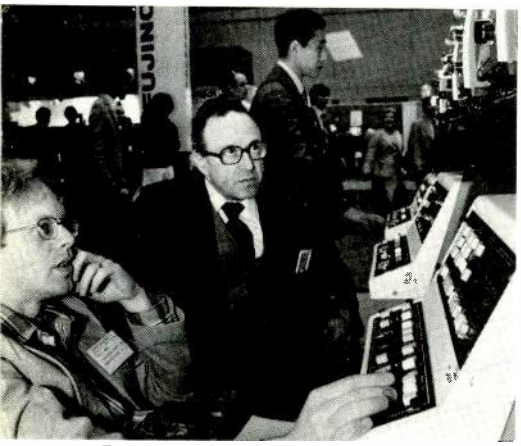
"Switchers in suitcases" more and more popular

Crosspoint Latch's introduction last year of its model 6104A portable five-input production switcher with automatic phasing of any camera combination has paved the way for several new, dc-powered, extremely portable production switchers which are mounted in cases for transportation to any location.

Camera Mart offers several modifications to the Crosspoint Latch system making possible single-cable connection between the cameras and console (carrying encoded video, return video, intercom, tally, sync, and audio from the camera head). The Production Console, in addition to a wide variety of mix/effects patterns (soft wipes, rotary wipes, built-in colorizer, etc.), also incorporates a four-channel audio mixer.

An extremely hot item at the show was Toshiba's FPC-10 case-mounted audio/video production console. The 27 by 20-inch unit weighs only 77 pounds. A four-input, three-bus system with two M/E amplifiers, it also incorporates a sync generator and color control for each of the four cameras. The same unit incorporates three four-inch monochrome preview monitors and a six-inch color monitor, switchable between preview and program. There is even a 1.5-inch waveform monitor with a choice of internal or external inputs. All of this is in addition to a four-input audio mixer, intercom, and on-air tally for each camera. Quite a feat of engineering, the system will become available in the U.S. in about three months at a price of around $20,000. Toshiba, moving into the U.S. broadcast market with carefully selected products such as this, announced it will shortly begin manufacturing the FPC-10 here.

Another new, amazingly portable unit is Asaca's ASW-100, also very popular at the show. A more modular approach is taken than with the Toshiba system described above. The basic switching unit, weighing less than 33 pounds, has three camera inputs plus a fourth input for a character generator



Dynasciences showed their new series of desk-top editors with positive reverse drive

CMX showed its new keyboard with dedicated function keys.

CVS's EPIC, introduced last year, has been placed in service at several facilities.

downstream of the main switcher. A dial-controlled mix/fade system is standard, with other special effects available as options.

The ASW-100 will operate with any genlock capable camera since it provides black burst sync; it is also genlock capable and can accept VTR sync. A special feature is automatic phase control which keeps cameras in phase ±15 degrees. Camera remote controls (master ped, R & B ped, R & B gain, and iris) are optional. Audio from camera cables is automatically processed and fed to the audio line output. When external mics are used, an outboard audio mixer is required. The system also provides tally and intercom.

Video monitoring in the ASW-100 is in a separate, optional case. Three monochrome source monitors and a waveform monitor are included; an external color line monitor must be added. When used without the monitor option, however, a single external monitor can be used to preview all inputs since an internal switch automatically displays the selected source.

For more information on portable production switchers: Camera Mart, **334**; Toshiba, **335**; Asaca, **336**; Crosspoint Latch, **337.**

Editing systems continue to proliferate

Both high-end and low-end videotape editing systems continued the rapid proliferation which we noted at last year's show. Editing and machine control systems of all kinds were among the most crowded booths, particularly since many manufacturers (including Convergence, Mach One, CMX, and others) brought working editors with them to run the machines through their paces. At these booths it was possible to sit with an editor and actually perform sample edits with a fascinating variety of prerecorded program material. The presence of working editors follows a trend in the system designs which has seen manufacturers moving away from using "computer types" to design the software and relying more and more on experienced workers in the field to provide design input.

Last year's show saw the introduction of several super-sophisticated microprocessor-assisted systems (March One, Datatron, and CVS's EPIC) to challenge the CMX systems which had dominated the industry for several years. Sales on all these systems are way up. March One, for instance, which at the time of last year's show had one installation, now has systems in 21 broadcast and post production facilities. All systems share the ability to control a large number of sources simultaneously, working with SMPTE time code and storing edit decisions either on floppy discs or as hard copy. All systems were shown interfaced to a wide variety of recorders, including the new one-inch Type C units. Another recent trend is to interface the editors with audio recorders, making it possible to perform complex audio edits synchronized with a common time code. Another trend in these microprocessor-assisted systems is the interface with large production switchers and digital effects devices, making possible post-production wipes, mattes, keys, and effects as complicated as the production switchers themselves.

Another common point among the systems is their ever-increasing software capabilities — capabilities which, as we mentioned earlier, are being expanded more and more by working editors themselves. Mach One, for instance, now has a program that will instantly convert from standard 525-line NTSC operation to 24 fps (655 lines) for transfer of audio to motion picture film, and 25 fps (625 lines) for working with PAL standard tapes.

Datatron, too, features expanded software — particularly in the form of a newly organized color display on its VTR status screen which groups functions such as VTR status scene timings and status of the auto-assembly process in brightly colored, easy-to-read color inserts on the screen.

Machine control flexibility through increased software also continues to expand. The CVS EPIC interface for the Sony BVH-1000, for instance, offers full remote control over all machine functions including jog and shuttle. Its interface with a Scully eight-track recorder, demonstrated at the show for the first time, features protection of the audio tape by having it not rest on the pickup heads during search modes. EPIC's interface with the Vital production switcher also offers expanded capability, and will control two mix/effects banks (permitting, for instance, a wipe into a matted key). Up to eight devices can be placed on-line at the same time, with control of up to four simultaneously. Three interfaces are supplied with the basic unit; additional interfaces are available at $3200 each.

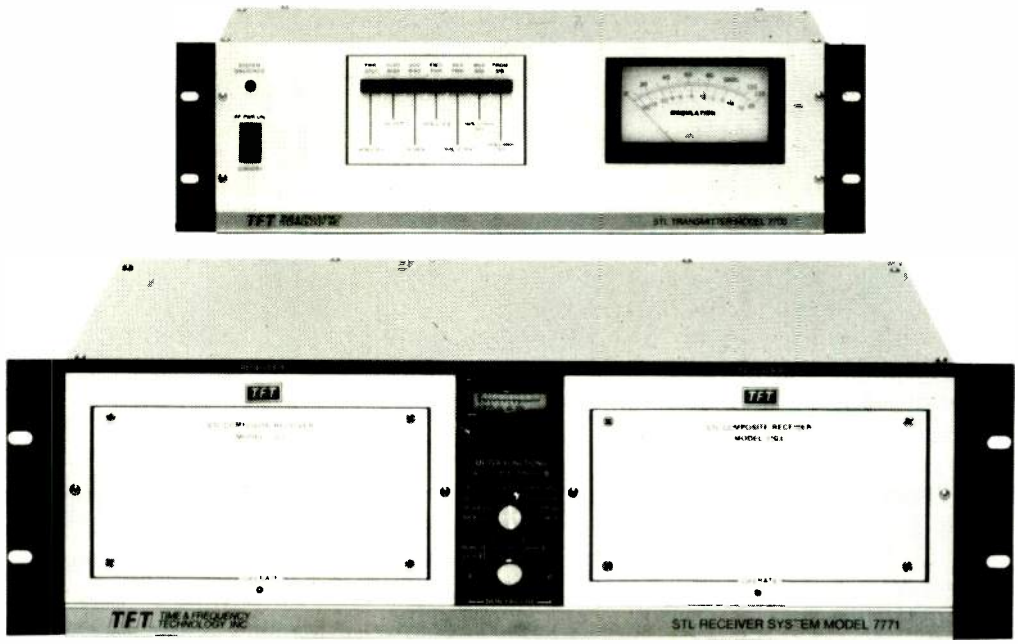
A slightly different approach to interfaces is taken by Mach One. Rather than making the interface itself intelligent, machine control is supplied through the microprocessor mainframe. To add an interface (up to eight) one need only plug an additional card into the mainframe, at a cost of only $500.

Other areas receiving considerable attention from all four manufacturers are edit list management and source listings so users can do their own programming for specialized editing functions. In the former case, all four systems were exhibited with far more sophisticated edit list management and cleanup functions in which software takes care of creating a compact, useable list of edit decisions. With this new software, it is also possible for the editor to enter his edit decision list at any point to change either whole scenes or trim scenes to new lengths; again, the software will automatically compute the new decisions and adjust scene and program lengths accordingly.

In the area of source listing, however, controversy remains. CMX still holds steadfastly to its decision to not supply software listings to its customers, preferring instead to create specialized editing functions upon request. CVS and Mach One, on the other hand, will supply their listings freely to any customer who signs a non-

continued on page 79

Introducing the TFT Model 7700 Series STUDIO TRANSMITTER LINK



A Powerful Addition to THE NEW ERA OF BROADCAST EQUIPMENT FROM TFT

The TFT 7700 SERIES STL is a fully secure, powerful, broadcast quality audio channel between the studio and transmitter which is a step beyond anything previously available in STUDIO TRANSMITTER LINKS. And answers the need for:

MORE POWER (12 watts minimum, adjustable) —provided by a high efficiency transistor-output-stage in the transmitter.

MORE USABLE SENSITIVITY—made possible by a low noise RF amplifier and a unique pulse counting discriminator system which produces 60 dB S/N ratio at 60 μV typical.

MORE SECURITY—assured by the TFT fully redundant receiver and transmitter—both with automatic transfer.

HIGHER QUALITY SOUND—now possible thanks to a 70 dB signal-to-noise ratio with less than 0.2% harmonic and intermodulation distortion, 40 dB stereo separation at 50 Hz to 15 kHz, and 60 dB crosstalk between main and sub-channels.

GREATER FREQUENCY STABILITY—the result of a fully frequency-synthesized transmitter.

EASE OF MAINTENANCE—through modular construction of the receiver, transmitter and mainframe—it saves you money.

THE TFT 7700 SERIES STL is just part of a new era of broadcast products engineered to be a step ahead of the times. For more facts on this and other broadcast equipment from TFT, call or write:

TFT *TIME AND FREQUENCY TECHNOLOGY, INC.*

3090 OAKMEAD VILLAGE DR., SANTA CLARA, CA. 95051 (408)246-6365 TWX 910-338-0584

Circle 144 on Reader Service Card

ARVIN/ECHO....you

For your Frame-Stor or slow motion requirements.

Our EFS-1 Frame-Stor really gets around...and around...and around—Jupiter for example.

The cost? $15,880.

The Jet Propulsion Laboratory, who managed Voyager's Jupiter Fly-By for NASA, used three EFS-1s to record on-line and playback those remarkable animated color sequences the whole world witnessed. It was a trip few will forget.

Our EFS-1 is also a sports nut.

Courtesy of the networks and many others, we've had front seats at the Kentucky Derby, Super Bowl, Indianapolis 500, the Olympics and many, many sports specials.

The EFS-1 is also used widely as another creative camera source.

We've reported the Academy Awards, Emmys, National election coverage and other heavy TV specials. It's Merv Griffin's favorite camera. Now Rona Barrett has her very own Frame-Stor. It's even used in production for animation effects.

With the EFS-1, weather reporting is at a new high (or low).

Our EFS-1 and TEL-WEATHER™ Systems have created vast new reporting opportunities for meteorologists. Animated color weather graphics, developed by our equipment, fed from radar or satellite sources, have brought accurate and timely information to those whose lives or businesses depend on it.

Weather journalism as we know it now would not be possible without these systems.

SLO/MO is now within the reach of everyone...

The cost? $47,750.

There is no comparable slow motion device anywhere near that price...or capability. And when you consider its portability...you can take us anywhere...in the field and the studio.

You should know something about its features;

■ Portable ■ Rugged—impervious to shock and bounce ■ Forward or reverse play at any speed ■ Time lapse recording ■ Digital comb filter ■ Freeze frame ■ Edit capability ■ Animation ■ and many other features.

In other words, SLO/MO does it all.

One last word

Arvin/Echo has, over the years, built a reputation for tough, rugged, high technology recorders that really go anywhere...on land, sea and in space...anywhere.

It's all part of the same family. Want to know more about the family? Contact our Marketing Director.

ARVIN/ECHO™

Echo Science Corporation
an Arvin Company
485 E. Middlefield Rd., Mt. View, California 94043
Telephone: (415) 961-7145 TWX: 910-379-6499

Circle 145 on Reader Service Card

can take us anywhere.

January 29, 1979...
the amazing Jupiter Fly-By.
Millions of people the world over traveled with the Voyager as it visited Jupiter and its moons. Three Arvin/Echo EFS-1s helped document this eventful trip. Two units were used to record on-line color images and a third was used to create the animated sequences. You can take us anywhere.

EFS-1 Frame-Stor System.
This system is the heart of most freeze frame effects for televising sports, special events, and production programming. Key to the efficiency of the system is the flexible Discassette® and the ruggedly simple Arvin/Echo record and playback technology. Shown is the basic system and the remote controller.

The signals in a TV plant are no better than the weakest link through which they pass.

Our TKA-105 Broadcast Routing Switcher offers performance specifications far in excess of the equipment signals it will route.

NEC, as the world's third largest semiconductor manufacturer, has developed a new, large scale television routing switcher. The heart of NEC's model TKA-105 is an 8 x 1 LSI video switcher and 1-in/6-out LSI video d.a. The application of LSI has allowed the use of up to 4 digital audio channels multiplexed with video through crosspoints consuming only 30 MW each. Optional VITS NTC-7 signal insertion on each input permits complete automated system testing and considerable savings in routine maintenance.

Each 2-wire controller is a microprocessor that confirms switching at all levels in the switcher via word exchanges to the four kinds of circuit boards. The TKA-105 was NBC's choice for the 1980 Olympics, NBC Burbank, NBC Chicago and the expansion of switching at NBC New York. If your routing requirements are for a matrix of 60 x 60 or larger, we invite you to explore the most advanced technology available.

Call us at 800-323-6656, 24 hours a day.

NEC
Nippon Electric Co., Ltd.

NEC AMERICA, INC., Broadcast Equipment Division
130 Martin Lane • Elk Grove Village • Illinois 60007

Circle 146 on Reader Service Card

disclosure statement. Both companies seem to have benefited from this policy, since editors often supply the companies with program modifications that are then incorporated in the systems' basic operating programs.

CMX has, however, added dedicated keys to its new "palatte" keyboard. Until recently, the keyboard on its System 340 required extensive communication with the computer to execute many functions. The keyboards on the Mach One, Datatron, and EPIC systems, on the other hand, were dedicated — that is, capable of controlling almost all machine and editing functions with single keystrokes. The CMX dedicated keyboard on its 340X system is now completely reorganized for convenient grouping of machine control and edit functions, while at the same time being largely dedicated to the tasks at hand. The E/D Keyboard and a new rapid-refresh status monitor have made CMX responsive to the needs of the working editor (see *BM/E's* report on the SMPTE Winter Conference, March, 1979).

CMX also took the show as an opportunity to unveil its new remote control box that permits the editor to pace around the room while viewing rushes. As well as controlling a VTR, the box allows marking of in and out edit points for later reference.

CMX also announced that the final version of its Videola will be available on 90-day delivery. The system converts pulse and SMPTE time-coded edit formats to the CMX format and stores the material on floppy disc for re-editing on the CMX system. Videola consists of a control panel with instruction-oriented pushbuttons such as "cut," "dissolve," "key in," and "key out." Working with an off-line videocassette editor, complex transitions can be stored.

Convergence Corporation's Superstick series was finally shown in its complete, three-source machine control configuration — the ECS-103. By taking a modular approach, Convergence has been able to satisfy clients such as stations which may not have been able to afford a fully integrated microprocessor-controlled system from the outset.

The basic system consists of an extremely simple device for searching for edit points — Cruise Control, which controls bi-directional tape motion of the record VTR and any or all of the three source VTRs at operator-determined rates. Pushbutton control of machine functions is also provided. Three large buttons alongside the Superstick Cruise Control provide preview edit and perform edit, while a third button automatically reviews the edit. ECS-103 also has adjustable pre-roll, manual tag and return to selected points for editing on-the-fly, split edit controls, an edit trim register, and storage and recall of up to 100 edit decisions. The status of the edit, including program length and edit decisions, are displayed on a user-supplied monitor. The unit contains a built-in audio amplifier and loudspeaker.

Rack-mounted options and plug-in modules make the ECS-103 a full-blown post-production editor. The TCR-100 SMPTE time code reader will display prerecorded time code on the status display screen for two machines (expandable to four with plug-in modules). The SE-100 is a dedicated five-input, two-bus audio-follow-video production switcher for two-source effects such as wipes and dissolves. 46 patterns (including soft wipes) are controlled from the ECS-103 keyboard. In addition, the basic system features Cut/Lap, a means of producing dissolve-like transitions with one-second automatic fade in and outs. Other accessories include Liplock — a plug-in module that makes speech intelligible even at extremely high and extremely low search speeds — and an automatic dialog replacement module, a remote control box to capitalize on the animation function of the system, and an RS-232 data port for logging edit decisions on paper tape or other hard copy printout. Price for the system with all modules is around $14,000. A similar system, called HPE-1, is distributed by Ampex.

Even with the competition as strong as it already is, a new microprocessor-assisted editing system was unveiled at the show — though not actually demonstrated on the exhibit floor. The $49,500 Sonn-Roy system was shown in a hospitality suite.

The SRS-1 is a software-based approach to editing which requires very slight or no modifications to the VTR. Interfaces (four of which are supplied standard, with additional cards available at a low cost) do not require dedicated VTRs. Up to eight units (including audio recorders and production switchers) can be handled at a time. The system features auto assembly (standard), automatic program loading when the machine is turned on, floppy disc edit decision storage, frame trimming by hours, minutes, seconds, or up to 300 frames, SMPTE time code or "on-the-fly" editing, and paper tape or hard copy printout option.

Moving away from the trend towards dedicated keyboards noted in the other systems, the SRS-1 uses a standard keyboard with a few dedicated keys for functions such as search. Its designers point out, however, that the language required to communicate with the computer is simple enough to be mastered within 15 minutes of hands-on experience.

Mach One demonstrated its new capability for 24/25 frames-per-second editing.

The Convergence ECS-103 Superstick received rapt attention both in its own exhibit and as Ampex's HPE-1.

Two systems have already been sold — one to Merill Lynch, Pierce, Fenner and Smith's A/V Department in New York City and one to the All Mobile Video teleproduction facility, also in New York City.

For more information on editors: Mach One, **338;** Datatron, **339;** EVS interface, **340;** CMX keyboard, **341;** remote control box, **342;** Convergence, **343;** Sonn-Roy, **344.**

Midrange editors feature greater flexibility

Several new entries in the midrange editing systems category are likely to soon provide competition for the current industry leader, Convergence Corporation. One of the hottest of these new systems is Videomedia's Z-6B (exhibited at the Winter SMPTE Conference as the Z-6 — see *BM/E*, March, 1979). The system, created by Bob Caesar, offers amazingly sophisticated, microprocessor-based control of record and playback VTRs (which must be modified by Videomedia), including one-inch Type C units.

The system is based around Videomedia's Micro-loc, a patented time code system which, unlike SMPTE time code, requires no audio track for playback or recording. The eight-bit system requires a far smaller digital processor than that used for the 16-bit SMPTE code, and hence is far

Datatron 2000 featured software capabilities and list management, and an easy-to-read color-keyed monitor display.

less expensive. Another advantage of Micro-loc is that it functions even at extremely slow speeds, whereas SMPTE code tends to become inoperative below one-fifth play speeds. The user has the option, however, of using an on-board calculator to instantly covert Micro-loc to SMPTE time code and of working in SMPTE code or printing hard copy or paper tape in SMPTE.

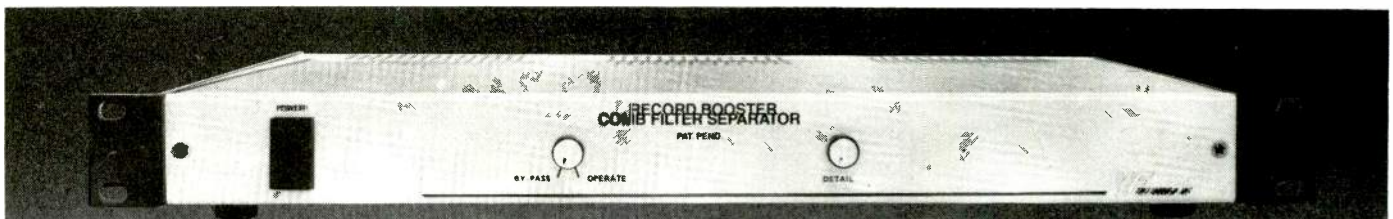
The fully-dedicated keyboard controls all editing functions and machine controls. One unique feature is the system's calculation of distances required in search or "go to" modes. If the distance is short, it will keep the videocassette threaded; if, on the other hand, the desired point is distant, it will unthread the tape, shuttle towards the stopping point, automatically re-thread the tape, and come to rest smoothly on the desired frame with no overshoot. Frame numbers are tracked even though the pinch roller is not engaged during shuttle operation.

Other features include auto edit, with 99 events programmable at a time. Material from up to nine videocassettes can be edited into the same programm. When, during auto edits, the program calls for material on a tape that is not loaded, the VTR will automatically eject the tape and the screen will call for the correct cassette. Whenever a new tape is placed in the machine for the first time, a single auto calibration button will rewind the cassette to the head and assign the correct Micro-loc frame pulses. Another unique feature is the system's ability to maintain sync between the record and playback VTRs at any offset; once the VTRs have been placed in the desired relationship, either VTR can be moved and, with the touch of a single button, the other VTR will be automatically repositioned in the same offset. Yet another important capability is Automatic Dialog Replacement, in which the record VTR keeps performing the same edit event until the function is aborted and the last dialog replacement left intact.

Another brand new editing system, demonstrated at the NAB show for the first time, is Servo Corporation's Model 712. The $11,000 unit (including two interfaces) is designed primarily for Sony 2850 and JVC VTRs and features pulse or frame-accurate SMPTE time code readers. All machine controls are carried to the editing console, including one-frame jogging and 2x play speed (depending on the VTR) via a joystick. Up to three edit points per VTR can be selected at any point, permitting editing on-the-fly. A single button returns the VTRs to the preselected points. A single button also controls the selection of edit points and will cue both record and playback VTRs for preview or actual edit. Best of all, the unit is extremely compact and lightweight so that it can be simply adapted for ENG/EFP mobile use.

Yet another brand new SMPTE time code-based two-machine editor was unveiled by a new company, United Media — its Commander I. The $9,950 price tag also included two SMPTE time code readers with user bits. According to United Media president Bob Ricci, the Commander I's microprocessor allows the unit to interface any combination of one-, two-, or

continued on page 83



Pre-enhance your cassettes

A revolutionary process that puts the highest picture quality into your original cassette recordings is now available to users of U-Matic and other color-under VTRs.

The secret is in the new YFI Record Booster, an add-on device which compensates in advance for the usual picture degradation that ¾" and ½" cassettes suffer in normal playback operation.

TV stations and production facilities that have used the Record Booster are impressed with the substantial improvement in picture quality, while liking the "non-enhanced" look the Booster gives. How is this paradox achieved? Well, this latest addition to the YFI line of image improvers crispens the small details in the picture without enhancing large outlines. As a result the playback image does not have the usual flat pasty appearance with over-emphasized edges that other enhancers produce.

To get even more further advantage from this unique signal process, the Record Booster generates a pedestal around small image details, allowing your playback enhancer to reduce luminance and chroma noise without loss of detail, and thus eliminating the "cartoon-like" appearance typical of too many ENG programs.

THE RESULT

A sharper, crisper, more detailed image that **does not look enhanced.** It looks as if it came from a much better VTR.

It makes sense to do it this way. The Record Booster goes in your signal path **ahead of the VTR,** after the camera or high quality picture source (film, quad master, etc.).

That means the enhancement is built into your original master cassette recording. So it will always be present in subsequent generations.

RACK OR PORTABLE CONFIGURATIONS

The Record Booster is available in rack mount form or in a portable battery-operated configuration as an add on (less than 3 lbs.) to portable VTRs. Easy video in/video out connections.

SEND FOR DATA

YFI enhancers are in widespread use today. Send for our detailed data and get further improvement in picture quality with our Record Booster.

YF

YVES FAROUDJA INC • 199 First St. • Los Altos, CA. 94022 • (415) 941-3555

Dealer inquiries invited

Circle 147 on Reader Service Card

The Orban 526A Dynamic Sibilance Controller:

the single channel de-ess specialist

Introducing the Orban 526A — an improved, single-channel version of our internationally-accepted Dynamic Sibilance Controller. It features a mike input, fully-balanced input and output, LED level display, and GAIN control.

The 526A performs the de-ess function *only* without the compromises inherent in multi-function processors. It's clean, quiet, stable, and easy to use. So it's invaluable anywhere speech is processed professionally: recording studios, cinema, broadcasting, cassette duplication, and more. It's a *simple* time-saver and problem-solver — and at $399* you can't afford to be without it.

The Orban 526A De-Ess Specialist is available at your Orban pro-audio dealer.

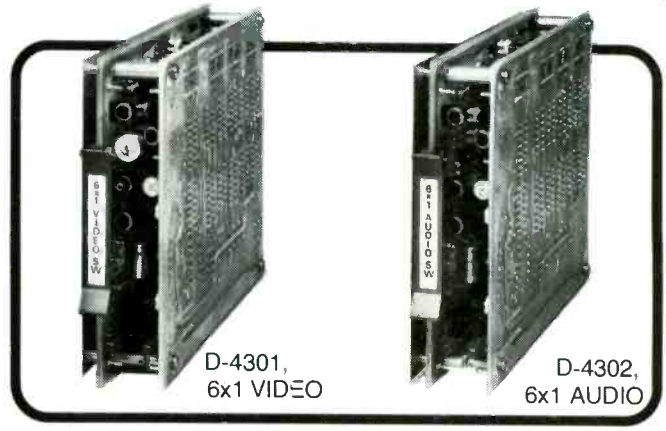
*suggested list

orban

Orban Associates Inc.
645 Bryant Street
San Francisco, California 94107
(415) 957-1067

Circle 148 on Reader Service Card

THE BETTER WAY



D-4301, 6x1 VIDEO

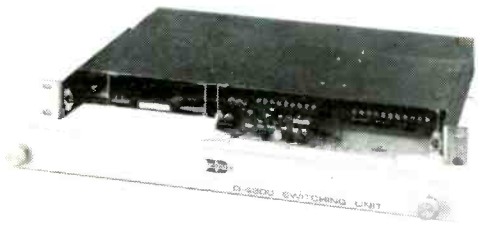
D-4302, 6x1 AUDIO

We make small routing switchers too!

D-4307, 16x1 VIDEO-AUDIO

Datatek has now added the D-4300 series video and audio switching units to its line of routing switchers. With building blocks of 6x1, 16x1 and 20x1, these switching units may be used for:

- Input preselects to production switchers to expand their capacities
- Switching inputs to vectorscopes and monitors
- Adding preview busses to existing switchers
- VTR Input selection
- These units may also be stacked to make up small routing switchers at an economic price.



D-4304, 20x1 VIDEO

D-4305, 20x1 AUDIO

For More Information, Write or Call

DATATEK CORP

1166 W. CHESTNUT ST. UNION, N.J. 07083 • (201) 964-3656

Circle 149 on Reader Service Card

¾-inch VTRs. Another important feature of the system is its ability to perform auto edits when fed through its RS-232 standard paper tape data port. All the circuits within the unit are on replacable circuit boards (including the large LED displays), making it possible for the user to simply exchange problem boards.

Variable motion control with certain Ampex and Sony VTRs without machine modification through a bi-direction wheel control is possible. The user can also program in and out and search points by entering SMPTE time code through a keyboard.

Another popular mid-range editor at the 1979 show, introduced previously, was Dynasciences' Model 104 multi-source editor. The unit was shown performing A&B roll dissolves through an interfaced switcher without the use of a microprocessor.

For more information on midrange editors: Videomedia, **345;** Servo Corp, **346;** United Media, **347;** Convergence, **348;** Dynasciences, **349.**

Under $6000 still buys a lot of editor

Several manufacturers have taken the cue that small stations and ENG operations may not be able to afford the highly sophisticated systems described above — nor, in fact, do they require the expanded capbailities. For this type of operation there were several well-engineered, low-cost systems displayed at the NAB show for the first time. These systems supplement the wide variety of two-machine editing controllers offered by manufacturers such as Sony, Ampex, JVC, and Panasonic for their VTRs and VCRs.

One of the more interesting of these is BTX Corp.'s Model 460 which the company calls a SMPTE Tape Controller but which operates like any other editor. Capable of preprogramming up to 30 events and executing them at the touch of a button, the unit will control up to four SMPTE-compatible units at once. Full remote control of machine functions and record electronics is provided through pushbuttons, and the machine will "learn" an editor's manual routine for searching out edit points, parking, and creating edits. All edits are previewable any number of times. Edit points can be captured on-the-fly or by entering SMPTE time code numbers through the keyboard. Full offset capabilities are offered, with automatic calculation of time offset between any VTRs. SMPTE code can be trimmed at any point during the program, and new events can be inserted within the previously assembled 30-event program. Cost of the basic unit (with two rack-mounted interfaces) is $5250.

In about the same price range ($4895 for the basic unit) is Dynasciences' new Model 1034 desk-top console editor, designed primarily for interface with U-matic type VCRs. A unique feature of the 1034 is Dynasciences patented positive reverse drive system which, without VTR modification, provides minimized wear of recoders and videotape in reverse modes. Search, still frame, cueing, preview, and review are all available through front panel controls, with bi-directional wheels for controlling tape motion. Insert editing is controlled by a digital insert memory which is adjustable for determining the length of the out-cue. Preview is either static for rocking back and forth between frames for precisely matched cuts, or full rolling preview with automatic recue. Editing accuracy is one frame, depending on the specifications of the VTR.

The Model 1034 is also capable of accepting Dynasciences' $995 Time-Trak option which provides an on-screen six-digit video time display (minutes, seconds, frames) and two-digit numerical tracking display representing the relative tracking level of the VTRs as measured by the amplitudes of their RF envelopes. Also available as an option is Dynasciences' RAM-100 random access system which permits programmable rapid search functions.

Another brand-new low-cost editor offering at the show was Jatex's VSEC-42T, priced at around $3,000 for the basic unit. Jatex claims delivery of 140 units since introduction in September. The basis of the system, which will interface with any type of VTR (including the new one-inch Type C units), is Scene-Dex — a four-digit time code written at 10 to 20 dB down at 1200 to 2400 cycles on any audio track. With Scene-Dex cueing, such advanced capabilities as auto search are easily accomplished, along with edit rehearsal, single-button recording of in and out edit points, and an integrated stopwatch timer. No VTR modifications are necessary, and all machine functions of the VTR are carried to the front panel. An optional end insert timer allows the Scene-Dex system to insert intervals from two frames to eleven minutes. This feature also makes it possible to use the system for two-frame-increment animation.

If the price tags on all the systems described above are still too high, consider another brand new line of editing control products from E.M.S. called Edit-Q. The top-of-the-line unit is the $1495 Res-Q which provides frame-accurate editing, remote control, variable preroll times, and unlimited time duration insert length timing either on-the-fly or in still frame. Time display

Servo Corp. showed its 712 video editor, one of many low-cost, full-function systems.

Videomedia's Z6-B is a new entry into the mid-range, sophisticated editor market. The system works with Micro-Loc time coding.

Bob Ricci (left) of United Media demonstrates the new Commander I SMPTE time code-based two-machine editor.

readouts are derived from control track pulses or from an optional SMPTE time code reader. The great advantage of the system is its truly modular design in which optional features are simply plugged in as needed. With several Res-Q units, for instance, control of multiple source machines becomes a simple matter. Another plug-in module, Aud-Q, permits reading of audio tracks at fast and slow speeds. the system relies throughout on the intelligent interface mod kit, MK60A, $599, which the company introduced at last year's show and which has been enjoying considerable success with owners of Sony 2850 VCRs. The intelligent interface also makes modified VCRs compatible with Convergence ECS-10 and TRI editing systems.

Video Aids of Colorado showed Edit-Aid II, a new system similar to its Quad-AR-1 but with the addition of automatic preview and a cross-pulse generator. Edit-Aid records audible pulses on an unused audio track of any VTR or VCR. The pulses signal in and

out edit points. The automatic preview function allows the operator to watch the incoming video before or during recording. The cross-pulse generator is used to check for wrong-field edits.

For more information on small editors: BTX, **350;** Dynasciences, **351;** Jatex, **352;** E.M.S., **353;** Video Aids, **354.**

SMPTE time code generator/readers

It seems that no sooner did the SMPTE adopt a standardized time code than everyone is trying to replace it with other systems. Micro-loc on the Z-6 system, Time-Trak on the Dynasciences editors, and Jatex's Scene-dex are perfect examples. These manufacturers and others are working seriously to overcome some of the shortcomings of the SMPTE code, especially its inability to be read below one fifth play speed. Another continuing trend is for manufacturers of many systems to integrate time code readers within the basic editing unit rather than relying on an outboard reader.

New from Shintron is the Model 644 edit code reader/display/printer at $5400. The EBU/SMPTE convertible reader displays time code or user code anywhere within the raster as large or small black or white characters. A freeze switch holds the display while the reader continues monitoring the code; a coincidence indicator lights when time code being read (from one-fifth to 40x play speed) equals the time code preset on front panels thumbwheels. The printer provides an instant paper tape hard copy of edit in and out decisions activated by two pushbuttons, ideal for quick logging of tapes for fast-paced editing situations. Also new from Shintron is the Model 641 portable edit code generator, available in either SMPTE or EBU formats. The 21-pound unit, which can be bolted to the side of a BVH-100, also generates user bits as a four-digit decimal number. Six-character display is via a half-inch liquid crystal.

Another portable time code generator is Electro and Optical Systems (Elector) Mk III, a battery-powered device weighing less than three pounds with full keyboard entry of a seven-segment time code or user bits. The unit was previously introduced, as was Elector's entire Mk II line of time code generators and readers.

Another new portable edit code reader (through not presently configured for dc operation) is Datametrics' SP-733. The unit, featuring eight LED readouts (0-9) for time code, A-F for user bits), has a wide variety of operation indicators including code present, foward direction, drop frame format, time operation, user bit operation, and display hold. The last is coupled to a control which enables the user to freeze a particular time for logging while the internal counter keeps going. Price of the SP-733 is $1950. Datametrics also showed its $4,050 SP-722 reader/generator/character generator, unveiled at last year's show.

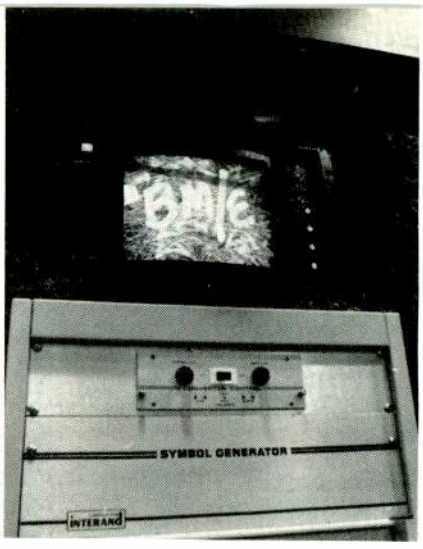
K-600 from Knox, will load up to 5 fonts at once from a mini disc.

The Interand Telestrator allows the user to create his own graphics with a light pen. TAPAS will also do animation.

One truly impressive innovation in the use of edit code user bits was offered by Skotel Corp. in its new intelligent RS-232 interface to its line of time code generators and readers. The interface is designed to allow the use of a keyboard in conjunction with the user bits to provide messages to operators, editor's notes, and even captions — at a rate up to 90 characters per second. The serial data channel encodes or decodes information into the 32 binary user data bits of the time and control code; the first four bits define the data packing format. Price of the is $800.

Another company with a deep commitment to edit code equipment is BTX, which showed a full line of its readers and generators, in addition to the Model 4500 Time Code Synchronizer. The completely self-contained microprocessor-based unit with universal interfacing permits the tracking of any source of SMPTE code to within ±50 microseconds at playback levels as low as -12 dBm and features programmable offset.

A new SMPTE code synchronizer, exhibited at the Philips booth, was the Adam Smith Model 605 which synchronizes two slaves to one master source with an accuracy up to 1/100th of a frame. This is accomplished by the use of digital servos rather than a phase-lock loop. Another feature — "dynamic skew" — enables the creation of even complex timing manipulation such as offsets, while the machines are running. The Model 605 has remote control capability up to 30 feet and comes with three machine interfaces. Its cost is $12,000.



The logo above could have been selected with any of 64 colors.

A useful new SMPTE code accessory is Berkeley Varitronics Systems' S.I.D. decoder. Large five-inch high LED readouts display the month, day, hour, minute, seconds and program source using the line 20 source identification code. The program source is supplied by user bits on lines 47 and 48. Cost of the unit is only $885.

A useful new item is also QSI's video backtimer, Model QSI/VBT-2. The unit displays hours, minutes, and seconds as both as LED readout and also in various positions and sizes within the raster. Time and direction of the count are pre-set in memory through the unit's touchpad. Time is transferred to viedo and the count started at the touch of a button. If the backtimer is counting down, once zero is reached it will automatically begin counting up. Once the pre-set time is transferred to video and running, a new time can be entered in memory.

For more information on time code gens/readers: Shinton, **355;** Datametrics, **356;** Skotel, **357;** Philips, **358;** Berkeley, **359;** QSI, **360.**

A new generation of character generators

Three broad types of character generators/graphics systems have emerged in the past few years, distinguished principally by their capacities, but also by the sizes of their memories. The most sophisticated systems —

continued on page 86

COST-EFFECTIVE BROADCAST EQUIPMENT. LONG BEFORE OTHERS WERE TALKING ABOUT IT, WE WERE SUPPLYING IT.

At RCA, we've had the basis for cost-effective products for decades: the RCA reputation for quality. And RCA quality starts with equipment design.

Today, we offer that high quality in a complete broadcasting line, with many cost-effective benefits for you.

Whether it's an RCA camera, or a complete system, it'll save.

We offer you cameras, VTR's, transmitters, antennas, film chains, and equipment for automated station breaks, special effects, and more.

Our TK-47 camera, the world's first fully-automatic studio camera, saves studio and personnel time. And our TK-76 is a multi-purpose portable that's never idle; over 1400 are in use.

The TR-600A quad VTR is modular: it expands as your station does—so you can plan for growth, and save. And our TH-Series 1" helical-scan VTR gives you similar expansion capability in portable and studio equipment.

Innovation, compatibility, flexibility —all are part of the RCA approach.

We help protect your equipment investment—with upgrading. TechAlert. And parts support.

As new developments in technology emerge, we design them into our line of equipment. And we can upgrade our customers' equipment, as well.

So your equipment offers the highest in technical performance, retains the highest market value.

And since long-range cost-effectiveness depends partly on quality service, it's good to know RCA TechAlert Service and parts support are at the ready.

Find out about RCA cost-effectiveness, now.

We can show you how you can better utilize technical personnel, help cut back on lost air time, aid in reducing advertiser rebates, and more.

Contact your RCA representative, or write RCA Broadcast Systems, Building 2-2, Front & Cooper Streets, Camden, NJ 08102.

NAB SHOW-IN-PRINT '79

The Telemation Compositor I displayed a new Font Compose unit this year.

The Vista 80 from MPB Technologies features a lot of graphics power in a comparatively small package.

Chyron, TeleMation, and Vidifont (see *BM/E*, February, 1979) — are full-blown digital graphics systems incorporating features such as font composers, animation programs, and automated election reporting packages; they use large-scale, outboard computers. The next group offers slightly less sophisticated software packages, slightly fewer proms, internal microprocessors and, often, mini floppy disc storage. The third group is generally used for relatively simple tasks such as titling or news material identification, and usually has relatively small internal memories. A trend which seems to be developing, particularly in the smaller systems, is an almost universal option for connection to mini floppy disc for increased memory capacity.

Full-blown graphics systems

TeleMation had its whole range of super-sophisticated software up and running, along with its new font compose unit. The graphics compose system can be connected to any dual disc Compositor I; it does not require TeleMation's dual-channel Compositor system.

The TeleMation system is somewhat different than the other font compose systems (and also somewhat different from TeleMations own prototypes shown in previous years). Artwork, which can be of any size and in any condition (including photocopier reproductions), is placed on a digitizer tablet and traced with a crosswire cursor something like a light pen. By using pushbuttons along the sides of the tablet indicating H, V, and other simple directions, the operator need only trace the outlines of the form; the computer does the rest. To create a vertical line, for instance, it is necessary only to indicate the two outside points on the line, since the software will fill in the actual stroke. When creating an "O", the operator simply traces around the circle which will then appear as a solid form. An instruction to "cut out" removes the center leaving the outline. A fully digital system, the GCS will resolve up to 1000 points per inch.

Once the character has been captured, it can be manipulated further by the system, expanded up to 127 scan lines high, and positioned in any degree of rotation about the X, Y, and Z axes. Large-scale graphics, up to 382 scan lines, are built as several separate characters, linked together, and stored on a single compositor page.

Incorporated within the Graphics Compose System is another exciting development from TeleMation — an animation program. Once a design or letter has been captured into computer memory, it can be put through a wide variety of animated moves including zooms in and out and rotation about the X, Y, or Z axes, or all three combined for a three-dimensional effect. As with font composition, the computer does much of the work. The operator simply selects a few stages within the desired movement and enters them into memory. Software then calculates the number of in-between frames between the points, depending on how quickly the movement is to happen. The program will also bounce a figure horizontally, vertically, or diagonally in an operator-positioned window. Thus, a bird can be made to skip across the sky, its wings beating as it flies.

Animation sequences are stored as up to 100 special addresses in the memory, independent of the 999 standard Compositor pages. The animation program is controlled by one of two separate compose/display or display-only keyboards.

Chyron, too, had its font compose system unit up and running. On the Chyron IV it interfaces directly to the standard keyboard; for the Chyron IIIB it is a separate, self-contained system. The system uses a standard monochrome camera as its input, coupled with an X-Y cursor display generated by the computer. First the cursor is used to define a window around the elements of the artwork to be captured. The resolution is extremely precise and enables cropping of fine details; for instance, a single letter, in a long word can be isolated from other letters and stored separately. Once the cursor is positioned, the image in the window is captured with a single keystroke.

By far the neatest feature of the Chyron system is its editing function. Elements in the captured page can be magnified up to 16 times, at which point each pixel or digitized bit is fully legible. If the artwork was not perfect in the first place, this system will make it so. By moving the X-Y cursor in one bit or line-by-line increments, the operator can effectively transform any shape into any other, or simply tidy it up. Serifs can be removed or made less conspicuous, pieces of letters missing because the artwork was damaged can be filled in, letters that are too thin can be enlarged by simply adding another row of bits to the captured information.

Once the artwork has been tidied up, the image is shrunk to its normal size and then stored for later recall the same as any other letter or figure in Chyron's extensive font library. Figures up to 420 scan lines high can be created.

Both TeleMation and Chyron now have election reporting systems that offer computer control over incoming election results, wither manually entered or through a teletype system. Results are tabulated in the computer, the candidates ranked, and the data displayed through the character generator's standard displays. Chyron, which has been marketing its system throughout the past year, did not actually demonstrate it at the show. The spotlight therefore fell on Thomson-CSF which unveiled its new Vidivote election reporting package.

Rather than relying on time-shared computers as is the case with Cyron, or on the character generator's full-blown computer as is the case with TeleMation, Vidivote uses its own internal microprocessor to handle information, then feeds it to the Vidifont Mark IVA for display. Up to eight inputs can be used, including satellite keyboards and teletype data through an optional RS-232 interface.

Incoming votes are tallied automatically by the system, which also ranks the candidates' names by vote totals or percentages. When entering vote totals, however, the candidates are presented in the same order each time to the operator and, following the entry, the system pauses for the operator to verify the total. Races appear in a predetermined sequence for both updating and display. The producer can go randomly to any race, however, and his status display monitor flashes races or candidates where new vote totals have been entered.

Access to on-air displays is either through the Vidivote keyboard or the Vidifont keyboard. A variety of presentation formats are available, but sta-

continued on page 89

THE FULLY-AUTOMATIC STUDIO CAMERA. IT CAN AUTOMATICALLY SAVE YOU SET-UP TIME.

Think about the time it takes to set up studio cameras.

Think about standby time for talent and production crews waiting for your technicians to get the best picture quality.

Think about the savings if that time could be reduced from hours to minutes—or seconds.

The TK-47. The world's first fully-automatic camera.

The TK-47 studio camera performs sequential set-up functions automatically—at the touch of a button.

And it does it in a matter of seconds, rather than requiring the usual hour or two for conventional studio cameras.

Daily performance checks are also done automatically. And with a Set up Control Unit, any number of TK-47's can be controlled—with truly consistent color rendition.

You get better utilization of technical people, a smoother operation, quicker problem-solving.

Inside the TK-47: RCA technology at its finest.

The TK-47 is filled with state-of-the-art technology. Extensive use of LSI's and digital memory circuits, for example. And we've eliminated troublesome potentiometers.

Everything in the TK-47 is designed to increase reliability, reduce downtime.

Automatically backed by RCA, and TechAlert.

Cost-effectiveness in a studio camera, or any other piece of equipment, depends on many things.

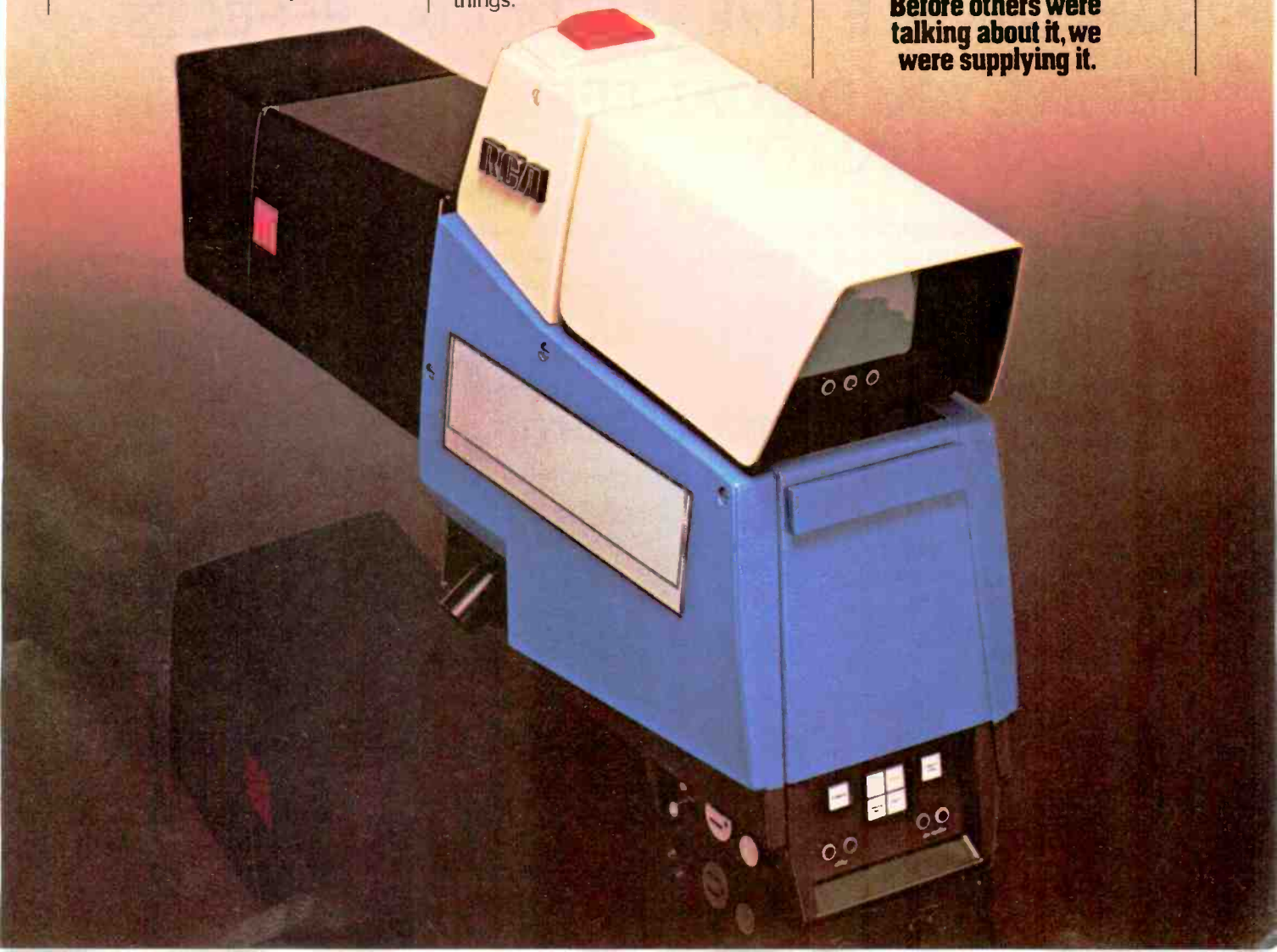
Quality. RCA has a reputation that can't be matched for reliable, enduring products and systems.

Service. Famous TechAlert service, and RCA parts support, can add years to the life of your equipment.

See your RCA representative, or write for details. RCA Broadcast Systems, Building 2-2, Front & Cooper Streets, Camden, NJ 08102.

RCA

Cost-effective broadcast equipment. Before others were talking about it, we were supplying it.



Production control panel of the DPE 5000.

SOME PEOPLE GIVE YOU DIGITAL EFFECTS.

WE GIVE YOU DIGITAL EFFECTS WITH OPTICAL QUALITY.

There's good reason why the Quantel DPE 5000 is the world's most widely used system for digital effects: optical quality.

The DPE 5000 produces effects that are smooth, realistic, virtually indistinguishable from optical effects. Good enough to be used live on the air. With confidence.

A full-fledged minicomputer and several microprocessors handle millions of digital manipulations that make Quantel effects more camera-like.

And our unique production control panel, shown above, gives the operator "extra hands" to smoothly control operation and bring into play the marvelous range of DPE 5000 effects. Automatic functions, programmed routines, and fail-safe limits simplify control and eliminate constant planning and anticipation.

With the DPE 5000, you can actually expand the power of your switcher. (It can be easily interfaced to *any* switcher.) You can preselect effects—shapes, sizes, positions, even transition rates from one effect to the next.

Using optional NO-BLANK noise reduction/blanking correction feature, you can salvage tapes that don't meet FCC blanking requirements.

The net effect of Quantel digital effects is a better, more exciting picture on the air—and a better, more rewarding bottom line.

For more details, call your nearest MCI/Quantel representative. Or get in touch with us directly:

Micro Consultants, Inc.,
P.O. Box 10057, Palo Alto,
California 94303, 415/321-0832.

MCI/QUANTEL

The digital video people

Circle 152 on Reader Service Card

tions have the option of creating their own. Two or more small races can be combined in a single display, while races with many candidates can be set up as a split screen. The system also offers on-air updating in which the actual updating of a race and re-ranking is held in memory until the producer airs it.

