

MAY 1975

BME

BROADCAST MANAGEMENT/ENGINEERING

TREASURY



Show-In-Print

Show-In-Print

Show-In-Print

NO
MONEY
RETURNED
UNLESS
MACHINE
HAS
BEEN
REPAIRED
HERE
BY

1975 NAB
Convention
Recap:

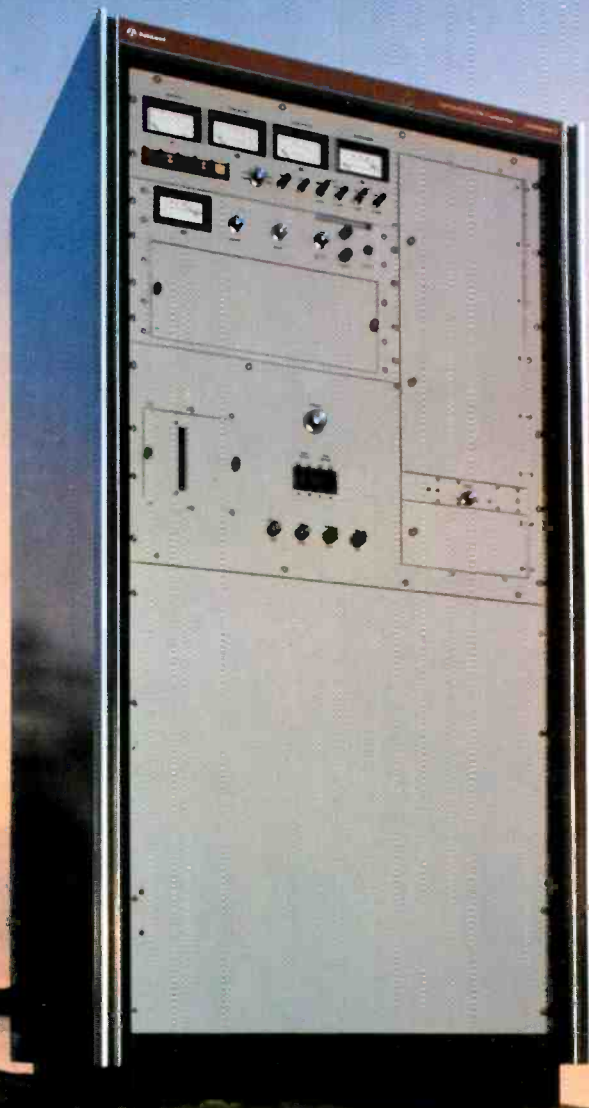
Exhibitors
Hit Jackpot.

TWIN JACK POT
NO 1 NO 2

PRINT

AV

Collins announces the next generation of FM transmitters. The Generation 4 line.



They're here now. Nine new FM transmitters from Collins. Named Generation 4™ because they're a full generation ahead of anything else on the market. And because every feature is the product of 4 decades of Collins broadcast experience.

At the heart of everything is Collins' new, field-proven Phase 4™ Exciter. The best FM exciter available today at any price. Just one part of a system designed to meet the requirements of today's new generation of radio audiophiles... with discrete quad compatibility and stringent specifications on all the things that count, like intermod distortion.

Choices? Everything from the big 40-KW

831H-2, the 22½-KW 831G-2B, and 2½-KW 831D-2, to the 10-watt 831A-2. And five more models in between. And they're available right now at prices that are going to be a pleasant surprise. With the same superior Collins quality you've come to expect. Backed with the same unexcelled 24-hour parts and field service.

Act now, while we're still able to hold our current pricing. Contact your local Collins Broadcast salesman. Or Broadcast Marketing, Collins Radio Group, Rockwell International, Dallas, Texas 75207. Phone 214-690-5574 or 214-690-5519.



**Rockwell
International**

AT KY-3-TV, THE BRAND OF REPORTING AND THE BRAND OF FILM HAVE A LOT IN COMMON.

When the people in this picture wave 3 fingers in the air, what they're saying is, "We're number one" at Springfield, Missouri, Chanel 3. Thanks to hard-nosed reporting and hard-hitting promotion, KYTV is the undisputed broadcast king in the Queen City of the Ozarks. By a margin of 3 to 1.