Vidivote is just one option in what Thomson CSF calls "Vidifont Plus." The system consists of a slightly updated version of the Vidifont IV, the Vidifont IVA, with random positioning of color windows anywhere in the raster, outline characters created by removing the character video and leaving the edging, black characters with nine levels or white edging, and background colors chosen by full row, partial row, or full page and stored as an integral part of the display.

Options in the IVA/Vidifont system are the RS-232 interface, an automatic sequencer for page displays at predetermined rates, and a full second channel offering color preview and additional composition flexibility. Also now part of the system are a time display, right-to-left entry with right-to-left crawl, horizontal or vertical roll, and a ripple effect. The latter has two clocks, one variable from one character per millisecond to one character per four seconds for individual words, the other in .10-second increments for whole words or phrases.

Thomson-CSF also offers a font compose system for the Vidifont, though it was not demonstrated this year.

For more information on graphics systems: TeleMation graphics compose system, **361**; animation program, **362**; Chyron font compose system, **363**; Thomson-CSF Vidivote, **364**; Vidifont Plus, **365**.

Midrange systems still offer great flexibility

3M's Datavision Model D-8800 is fully operational. The dual-channel system can be used for either full-color preview or for expanded composition flexibility. An internal memory stores up to four intermixable fonts at once, along with 12,000 25-character rows of information. Additional mini floppy discs (up to four) increase the title storage capacity, while up to 20 full fonts can be stored on discs and loaded (four at a time) in about 12 seconds. An animation mode provides for some interesting compositions by cycling through pages at a rate up to 10 or 12 per second.

Composition features are like those found on even the super systems described earlier. They include automatic page centering and left/right/both justifying; character, word, or line flashing; three thicknesses of underline (to be expanded to four), available on a line-by-line basis; variable proportional spacing; variable speed crawl and roll (left and right, up and down), individual letter to whole page colorizing and line-by-line background colorizing; and up to 10 tabs per page carried over in the memory for later additions or deletions.

The D-8800 also offers a full range of editing capabilities, including individual character changes and changes in spacing. Once the changes have been made, a single keystroke re-centers the page and another re-justifies it. One feature which 3M touts as an advantage but which some users might have problems with is the automatic line spillover which begins a new line when the maximum length is reached — regardless of whether the break falls in the moddle of a word. Its base price is now set at $27,000.

Another new system is approximately the same price range ($33,500) is MPB Technologies' Vista 80 graphics system desk-top model. Apart from being a rather flexible, two-channel system, this model of the Vista 80 manages to pack an amazing amount of hardware — including a color monitor, disc drives, microprocessor, composing and controller keyboards, power supply and all its electronics — into a standalone 33 by 23 by 28-inch unit.

Working within the TV safe title area only (the rest of the screen is used to display control functions) the Vista 80 will compose pages made up of characters as large as 384 lines high. Two to three fonts (depending on size and style) are loaded at a time from mini floppy discs and can be totally intermixed throughout the page. A large number of standard fonts are available, as is a camera-inputted compose unit which was not demonstrated. Once the font/operating program has been loaded, the font disc can be replaced by a storage disc; or, one may add a second disc drive option.

Composition features include individual to whole raster coloring, flashing, color wipes and overlays (using cursor-controlled dual channel operation), roll and crawl (four standard speeds), and automatic lower thirds. Editing functions include page and line centering, character/line/page delete and correct, and tabbing. MPB also supplies a self-diagnostic program which runs all parameters of the system and displays a sample message which the operator checks against a printed master display for errors. Another diagnostic program draws a perfectly straight diagonal line to indicate that all systems are functioning.

Colorado Video showed its Model 275 Video Expander.

System Concept's Quantafont QVI is demonstrated by Jesse Unrath, Nanalog, which was due to be shown, will make its appearance soon.

Also popular at the show was Dynasciences' Model 9048, a unit with a self-contained mini floppy disc storage for 1000 single-line titles or over 256 pages. Three upper and three lower case fonts are stored internally. With a normal character height of 24 scan lines for upper case letters and 14 for lower case, this yields 10 rows per page, 20 proportionally spaced characters per line. A $3000 digital font compose unit is also available.

One optional feature is especially worthy of note. Vari-Text, available on all fonts, offers a ±50 percent change in the size of the characters in nine incremental stages. The operator selects one of three speeds and, on command, the zoom happens smoothly without loss of character resolution. This feature can be used both to control the size of characters and also to provide on-air emphasis to certain portions of the message.

The low end of midrange character generators is held up by a new system from Knox Video Products. The K600 will load up to five fonts at once from a mini disc (either standard or custom created) — though it will compose with only one font per page. Within any font, however, there is an intermixable selection of 56 character sizes (eight heights and seven widths) and a choice of eight per-character colors. Individual line backgrounds up to the full raster can be colorized with seven colors plus black. Part of the versatility of

the system comes from its independent baseline; the operator, having selected the width of the line based on the size of the largest character within it, can then set an independent baseline for any smaller characters. Another feature of the K600 normally found only on far more costly systems is character overlap. In addition to five speeds of roll and crawl, the K600 has a reveal mode that will wipe horizontally or vertically, again with five selectable speeds. Cursor-controlled editing capabilities include insertion and deletion of individual characters, lines, and pages.

The base price of the K600 system is $12,000, which includes a 16-page internal memory. A functional addition to the system is the KD128 programmer that permits storage of 350 pages on a mini floppy disc with random access. The programmer will also sequence pages automatically from speeds as high as ¼ second per page, and can also be used to control roll and crawl speeds and to loop pages for repeated messages. Cost of the programmer is $875, which does not include the cost of the disc drive itself.

A comparably priced and equipped unit is System Concepts Quantafont Model Q VII — actually similar to the Q VIA, Q VI, and Q V which came before it but with expanded software capabilities. The system works with two basic fonts — serif and sans serif, in both upper and lower case. A choice of 24 character heights and four character widths, however, provides a broad range of styles. Fonts are assignable line-by-line, as are drop shadow and colored background or text. Six colors plus black or grey are available for backgrounds or text characters. Flashing is available by word or row. A nice feature in the system is a variable zero to two-second page fade in or out. Automatic centering is by page or row, and a row of characters can be moved incrementally by one-eighth of one character's width. Thirty-two tab positions are available.

The Q VII has a relatively large memory which will store 192 lines consisting of 6000 characters. Two speeds of roll and crawl will run any length message (up to the 192-page memory limit), and the entire message can be looped. Static and dynamic messages can be mixed, and a window can be established so that the crawl ends below the static message.

The basic price of the system is $9,995. Once again, however, several options are available to extend the memory. Besides a disc drive/sequencer/display monitor that will store up to 1600 one-line messages

Video Data Systems showed its T-2001 with variable height and width characters.

($4,450), and a dual disc system (double the capacity for $5950), there is a digital cassette/display monitor that will store one entire 192-line memory and transfer it to the internal RAM in less than 10 seconds ($2950).

Nanolog, which System Concepts had hoped to have ready for NAB, did not make it because of developmental work yet to be completed. The new system for improved character resolution will be ready soon.

For more information on mid-range graphics systems; 3M D-8800, **366**; MPB Technologies, **367**; Knox Video, **368**; **System Concepts, 369**.

Under $6000 — and still going strong

Low-cost systems are useful in a variety of situations. Though you may not be able to create your station's logo or elaborate, multi-colored flashing bulletins on them, these systems are ideal for limited applications such as news and sports. They are also small enough to be mounted in a mobile van.

One such unit is Video Data Systems' T-2001. A single set of upper and lower case characters is supplied. Character height (three sizes), character width (two sizes), and black or white characters and edging are selected on a line-by-line basis. A crawl line, which can run up to the entire 16-page memory (expandable to 112 pages), can be positioned anywhere on the page. A roll mode is optional. Putting the system into its title mode also permits the creation of one or two-line titles within an operator-positioned window. Title pages can then be manually or automatically sequenced at an operator-determined page rate. Editing functions include absolute line and page centering.

In addition to the expandable memory and roll options noted above, the T-2001 can also be provided with a second, independent edit channel and a clock/calendar. Also optional are 32 graphics elements (lines, curves, stars, etc.) with which the operator can "draw" pictures or emphasize portions of messages. Base price of the system without options is $5995.

3M, encouraged by the advances of its D-8800, introduced a smaller version, the D-2500, which has a four-page memory. Three fonts in upper and lower case are available. Within the page, large (28 scan lines) and small (20 scan lines) characters can be intermixed. The D-2500 has three roll speeds and three crawl speeds; the crawl, or a title window, can be positioned at the top, center, or bottom of the screen. Characters are edged, and words can be flashed individually. The price is $5495.

Laird Telemedia showed the newly redesigned version of its Model 1200 titler which has a base price of only $2000. Memory here is defined by lines rather than pages. The standard 1K memory will handle up to 32 characters a line at a time; plug-in cards are available, however, to expand the memory to 4K. The 1200's compositional features include adjustable character width, edging, choice of white or black characters, and whole page or line-by-line flashing. The one-line title window can be positioned anywhere within the page.

For more information on low-cost graphics systems: Video Data Systems, **370**; 3M D-2500, **371**; Laird Telemedia, **372**.

Teletext . . . and beyond

Despite some media predictions that teletext systems would be the hottest new items at the show, only one manufacturer — Sofratev — demonstrated its system. Nonetheless, it was the first time that a teletext system has been shown at the NAB.

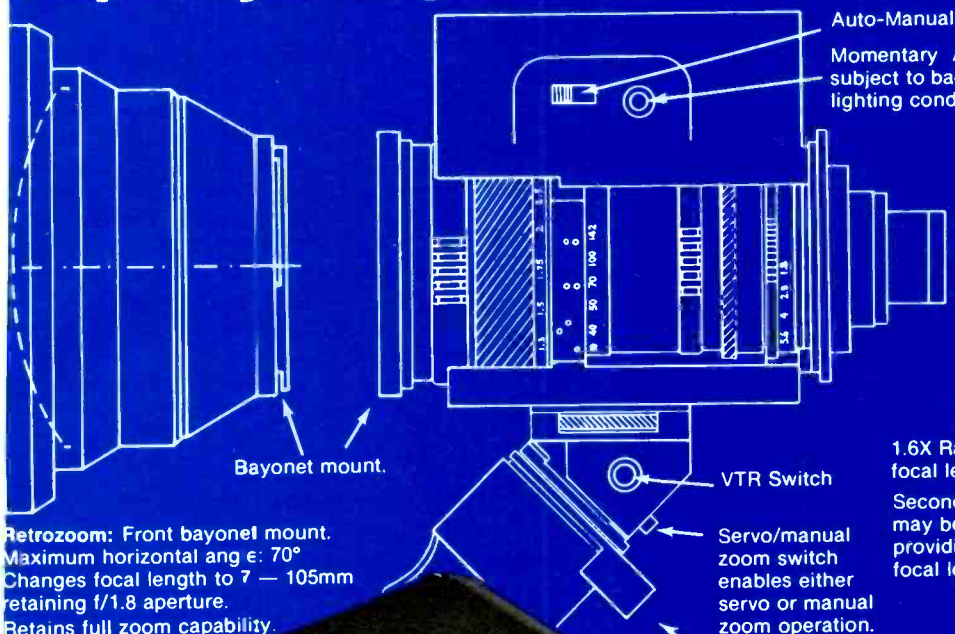
The system is called Antiope, and it was developed in France for use on the French national network. Graphics display pages, offering a wide variety of compositional elements with variable size and colors of characters and backgrounds, are first composed on a character generator-like keyboard. The digitized signal (20-byte words with an eight-byte prefix) is then multiplexed with a standard television signal and carried in the vertical interval.

At the receiver end, a decoder reconverts the digital data and formats it on an unused standard TV channel. With a transmission rate of one TV line per field, each page is formatted in approximately one second. This gives the viewer a choice of which of dozens of possible pages he wants to watch. Two-way interactive systems also enable specialized users (perhaps those willing to pay for special services such as stock market quotations) to dial up selected special pages.

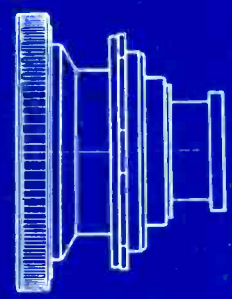
continued on page 92

angēnieux's 15x system

simplicity in engineering = reliability of performance



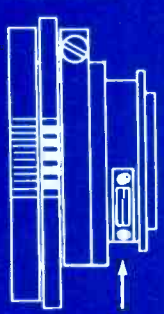
Retrozoom: Front bayonet mount. Maximum horizontal angle: 70° Changes focal length to 7 — 105mm retaining f/1.8 aperture. Retains full zoom capability. M.O.D.: 0.30 meter (1 foot).



Range Extender

1.6X Range Extender changes focal length to 15 — 225mm, f/2.9

Second Range Extender (1.6X) may be mounted in tandem providing 2.56X factor, changing focal length to 24 — 360mm, f/4.7



Rear Mount

Adjustable back focus mount with indicator

Detachable Pistol Grip. Adjustable forward and back for proper balance of camera on shoulder. Accessory bracket available for adjustable angular rotation.

angēnieux corporation of america

1500 OCEAN AVE., BOHEMIA, NEW YORK 11716 • (516) 567-1800
13381 BEACH AVE., VENICE, CALIFORNIA 90291 • (213) 821-5080
4 HAVEN HILL SQ., AGINCOURT, ONT. M1V1M4 • (416) 291-2363

SPECIFICATIONS	BASIC LENS	WITH RETROZOOM 0.76X	WITH TELE-ATTACHMENT 1.66X	WITH ONE RANGE EXTENDER 1.6X	WITH TWO RANGE EXTENDERS 2.56X	WITH TELE-ATTACHMENT AND ONE RANGE EXTENDER 2.66X	WITH TELE-ATTACHMENT AND TWO RANGE EXTENDERS 4.25X
Focal Length	9.5-142mm	7-105mm	40-240mm	15-225mm	24-360mm	25-375mm	41-615mm
Continuous Zoom Range	15X	15X	6X	15X	15X	15X	15X
Maximum Aperture	f/1.8-f/2.6	f/1.8-f/2.6	f/1.9-f/2.6	f/2.9-f/4.2	f/4.7-f/6.7	f/2.9-f/4.2	f/4.7-f/6.7
Minimum Object Distance	0.60m 2 ft.	0.30m 1 ft.	50m 5 ft.	0.60m 2 ft.	0.60m 2 ft.	1.50m 5 ft.	1.50m 5 ft.
Weight of Total Package: lens, iris/zoom, servoes, pistol grip, mount and attachments	2.5 kg 5.5 lbs.	3.8 kg 8.4 lbs.	4 kg 8.8 lbs.	2.7 kg 6.0 lbs.	2.9 kg 6.4 lbs.	4.2 kg 9.3 lbs.	4.5 kg 10.1 lbs.

15 x 9.5 FOR 2/3" PRISM COLOR CAMERAS

Circle 153 on Reader Service Card

SHOW-IN-PRINT '79

Whether Antiope or any other teletext system will ever find widespread commercial use in this country remains to be seen. CBS has taken the lead and is currently conducting A/B comparisons between two teletext systems at its St. Louis, Mo. facility. Watch *BM/E* for an exclusive report on the progress of these tests in coming months.

The "beyond" section of this report is devoted to a truly mind-boggling system shown by Interand — TAPAS (Telestrator Automatic Programmable Animation System). Using a light pen, the operator draws on a screen which can be filled with any of 64 colors, live video, National Weather Service radar maps, etc. There is complete, totally variable control over the size of the light pen's stroke, its color, and also which of the three levels of memory is being written on and which is being masked out. This is all connected to a pushbutton programmable sequencer which will store up to 100 events on any of the memory planes. Thus, truly sophisticated video animation can be created in extremely short time periods. A talking face, for instance, would be created by first drawing the non-moving parts (hair, upper face, nose, ears, etc.) on one memory plane. Moving parts would be entered on another plane, and successive stages of jaw, lower face, and eye movements programmed in sequence. The third memory plane could contain a background, animated or still. The sequencer could then be instructed to run through the program on the second memory plane in any order at any rate, holding the other two planes constant. The masking feature allows sequences such as a car driving in front or behind a tree to be simply created, also.

A symbol generator addition to the Telestrator makes the system even more versatile. Twelve preprogrammed geomatric shapes are included with provision for incorporation of several customized symbols such as weather maps, weather symbols, and station logos. The light pen once again becomes the control device. Touch it down anywhere on the screen and the symbol appears instantly. Touch it down many times and the symbol keeps appearing — as if the light pen were a rubber stamp. Keep it down in one place and the symbol will appear to grow outward from the original. Move the pen, and it will actually draw lines and shapes with the symbol, even if it is the station logo. While one hand is controlling the movement of the pen, the other is left free to manipulate the potentiometers that change the color and size of the symbol being generated. Thus, while drawing a circle with a brush which is effectively the shape of the number 5, one can continually vary its color as it goes around, and also change the size of the "brush" to make it continually increase into a spiral shape.

The basic TAPAS system, with symbol generator and three levels of memory, is $33,860. It is also available with six levels of memory at $48,760, and nine levels at $63,660. We caution all who may be considering this system that it is highly addictive and mesmerizing. Fortunately, the booth was positioned somewhat off to the side or more than a few broadcasters might have never made it around the rest of the exhibit floor.

For more information: Sofratev Antiope, **373**; Interand TAPAS, **374**.

Still store and slow mo action

The battle for electronic still storage heated up this year as CVS and MCI/Quantel showed prototypes of new high-end electronic still storage systems. Though Ampex and Adda Corp. remain the only two companies with high-end mass storage systems on the

continued on page 97

Amber 4400A: for the broadcast engineer on the spot.

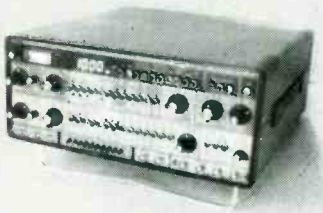
AMBER 4400A MULTIPURPOSE AUDIO TEST SET. Designed to provide virtually every test and measurement function you need in a single, sophisticated, integrated instrument. Its performance equals or exceeds competitive equipment, at a fraction of the capital expenditure. The Amber 4400A is a proven product used by station and network engineers around the world.

Use the Amber 4400A with your oscilloscope to plot the frequency response of a cartridge machine or an STL link; measure the weighted noise of a tape recorder.

Plot crosstalk vs frequency or phase response of a stereo system. Speed up proof of performance measurements. The Amber 4400A makes so much of what you do... so much easier.

The Amber 4400A offers versatility and quality. Its features include sine, function, sweep, tone burst and noise generator; autoranging digital dBm meter and frequency counter; multimode filter; spectrum analyser; frequency response and phase response plotter. High performance: low distortion and high output together with high measurement sensitivity and resolution.

Next to your oscilloscope, perhaps the most powerful test instrument you can own.



Export:
Gotham Export Corporation, New York

Amber Electro Design Ltd.
4810 Jean Talon West
Montreal Canada H4P 2N5
Telephone (514) 735 4105

amber

Circle 154 on Reader Service Card

pictures & power

Leddicons . . .

the image standard for quality camera tubes.

The Leddicon® family of lead oxide tubes includes integral fixed and variable light bias types, extended reds, high resolution greens and H.O.P.'s.

And our Vidicons are the image standard for all broadcast color telecines.

Klystrons . . .

that pay for themselves in 1 to 3 years.

Our 55 KW high efficiency klystrons save 36 KW of input power, every operating hour, compared with other designs. That's why they pay for themselves. EEV klystrons are available from 10 to 55 KW.

Power Tetrodes. . . we have a complete power range for TV, AM and FM transmitters. . . and ask about our TWT's for microwave communication links.

Leddicons®

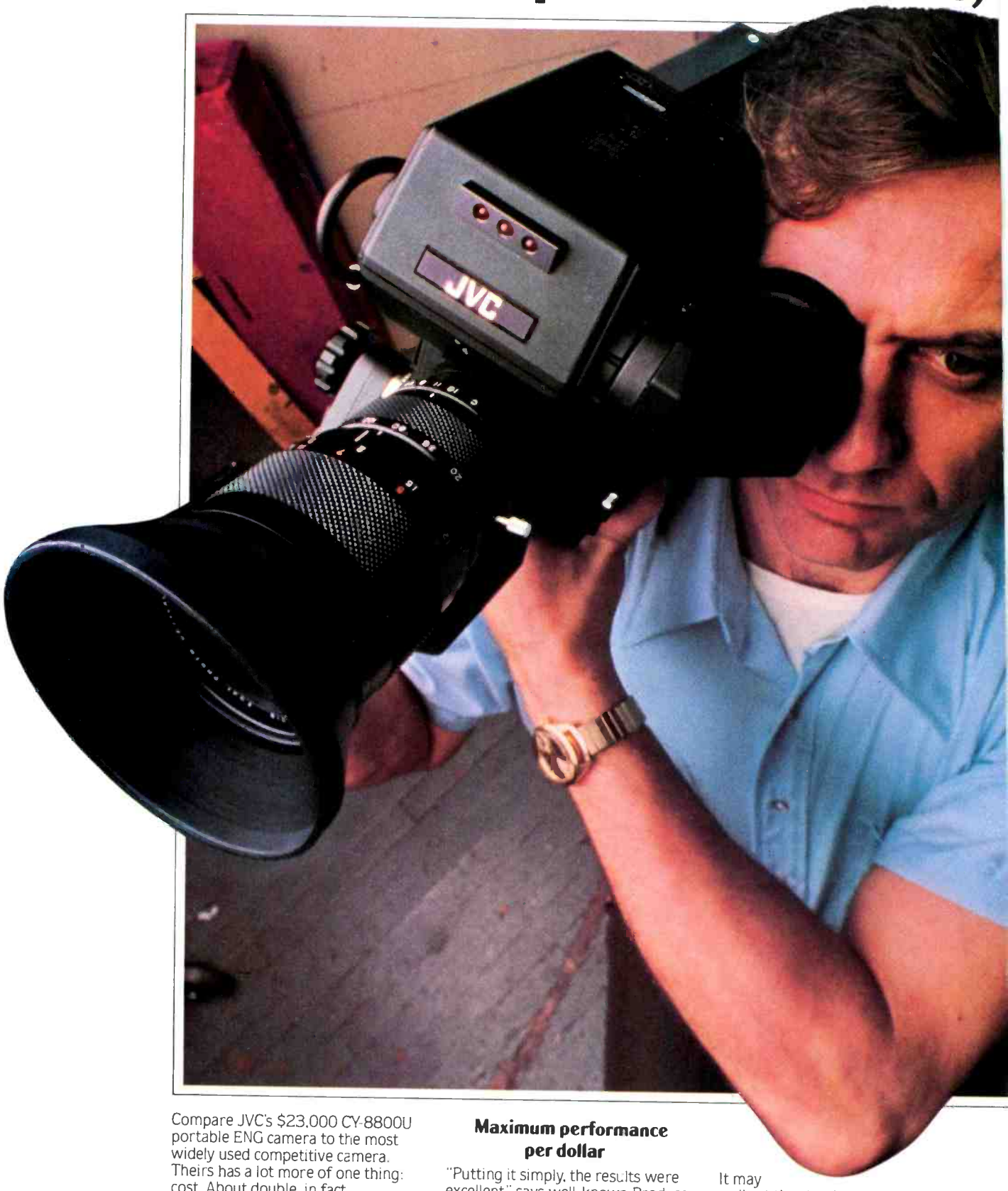
Klystron

®Registered Trademark of EEV Lead Oxide Camera Tubes

Circle 155 on Reader Service Card

EEV, INC.
7 Westchester Plaza, Elmsford, NY 10523, 914-592-6050, TWX 710-567-1215
In Canada: EEV CANADA, LTD., 67 Westmore Drive, Rexdale, Ontario M9V 3Y6, 416-745-9494, Telex 06-965864
In Europe: English Electric Valve Co. Ltd., Chelmsford, England CM1 2QU Tel: 0245 61777, Telex 851-99103
Members of the GEC-English Electric Groups of Companies

Get two for the price of one. Or one,



Compare JVC's $23,000 CY-8800U portable ENG camera to the most widely used competitive camera. Theirs has a lot more of one thing: cost. About double, in fact.

But there, for all intents and purposes, the differences end.

Because, in any ENG/EFP assignment where you find normal lighting conditions, you'd be hard pressed to see any difference in results.

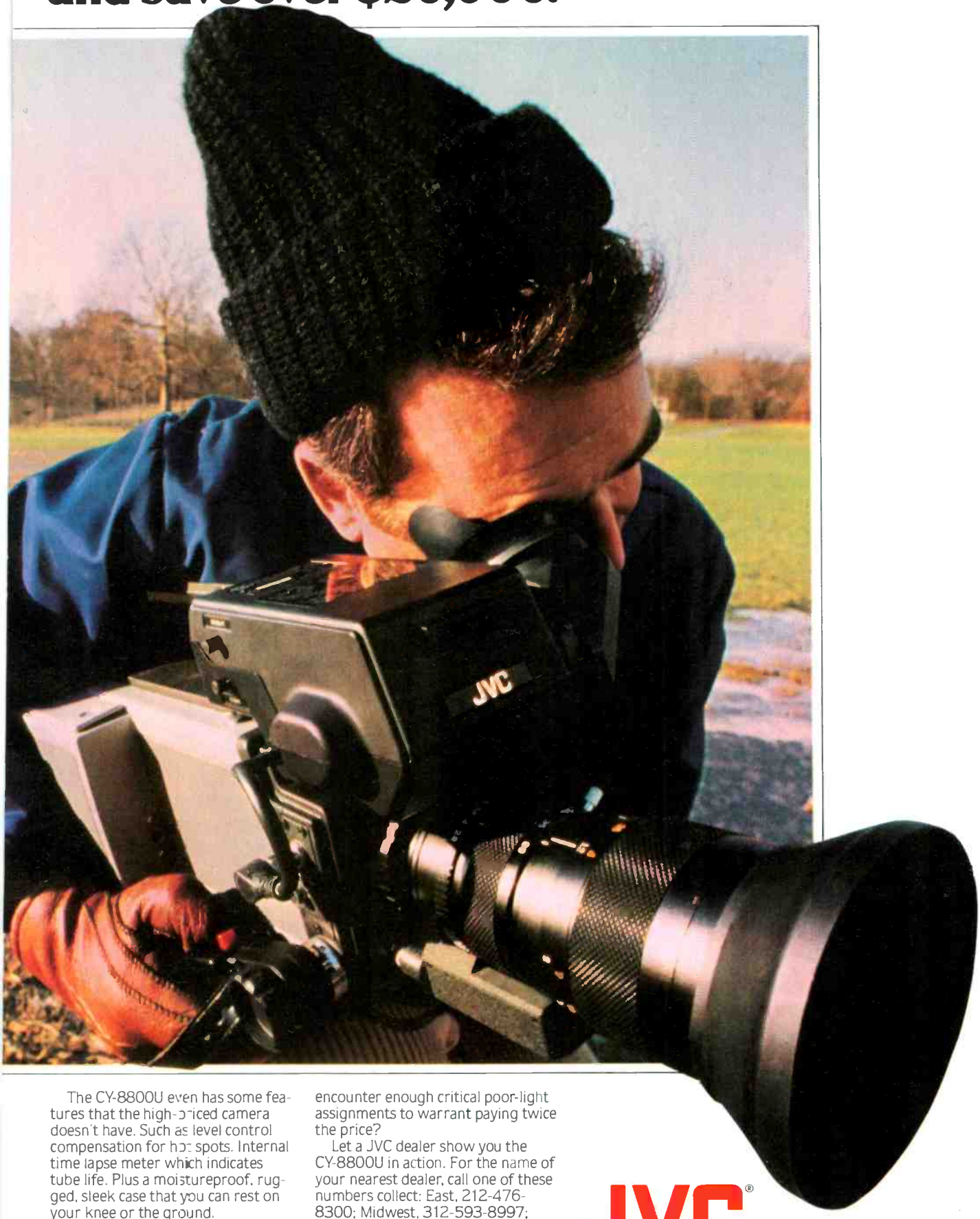
Maximum performance per dollar

"Putting it simply, the results were excellent," says well-known Producer-Director/Cameraman Lon McQuillin in his review of the CY-8800U. "Color quality is marvelous...There are few ENG cameras at any price that can top the JVC's performance, and then only when pushed into very poor lighting conditions...

It may well set the standard for the rest of the cameras in the category."

Behind that performance are high sensitivity and S/N ratio (50 dB). 500-line resolution. Sensitivity doubling (6 or 12dB). Auto white balance. And horizontal and vertical contour correction.

and save over $20,000.



The CY-8800U even has some features that the high-priced camera doesn't have. Such as level control compensation for hot spots. Internal time lapse meter which indicates tube life. Plus a moistureproof, rugged, sleek case that you can rest on your knee or the ground.

What do you really need?

Think about it. If you can get excellent results from JVC, do you really encounter enough critical poor-light assignments to warrant paying twice the price?

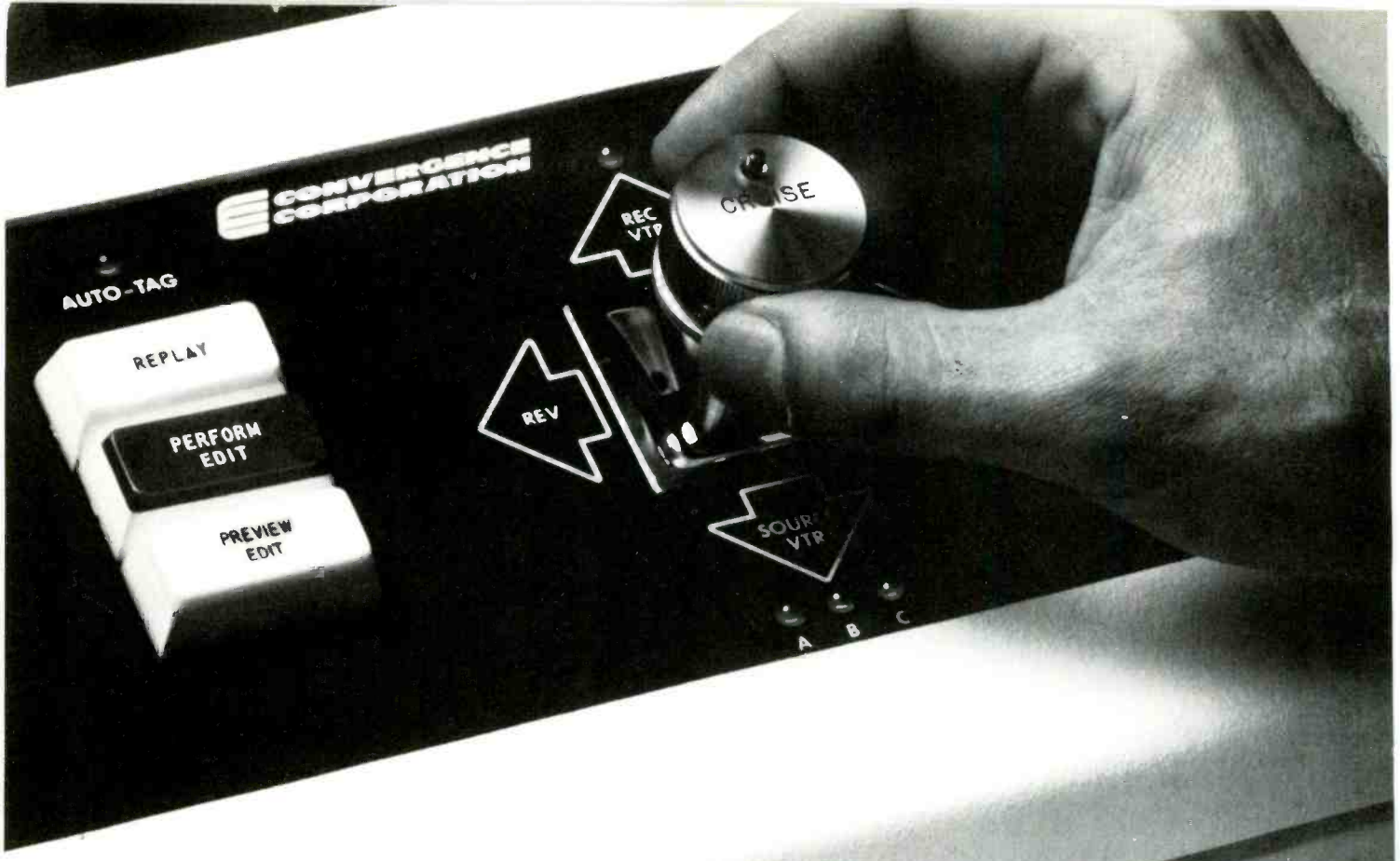
Let a JVC dealer show you the CY-8800U in action. For the name of your nearest dealer, call one of these numbers collect: East, 212-476-8300; Midwest, 312-593-8997; South, 713-741-3741; West, 213-537-6020. US JVC Corp., 58-75 Queens Midtown Expressway, Maspeth, NY 11378.

JVC®

PROFESSIONAL VIDEO DIVISION

US JVC Corp.

Circle 156 on Reader Service Card



Creative tape editing simplified.

Superstick gives you complete creative control. Superstick—a Convergence exclusive—makes videotape editing as easy as working with film. Without taking your eyes off the monitors, this single control lets you switch between scenes and move tape forward or backward at any speed you select. It's that simple.

Liplock® makes sense out of fast talk. Our "Liplock" audio control delivers accurate sound at regular, fast and slow speeds—no more "Donald Duck" or "growl." You can select audio cues in record time with Liplock.

Cut/Lap™ produces deceptively simple "dissolves." This Convergence breakthrough simulates dissolves quickly, economically. Viewers like what they see, and you'll love the low cost.

Ask for a demo—no cost or obligation. See for yourself how Convergence videotape editors let you concentrate on the creative, instead of fighting with the equipment. You'll get the results you want quickly, precisely, and economically. Write or call for details. We'll send information by mail and call you about a demo, at your place or ours.

Editing means Convergence.

CONVERGENCE CORPORATION

17935 SKY PARK CIRCLE, IRVINE, CA 92714
(714) 549-3146 TWX: 910-595-2573

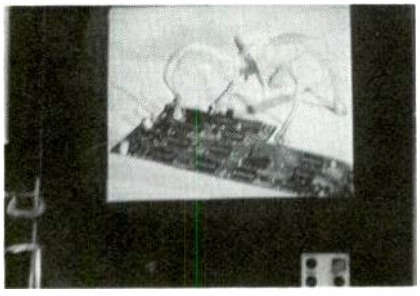
For information Circle 142
For demonstration Circle 157

market (the ESS-2 and ESP systems respectively), new systems seemed to be just around the corner. The CVS system, dubbed IRIS (Image Retrieval Image Storage system), was displayed in the CVS exhibit as a developmental model not expected to be on the market before the last quarter of 1979. Meanwhile, MCI/Quantel showed the DLS-6000 Digital Library System in its suite to selected audiences. As it did with the DPE-5000 two years ago, Quantel preferred to solicit feedback from potential users privately before making a public introduction. Depending on the ultimate features included in the DLS-6000, the systems could be available within a year.

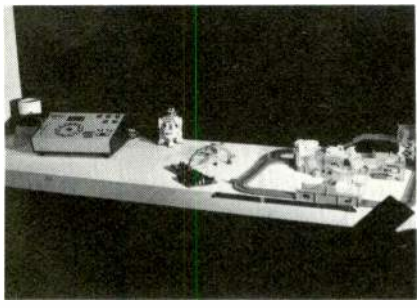
The IRIS system will offer varying slide capacities from as low as 80 frames stored on a single disc to 600 frames on a disc pack. The system will handle up to eight disc drives each, handling 600 slides for a total of 4800 on-line slides. Search time to any slide is about one-half second with instantaneous display from preview.

A major feature of the system will be its list management capabilities, offering the user an eight-character label and 20-character description for each slide in memory. The system will be able to group slides by file label, thereby cutting down on search time for particular slides.

The Quantel DLS-6000 introduces some new wrinkles in slide storage, including the ability to compose new slides from slides already in storage.



Above, a frame from an animated sequence created within just a few minutes, using the display below.



The Eigen control panel (left) enabled the operator to do the animated sequence in the video equivalent of single cell film animation.

The system is extremely compact and will provide 700-slide storage capacity, slide compression and slide positioning in a single 12-inch high rack-mounted unit. The small size and low power consumption makes the people at Quantel see the system as useful in mobile van applications. The storage capacity is expandable in increments of 700 by adding additional disc drives, though this would compromise the size advantages.

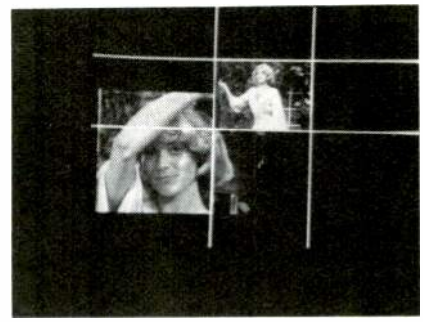
Some of the features of the systems include the ability to access each slide, compress it to any size from full raster to zero, position it anywhere within the raster, and alter its aspect ratio along both horizontal and vertical axes. The positioning and aspect ratio are defined by the alteration of a grid whose vertical members and horizontal members can be moved independently. Once these cursors describe the area that the slide is to fill, the slide is exposed within the defined borders.

Another useful feature of the DLS-6000 is the so-called "Browse" mode which permits up to 64 frames to be displayed at one time. In this mode, the operator may literally browse through the library's contents and select those slides he wishes to use. The details on just how this browse mode can be best used awaits user inputs, according to the manufacturer. Ultimately, a system of this type will probably be priced in the $75,000 range.

Adda Corp. continues to work with its ESP system to provide more and more flexible configurations. The latest addition to the ESP line is the ESP-100B, a 200-frame capacity unit which will sell for about $42,000. This system will allow the user to preprogram up to 25 slide sequences for the two channel outputs. Preview and program outputs are standard. The S/N ratio is still an admirable 56 dB and field or frame storage is selectable. The fundamental advantage of the system over its predecessors from Adda is the suitability for the station with a smaller appetite in the slide department.

Ampex, at this point, seems happy with the ESS-2 as it has evolved from a still store to a Variable Speed Recording system offering slow motion and fast motion in addition to still storage.

Arvin/Echo, Eigen, and Oktel, which present their systems as both still stores and slow motion systems, have remained fundamentally unchanged since last year. Arvin/Echo, hot off its success as principal frame store system for the recent Voyager I spectacular that brought us the first up-close picture of Jupiter, showed a new Time Lapse Recording technique achieved through modifications of its Slo-Mo controller. In a new three-unit configuration, the Arvin/Echo system is able to provide up to 60 seconds of slow motion for either



The white "cross hairs" describe the area in which the slide from Quantel's DLS-6000 will be placed.

A composite can be built using additional slides.

Eventually (just minutes) a totally new slide is created and can be stored with a new address.

production or post-production applications. A new TBC has also been added.

Eigen put on an impressive display of its animation capabilities by having its operator compose a live single-cell animation sequence in just a matter of minutes. With its new random access control of 600 electronic slides in combination with full "Instant Replay," the Eigen system can now be played in single steps, animation crawl, or at speeds up to full motion in either direction. The display can be either field or frame depending on the demands of content. Previously purchased Eigen Disc Recorders can be upgraded to the Random Access controller. The full system is priced at $27,500. The Eigen system is now high-band color.

The Oktel Broadcast Disc Recorders, which come in a BDR-300 Slide File configuration, are now operating in several broadcast stations including KOOL, Phoenix, and KSGO, Kansas City. The 1200 frame capacity BDR-300 and 30-second BDR-400 slow motion recorder remain fundamentally unchanged from the models introduced last year in Las Vegas.

SHOW-IN-PRINT '79

Other slow motion activity was apparent in the exhibits of one-inch VTR manufacturers, including Bosch Fernseh which showed its slow motion controller for the BCN system.

Generally, manufacturers of dedicated slow motion recorders indicated that the slow motion capabilities of the new one-inch VTRs had caused some softening of the marketplace for their machines as many broadcasters have taken a wait-and-see attitude towards slow motion. Now, however, the signs seem to indicate that broadcasters are returning to the idea of the dedicated slow motion recorder. Since the broadcastable slow motion capability of the one-inch recorders comes in a $70,000-plus package, producers are finding cogent reasons for using the slow motion recorders, which generally fall in the $40,000 ballpark.

Jules Barnathan, ABC president, broadcast operations and engineering (left) discusses the BVR-20 with Sony's managing director, Masahiko Morisano (2nd from right).

As a sort of confirmation of this trend, Sony, whose Dynamic Tracking feature on its BVH VTRs offers slow motion, also showed a BVR-20 dedicated Slow Motion recorder. Sony expects to bring the BVR-20, which provides five minutes of slow motion recording, onto the market in the very near future. This slow motion system is a tape-based system rather than disc. Essentially, there are two small tape transports with separate head assemblies. The two head assemblies read and write alternately, providing for frame rate control.

For more information on still stores and slo mo: CVS, **375;** MCI/Quantel, **376;** Adda, **377;** Arvin/Echo, **378;** Eigen, **379;** Sony BVR-20, **380;** Oktel **645.**

Better audio? See the radio section

The television engineer who is responding to the current pressure for better audio may well want a new console, or audio processor, or microphone, etc.

ADDA Corp.'s ESP-200 system control panel is explained to interested broadcasters.

In the radio section of this report he will find a large number of new units for every important function in the audio line, from tape recorders through to limiters and compressors. The important fact about this shelf-full of new audio units is that so many are of top quality. The engineer is likely to be concerned with many factors in his drive for better audio; with an up-to-the-minute audio line, a lot of his problems are solved.

continued on page 101

General Electric Professional Large Screen TV Projection

The new look in TV Production.

You get new dimensions of viewer impact and operating flexibility with a rear-projection background for news-weather-sports and special effects using a General Electric Professional Large Screen Color TV Projector.

The projected background visually displays virtually any signal from a video source, and eliminates production restrictions and video problems possible with electronic backgrounds.

For data display, such as election returns or stock prices, the projector can display signals from an alphanumeric character generator. Also, use it to preview new programming impressively for sponsors and agencies.

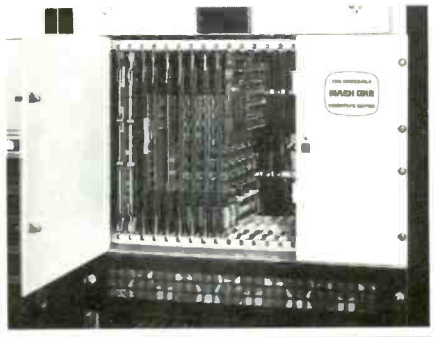
Circle 158 on Reader Service Card

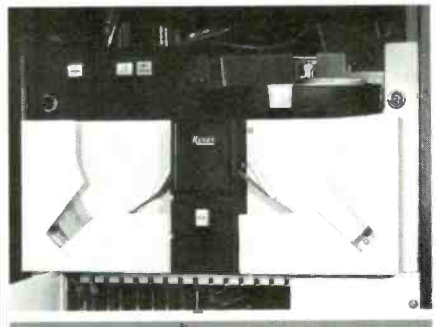
Join a major network and local stations in the U.S. and overseas which have put this exciting, versatile new production approach to work. For application information, call (315)456-2562 today and ask for J.P. Gundersen. Or write General Electric Company (VDEO), Electronics Park 6-206, Syracuse, NY 13221.

GENERAL ELECTRIC

General Electric Professional Large Screen Color TV Projector in rear-projection application at WTMJ-TV, Milwaukee, WI.

MACH ONE.





MACH ONE takes you a step beyond any other computerized video tape editing system now available.

MACH ONE is more versatile, faster and gives you greater list management capabilities.

MACH ONE's dedicated keyboard is editor-oriented and offers one-button commands that eliminate non-essential computer communication which cuts into your editing time.

MACH ONE can be used on-line or off-line with 2″ quad, 1″ helical or ¾″ cassette recorders.

MACH ONE is the only editing system capable of switching between and editing 24-, 25- and 30-frame-per-second formats.

MACH ONE provides a total range of editing freedom with full effects generation and automatic assembly operation.

MACH ONE's space-saving, single-rack electronics are instantly expandable to upgrade your system from a simple, two-VTR, cuts only to a fully-equipped, six-VTR operation.

MACH ONE includes a one-year package of software updates.

To find out for yourself all the reasons why **MACH ONE** is the final solution to fast, accurate and efficient video editing, call your nearest **MACH ONE** sales and service representative.

MACH ONE Digital Systems, Inc.
3515 Cahuenga Blvd. West
Los Angeles, CA 90068 • 213/851-3211

MACH ONE

We're Dedicated

Circle 159 on Reader Service Card

NEED MONITORS NOW?

Lenco's new line of PMM-900 Series professional monochrome monitors is not only the finest available, but it's available *now*. Unlike other monitor manufacturers, we don't make promises . . . we deliver.

Our special warm, white phosphors produce an exceptionally sharp, bright picture with *900 lines of resolution*. And the foot-candle output is twice that of other monitors on the market.

And only Lenco gives you the unique, plug-in modular chassis that allows you to interchange the five individually shielded circuit modules with any of the 900 Series monitors regardless of CRT size.

Couple that with our *two-year warranty*, underscan and pulse-cross options, a range of cabinet monitors from a 9″ through a 23″, dual 9″ and 12″, 15″ and 19″ rack-mounted models. That's a combination that can't be beat.

So forget about waiting for Brands "A", "B", or "C". Lenco is here with the best . . . *NOW!*

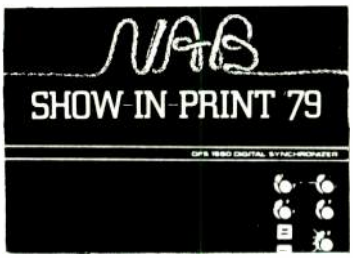
LENCO, INC., ELECTRONICS DIVISION

300 N. Maryland St., Jackson, MO 63755, (314) 243-3147

13620 Littlecrest Dr., Dallas, TX 75234, (214) 241-0976 • Post Office Box 301, Atchison, KS 66002, (913) 367-1146

1 Elmwood Lane, Westport, CT 06880, (203) 226-4482 • 2390 Tiffany Circle, Decatur, GA 30035, (404) 288-2080

Circle 160 on Reader Service Card



TV SIGNAL CONTROL AND PROCESSING - DIGITAL LEADS THE WAY

FRAME SYNCHRONIZERS, TBCs, noise reducers, and image enhancers continued to borrow from each other and address special problems like H and V blanking and ENG. Moreover, competition in the synchronization field since last year's introduction by Adda Corp. of the under-$20,000 VW-1 frame synchronizer has brought out even lower-priced devices with straightforward synchronization as their goal.

MCI/Quantel introduced the DFS-1550, a successor to the DFS-1500 field store synchronizer, priced at $15,750. This device offers synchronization of any non-synchronous NTSC TV signal as well as time base correction of direct record and non-phased videotape recorders. Included in the system is a non-phase detection feature that enables it to switch modes automatically depending on the input signal. Standard features include look-ahead velocity compensation, sync pulse generator, DOC, diagnostic store analyzer, and switch-selectable blanking of VITS and VIRS.

MCI/Quantel also showed the DFS-3500 framestore synchronizer and automatic noise reducer. Chief among the features of this machine is its ability to distinguish between actual noise and swiftly moving pictures. In addition to the noise reduction capabilities, the DFS-3500 offers image enhancement for both vertical and horizontal aperture correction and chromonance/luminance delay correction. Time base correction is also included in the DFS-3500, which can process any incoming asynchronous video signal and has the ability to detect phased or non-phased VTR feeds and adjust automatically. Picture freeze is also included in the system.

Digital Video Systems (DVS) introduced its Phaser, a $17,500 frame store synchronizer/TBC. John Lowry of DVS describes the system as "smart" since it employs two microprocessors, one for memory management and the other for automatic switching between non-synchronous hetrodyne and direct color signals. The ability to provide a "hot-switch" is reflected in a number of the other systems, since this is a common requirement during news programs.

The Phaser is an eight-bit, 4 fsc sampling system offering a greater than 58 dB S/N ratio. Front panel controls include video level, setup, hue, chroma gain, system horizontal phase, subcarrier phase, unity, bypass, and freeze. A freeze of the last frame or field is provided whenever the input signal is interupted.

Adda Corp., which began the idea of the "plain vanilla' synchronizer, added the VIP-1 Video Image Processor to its line this year. The new VIP-1 represents a departure from the plain vanilla approach and offers such additional features to synchronization as time base correction for hetrodyne color VTRs, horizontal and vertical expansion of up to 10 percent to correct H-V blanking errors, and field or frame freeze.

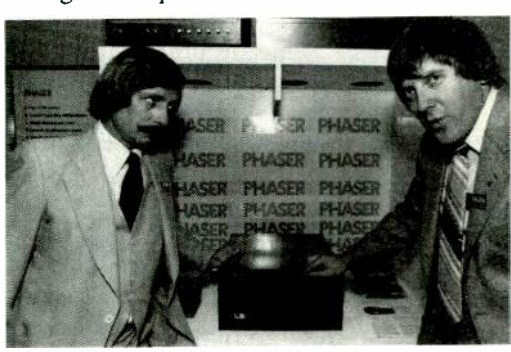
The expansion mode is automatic or manual through a front panel switch. Horizontal and vertical expansion can be adjusted independently or they can be locked together to maintain a strict 4:3 aspect ratio. An LED provides a digital readout of the percentage of expansion applied and the degree of expansion can be achieved in either single steps or in an automatic slewing process.

Earlier this past year, NEC introduced the FS-15/FE which also addressed the problem of H-V blanking errors through the expansion approach. The FS-15/FE provides selectable fixed expansion rates of from one to seven percent, which should be sufficient to correct horizontal blanking errors up to 14.7 μs and vertical errors as great as 32 lines. The FS-15/FE is the standard FS-15 frame synchronizer with fixed expansion added. It can be further upgraded, as can the FS-15, to include time base correction, velocity correction, DOC, picture freeze, etc. The system can also be upgraded to the full DVE package.

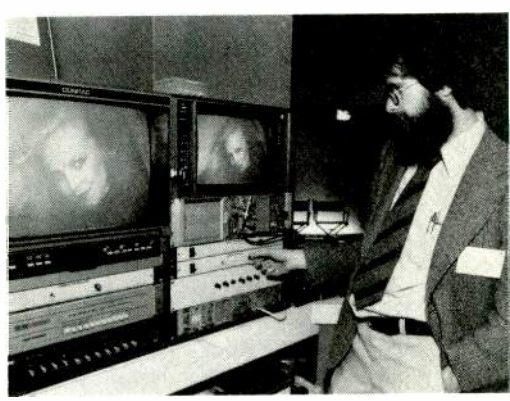
Another new addition to the NEC FS-15 system this year is the DVC-151 Digital Video Compressor. Also introducer earlier, the DVC-151 offers compression and positioning of non-syncronous video sources in conjunction with the FS-15 synchronizer.

Microtime and Consolidated Video Systems (CVS) introduced frames synchronizers entirely new to their lines. The Microtime unit is 2525 Video Signal Synchronizer, which includes time base correction. The 2525 includes Line Error Detection, field one, field two, or frame freeze; a new RS-170A Sync Generator for improved lockup and easy interfacing with any switcher; and Hetrocolor™ processing to provide optimum performance for color under signals. The 2525 will correct VTR signals from no-lock or V/H lock, non-syncronous or synchronous, direct or hetrodyne sources. Standard features include H phasing for output timing control, output H sync, and burst level control. The field or frame freeze function is automatic, or black can be selected. The unit will pass VITS with the same processing as active video. The 2525 can be remotely controlled. The unit is priced at $24,995.

The CVS 630 series of Digital Frame synchronizers, introduced by Consolidated Video Systems, employs a new digital architecture, according to the manufacturer. The CVS 630 uses an eight-bit, 4 fsc coding system that process the video signal in component rather than composite form. As a result, all signal inputs are treated exactly the same in memory. Not only are synchronous or non-snychronous, direct or hetrodyne color characteristics irrelevant to the system, but the component coding technique means that NTSC,

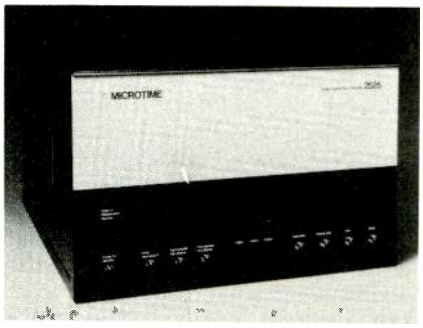


The Phaser from DVS is one of the new low-cost frame synchronizers.



Yves Faroudja showed his new comb filter decoder (left) and record booster (right).

Edutron expanded its line of low-cost TBCs to include new 2H and 16H models with image enhancement.



Microtime introduced its top-of-the-line 2525 video signal synchronizer.

PAL, or SECAM color systems can be easily accommodated with just slight differences between color standard models.

The CVS-630 offers time base correction, digital noise reduction, picture freeze (field or frame), and picture compression and positioning. The optional noise reducer can provide as much as 12 dB improvement. With a direct memory access (DMA) digital I/O, digital interfacing for future expansion of the system has been simplified.

Thomson-CSF Laboratories has expanded its Digital Noise Reducer to a Digital Video Processing System, the DVP-9100. The DVP provides selectable synchronization and precise automatic timing for multiple picture sources without the need for conventional genlocking. Up to 15 dB of S/N improvement can be achieved, and a special ENG mode provides additional noise reduction to the low frequency chroma signals that are commonly troublesome in U-type VTRs.

As a synchronizer, the unit can handle up to four sources through its built-in 4 x 1 switcher which routes signals to the A/D. Time base correction is available on a plug-in board. The DVP-9100 also offers field or frame freeze as part of its noise reduction package. A loss of video input or a hot switch will cause the last good field to freeze until proper video is restored.

The need for time base correction within the frame synchronizer has reached a general level of acceptance on the part of those broadcasters involved in ENG. As a result, nearly all the new synchronizers offer time base correction and earlier frame synchronizers are now offering a TBC option. RCA's TFS-121, for instance, was shown this year in what the company called an "ENG mode." The ENG mode involves the inclusion of time base correction and freeze frame protection from loss of video input or hot-switch conditions. The new version of the TFS- 121 will go for approximately $34,900.

For more information on digital processing: MCI/Quantel DFS-1550, **381;** DFS-3500, **382;** DVS Phaser, **383;** Adda, **384;** NEC FS-15/FE, **385;** DVC-151, **386;** Microtime, **387;** CVS, **388;** Thomson-CSF, **389;** RCA, **390.**

Digital noise reduction developments

Digital noise reduction seemed like such a good idea when Thomson-CSF first showed the DNR-9000 (an outgrowth of CBS research) that the machine eventually won an Emmy. Last year, in Las Vegas, other manufacturers introduced digital noise reducers with varying approaches. MCI/Quantel, CVS, and TeleMation all showed devices that measurably improved S/N in video signals. CVS and MCI/Quantel, on the one hand, have seen fit to take their digital noise reduction technology and incorporate it into other digital systems, since noise reduction seemed to be desirable in the company of other products. TeleMation stayed with a standalone noise reduction approach, its TDF-1 Digital Noise Filter which allows the user to select a combination of digital filters that best suits the picture being processed.

Up to 18 dB of noise reduction can be obtained through the TDF-1 approach. This year Philips introduced the LDM3001 Digital Noise Reducer which, like the TeleMation unit, is intended to be installed in the program line. Unlike the TeleMation filter combination approach, the 3001 is an automatic noise reducer. The input noise and picture movement are analyzed element by element, then adaptive detection circuits automatically adjust the operating threshold for input noise levels over a wide range. The 3001 uses a recursive low-pass filter in which the output signal is recirculated. During movement, an auxiliary side chain detector bypasses this filter to preserve picture detail in a manner which eliminates subjectively noitceable and objectionable noise transactions.

In series with the main store of the noise reducer is a predictor which adjusts the subcarrier phase of the stored signal to make it equal to the incoming subcarrier. This cirucit prevents variations which usually occur in picture-to-picture differences in areas of high color saturation.

For more information: Philips LDM3001, **391** TeleMation, **392.**

TBCs show some changes

Just as frame syncs have shown changes as a result of feedback from users, TBCs are also changing in response to a number of factors, not the least of which is FCC complaints about blanking.

The trend this year is to provide wider windows and circuitry to steer video signals toward the center of the correction window. CVS, for instance, showed AVA, Automatic VTR Sync Advance Generator, which is intended as a standalone accessory to any TBC. Essentially, AVA monitors off-tape vertical sync, compares it with TBC vertical, and generates a "steering" signal which reduces the possibility of excess vertical blanking. As a standalone, AVA is priced at $1990.

AVA circuitry is likely to be included in new models of CVS TBCs, such as the new CVS-520B, which will feature digital video outputs for interface with other digital systems, reduced and simplified color processing, and a new 16H window for approximately $14,990. The CVS-516 will also feature a wider window and an adjustable H-V control.

Other progenitors of new time base correctors are the requirements of Type-C VTRs with variable speed playback. The requirements of AST, which caused Ampex to introduce the TBC-2 for its VPR-2 recorders, have also caused Sony and RCA to introduce the BVT-2000 and TBC-200, respectively, in order to accommodate Dynamic Tracking.

Even though these new TBCs were designed with the new VTRs in mind, they are in and of themselves fine time base correctors. The BVT-2000, for instance, is a nine-bit resolution, 4 fsc sampling system that can be expanded to provide a 12H window. If the time base error exceeds the correction range, no horizontal movement or sync breakup appears in the output of the BVT-2000.

For more information on TBCs: CVS AVA, **239** ; CVS-520B, **393;** CVS-516, **646;** Sony, **395;** RCA, **396.**

Analog enhancement and correction

Edutron, which has made a name for itself with its low-cost, special-purpose analog time base correctors, extended the range of its CCD technology with

continued on page 105

*Simulated pictures?

They're real.

But, if the printing press made as good an impression as Conrac monitors make, you probably couldn't tell.

Conrac's clarity and color consistency are the result of years of experience and technological depth. We were designing and manufacturing monochrome broadcast monitors before the first late-night host delivered a monologue.

And ever since color television began, Conrac's Colormatch™ has been the industry standard. Monitor to monitor, nobody's better at matching screen phosphors for identical color.

What's more, nobody offers a larger selection of broadcast monitors. Only Conrac covers the entire spectrum.

And since we're committed to the professional side of television, your needs get our full attention. Engineering conveniences like front-pull drawers for access to critical controls are standard on all Conrac color monitors. Modular construction assures fast servicing, too.

Be sure to call or write for a Conrac Broadcast and Teleproduction Catalog. It features all our monitors, including the incredible Model 6100 with beam current feedback, independent convergence control and optional comb filter.

See why we still outsell everybody else six to one.

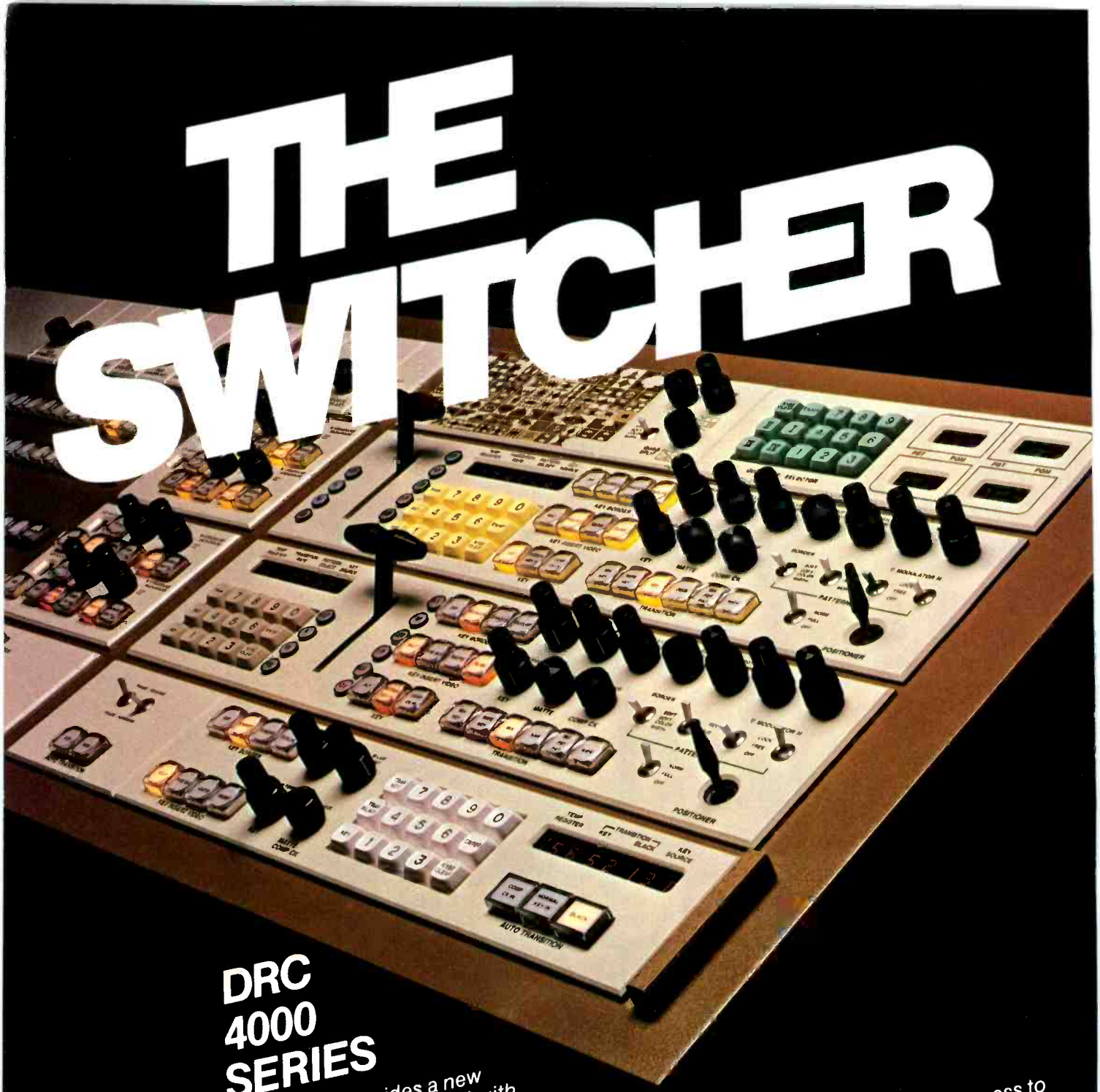
Conrac Division, Conrac Corporation, 600 North Rimsdale Ave., Covina, CA 91722, Tel. (213) 966-3511, Telex: 67-0437.

Circle 161 on Reader Service Card

CONRAC

We're more than meets the eye.

THE SWITCHER



DRC 4000 SERIES

Now Ampex provides a new dimension of video control with increasingly popular Duca-Richardson production switchers. The most advanced, most capable, most f exible big boards in the world of video creativity.

Think of an effect, and get it. A simple, calculator-type keyboard gives you access to 100 patterns. Key ahead of mix/effects from two buses simultaneously. Create each composite from as many as five sources, using just a single mix/effects.

Ten different standard systems let you go for Duca-Richardson quality in a number of size/capability combinations.

Duca-Richardson production switchers. A perfect complement to Ampex color cameras and VTRs. Now the Ampex brand is on the big boards, too.

AMPEX MAKES IT EXCITING.

Ampex Corporation, 401 Broadway, Redwood City, California 94063, 415/367-2011

Circle 162 on Reader Service Card

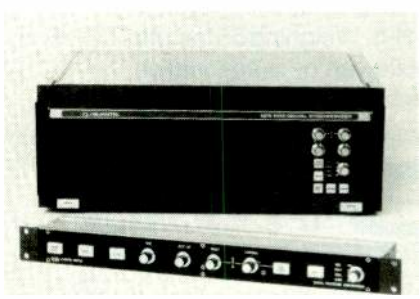
the introduction this year of CCD-based system that starts off as a 2H TBC and works its way up to a 16H TBC and video processor.

The basic ccd-2h Video Time Base Corrector from Eductron costs $8950 and is intended for use with all hetrodyne VTR studios. It includes a color genlock sync generator which meets RS-170A standards and has an oven-conrolled crystal oscillator. Blanking widths are adjustable, as are sync and subcarrier timings.

Noise reduction in the system can improve chromiance up to 10 dB and luminance up to 7 dB. Both horizontal and vertical image enhancement are featured. With the addition of digital circuitry, the ccd-2h can be expanded to the ccd-16h, priced at $14,500. This expansion gives the machine a 16H correction window and the ability to stretch the active video to eliminate black border effects.

Microtime showed its line of image enhancement processors, including the newly designated 2100 Video Image Processor, formerly known as Image Plus, and the 2020 Video Signal Processor, formerly known as the Microtime 2020 TBC with Image-X. Other image processing and enhancement devices were shown, including the Dynsciences Model 888 Video Enhancer for video cassette format its Models 854, 877, and 834 enhancers for improvement of studio camera chains. New from Dynasciences was its Model 6600 Video Processing System intended to restore the input video luminance and chrominance to its original level. The 6600 also reinserts sync and blanking and clips black and white overshoots. A choice of reinserting a new burst of gating through the original burst is available, as is phase-locked black burst. The system includes a sync generator which may be locked to a wide variety of signals.

Yves Faroudja, Inc., made his first solo appearance at Dallas with a line of processing equipment that includes the Record Booster and the YFI Comb filter Separator. The Record Booster is intended to be used prior to recording on any color under videotape recorder, and provides significant improvement in the ability of such recorders to produce image detail. The Comb Filter Separator is designed to provide separate luminance and chrominance components from a standard NTSC encoded signal. The unit provides full bandwidth luminance without ringing or band rejection and keeps the luminance signal free of chroma interference or intermodulation products. Chrominance signals are free of high frequency luma crosstalk. The Comb Filter Separator is designed for numerous applications where non-composite signals are required.



MCI/Quantel's DFS 1550 is one of the new low-cost synchronizers

For more information: Edutron ccd-2h, **397**; ccd-16h, **398**; Microtime 2100, **647**; 2020, **399**; Dynasciences 888, **400**; 6600, **401**; Yves Faroudja Record Booster, **402**; Comb Filter Separator, **403.**

Routing switchers assume increasing importance

Today, large routing switchers have become almost a necessity, what with dedicated 3/4 - and one-inch VTRs, a host of time base correctors, noise reducers, frame syncs and the like, time code, and the necessity of time sharing of expensive pieces of equipment such as large production switchers, digital effects devices, and character generators. To keep pace with the constant demand for larger switchers, manufacturers have turned to the microprocessor for control of the routing system.

With the microprocessor have come operating advantages, too. Touchpad control boxes are common to many of the systems on view at the show. With them, the operator simply indicates by number which output(s) are needed. The microprocessor also enables salvo commands to be programmed easily, and the digital nature of the systems enable them to be controlled from remote sources so that an incoming feed from, for instance, a satellite, can carry a signal that will activate the routing switcher to send the signal to its appropriate destination automatically.

Almost all of the modern routing switchers are capable of audio-follow-video, video only, and audio breakaway at the touch of a button — again thanks to the microprocessor. Systems can carry multiple audio channels in addition to the video. This not only assists in distributing time code around a facility but also paves the way for stereo audio once that becomes a reality. Another advantage of the microprocessor that is found in most systems is the ability to tie devices together with pieces of coax cable rather than extensive lengths of ribbon cable. Often the control boxes are powered directly from the mainframe through the same cable. Automatic alarm circuits in case of system failure and battery protection in case of power failure are other frequently available options.

One of the most impressive of these new routing switcher systems is NEC's TKA-105 which was exhibited as the first input unit and last output unit of the gigantic 120 in by 90 out system that will be used by NBC at the 1980 Moscow Olympics and then installed at KNBC, Burbank (see *BM/E*, April, 1979). LSI circuits are used throughout the system, both in the mainframe switcher and in the control panels, each of which contains a microprocessor. Up to four channels of digital audio are multiplexed directly with the video and passed via wideband crosspoints or output demultiplexing, in which an identical signal is reproduced with dual audio and video outputs. The use of individual microprocessor-controlled touchpads or pushbutton buses also enables the system to tag the source of each signal. In addition to the use of only four types of circuit boards throughout the system — enabling rapid replacement and troubleshooting — the system features VITS inserters at each input so the matrix can be completely checked from any terminal for system performance.

3M (Video Products/Mincom Division) also displayed a new, large matrix, microprocessor-controlled system — its 40X routing switcher and 6500 microprocessor control. The switcher incorporates 40 inputs and 10 or 20 outputs in a single mainframe, with additional expansion of inputs 10 at a time and outputs one at a time. An entire 40 x 1 output channel is contained on a single plug-in board, with output amplifiers and crosspoint cards plugged into each switched module board. Thus, the removal of an output card affects only a single output, not the entire matrix.

A key feature of the 3M system is the flexibility of its controls, ranging from 15, 20, and 40-position momentary pushbuttons with LED or incandescent indicators all the way up to a keyboard/video terminal. The terminal displays the complete status of the matrix as well as all the commands. Software enables extremely simple, practical programming of salvo commands, automatic addresses, machine control, diagnostic routines, etc. Between the pushbuttons and the keyboard controller are both a touchpad control panel with numeric readouts of line and preset sources and a lookup table. Perhaps the most useful control panel in the system is the Universal Control Panel, which can be used to control single or multiple channels.

When using multiple channels, the operator can lock out other locations from access to a channel until released by the operator or master control — making for efficient distribution of devices such as character generators or digital effects generators. The keyboard is alphanumeric and designates not only what type of source (telecine, audio recorder, VTR — up to 12 types), but also which of up to 99 machines per category is to be selected. Preset registers for both audio and video indicate with a tally lamp the type of source, while an accompanying LED displays indicates which machine. The same is true for video and audio lines. Thus, lookup is completely eliminated.

Associated with the 6500 is also a microprocessor-controlled machine control system with an ingenious control panel. The operator first selects the type of source and the machine number, as with the universal control panel for the routing switcher. As soon as the source is selected, tally indicators blink alongside function controls that show which eight of 16 possible controls that machine is capable of (the control for "Reject" and its tally are inoperative, for instance, if the machine to be controlled is a film projector or VTR, while they do function if the machine is a VCR). A lock/unlock button allows the operator to lock out any other control panel from operating the same machine until the operator releases it. The Machine Control System can be used separately, or connected to the routing switcher.

Grass Valley Group, too, introduced a new, large matrix microprocessor-controlled routing switcher at the show — the 440 Series. Available in configurations ranging from 64 x 64 to 1024 x 1024, it is GVG's top-of-the-line routing switcher. Like the 400/410 Series routing/assignment switchers seen at earlier shows, the 440 offers a basic 32 input by 16 output switching matrix. Two channels of audio-follow-video are standard, though the system has options for additional audio channels as well as audio breakaway. Provision is also made for the incorporation of a tally relay system and also a machine control system. One key feature is an elaborate battery power supply that will keep the system operative for as long as 24 hours in the event of a power failure. Controls are similar to those found in most of the systems already discussed and include pushbutton momentary switches, touchpads, thumbwheels, and X-Y controls.

Grass Valley also introduced a stand-alone audio routing system, the 410 Series, similar to the 410 Series audio-follow-video system. The 410 Series can be expanded to a 32 x 64 matrix and larger without the need for fan-out DAs.

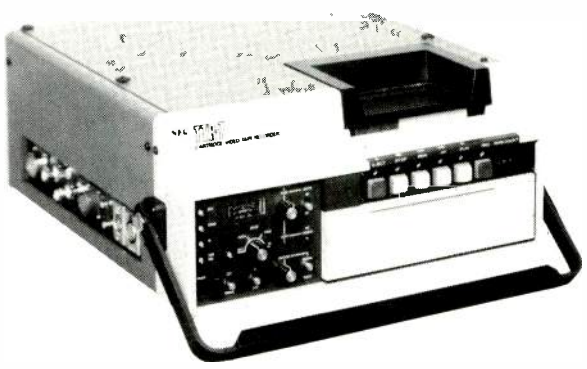
Another brand new routing switcher was unveiled at the show by Vitex, a newly-created division of Vital Industries designed to fill gaps in Vital's marketing plan. The Vitex Model 710 is a totally modular system enabling expansion from a very small (10 x 4) to a very large (240 x 400) system; performance specifications remain virtually the same throughout. The matrix comes in three sizes (10, 20 or 30 inputs), and is expandable in groups of 30. Each matrix has four output buses; output is therefore expandable in groups of four. Up to 26 modules can be housed within a single frame. Two audio and two video channels per bus constitute the standard configuration. Control is achieved either with BCD control or momentary BCD control through a CA code adaptor, or through an X-Y control panel indicating the bus being used, the source, and a source preset. Other controls include a key pad and thumbwheel dial; both indicate the on-line source.

Dynair Electronics featured increased capabilities for both its System

continued on page 109

From Cinema Products

NEC's TTR-7 Ultra-Lightweight 1" VTR



Weighs less than 33 lbs! (Including tape and battery)

Designed exclusively for portable *over-the-shoulder* operation and rugged reliability with utmost stability, the broadcast-quality 1" TTR-7 is ideally suited for the wear and tear of remote use.

For maximum operational and handling ease, the TTR-7 1" helical "D" format VTR utilizes NEC's advanced self-threading cartridge design, which eliminates the majority of field tape-handling problems.

Outstanding Features:

- *Internal battery will drive a minimum of two 22-minute self-threading tape cartridges on a single charge (continuous run).*
- *Despite its lightweight design, the TTR-7 has a built-in video confidence head, edit system, full status indicating system, and will play back in color (with the use of an optional AC/color adapter).*
- *Virtually foolproof servo-control system.*
- *Modular construction permits easy in-the-field replacement of video head cartridges.*
- *Can be ordered with optional second audio channel!*

Also available is NEC's matching-system 1" cartridge VTR, the TTR-5. Weighing 55 lbs., the TTR-5 was designed for mobile van or fixed-location remotes, and light studio use, if desired.

For further information, please contact:

cinema products CORPORATION

Technology In The Service Of Creativity

2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 • (213) 477-1971 • Telex: 69-1339

For video service (7 day/24 hr.), call: 800-421-7486.

Manufactured by **NEC** exclusively for Cinema Products...

MNC-71CP

The multi-purpose portable video camera.

News, documentaries, sports, commercials or TV specials...no matter what you're shooting, the portable MNC-71CP is the ideal camera for all your video production needs. And the best value for your money.

Because, in design and performance, the MNC-71CP is the most advanced camera of its class. With built-in linear matrix, 2-line image sharpener, comb filter and coring, I/Q encoder and color bar generator, automatic iris, white balance, black balance, flare compensation. Delivering *studio-quality* picture resolution and outstanding colorimetry, with ENG/EFP portability and versatility.

ENG/EFP Design Excellence

Manufactured by Japan's largest manufacturer of broadcast equipment — Nippon Electric Co., Ltd. (NEC) — the MNC-71CP incorporates design inputs from Cinema Products, and features many improvements over all first-generation backpackless cameras. It is a totally new video camera system, specifically designed from its inception to be used both as a compact, lightweight, fully self-contained ENG camera, as well as a broadcast-quality studio/field production camera with sophisticated remote production control capabilities.

Studio-Type Applications

There's no need to repackage the camera in a bulky outer shell for studio operation. Just add the optional 5" viewfinder and the portable production CCU (with cable compensation up to 155 feet), or the rack-mounted teleproduction CCU (with cable compensation for more than 1000 feet)... and your MNC-71CP readily converts into an MNC-710CP studio/field configuration. Ideal for multi-camera shoots on location and in the studio.

Around-The-Clock Service

The MNC-71CP was designed for utmost stability and reliability in performance as well as ease of maintenance.

What's more, it is backed by Cinema Products' outstanding after-sales service. With an unprecedented full one-year warranty, and replacement parts available anywhere in the United States within 24 hours! Plus an extensive network of MNC-71CP dealers with "stand-by" loaner/rental cameras...just in case.

And for around-the-clock seven-day video service, you can call Cinema Products' toll-free number: 800-421-7486.

Less Than $1000 Per Month!

The MNC-71CP is probably the most reasonably priced broadcast-quality camera system available. And Cinema Products' easy-term lease/purchase program makes it easier than ever to "pay as you go" on your equipment purchases. For example, you can acquire a complete MNC-71CP outfit, ready-to-shoot, for less than $1000 per month!

So be sure to call on us as you analyze your present and future equipment needs, and we will design a complete package deal specifically tailored to meet your production needs as well as your financial requirements.

MNC-710CP Studio/Field Production System

Rack-mounted Teleproduction CCU

Portable Production CCU

("Paint Box") Remote Control Panel

For full details, call 800-421-7486.

cinema products CORPORATION

Technology In The Service Of Creativity

2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 • (213) 477-1971 • Telex: 69-1339

Portable Studio Quality. BCN-KCA

50 BOSCH FERNSEH 1929-1979

The first portable studio quality recording system with reels and cassettes. 1 inch type B format according to SMPTE/EBU operating in all TV standards throughout the world. Full compatibility in the most extreme environmental conditions. Battery powered, self contained units: Cassette version BCN 5, reel to reel version BCN 20, compact light weight system camera KCA. The advanced and economical equipment for electronic news and field production. From Bosch.

Your Video System Partner

BOSCH

Television Systems Division

Further information obtainable from our regional representatives, subsidiaries or head-office in Darmstadt · Robert Bosch GmbH, POB 429, D-6100 Darmstadt, Fed. Rep. of Germany · Robert Bosch Ltd., POB 166, Watford, Great Britain · Robert Bosch Corp., 279 Midland Ave., Saddle Brook N.J. 07662, USA · Robert Bosch Pty. Ltd., 69 Edward Street, Pyrmont NSW 2009, Australia · Robert Bosch Pte. Ltd., POB 4, Thomson Road, Singapore 20.

Circle 163 on Reader Service Card

21 and Series 10 routing switchers. On the System 21, a 10 x 10 matrix expandable with standard modules to 1000 x 1000, an important new feature is automatic logging provided by means of an RS-232 input/output port for connection to a teletype terminal. The same feature enables complete master control of the entire system through a keyboard connected to a video status display monitor. This type of control is especially effective when executing extensive salvo commands. Other control panels, including thumbwheel, touchpad, X-Y, and pushbutton are, of course, also available, as is a machine control system. Other new features found on both the System 21 and the Series 10 (a 10 x 10 matrix designed for smaller applications) are time code and tally switching. In addition, the Series 10 can also now be operated by remote control over a dedicated telephone line. Both systems offer an extremely wide selection of control devices for both individual and master control.

A somewhat different approach to routing switchers is taken by Di-Tech in its new Model 5840 40 x 15 matrix. Audio and video modules are housed in separate frames, making possible up to three channels of audio with audio and video breakaway simply achieved. Although the system does not actually incorporate a microprocessor, a BCD parallel input port is provided for computer interconnection. Otherwise the system operates with serial RS-232 interfaces for single-connector cabling. X-Y master control will handle a matrix as large as 100 x 100, while individual controls are offered in a wide variety of configurations. Another interesting feature of the system is its backup switching. Each 40 x 1 audio or video crosspoint card can be equipped with a single bus thumbwheel and take button control system and LED numerical readout for same. If control boxes or master control become inoperative for any reason, the switcher itself can thus be easily accessed for manual control.

Image Video, a Canadian company, brought its 6100 Series microprocessor-controlled routing switcher to the show for the first time. Designed for medium and large applications, the system is designed to be as compact as possible with 10 x 1 crosspoint modules plugged into the same board as the input and output amplifier modules. Up to 24 outputs per 10-inch rack frame can be accommodated, with unlimited expansion capability. Single coax connects the frame to a variety of control panels, each equipped with its own microprocessor to handle scanning, LED refresh, etc. Up to 32 control panels can

Utah Scientific introduced four new control panels for its AVS-1 routing switcher.

be accommodated with the standard system. The panels are sequentially integrated by the mainframe computer once every 3.5 ms.

Datatek, a company with a strong committment to routing switchers, unveiled two new lines. The D-4300 series, available for video only, audio only, audio follow video, and split audio operation, comes in 6 x 1, 16 x 1, and 20 x 1 expandable modules. Digital control is used, so that remote control panels are connected by coax cables. The audio portion of the system features a +30 dBm balanced output.

Also new from Datatek is the D-2000 Series, designed for larger installations. Two matrix sizes — 50 x 25 and 25 x 20 — are available, and can be stacked up a 250 x 250 matrix using the standard control system. Each output bus has an independent control port for maximum security, and each bus has its own microprocessor control system. In this way a mixture independent bus control and X-Y control for any matrix allow total security. Further, up to eight levels of control (both audio and video) can be achieved from any control panel.

Utah Scientific, which entered the routing switcher field last year with its AVS-1 system, this year introduced the CAV-7 system which uses the same circuit cards as the AVS-1. Designed to be used at relatively small facilities such as CATV operations, the system offers a choice of audio, video, audio/video, or tally switching at highly competitive prices. 10 x 10 crosspoint cards can be stacked within a frame, with separate cards for audio and video. Three styles each of local and remote control panels offer a wide variety of control options. One important feature of the system is an FSK option which allows for STL microwave or extended distance hardwire control of the system, making it ideal for use at automated transmitter sites.

Utah Scientific also introduced four new control panels for its AVS-1 switcher, including full matrix X-Y control, single bus control, 10 bus control, and a 20 button-per-source panel. All feature loop-through party line matrix connection, continuous status readout, and separate audio and video

Di-Tech introduced a new Model 5840 routing switcher, expandable to 100 x 100.

switching and statusing.

Several other companies exibited routing switcher systems which were introduced at previous shows. One which is enjoying increasing popularity is ADC's 900 Series, which features a matrix of up to 20 10 x 1 crosspoints and LED crosspoint status display, and is fully computer-compatible.

For more information on routing switchers: NEC, **404;** 3M, **405;** Grass Valley, **406;** Vitex, **407;** Di-Tech, **408;** Image Video, **409;** Datatek D-4300, **410;** D-2000, **411;** Utah Scientific, **412;** control panels, **413.**

Master control switchers and technical automation

While competition rages fiercely among manufacturers of production switchers, new developments in MC switchers are relatively scarce.

A new entry in the field is the Vitex 730 Series, which combines video, audio, and machine control functions in a single present/take operation. A single pushbutton activates all starting, rolling, flipping monitors, switching audio and video, key, matte, and mixing and fading that have been preset. 16, 20, or 24-input versions are available (including color black and color backgrounds), plus five audio-only inputs. The system works with three buses — audio breakaway, preset, and program.

A host of options in the 730 Series include downstream keying, bordering and edging with drop shadow, automatic presettable audio levels, and interface with Vital's Micromax-32, Micromax-200, and Vimax-200 control systems. The machine control options provide for complete control of all functions of up to four film/slide islands in addition to programmable VTR prerolls.

Image Video demonstrated its ability to custom-build MC switchers for all types of applications. Standard and optional features of the system include auto fade (variable from 0.2 to eight seconds), downstream keying, full additive mix, and chroma and matte

NAB SHOW-IN-PRINT '79

TeleMation introduced a new, microprocessor-controlled machine control system, the TCS-1.

keying. A full range of audio switching, including audio-followvideo and audio breakaway, is available, along with automatic audio fading with one-second dissolve, fade down/cut up, and cut down/fade up. The system can be fully or partially automated, and can be fitted with a full range of machine controls as required.

Other sophisticated MC switching systems on view at the show were ADC's 3100 Series switcher, with ACTS machine control, Central Dynamics' CD-480 MC switcher with interfaces for a variety of automation systems, Grass Valley's Model 1600-US switcher interfaced with the M200 automation system, Vital's VIX-115 Series switchers interfaced with its Micromax-32 or Vimax-200 automation, and ISI's Model 821. MC switcher manufacturers typically downplay these units in favor of their flashier production switcher models, so getting a reading on the current state of the art is often difficult. Most if not all of these systems are capable of being interfaced with automation systems, and most if not all have associated machine control to go with the switcher/automation systems.

With microprocessor and computer control of all phases of broadcasting becoming more and more prevalent, the dividing line between routing switchers, master control switchers, and technical automation is becoming increasingly less defined.

For more information: Vitex 730 Series, **414**; 3M, **415**; TeleMation, **416**.

A prime example is 3M's new machine control system designed to be used in conjunction with same Model 6500 microprocessor control that drives its new 40X routing switcher.

TeleMation, too, unveiled its new TCS-1 microprocessor controlled machine control system. Capable of controlling up to 100 VTRs and film chains, the TCS-1 delegates machines to any of eight studio control panels or machine control multiplexers. Each studio control panel can operate up to four VTRs and three film chains simultaneously. The multiplexers can accomodate up to 30 MC-24 control panels. These single control panels are designed to be located next to the VTRs and/or film chains they control and provide for local operation.

Twisted pair wiring connects all three types of control panels to the machines. Machine interfaces are standard MI-8 eight-function controls for the VTRs and MI-24 24-function interfaces for film islands. A special feature of the system is its adaptability to situations where particular machines remain dedicated to particular studios or locations.

There was an enormous multiplication of companies offering business automation systems at the convention. Both radio and television services saw the addition of new firms and new software from the established companies. A complete 1979 Business Automation Update, will appear in our July issue of BM/E.

Sync pulse generators, DAs, equalizers

As might be expected, there were no startling new developments in the area of sync pulse generators, DAs, proc amps, equalizers, and other types of signal processing equipment. There were, however, several refinements to existing systems.

Video Aids of Colorado announced that it would shortly be adding variable H & V blanking adjustment features to its Model 500 sync generator.

Leitch showed a new automatic changeover unit designed to work with two sync generators to provide absolutely fail-safe signals. The Model ACO-131 will work with color black, subcarrier, and all standard synchronizing signals and will switch from one generator to the other with a drop of approximately 3 dB in any one of the input signals. Both audio and visual LED alarms indicate the changeover. Leitch also showed its SPG-13N generator.

Grass Valley has also come up with a new line of sync generating and processing equipment. The system includes the Model 3256A generator which can be used as a master, or as a slave locked to encoded or standard subcarrier. Conforming to EIA RS-170 standards, it maintains fixed SCH phasing. Single line subcarrier distribution is used, with optional pulse DAs. Another part of the new system is the Model 3230 isophasing unit, which features automatic video delay of ±20 degrees with overrange indicators. One to 32 DAs per system with five outputs per DA are standard.

GVG appears deeply committed to the open loop synchronization method under which this new system operates. According to a paper distributed at the show, GVG believes that with the isophasing DA within the system, it now offers precision timing and accurate SCH phasing in this open loop approach.

Rounding out its new line of production, MC, and routing switchers, Vitex displayed its new 720 Series video distribution/pulse distribution/audio distribution/video equalizing/video delay amplifiers which are housed within a single mainframe. The modular frame accommodates up to 11 of the amplifiers in any combination. All amplifiers feature six isolated outputs.

For more information: Video Aids, **417**; Leitch ACO-131, **418**; GVG, **419**; Vitex, **420**.

Video monitors heading to ENG

A clutch of monitor manufacturers came to Dallas with new equipment. And if some makers were not introducing new monitor lines, they at least were showing equipment that has been spruced up from existing lines. The predominant trend among monitor makers was toward compact, ready-to-go ENG equipment, particularly suitable to outside broadcast vehicles and mobile studios.

A new 12-inch Trinitron color monitor that features a split screen and a price tag of less than $2000 was introduced by Videotek, Inc. Called Studio 12, the new monitor provides two selectable channels, thanks to A-B inputs. High voltage regulation limits raster variation to less than one percent. The A-B inputs to the split screen, which can be wiped selectively or simultaneously, give the monitor capability as a compositor for matching house color bars, sync, timing, blanking widths, color chroma levels, and burst in addition to its editing functions. The horizontal time constant can be selected for time base correction. The Studio 12 includes pulse cross with individual horizontal and vertical delay and expanded vertical delay (screw driver adjustments are provided for positioning the horizontal and vertical delays) normal/underscan function in addition to switchable internal/external synchronization. The Studio 12 lists for $1995.

Another new Videotek monitor introduced at the Dallas exhibition is the VM-15 Pro, a 15-inch Trinitron that requires 12.25 inches of vertical rack space. Like its smaller but more expensive Studio 12 stable-mate, the VM-15

continued on page 113

Direct drive made Panasonic Series 9000 a great 3/4" editing system. Here's what makes the new 9000A an even better one.

The new Panasonic Series 9000A offers even more impressive performance, even more quality, and more professional features than the Series 9000 did last year. And we still have the lowest price tag in the business.

The new system consists of the NV-9500A editing recorder, the inexpensive NV-9200A player/recorder, and the NV-A950, the versatile editing controller that goes between them.

Together, they deliver the cleanest Panasonic frame-to-frame edits ever.

S/N ratios are our highest ever, 46 dB color and 50 dB black and white, thanks to new crystal-oriented HPF™ video heads. And in addition to those crisp, clean edits, you get reduced audio delay at the edit point. And substantially increased frequency response at the first generation.

That's not all: The newly increased frequency response works with a patented dubbing mode for even better dubbing quality. And still another of the many important improvements is a new tape guide path on the video head cylinder. It reduces tape edge movement for an even better RF envelope, and an even better signal—the best yet from Panasonic.

You get all these improvements, plus professional features you can count on in a Panasonic editing system: Like controls that are completely solenoid-operated. A separate RF output for use with an external TBC. Even subcarrier and external sync inputs for use with a time base corrector.

The Panasonic Series 9000A ¾" editing system. The only thing that looks better than its performance is its price.

For more information, write: Panasonic Company, Video Systems Division, One Panasonic Way, Secaucus, N.J. 07094. In Canada, Panasonic Video Systems Department Mississauga, Ontario.

Exterior cabinetry is simulated woodgrain.

Panasonic®
just slightly ahead of our time.

Circle 164 on Reader Service Card

100 W solid state UHF TV transmitter or transposer

Over 7 500 equipments in operation throughout the five continents.

Designed for unattended operation from 1 W basic transmitter or translator up to dual 1 kW equipments in passive or active reserve

LGT

laboratoire général des télécommunications
51, bd de la République, 78400 CHATOU (France)
B.P. nº 17 - Tél. 071.92.60 + - Télex : 696.833 F

THOMSON-CSF

Circle 165 on Reader Service Card

Pro has A-B inputs for two selectable channel sources. Unlike the Studio 12, however, the VM-15 Pro does not feature a split screen. Price of the monitor, which has broadcast, teleproduction, government, educational, and medical applications, is $825.

An example of a monitor that has been seen before, but which came to Dallas in a new package, is World Video, Inc.'s CP 8000. Although introduced last year as a rack-mounted CDR 8000, the eight-inch Trinitron monitor appeared for the first time as a portable, well suited for ENG/EFP production. The CP (for color portable) 8000 features high voltage regulation, underscan, pulse cross and dual inputs, with all control switches on the front panel. The unit is available in either 12 or 24 volt dc or 110V ac, and while it is presently applicable only to NTSC standards, the manufacturer is thinking "seriously" about introducing the portable unit for PAL and SECAM standards. The CP 8000 is considerably lighter than either the rack-mounted CDR 8000 or the CDR 8800 (which is a tandem setup with two eight-inch monitors). It weighs 26 pounds with its case, compared with the rack-frame versions that are 35 and 56 pounds respectively. The portable monitor lists for $1295. An optional audio amplifier and speaker for the unit costs an additional $50.

Beligan manufacturer Barco-Cobar Electronic N. V. and its U.S. representatives Rohde & Schwarz Sales Co., Inc., and E & O Systems Ltd., unveiled Barco's CM 33 color monitor, a 14-inch unit designed for ENG/EFP applications. Considered a professional product by the manufacturer, the CM 33 accepts one Vpp composite video signal on BNC and "J"-type eight-pole sockets that offer loop-through facilities. The monitor, powered by 110/220 V at 50/60 Hz, is available in NTSC 3.58, PAL, and SECAM versions. The display screen is a 90-degree Precision In Line (PIL) with black matrix (solid colors cannot be set to check correction on this unit, nor does it incorporate cross bars like more expensive monitors). The list price of the CM 33 is $2075. An optional 12 V dc model is offered at $2310. An optional sunshade, which folds down to protect the screen while the monitor is being moved, costs another $75.

Although they have been on the market since last year, Lenco, Inc.'s PCM-500 series color monitors appeared for the first time at an NAB show. The professional monitors, available in three different sizes, feature a switchable comb filter, two NTSC inputs and an RGB input, and 625-line resolution on the shadow-masked PIL picture tube. The brightness, contrast, chroma, and hue controls are internally preset. The preset is a push-pull switch so that manual control does not have to be tuned to minimum to engage the preset switch. Other front panel controls include comb filter in and out, mono only, align (or blue only), and underscan switches. Except for the underscan swtch, all controls — including three input selectors — can be remotely controlled up to 1000 feet from the monitor. Models in the series include the PCM-514, a 14-inch monitor designed for VTR over-console mounting, the PCM-519, a 19-inch CRT with optional rack mounting slides, and the PCM-522, a 22-inch screen monitor that provides maximum viewing area. The monitors are degaussed automatically. Prices range from $4295 for the PCM-514 to $4995 for the PCM-522. The remote control panel is an additional $250.

While Electrohome introduced its 2000 Series of color monitors last year at the Las Vegas NAB, the company has made some changes and now is preparing to market the monitors in western Europe. Consequently, the 2000 series monitors — available in 19-inch and 25-inch CRT sizes — are available not only in NTSC standard, but can be converted to PAL and SECAM simply by replacing optional plug-in circuit boards. The Canadian-built monitors are offered with an optional comb filter.

And a down-market version of a high-resolution color monitor was shown by Amtron Corp. Although considered part of its 7800 Series, which are high-resolution monitors offered with either a 13-inch or a 19-inch CRT, a medium resolution model is being put on the market. Amtron officials admit they are still waiting for reactions to the medium resolution monitor, which is about 10 percent less expensive than either the 7813 or the 7819, priced between $4000 and $4500.

Meanwhile, the BVM-1200 was introduced at the show by Sony Broadcast. This color monitor, with a 12-inch screen and a horizontal resolution of 400 lines at center, boasts a high-performance CRT with NTSC and RGB inputs, as well as adjustable aperture correction and linearity within one percent. Controls include variable AFC time constant, pulse cross, and remote control capability.

The Dallas NAB provided the opportunity for an English company to introduce a monochrome monitor to the North American market. Cotron showed its PMP series in this country for the first time. The monochrome monitors, intended for broadcast or high quality data display purposes, are

The Rank Cintel flying spot telecine now incorporates a digital framestore for reducing flicker, and automated color correction.

available in nine-inch, 14-inch, and 19-inch picture tube sizes. Looped dual video inputs with separate looped sync are standard, as s pulse cross that automatically increases brightness and height. Also standard is a 26 dB subcarrier notch filter. Remote control of A/B channel selection, cue, brightness, and contrast is available through the rear of the units, which feature interchangeable electronics among the three sizes.

"What we've done is basically a clean-up exercise on existing equipment," a Conrac official explained, adding that the California monitor builder was in fact offering its high resolution 13-inch 5700 series NTSC unit with a comb filter for the first time. With the addition of the comb filter, Conrac's 5722 broadcast color monitors are redesignated 5742. The NTSC unit — the company manufacturers monitor for PAL B, PAL M, and SECAM standards as well — with comb filter will cost $800 more than the 5722 monitors, which currently list between $3850 and $4010, depending upon mounting configurations.

Another California electronics manufacturer took the opportunity at Dallas to introduce a new line of monochrome monitors that range from nine-inch to 14-inch to 19-inch CRT size. Cohu, Inc. pulled the wraps from its DM Series, which incorporates the company's Automatic Video Level Control — a feature that allows maintainance of a set contrast level independent of signal strength. All three sizes are available in chassis-only, cabinet, and rack models. The nine-inch version — the DM 9 — also is available as a dual-rack model; one panel can be left blank or the monitor can be purchased with an accessory Tektronix Model 528 or 1420 mounted on either side. The DM 17, the largest monitor of the series, is available as a yoke mount unit. In addition to the Automatic Video Level, the series features 800-line center resolution, back porch gated dc restoration, loop-through input, and differential input available by jumper selection. Scan rates are 525/60 for U.S. and 625/50 for CCIR specifications.

Also showing color monitors aimed primarily at the educational market were Panasonic and Shintron. Introduced earlier this year at the National Audio Visual Association convention in New Orleans, Panasonic's new line includes 13-inch and 19-inch color video monitors and monitor/receivers, as well s a 10-inch color video monitor. Shintron of Cambridge, Mass., displayed its Model 913, a 13-inch receiver/monitor intended for industry and education.

For more information on monitors: Videotek Studio 12, **421**; VM-15 Pro, **422**; World Video, **423**; Barco, **637**; Lenco, **424**; Electrohome, **425**; Amtron, **426**; Sony, **427**; Cotron, **428**; Conrac, **429**; Cohu, **430**.

Telecines and image multiplexers

Surprisingly, neither of the two companies which have cornered the market on newsfilm cameras — Cinema Products and Frezzolini — emphasized cameras at their booths. CP concentrated on its growing line of video products while Frezzolini showed its line of power supplies, chargers, etc. (see reports elsewhere). The real developments in the film area, therefore, were in telecines and image multiplexers.

Rank Cintel, an English company which has consistently shown technological innovations surrounding its flying-spot scanner telecine, this year stole the show with an idea nothing short of brilliant. The Mark 3 now contains a digital frame store, dubbed Digiscan, that not only produces virtually flicker-free images but makes alignment and setup of the system for all types of film a breeze. Also demonstrated for the first time, though announced last year, was TOPSY (Telecine Operation Programming System), a microprocessor-controlled programmer that enables color correction to be programmed for scene lengths as short as one frame. TOPSY is also used to control the pan/scan feature, and will automatically calculate the smoothest move given the start and end point of the pan and the desired frame rate. Both Digiscan and TOPSY are standard features on the Mark 3, and available as options on the Mark 2.

Cinema Products also demonstrated its KM-16 low-cost telecine at the NAB show for the first time. Using any non-dedicated ENG/EFP camera-plus-lens, the KM-16 employs the camera's sync to turn the Xenon lamp on and off 60 times a second. The vertical blanking pulse is also used to coordinate the pin-registered pull-down mechanism in conjunction with lamp circuit. With the camera's lens the magnification is normally one-to-one; slight changes in focal length fill the monitor or camera viewfinder. The image is projected to infinity through a 45-degree mirror that reverses the field.

Cincema Products suggests some unique applications for the telecine, including situations in which it could be brought into a remote area where only film was accessible, then used to transmit the images back via satellite or microwave.

RCA demonstrated its new FR-16 16 mm projector designed for telecine and other broadcast operations. One of the projector's outstanding features is its ability to come up to full 24 or 25 fps speed in less than five film frames, and to stop in one. This feature holds true for both forward and reverse operation. In still-frame, there is as much image illumination as when the projector is running. The speed is incrementally adjustable from 0 to 48 fps, either forward or reverse. Absolutely constant speeds are achieved by locking the projector to 60 cycle power lines or, for telecine operation, locking it to vertical sync.

Cohu unveiled a new model of its popular telecine — the 1550B Series. The major change in the system is a completely new NTSC/PAL encoder with two-level image enhancement, au-

tomatic black and white balance, and automatic differential gamma balance. The new encoder also features easily accessible, front panel plug-in modules plus a gamma remote control panel.

L-W International, manufacturer of the Athena 4000 telecine projector and the Athena 5000 broadcast projector, continued to demonstrate how its projectors can be used to create extremely low-cost, first generation special effects. Both projectors utilize a shutterless film gate in combination with digital control circuits to produce freeze frames, slow motion, instant start and stop, and forward and reverse operation with no image degradation or change in light levels. The digital control circuits also provide for A & B roll effects and matched cuts. Since start and stop are instantaneous, frame-accurate cuts can be made by simply having one projector stop and the other begin. Having stopped, the first projector can then be programmed to search automatically for its next cue. The great advantage in producing film-to-tape transfers in this way is that they are first generation copies from the film. The same holds true for freeze frames and slow motion effects.

Optical multiplexers have also been receiving some attention from manufacturers. Laird Telemedia introduced its new Model 5330 large image multiplexer, designed for use with any large image camera. Laird will shortly have available an adaptor to convert small area cameras to the large image format. The converter will have a field lens plus a neutral density filter wheel. The multiplexer itself features linear bearings and cam followers for smooth, jam-free operation. Price for the unit is $2495.

BEI featured its Model 709 auto-light control module for telecine cameras which can compensate for changes in light levels as great as 10:1 in less than 250 milliseconds. Used with composite video, R,G,B, or R,G,B,Y inputs from the camera, the adjustable black sense level automatically compensates for the changes without affecting color hue over its entire 100:1 light change range. Remote control for setup is provided. Accessories are BEI's multiplexer logic relay card and R,G,B or R,G,B,Y for converting composite video into components if this method of sensing for auto-light control is preferred.

A new development in film technology was also demonstrated by RTI in its Data-Film microprocessor-controlled film logger, timer, and evaluator. The system is ideal for broadcast applications where large volumes of film are handled. Using a touchpad entry terminal as its control, the system counts sprocket holes as a means of determining footage and timings. Connected to

The BEI Data Prompter features character generator-type entry

RTI's TV-120, Data-Film can be used like a film editor and can be programmed to roll to preselected timings or footage counts. A back-timer automatically re-calculates new program lengths. Individual segments can be timed, along with the total program length. The system also has a no-contact cue tab reader and evaluator. Another feature is RTI's film evaluator which keeps count of defects (splicing tape, damaged sprockets, audio pops, and hot splices) and displays the total defects.

A high-resolution film-to-tape transfer process was demonstrated by Image Transform — side-by-side comparison of original videotape and Image Transform's patented transfer process showed that the days of the old kines-

1 watt Transmitter, 7 lbs.

HERE'S YOUR MISSING LINK.

It is 1 watt, 2GHz and frequency agile over 13 to 21 frequencies.

■ Built in AC/DC operation. Uses only 1.2 amps from any conventional 12-15V battery pack.

■ Low noise high selectivity receiver with 16 poles of IF filtering. Weighs 11 lbs. Can be antenna mounted.
■ Transmitter and receiver can be remotely controlled.
■ 5 second "On" operation.