In addition to top-notch journalism, smart programming has meant using plenty of film. And the film they use is Eastman film.

Over the past year, Channel 3 news cameras unlocked the secret of behavior modification programs in a Missouri federal prison; dug up a problem in the underground water supply; whooped it up at a genuine hoe-down; and made friends with a mountain hermit whose only other visitors dropped in by UFO.



Besides winning viewers, their documentaries have won a silver gavel from the American Bar Association, a certificate of achievement from the state medical association, and an Emmy nomination.

When the KYTV cameras aren't recording news, the KYTV people are busy making it, through locally produced sports and entertainment shows. Take Virgil Ward (front row left) and the capable assistant you see perched on his lap. You can catch their weekly fishing show on 87 markets in the U.S. and Canada. And when Virgil packs his rod and reel, he includes a reel of

Eastman film.

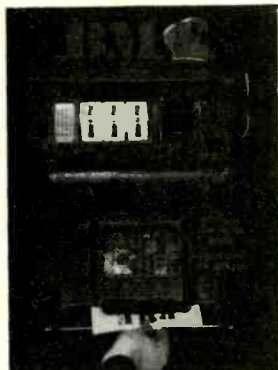
Then there's Promotion Director Clarence Martin (front row right). His 10-second-film ID spots for the station not only built awareness, but they helped develop a new market for locally produced commercials.

In the words of News Director Bill Williams (2nd row, 4th from right), "Film is essential to everything we do. After all, TV is *the* visual medium, and it wouldn't do to have a person on camera merely reading a piece of paper. We use film to tell our story. And, besides, our anchormen just aren't that pretty."



BM/E

BROADCAST MANAGEMENT/ENGINEERING



It was a good NAB show. Conventioneers were in a buying mood and exhibitors were delighted. For a comprehensive recap, turn to Show-In-Print page 50.

BROADBAND INFORMATION SERVICES, INC.

274 Madison Ave.
New York, N.Y. 10016
212-685-5320

Editor

James A. Lippke

Associate Editor

Robin Lanier

Washington Editor

M.L. Hollowell

Contributing Editor

Robert Wollins

Assistant Editor

Djuna Zellmer

Show-In-Print-Photographer

Pepe Lobo

Art Director

Gus Sauter

Production Manager

Helen Horan

Circulation Manager

Barbara Connolly

FCC Counsel

**Pittman Lovett Ford
and Hennessey**

Publisher

Charles C. Lenz Jr.

MAY 1975/VOLUME 11/NUMBER 5

- 6 Broadcast Industry News**
Pay TV goes on satellite
- 26 Interpreting the FCC Rules and Regulations**
Commission rules frequently violated by broadcast stations
- 30 On "C-Day" in Australia, 120 Stations Turned on Color at the Same Time**
March 1st signaled the day Australians turned on their sets to color
Also: Ultra Modern Television Net on the Way for South Africa
Next January South Africa catches up with the times with new, unusual equipment and a national color TV network
- 40 The Video Disc Looks Ready for the Consumer**
RCA and Philips vie for the standard in this field—the disc is ready to take off
- 48 Single-Tube TV Cameras: Now They Are Solid for Many Applications**
Optical encoding, precision manufacturing and electron optics makes the single-tube camera useful

50 NAB SHOW-IN-PRINT 1975

Electronic news gathering	51	Film equipment	96
Transmitters	63	Studio lights	98
Antennas	66	Business automation	99
Studio cameras	70	TV automation	100
Lenses	72	Radio automation	101
Stands	74	Open reel recorders	102
Videotape editors	76	Cart machines and carts	104
Super sync handlers	80	Audio consoles	104
Production switches	80	Turntables, microphones, etc.	105
Routing switchers	86	Audio processing units	106
Video systems, processors	89	Radio remotes, STI's etc.	108
Videotape recorders	94	Radio monitors	108
Time base correctors	94	Test equipment, systems	109
Character generators	95	Miscellany products, services	112
Picture monitors	96	Getting ready for EBS two-tone	112