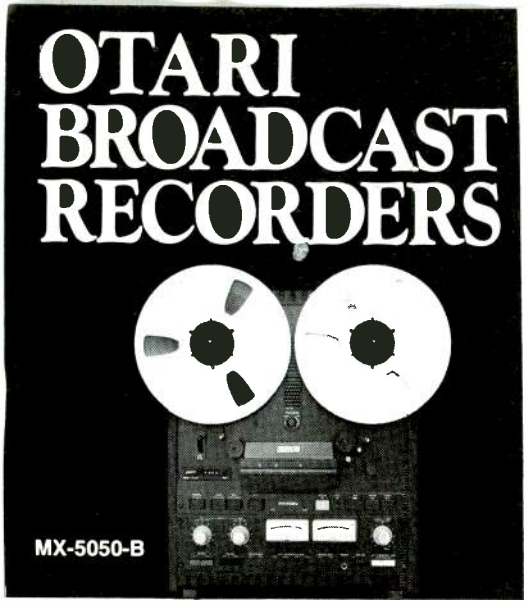
■ 2 audio channels. One with integral mike preamp.

The newest and most advanced development from RF Technology . . . the people who gave you the reliable broadcast quality 950MHz Diversity RF Mikes.

RF TECHNOLOGY INC.
54 Wilton Road
Westport, CT 06880 ■ (203) 226-9511

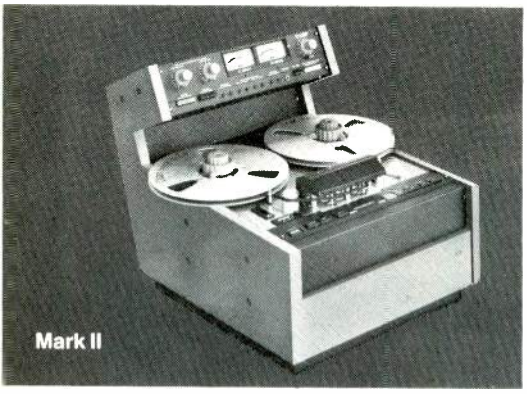
Circle 166 on Reader Service Card

OTARI BROADCAST RECORDERS

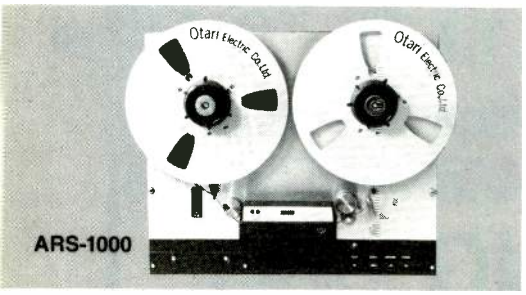


A complete line of professional tape machines (from one to eight tracks) built to meet the current and future needs of the broadcaster (including AM stereo) for long term reliability, high performance, full production capability, and backed by a new expanded program of parts and technical support.

MX-5050-B Compact Broadcast Recorder. Newest version of this field-proven two-channel machine, widely used in broadcasting worldwide. Three speeds, 24 dBm headroom, dc capstan servo, and modular construction.



Mark II Broadcast Recorder. Separate transport and electronics for mounting convenience, plug-in card electronics, complete alignment accessibility. Two-channel ¼-inch or four-channel ½-inch models.



ARS-1000 Automated Radio Station Reproducer. Two-speed two-channel stereo reproducer specifically for automation systems. Ruggedly constructed for long term reliability and continuous operation.

Call Ruth Pruett at 415/593-1648 for your nearest Otari broadcast dealer.

PREFERRED BY PROFESSIONALS

OTARI®

WORLDWIDE **Circle 167 on Reader Service Card**

Otari Corporation, 981 Industrial Road,
San Carlos, California 94070
415/593-1648 TWX 910-376-4890

SHOW-IN-PRINT '79

cope transfer process are truly numbered.

For more information: Rank Cintel Mark 3, **431**; RC FR-16, **432**; Cohu, **433**; Laird Telemedia, **434**; RTI, **435.**

Teleprompting systems discover digital circuitry

Teleprompting equipment, which has remained quiescent for several years, suddenly erupted with some brand new systems at the show.

Telescript, a teleprompter which uses a reflected video monitor counterbalanced with the camera, had a new contrast enhancer with its input camera. The unit, which contains its own power supply, can accept two monochrome inputs and provides four outputs. Using digital analysis and synthesis of a vidicon-tube camera input, the enhancer provides a far more legible image. It also incorporates a positive/negative image switch.

Q-TV also announced that it would shortly have available an image enhancer for its new Model VIV-1 video monitor teleprompter. This enhancer, too, will reverse the polarity of the image. The VIV-1, which will be in production within a few months, is based on a small, 8½-pound monitor which is enlarged as it is projected.

An even more technologically advanced approach is taken by BEI with its new Data-Prompter. This system is actually a digital character generator. The text is entered through a standard keyboard and is automatically formatted into lines of easy-to-read, 36 raster-lines-high characters. Long texts can be easily accommodated since the system can store up to 90 pages of six lines each. Once the text has been entered, the operator simply enters the running length and the microprocessor calculates the rate at which the lines appear. The system will also count down the time of commercials or program segments automatically. Delivery is expected within six months.

A completely different approach to prompting was demonstrated at the Cinema Products booth where a prototype of a new, extremely lightweight system for ENG/EFP cameras was shown. The only electronic parts here are a small motor which advances the acetate scroll on which the text is written and the light bulb to illuminate the words. Both will probably be powered from the camera battery. The whole unit, motor and all, mounts directly onto the front of a portable camera's lens. The lens shoots through a one-way mirror set at 45 degrees to the front of the lens. The reflective surface mirrors the words on the rear-illuminated acetate scroll directly into the performer's eyes while the camera shoots with no appreciable light loss. The low-cost unit makes possible a wide range of new options for the news or EFP crew since the camera can still be hand-held.

For more information: Telescript, **436**; Q-TV, **437**; BEI, **438.**

Lighting — smaller, brighter

Electronic dimmer units and control boards with microprocessor memories, a host of halogen lamps, and a range of shrinking fixtures have marked the direction in which lighting suppliers and manufacturers have been going in recent years.

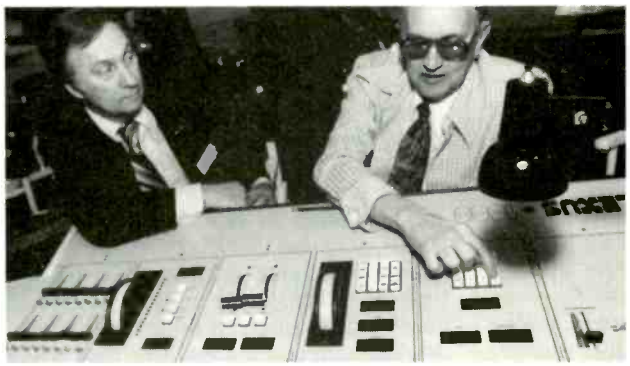
A new line of fresnel spotlight fixtures almost half the size of existing models were introduced by Strand Century. The fixtures, manufactured by Ianiro of Italy, are called "bambinos" and are available in 2000, 5000, and 10,000 watt outputs. The 2K bambino, fitted with a six-inch fresnel lens, puts out as much light as 2K spot lights with 10-inch lenses, according to Strand Century. It weighs 14 pounds compared with more traditional 2K fresnels that weigh 21 pounds. The 5K bambino has a 10-inch lens, while the 10K carries a 14-inch fresnel lens. But light output is equivalent to other 5K and 10K units that require 12-inch and 20-inch lenses respectively. Strand Century claims the cost of the new line of film and television lights is competitive with the more traditional, but bulkier, units on the market.

Although the hit of Skirpan's booth was its Autocue lighting control system, no stranger to lighting technicians, the company introduced a multi-channel dimmer chassis that can be mounted on a 19-inch rack. The unit, called Type K, is based on the Type C plug-in dimmers. Type K, however, provides either three (2K/3) or six (2K/6) 2000 watt dimmers on a single rack-mounted chassis, so systems may be constructed more compactly.

A compact lighting control console with memory, called the Performer, was unveiled by Kliegl Brothers. The Performer, which in the six weeks preceeding NAB had racked up 50 sales, is available as a 32, 64, or 96-channel system, with accompanying price tags of $14,000, $16,000, and $18,000, depending upon model. The Performer is offered with 100+ or 200+ memories, and on optional tape unit for library storage and recall for infinite capacity expansion is offered. An integral back-up matrix assigns channels to group masters, of which there are 10 controls.

continued on page 118

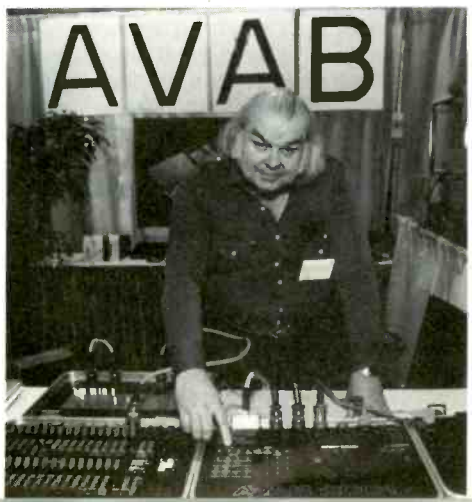
Strand Century showed new HMI lights by Italian manufacturer Ianiro



Berkey Colortran Plexus 1000 offers a modular memory control system

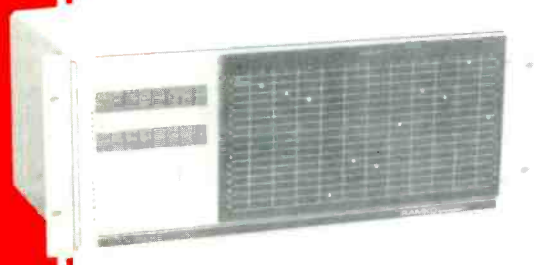
Mole-Richardson displayed a full range of HMI Mole Solar-Arc spotlights

Kliegl showed the Performer lighting control panel with memory of 100 to 200 scene settings



Avab showed a remarkably compact lighting control panel housed in a suitcase

NEW! The most useful audio tool your station may ever buy.



FORGET THE PAST! The new ARA-1612 "electronic patch panel" will provide your sterec or mono station with flexibility and performance that, until now, you could only wish for. And at about the same price as todays patch panel systems.

Local and remote access to all station audio sources simultaneously and individually. No more signal degradation due to branching or impedance mismatches. No more operator interruptions due to patch panel limitations. In fact, the basic system can feed from 16 sources to 12 different locations at once. Expansion capabilities to 45 in and as many out as needed.

In addition the ARA features — local and remote lighted output status displays — individual, gain adjustable, input amplifiers — programmable output cards for stereo and/or mono feeds — dual, instantaneous switch over, power supply for 100% on air reliability — balanced in and out — and a lot more. All backed by a 2 week trial period and our famous 2 year warranty. Priced from $1099.

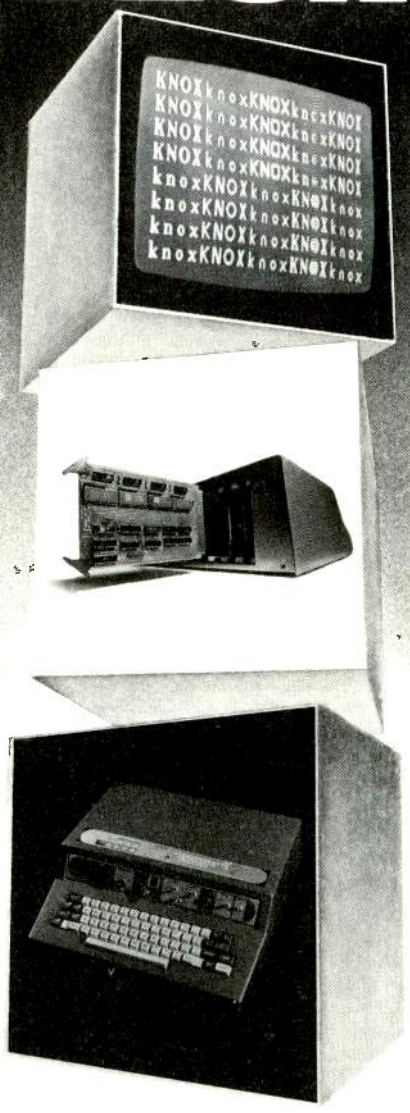
Don't delay! Write, call collect or contact your nearest RAMKO Rep. today. Ask for our new full color brochure, #ARA 379.

RAMKO RESEARCH

11355 "A" Folsom Blvd.
Rancho Cordova, Calif. 95670
(916) 635-3600

Circle 168 on Reader Service Card

KNOX BLOX



The K128 Character Generator is something to build on.

Every innovative feature found in today's K128 can easily be added to our very first K128 — and to every unit we've built since.

The Knox design assures that the K128 you buy today can always be upgraded to include all of the latest functions of tomorrow's K128.

Get your hands on a Knox — and build something.

Knox

9700-B Palmer Highway
Lanham, Maryland 20801
(301) 459-2106

Circle 169 on Reader Service Card

SHOW-IN-PRINT '79

In addition to the new control console, Kliegl was showing a range of Kobold HMI spotlights (as was Roscoe), which are being imported for the first time to this country. The variable-focus lights, which run from 200 to 4000 watts, operate from 300 hours to 750 hours at 5600 degrees Kelvin with Osram HMI lamps.

Another manufacturer to cash in on Osram's recently developed metallogen lamp is Mole-Richardson, which displayed four new HMI Mole Solar-Arc spotlights in 575, 1200, 2500, and 4000 watt sizes. The lamps, debuted at last October's SMPTE meeting, provide an even daylight field from spot-to-flood. A consistent color balance throughout the rated life of the globe is claimed, and daylight filters are unnecessary with these units.

Prewired telescopic power bridge packs, available with optical remote-controlled electronic dimmers, were introduced by Packaged Lighting Systems, Inc. The packs, which resemble a lighting technician's erector set, are available in two forms: PB-220/315 includes two 20-foot and three 15-foot power tracks, four CS-4 strands, and six SA-1 stand adapters and costs $25000; PB-210/38 is a kit with two 10-foot and three eight-foot power tracks, four CS-4 stands, and six SA-1 stand adapters that sells for $1600. All tracks are prewired with grounded 15 amp receptacles on independent circuits. In addition to the power bridge packs, Packaged Lighting also introduced its Traveliter quartz fresnel spotlights, available in three sizes. The smallest is a 4.5-inch lens 250-325 watt spot. The midrange unit, 350-650 watt, incorporates a 6-inch fresnel lens, while the largest lamp in the series has an 8-inch lens with an output of 1000 to 2000 watts.

A memory control system offered in module form and dubbed Plexus 1000 was shown for the first time by Electro Controls, Inc. The system is offered in several configurations: a memory-only record and playback; a memory-only system with space for future manual single or two-scene preset; a total system with memory and single or two-scene manual; a manual-only; single or two-scene preset; or a manual single or two-scene system with space for future memory capability. An optional video display (CRT) displays complete cue and sequence with preview capability to simplify playback, sequence, or intensity modification. Cues may be recorded from either the manual or memory control modules, and an optional mini-discette drive unit offers a non-volatile, quick access storage system.

Two new focusing scoop lamps have been introduced by Berkey Colortran. The fill/flood toning lights, in either 1000 or 2000 watt sizes, feature continuously variable focus from medium beam to wide flood. The 1 kW light provides 42,000 candlepower in spot focus (27.5 degree beam and 60.5 degree field beam) and 16,845 candlepower in flood focus (50.8 degree beam and 88.0 degree field). The 2 kW scoop, which has a steatite insulated socket assembly rated at 600 volts that can operate at 200 degrees C continuously, throws 88,000 candlepower in spot focus (28 degree beam and 68 degree field) and 21,937 candlepower in flood (75 degree beam and 110 degree field). Both are fitted with quartz lamps.

The company revealed that this autumn it plans to replace its Multi 6, Multi 10, and Multi 20 lights with glass-front lights rated at 650, 1000, and 2000 watts. Although no designation has been made on these new lights, Berkey officials contend that they will have improved optics and smoother focusing machanisms — the lights will be twist rather than slide focused. Costs will be comparable to the current Multi series. Production of the new lights has started in London, England, but Berkey expects to manufacture the units later this year at its Burbank, Calif., plant.

A lightweight soft light, the 1200 watt Bubblelite, provides the equivalent of a 2000 watt standard soft light, according to Cinema Products Corp., which introduced the new unit. Bubblelite incorporates a newly designed reflective-type umbrella. The light intensity at eight feet is 200 footcandles, provided by two 600 watt tungsten-halogen single-ended lamps. The Bubblelite, intended for film and television field production, can be either a shadow fill or a key light where feathered, soft, and deeply graded shadow light is desired. The light kit, which includes two Bubblelite heads, stands, and related cables fitted in a case weighs less than 12 pounds. The kit, less lamps, is under $500.

A follow spot that features the Osram HMI lamp was unveiled by Christie Electric. Called HAL, the follow spot, which claims two to three times the equivalent light power of an incandescent unit, is available as either a 575 or 1200 watt source. In a 60 foot flood throw the light produces 280 feet Lambert, while at 200 foot flood throw, its illumination strength is 50 feet Lambert. According to Christie, within a 20 foot diameter circle the HALs will cast twice the light of a Supertrooper arc lamp.

With the variety of new lights making U.S. debuts at the show, lamp manufacturers were not to be left in the cold. Both General Electric Co. and

Sylvania Lighting Products displayed several new lamps.

General Electric's FEL, FEY, and fresnel lamps have one-piece ceramic bases coupled with shorter filaments this year, so the lamps are more compact. And for the first time, GE has dischro-coated the inside of its Par lamp lenses, which are then hermetically sealed. The company argues that dichro coating inside the lens prevents abrasion of the daylight filter material.

Meanwhile, Sylvania introduced a new line of tungsten-halogen lamps, called "XL," which are rated at 500, 750, and 1000 watts. They have an average rated life of 2000 hours, claimed to be the longest life of any 3050 degree Kelvin tungsten-halogen lamp on the market. At the same time, the company has launched its 2000 watt DCT, which has an average rated life of 1000 hours, some four times the average life of the CYX lamp that it directly replaces. The DCT has a color temperature of 3050 degrees K, compared with 3200 degrees K for the CYX, but the difference is not considered critical in most tasks.

A positive action pipe clamp that holds up to 200 pounds was shown by Olesen, which is distributing the clamp manufactured by J.R. Clancy. Called Sure-Clamp, the unit grips pipe up to two-inches in diameter. The weight of the lighting fixture being hung from the clamp automatically secures the jaw lever, so hand-holding lights in position while tightening the clamp is unnecessary. List price of the Sure-Clamp is $20 a piece, although quantity discounts are offered.

Also new from Olsen: three television studio packages that range 15 feet by 20 feet, 20 feet by 30 feet and 30 feet by 40 feet. Each package is ready to install and includes all necessary lighting equipment with lamps, hanging hardware and color filters, dimmers and color console, patch panel and connector strips, and rigging and curtains. Prices for the packages are available from Olesen.

For more information on lighting: Strand Century (laniro), **635;** Skirpan Type K, **636;** Kliegl Performer, **638;** Kobold, **439;** Mole-Richardson, **440;** Packaged Lighting power bridge packs, **441;** Traveliter, **442;** Electro Controls, **443;** Berkey, **444;** Christie, **445;** GE, **446;** Sylvania, **447.**

Film and videotape

Last year Kodak announced a new, rapid developing process for 16 mm newsfilm — R VN P. Reports from stations around the country indicate a widespread conversion to this new technique. Meanwhile, Kodak took the 1979 show as an opportunity to reveal

continued on page 120

STILL NUMBER 1

in design, performance and features

Spotmaster®

5300B

MULTI - DECK

The cart machine with features competitors can't match . . .

FEATURES	5300B	ITC 3D	HARRIS 90-3
Nortronics® Duracore™ Heads	YES	YES	No
Single Connector Plug-In Decks	YES	No	No
Companion Record Amplifier	YES	YES	No
Low-Voltage Solenoid	YES	No	No
Independent Azimuth Adjustment	YES	No	No
Shielding Above & Below the Head	YES	No	No
LED Service Aids	YES	No	No
Tapered Cartridge Guides	YES	No	No
Companion Audio Switcher	YES	YES	No
Do the decks lock in place to a bulkhead permitting operation with the front panel down?	YES	No	YES

Plug-in removable decks and superb electronics make this the most up-to-date monaural or stereo three deck cart machine available. Rugged machined deck, quiet air-damped solenoid, unique cartridge guidance system, drop down front panel and run lights next to each deck. The improved 5300B now includes individual level controls for each cue tone.

For complete information call or write your local *Spotmaster*® distributor or contact:

BE

a FILMWAYS company

BROADCAST ELECTRONICS INC.

4100 NORTH 24th STREET • P.O. BOX 3606
QUINCY, IL 62301 • PHONE: (217) 224-9600

Circle 170 on Reader Service Card

that over 85 percent of prime time programming is still produced on film. Another revalation was that U.S. stations, which a couple of years ago maintained 1500 newsfilm crews, still maintain some 1200; in comparison there are about 1200 ENG crews.

New developments were evident in the area of videotape, however, with several major companies rushing into mass production with their new one-inch tapes.

Ampex's new 196 Series one-inch helical tape is finally available. An Ampex spokesman confided that, until now, Ampex engineers had been using videotape supplied by other manufacturers, but that they themselves were "estatic" about this new tape, which offers S/N in excess of 51 dB and fewer than 15 dropouts per minute average maximum, and is capable of exceeding 2000 passes (in still frame more than 60 minutes).

Ampex also announced at the show that all of the plastic molding for its 167 Series ¾-inch videocassettes will now be done in-plant. Users had been experiencing some problems which were attributed to faulty plastic molding by outside vendors.

Fuji provided a very convincing demonstration of the audio capabilities of its H621 one-inch tape. A full stereo soundtrack, played through good loudspeakers, proved the equal of any professional audio recorder. The Berridox-coated tape also provides less than 15 dropouts per minute, and is capable of 2000 passes (more than one hour in still frame). Fuji was also promoting its new Beridox formulation on U-matic, VHS and Beta format videocassettes.

3M is another company actively promoting one-inch tape — its Scotch 479. Like the tapes already described, it features less than 15 dropouts per minute, 2000-pass capability, and up to one hour of continual use in still frame. Scotch videocassettes — both the MBU-5S heavy-duty type and the UCA cobalt-doped high energy oxide formulation — are enjoying good sales.

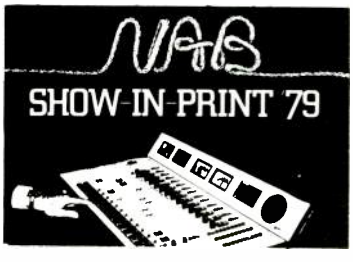
Memorex, in addition to offering its MRX-716 one-inch tape that meets the same performance criteria as the other one-inch tapes outlined above, and its Q2HD videocassette line, had a new product to help users of ¾-inch VCRs. The spindle height alignment gauge prevents tape edge damage caused by misalignment of spindle heights in VCRs by metering the heights of the two spindles. The gauge simply slips into the VCR like a videocassette and the heights are read on two dials.

Agfa-Gevaert, a European company, introduced two new videotapes to the U.S. market. PEV-500 is a two-inch quad tape that offers 2000 passes, less than 15 dropouts per minute, and an audio S/N greater than 53 dB. Agfa's Videochrom U-matic videocassette is a chromium dioxide formulation with better than 45 dB video S/N and less than 30 video dropouts per minute.

The Video Tape Company, as its name suggests, took the show as an opportunity to reveal the performance record of its all-format videotape duplicating services.

Another new useful videotape accessory is Garner Industries' Model 270 Video Raser Unit. In less than five seconds, the bulk eraser will pass reels up to 8½ inches in diameter and all sizes of videocassettes on a continuous belt over high-flux coils. Erasure level in -75 dB.

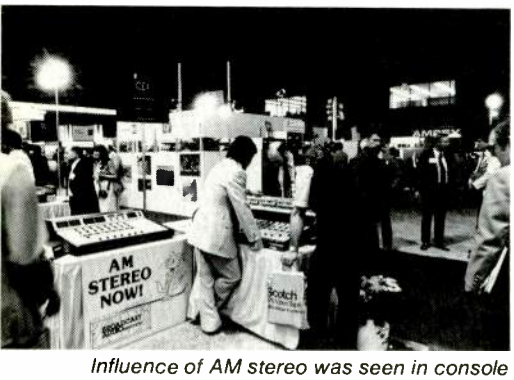
For more information on videotape:
Ampex one-inch, **448**; Fuji, **449**; Memorex alignment gauge, **450**; Agfa-Gevaert quad tape, **451**; videocassettes, **452.**



RADIO: BUILDING BLOCKS FOR THE GREAT UPGRADE

FOR RADIO BROADCASTERS, Dallas '79 did not unveil any technological sensations. But radio got the broadest and strongest technical support in history for the upgrade in signal quality that is accelerating throughout the industry. The main message of the show: the equipment is here to do it!

The forces behind the upgrade are by now pretty familiar: tightening competition in most radio markets, hi-fi consciousness rapidly spreading among the listening public, the imminence of AM stereo — and of course, technical advance itself. The Dallas show brought together broadcasting's awareness of the need, with the hardware industry's greatest readiness to meet the need. Add one more factor — radio's most profitable year in history — and we had all the elements for a "selling" show.



Influence of AM stereo was seen in console displays

We got it — Dallas was the "sellingest" radio show that anybody could remember. A gentleman in a Texas-type hat walked into the booth of one of the top console makers, saying, "I want that console and I've got a truck at the back door to take it home" (apply Texas accent). When he was invited to sit down and discuss credit arrangements, he said, "Credit, hell! I've got $35,000 in cash right here in my pocket!"

That was obviously a freak, but it does help express the character of the show. A top maker of program automation equipment sold six systems on the floor. The vice president of a small firm, with a product for a restricted, specialty market, when asked what the response had been, said, "About 40 times what we expected."

AM stereo: still the big wait

The "underground" topic at the show was, of course, AM stereo, but the force from this underground came to the top in an emphasis on stereo consoles for AM broadcasters (see below), in "stereo readiness" of several transmitters, and in the audio upgrade in general.

Harris did give a "live" demonstration of a revision of its CPM system, with a "variable angle" function that changes the system from a fixed phase angle of 30 degrees to an angle determined by program level, which, says Harris, has the same S/N ratio as a pure 90-degree quadrature system. The material heard through the system had apparently very low noise, low distortion, and high separation.

Belar played recordings made at many listening spots of experimental broadcasts at WJR, Detroit, using the Belar system. Again, the results were persuasive.

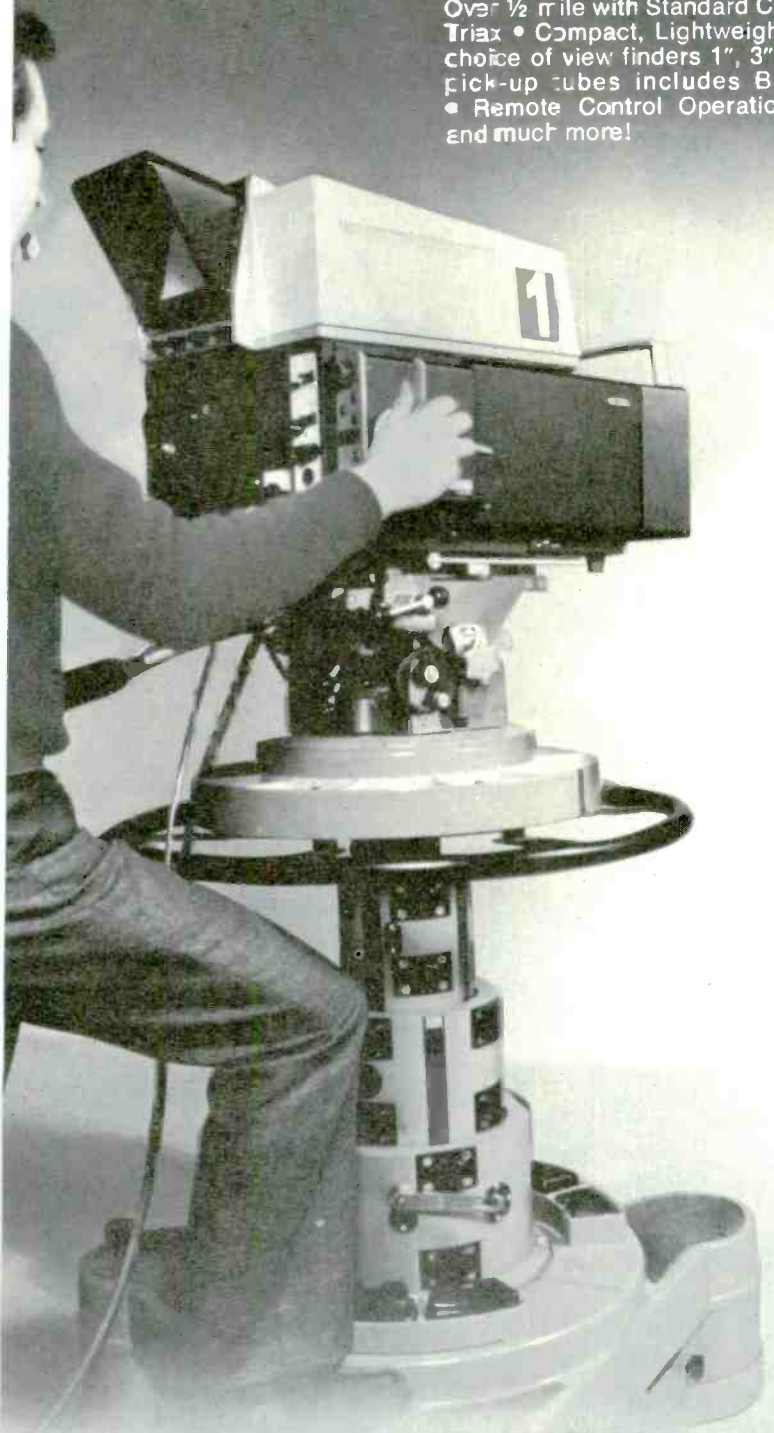
What were the products that stimu-

continued on page 125

The NEW MARK IX Family of Color Cameras

We Have It All!

• Studio/Remote/Portable • Multiple Configurations • Standard or Triax Cable • Low Power Consumption (400 Watts) • 110/220 VAC or 24 VDC • Manual or Automatic Registration/Operation • Over ½ mile with Standard Cable, up to 1 mile with Triax • Compact, Lightweight CCU • Select from choice of view finders 1", 3" or 7" • Selection of pick-up tubes includes Bias Light and HOP • Remote Control Operation up to 500 ft. . . . and much more!



STOP PRESS!!
1" Helical Type C VTR's
We've Got Them!

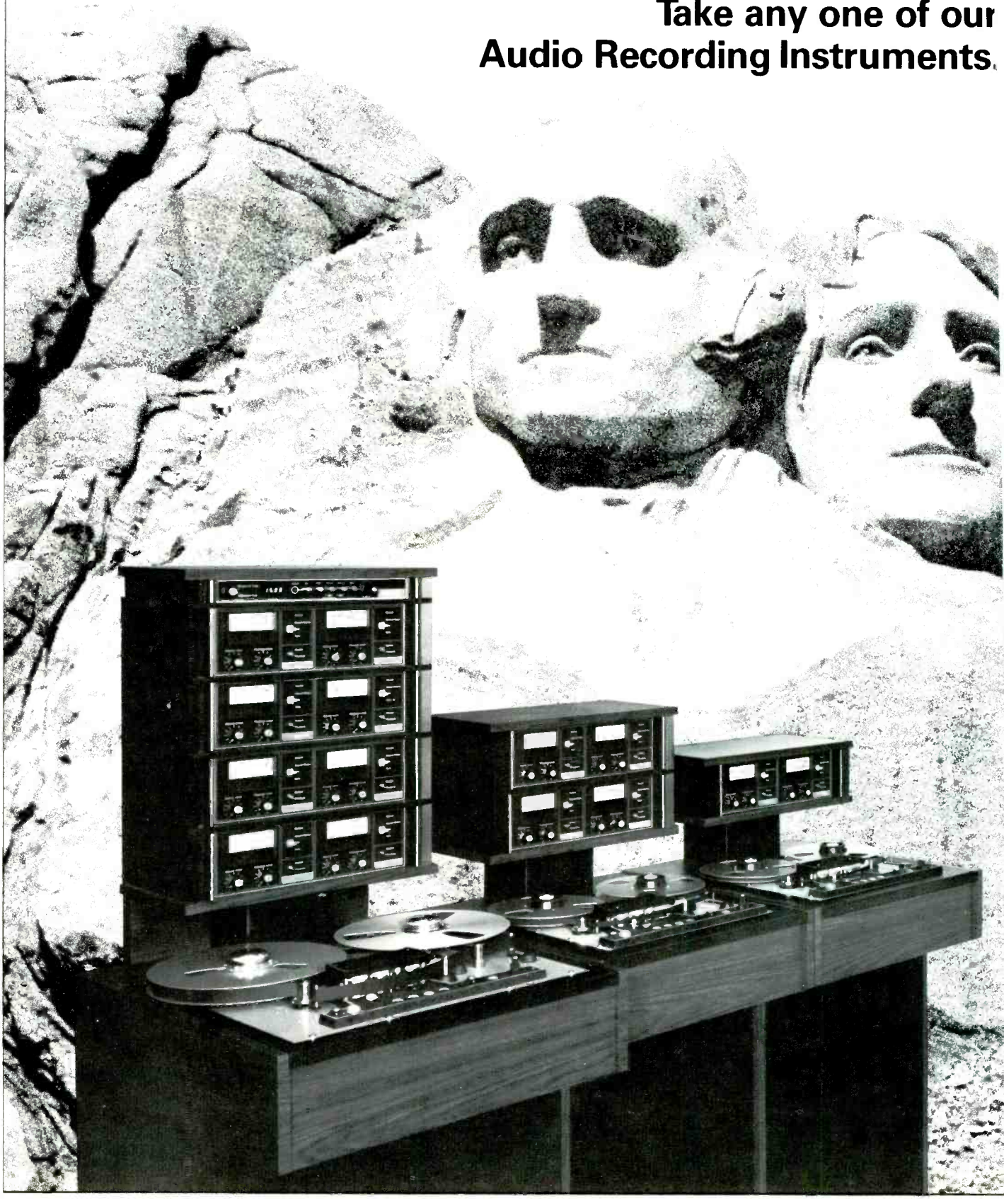
Marconi Electronics, Inc.

100 Stonehurst Court Northvale, New Jersey 07647 (201) 767-7250

Circle 171 on Reader Service Card

There are few things in life

Take any one of our Audio Recording Instruments.



as dependable as a Scully.

The quality of sound is extraordinary...the rugged design is built to last. The performance is classic.

Built by Scully...one of the first names in broadcast history. Equipment you can trust, by a company you've come to depend on.

For complete details, write or call Scully Recording Instruments, Division of Dictaphone Corp., 475 Ellis Street, Mountain View, California 94043 (415) 968-8389. TLX 34-5524

Scully

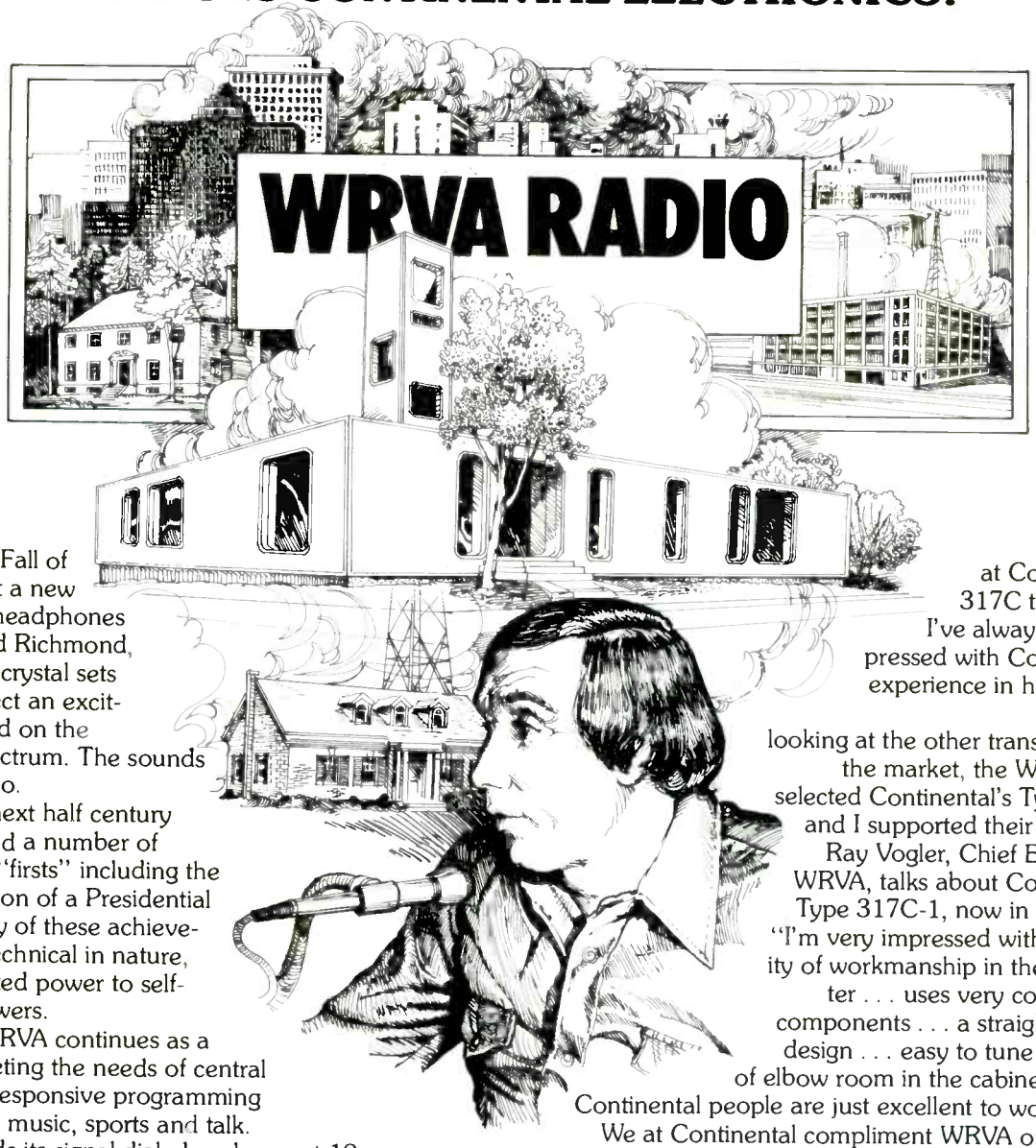
Recording Instruments

For classic performance.

Circle 172 on Reader Service Card

WRVA KNOWS EXACTLY WHAT THEY WANT IN A 50 KW TRANSMITTER.

SO DOES CONTINENTAL ELECTRONICS!



The late Fall of 1925 brought a new signal to the headphones in and around Richmond, Virginia. The crystal sets began to detect an exciting new sound on the broadcast spectrum. The sounds of WRVA radio.

For the next half century WRVA initiated a number of broadcasting "firsts" including the first transmission of a Presidential address. Many of these achievements were technical in nature, from transmitted power to self-supporting towers.

Today WRVA continues as a leader by meeting the needs of central Virginia with responsive programming offering news, music, sports and talk. Late night finds its signal dialed-up by most 18 wheelers from Canada to the Carolinas, Wisconsin to the Atlantic Ocean.

Mr. Jim Hoke, Vice President Engineering, Southern Broadcasting Company, explains how WRVA chose a new 50 kW AM transmitter: "I suggested to our engineering staff at WRVA that they go down to Dallas and take a close look at Continental's 317C transmitter. I've always been impressed with Continental's experience in high power. After looking at the other transmitters on the market, the WRVA team selected Continental's Type 317C, and I supported their decision."

Ray Vogler, Chief Engineer at WRVA, talks about Continental's Type 317C-1, now in operation: "I'm very impressed with the quality of workmanship in the transmitter . . . uses very conservative components . . . a straight forward design . . . easy to tune . . . plenty of elbow room in the cabinets . . . and Continental people are just excellent to work with."

We at Continental compliment WRVA on their fine operation. They knew what they wanted in a 50 kW AM transmitter. So did we.

For information on the 317C, write Continental Electronics Mfg. Co., Box 270879, Dallas, Texas 75227.

Continental Electronics

Circle 173 on Reader Service Card

lated so many broadcasters to sign those order blanks? The selling strength spread right across the board, from audio source equipment to processors to radio transmitters, with all the units between.

Tape recorders: solid for the future

At the top of the wanted list in *BM/E*'s Panels of 100 this year were tape recorders, and there were plenty of machines on the floor at a state-of-the-art level, although none were technical radicals. MCI brought a new JH-32 which records up to 32 tracks on three-inch tape (introduced last fall at the New York AES meet). They also announced that all small MCI machines, up to eight-track, will have as standard a new return-to-zero locator with four programmable locations. And they showed a new Autolock, for synchronizing audio/audio and video/audio combinations, incorporating a microprocessor for a very wide variety of sync functions.

The Studer Tapelock TLS 2000, perhaps the most flexible and elaborate "K" combination sync and control system available, was shown in a new version with even more control functions than the earlier one. Any combination of video/audio or audio/audio can be handled, with a microprocessor providing great control capability.

A tape machine of a specialized kind is the Telex 230L logger, which can put over 12½ hours of information on 3600 feet of tape, recording at 15/16 ips, with

The 3M Centracart system, though it did not make the show, was promised for soon after

The new ITC Series 99 cart machine brought many innovations in design and improved performance

the LCC-1 logger cycle control, and two logger decks, the system will automatically switch from deck A to deck B, allowing uninterrupted service for an indefinite period. (Deck A is reloaded after Deck B starts).

Other large open-reel machines came from Studer (the A800, now in production), Telefunken Magnetophon 12A (Gotham Audio), Ampex, and 3M. In a somewhat lower price bracket were Otari, Scully, Telex, Technics, and Lyrec (in Neve booth). All the tape machine makers had a good show.

A brand-new cart machine

One crucial system for which the upgrade outlook is still somewhat cloudy is the endless-loop cart, immensely popular in radio now. Two firms, International Tapetronics and 3M, had promised before the show to bring radically new machine designs — 3M's Centracart, in fact, has a completely new tape path and head placement. 3M announced at the show that Centracart was not quite ready, although in advanced development and due in a few months.

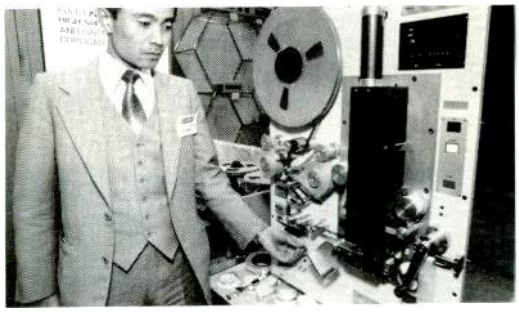
ITC did have their new cart system, the Series 99 (it had been introduced at the IBC in London in the fall of 1978). From the announced specs and full description given in a seminar at the show, it does seem to bring a large step ahead in cart machine quality.

A dc servo motor brings wow and flutter ratings (a main weakness in many cart machines) down to the same general area as those of good open-reel machines. A brand-new head (ITC design) and new electronics lead to claimed frequency response in the same class. Distortion is rated in the under-one-percent area. A microprocessor, plus built-in oscillator and bulk eraser and motorized azimuth, supply automatic azimuth adjustment to match each cartridge. The microprocessor also provides a lot of operation facility, such as automatic cue tone placement and splice finding.

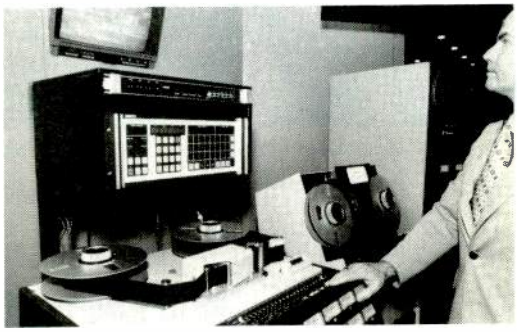
This machine was evidently a hit at the London show, and ITC is now quoting a six-month delivery time. The price of about $3000 for a player/recorder is roughly twice as high as that of many available cart machines, but the consensus among broadcasters present at the seminar was that medium-to-large market stations would take that in stride.

New cart machines priced over an intermediate range came from several firms. Broadcast Electronics had a new series 2100 that handles all three broadcast cart sizes, A, B, and C, with an "open" slot giving room for the larger sizes to protrude from the machine. Solidity of action in handling the carts came from this firm's long experience in cart machine manufacture.

Scully had full display of tape machine line



Otari showed cart duplication machine



Ampex demonstrates its MQS-100 for synchronizing audio and video recorders

UMC brought a new series also emphasizing ruggedness and reliability, said by the maker to be significantly superior to their existing models Type 10 and Type 20. Audiocorda had new Type A series, with modular construction, interchangeable transports.

Track Audio of Federal Way, Washington, showed the Sonifex line of mono and stereo cart machines. They appear to be very well made; with claimed characteristics like those of a number of American brands in the intermediate price range.

Some accessories for cart users were interesting, Sharepoint Systems is a new firm, with Haddon Heights, NJ, headquarters, formed by Eric Small, Ted Schober, and Art Silver, to manufacture specialized equipment for broadcasters. They introduced their first at the show, "Upstart", a unit for controlling and timing cart and source machines during cart production. It will start and pre-roll turntables or reel-to-reel tape machines, start and pre-roll cart machines, switch on the audio, di-

gitally time the cart, while separately timing the intro to vocal and the outro. The objective is to produce tight, consistent carts free from clicks, pops or upcuts.

A new hand-held bulk eraser came from Fidelipac, called "Blank-it". Usable to erase carts, cassettes, open reel audio and video tape, it is rated at 1550 Gauss, at ¼" from the center of base (claimed to be the highest field strength of any hand-held eraser). It has internal overload protection to prevent accidental burn-outs, and considerably higher erase capacity, according to the maker, than any upper case VHS or upper cast B beta machine internal circuit.

Automated console was displayed by MCI.

For more information on tape cart machines: MCI JH-32, **453;** locator, **454;** Autolock, **455;** 3M Centracart, **456;** ITC Series 99, **457;** TLS-2000, **458;** Telex 230L, **459;** BE Series 2100, **460;** UMC Beaucart, **461;** Audiocord Type A, **462;** Sonifex, **463;** Upstart, **464;** Fidelipac, **465.**

Consoles — more of a flood than ever

The audio console, as for years, was the quantity king of the show, with around 30 firms as console sellers. The technology of the console, at its best, is today very high indeed: but mystery attaches to the decision of so many firms to leap into this battle-royal already swarming with heavyweights.

There were no large new trends in console design. The controversy of the last few years on audio metering has not, by and large, displaced the VU meter. a few firms offer to put PPM meters on if the customer wants. Tangent (a Phoenix, Ariz., firm new to the NAB) had a new 32-in, 16-out console with LED metering switchable to either VU or PPM.

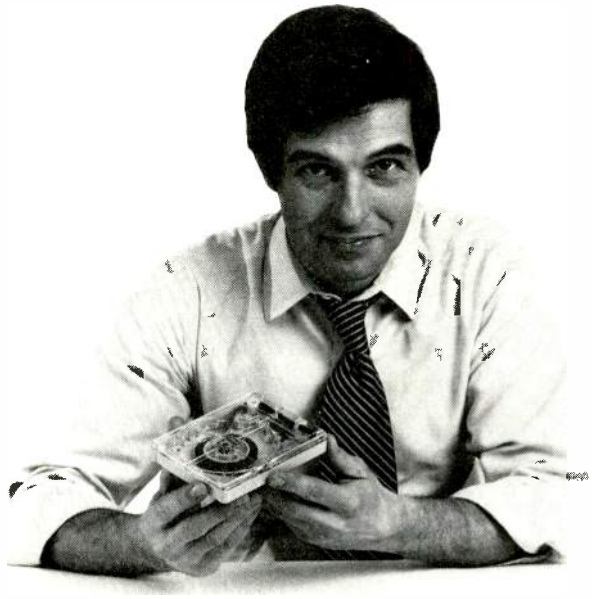
There were a couple of new outboard meters: ESE showed the Dynamic Audio Level Indicator, which can be adjusted for PPM, fast averaging, or VU. Track Audio had the RTW Peak Meter, a dual-channel indicator with PPM response, available with from 100 to 300 light-up elements that change color in passing from minus values to zero and positive.

New consoles came from both old and new firms. Ampro showed the Microtouch, a five-channel and eight-channel series with either rotary or linear faders, and a five-input remote channel, all aimed at operational simplicity. RCA brought two new series. The BC-500 is intended for broadcasters, audio production houses and recording; it is largely modular for adjustment to need, with up to 12 channels available. The BC-300 Series has six-, eight-, and 10-fader models, with four inputs per mixer, programmable remote start, programmable peak LED indicators, etc.

Quantum Audio Labs had a new line of broadcast production consoles, the QM-8P (eight channels) and QM-12P (12 channels), with very complete operational facilities (pan pot, echo send, equalizer in each channel, and many others). Rockwell/Collins showed the new Audio Rock 10, a 10-mixer stereo board with 30 inputs (including up to eight microphones). Input and output

continued on page 128

FIDELIPAC Cartridges are designed by broadcast engineers.



Someone else transferred someone from 8-tracks.

You know the difference between an 8-track and a broadcast cartridge. An 8-track is built for fun, a broadcast cartridge is built for war. Fidelipac knows that too. That's why our seasoned broadcast veterans have already defeated problems somebody else just discovered. Like lowering IM distortion. Reducing tape wear. Ensuring a smooth fit no matter whose cart deck you use. And a lot more. Because, at Fidelipac, we think a bad cart is no fun at all.

FIDELIPAC®
109 Gaither Drive • Mt. Laurel, NJ 08057 U.S.A. (609) 235-3511
© Trademark

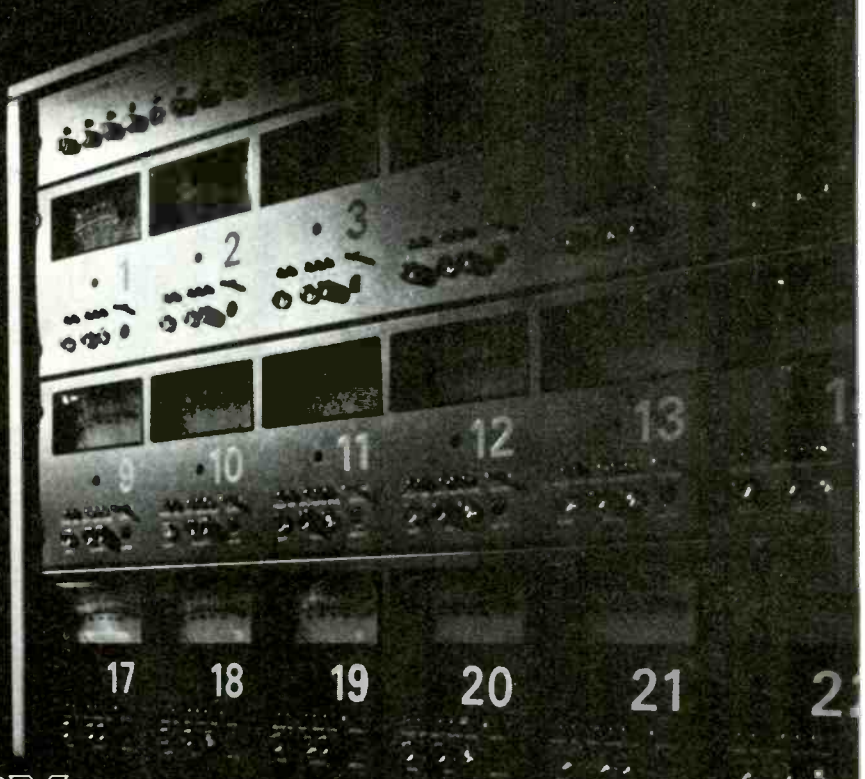
Circle 174 on Reader Service Card

A800 by STUDER

Our A800 has the fastest, most accurate tape handling of any multitrack recorder available today. Its principle features are: 14" reel capacity, for over 60 minutes of recording time at 15 IPS, gap free electronic editing and control of all functions by intelligent microprocessor.

The fully phase compensated electronics of the new A800 provide better signal to noise performance, wider useable dynamic range and lower distortion than any other multitrack recorder you can buy.

For complete information circle reader service number or contact —



STUDER REVOX

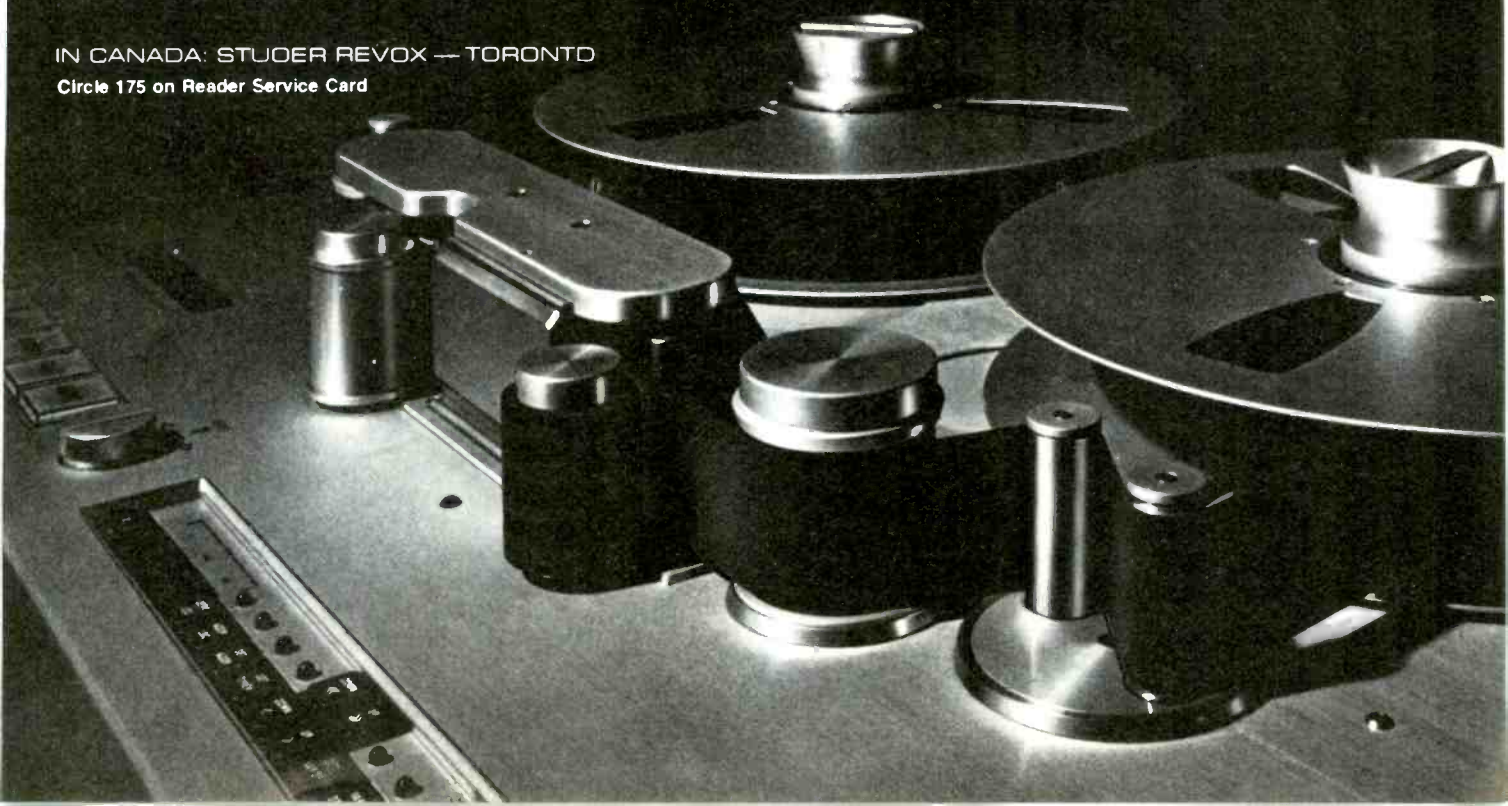
AMERICA INCORPORATED

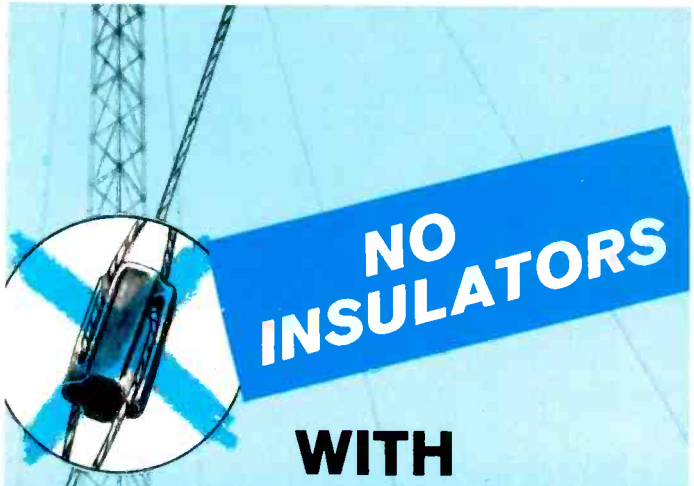
1819 BROADWAY, NASHVILLE, TENN. 37203

TEL: (615) 329-9576 TLX: 55-4453

IN CANADA: STUDER REVOX — TORONTO

Circle 175 on Reader Service Card





NO INSULATORS

WITH

PHILLYSTRAN®

DIELECTRIC

GUY

SYSTEMS

- **NON-CONDUCTING**
  Non-metallic PHILLYSTRAN eliminates R.F. interference or reflection. No insulators are required.
- **NO MAINTENANCE**
  PHILLYSTRAN, the result of advanced technologies, provides the strength of steel, and is resistant to corrosion, U V degradation and weathering.
- **EASY INSTALLATION**
  PHILLYSTRAN is lightweight, flexible, and not subject to kinks or tangles. PHILLYSTRAN may be ordered to length with standard sockets or in coils for the rigger to assemble on location.

Write today for Free Informative Bulletins showing easy application procedures and test results.

CHOCKFAST®
PHILLYBOND®

PHILLYCLAD®
PHILLYSTRAN®

PHILADELPHIA RESINS

PHILADELPHIA RESINS CORPORATION
20 Commerce Drive, Montgomeryville, Pa. 18936
Tel: 215-855-8450
Telex 84-6342 Cable: Philres MMLL

Circle 176 on Reader Service Card

SHOW-IN-PRINT '79

Robot entertained visitors to Ward-Beck console display.

Shaking hands with robot seems to cheer broadcaster.

Neve had new version of NECAM, console automation.

Tweed Audio showed large cons built for broadcast station.

Console by Audio Design and Mfg. was put through its paces.

Audio consoles find their way into sophisticated mobile operations. Filmways Heider exhibited its audio recording vehicle

delegation switching is remotely controlled for mini-automation. Stereo output is standard, with mono mixdown for AM stations.

Tweed Audio, a Scottish firm that has established an American office in Santa Monica, Calif., showed large and small consoles of thoroughly up-to-date design intended for both recording and broadcasting, including attractive portables. On display was a 20-channel on-air console built for KCPB in Thousand Oaks, Calif. Logitek, a Houston firm new to the NAB, showed a series with five, six, eight, and 12 mixers and up to 24 inputs, very attractive specifications, and operational features well thought out for broadcasting.

Micro-Trak introduced its S line of studio furniture, available with Microtrak consoles with flanking space for turntables. QRK had the Omega consoles, six and 10 channels, with digital switching and electronic attenuation, plus digital clocks.

LPB had its Monogram series of low-priced consoles, five mixers in mono and stereo, as well as its long-established Signature series, with up to 10 mixers. Broadcast Electronics showed new lines, the 150/250/350 series. The 350 series has vertical faders for up to 10 channels, with 22 inputs in mono or stereo. The 250 and 150 series have rotary faders. All three series have a new laminated polycarbonate surface of very high scratch resistance.

Ward-Beck showed a full range of their familiar consoles, from small to very large. McCurdy had a similar comprehensive display of their equally well-known consoles. Pacific Recorders brought their latest model in the BMX series, with 22 channels (26 channels are available). As at some earlier shows, Pacific had a complete testing routine set up, with generators, spectrum analyzers, distortion meters, etc., so that visiting engineers could run their own checks of the consoles.

Audio Designs and Manufacturing had a new 16-channel stereo console with three stereo outputs and features aimed specifically at TV audio use; it carried forward the quality associated with this maker.

Auditronics had a new model in their 110 Series, the 110B, designed specifically for broadcast with good on-air operation features. Autogram brought a new eight-channel mono and stereo unit with 26 inputs, the AC-8, and outputs chosen by plug-in modules: one stereo program, monitors, cue, etc.

Neve was showing large consoles with the latest development in its NECAM computer-assisted console automation, the NECAM D, aimed at TV post-production. The system allows synchronizing (by SMPTE or other code) between audio and video and has

continued on page 130

INNOVATIVE
TITLING GENERATORS

TOMORROW'S PRODUCTS ... TODAY

Our T-1024 SERIES provides features and performance hereto not available in an inexpensive system.
While compact, it boasts an 8-page memory expandable to 16 pages, auto line centering, character insert/delete, and a high legible display of 24 characters per line using a 10 x 14 character matrix. PRICED FROM $1095.

Our T-1000A is designed for simplicity of operation with outstanding features. Fingertip controls provide access to a 16 page memory with simultaneous program and preview display channels, variable length roll, crawl, adjustable title window, and eight choices for character font enhancement. PRICED $3995.

NEW!! Our T-2001 offers programming flexibility at an affordable price. Select on a character line basis, three character heights, two character widths, black or white characters, and three choices of edging. The font library provides 128 characters including upper/lower case and 32 graphic symbols. Special editing and control features provide operator programming flexibility and ease of operation. PRICED FROM $5995.

NEW!! Our T-5002 encompasses all of the features of our other titling systems and more.
Imagine the features of the T-2001 along with a super high resolution dual font library, colored characters or background, and an independent edit channel which can double as a second program channel.
Optional expanded memory, two channel mix, and custom characters or logos makes the T-5002 an unusual titler. PRICED FROM $8995.

vds
Video Data Systems
... IN TOUCH WITH THE FUTURE

VIDEO DATA SYSTEMS, corporate office, New York, N.Y. (516-231-4400)
VIDEO DATA SYSTEMS, National Sales, Salt Lake City, UT. (801-272-8296);
International Sales, ADCOM ELECTRONICS LTD., Ontario, Canada (416-251-3355); CATEC AG LUZERN, Luzern, Switzerland (041-22-66-79).

Circle 177 on Reader Service Card

New "Rock 10" console came from Rockwell/Collins.

Tangent, British firm, brought large recording console.

memory for preprogrammed sequences of settings. It includes the servo-driven faders that are a main feature of the NECAM system: physical position of the fader always corresponds to the electrical level set, whether automatically or by hand.

Russco introduced a new eight-channel mixer in mono and stereo versions. It has built-in digital clock, off-air monitoring, and pushbutton FET switching. Industrial Sciences, Inc., had the new Model 702, a television audio board with 10 inputs, two outputs, modular inputs for selection of high and low level, equalization foldback, echo send, other features on each channel, and input switching designed specifically for television (36 sources selectable on four faders, expandable).

Another new audio system for TV was brought by Hallikainen and Friends, and expansion of the system shown last year. It is a rack-mount system with audio-follow-video as well as manual control, six inputs (expandable to 36) assignable to mic or line level, three program outputs and cue, monitor, stated distortion at operating level of 0.25% and other characteristics to match.

In addition, a number of console makers were emphasizing television-oriented versions of their standard models: Audio Designs and Manufacturing, McCurdy, Ward-Beck, Pacific Recorders were some of them.

UMC showed for the first time at NAB their plug-in modular Beaucart consoles with 8 to 16 channels. Each channel has three switchable inputs. There are three fully metered matching stereo buses, complete facilities for cueing, monitoring, etc.

Compact Video, a newcomer, showed a "miniaturized audio mixing console", 12 inputs, 4 bus outputs, very complete monitor and cue facilities, equalization module, programmable mute, many other operation features.

New "MAP II" audio processor of Inovonics got a live demonstration.

That line-up should illustrate well our theme on consoles. A great many are very good, in large part because this is by all odds the most competitive sector of the radio hardware market.

For more information on audio consoles: Tangent, **466**; ESE, **467**; Track Audio, **468**; Ampro, **469**; RCA BC-500, **470**; BC-300, **639**; Quantum Audio Labs QM-8P, **471**; QM-12P, **472**; Rockwell/Collins, **473**; Logitek, **474**; Micro-Trak, **475**; Broadcast Electronics, **476**; Pacific Recorders, **477**; Audio Designs & Mfg., **478**; Auditronics, **479**; Autogram, **480**; Neve, **481**; Russco, **482**; Industrial Sciences **483**; Weed **484**; LPB, **485**; Halli Kainen, **486**; UMC, **487**; Compact Video, **488**.

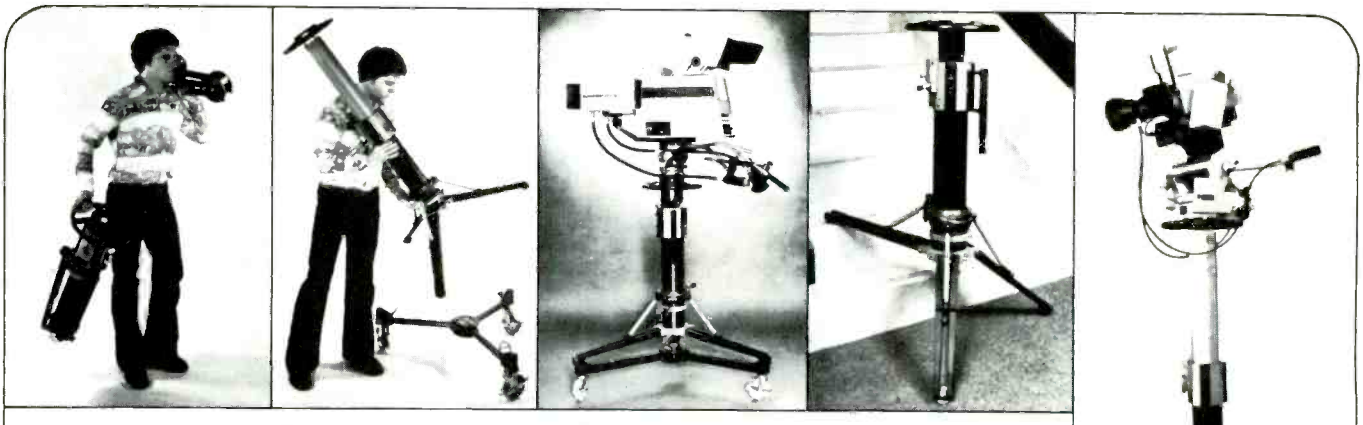
Audio processors — They are good, too

Processing the audio signal continues to be very high on the radio broadcaster's scale of interest. And the hardware makers have responded with a good quantity — though not a really large one — of processing units for both FM and AM. As at other NAB and NRBA shows of the last two years, the marked trend is a new level of performance with much lower distortion, an important part of the audio upgrade.

McMartin's new MAXI-I for FM stations is a good example. It is rated for 20 dB of gain reduction at low frequencies, 30 dB at high with preemphasis in. The variable gain cell, driven by a dc control voltage, has a distortion-cancelling circuit. Overshoot is rated two percent or less; harmonic distortion is 0.3 percent (0.15 percent typical) 0.6 percent when combined with a stereo generator. IM claimed is less than 0.25 percent.

Inovonics had a redesigned version of its eight-band processor for AM

continued on page 132



PUT-IT-ANYWHERE "PortaPed." Pneumatic, Lightweight, Folding, Self Leveling, Self Charging, Portable Studio and Field Pedestal

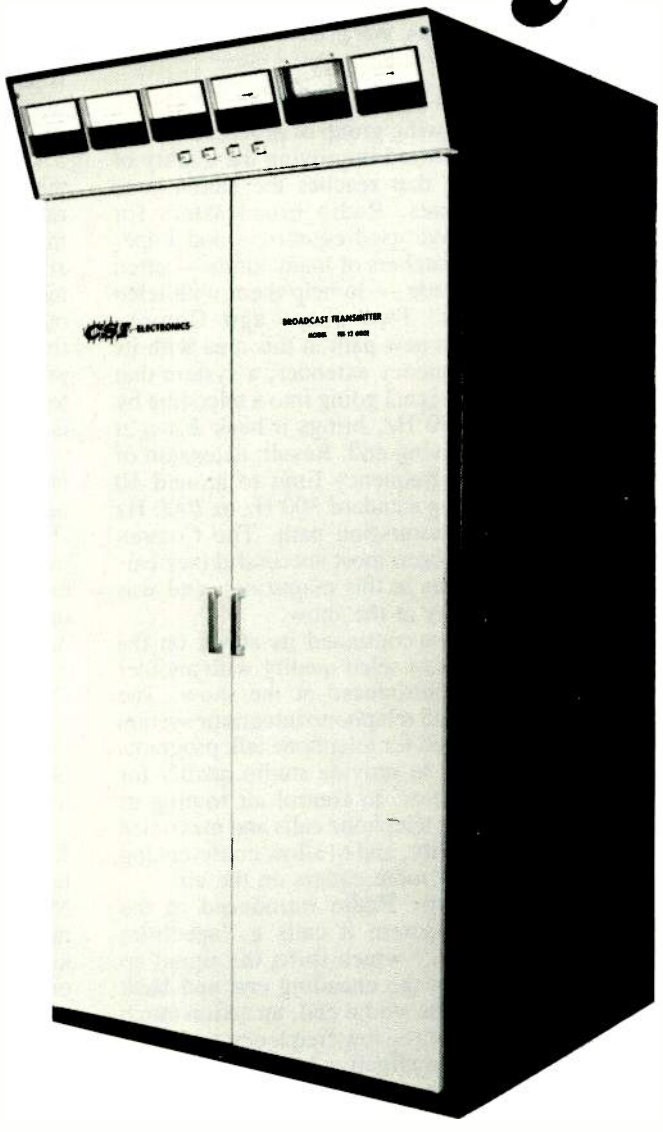
** 100 lb. capacity * available with foldable crab dolly and foldable castor dolly*

Listec

LISTEC TELEVISION EQUIPMENT CORP.

LISTEC
39 CAIN DRIVE, PLAINVIEW, NEW YORK 11803
(516) 694-8963 TELEX 640470
(WEST COAST)
4527 SAN FERNANDO ROAD, UNIT 1, GLENDALE, CALIFORNIA 91204 (213) 244-0838
Circle 178 on Reader Service Card

Five and Feisty!



CSI is now in its fifth year of offering commercial AM and FM transmitters to the broadcast industry.

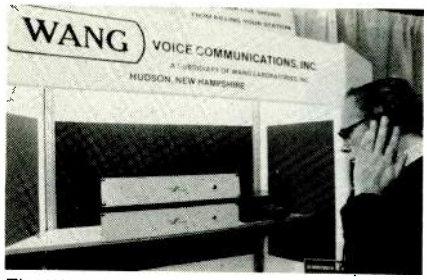
CSI ELECTRONICS INC.

3800 South Congress Street • Boynton Beach, Florida 33435 • Phone 305/732-0300 • Telex 513458

In CANADA contact Peter MacFarlane, CSI Electronics, Pointe Claire P Q Phone 514-695-8130 or 514-484-6601

Circle 179 on Reader Service Card

McMartin introduced new processor, MAXI-1.



The Wang "voice tunnel" was a delay unit for eliminating objectionable material on talk shows.

broadcasters, called MAP-II or Model 231, which continues the trend. It has many changes from the earlier 230 which Inovonics says are addressed to broadcasters' statements as to what they want in a processor. Among them are switchable low frequency cut-off, gated AGC ahead of the compressors, feed-forward gain control for gradual "knee," feedback between bands to make sure none is far removed from the next, and many others. Rated distortion, again, is extremely low.

Gregg Laboratories, a firm from Anaheim, Calif. and new to the NAB, introduced a tri-band audio processing amplifier, Model 2530, which is available in versions for FM/TV/recording and for AM. It too has a number of sophisticated circuits aimed at noiseless, distortion-free signal compression, resulting in distortion rating of 0.1 percent, S/N ratio above 80 dB, etc. The operation characteristics claimed for this unit seem most attractive; it is certainly worth the broadcaster's investigation. A companion unit from Gregg is a peak limiter for AM, aimed for the final "safety" spot in AM chains.

The processors that have mainly set the new level in this field were very much on hand. Harris demonstrated their MSP-100 and newer MSP-90, both available in AM and FM versions. Orban had both the AM and FM Optimod systems, in attractive demonstration setups. Moseley showed their Model TFL-280 limiter for FM broadcast and TV audio.

There were some new units for specialized parts of processing. Orban introduced the 672A equalizer, which combines features of both the graphic and the parametric: each band has variable bandwidth (Q from 0.3 to 20) and center frequency adjustable over a 3:1 range, with a ± 16 dB control range.

Orange County also had some new equalizers. The DEQ has a constant Q for creating very deep notches, up to 60 dB; or each section can be used as a regular program equalizer. The PEQ has 20:1 bandwidth adjustment on each of four sections, with center frequencies widely adjustable.

Wang Voice of Hudson, New Hampshire, another newcomer, showed the Voice Tunnel, a digital audio delay system for talk shows. It gives the operator six seconds to eliminate objectionable material; the quality is aimed to allow music to be run through.

For more information on audio processors: McMartin, **489**; Inovonics, **490**; Gregg Labs. **491**; Orban 672A, **492**; Orange County DEQ, **493**; PEQ, **494**; Wang, **495**.

Pushing up telco quality

A growing group of processors is directed toward improving the quality of material that reaches the studio over telco lines. Radio broadcasters for years have used equalizers and impedance matchers of many kinds — often home-made — to help them with telco pickups. Two years ago Comrex opened a new path in this area with its low frequency extender, a system that lifts the signal going into a telco line by about 200 Hz, brings it back down at the receiving end. Result: extension of the low frequency limit to around 60 Hz, in the standard 300 Hz to 3000 Hz telco transmission path. The Comrex unit has been most successful (see earlier stories in this magazine), and was on display at the show.

Comrex continued its attack on the problems of telco quality with another system, introduced at the show. The Model 205 telephone integrator system is designed for telephone talk programs and aims to provide studio quality for the talk host, to control air routing of incoming telephone calls and maximize their quality, and to allow conferencing of two or more callers on the air.

McCurdy Radio introduced at the show a system it calls a "spectrum translator," which shifts the signal up 240 Hz at the encoding end and back down at the studio end, an action much like that of the low frequency extender. Again, the effective low limit of a 300 to 3000 Hz telco line is pushed down to about 60 Hz. Model 1910 is the transmitter (encoder) and Model 1911 is the receiver.

McCurdy also introduced the MTPL OL1930 system for automatic matching of telco lines to studio equipment, on telephone talk shows. This is aimed to take the place of the passive hybrids or 2-wire to 4-wire converters historically used for the purpose, which have the disadvantage that they require rebalancing for each new telco line. The OL1930, says McCurdy, in about 12 msecs adjusts all the parameters automatically for maximum isolation of studio feedback and line matching.

Studer brought a somewhat related device, a "telephone hybrid." It matches the studio to the telco line for telephone talk shows, and automatically reduces the poor quality resulting from the operator's talk passing through the telco line.

For more information: Comrex 205, **496**; McCurdy, **497**; Studer, **498**.

Microphones: wired and wireless both up

The microphone, about the oldest device now in use in radio, hasn't changed much in a long time. But there is considerable activity in wireless mics, with new and better systems from several firms.

One new mic that looks interesting is the Shure SM81, a condenser cardioid model that appears to lift this American maker to the current state-of-the-mic-art club. Distortion claimed is extremely low, frequency response really out to the ends — the thoroughness of the specs in itself induces respect. The price is less than that of many of the top-level condenser mics, so the SM81 is worth looking into.

In the long-dominant Neumann line, (sold here by Gotham Audio), a unit new to the U.S. was the KMR-82, a shotgun condenser mic with the extreme directivity characteristic of this design. Electro-Voice brought two new ones. The DO-56 is a shock-mounted omni dynamic with a number of operation facilities. The RE-18 is a "variable D" cardioid dynamic with similar conveniences. Electro-Voice was also showing new models in their line of phantom power supplies for condenser mics.

The wireless mic scene was bustling. RF Technology of Westport, Conn., had transmit and receive units in a 950 MHz diversity system, usable with most standard microphones. The pocket sized transmitter weighs 12.5 ounces. Complete systems for one, two, and five channels are available. Guaranteed range is 500 feet, extendable with high gain antennas (also available from RF). The diversity receivers have two separate antenna inputs and switch automatically to the better signal of the two. RF Technology systems were formerly marketed by Thomson-CSF (see last year's NAB report); the maker is now marketing them directly.

A newcomer on the wireless mic front was Sony, with a 950 MHz transmitter and matching receiver, the WRT-27 and WRR-27 respectively. Audio rating is 100 Hz to 15 kHz, ±0.5 dB, 57 dB of weighted S/N ratio, and

continued on page 134

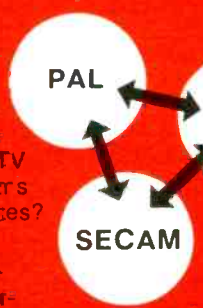
We're the BIG PLUS!

in International TV Standards Conversion

Audio + Video, Ltd. PLUS... Video Services Corp.

An Affiliate of A.F. Associates, Inc.

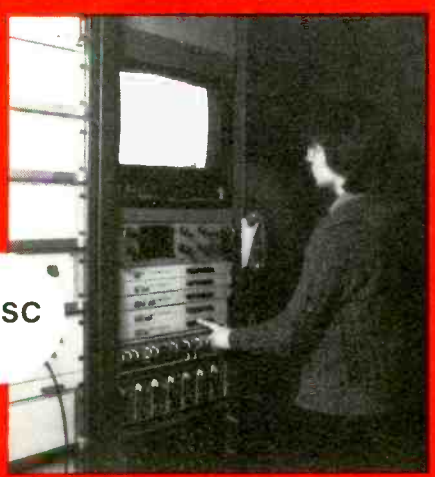
PLUS... DICE Digital TV Standards Converter for NTSC, SECAM and PAL



Who knows more about VTR's and TV Production Systems than A.F. Associates?

Who knows more about Video Tape Standards Conversion for worldwide distribution than Audio + Video, Ltd. of London, England?

Put them together and you have Audio Plus Video International and put that to the heart of the Broadcast, Corporate Communications and Advertising megalopolis . . . and you have the only Video Tape Center in Metro New York offering DICE TV Standards Conversion . . . Plus much more!



There are only three privately owned Marconi DICE Digital TV Standards Converters in the world. We have two. One in our London headquarters and the other in our New Facilities in Northvale, New Jersey. Built to FCC specifications, it is the state of the art in digital standards conversion.

We have thousands of hours of operating experience on the DICE, for multinational corporations, advertising agencies, feature film producers, TV program distributors, etc.

PLUS... we can convert and supply multiple copies from NTSC, PAL and SECAM originals to any other standard in any assortment . . .

quad to quad . . .

quad to cassette . . .

cassette to cassette

PLUS... we offer the highest quality broadcast standards in choice of formats.

PLUS... we have the *proven* international recording and conversion expertise.

PLUS... we have the *proven* expertise with the best VTR's in the world.

PLUS... we have rates which put standards conversion within reach of everyone involved in international TV.

Want to know more about the Big Plus? Call Noel Copley, International Marketing and Sales.

Audio Plus Video International, Inc.

Where the BIG PLUS is service!

Bookings & Production Facilities: 100 Stonehurst Court, Northvale, NJ 07647 / **(201) 767-3800**

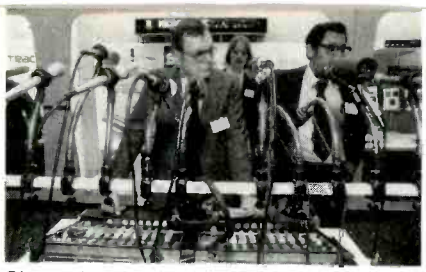
Sales: Exclusive Representation, Worldwide Video Services, Inc. Attention: Noel Copley / **(201) 767-3800**

Circle 222 on Reader Service Card

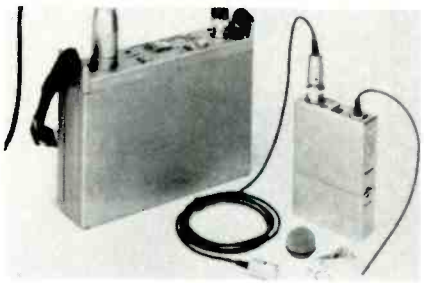
harmonic distortion under 0.3 percent. The dimensions of the transmitter are ¾ inches thick, 2 ⅜ inches wide, and 3½ inches high. It operates with a single 9 volt battery. The also compact receiver, supplied with carrying case, has 80 dB of selectivity at ±300 KHz, and a helical-resonator filter for spurious response rejection better than 80 dB. It runs on six AA batteries.

HME of San Diego showed units from their extensive line of wireless mic systems, including the new Flat-Pac portable receivers, WM-152 (with dynamic expansion) and WM-155. They run on two 9 Volt batteries; the systems are mostly in the 150 MHz to 200 MHz band. New also is their System 22E with pocket transmitter, usable with most dynamic and electret mics.

Swintek (marketed by Alan Gordon) added to their big line of wireless microphone systems with the Mark Q/dB-S receiver, using the maker's new dB-S compandor noise reduction system. The receiver is a pocket-sized portable for cueing, remote listening, and similar applications, and is crystal-controlled on any frequency in the 120 to 240 MHz band.



Shure showed a complete line of microphones



The new WRR-27/WRT-27 wireless mic system from Sony

Comrex had a new diversity receiving system on the 450 MHz band, the 450DS. It is designed to operate with the Comrex pocket transmitter, Model 450 TA, which has an output of 150 mW, or with the hand-held HHT-IKA transmitter, with one full watt of output. The 450-DS diversity system is in a portable case, 12 inches by 18 inches by four inches, with the two antennas at the forward corners, extendable when the case is opened. The case also has room to carry one TA pocket transmitter and one HHT-IKA hand-held transmitter (both at the same time). It weighs 10 pounds and can run on internal rechargeable Ni-cad batteries or external 115 – 230 volt, 50 or 60 Hz power. Included in addition to the two receiver sections are a diversity combiner that automatically selects the stronger signal and a monitor speaker amplifier and separate squelch.

For more information on mics: Shure SM81, **499**; Gotham Audio (Neumann) KMR-82, **500**; Electro-Voice DO-56 **501**; RE-18, **502**; power supplies, **503**; Sony WRT-27, **504**; WRR-27, **505**; HME Flat-Pac, **506**; System 22E, **507**; Swintek, **508**; Comrex, **509**.

Loudspeakers — new version of a standard

The idea that the program monitor system in a radio studio must be of top-most quality is getting more and more acceptance. The loudspeaker is a crucial element, and the appearance of the JBL 4313, a new speaker aimed at "top-most monitoring," is therefore significant. This is an update of the Model 4311, which was one of the most popular studio monitors of the last decade. The 4313 is a three-way system

McMartin BFM-15

THE FM EXCITER WITH THE "MAXI" DIFFERENCE!

Meet the BFM-15 from McMartin Industries. A **complete** FM exciter package with all the features you want including the new McMartin **Maxi-I** full **audio processor option** for **maximum loudness with less than 2% overshoot.**

The BFM-15 produces a typical 40dB or better minimum stereo separation from 30 to 15,000 Hz, and uses tested circuits for top performance with extreme reliability and stability. Fully modular construction allows you to choose the exciter configuration you need, and makes maintenance easy. Complete range of options for audio processing, stereo and SCA operation.

High performance at a surprisingly low price. Find out more about the BFM-15 from your McMartin Salesman or contact McMartin Industries.

McMartin is what you've been looking for.

MCMARTIN

McMartin Industries, Inc. • 4500 S. 76th St. • Omaha, NE 68127 • (402) 331-2000 • Telex 484485

Circle 181 on Reader Service Card

with a rated maximum power input of 40 watts continuous power, sensitivity of 89 SPL for 1 Watt input at one meter on axis, frequency response stated as 40 Hz to 18 kHz, ±3 dB, and distortion rated less than 0.3 percent third harmonic, from 100 Hz to 15 kHz, with 92 dB SPL output at three meters.

For more information: JBL 4313, **510**.

Remote pickup, remote control, STL

The use of studio-quality remote systems is now thoroughly established, with hardware from such firms as Marti, McMartin, Moseley, and Comrex, as described in detail in earlier issues of this magazine.

Marti continued the trend with new versions of its mobile relay systems on both 150 MHz and 450 MHz. These systems consist of a receiver and 25-watt transmitter in one mobile package, which can be automatically keyed on from a remote pickup point after being moved to a location that gives advantageous transmission to the studio. The mobile-relay operation has become one of the popular techniques for getting top-grade remote signals back to the studio; systems are available from all the top firms in the field.

The STL is also moving to higher levels of signal quality and operational facility. Time and Frequency Technology had production models of its 7700 series STL, operating in the 950-MHz band with overall specifications of "hi-fi" grade: ±0.1 dB, 50 Hz to 60 KHz (for composite signal); distortion 0.35 percent, 30 Hz to 60 kHz; and S/N ratio greater than 70 dB. The system is available with "hot standby" that automatically takes over if any outage occurs. It comes in five optional configurations, mono and stereo, with either composite on stereo or "dual mono" for separate left and right transmission.

Moseley brought production models of its new MRC-1 remote control system, microprocessor-based, which has 64 command lines, 32 telemetry channels, and 32 status channels (each independent of the others). Like most microprocessor systems, the functions provided depend on software and are very broadly alterable, with EPROMS establishing operation sequences. The system has keyboard channel mapping, keyboard telemetry calibration, programmable logic states, presettable tolerance alarms, self-check, multi-site operation. Interconnect can be by wire or radio, with Moseley radio systems available. The system exploits to a remarkable degree the ease and flexibility of operation that can be had with microprocessor control. Moseley says it can become an ATS simply by installing new software — new EPROMS.

Harris introduced its Model 9100 Facilities Control, which can be configured for remote control, ATS, or a broad facilities control including heating, air conditioning, ventilation, temperature, and intrusion alarms. A family of microcomputer-controlled building blocks can be assembled in various ways to provide any of these functions. The system can be run from the pushbutton Model 9160 automatic control unit. Warren Communications of Livingston, N.J., a NAB newcomer, showed what it called a "central reporting system," essentially a monitoring system to show the status of fuses, switches, pumps, circuit breakers, valves, thermostats, etc. It is aimed for unattended telephone offices, remote satellite earth stations and microwave repeaters, and similar plants. Capacity is 256 remote units per central control, 32 alarm inputs, eight command control items on each remote. The last allow remote switching, malfunction corrections, etc. Microprocessor control, again, supplies broad facility and resourcefulness.

Micro Controls, Inc., of Arlington, Texas, described an STL system with a new twist. Operating in the 950 MHz

Time Tunnel because: what you don't say can't hurt you!

Talk shows. Live interviews. Instant action news... It's today, and the airways belong to the public. But the responsibility for keeping it clean belongs to broadcast engineers and station managers. And that's where Wang's Time Tunnel can help.

Time Tunnel gives you six seconds to catch and delete the "offense" before it's broadcast. Without unreliable, expensive tapes. And at a price below most FCC fines. Time Tunnel features:

- Solid State Digital Memory
- Wide Dynamic Range
- High Reliability
- Standard EIA Rack Mount

Want to know more: Fill out the coupon or give us a call at (603) 889-8564.

Model 150

Name _____ Station _____

Address _____

City _____ State _____ Zip _____

Wang Voice Communications Inc.
Executive Drive, Hudson, NH 03051
A subsidiary of Wang Laboratories

WANG

Call Toll Free (800) 258-1034

DP90/BME 59

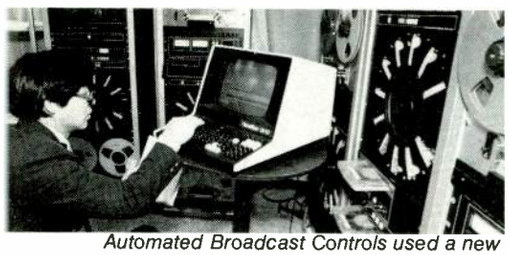
Circle 182 on Reader Service Card

NAB

SHOW-IN-PRINT '79

Micro Controls displayed an experimental hetrodyne STL system

Cetec's System 7000 showed improved software for business functions



Automated Broadcast Controls used a new Hazeltine CRT for its automation system

band, the receiver is designed to inject a modulated signal directly into the transmitter IPA or PA without benefit of the conventional exciter, avoiding the modulation and demodulation necessary in many systems in the path from studio to transmitter. Claimed specifications were on the same general level as those of other top-grade STLS.

Hallikainen and Friends added a new unit to their converters of Moseley remote control systems to digital metering. The Model TEL 172 is designed to work with the Moseley PBR-30AW and PNR-30AR, substituting five new circuit boards that directly replace the metering oscillator, audible metering processor, SCU metering processor, metering demodulator, and analog meter. New display is 3½ digit, updated twice a second.

For more information: Marti, **515;** Moseley, **516;** Harris, **517;** Warren, **518;** Micro Controls, **519;** Hallikainen & Friends, **520;** TFT, **521.**

Program automation keeps moving

With the widespread application of the microprocessor to program automation systems, design has reached a kind of plateau where it is wide open to any wanted advance in operation capability without the need for new kinds of hardware. Cetec-Schaeffer, for example, introduced their Level 2 software for their microprocessor-based 7000 system. It assigns information to sections in the memory for instant call-up by the traffic, billing, or other department, with convenient categories set up. Each category in the memory can be spilled as wanted. A new accessory for the system is a "debug card," which can be plugged in for system self-diagnosis of operation faults: the data appears on the CRT readout.

Sono-Mag Corporation had a new Model DP-2-7 control unit and video operating display for their DP-2 systems. It is a "smart terminal" bringing seven days of auto control, with great operational flexibility added. They also showed their ESP-1 ("extremely simple programmer"), introduced at the NRBA last fall but new to the NAB. This, as the name indicates, is an economically-priced control for automation systems (Sono-Mag or others) with operation facility a major objective in the design.

Broadcast Electronics had the Econo Control 16, a lower-cost version of its Control 16, with many good operation features, also with microprocessor control. The Econo is field-convertible to the full Control 16 with the addition of the CRT readout system and some additional electronics.

Harris brought a new Model 9000 Program Control unit for its System 90 automation. The design emphasis in the 9000 controller is on extreme ease of operation combined with the wide-open facility of microprocessor control. Harris continued the Multifile software system introduced last year, with material in categories in the memory, like the new Cetec system noted above.

IGM showed a new system for using its Instacart. Called the Information Retrieval version, this Instacart plays any or all of its carts simultaneously, each to different outputs. Each cart comes up in response to a telephone call so that a station can use the machine to provide off-air information to callers, plus ID's, etc. IGM suggests that a station can sell an on-air commercial with a telephone number tag; when the listener calls, an off-air cart can handle the inquiry.

New in IGM's Basic A automation system is a Techtran micro-floppy disc memory, onto which programming can be dumped during maintenance and automatically dumped back afterwards.

Automated Broadcast Controls brought a simplified controller, the 1600S, which holds 16 events and serves nine sources with FET audio switching front panel selected, internal clock for deck reset 15, 30, 60 minutes, remote control, LED next-to-play indicator, internal 25 Hz notch filter, and other operation facilities. Source capability is expandable to 32.

Microprobe Electronics had its new 100B programmer, update of the economical thumbwheel control system, handling eight sources and 24 events and available as a standalone or in complete systems including one or more carousels, open-reel tape machines, and turntables.

There were some new specialized devices providing aspects of automation. Telex introduced an Intersperser for automatic selective operation of two sources, with any pattern of repeat or interchange between the two available.

Inovonics had a new series of electronic units to pick up the signal at the playback head in automation systems and get it up to line level with very low distortion.

A new idea is a synchronizer for keeping together the voice track and the music track in syndicated programming, introduced by Concept Productions. It works with an identification code on each song, matched with a code at the right place on the voice track. The synchronizer continuously scans the upcoming code and warns the operator of any error in time for a correction to be made.

Not for sale directly to the broadcaster, but highly interesting to him nevertheless as a potential unit of an automations system he may buy, is the ITC multi-cart machine, the 1K, shown in previous shows in prototype form, now in approximately final shape. It holds up to 1024 carts in two large cylinders, with automatic, programmable selection of carts for play. In the latest version it incorporates the new Series 99 ITC cart machine, a sharp advance over earlier cart standards, as described in detail in the section on carts, preceding.

For more information on program automation: Cetec, **522;** Sono-Mag DP-2-7, **523;** Broadcast Electronics, **524;** Harris, **525;** IGM, **526;** Microprobe, **527;** Telex, **528;** Inovonics, **529;** Concept Productions, **630;** Auto. Bdcst, Controls, **531.**

Intercoms — more of the new breed

The development of intercom systems using microprocessors for great operational flexibility, and with signal quality adequate to audio program distribution, was a notable event last year. Then, Automated Processes brought a hub-and-spoke system, with microprocessor-controlled solid state switching, digital control signals, and broadcast-grade audio quality throughout, operating on a two-pair telephone cable from each remote to the hub. With software establishing operation programs, any individual or group could talk to any individual or group, with simple pushbutton control at each terminal.

This year, Automated brought an advanced System 8000 with two kinds of

continued on page 139

Built-in 2X Extender
9mm to 306mm

Introducing the world's lightest, longest, widest ENG/EFP zoom lens.

FUJINON'S new F/1.7 17 x 9 ... the One and Only.

The new FUJINON 17 x 9 ENG/EFP zoom is the **only** lens to meet all of these qualifications:

The longest: **306mm without attachments, 560 with the optional front extender.**

The widest: **9mm without attachments, 7mm with the optional adaptor.**

The lightest: **2.5kg**

Which makes the F/1.7 17 x 9 the **one** lens for every assignment. Simply put, it outperforms anything else on the market.

It's at home at any range. Normal zoom is 9mm to 153mm. Flip the built-in 2X extender, an exclusive FUJINON feature, and the range is 18mm to 306mm. The optional extender and adaptor give you even greater range.

Zoom and iris are servo controlled, or you can use the manual override. Adjustable back focus gives you faster lens changing and eliminates making internal camera adjustments. And to make the new 17 x 9 an even better investment, FUJINON offers a full list of accessories for studio conversion.

More information or a demonstration of any FUJINON lens, including the new "one and only", is yours for the asking.

For your new cameras, for your existing cameras...specify FUJINON. In studio, field, ENG/EFP lenses and optical systems, FUJINON is light years ahead.

FUJINON

Fujinon Optical Inc.
672 White Plains Road
Scarsdale, New York 10583
(914) 472-9800 Telex 131-642

West Coast Distributor: F.P. Optical Inc.,
3333 Bowers Avenue, Santa Clara, California 95051
(408) 727-2757, Telex: 171-200

Circle 184 on Reader Service Card

fact: this condenser microphone sets a new standard of technical excellence. & it sounds superb!

The Shure SM81 cardioid condenser is a new breed of microphone. It is a truly high-performance studio instrument exceptionally well-suited to the critical requirements of professional recording, broadcast, motion picture recording, and highest quality sound reinforcement — and, in addition, is highly reliable for field use.

Shure engineers sought — and found — ingenious new solutions to common problems which, up to now, have restricted the use of condenser microphones. Years of operational tests were conducted in an exceptionally broad range of studio applications and under a wide variety of field conditions.

As the following specifications indicate, the new SM81 offers unprecedented performance capability — making it a new standard in high quality professional condenser microphones.

SM81 puts it all together!

- WIDE RANGE, 20 Hz to 20 kHz FLAT FREQUENCY RESPONSE.
- PRECISE CARDIOID polar pattern, uniform with frequency and symmetrical about axis, to provide maximum rejection and minimum coloration of off-axis sounds.
- EXCEPTIONALLY LOW (16 dBA) NOISE LEVEL.
- 120 dB DYNAMIC RANGE.
- ULTRA-LOW DISTORTION (right up to the clipping point!) over the entire audio spectrum for a wide range of load impedances. MAXIMUM SPL BEFORE CLIPPING: 135 dB; 145 dB with attenuator.
- WIDE RANGE SIMPLEX POWERING includes DIN 45 596 voltages of 12 and 48 Vdc.
- EXTREMELY LOW RF SUSCEPTIBILITY.
- SELECTABLE LOW FREQUENCY RESPONSE: Flat, 6 or 18 dB/octave rolloff.
- 10 dB CAPACITIVE ATTENUATOR accessible without disassembly and lockable.

Outstanding Ruggedness

Conventional condenser microphones have gained the reputation of being high quality, but often at the expense of mechanical and environmental ruggedness. This no longer need be the case. The SM81 transducer and electronics housing is of heavy-wall steel construction, and all internal components are rigidly supported. (Production line SM81's must be capable of withstanding at least six random drops from six feet onto a hardwood floor without significant performance degradation or structural damage.) It is reliable over a temperature range of −20° F to 165° F at relative humidities of 0 to 95%!

Send for a complete brochure on this remarkable new condenser microphone! (AL577)

SM81 Cardioid Condenser Microphone

SHURE®

Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204, In Canada: A. C. Simmonds & Sons Limited
Manufacturers of high fidelity components, microphones, sound systems and related circuitry.

Circle 183 on Reader Service Card

terminals. The "intelligent" one has an enlarged set of control buttons and can "converse" with the central and set up every kind of routing sequence. The "dumb" terminal can receive and originate calls, but cannot set up preprogrammed sequences, etc. The software has been made responsive to an enormous variety of functions — any pattern of connection is immediately available. Up to 100 stations are standard, more can be built on order. The system looks extremely attractive for routing audio at top quality around any complex of studios and offices, delivery to on-air consoles, elaborate monitoring, and interface to telephones.

An intercom of somewhat similar facility, brought last year by Audio Design and Manufacturing, was demonstrated again, this time in production models. Also with microprocessor control, it too exhibits the versatility the microcomputer can bring.

Ward-Beck showed a new version of the intercom system marketed by it for some years, this time with circuitry that is "microprocessor-ready" — the new control system is going to be added at an early date.

A unit of related character that also benefits from advanced solid state technology is Ramko's ARA-1612 electronic patch panel. This uses solid-state switching to connect any of 16 audio sources to any of 12 locations, in any combination. Switching is controlled by two groups of front-panel pushbuttons. A large display grid on the front panel shows with LEDs the switching assignments made at any moment. Frequency and distortion specs make the electronic patch panel suitable for top-grade audio program lines. The input side is expandable to 45 channels; outputs are unlimited. There is a dual power supply with automatic switch to the "hot standby." Switching can be remotely controlled; inputs do not load audio sources (high impedance balanced bridging); gain of each channel is adjustable.

For more information on intercoms: Automated Processes, **511**; Ward-Beck, **512**; Audio Design & Mfg., **513**; Ramko, **514**.

Turntables and disc preamps

The audio upgrade has been spectacular in the turntable line, with the dc-servo-motor and direct drive lifting performance several grades above earlier standards. Technics of Panasonic, which had much to do with this upgrade by selling scores of their SP-10 turntables to broadcasters, brought to the show a new table aimed for much the same slot with new operational conveniences and a persuasive price — about $600. Called the SP-15, it has thorough digital pushbutton control, including step-by-step increments in speed control with digital readout. The characteristics are much like those of the SP-10. It has easy back cueing; the platter is damped from the table by a visco elastic; and it has a pitch lock to avoid speed change from accidental contact with the pushbuttons.

QRK brought a new turntable in the dc servo class, the Galaxy, also with digital switching, a Hall-effect motor, and the performance advantages of the class. And RCA joined the club with the new BQ52, another dc servo drive

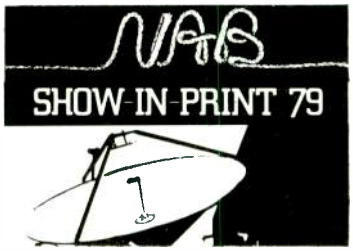
Russco had several turntable models.

Technics introduced new Model S-15 turntable with DC servo drive and other features popular on their dc tables.

with digital speed readout and backcueing with platter clutch.

In addition to far better turntables, the playing of recordings in radio stations has benefitted from a sharp improvement in preamp design, noted in earlier show reports. Amplifier makers keep adding to the supply of turntable preamps with sky-high performance. Ramko, Audio and Design Recording, and Logitek had new units of this kind.

For more information on turntables and preamps: Technics SP-15, **532**; QRK, **533**; RCA, **534**; Ramko, **535**; Audio & Design Recording, **536**; Logitek, **537**.



SATELLITE FEVER

For the past few years satellites have been a growing topic at NAB, and an increasing amount of exhibit space has been devoted to satellite-related displays. The primary movers in satellites have been the organizations like Mutual Broadcasting System, UPI, and AP who have stressed use of satellites for their radio programs. The main objectives have been improved quality over terrestrial audio channels and, perhaps most important, greater economy.

But this year, television broadcasters leaped into the satellite business with both feet right on the heels of the RCA Americom announcement of its new SMARTS (Selective Multiple Address Radio and Television Service). As a result, satellite technology and services were represented in many booths that dealt with everything from hardware, programming, transmission, and earth station surveys to demonstrations of programming already available on the birds.

Andrew F. Inglis, president of RCA Americom, typified the attitude of many satellite-related exhibitors when he told a group of broadcast consultants, "We've been used to coming to the NAB for the past couple of years as a poor relative. This year we're one of the highlights of the RCA exhibit." Throughout the convention, satellite-related exhibits drew large and enthusiastic crowds.

The announcement that helped to trigger the satellite fever was RCA's plan to install, at its own expense, receive-only earth stations on the premises of any commercial broadcaster requesting SMARTS. The broadcaster need only supply the land for a five-meter dish, standard 120 V ac power, some form of security such as a chain link fence, and a VTR for recording off the receiver. Frequency coordination and clearance, installation, maintenance, and insurance will be supplied at no cost by RCA.

If the field tests that are planned for later this year establish the feasibility and cost-effectiveness of the new sys-

continued on page 140

Enterprise Electronics showed a new zoom capacity for its weather radar system.

tem, Ingliss said, "we would offer it to both the program suppliers and their customers, the television stations."