114 The Great Idea Contest
5 more ideas; vote; send in your ideas

118 Broadcast Equipment
New and significant products for broadcasters

123 New Literature
Useful reading materials



BM/E, BROADCAST MANAGEMENT/ENGINEERING, is published monthly by Broadband Information Services, Inc. All notices pertaining to undeliverable mail or subscriptions should be addressed to 274 Madison Ave., New York, N.Y. 10016. 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: \$15.00 one year, \$25.00 two years. Foreign: \$20.00 one year, \$35.00 two years. Foreign Air Mail: additional \$24.00. Copyright 1975 by Broadband Information Services, Inc., New York City. Controlled circulation postage paid at East Stroudsburg, PA.

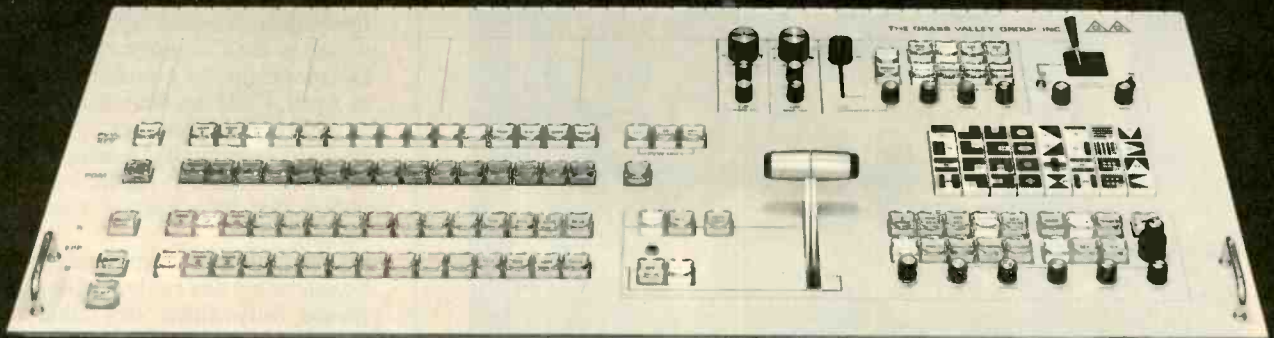
MODEL 1600-2A ----- A SWITCHER OF MODERATE SIZE AND PRICE PROVIDING STATE OF THE ART TELEVISION PRODUCTION TECHNIQUES SUCH AS *LINEAR KEYING, SOFT WIPE AND ELECTRONIC VIGNETTE.*

STANDARD FEATURES

- 16 VIDEO INPUTS
- 4 OUTPUT BUSES---MIX/EFFECTS A & B, PREVIEW/KEY, PROGRAM
- COLOR BLACK/COLOR BACKGROUND GENERATORS
- 32 WIPE PATTERNS
- JOYSTICK POSITIONER WITH MODULATION
- HORIZONTAL AND VERTICAL PATTERN LIMIT PRESETS
- ELECTRONIC SPOTLIGHT
- SOFT WIPE -- ADJUSTABLY SOFT PATTERN EDGES
- BORDERED PATTERN EDGES -- ADJUSTABLE COLOR AND WIDTH
- FOUR KEY MODES

OPTIONAL FEATURES

- CHROMA KEY SIGNAL GENERATOR
- DOWNSTREAM (PGM BUS) KEYSER SYSTEM
- BORDERLINE GENERATORS FOR MIX/EFFECTS OR DOWNSTREAM KEYSER
- CUTBAR SYSTEM
- RBG CHROMA KEY SWITCHER, 6 INPUT
- TECHNICAL PREVIEW BUS
- AUDIO FOLLOW VIDEO SYSTEM



THE GRASS VALLEY GROUP, INC. 
A TEKTRONIX COMPANY

Station Plaza East
GREAT NECK, NY 11021
(516) 487-1311

4419 Van Nuys Blvd, Ste 307
SHERMAN OAKS, CA 91403
(213) 990-6172

1644 Tullie Cir, NE
ATLANTA, GA 30329
(404) 634-0521

P.O. Box 482
MABANK, TX 75147
(214) 887-1381

810 W Bristol Street
ELKHART, IN 46514
(219) 264-0931

BROADCAST INDUSTRY NEWS

Cable Systems to Get Programs Via Satellites

A new milestone was marked last month when Home Box Office Inc., a packager of movies and sporting programs for cable systems for an extra monthly subscription fee (pay cable) announced plans to distribute its programs via domestic satellite to UA-Columbia Cable system in various parts of the country.