The field test will be conducted using the four Post-Newsweek Stations and the program offerings of Viacom. RCA will install four-channel receivers at each of the PNS stations. Viacom's programming will be uplinked from RCA's Vernon Valley facility.

The system envisions a program supplier delivering to Vernon Valley, or eventually other RCA uplinks, a tape or film of his show. The program supplier will also provide a list of the stations to receive the program. The subscribing stations will each have a coded address that will be encoded in some portion of the satellite signal. The program will be transmitted scrambled. The accompanying code will trigger the receiver and alert the station to begin taping. The code will also enable the receiver to descramble the program automatically.

The cost of this service will be borne by the program distributor, based on a tariff yet to be formulated.

The RCA Americom exhibit displayed the associated earth station equipment. In a recreational vehicle outside of the convention hall, RCA also showed its system currently being used to carry AFRTS programming. The purpose of this demonstration was to show how much information could be packed onto a single transponder. With special multiplexing equipment the single RCA transponder was carrying two video program channels, three FM audio channels, and a channel of alphanumeric information.

A key element for carrying this information is the STRAP system, developed by CBS. This technology is now being manufactured and marketed by Thomson-CSF Laboratories designated as the Vidiplex™ System. Vidiplex involves the use of an encoder at the transmit end and a decoder at the receive end. Two separate video signals are interleaved field-by-field in real time by the encoder. They are transmitted on a single video channel in this mixed field state. When the signals are received, they are converted to digital format and separated by alternating fields so that the two original sources are restored. The resulting single field signals are then processed to restore the missing information using interpolating techniques. The encoder is priced at approximately $5000 and the decoder costs about $30,000. The system can be used on telco or microwave channels as well as satellite systems.

Other hardware shown at NAB for satellite earth stations included the VR-4B Broadcast satellite receiver from Microwave Associates. MA also showed the XFC-1 External frequency control for its line of All Channel Satellite Receivers. DATE, Digital Audio for Television, was also shown in the MA booth. DATE is the system developed by DCC with PBS which enables four channels of 15 kHz bandwidth audio to be transmitted digitally along with video.

Andrew Corporation and Scientific-Atlanta showed their earth station systems. McMartin showed its first Satellite/Microwave modulator and demodulator system, the SMR-1. Both units are intended for narrowband FM service using a maximum 5 kHz audio bandwith in a 52 MHz to 88 MHz frequency range. The IF Demodulator is able to acquire, track, and relock a very weak FM signal even when the transponder frequency error exceeds ±50 kHz. The units are intended for broadcasters, and CATV operators' medium grade program communications and distribution of digital information.

Another useful device shown at NAB was from Gardiner Communications, who in addition to providing complete earth station packages including frequency coordination and clearance, also manufacture the Channelcue crystal-controlled programmable earth station switcher. The unit is intended to prevent unauthorized carriage of programming from earth station transponders and to provide switching and substitute programming for Network Nonduplication and Syndicated Exclusivity protection.

A number of companies that specialize in frequency coordination for earth stations had exhibits on the convention floor. These firms will survey a station's area for a potential earth station site, study the potential problems, analyze the antennas most suitable for use at the site, recommend alternate sites, and handle the paperwork required by the FCC. These services generally cost about $1000 unless an on-site inspection is required. Then, the broadcaster also pays travel, lodging, and associated expenses for the survey team. Normally survey teams need only make on-site inspections when microwave or other RF traffic is particularly dense. One company, Rockwell International/S.A.F.E., has several teams in the field and will attempt to coordinate on-site inspections so that these expenses may be shared by area broadcasters. Other companies offering these services include Comsearch Inc., Compucon, and Gardiner.

With the RCA Americom announcement and the expected entry of AT&T into the satellite field this July, broadcasters can expect a much wider choice of programming via satellite.

For more information: RCA SMARTS, **538;** Thomson-CSF Vidiplex, **539;** Microwave Associates VR-4B, **540;** McMartin SMR-1, **541;** Gardiner Channelcue, **542;** frequency coordination, **543;** Rockwell International, **544;** Comsearch, **545;** Compucon, **546.**

Radio organizations still lead in birds

Mutual Broadcasting System was responsible for a number of the 10-foot dishes that dotted the perimeter of the Dallas convention center. Their main thrust at NAB this year was to show more and more radio broadcasters the wide range of programming Mutual provides over its satellite network. Mutual is offering many new radio programming services through its satellite system including its regular news service, the *Larry King Show, Jamboree, Money Makers, Sports,* and sports features.

Western Union also demonstrated the services it provides to broadcasters through its Westar satellites. The recently announced program of spot distribution to television stations by Blair and the Ogilvy-Mather advertising agency is now in operation. The service is being coordinated by Hughes Television Network.

The wire services, UPI and AP, have both announced plans to further exploit the satellite system for the distribution of their news and information services, both voice and text. UPI showed the Unifax II satellite weather picture receiver in conjunction with the Weathermation exhibit. Unifax II produces a hard copy printout of satellite weather photos.

For more information: Western Union, **547;** UPI Unifax, **548.**

Weather radar heats up

With the importance of weather news, it is no surprise that more and more weather radar systems are appearing at NAB. This year RCA displayed a weather radar system, as did the other companies who started bringing systems to NAB two years ago.

Arvin Echo was back with its Tel-Weather system that provides simulated radar scan to weather information

continued on page 143

RCA Americom's local control console for its SMARTS system.

SMARTS provided four simultaneous Viacom programs through the Satcom satellite.

Weathermation was a new color weather radar system exhibited in Dallas.

Western Union's mobile earth station was one of several located around the convention hall.

AM STEREO? Do it right the first time.

If you have been under the impression that all audio consoles are more or less alike, then you haven't seen RAMKO's exciting "silent series" of 14 different models.

The superior, DC controlled, audio concept (introduced by us over 4 years ago) has been under continual refinement from the very beginning. Thus, today our consoles are considered far and away the most advanced on the market.

The benefits of this ongoing research are myriad. The quietest operating units on the market — The most mechanically dependable — Patch panel gain selects so that each input can accept anywhere from mic thru high level — Programmable remote control of external equipment — Solid state meters proven to be decidedly superior to the old "VU" meters — Instant interior access and plug in modules — Human engineered for reduced operator fatigue — An abundance of RFI suppression features — Built in clock/timers — Stereo phase and mono output meters — Backlighted and LED alpha-numeric input and output status displays — And a whole lot more. All backed by a 2 week trial period and our famous 2 and 4 year warranties. Priced from $995 to $5200.

Don't delay! Find out for yourself why the competition is not too happy with us. Write, call collect or contact your RAMKO Rep and ask for brochure package #AC-479.

RAMKO RESEARCH

11355 "A" Folsom Blvd.
Rancho Cordova, Calif. 95670
(916) 635-3600

Circle 185 on Reader Service Card

The First Frame Store We'd Put Our Name On

From the industry's first standalone Time Base Corrector through the innovative 2020 Series Signal Processor, MICROTIME has combined its highly creative design capability with advanced technology to provide the highest quality products for the Video Industry. MICROTIME's goal has always been simplicity, reliability, and low cost, while maintaining the best performance standards available. For that reason, the 2525 Video Signal Synchronizer is the first Frame Store we'd put our name on.

The 2525 includes:

- Line Error Detection
- A new RS-170A Sync Generator for improved lock-up and easy interfacing with any switcher
- Field 1, Field 2, or Frame Freeze for digital video effects applications
- Auto Freeze or Black selectable
- H Phasing for output timing control
- Output H Sync and Burst Level Control
- Unique HETROCOLOR™ Processing for optimum performance for color under signals

The 2525 will correct VTR signals from no-lock or V/H lock, synchronous or non referenced, direct or hetrodyne, ½" helical through 2" quad. It passes VITS with the same processing as active video, can be remotely controlled, and is transparent to input signals from any source—and all with MICROTIME's proven reliability and ease of operation.

Find out more about the 2525 Video Signal Synchronizer. Write or call today to arrange for a demonstration.

Available through MICROTIME's worldwide distributor network.

MICROTIME

Microtime, Inc.
1280 Blue Hills Avenue
Bloomfield, Conn. 06002
(203) 242-0761 TWX 710-425-1165

Circle 186 on Reader Service Card

transmitted from National Weather Service over voice grade lines. Animation of incoming fronts and cloud formations is possible with the use of Arvin Echo's Frame Stor. This year the system has gone from a three-color display to a four-color color display.

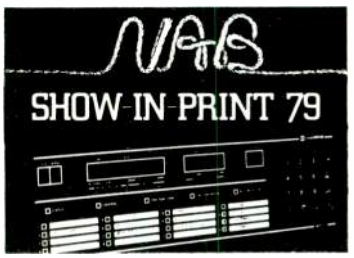
Technology Service Corporation (TSC) was the first company to bring a weather radar system to NAB two years ago. New additions to the TSC system include a "sector zoom option" which enables, for example, a regional map overlay to be zoomed in for a close-up of a smaller region such as a metropolitan area. Another option is the Automatic Time Lapse Recorder/Control System with floppy disc memory to handle up to 300 color weather radar pictures. The pictures can be played back in animated sequences. The two basic TSC systems are a Medium Range System, the WRS-10, which provides coverage of a 150 mile radius, and the Long Range, WRS-20, which will track weather up to 250 miles.

Enterprise Electronics Corp. (EEC) was back with its WR100-2/77 Weather Radar System. EEC offers a complete service to broadcasters; only the installation materials and interconnections to the station sync and video are required for full on-line operation.

A new company at NAB with a color weather radar system was Weathermation. The Weathermation Color Computer Radar System offers a 525-line interlaced six-color calibrated display, a dial-up high resolution interface to any transmitter equipped radar, and a dial-up three-color display from all 37 NWS WBRR-equipped radars. A 16-color graphics and map overlay unit is provided along with an Arvin Echo discassette recorder for animated playback, an automatic dialer, video hard copy unit, and a Unifax II Satellite receiver. The "System," as it is dubbed by Weathermation, is equipped with a single controller with all necessary operational controls on the front panel. The controller fits a normal 19-inch rack.

Scientific-Atlanta showed its Model 3555-8 meteorological satellite terminal (METSAT). The system accepts inputs of satellite orbital elements and calculates satellite orbital trajectory. The system can be programmed to track a weather satellite on a daily basis. The earth station and GOES frame synchronizer/sectorizer can interface with a computer for additional processing of weather information.

For more information on weather radar: Arvin Echo, **549**; TSC WRS-10, **550**; WRS-20, **551**; EEC, **552**; Weathermation, **553**; Scientific Atlanta, **554**.



TRENDS IN RADIO AND TELEVISION RF

THE STORY ON RADIO transmitters is in some respects the same as that on consoles: steady refinement under competitive pressure. Without any radical advances, the transmitter makers are steadily improving performance and adding features. A broadcaster needing a transmitter must check each manufacturer's current models carefully because there are likely to be some new things that may be important to him.

Harris brought its new Model FM-330K, a 300-watt all solid state FM transmitter also available in a completely redundant version, the FM-300KD, which has automatic changeover. The model has digitally synthesized modulation and a dynamic transient response filter which holds overshoot on program material to two percent or less, both features used in other Harris FM transmitters.

Harris also introduced a 25 kW FM transmitter, the FM-25K, which has a single tube, the final power amplifier. The driver stage uses a series of power transistors in combination to produce 350 watts of drive power for the solid state IPA. There are five identical modules, two amplifiers per module, with one module functioning as the IPA driver and the other four as power amplifiers. If the driver fails, a power amplifier can be substituted; if a power amplifier fails, the other three carry on and air time is not lost. All are broadbanded to cover the 88 to 104 MHz band and do not need tuning. The final amplifier is an Eimac tetrode, Model 8990, and Harris says the tube produces the 25 kW with nearly 80 percent efficiency.

Another new Harris transmitter was the MW-10, a 10 kW AM for medium wave (U.S. AM broadcast band). It uses pulse duration modulation, can produce positive peaks at 125 percent modulation, and uses just two tubes: a 3CX15,000H3 as final power amplifier and a 4CX15,000A as modulator.

Collins/Rockwell also brought a new 25kW FM transmitter, the 831G-3, using the Collins Phase 4 exciter, with the state of the art specs that we now look for in top-of-the-line FM transmitters. It has LED indicators to show the situation in each level of the control ladder, including all overloads and the status of door interlocks, and a phase loss-rotation detector to warn of main ac power problems.

Collins also introduced an AM transmitter, the Power Rock 828D/E (5 kW), which has 12-phase power supply, automatic modulation control, built-in peak limited, a continuous low-power adjustment over the entire range (500 W to 5 kW), a signal access card for direct connection to RF and audio drive (which will simplify adapting the transmitter to AM stereo), and phase characteristics also "AM-stereo-ready."

McMartin was another maker with a new 5 kW AM transmitter, the BA-K2, which uses high-level plate modulation with an oil-filled modulation transformer. The circuit is all solid state to the final power amplifier and modulator: one 4CX5000A tube acts as the power amplifier and two of the same type are in push-pull in the modulator. The transmitter has very complete metering, and the stated specs include 2.5 percent or less harmonic distortion, 50 to 10,000 Hz, 60 dB or better S/N ratio at 100 percent modulation and frequency response 50 to 10000 Hz, ±1.5 dB.

McMartin also showed a new line of FM transmitters in power levels from 1 kW to 55 kW, the M Series, all using a new exciter, the BFM-15, as the main signal source. The exciter can act as a 15 watt transmitter or can be combined with new McMartin power amplifiers at 50 and 100 watts to form transmitters at those power levels; the latter, of course, will interest education broadcasters who must raise power to 100 watts under the recent FCC ruling.

Another McMartin RF system introduced last fall at the NRBA, but new to the NAB is their SCA-Plus, which allows an audio signal and a digital data channel to be sent simultaneously over the same SCA channel. The system makes use of a band-sharing method, assigning frequencies with most of the energy of voice and music to the aural "section," and assigning digital data to less used frequencies. There is an encoder for the headend and four types of

continued on page 144

decoders for different applications at the receive end. The objective of the system is to give the FM broadcaster another service that he can sell, without any sizeable addition to his plant.

Wilkinson added to its all solid-state line with a new 250 watt AM transmitter and also brought a 100-watt amplifier for low-power FM transmitters, another unit aimed at the educational FM field.

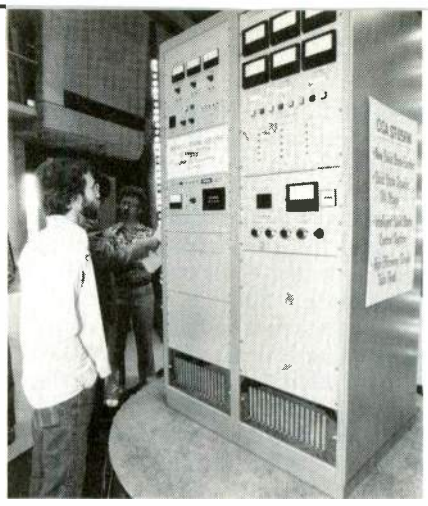
Bayly Engineering of Ajax, Ont., a subsidiary of AEG-Telefunken, brought complete information on the very extensive line of FM and AM transmitters marketed by that leading German manufacturer. Newly introduced in North America is the line of AM transmitters using a special form of pulse duration modulation, Pantel, available for long wave, medium wave (U.S. broadcast band), and shortwave service. AEG-Telefunken claims very high efficiency for the Pantel modulation method, with savings of up to 1,000,000 kwh per year in mains power as compared with a standard anode class B transmitter of 600 kW output.

The Harris 9100 control system will monitor and maintain up to 16 functions.

Bayly is also marketing here the AEG-Telefunken FM transmitters, which are all solid state from low power up through the 3 kW rating, and with one tube to 10 kW. Stated specs are at the FM top level.

CCA Electronics had two new radio transmitters. The AM-1000D is a 1 kW model, usable from 500 kHz to 2 MHz, with 125 percent positive modulation capability, audio response from 30 Hz to 10,000 Hz, ±1.5 dB, distortion 2.5 percent maximum, and noise 55 dB below 100 percent modulation. The control ladder provides protection for cooling, preheating the PA stages, application of bias, and closing of interlocks. The power amplifier and modulator tubes (two each) are all 4-400As.

The second new CCA transmitter is the ST-25FM, a 25 kW FM model. It has a single tube (as power amplifier)



CCA showed its high-efficiency ST-25FM transmitter.

and microprocessor control of all operating functions. There is a "dyatic" solid state IPA stage, exciter operating on the output frequency; the use of the microprocessor makes the transmitter ATS-ready.

Sintronics introduced a complete new line of FM transmitters, 1.5 kW to 27.5 kW. All use a new solid-state exciter, the S1-10E, operating on the RF frequency, a 12-pulse power supply, automatic power output control, with stated specs for frequency response within 0.5 dB of preemphasis curve, distortion o.5 percent maximum, and IM 0.2 percent maximum with 4:1

continued on page 147

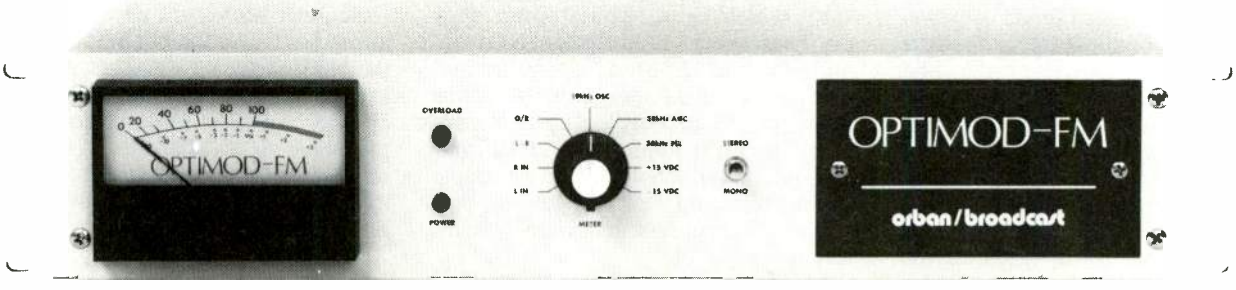
OPTIMOD-FM
THE LOWER YOUR POWER, THE MORE YOU NEED IT.

Sometimes it seems like the cards are always stacked against the Class A's. Low power... low antenna height... poor terrain... they make it tough to reach the audience you deserve. The OPTIMOD-FM Compressor/Limiter/Stereo Generator can change the odds. Its cleaner, brighter, louder signal penetrates farther—and stands out even in strong-signal areas. Many of the almost 2000 OPTIMOD-FM stations now using it report dramatic improvement in coverage and in signal quality.

At $3195* OPTIMOD-FM is the most cost-effective way we know to optimize your signal. Available through selected dealers. Call us toll-free at (800) 227-4498 for further information.

orban

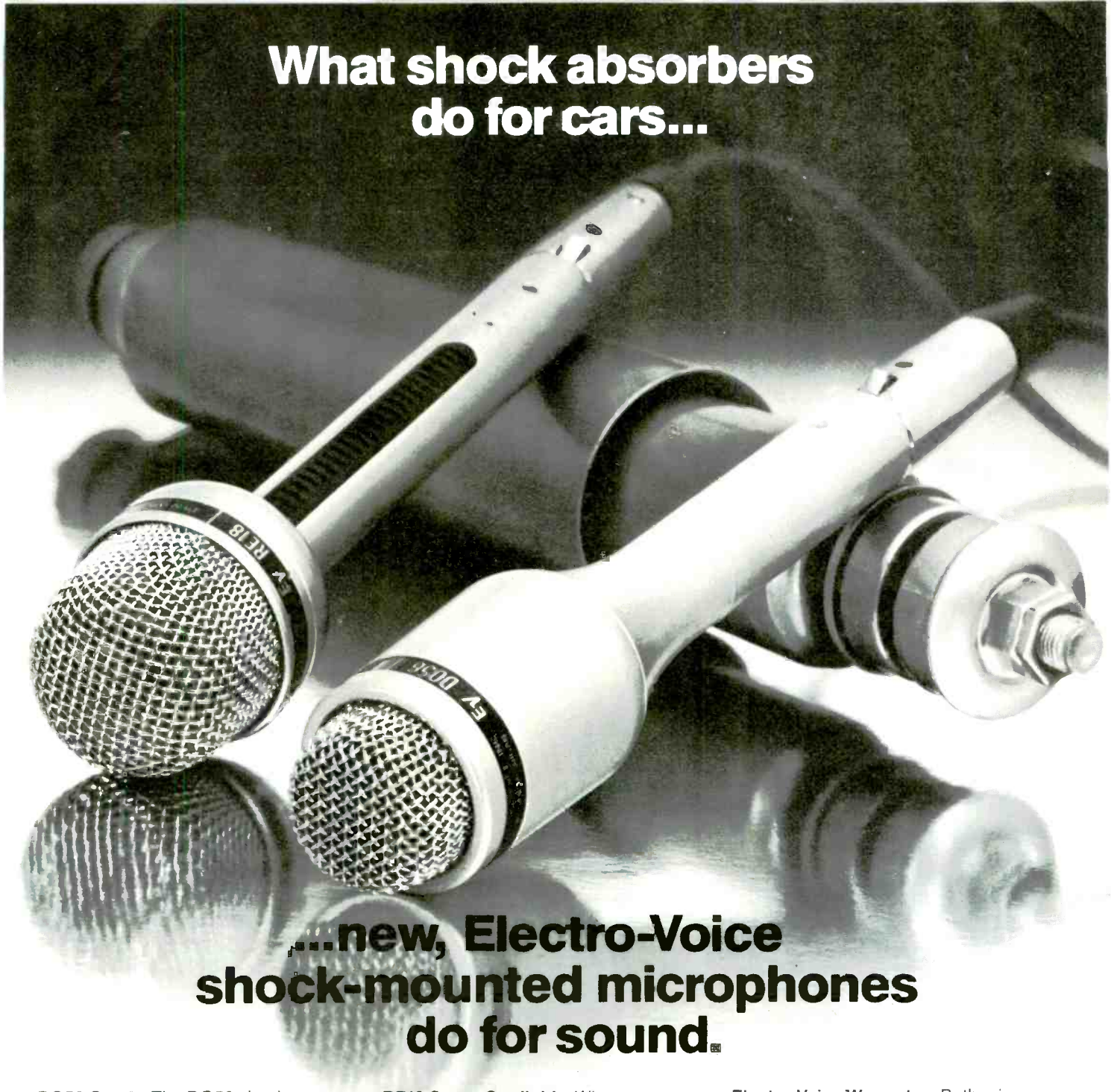
ORBAN ASSOCIATES INC., 645 Bryant Street, San Francisco, CA 94107 (415) 957-1067



*Suggested List Price

Circle 187 on Reader Service Card

What shock absorbers do for cars...



...new, Electro-Voice shock-mounted microphones do for sound.

DO56 Omni – The DO56 shock-mounted omnidirectional microphone is virtually impervious to mechanical noise. Its isolated capsule eliminates the possibility of capsule/case collision making the DO56 the ideal microphone whenever there is lots of action. The excellent "G-factor" margin makes this new microphone less susceptible to the bell-like clang typically heard from other shock-mounted microphones when they are accelerated or decelerated rapidly. Plus, a built-in blast filter reduces "P-popping" dramatically to keep your audio clean.

The DO56 also offers attractive styling, making it ideal for broadcast applications where visual appeal is a necessity. The memraflex grille resists denting, keeping the DO56 looking like new indefinitely.

RE18 Super Cardioid – Where ambient noise rejection is mandatory, the companion RE18 super cardioid combines the best performance features of the famous RE15 and RE16 with superb mechanical noise isolation. Acoustic performance is the same as an RE15, while a refined small-profile blast filter resists "P-popping" as much as the larger RE16.

Unlike "multi-port" directional mikes, E-V's exclusive Variable-D® design insures uniform frequency response at *all* angles, for uncolored pickup on and off axis. And Variable-D reduces the bass-boosting proximity effect found in Single-D cardioids, for consistent sound quality at any working distance.

Electro-Voice Warranty – Both microphones are covered by Electro-Voice's unique two-year unconditional professional microphone warranty. For two years E-V will replace or repair these microphones, when returned to Electro-Voice for service, at no charge – no matter what caused the damage.

These are microphones to depend on, in the studio or in the field. If they weren't, E-V couldn't offer this warranty. When your application calls for a shock-mounted microphone, test one of these at your E-V professional microphone dealer.

Electro-Voice®
a gulton company
600 Cecil Street, Buchanan, Michigan 49107

Circle 188 on Reader Service Card

HEAR FROM US BEFORE YOU HEAR FROM THEM.

Today's broadcasting equipment and standards let you transmit things you never could before.

Like tape hiss, cue tone leakage and turntable rumble, to name a few.

And that's precisely why you need the 4301 Broadcast Monitor. It's made by JBL, the recognized leader in professional sound equipment.

The JBL 4301 lets you hear everything you're transmitting. All the good stuff. And, all the bad. So you can detect the flaws before your listeners do.

It's super-compact, so it fits all EIA Standard racks. 19" h x 12 1/16" d x 11 1/2" w.

Just give us your name and address and we'll send you all the 4301's very impressive specs.

Along with the name of your nearest JBL Professional Products Dealer.

He'll tell you everything you need to hear.

JBL

GET IT ALL.

James B. Lansing Sound, Inc. / Professional Division, 8500 Balboa Boulevard, Northridge, California 91329

Circle 189 on Reader Service Card

intermix. Sintronics also had their all solid state 1 kW AM transmitter, introduced at earlier shows, plus new 5 kW and 10 kW AM models of similar design, using tubes in the power amplifier.

LPB had production models of their FM-150SS all solid state FM transmitter for 100 and 150 watts (adjustable). The FM-10SSE exciter (previously available) in a separate matching package is convertible to stereo by addition of the LPB Model 772 stereo generator and to SCA service with the Model 811 SCA generator. The exciter also interfaces directly with the Optimod compressor/limiter/stereo generator. The power amplifier can be added to many available exciters of other brands to form a transmitter at the 100 watt or 150 watt level. Again, educational broadcasters are the most important potential users of this new transmitter system.

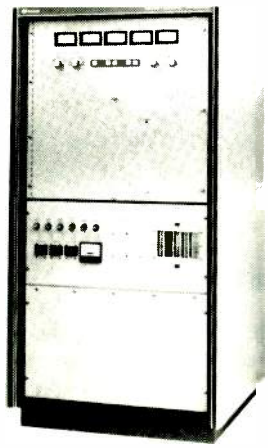
The same application is the main objective of an RF power amplifier from Versa Count, an Elk Grove Village, Ill. firm new to the NAB. The Model LA-150 takes 10 watts of input, produces 150 watts of RF power at FM frequencies, is completely solid state, and has output power regulation of ±1 percent, reverse power protection for shorts and open circuits, and readiness for remote control. Versa Count also showed a new FM translator, available in two versions, Model V-316 with 1 watt output and Model V-317 with 10 watts output. Stated specs are -66 dB or better for spurious signals and harmonics, 120 dB of AGC, sensitivity 1.5μ for 30dB of quieting, and conversion accuracy .005 percent or better.

For more information on radio transmitters: Harris FM-300K, **555;** FM-300KD, **556;** FM-25K, **557;** MW-10, **558;** Collins/Rockwell 831G-3, **559;** 828D/E, **560;** McMartin BA-5K2, **561;** M Series, **562;** Wilkinson, **563;** Bayly, **564;** CCA AM-1000D, **565;** ST25FM, **566;** Sintronics, **567;** LPB FM-150SS, **568;** Versa Count LA-150, **569;** FM translator, **570.**

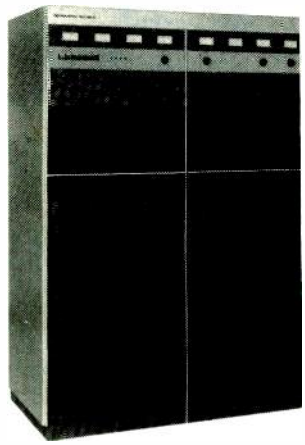
ATS: on the back burner

Two years ago the coming of ATS, a new way of operating freshly opened by the FCC, created a tremendous interest with a number of firms announcing manufacturing plans. But broadcasters did not rush to buy, and most firms put their ATS effort on the back burner.

One firm at the show that did not is QEI. They told *BM/E* they had sold around 30 FM systems up to show time. QEI is continuing all-out development work and hopes to have an AM ATS ready soon.



The Collins 5 kW AM transmitter.



The McMartin 5 kW AM transmitter.

Another firm keeping ATS alive at the show was Stevans, a newcomer with a new system, marketed by Allied Broadcast of Richmond, Indiana. The Stevans ATS is built around the Motorola MC6800 microprocessor, and has all the functions that ATS makers have developed to meet FCC requirements and give broadcasters the benefits of the system.

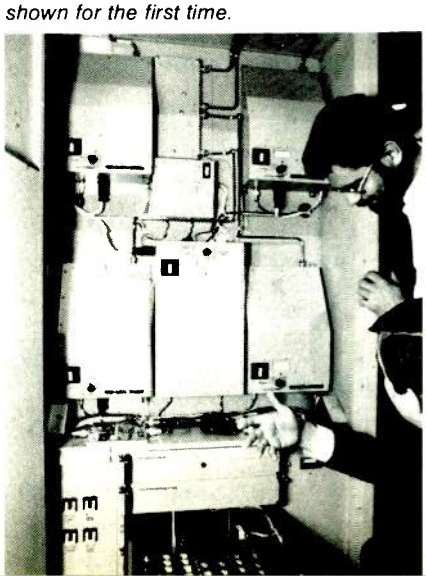
Other firms in the remote-control STL area with equipment that is ATS-ready are Marti, Moseley, and Time and Frequency Technology (as noted in the foregoing). In many cases the up-to-date remote control systems can go to ATS simply with a change of software. Atuomation systems, too, lend themselves to this extension of function, and several automation makers alert buyers to this possibility, as the story on automation relates.

For more information: QEI, **571;** Stevens, **572.**

Television transmitters show some changes

There were a couple of new concepts in transmitter design at the Dallas convention. RCA's TTG series of VHF transmitters that have adopted IF modulation and gotten the power amplifier section down to a single visual and single aural tube marked this company's first major transmitter design change in ten years. The new TTG series is designed with a maximum use of high power solid state components and achieves considerable efficiency from its broadband circuitry in the driver stage.

RCA's new TTG Series transmitter was shown for the first time.



The new TTG transmitters are designed for the world market. The new power levels, 16 kW and 30 kW, should provide more headroom for American broadcasters and easily accomodate the power levels commonly associated with PAL and SECAM systems. (For details, see *BM/E,* April, 1979).

Another new design concept to the American market was the IF-diplexed transmitters shown by Acrodyne. Acrodyne vice president, Nat Ostroff, who has been carrying on an almost single-handed battle with the FCC to get IF-diplexed transmitters accepted in this country, was pleased to announce the first FCC approval for a transmitter of this design. The first IF-diplex transmitter in the U.S. will go into operation at KCBY-TV, Coos Bay, Ore. The KCBY transmitter will be a 2.5 kW.

The advantages of IF-diplexing, according to Ostroff, are chiefly low-cost and high efficiency for relatively low-power television broadcasters. Ostroff feels that the top power liable to be reached with IF diplexing is about 20 kW, though European sources are reporting success with the design at 10 kW UHF, and 20 kW, VHF.

Acrodyne, which has a line of IF diplexed transmitters through the 5 kW level and externally diplexed TV transmitters through 12 kW, expects to see an upsurge of interest in the new design. Shown was a new TT-342-U, 2.5 kW UHF model.

A new line of VHF and UHF trans-

continued on page 148

Acrodyne showed the recently type-accepted IF diplexed TV transmitter.

mitters was announced at the convention by NEC. The VHF series, known as the PCN-1200, is an IF moduated transmitter using a minimum of vacuum tubes, a broadband matching system that allows full coverage of the Band III range without adjustment, a SAW filter as a VSBF and low pass filter. A pedestal AGC circuit has been added to visual section to automatically keep visual output level constant and reduce hum which may be induced at high power stages. Integrated circuits have been used to minimize electrical and mechanical parts and improve performance. A CIN Diplexer is used to reduce size and ease installation. The PCN is available in 1, 2, 5, 10, and 25 kW models.

The new UHF PCU-700 series from NEC uses all solid-state IF modulator and exciter high efficiency Klystron for both visual and aural power amplification. ICs and other circuit techniques have been used to provide a 70 percent reduction in parts. Vestigal side-band saw filters are used, as are other improved components. The transmitters have been specifically designed for unattended operation. They are available in 10, 30, 40, 55, 60, and 110 kW models.

Comark Communications showed a new 55 kW UHF transmitter, the first units built entirely by this company. Comark has long provided complete RF installations on a turnkey basis but has only recently entered the transmitter manufacturing business. The new UHF transmitter utilizes either the EEV or Varian klystron and is water or vapor-cooled. The system has been designed for ATS operation. Two Comark transmitters have been placed in service, one at Ch. 22 in Clearwater, Fla., and the first 10 kW model has been delivered to Ch. 46 in Charleston, W. Va. The Ch. 22 transmitter is due to go on air in a few months and will boost Ch. 22's power to 5 million watts.

Harris continued to draw broadcasters to its exhibit with the BTD series of VHF color television transmitters. Though Harris introduced no new models this year with the exception of its new radio transmitters (see radio transmitters earlier in this report), the BTD-10H3 and BTD-50H continue to represent the top of Harris's line in VHF transmitters.

Philips reported good acceptance by the American broadcasting industry of its transmitters since they were introduced to the U.S. two years ago. In the past year, reported Paul Berquist, president of Philips Broadcast Equipment Corp., 16 Philips transmitters have been sold to nine stations and an additional five stations have purchased Philips exciters.

Philips 17.5 kW VHF and 55 kW UHF transmitters, displayed at the convention, are now available with manual or electronic phasing and automatic changeover.

CCA's primary thrust this year in the TV transmitter area was its new line of VHF television transmitters. Though shown earlier, these transmitters begin at the 1.3 kW power level and are designed to "stair-step" to the 50 kW range. The CCA VHF transmitters use the SST solid state exciter manufactured by Thomson-CSF in France.

continued on page 151

Useful Bits of Data

Skotel Time Code Generators and Readers will conveniently and accurately identify audio and video tapes with SMPTE User Data.

The TCG-80N Generator has unique features that meet the growing demand for identifying tapes with start of program sequences, scene/take numbers, official time of sporting events, time countdowns and documentary data.

The User Data memory can be loaded from the thumbwheels or from an external source, and the Data and Time code is displayed on the front panel.

Another feature that can be added to the Generator and Reader is our video character generator. It has an integral insert keyer that can simultaneously insert User Data and Time code into selected positions in the video of a work print or on a monitor.

Our Reader TCR-80 will save you time because it reads User Data and Time code from hand turn reel speed to 40 times play speed.

If we have all this, you can count on Skotel to include all the other features you require in Time code Generators and Readers.

For complete details and application information call. . .

North: Mike Dyer (313) 478-2157
East: Jim Landy (609) 424-4660
South: Gene Sudduth (214) 785-5764
West: Dave Hill (602) 948-1075

skotel

SKOTEL CORPORATION
1445 Provencher
Brossard, Que.,
Canada J4W 1Z3
(514) 676-1813

Circle 190 on Reader Service Card

What's your angle of view?

Attention: Cameramen, Directors, Engineers...

Varotal MRL is a multi-role lens. It is designed to give you all the shots you need, inside studio or out, with standard or EFP cameras. It's the world's smallest and lightest production TV zoom lens, yet delivers a range of angles 52°-1°.

Most important MRL lens specifications are studio quality. There's no need to compromise sharpness, focus or contrast for weight and utility. With MRL you can expect, and get, production quality that is deserving of your credit line.

Discover the flexibility, versatility, and economy—the quick change artistry—of Varotal by Taylor-Hobson.

Send for 12-page Bulletin MRL.

VAROTAL MRL

RANK OPTICS TAYLOR-HOBSON

MRL has snap-on front units—one for studio, one for outside, and one for all-around use; and, there's no need to re-register or re-set the back focus when you change lenses.

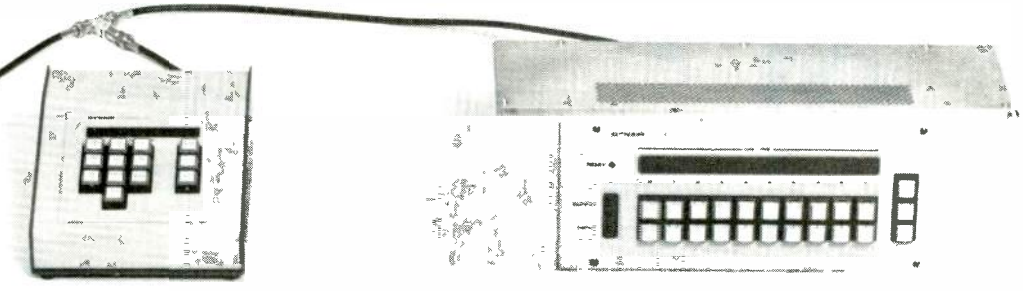
RANK PRECISION

RANK INDUSTRIES, INC.
260 North Route 303
West Nyack, NY 10994
(914) 358-4450

Circle 191 on Reader Service Card

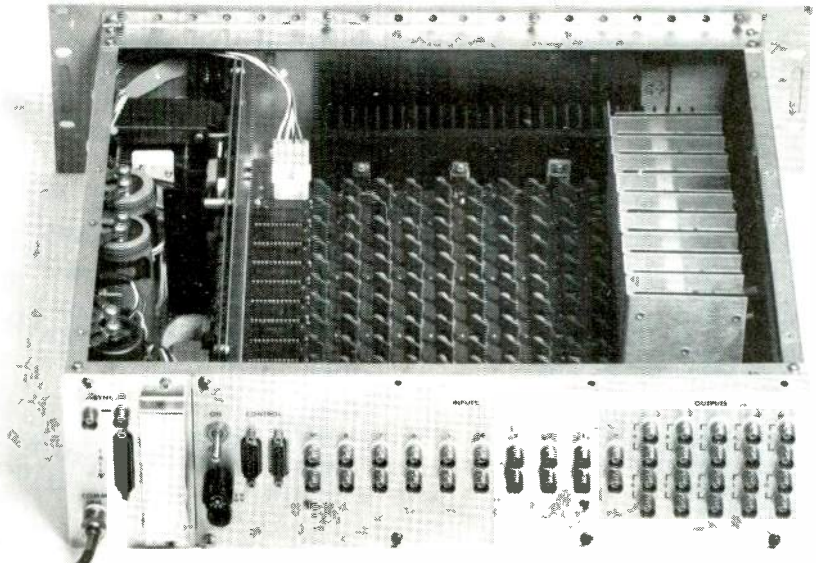
RO-279

10 X 10 the easy way.



Take ten video signals, switch them to ten dual outputs in any combination. Do it in 5-1/4" of rack space. Control the switching from the front panel — or with remote masters and bus units anywhere along 2000' of coax. For each audio or time code level add another 5-1/4" unit.

It's the recipe for the most versatile 10 X 10 video, audio and time code switcher around. Write or phone. We'll send you more information about our vertical interval, microcomputer-controlled SERIES 10. **DYNAIR**



DYNAIR ELECTRONICS, INC. 5275 Market St., San Diego, Ca. 92114; Phone: 714/263-7711, TWX: 910/335-2040

Circle 192 on Reader Service Card

SHOW-IN-PRINT '79

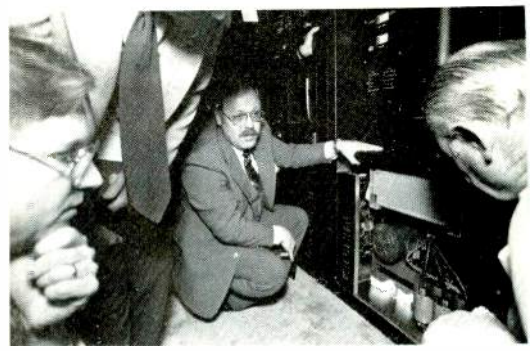
CCA's UHF transmitters were being touted for their efficiency using the new EEV klystrons and exciters. One suggestion made at the CCA exhibit was that the higher efficiency 55 kW EEV klystrons could be substituted for older tubes operating at the 30 kW level. This would provide the broadcaster with greater efficiency and longer tube life since he could operate the transmitter more conservatively. Of course, this approach is very practical for the broadcaster anticipating an increase in power eventually.

Both Eimac/Varian and EEV showed their latest power tubes. As of the convention, however, there were no wholly new designs from either of the companies since last year.

At Electronics, Missiles and Communications, Inc. (EMCEE), the display focused on their translators and MDS systems. A new 11W UHF translator was shown, as were its 5 kW VHF transmitter and a 20 W MDS system. According to an EMCEE spokesman, a third generation translator with much improved performance should be announced in the coming months, probably around the end of this year. The new translators will have improved linearity at 1 W with third-order intermodulation distortion 60 dB down.

Versa Count showed its Model V-213 1 W and Model V-214 10 W translators. These units use a highly selective Cascade MOS-FET front end with dual gate mixing to provide high overload capability, and excellent cross modulation and image rejection. MCI showed its line of RF devices including the new Integrated Switching Combiner which will remotely bypass the respective combiner to permit connection directly to the Notch Diplexer or to a separate visual and aural bypass line. Also new was the dual transmitter Phase Detector/Compensator and the TV-Channel Combiner. The highlight of the exhibit however, was the Coaxial transfer switch which will switch typically at 60 milliseconds for the 1⅝-inch coax, 150 milliseconds for 3⅛-inch, and 300 milliseconds for the 6⅛-inch coax.

The featured product in the SWR exhibit was its heat flow connector for the new C-"K" Line rigid transmission line. —The new heat flow connector is a highly thermo-conductive rigid transmission with the ability to conduct calories twice as fast as present transmission line connectors, according to the manufacturer. The SWR exhibit was completed with its line of Coaxial Switches.



Harris TV transmitter gets close inspection by broadcasters.

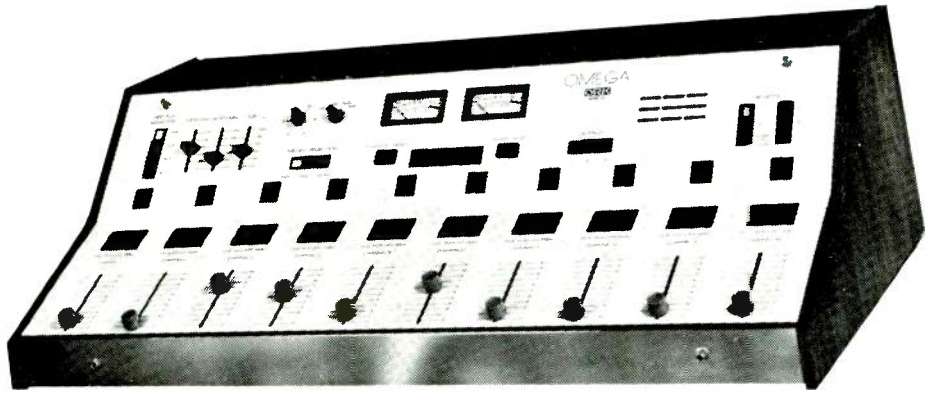
RCA, however, did introduce three new forced-air-cooled power tubes for VHF. These tubes were designed for the new TTG series transmitters, though they are intended for use in other series transmitters as well. The Type 8976 has an 18 kW peak sync output and a 15 dB gain. The Type 8977 has a 7 kW aural output and an 18 dB gain. The type 9007 has a 33 kW peak sync output and a 14 dB gain.

For more information on TV transmitters: RCA TTG Series, **573;** tubes, **574;** Acrodyne, **575;** NEC PCN-1200, **576;** PCU-700, **577;** Comark, **578;** Philips, **579;** CCA VHF, **580;** EMCEE translator, **581;** MIC, **582;** SWR, **583.**

continued on page 152

Today's Professional Studio Deserves A QRK Omega

No other Broadcast Console has all these features at a comprable price!



- Solid State Attenuators
- Programable Gain Select on all Inputs Allowing Mixing of High and Low Level on Same Channel
- Electronic Line Protection for RFI
- Dual Output — Stereo & Mono
- Programable Muting
- Master Gain Inside Cabinet
- Real Time Digital Clock and Elapse Timer for Production
- Programable Remote Start All Inputs
- Digital Switching
- Alpha Numeric Readout on • Master Bus

QRK

24 Inputs $3,795 • 40 Inputs $5,495

CALL TOLL FREE (800) 344-2181
California call collect (209) 251-4213

© QRK Electronics Products 1568 N.Sierra Vista, Fresno, CA 93703

Circle 193 on Reader Service Card

SHOW-IN-PRINT '79

Comark showed the first of its new line of TV transmitters.

Television transmitting antennas

In television antennas the news continues to be circular polarization. RCA took the show as an opportunity to introduce two brand-new developments. Type TDM is designed for VHF channels 2 through 6. A top-mounted design, it features windloading equal to or less than the Superturnstile antenna which it is designed to replace. Using a single radiator for both horizontal and vertical polarizations, its standard configuration is seven layers, each consisting of three of the dual-mode radiators. This generates a power gain of three per polarization. The axial ratio remains at 3.0 for all channels, the circularity at ±1.5 dB, and the maximum VSWR at 1.05 picture carrier/1.08 color subcarrier.

RCA's second new antenna, Model TFU, is designed for UHF channels 14 through 70. The antenna is designed to replace the RCA pylon horizontally polarized antenna when stations wish to upgrade to CP. Most currently existing HP pylon antennas can be mechanically replaced with the TFU. The design combines the RCA UHF pylon and VHF traveling wave antennas by slanting successive layers of slots. The antenna has a 220 kW maximum power rating. Excellent axial ratio, circularity, and VSWR are maintained at all frequencies, and the design permits efficient omnidirectional or directional configurations.

Harris, another leading manufacturer of CP antennas, announced that the first delivery of its CPV low windload antenna would be made to station WWL this summer. The antenna, available in models for all VHF channels, is a top-mounted design with a less than 2 dB axial ratio, less than 1.05 picture carrier/1.1 color subcarrier VSWR, and ±2 dB horizontal circularity with excellent pattern-shaping vertical patterning.

Bogner, another company with a very active interest in CP, showed a section of its slot-and-dipole CP design now functioning with a 1000 W translator on top of the World Trade Center for WTVG. The single Bogner design can be top or side-mounted and is suitable for high-band VHF and all UHF frequencies. A prime advantage of the Bogner antenna design is its excellent pattern-shaping ability.

Cetec Jampro had on hand some excellent photographs of the recent installation of its unique spiral-design CP antenna in Boston for channel 68. The design is suitable for all VHF and UHF channels, with a two-bay version standard for low-band VHFs and a three-bay version for other channels. The omnidirectional antenna, consisting of steel radiators wound in a spiral about a central column, offers probably the best circularity and axial ratio of any other CP antenna on the market. Cetec Jampro also offers a ring-panel design antenna for directional applications. A paper distributed by the company at the show and available for those interested presents an account of the antenna range tests of the channel 68 antenna.

For a complete wrapup of currently available CP antennas, see *BM/E*'s report in our November, 1978, issue. An

continued on page 155

Let Beau Replace Your Japanese Motor.

Many broadcast cartridge machine users are having trouble with the Japanese tape drive motors in their machines. And they're coming back to Beau for our high quality, American-made replacements. Can a manufacturer like Harris, Spotmaster, or ITC save a little money on an imported motor? Probably. But check the motor life and operating specs: You're not really getting the performance you're paying for. Upgrade your equipment, buy Beau. Close to home, we're the Broadcast Products Division, UMC Electronics Co., 460 Sackett Point Road, North Haven, Connecticut 06473.

UMC®

To order, specify Motor Type and Machine:	Prices
Single Speed	$272.00
Dual Speed	$288.00
Multi-Deck	$295.00

Outside Connecticut, toll free, (800) 243-6178.

lightweight and comfortable

headsets

- Independently wired phones
- Intercom and Sportscaster Applications

Literature on request from

Television Equipment Associates, Inc.

TEA Box 260, South Salem, N.Y. 10590
Tel: 914-763-8893
TWX: 710-575-2600

Circle 194 on Reader Service Card

A perfect pair. RCA and your RCA Distributor.

For over 40 years, RCA has been a leading innovator in the design and development of electro optics and devices. With a proven record of quality and performance, RCA continues to make advances to meet the growing demand for industrial tubes.

Your RCA Industrial Tube Distributor has kept pace with RCA to offer you the best, most up-to-date service and to assist you with your specific design and engineering requirements.

Together, we bring you one of the broadest selections of industrial tubes. RCA Electro Optics and Devices include: Imaging Devices • Display Tubes • Lasers • Photodetectors • Power Tubes • Receiving-Type Tubes. We also offer a comprehensive group of sockets and circuits designed to enhance the advantages of RCA industrial tubes.

THE TWO OF US

Whatever your industrial tube requirements may be, look to RCA and your RCA Distributor to solve your problems. Get the service along with the product from the two of us. We want to be your tube supplier.

RCA Distributor and Special Products Division, Deptford, N.J. 08096.

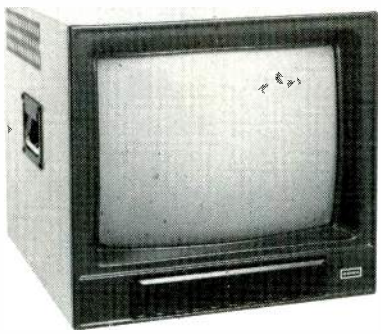
RCA Electro Optics and Devices

COHU

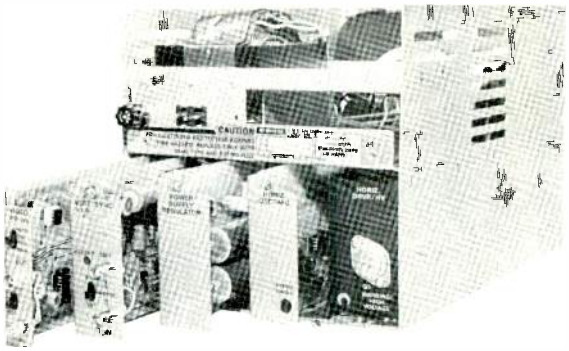
THE LEADING U.S. MANUFACTURER OF QUALITY VIDEO PRODUCTS FOR OVER A QUARTER CENTURY

Introduces *The professional quality* television monitors *you've been waiting for*

Available Now!



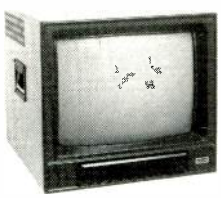
A COMPLETE LINE of monochrome monitors. 9-, 14-, and 17-inch. Available in cabinet and rackmount. Competitively priced.



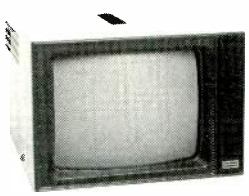
MODULAR CONSTRUCTION with common electronics on plug-in modules that are interchangeable among all models.

FEATURING AVL* – Cohu's Exclusive Automatic Video Level*. The feature that makes it possible to maintain a set contrast level independent of signal strength. Think of what this will do in a multiple-camera CCTV system!

OTHER STANDARD FEATURES INCLUDE • 800-line center resolution • 525/60 U.S. and 625/50 CCIR scan rates • back porch gated dc restoration • loop through input • regulated power supplies • external drive capability • differential input selection. OPTIONS AVAILABLE • P31, P39 or P42 CRT phosphors • 240V operation • remote dc contrast and brightness controls • underscan switch • rack slides

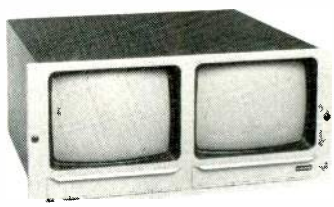


17"



14"

9"



DUAL 9"

Call, wire or write your Cohu Sales Office TODAY for detailed information on Cohu's exciting new line of monitors. OEM inquiries invited.

NORTHEAST Florham Park, NJ 201-377-6636; Framingham, MA 617-879-7530; WASHINGTON, DC 301-656-3061; SOUTHEAST Mobile, AL 205-661-9088; High Point, NC 919-869-3335; PENNSYLVANIA Wayne 215-688-7325; GREAT LAKES Warren, MI 313-739-5444; TEXAS Richardson 214-783-8400; Houston 713-488-0817; ROCKY MOUNTAIN Denver, CO 303-623-6447; NORTHWEST 303-623-6447; NORTHERN CALIFORNIA Palo Alto 415-326-0280; LOS ANGELES AREA Costa Mesa 714-772-5211; Simi Valley 714-772-5211; SOUTHWEST San Diego, CA 714-278-8931.

COHU INC
ELECTRONICS DIVISION
SAN DIEGO CALIFORNIA

YOU EXPECT MORE FROM COHU ... AND YOU GET IT

Box 623, San Diego, CA 92112 ● 714-277-6700 ● TWX 910-335-1204

Circle 195 on Reader Service Card

SHOW IN PRINT 79

update report on CP, outlining the recent CBS paper on CP and the controversy surrounding it, will be published in an upcoming issue.

For more information on TV antennas: RCA TDM, **584**; TFU, **585**; Harris CPV, **586**.

Microwave ENG takes off

The story in microwave ENG systems this year was anything but pedestrian — in fact, microwave ENG displays gave the convention floor the look of a transportation exhibit with helicopters, vans, station wagons, and even an amphibious all-terrain vehicle.

Though the vehicles exhibited were the creations of outfitters, the point the microwave manufacturers made was that if you can get to the scene, microwave gear can get your pictures back. To this end, numerous new antenna systems, receivers, and transmitters were introduced.

The current situation in the microwave field is well known. Many markets find the overcrowding of the 2 GHz band a serious problem, so a number of approaches to solving this were proffered by manufacturers. Various degrees of filtering have been employed, more CP transmitting and receiving gear with selectable polarization has been manufacturered, other bands such as 7 GHz and 13 GHz have been explored to varying degrees, and more frequency-agile systems have been built.

As Jorgen Bistrup, marketing manager of Farinon Video, pointed out, "You work with the antenna system first since it is a very effective filter and gain system. Then you work with the receiver to improve its sensitivity, and last, you work with the transmitter."

Nearly all of the microwave manufacturers took this approach and have worked on more efficient antenna systems, improved their receivers, and then worked on their transmitters.

The highlight of the Nurad exhibit, for instance, was the Nurad/Farinon Video N/FV2CR system. As displayed, the system consisted of the Nurad 30-inch Super Quad antenna system and the Farinon FV2CR receiver. Though the small Nurad Super Quad dish does have a lower gain than larger dishes, its windloading characteristics are superb. Remote control for the antenna system is through the Nurad MC-2 or new MC-3 digital remote control system, which is rack-mounted. All antenna functions are visible on an LED readout. A thumbwheel switch sets the degree orientation desired for the panning of the Super Quad antenna.

The FV2CR receiver employs an extended acquisition feature that sums the AGC and noise detector readings, giving the operator location and tuning information even when RF is 10 dB below the useful threshold. As a result, the Super Quad antennas can be on target almost as quickly as the transmitter is turned on.

Farinon's FV2CR receiver has a dynamic range of 82 dB (-5 to -82 dBm) and compensates automatically for varying signal strengths. It can operate with a minimum system fade margin of 20 dB for transmissions up to 300 miles. Transmissions originating as close as ⅛-mile do not overload the receiver's front end and cause distortion. The receiver operates from 1.99 to 2.11 GHz and has 21 synthesized, phase-lock channels which can be selected remotely or manually.

A narrow-band IF SAW filter provides maximum adjacent half-channel selectivity of more than -45 dB with minimum transmission degradation. The RF noise figure is 3.0 dB and standard audio subcarrier frequency is 4.83 MHz, with 6.2, 6.8, or 7.5 MHz subcarrier frequencies if the optional 15 MHz IF filter is used rather than the standard 10 MHz filter. The unit fits into a standard 19-inch rack space and is priced at $9,300, including the new

ULTRA HIGH VOLTAGE TRANSMITTING CAPACITORS

High Voltage Transmitting Capacitors
2.5 to 30 KV

Designed for use in critical and general applications in LF to UHF equipment

Range. 1 pf to .068 mfd

Temp Range. −10 to +125°C (standard)
−55 to +125°C (military)

Available Tolerances. ±1% thru GMV
Closer tolerances available

Types. NPO thru N2200, K1200 thru K5000

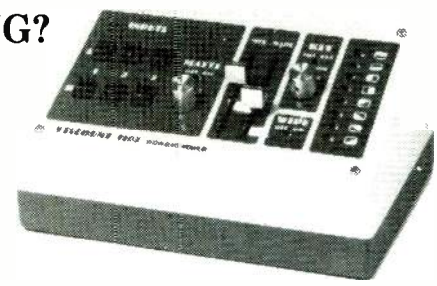
KD COMPONENTS, INC.

3016 S ORANGE AVENUE, SANTA ANA, CALIFORNIA 92707 (714) 545-7108

Circle 196 on Reader Service Card

MODEL 1107 VIDEO SWITCHER

ENG?



HAVE A LOOK!

- 3 INPUTS, 2 BUSSES, VERT. INT. SWITCHING
- FULL COLOUR DELAY COMPENSATION
- MIX, WIPE, MIX OF EFFECTS, KEY, MATTE, WIPE OF KEY
- 22 STANDARD EFFECTS PATTERNS
- $995

INCREDIBLE . . .
AND . . . OFF THE SHELF

VISCOUNT INDUSTRIES ltd

105 EAST 69th AVE., VANCOUVER, B.C.,
CANADA V5X 2W9 - PHONE (604) 327-9446 TELEX 04-508605

CALL OR WRITE FOR FULL DETAILS

Circle 197 on Reader Service Card

60576-M2 low-noise preamplifier which provides a 20-dB gain, out-of-band protection and is remotely controllable.

Farinon also showed a new FV6-13MP "mini link" portable microwave for short-range TV transmissions. The new mini-link is frequency agile from 6 through 13 GHz and operates from ac or an optional 24 V battery pack.

A new FV2-2.5MP portable microwave minilink of essentially the same characteristics but for the 2 GHz band completes the line.

Microwave Associates' exhibit drew large crowds with its microwave-equipped helicopter and All Terrain Vehicle. The helicopter package utilized a Bell Jetranger Series aircraft, of which nearly 5000 are in service. While many stations may not be in the market to purchase a $250,000 helicopter, many of the Jetranger craft belong to flying services that rent the choppers for $180 to $200 a day.

M/A's airborne microwave package is designed to install in a chopper in as little as ten minutes. A simple bracket and adapter attach to the chopper's cabin divider to hold the M/A receiver and transmitter. Only a single RF and dc connection need be made. The idea behind this system, which will sell for about $20,000 to $22,000 including the Microwave Associates Omnex aircraft ENG antenna, is that the standard M/A system can be configured for airborne use only when required. At all other times the unit can be employed in routine station ground operations.

The antenna used in the system is also new. The Omnex attaches to the cargo struts of the chopper and is about the size and shape of a one-pound coffee can. A single cable connects the antenna to the transmitter/receiver units. The antenna design includes four radiating elements which are phased to achieve an antenna pattern for maximum radiation on the horizon, yet with downward null fill. The system should produce broadcast quality signals to a range beyond 20 miles despite aircraft turning and banking. An optional duplexer permits the Omnex to operate as a transmit/receive antenna so that the chopper becomes an effective repeater station as well as camera position.

Microwave Associates began this year to offer its own line of ENG microwave antennas. The new antennas come in a variety of configurations including Disc-Rod™, Disc-Array™, and Quad Horn central receive antennas. The Disc-Rod series offers 23.7 dB gain, adjustable polarization, and a lightweight modular design that has an extremely low wind profile.

There are five models available in the Disc-Rod line. The DR-16 and DR-18 are two-rod element models offering 16 and 18 dB of gain respectively with polarization pre-set at the factory. The DR-219 and DR-221 are two-rod element models with (obviously) 19 and 21 dB of gain, but are also available with remote control or local control of polarization. The top of the line is the DR-424.

Polarization of the antennas is continuously adjustable over an infinite number of settings to correct for depolarization effects caused by undesired multipath. This feature is also useful in reducing adjacent and low-level co-channel interference.

The Disc-Array is the receiving antenna for this system. The Model DA-624 is a fully rotatable six-rod element receiving antenna providing 23.5 dB of gain. Designed for the 2 GHz broadcast band, the antenna one-third the windloading of conventional rotating dish antennas. A weatherproof radome is included with the antenna. Like the other antennas in this series, polarization is continuously variable

continued on page 158

MCI JH-110 Series

The production workhorse of today and the future...designed specifically for the production requirements of today's broadcaster with:

- 3 speed operation
- variable speed
- tape timer memory
- ease of editing

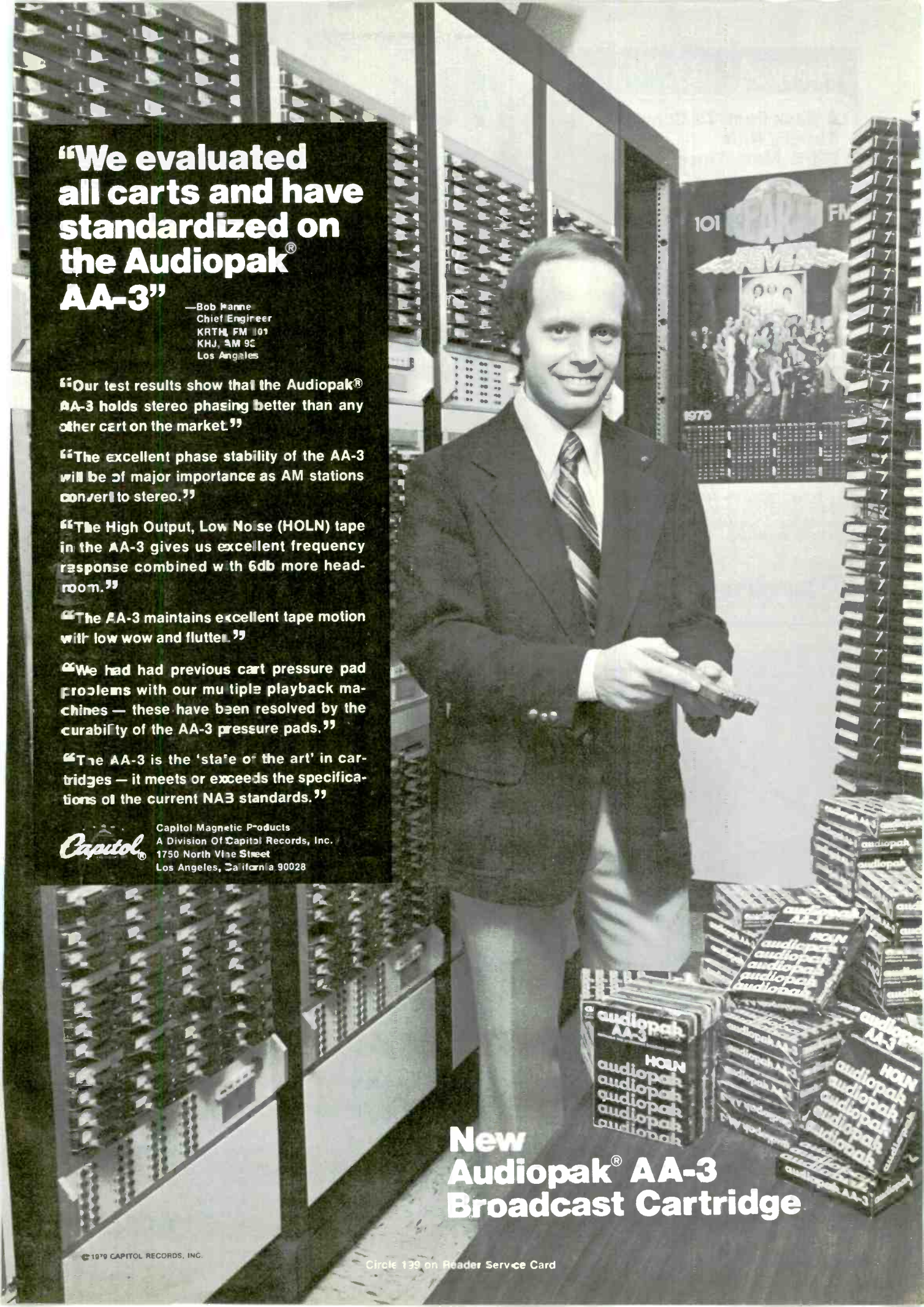
Available in a mono, two, or four-track configuration, the JH 110 can be easily converted as your tape recorder needs change.

When you think about present production requirements, think about the future, think MCI

For information and pricing call your broadcast representative:

PACIFIC RECORDERS AND ENGINEERING CORPORATION
11100 ROSELLE ST., SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255

Circle 198 on Reader Service Card


"We evaluated all carts and have standardized on the Audiopak® AA-3"
—Bob Hanne
Chief Engineer
KRTH FM 101
KHJ AM 93
Los Angeles
"Our test results show that the Audiopak® AA-3 holds stereo phasing better than any other cart on the market."
"The excellent phase stability of the AA-3 will be of major importance as AM stations convert to stereo."
"The High Output, Low Noise (HOLN) tape in the AA-3 gives us excellent frequency response combined with 6db more headroom."
"The AA-3 maintains excellent tape motion with low wow and flutter."
"We had had previous cart pressure pad problems with our multiple playback machines — these have been resolved by the durability of the AA-3 pressure pads."
"The AA-3 is the 'state of the art' in cartridges — it meets or exceeds the specifications of the current NAB standards."
Capitol®
Capitol Magnetic Products
A Division Of Capitol Records, Inc.
1750 North Vine Street
Los Angeles, California 90028
New
Audiopak® AA-3
Broadcast Cartridge
©1979 CAPITOL RECORDS, INC.
Circle 139 on Reader Service Card

How About That!

A Back Pack TV Camera Battery With 250% More Power Output

(At No Increase In Weight)

Specify **silvercel**

By Yardney

Or, If Your Present Battery Is As Powerful As You Want It . . . How Would You Like To Have It At ⅓rd Its Present Weight?

Silvercel rechargeable batteries pack the most useable power into the smallest and the lightest modular package. Used by all major manufacturers of TV Back Pack Cameras as original equipment, they offer the added advantage of a QUICK CHARGE without battery damage by the use of a quick pulse charge.

Silvercel (silver/zinc) rechargeable batteries — the recognized standard of excellence in power output for back pack TV cameras. Our technical assistance and catalog are yours for the asking.

Yardney ELECTRIC CORPORATION

82 Mechanic Street
Pawcatuck, Connecticut 02891

Circle 200 on Reader Service Card

AM STEREO - NOW!

SYSTEM 16
BROADCAST
MIXER

WHY WAIT?

Our elegant mixer has a metered mono output, so you can convert to stereo now, but continue to broadcast in mono until FCC system approval. In the meantime, you'll be monitoring in glorious stereo sound — imagine the impact on a client entering your lobby! Why Wait? Start using stereo now.

$8250 price includes 8 mixers (expandable to 16) with 3 metered stereo outputs and 1 metered mono output. Additional mixers $365 each.

BROADCAST AUDIO ASSOCIATES

11355 PYRITES WAY
RANCHO CORDOVA, CA 95670
(916) 635-1048

Circle 201 on Reader Service Card

SHOW-IN-PRINT '79

and remotely tunable. The final antenna in the MA line is the Quad Horn central receive antenna, designed for the 2 GHz band. Four modules, each with a 90-degree segment of azimuth, make up this antenna. Selection of each module is accomplished through a solid state switching matrix requiring just 200 nanoseconds for completing of any switch.

Rounding out the M/A system is an ENG Master Control for both antenna and receiver. The master control uses high speed digital signaling over standard telco lines to control antenna polarization, direction, preamplifier bypass, and receiver frequency.

Tayburn Electronics used its helicopter microwave system to highlight its line of transmitters, receivers, and antennas. The airborne package will cost about $30,000. It consists of a 2 GHz transmitter/receiver, a special switcher, power amplifier, and five antennas. The antenna system consist of two omnidirectional antennas, one transmit and one receive, on retractable gear mounted under the helicopter. Two 2 GHz horn antennas are mounted inside the aircraft, one fore and one aft.

The key to the Tayburn airborne system is its Autotraker Cos2 Antenna ground station. This unique antenna is able to accurately track the moving aircraft latitudinally and longitudinally. The six-foot Cos2 antenna has a beam of 60 degrees vertical and eight degrees horizontal so the tracking system needs only to pan. The tracking controller orients itself to the incoming signal by adjusting the pan of the antenna for maximum signal strength. Tayburn estimates that the system will track and deliver broadcast-quality signals from a distance of 60 miles off the omni antenna and up to 125 miles off the horns. The helicopter will pick up from an uplink at a distance of 25 miles. The Autotracking antenna and controller are priced at approximately $33,500, and a Tayburn receiver will cost an additional $7500 to 9500, depending on model.

Both NEC and Hitachi brought new lines of extremely small portable microwave units to Dallas. The NEC line was in 7 GHz and 13 GHz bands. The TVL-107M and TVL-113 use 1 W and 3 W respectively with the transmitter weighing 10.1 pounds and the receiver weighing 12.4 pounds. Use of new SHF FET technology provides 1 W at 7 GHz and 0.3 W at 13 GHz with reciprocal noise figures in the receivers of 5 dB and 9 dB respectively.

The units can be powered by a 12 V dc source with an optional adaptor. A 12 V car battery would power the sys-

continued on page 160

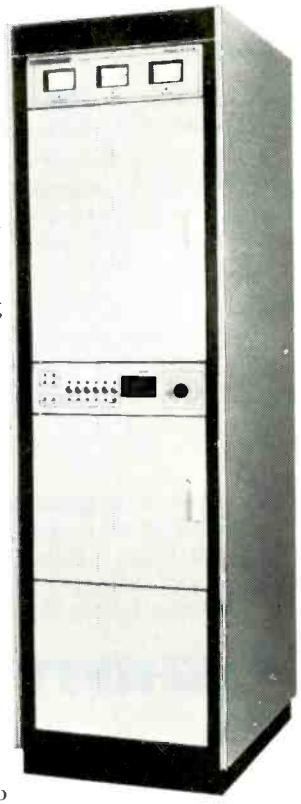
The helicopter displayed by ENG Helicopter Satellite, Ltd. used Farinon microwave equipment.

Tayburn Electronics showed its Auto-Tracker dish for airborne systems.

ENG Manufacturing displayed its Suburban vehicle equipped as a microwave repeater station.

In Microwave Associates' booth was this fully-equipped, all-terrain-vehicle from WEHT-TV, Evansville, Ind.

Solid State at Tube Prices.



Sintronic Model SI-A-1S 1kW AM Transmitter

And when we say solid state, we mean 100% solid state. So you get all the energy savings and improved reliability that solid state technology implies. But price isn't the only thing that's exciting and important about the new Sintronic SI-A-1S 1 kW AM transmitter. It's also loaded with features that save downtime and reduce maintenance.

Most of the circuitry is on 26 computer-type plug-in cards, even the power amplifier. Circuit monitoring and maintenance is a cinch. Panel indicators and a direct reading digital multimeter monitor all critical circuitry. Card extenders allow easy access to components for in-service maintenance. The operating frequency is precisely maintained by a synthesizer referenced to a high stability crystal requiring no oven. It has 125% positive peak modulation capability, but does not use a modulation transformer which can cause phase shift distortion.

Multiple muffin fans move a column of air *slowly* and *evenly* through the transmitter, reducing filter cleaning and eliminating the worry of catastrophic failure as when a single, high-speed blower suddenly quits. The output power is monitored and automatically adjusted to maintain the correct output power . . . precisely and continuously. The RF drive and modulation are constantly compared and the drive is automatically regulated for the optimum level *throughout each audio cycle.*

A strappable 7.5 khz low pass filter is standard so you can use your audio energy where it will do the most good. We have added a switchable peak-riding audio clipper too, removing those sharp, low energy peaks causing the modulation meter to flash prematurely.

Remote control facilities are standard.

Of course Sintronic makes transmitters other than the SI-A-1S. They can provide you with the transmitter you need from 10 Watts to 55kW FM, or to 50kW AM.

There are many more impressive facts about this transmitter we would like to tell you about. Write or telex: Broadcast/Communications Division, Singer Products Co., Inc., One World Trade Center, Suite 2365, New York, NY 10048. Cable: EXREGNIS. Telexes: RCA, 233298 SPC UR; ITT, 423592 SPC UI; WUI, 667353 SPC.

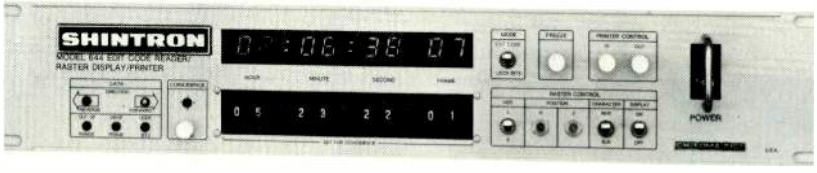
Sintronic CORPORATION
SINGER PRODUCTS
COMPANY INCORPORATED

Circle 202 on Reader Service Card

Go anywhere SMPTE Edit Code Generator and Companion Reader that will give you an instant shot list.

The only portable SMPTE Code Generator. Shintron Model 640 SMPTE Edit Code Generator.

- Goes anywhere with your ENG crew.
- Light and rugged. It attaches to your VTR and produces accurate edit code as you shoot important scenes.
- You cannot enjoy full advantages of ENG unless you have the 640 SMPTE Edit Code Generator.
- EBU European Standard version available.



Model 644 Edit Code Reader

When Shintron builds a new product, we think of our customers' convenience first. Good Edit Code Readers are a dime a dozen today, but which one can generate an instant shot list? The only one is Model 644 Edit Code Reader / Raster Display and Shot List printer.

SHINTRON Worldwide

Cambridge, MA 02142 USA
(617) 491-8700 / telex: 921497

Circle 203 on Reader Service Card

Change Sound to Silence with a TABERASER

This rugged, heavy duty bulk tape eraser wipes sound from all magnetic tapes, cartridges, cassettes and magnetic film stock; handling up to 2".

It erases with minimum residual noise because the field automatically diminishes at the end of each 30-second cycle.

A thermal control and blower keeps the unit below 71° C.

Available for 60Hz or 50Hz operation.

For the distributor in your area—Call or write:

TABER Manufacturing & Engineering Company

2081 Edison Ave. • San Leandro, Ca. 94577 • (415) 635-3831

Circle 204 on Reader Service Card

tem for 24 hours. The entire operational design of the system centers around quick-mount concepts for dish, radiator, and main mount. No tools are required for setup.

The Hitachi units also make heavy use of FET (field effect transistor) technology for their input-output separation and low power consumption. FETs are employed for microwave oscillators and amplifiers. Though not yet FCC type-approved, Hitachi will probably enter the market with 7 and 13 GHz models. The units displayed at the show included the FR7G1-S7 and FR7G5-S7 field portable units and the FR7G01-S8, an extremely small unit with a transmitter weighing about 2 kg and a receiver that weighs 3 kg.

Terracom showed its full line of microwave radio systems for television, audio, and data transmissions, but added nothing truly new to its line. Earth station receiving equipment was also explained, but Terracom's main thrust this year was its Bell system-compatible audio diplexers, which provide two full 15 kHz audio channels over normal Bell system channels.

For more information on ENG microwave: Nurad N/FV2CR, **587;** ME-3, **588;** Farinon FV2CR, **589;** 60576-M2, **590;** FV6-13MP, **591;** FV2-2.5MP, **592;** Microwave Associates airborne system, **593;** Disc-Rod, **594;** Disc-Array, **595;** Quad Horn, **596;** ENG Master Control, **640;** Tayburn airborne system, **597;** NEC TVL-107M, **598;** TVL-113, **599;** Hitachi FR7G1-S7, **600;** FR7G5-S7, **601;** FR7G01-S8, **602.**

Vehicles make important contributions to microwave readiness

In addition to the Jetranger helicopter in Microwave Associates' booth, they also had the WEHT-TV Max II All Terrain Vehicle on display, which was featured in last month's special report on field production (*BM/E*, April 1979). WEHT director of engineering Elmer Chancellor has since updated his Max II to the new MA-2CP transmitter with the Microwave Associates antenna system.

Sharing Farinon's microwave extravaganza was E.N.G. Manufacturing's GMC Suburban unit. Units such as these are the mainstay of WMAQ-TV's ENG operation which was also featured in last month's Field Production Special Report. The units are setup as microwave repeater stations with both 2 and 7 GHz transmitter/receivers. A 7 GHz dish antenna is located aft, with 2 GHz Dual Golden rods fore. The

continued on page 162

Dish out more entertainment.

Everytime you look up, more comes down. Sports. Syndicated shows. Live events from around the world. All via satellite. Isn't it time you got your own dish, and fattened up your ratings.

Scientific-Atlanta stands ready to help you only as we can. By the year's end, over 1,500 of our earth stations will be operating around the world. From the icy reaches of Alaska to the hot deserts of Africa, we're number one.

The extent of our product line is one reason nobody on earth knows more about earth stations. We make the antenna itself, the automatic positioning equipment, the video receivers (multi-channel or single channel), the transmit exciters, the up/down converters, the automatic protection switches. And so on.

Then we package it all. And in case of trouble we fix it all. That means Scientific-Atlanta service centers are strategically located across the nation and ready to rush to your aid on a 24-hour a day basis. It's why our earth station owners sleep better. So will you.

For more information, call Ken Leddick at (404) 449-2000. Or write us.

Scientific Atlanta

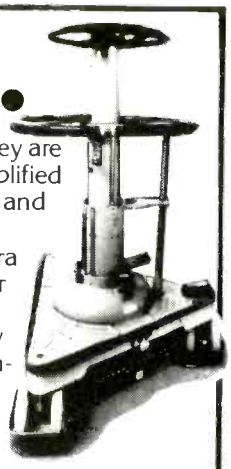
United States: 3845 Pleasantdale Road, Atlanta, Ga. 30340, Telephone 404-449-2000, TWX 810-766-4912, Telex 054-2898
Canada: 1640 Bonhill Road, Unit 6, Mississauga, Ontario, L5T 1C8, Canada, Telephone 416-677-6555, Telex 06-983600
Europe: 1-7 Sunbury Cross Centre, Staines Road West, Sunbury on Thames, Middlesex TW16 7BB, England,
Telephone Sunbury on Thames 89751, Telex 896015

Circle 205 on Reader Service Card

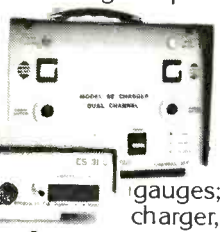
Outstanding...

Our products are outstanding in the way they are manufactured...superb engineering and simplified design make them virtually maintenance-free and give many years of dependable service.

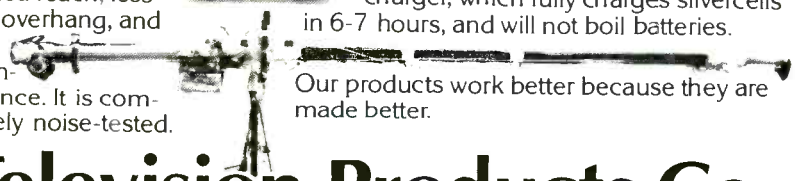
With 5 to choose from, we have a camera pedestal for every need, ranging from our P-20 to our heavyweight, the P-50. The **P-20** (shown on left), which weighs only 160 lbs., will operate with 300 lbs. of camera weight. The **P-50** (shown on right) has unsurpassed stability with extreme versatility and heavy camera weight capability.



Our outstanding **microphone boom** (shown below) is a modified M-R 103 which is completely reworked to give extended reach, less rear overhang, and low maintenance. It is completely noise-tested.



Our outstanding **silver power battery system** (shown on left) includes the **ES-31** 10 amp hour battery pack in 3 configurations (ENG, VTR, and lighting), all with LED energy gauges; and the **Model #98** dual pack charger, which fully charges silvercells in 6-7 hours, and will not boil batteries.



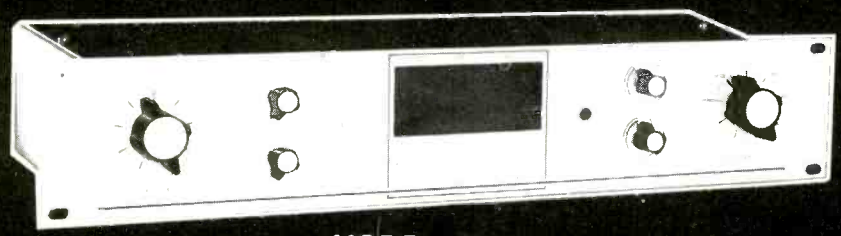
Our products work better because they are made better.

Television Products Co.

9016 Aviation Blvd., Inglewood, CA 90301 Phone: (213) 776-3276

Circle 206 on Reader Service Card

COMPLIMITER™



MODEL 610

Used in recording studios; disc mastering studios; sound reinforcement systems; TV, AM, FM broadcast stations to maintain a *sustained average signal* at a level *significantly higher* than that possible in conventional limiters, and with performance that is seldom attained by most *linear amplifiers.*

Rack mounted, solid state, *new* functional styling, the Model 610 is in stock for immediate shipment.

Specifications are available from:

SPECTRA SONICS

3750 AIRPORT ROAD, OGDEN, UTAH 84403
(801) 392-7531

Circle 207 on Reader Service Card

SHOW IN PRINT 79

antennas are mounted on pneumatic-powered 25-foot telescoping masts with either manual or remote control of pan and tilt. Also mounted on the roof are two-way radio antennas, an RCA FM off-air antenna, and quartz outboard lights. Installed in the right-hand rear fender is a connector panel for audio, video, and power. The main equipment rack is located aft of the left hand rear passenger's seat. The seat swivels from a forward travelling position to a rear-facing operating position.

Wolf Coach also showed van designs for ENG and EFP units. The microwave equipped units are built according to the customer's specifications, but Wolf Coach uses some ingenious design to pack a lot of gear into rather small places. Also typical of the Wolf Coach units is a high degree of built-in creature comforts. These elements are essential in the larger EFP units such as "The Hippo," where a production crew may spend hours.

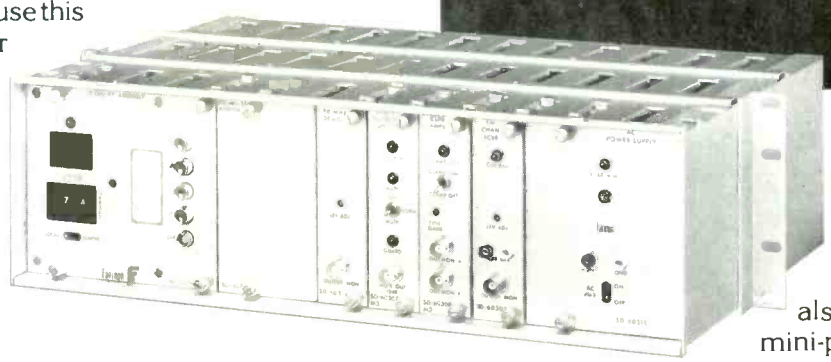
Another ENG helicopter system that drew a lot of attention was the creation of ENG Helicopter Satellites, Ltd. This airborne unit was built into a Hughes 500 turbine-powered helicopter. Packed into the chopper was a TK-76 on a specially designed mount built to eliminate vibration; recording equipment, a Farinon transmitter and receiver, and a Nurad Model 20 CO1 airborne antenna system. The airborne package is available for$71,000 installed, plus the cost of camera and VTR. The package is designed to install in a leased helicopter in under 15 minutes. The chopper on display also carried a Farinon 2-2.5MP transmitter and antenna as a portable uplink to be dropped off at a location with camera crew. The chopper would then lift off to a repeater position.

Microwave relay links and STLs were on display in a number of the microwave manufacturers booths. Rockwell-Collins Transmission Systems Division showed its MVR-12 system for intra-city and STL. One useful tool for the new level of complexity coming into the ENG era was shown in the Dynasciences booth, the Model 9200 Video Source Identifier. This unit provides for the insertion of an identifying code (station call letters and unit number) in the vertical interval of field transmissions, as required by the FCC.

For more information on microwave vehicles: Microwave Associates Max, **603;** ENG Manufacturing, **604;** Wolf Coach, **605;** ENG Helicopter Satellites, **606.**

Our new receiver couldn't care less where your ENG crew goes.

With Farinon's new FV2CR Central Receiver you can now send your ENG crew to wherever the action is. And minimize the problems of weak signals and distortion. That's because this outstanding receiver has an unsurpassed 82-dB dynamic range. When signal strengths vary due to different transmission distances, the FV2CR compensates automatically to assure optimum performance.



For transmissions as far away as 300 miles, the FV2CR can operate with a minimum system fade margin of 20 dB. And with the ENG crew as close as 1/8 of a mile, the receiver's front end won't overload and cause distortion like other receivers.

The FV2CR provides 21 synthesized channels in the 2-GHz band. By instantaneous phase-lock loop, the channel you select (manually or remotely) is the channel you get. And the receiver's unique, extremely sharp IF SAW filter provides excellent selectivity of at least −45 dB with maximum half-channel rejection. Also its noise figure of only 3 dB is tops in the industry.

Now you'll have a new degree of freedom in news coverage. So you can send your ENG crew wherever the action is. And Farinon's new FV2CR Central Receiver couldn't care less where they go.

Farinon Video also offers portable and mini-portable video transmission systems, STL microwave radios, FM transmission channel systems, as well as video baseband treatment units and ancillary equipment.

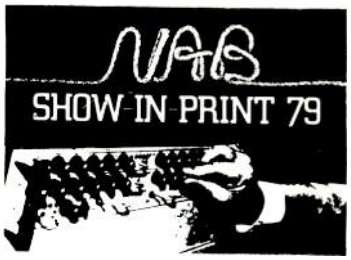
For information, contact Farinon Video today.

Farinon
VIDEO
A Farinon Company

Main Office: 1680 Bayport Ave.,
San Carlos, CA 94070; Telex: 34-8491
Domestic, Phone: (415) 595-3500
Export, Phone: (415) 592-4120

Canada: 657 Orly Ave., Dorval, PQ H9P 1G1
Phone: (514) 636-0974; Telex: 05-82-1893;
TWX: 610-422-4122

Circle 208 on Reader Service Card



AUTOMATICS LEAD THE TREND IN TESTS AND MEASUREMENTS

The bonanza of new product introductions in the television test and measurement area at last year's show appears to have quieted somewhat. On the other hand, manufacturers of H & V blanking measurement instruments report sales way up. As at last year's show, considerable interest was shown in automatic VITS analyzers. Tektronix ANSWER system, a microprocessor-based, digital instrument (4 x fsc sampling), remains the most sophisticated of the automated VITS analyzers. Delivery as product is now promised for the fourth quarter of this year. The system will run a full set of VITS and timing measurements in less than a minute, with flags on out-of-parameter specs. Hard copy printouts of any or all portions of the analyzed signal can be directly copied from the CRT display. New to the system this year is a set of interpolation graphics that help eliminate the sharp edges in sine wave curves introduced by the digital sampling technique. The signal averaging can add up to eight steps between each digital sampling point, providing a truer plot of the sine wave form.

Marconi (TAME) and Philips T&M (PM 5578) both had their VITS analyzers on hand; both were the same as at last year's show. For a complete wrap-up of automatic VITS analyzers, see *BM/E*, November, 1978.

Demodulators are once again capturing the attention of broadcast engineers, with several new models exhibited. Barco announced preliminary specifications for its AVD-33, exhibited at Electro & Optical Systems' booth. The demodulator uses digital turning techniques (voltage snythesis) to cover all VHF and UHF stations. Locations of 20 channels can be memorized, then run through sequentially in either direction.

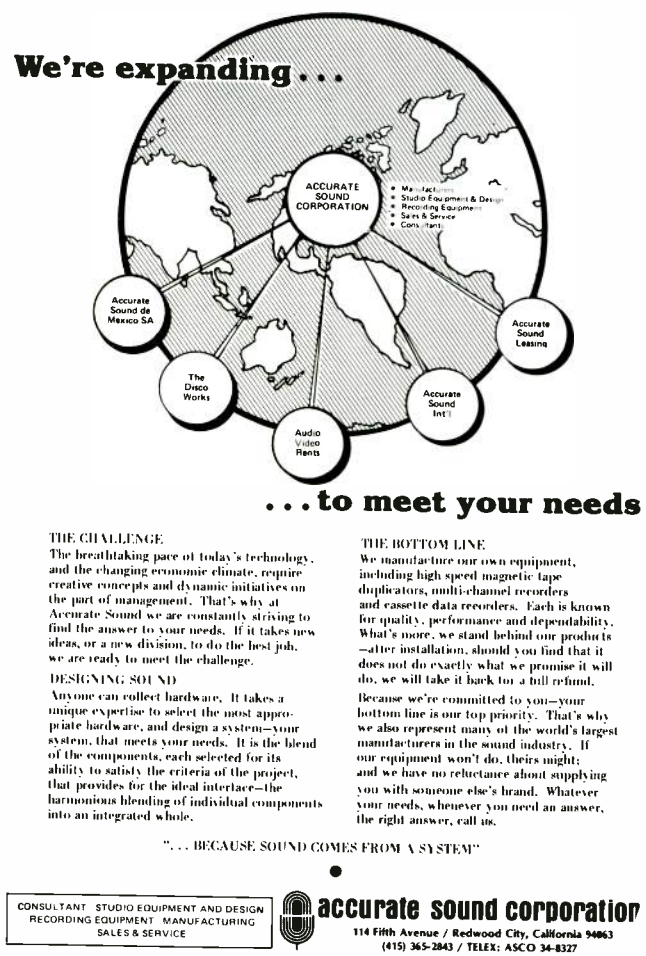
Tektronix, which last year introduced its increasingly popular Model 1450 demodulator, this year had a new Model 1450-1 demodulator with tunable down converter. Extremely precise manual tuning is used for all UHF and VHF frequencies; two lights alongside the tuning knob glow when the station is overshot or undershot. The system is phase locked and will perform IPCM measurements on an accompanying test set and waveform monitor display. A headphone is used for audio monitoring.

A new, fixed channel demodulator was offered by Telemet. Suitable for all VHF and UHF bands, the Model 3710 includes both synchronous and envelope detectors. The two outputs are multiplexed and can be seen simultaneously on a scope. Front panel LEDs display RF input level, FM deviation, and ±dc regulated lines. The demodulator also has an excellent audio package with 4.5 MHz output with sound traps off. Switching the sound traps in produces an envelope delay inversely proportional to the FCC's required delay characteristic.

There were also several new developments in television test signal generators of various sorts. Once again, Tektronix led the way with a new pulse and bar generator (Model TSG5 for NTSC) and switcher/convergence generator (Model TSP1 for NTSC) modules for its Model 1410 test signal generator. The pulse and bar generator permits pulse and bar overlays for pulse/bar amplitide measurements, and full or half amplitude pulse and bar.

The TSP1's principal value is as a switching system for the rest of the 1410 patterns, though it also generates crosshatch, dots, and crosshatch/dots convergence signals. On the switcher side of the module, from two to six signals from the 1410, in addition to convergence, can be displayed on a single full-field display. The user selects the signals that will pass through the switcher; the individual parallel outputs from the test signal generator remain, however, fully operative and accessible. The TSPI will also automatically cycle through the six test signals.

NTI, which for several years has been marketing its Model 535 digital color monoscope signal generator, came to NAB with something new this year — the 700 Series modulated chroma generator. The Model 707XA (the NTSC version) is actually designed to be used as a research tool, and offers complete control over all variables



Circle 209 on Reader Service Card

Tektronix's new 1450-1 demodulator now features a tuneable down converter.

AF Associates enters the test and measurement market with its HV 100 system for measuring timing pulses. The unit will sell for $1690.

The Tektronix ANSWER system for automated VITS and timing measurements now has interpolation graphics.

The Tentel Tentelometer can now be used with both audio and video recorders.

CREATIVE FREEDOM

Z6

EDITING SYSTEM

A Microprocessor Based Editing Control System

. . . a fresh new approach to creative freedom. The Z-6 has more of what you are looking for than *any* other VTR editing system.

Z-6 HAS WHAT YOU NEED!

Reliability — the Z-6 utilizes the computer industry's standard IEEE S-100 buss electronics - the heart of your Z-6 is a tried and proven Z-80 micro computer. Moreover your Z-6 interface requires *NO* mechanical modifications to the VTR. Your transports are factory reliable.

Accuracy — with "micro-loc"* the Z-6 is "dead lock" accurate. The frame of video you select is the frame of video you edit. "Micro-loc"* is an exclusive Z-6 technique which obviates the need for SMPTE time code. For the first time control track editing is as accurate as the "old standard".

Expandability — the Z-6 is software based. Your Z-6 future is the future of the computer world. Every Z-6 is state of the art year after year and software upgradeable.

Z-6 HAS WHAT YOU WANT!

Features — the Z-6 comes with a 99 event memory. Bi directional shuttle controls, auto search, cruise control, event tag, rehearse, perform, review edit and many more features far too numerous to mention. . . there's even a built in electronic scratch pad for calculations. All the features of conventional editing systems plus many they haven't even thought of. The Z-6 was conceived and designed by professional editing people.

Human Engineering — the keyboard is simple. Each primary function has a dedicated button. No shifting or typing. The Z-6 keyboard is layed out logically. The CRT display is organized in a similar fashion. The status of your production is simply and accurately displayed throughout the editing process. Cursors prompt the operator to the next logical function and error messages appear when an illogical command is attempted. The Z-6 edits, it relies on you only for the *"creative decisions"*.

Flexibility — the Z-6 can edit the most demanding production you can give it, with consecutive event mode changes, simultaneous tape searching, event memory recall, automatic computation of times and durations, custom programmed pre rolls and post rolls, automatic return to last event edited.
However, if you are a novice, the Z-6 will operate like the simplest control track editing system you have ever used except it will be the most accurate. Forget the numbers, durations, roll times, events. Simply shuttle to the pictures and rehearse and/or perform the edit. The Z-6 can handle your novices *and* your pro.

THE Z-6 HAS IT ALL!

For the first time you have a first class production without the hardware hassle - it's that simple. YOUR EDITING SYSTEM SHOULD HAVE "Z-6 APPEAL"

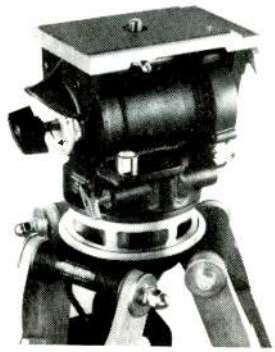
* pat. pend.

Videomedia
Professional Television Systems

250 North Wolfe Road, Sunnyvale, CA 94086 408/733-6500

Circle 210 on Reader Service Card

UNIVERSAL
FLUID HEAD
Model 205B



For film and video cameras weighing up to 50 lbs.

- With Hydralok® & Autoslip® Pan.
- Additional Positive Tilt Lock.
- Quick leveling claw-ball and cavity system.
- Weighs only 8 lbs.

Manufactured by Universal Fluid Heads (Aust.) Pty., Ltd.
Sole U.S.A. Distributor:

cinema products CORPORATION
Technology In The Service Of Creativity
2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 • (213) 477-1971 • Telex: 69-1339

HEY CHIEF:

WHILE YOU WAIT DELIVERIES ON THOSE EXTRA WAVEFORM MONITORS YOU NEED . . .

. . . Let **THE MATCHBOX** increase your existing monitoring capacity by a factor of 3.

AND match your cameras faster and more accurate as well.

Even get the optional **FINE BOX** module to warn you whenever your V-Blanking is illegal.

You just may wish those deliveries take forever.

Call us or your favorite distributor:

Cezar
International, LTD.
491 Macara Ave., Suite 1003
Sunnyvale, CA 94086
(408) 733-1436

Circle 211 on Reader Service Card

SHOW-IN-PRINT '79

within the color signal. Some of the control parameters are variable level and polarity of both R-Y and B-Y, variable subcarrier frequency, variable burst width and position, variable burst and color relative phase, accurate step attenuation for luminance, chroma, sync and burst signals, and so on. Sync is provided either internally or from an external source.

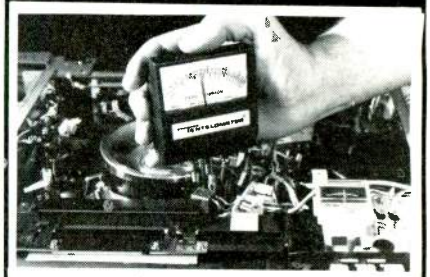
Another new TV test signal generator, Model TG-7, is available from Asaca. Again a modular approach, the mainframe can accomodate up to three plug-in modules simultaneously, switchable from the front panel. The mainframe contains a sync generator which can be genlocked, a built-in dual axis balanced modulator, and a subcarrier oscillator. The plug-in modules test frequency response (color bars), linearity (DG-DP), and sine-squared characteristics.

New from Philips is the PM 5533 TV signal generator, providing a complete color sync pulse generator (color bars), a cross-hatch with gamma corrected grey step, and a flat field signal generator for color temperature analysis of monitors and receivers. A constant-temperature time base oscillator provides for high stability. Separate output connectors are available for a variety of sync drives including composite sync and blanking, H and V drive, and color subcarrier and burst keying. The flat field signal can be used as a black burst synchronizing signal.

A new encoded color bar generator — Model CBG-230N — was introduced by Leitch Video. Based on the SMPTE ECR-1 alignment color bar test signal, one output each of color bars, color black, R, G, and B is provided. Internal selection can switch the outputs to Y, R-Y, and B-Y signals. Grating and dot outputs are available optionally.

Video Aids of Colorado unveiled its new Model 4000 combination H phase/burst phase VIRS phase meter. The unit is actually a combination of several other Video Aids products with separate H and burst phase metering. Two meters read H phase (in 1 μs increments) and either burst phase or VIRS phase (in 10 degree increments). Video Aids demonstrated convincingly that the system offers far more accurate measurements than are generally possible with a vectorscope. The Model 4000 is also a VIRS inserter; an indicator shows when VIRS is present on the incoming signal so the operator can decide whether to strip and reinsert new VIRS or let the signal VIRS carry through.

TECHNICAL PROBLEMS
PLEASE STAND BY



Tape tension in your video recorder or player is the most important factor for trouble-free operation. Using the TENTELOMETER® will save your tapes and help assure high quality reproduction. It is so easy to use, even a non-technical person can perform critical maintenance checks.

Send for our complete data sheet and a free copy of the 16-page tape tips instruction manual. Price $195 complete.

50 Curtner Avenue
Campbell, CA 95008
TENTEL (408) 377-6588

Circle 212 on Reader Service Card
See us at Los Angeles Video Show Booth 630

SONY 2850 OWNERS SOLVE YOUR FRAME LOCK-UP PROBLEMS WITH CEDCO'S NEW FIELD FRAME KIT

Your VCR will *ALWAYS* lock-up on the proper field.

P.C. Board,
Complete Instructions,
Easily Installed.

Price — $295.00 Ea.

CEDCO
CONSOLIDATED ENGINEERING DEV. CO.
P.O. BOX 2213, ANAHEIM, CA 92804
PHONE (714) 956-5590

Circle 213 on Reader Service Card

SHOW-IN-PRINT '79

World Video introduced its new PWI/H pulse width indicator. Digitally derived pulses appear as two independently controlled cursors in the pulse-cross configuration on a picture monitor. The pulse cursors are then positioned on either side of the portion to be read, and the measurement appears as LED readouts on the front panel of the instrument with an accuracy of ±0.05 percent.

Also shown at World Video's booth was Beta Technology's Model 710 blanking width verifier. The system generates an outline (operator defined) of usable picture area in a picture or waveform monitor. The operator can then determine whether the picture falls within acceptible blanking widths. Vertical blanking is outlined by pulses on lines 17 through 21 (selectable) and/or line 262.

Marconi Instruments brought its T.I.T. (Television Interval Timer) to the NAB show for the first time, though it was introduced earlier in the year and shown at the SMPTE conference in New York last year. T.I.T. measures the 15 timing parameters as outlined in the EIA specification RS170A. A digital sampling instrument, T.I.T. displays its measurements on front-panel LEDs. However, the system is easily connected to a remote logging/alarm system. For measurement of parameters not involving picture information — such as H and V blanking and picture start — T.I.T. averages a large number of samples to diminish noise distortions. For a full rundown of the system see *BM/E*, November, 1978.

Leitch Video helped cast some light on one of the perennial problems in television signal standardization. A paper distributed at the show discussed the horizontal sync to subcarrier phase relationship (SCH). As most engineers now know, although the FCC rules allow the phase of subcarrier cycles with respect to horizontal sync to be random, the EIA has defined the relationship to be a specific time duration between the 50 percent point on the leading edge of sync and the first zero crossing of the color burst; 19 subcarrier cycles has been established as the correct SCH timing. The measurement and correction of SCH timing errors is seen as critical in providing correct H blanking, and the measurement of these errors (plus and minus in degrees or nanoseconds) is a function provided by Leitch's new Model SCH-730N SCH monitor. The unit, with a readout range of ±90 degrees or ±70 nanoseconds, is available immediately at $750.

Philips T&M introduced a new system for analyzing the performance and callibration of color monitors. The PM 5539 analyzer uses three independent LED displays to analyze the R, G and B intensities emitted by a picture tube. It also provides for accurate measurement of the color "white," even at low illumination levels, by the additive mixing of R, G, and B in appropriate proportions. Pushbuttons allow adjustment to several different color temperatures.

A related product is QSI's new color bar identifier, Model CB-8000. By combining a color bar generator with a character generator and audio signal source, the unit provides an EIA standard RS-189 split field color bar with an eight-character ASCII identifying word. A 400 Hz audio tone can be supplemented with voice identification through a mic input.

Test patterns were also the theme of Porta-Pattern's booth. The company supplies a wide variety of test charts, cardboard-mounted or on slides and transparencies.

Another useful testing instrument, introduced at last year's show, is Datatek's Model D-640 envelope delay test set. Its features include a wide frequency range (50 kHz to 20 MHz), spot or frequency swept measurements, amplitude and delay characteristics simultaneoussly, and an internal sync/blanking generator. The unit provides

Manufacturers & Suppliers Take Note . . .

BM/E's Annual Buyer's Guide for Broadcasters

—The Source—

is in production.

Don't miss out on your free listing in the industry's most reliable buyers guide.

How to be listed in The Source:

1. If previously listed you will receive The Source questionnaire shortly. Promptly complete it and return it to BM/E.
2. If not previously listed **contact us now** by phone (212) 685-5320 or by postcard addressed to:
   BM/E's The Source
   295 Madison Avenue
   New York, NY 10017
   Ask to receive the questionnaire.

Remember — The Source is broadcasting's only ***Verified*** buyers guide — that's why last year's readers said:

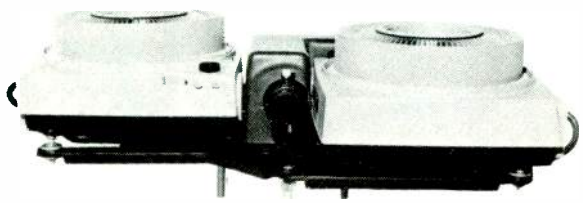
"best buyers guide in the business." — Chief Engineer, N.Y. group station owner
". . . the Source issues are super. Must use it once a day." — Broadcast Coordinator, Ill. independent broadcast service
"Invaluable buyers guide." — Director of Engineering, Va. TV-radio station
"The Source is terrific." — Station Manager, Ind. FM radio station
"The buyers guide" — it's helpful!" — National television network design engineering
"I liked the buyers guide!!" — General Manager, Calif. radio station

The Source '79 will keep you in touch with broadcasters across the country throughout the year.

Circle 214 on Reader Service Card

OPTICAL EFFECTS

THROUGH MICROPROCESSOR-CONTROLLED SLIDE DISSOLVE



MODEL 4220
DISSOLVE PROJECTOR

- ★ STATIONARY OPTICS
- ★ ADJUSTABLE DISSOLVE RATE
- ★ SUPERIMPOSITION
- ★ EXTRA LARGE CAPACITY
- ★ AUDIO PROGRAMMABLE

FROM THE WORLD'S LARGEST SUPPLIER OF TELECINE EQUIPMENT

LAIRD TELEMEDIA INC.
2125 SOUTH WEST TEMPLE · 801 487 6251
SALT LAKE CITY, UTAH 84115

Circle 215 on Reader Service Card

both meter and oscilloscope outputs. Datatek also showed its D-630A video sweep generator with a frequency range up to 20 MHz.

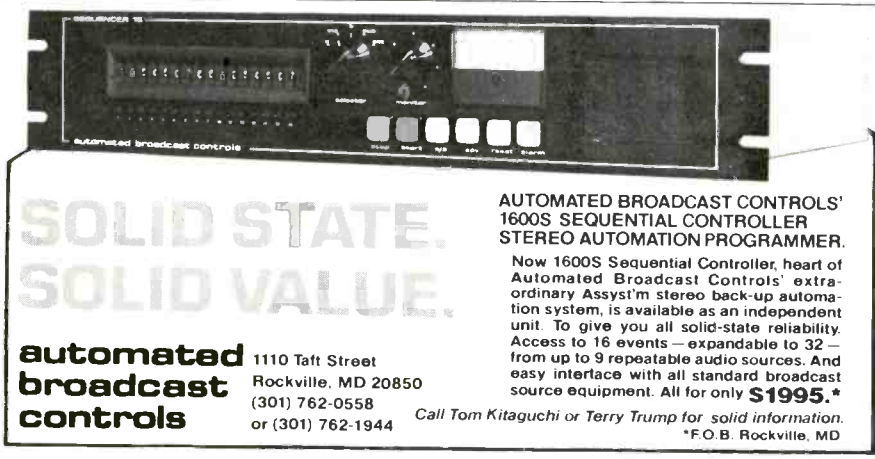
Considerable interest was shown in Asaca's new Model 1130 color camera measuring set. The digital device displays its readings in LED form on the front panel, and can be set to automatically cycle through the measurements or perform them one at a time under manual control. R, G, B camera inputs are used, with the camera pointed at the appropriate test chart. Registration, blanking, and signal levels of the three camera outputs are the principle parameters measured, though other tests are possible. An output data port is provided for connection with automatic logging equipment.

Another system to aid in camera setup, though not as automated, was shown at the Cinema Products booth. The system consists of a Tektronix 528 waveform monitor, a Tektronix 1420 vectorscope, a nine-inch slotted mask color monitor with pulse cross, black calibrate, blue gun only, external/internal sync, and A/B inputs, and a nine-inch monochrome monitor with H and V centering internal/external sync and A/B inputs. The system is mounted inside a lightweight case. A similar system, housed within a rack-mountable Zero case, includes the Tektronix waveform and vectorscope monitors above, plus the Tektronix 1470 sync and test signal generator. A 14-inch Ikegami TM4-2RH color monitor in its own metal case completes the system.

Waveform monitors and vectorscopes were in evidence everywhere throughout the show, though there appeared to be no new product developments in this area. Lenco showed its Models 1204 (waveform analyzer) and 1202 (waveform monitor). Hitachi once again brought its relatively new line of high quality, portable scopes. These include the Model V-0598 mini portable scope, small and light enough to be carried over the shoulder, and its somewhat larger V-151, V-152, V-301, and V-302 models.

Tentel, as promised, distributed many thousands of copies of its *Tape Tips Guide* — a pamphlet describing the use of its Tentelometer for measuring tape tension on all types of recorders from audio decks to one-inch Types B and C and ¾-inch U-matic video recorders.

Other T&M gear which has been seen before but which is worthy of noting again were Rohde and Schwarz's microwave directional power meter (20 mW to 30 W in the 1-4 GHz and 4-8 GHz bands), directional RF wattmeters



SOLID STATE.
SOLID VALUE.

AUTOMATED BROADCAST CONTROLS' 1600S SEQUENTIAL CONTROLLER STEREO AUTOMATION PROGRAMMER.

Now 1600S Sequential Controller, heart of Automated Broadcast Controls' extraordinary Assyst'm stereo back-up automation system, is available as an independent unit. To give you all solid-state reliability. Access to 16 events — expandable to 32 — from up to 9 repeatable audio sources. And easy interface with all standard broadcast source equipment. All for only **$1995.***

Call Tom Kitaguchi or Terry Trump for solid information.
*F.O.B. Rockville, MD

automated broadcast controls
1110 Taft Street
Rockville, MD 20850
(301) 762-0558
or (301) 762-1944

Circle 217 on Reader Service Card

NEW . . . THE SYSTEM S STUDIO
A PREWIRED SIX CHANNEL BROADCAST SYSTEM

6618 audio console .....
6 channel 18 input .....
handsome styling .....
prewired for turntables .....
for new studio or stereo conv
contact your Micro-Trak dealer or call 413 536-3551

MICRO-TRAK CORPORATION
620 RACE STREET HOLYOKE, MASSACHUSETTS 01040

Circle 218 on Reader Service Card

When accuracy Counts...Count on Belar for AM/FM/TV MONITORS

BELAR
AM MODULATION MONITOR

BELAR CALL ARNO MEYER (215) 687-5550
ELECTRONICS LABORATORY, INC.
LANCASTER AVENUE AT DORSET, DEVON, PA. 19333 • BOX 826 • (215) 687-5550

Circle 219 on Reader Service Card

swintek
The Leading Name In Cordless Microphone Systems

Transmitters small enough to be hidden almost anywhere, tiny microphones that are so unobtrusive that they probably won't even be noticed, hand-held microphones without the encumbrances of hundreds of feet of wire — that's what cordless microphone systems are all about. But there's one more factor of prime importance — reliability. If you're in television, radio or film and you want a cordless microphone system that not only offers the most advanced state-of-the art electronics but the highest reliability rating in the industry, Swintek is the answer. There's a Swintek transmitter and receiver to fit your specific needs, no matter what your requirements. Check with us today about the greatest name in cordless microphone systems — Swintek.

alan gordon enterprises inc.
1430 N. Cahuenga Blvd., Hollywood, CA 90028
Telephone: (213) 466-3561 • (213) 985-5500
TWX: 910-321-4526 • Cable: GORDENT

Circle 216 on Reader Service Card

Datatek's Model D-640 envelope delay test set has a wide 50 kHz to 20 MHz frequency range.

from Dielectric, and the DOM system from Studio Tape Exchange which provides automatic logging of the electrical mechanical performance of the Ampex ACR-25 and RCA TCR-100 cart VTRs.

For more information on TV T&M: Tektronix ANSWER, **633;** demodulator, **607;** pulse & bar gen, **608;** switcher/convergence gen, **609;** Barco, 610; NTI, **634;** Asaca TG-7, **611**; 1130, **612**; Philip signal gen, **613**; analyzer, **614**; Leitch color bar gen, **615**; SCH monitor, **616**; Video Aids, **617**; World Video, **618**; Marconi T.I.T., **619**; QSI, **620**; TeleMation, **621**.

Test and measurement for radio

All firms long established in producing test equipment were on hand with full displays. QEI brought a new multiplex monitor set which checks all functions of an FM transmitter in real time — it has a spectrum analyzer with 80 dB of range, a peak/minute counter, two autoranging voltmeters, and front-panel distortion and scope outputs. It will monitor the left, right, main, subchannel, pilot level, S/N,ratio, and about a dozen other significant quantities.

Rohde and Schwarz introduced a new test device for stereo signals, the MSDC-2 stereo decoder, which allows checking of all aspects of a multiplex signal by extremely low distortion and high loss separation for precise checking of each signal element. Harmonic distortion is rated under 0.1 percent at an output level of 12.5 dBm.

Marconi brought a new low distortion audio oscillator, Model G232. Distortion is rated at 0.001 percent with stepped and variable attenuators and output frequency measured on a 3½-digit readout. The lower-cost Model G233 uses a Wien bridge oscillator and a sample and hold circuit. Output is varied with pushbuttons and continuous attenuator.

Marconi also introduced an audio distortion and noise meter, Model F2424, operating up to 20 kHz. Input is balanced or unbalanced and the "notch" frequency is automatically tuned over the operating range. For noise measurements the meter is calibrated in dBm and volts rms. A third instrument from Marconi is a wow and flutter meter, allowing measurement in terms of DIN, IEC, IEEE or ANSI. If a test recording is not available, the test can be made with internal 3150 Hz oscillator.

Bird Electronic had a new series of digital calorimeters for RF power measurement with ratings up to 80 kW. Bird also brought a new series dummy of loads in a variety of configurations.

Belar had a new AM frequency monitor, the AMMM-4, designed specifically to work with ATS. It has 10 Hz and 20 Hz off-frequency alarms, RF level alarm, and an invalid count alarm (for too low RF level or malfunction). Display range is ±1999 Hz, resolution 0.5 Hz, gate time two seconds, sensitivity 100 MV, and frequency range 10 kHz to 50 MHz.

Belar also brought a stereo modulation monitor, FMS-2, an update of earlier models with that number, having improved specifications. Ih has two autoranging voltmeters with LED displays for range to measure channel separation, crosstalk, etc.

Electro Impulse, as an addition to the line of RF loads and power meters, brought a new version of the Model CPTC-30K self-water-cooled load for AM/FM/TV with 40 kW capacity for continuous power in ambient temperature up to 85 degrees F, 30 kW in 105 degrees F, and 50 kW for short periods. The VSWR is 1.1:1 over the range 60 Hz to 1 GHz, 1.5:1 from 1 to 1.5 GHz, and 1.20:1 from 1.5 to 2 GHz. The heat exchanger, cooled load and interlock system are in one package. Resistor is field replaceable.

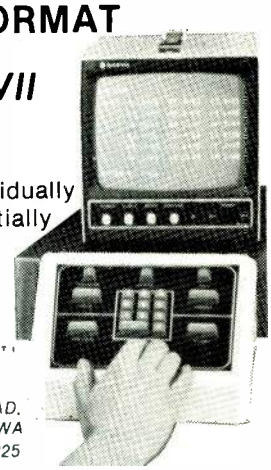
Wilkinson Electronics also introduced high-power dummy loads, the DLU series, which combine loading with precise calorimeter power measurement. DLU-80, rated 80 kW, and DLU-25, rated 25 kW, are air-cooled liquid dielectric systems each complete in one package. Coolant is ethylene glycol in a forced-air cooling system. The temperatures of the coolant at the input and output to the load resistor are measured; the flow is precisely controlled. The temperature difference can thus be directly calibrated for power in the load. Other models are available at lower power levels.

For more information: QEI, **622;** Rohde & Schwarz, **623;** Marconi G232, **624;** G233, **625;** F2424, **626;** wow & flutter meter, **627;** Bird calorimeters, **628;** Belar AMMM 4, **629;** FMS-2, **630;** Electro Impulse, **631;** Wilkinson, **632.**

DJ'S YOU NEED HELP!

ORGANIZE YOUR LIVE FORMAT with MARC VII

- Program 18 events
- Start individually or sequentially
- Control 7 sources

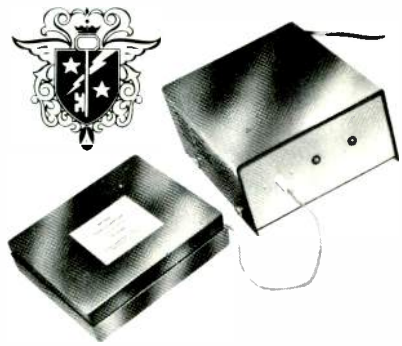


ICM A DIVISION OF NTI

[206] 733-4567
4041 HOME ROAD.
BELLINGHAM, WA
98225

Circle 220 on Reader Service Card

NICKEL CADMIUM ENG. BATTERIES AND ONE HOUR AUTOMATIC CHARGERS



For ALEXANDER Nickel-Cadmium REPLACEMENT BATTERIES For...
SONY (BP20) — JVC (PBP-1)
AKAI (PACK) — etc.

CHARGERS WILL AUTOMATICALLY CHARGE IN 1 TO 4 HRS. DEPENDING ON CAPACITY . . . (SWITCHES TO TRICKLE)

Write Wire or Phone
ALEXANDER manufacturing co.
Box 1645 Mason City, Iowa 50401
Phone (515) 423-8955

Circle 221 on Reader Service Card

INTERPRETING THE FCC RULES & REGULATIONS

Section 315 Expanded — Again

By Frederick W. Ford and Lee G. Lovett:
Pittman, Lovett, Ford and Hennessey, Washington, D.C.

ON SEPTEMBER 11, 1978, the United States Court of Appeals for the District of Columbia decided the reknowned *Church of Christ* case.[1] The case involved the latest expansion of the "on-the-spot" exemption to the equal opportunities provision of the Communications Act of 1934.[2] The decision of the Court expanded the exemption to include delayed broadcasts of political events.

Background

Until 1976, the Commission had insisted that broadcasters could not provide on-the-spot coverage of public appearances by legally qualified candidates without incurring an obligation to offer equal time to other legally qualified candidates for the same office. After 1976, the Commission removed the obligation with respect to *live* broadcasts of newsworthy political events. In the *Church of Christ* case, the Court decided to affirm the FCC's decision to eliminate the obligation for delayed broadcasts of "bona fide" news events involving political candidates. The facts of the case are as follows.

In July 1976, WILM-AM, Wilmington, Del., informed the FCC that it planned to record a public debate between Republican and Democratic candidates for airing "the evening of the same day or three days later." The Commission's Complaints and Compliance Branch ruled that such a taped broadcast created an obligation by the licensee to afford equal time to all legally qualified candidates for the office in question.[3] This ruling was reversed by the Commission, which cited the need to preserve "considerable discretion in the presentation of news programming." In addition, the opinion stressed the broadcaster's responsibility to judge whether delayed broadcast of such a public event would be justified by its "current newsworthiness." The Commission stated that length of delay would be a "factor in determining the broadcaster's reasonableness and good faith," adding, "absent unusual circumstances, a delay of more than a day would raise questions" as to the eligibility of the broadcast for a Section 315 (a) exemption. In affirming the decision, the Court based its decision primarily upon Section 315 (a), including the Congressional debates accompanying its adoption. With the foregoing in mind, let us take an in-depth look at the decision.

The meaning of "on-the-spot"

Section 315(a)(4) exempts a broadcast licensee from an equal time obligation if any candidates appear in "on-the-spot" coverage of a bona fide news event, including but not limited to political conventions and incidental activities. The central ambiquity in this provision is the meaning of the phrase "on-the-spot." The church argued that the term refers to events broadcast as they happen, i.e., "on-the-spot."

On the other hand, the intervenors, who opposed the United Church of Christ, contended that the phrase was a "term of art" in the industry. In their opinion, the term refers primarily to the location of the news coverage rather than to the time it was broadcast. On this point, the Court noted that the FCC's decision did not directly address the precise meaning of the term. However, the Court stated that the Commission held in a subsequent case that the language refers to *contemporary*, if not simultaneous, broadcast of news events. The Court reasoned that this

continued on page 172

[1] *The Office of Communication Commission of the United Church of Christ vs. Federal Communications Commission and the United States of America, U.S. Court of Appeals (D.C. Cir. 1978). No. 76-1878.*

[2] *Communications Act of 1934*, 47 U.S.C. §315 (1970). Section 315 establishes four exemptions to the equal opportunities requirement, determined according to the type of news coverage: (1) regularly scheduled newscasts, (2) news interview shows, (3) news documentaries, and (4) on-the-spot news events.

[3] Although the Court referred to this provision as the equal opportunity provision, for the purpose of clarity we will use the phrase equal time.

Compute your battery needs, and "go" with

Frezzi™ ENERGY High-Capacity Battery Packs

Portable power for all video cameras, video recorders, and hand-held "Frezzi"™ Lights.

Less than 1 hour re-charge time with "Frezzi-Fast"™ Chargers. Universal AC-inputs available.

Frezzolini® E.N.G. support equipment.
Made in U.S.A.

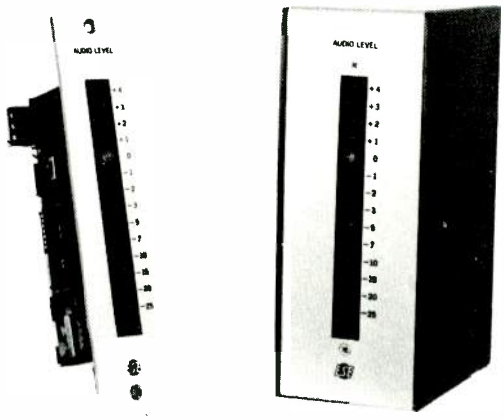
Frezzolini Electronics Inc.
7 Valley St. Hawthorne, N.J. 07506 USA
(201) 427-1160
(212) 594-2294

Circle 180 on Reader Service Card

These are "Frezzi" Model FBP plug-in Battery Packs for the JVC CR-4400LU Videocassette Recorder.

Export Agents:
CINECRAFT INTERNATIONAL INC
11 Caesar Place, Moonachie,
New Jersey 07074 U.S.A.
Telephone: (201) 939-0875
Cables: Cinecraft Moonachie
Telex: Cinecraft Moon TLX 13-8875

Perfect Levels



ES 214 Dynamic Audio Level Indicator

made especially for the broadcaster and recording engineer

Features:

- **Peak Audio Levels or Apparent Loudness (Fast Averaging)**
- **Uses Standard V.U. Scale**
- **High Brightness, 3-Color Display**
- **Transformer Isolated Input**
- **Unregulated "Single-Supply"**
- **High Input Impedance and Sensitivity**
- **Low Cost**

There are a number of Audio Level Indicators using L.E.D. bar graphs on the market today. Their acceptance is becoming widespread due to obvious advantages. However, the ES 214 gives you more: Transformer Isolated Input others consider too costly; A Power Supply Regulator on the circuit board, so you can use any unregulated D.C. voltage from +15 to +35 while others require dual supplies; The Standard Scale so you don't have to adapt to new numbers; and, the ability to select Peak Responding Mode or a special Fast Averaging Mode to approximate Apparent Loudness.

Get a handle on your levels with the ES 214

$105.00

ESE

(213) 322-2136

142 SIERRA STREET • EL SEGUNDO, CA 90245

Circle 223 on Reader Service Card

Commission interpretation was the basis of the Commission's view that broadcasts delayed up to one day are presumptively exempt from the equal opportunities obligation.

In the Court's view, the meaning of the phrase "on-the-spot coverage" was signified by the Communications Act's use of political conventions as a paradigm or model for such coverage. This exemption was developed from a Congressional desire to protect news coverage of national political conventions from the equal time doctrine. The Court stated that, although much convention coverage is ordinarily presented live, the use of tape or film segments in such broadcasts is common; hence, "on-the-spot coverage" *is not necessarily limited to live broadcasts*, although an element of timeliness is certainly required. Finally, broadcasters should note that long delays are substantially less likely to qualify for the exemption.

The Court's opinion on where congress stands

In deciding to affirm the FCC's findings, the Court went beyond the plain meaning of Section 315 (a) of the Communications Act. The Court noted that Congress had enacted the exemption to Section 315 for the purpose of reversing a Commission decision to strictly construe the equal time requirement. This strict construction of the requirement was supplanted by a legislative directive to balance the competing interests of (1) equal treatment of candidates and (2) full coverage of political questions. The Court observed that Congress recognized that striking a proper balance would be difficult, but insisted that "the difficulties which lie in the path of achieving such a balance cannot be magnified to an extent that either of these principles is lost sight of."

On this issue, the Court quoted from the *Congressional Report*. The *Report* stated:

> It is difficult to determine with precision what is a newscast, news interview, news documentary, or an on-the-spot coverage of a news event or panel discussion. That is why the Committee, in adopting the language of the proposed legislation, carefully gave the Federal Communications Commission full flexibility and complete discretion to examine the facts in each complaint . . . based on (its expertise in broadcast regulation) and other information that it is in a position to develop, the Commission can set down some definite guidelines through the rules and regulations wherever possible by interpretations."[4]

Therefore, the Court concluded that Congress intended the FCC to have wide discretion in interpreting the Section 315 exemptions.

Conclusion

In view of the Court's decision, broadcasters have clear discretion in determining a challenging, if not obscure, issue: whether or not a particular broadcast falls within the "on-the-spot" exemption. However, the element of timeliness is most important in making any decision. The length of delay is a "factor in determining the broadcaster's reasonableness and good faith." Therefore, broadcasters should exercise great care in making their decisions and should do so in consultation with their communications counsel. **BM/E**

[4]S. Rep. No. 562, 86th Cong., 1st Sess. 12 (1959).

PHILIPS®
Video 80 Color Camera System with Prism Optics for just $49,900

Professional Performance • High Sensitivity and Resolution
• Superior Color Rendition • Proven Reliability

Price includes:
2 - 9801/0911 color cameras each with 3 - XQ1428 Plumbicons®, 10/100mm fl.8 fully motorized macro zoom lens, two head sets and 15 meter camera cables
2 - ITE tripod sets H9P, T6-D6
1 - PVM 1211 Sony Monitor
1 - WV763 Triple 5" Panasonic Monitor
1 - M67 Shure Mixer
1 - 2103 ADC Switcher
1 - 1474 Tektronix Sync Generator
2 - Equipment Cases
Delivery, assembly and setup

Camera features makes waveform monitoring unneccessary.
Studio cameras can be converted for Telecine EFP or ENG.
Substitutions permitted

For more information call (215) 223-8200 and ask for Joe Burke

LERRO
ELECTRICAL CORPORATION
COMMUNICATIONS SYSTEMS DIVISION/3125 North Broad Street Philadelphia, PA 19132

PLUMBICON® is a registered trademark of N.V. Philips' of The Netherlands

Circle 224 on Reader Service Card

UN-CAN IT.

The tape cartridge is a handy little device. Unfortunately the sound quality of programming varies noticeably between "live" and "canned."

dbx has overcome this problem by developing a tape noise reduction system especially for broadcast use. It provides 30 dB noise reduction and 10 dB headroom improvement. This dbx system offers the same benefits as the dbx tape noise reduction system used by recording studios.

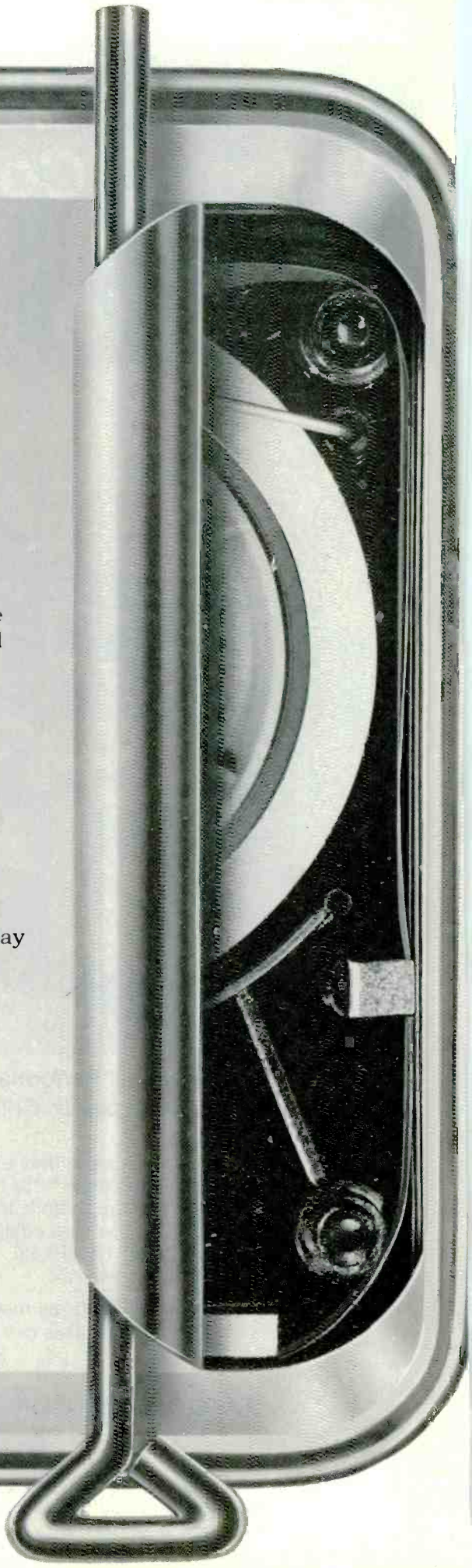
The new dbx 148 provides 8 channels of playback (decode) noise reduction in a plug-in modular chassis (space is provided for a spare module). There are two modules available—the 408, for tape playback, and the 409, for playback of noise-free dbx-encoded discs. Typically, the 148 is used in the control room to play back tapes recorded in the production studio with the dbx 142, a 2-channel, switchable (encode-decode) tape noise reduction unit.

Besides "un-canning" carts, the dbx system extends the useful life of old reel-to-reel machines, quiets audio tracks on VTR's, and even cleans up full-frequency telephone lines and microwave links. Because it prevents noise from coming between you and your listeners—and you and your advertisers—it just may be the most important investment you will ever make.

dbx, Incorporated,
71 Chapel Street,
Newton MA 02195
617-964-3210

dbx

UNLOCK YOUR EARS



Circle 225 on Reader Service Card

GREAT IDEA CONTEST

7. Turntable Remote Control

Douglas H. Howe, Chief Engineer,
WMUK-FM, Kalamazoo, Mich.

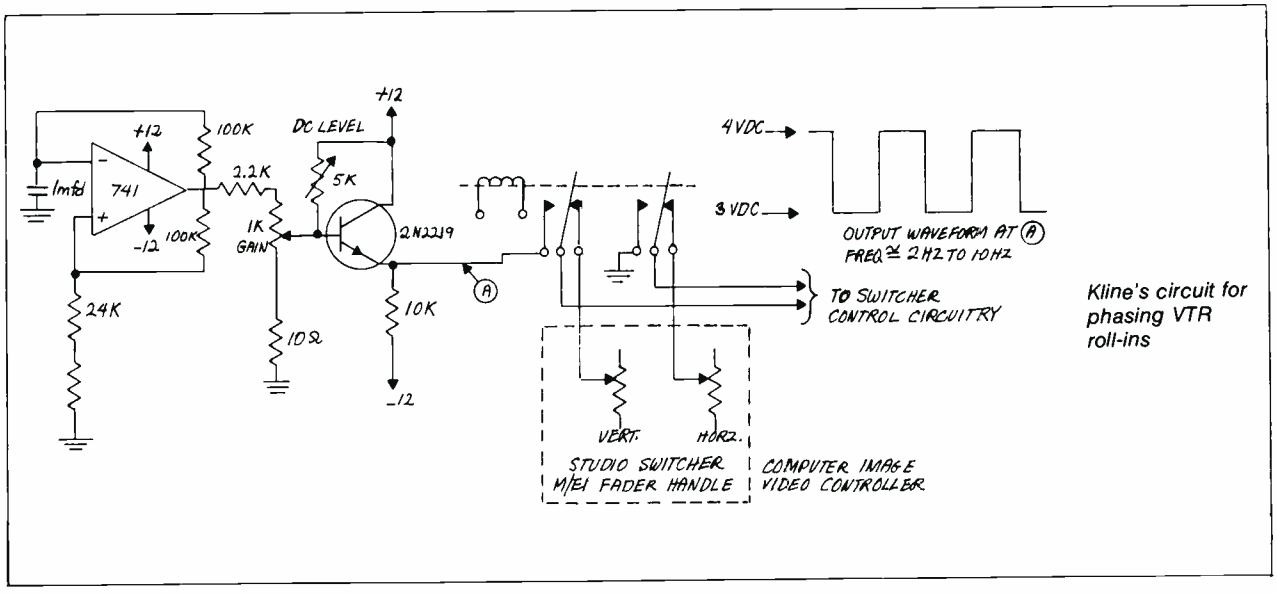
Problem: Turntable remote control from console delegation switch.

Solution: Our console fed a constant 24 V control signal to the old turntables whenever the delegation key switch was thrown. We wanted to retain this control signal to control our new turntables, Technics SP-10MKIIs. However, the new turntables require a momentary contact closure for both start and stop. As the diagram shows, we managed to achieve this logic change with only one relay — along with a few other parts.

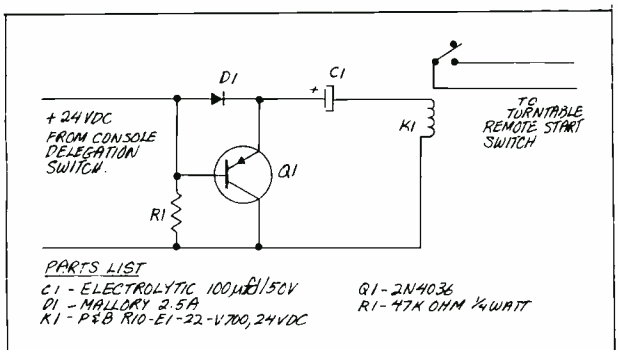
K1 is energized through D1 and C1 when the turntable delegation switch applies a 24 V dc control voltage to the circuit. As C1 charges the current through, K1 decreases, resulting in a momentary contact closure to start the turntable. The forward drop across D1 during the initial charging of C1 helps insure cutoff for Q1. When the 24 V control signal is removed, D1 becomes reversed biased, thus forward biasing Q1. C1 discharges through Q1 and K1, resulting in another momentary contact closure to stop the turntable. We used a relay with bifurcated contacts to help minimize contact problems.

Also, there is nothing sacrosanct about the transistor. We simply had a few of them on hand. If a different transistor is used the value of R1 will have to be selected to bias it properly.

Parts used in the circuit are: C1, Electrolytic 100 μF/50 V Sprague TVA-1310; D1, Diode Mallory 2.5A; K1, Relay P & B R10-E1-Z2-V700, 24 V dc; Q1, Transistor 2N4036; R1, Resistor 47K ohm ¼ W.



Kline's circuit for phasing VTR roll-ins



Schematic for Howe's turntable remote control

Editor's Note: In the February issue we published Carl Tuveson's idea for a color weather radar storm beacon (Great Idea number 6, p. 166). Lee Wimbs, technical supervisor of WFMY-TV in Greensboro, N.C., suggests running a connection between ground (pin 1) of NE555 and the cathode of the LED photo resistor to save time and trouble in building this circuit.

8. Phasing VTR Roll-ins

Dave Kline, Staff Engineer,
KYNE-TV, University of Nebraska at Omaha

Problem: Phasing VTR roll-ins to the studio switcher.

Solution: The main purpose of this circuit is to eliminate the need for a second person to wipe between video sources while the tape engineer phases the VTR to the studio for roll-in segments. It's also useful for timing and phasing other video sources to studio.

A square wave generated by the 741 op-amp, used as a multi-vibrator, is applied to the switching circuitry of mix/effects 1 on our studio switcher. This causes a continuous switching between the studio reference video and the VTR (A bus and B bus).

With M/E 1 in a wipe mode, the dc level and gain controls are adjusted so that only sync and burst are switched, with little or no video switching visible on a picture monitor.

Burst and chroma phase can be adjusted while viewing the studio switcher output on a vectorscope.

continued on page 176

Circle 226 on Reader Service Card

Great Ideas

The relay can be operated either at the studio switcher position or remotely by the VTR engineer.

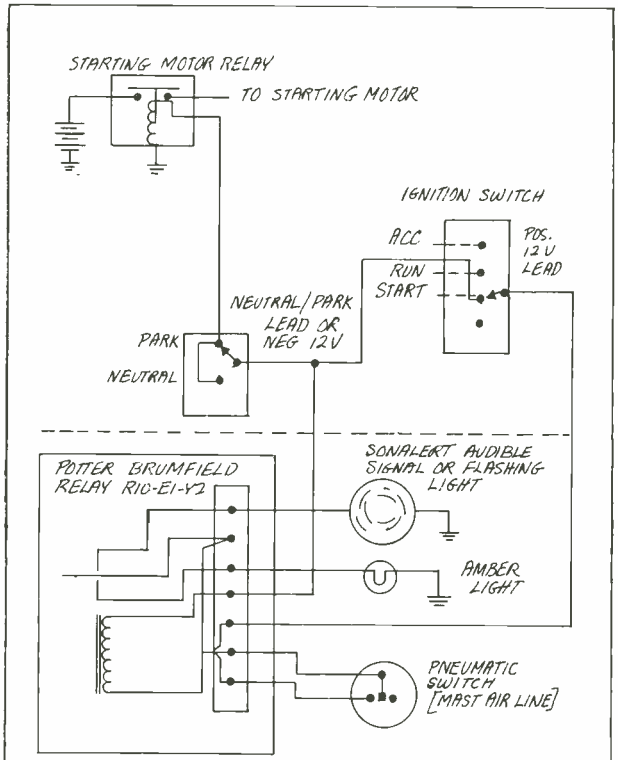
9. ENG Mast Alarm

Frank Zacharias, Transmitter Supervisor, WHIO-TV, Dayton, Ohio

Problem: To alert driver of mobile van when ENG mast is extended.

Solution: ENG Golden Rod masts are constantly being torn off by power lines, garage doors, low bridges, etc. because the driver has no way of knowing whether the ENG mast is extended or retracted. Local auto dealers and TV stations which I contacted had no solutions.

I developed an alert signal to remind the driver that the ENG Mast is extended (via the Neutral/Park switch). I used the idea of connecting a 15 W light bulb in series with a 200 W light bulb. The 15 W bulb is the added relay and the 200 W bulb is the 2 A solenoid or starting motor relay. This added relay draws 15 mils but I have used a 500 mil relay with success.



Zacharias's ENG mast alarm light

Unless you are fortunate enough to have someone on your staff who knows how to remove the ignition switch completely from the dash board, you will have to reach behind the switch and remove the terminal block from its back side. Terminal blocks on Fords slide off easily; those on Chevrolets have two ears that must be depressed.

Using a test lead, find the positive 12 V lug and then test the other lugs until you find the one that energizes the starting motor. This will be your negative 12 V or Neutral/Park lead. If you have removed the ignition switch, you will be able to read where the BATT and START leads are on the section at the back of the switch that houses the tumblers.

To remove the lugs (they will be of the push-on type)

insert a small screwdriver alongside the lug and the lead will pull out from the back very easily. Solder an audio pair *along the narrow side of the lug* in order to leave sufficient room to reinsert the lead. You may have to bend out the tab to ensure that the lugs will latch.

The Sonalert Audible Signal was mounted on the dashboard to the left of the steering column (if the signal is inaudible try reversing the polarity), the relay chassis was mounted on the fire wall just behind the steering column and below the brake pedal shaft, the light was mounted on the dash to the right of the steering column, and the pneumatic switch was mounted behind the driver's seat on the cabinet wall.

10. Broadbanding VTRs For High-Speed Dubbing

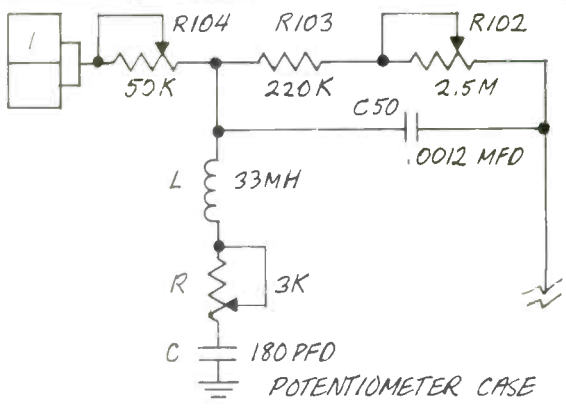
Lowell R. Gayman, Supervisor, CBS Radio Stations News Service, Washington, D.C.

Problem: To broadband Ampex AG 440-C tape machines to 60 kHz for the purpose of high-speed dubbing in addition to use as studio/edit machines.

Solution: When Ampex was asked about the possibility of a recording and playback frequency response of 60 kHz (4x15 kHz), they gave us the following information:

On amplifier assembly number 4050435-15, (1) remove C4; (2) check that C10 is a 47 pF capacitor; (3) check T1 to be sure it is part number 4580044-01; and (4) cut the conducting path of the moving element of R32.

On equalizer part number 4020270-01 or -02, (1) replace C50 with a .0012 MFD ± 5 percent 50 V capacitor and (2) add an L-C-R series network as shown in the accompanying schematic.



Schematic showing addition of L-C-R network on Ampex equalizer

In modifying the machine, we found that C7 in the headphone circuit loaded the reproduce circuit so that the top end of the frequencies rolled off very sharply at about 48 kHz. We removed the headphone circuit as it is not needed in our operation and the problem was resolved.

Since the L-C-R circuit was to control the upper frequencies, it was decided that we should use a potentiometer in place of the fixed 3K resistor, but we still had problems with the low frequencies. To eliminate these problems, we found that C51 in the reproduce equalizer should be .0040 μF to further smooth out the low frequency response.

On the record machines we used a record equalizer number 4020269-07 and adjusted it for 30 ips on the high speed and 7.5 ips on the low speed. This gave us a record response of ± 2 dB or better for both 30 and 7.5 ips. With no added space requirements, we are now able to dub 72 hours of 7.5 ips air tape per day (eight-hour shift).

new...
multi-phase meter/ VIRS inserter

ENGINEERS....

BEFORE YOU BUY ANOTHER SCOPE TO MEASURE PHASE... (BURST, VIRS, H) REMEMBER WHO WILL BE USING IT!)

If it's you, great! Because you know professional scopes are expensive, not very portable, and take lot's of skill to obtain the correct measurements.

NEW MULTI-PHASE METER: If it's not you, consider buying VACC's new Model 4000 Multi-phase Meter to measure BURST/VIRS/H-Phase. You get five times more resolution and your personnel will find the dual lighted analog meters easier to read, easier to use and an ideal aid for insuring consistent, high quality color video.

VIRS INSERTER: With the Model 4000 you can insert VIRS downstream manually or automatically, and if you like, you can insert external line 19 video, such as color bars to equalize video tape playbacks.

LOW COST: You will like the low price of the Model 4000 at only $1295, which is a lot lower in price than those professional scopes, more accurate and easier to use.

OTHER MODELS: If you do not need VIRS, consider VACC's BPM-1. Ideal for use at the output of a switcher, your director can tell you that Burst is off phase in keys or special effects. Or, if you need Burst and H-Phase simultaneously, VACC's BPM-1 Option:03 is a great choice.

NEW TECHNICAL CATALOG: Free for the asking, VACC's new 1979 catalog is loaded with technical articles and products.

VACC

VIDEO AIDS corporation of colorado
phone USA (303)-667-3301
Canada (800)-261-4088
325 East 7th Street, Loveland, Colorado 80537

Circle 227 on Reader Service Card

Advertisers' Index

Accurate Sound Corp. 164
ADDA Corp. 40
Alan Gordon Enterprises, Inc. 168
Alexander Mfg. Inc. 169
Amber Electro Design Ltd. 92
American Data Corp. 29
Ampex Corp. 104
Angenieux Corp. of America 91
Arvin/Echo 76-77
Asaca 19
Audio Designs & Mfg. Inc. 72
Audio Distributors Inc. 26
Audio Plus Video Intl. Inc. 133
Automated Broadcast Controls 168

Belar Electronics Lab Inc. 168
Robert Bosch Corp./Fernseh Group 108
Broadcast Audio Assoc. 158
Broadcast Electronics Inc. 119
Broadcast Products Div., UMC Electronics 152
BTX Corp. 114

Camera Mart 33
Capitol Magnetics Products Inc. 157
Central Dynamics Ltd. 21
Cezar International 166
Cine 60 66
Cinema Products Corp. ... 106-107, 166
CMX Systems 4-5
Cohu Inc. 154
Convergence Corp. 96
Conrac Corp. 103
Consolidated Engineering Development Corp. 166
Consolidated Video Systems 51
Continental Electronics Mfg. Co. ... 124
CSI Electronics 131

Datatek 82
DBX Inc. 174
Digital Video Systems ..... Cover 2
Dynair Electronics Inc. 150

EEV Inc. 93
Eimac, Div. Varian ..... Cover 3
Electro-Voice Inc. 145
E-N-G Corporation 178
ESE 172

Farinon 163
Yves Faroudja 80
Fidelipac 126
Frezzolini Electronics Inc. 171
Fuji Photo Film 45
Fujinon Optical Inc. 137

GE Video 98
Grass Valley Group 7
David Green Broadcast Consultants Corp. 14

Harris Corp, Broadcast Equip. Div. .. 10
Hitachi Denshi America, Ltd. 57, 59

IGM, Div. NTI 169
Ikegami Electronics Inc. 13
Industrial Sciences Inc. 42
Inovonics 18
International Tapetronics Corp. 27

James B. Lansing 146
JVC Industries 94-95

KD Components 155
Knox Ltd. 118

Laird Telemedia Inc. 167
Lenco 100
Lerro 173
Listec Television Equip. Co. 130

3M/Magnetic Tape Div. 61
3M/Mincom Video Products 9
Mach One Digital Systems Inc. 99
Marconi Electronics Inc. 121
Marconi Instruments 48
McCurdy Radio Industries Inc. . Cover 4
MCI/Quantel 88
McMartin Industries Inc. 134
Microtime 142
MicroTrak 168
Microwave Associates 34-35

NEC Broadcast Equip. Div. 78
Nippon TV Ind. 30

Orban Associates 81, 144
Otari Corp. 116

Pacific Recorders and Engineering Corp. 16, 156
Panasonic Matsushita Electric Corp. 111
Philips Broadcast Equip. Corp. 39
Philadelphia Resins Corp. 128
Potomac Instruments Inc. 18

QEI Corp. 12
QRK 151

Ramko Research Inc. 117, 141
Rank Precision Industries Inc. .. 31, 149
RCA Communications Syst. Div. . 85, 87
RCA Distributors & Special Products 153
Recortec Inc. 53
RF Technology Inc. 115
Rohde & Schwarz Sales Co. 71
Russco Electronics Mfg. Inc. 176

Scientific/Atlanta Inc. 161
Scully 122-123
Sharp Electronics 62-64
Shintron 160
Shure Bros. Inc. 138
Sintronic Corp. 159
Skotel 148
Spectra Sonics 162
Stanton Magnetics Inc. 25
Studer ReVox America Inc. 127
SWR 43

Taber Mfg. and Eng. Co. 160
Tektronix Inc. 17
Television Equipment Assoc. 152
Telemation Inc. 15
Telex Communications Inc. 58
Tentel Corp. 166
Thermodyne 24
Thomson-CSF Labs 22-23
Thomson-CSF (L.G.T.) 112
Time and Frequency Technology Inc. 75
Toshiba 46-47
TV Products 162

UMC Electronics, Broadcast Products Div. 152
Utah Scientific Inc. 69
UREI 20

Video Aids Corp of Colorado 177
Video Data Systems 129
Videomax 3
Video Media 165
Viscount Industries Ltd. 155
Vital Industries Inc. 11

Wang Voice Communications Inc. .. 135
World Video 32

Yamaha International Corp. 54
Yardney Electric Corp. 158

SALES OFFICES

BM/E
Broadcast Management/Engineering
295 Madison Ave.
New York, New York 10017
Telex: 64-4001

Manager, North American Sales
Kenneth F. Luker, Jr.

Eastern & Midwestern States
295 Madison Avenue
New York, New York 10017
212-685-5320
Kevin J. Condon
Kenneth F. Luker, Jr.

Western States
353 Sacramento Street
Suite 600
San Francisco, CA 94111
415-421-7330
William J. Healey

3420 Ocean Park Blvd., Suite 3020
Santa Monica, CA 90405
213-450-7181
Neal Wilder

United Kingdom
Chilberton House Doods Road
Reigate, Surrey
74 43521
Derek Hopkins

Japan
Kakyo Bldg. (No. 416)
15-13 Tsukiji 2-chome
Chuo-Ku, Tokyo 104 Japan
03 (543) 0398
S. Yasui
K. Yamamoto

MOBILE ELECTRONIC JOURNALISM

FIELD TESTED VANS AND FOUR WHEEL DRIVE DESIGNS TO MEET YOUR ENG/EFP REQUIREMENTS.
QUALITY • RELIABILITY • ECONOMY

E-N-G CORPORATION

1009C SHARY CIRCLE • CONCORD, CA. 94518
(415) 798-4060

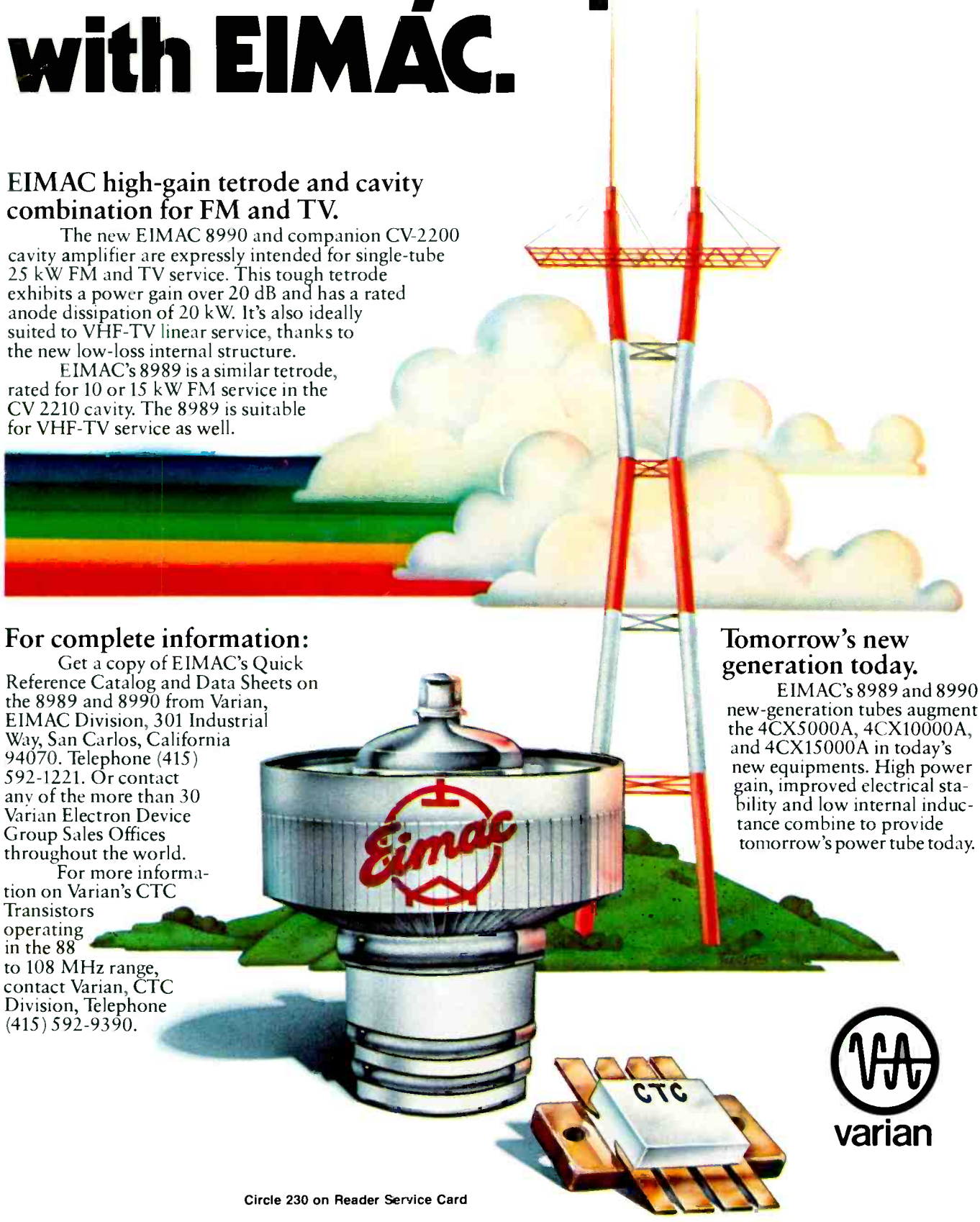
Circle 229 on Reader Service Card

From transistor to 25kW is one easy step with EIMAC.

EIMAC high-gain tetrode and cavity combination for FM and TV.

The new EIMAC 8990 and companion CV-2200 cavity amplifier are expressly intended for single-tube 25 kW FM and TV service. This tough tetrode exhibits a power gain over 20 dB and has a rated anode dissipation of 20 kW. It's also ideally suited to VHF-TV linear service, thanks to the new low-loss internal structure.

EIMAC's 8989 is a similar tetrode, rated for 10 or 15 kW FM service in the CV 2210 cavity. The 8989 is suitable for VHF-TV service as well.



For complete information:

Get a copy of EIMAC's Quick Reference Catalog and Data Sheets on the 8989 and 8990 from Varian, EIMAC Division, 301 Industrial Way, San Carlos, California 94070. Telephone (415) 592-1221. Or contact any of the more than 30 Varian Electron Device Group Sales Offices throughout the world.

For more information on Varian's CTC Transistors operating in the 88 to 108 MHz range, contact Varian, CTC Division, Telephone (415) 592-9390.

Tomorrow's new generation today.

EIMAC's 8989 and 8990 new-generation tubes augment the 4CX5000A, 4CX10000A, and 4CX15000A in today's new equipments. High power gain, improved electrical stability and low internal inductance combine to provide tomorrow's power tube today.

varian

Circle 230 on Reader Service Card

SS8650
STEREO AUDIO CONSOLE

A new standard modular audio console offering full facilities, quality circuitry of proven reliability, comprehensive features and a range of standard, pre-wired options. A maximum of fourteen channels are available along with a convenient centrally-located script board and input and accessory modules to satisfy any requirement. Standardization allows these features to be incorporated into a well engineered, compact, functionally styled package at an unusually economical price.

McCURDY

McCURDY RADIO INDUSTRIES

TORONTO [416] 751-6262 • CHICAGO [312]640-7077 • NEW YORK [201]327-0750

Circle 231 on Reader Service Card