Until now, the HBO network has served only the northeast via microwave. By going to satellite distribution, the entire nation can be served. UA-Columbia announced that its systems in Florida, Arkansas, Texas, Arizona, California and Washington will be offered the pay programs.

Seven ground receiver stations will be built by UA-Columbia at a cost of about \$75,000 each. The systems served will reach 85,000 subscribers. At least 40 percent are expected to sign

up for the premium programs. HBO said it will transmit 70 hours a week on each of two channels of a RCA Globecom satellite.

Following on the heels of the UA-Columbia announcement, another large multiple system operator, American Television Corp., said it would begin a pay cable operation in Orlando, Fla., after building an earth station there to receive the HBO satellite signal.

With the launching of the new service, HBO, a subsidiary of Time Inc., says it expects to become profitable in 1976.

Business Leaders For Less Control, Freer Cable

The careful phasing out of federal control on broadcasting, and of restrictions on cable television in a way that does not damage "free" television, are two main recommendations of a group of 60

Broadcasters high rolling in Vegas; No Mardi Gras for cablemen in New Orleans

The NAB Convention and Exhibition in Las Vegas, April 6-9, drew a good crowd of broadcasters, high in spirits and with money to spend. Exhibitors were nearly ecstatic over interest shown in equipment.

It was a different story in New Orleans a week later as cable operators met in gloom at the NCTA Convention. Depressed over financial woes and regulatory binds, cable operators said they had little money to spend and exhibitors there took bets on who wouldn't survive the depression. Only bright note for operators was the announcement of pay cable programs available via satellite—see preceding story.

There's more on the NAB Convention inside this issue in BM/E's Show-In-Print report. The NCTA convention will be covered next month in the CM/E section.



NAB Convention in Las Vegas drew enthusiastic attendance. All exhibits got keen attention from attendees who revealed themselves to be ready to buy. Here new Programmed Broadcast Recorder from IVC gets close inspection. For a complete Show-In-Print rundown turn to page 50.

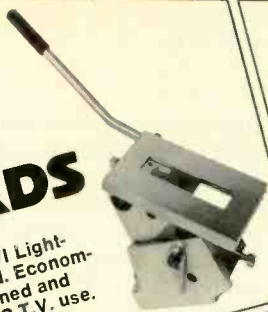
business and communications leaders forming a research and policy committee of the Committee For Economic Development, in a report issued early in April. CED has been for many years a highly respected voice of the top business community, issuing from time to time research reports on public policy that have carried considerable weight.

- The CED recommendations on broadcasting and cable, not designed to please fully either the cable or the broadcast industry, include these main elements:
- Maintaining the "fairness doctrine" as a "temporary safeguard" until only an abundance of electronic channels makes government enforcement of "fairness" unnecessary;
- Excluding presidential and vice-presidential candidates from the equal-time requirements, as a means of reducing the cost of campaigning and opening the airwaves to fuller debate during election campaigns;
- Opening the Senate and the House of

continued on page 8

PAN HEADS

Vinten MK. VI Light-weight Head. Economically designed and ideal for C.C.T.V. use. Capacity 115 lbs.



Vinten MK. IIIA Heavy Duty Cam Head for broadcast use. The Industry standard. Capacity 500 lbs.

Vinten MK. V Intermediate Weight Cam Head. Little sister to MK. IIIA. Capacity 165 lbs.

Vinten 730 Remote Field Dolly with geared elevator and separate folding base. Capacity 200 lbs.



TRIPODS & DOLLIES

Vinten 739 Heavy Duty Field Tripod. Weighs only 26 lbs. Capacity 200 lbs.



Vinten 719 Heavy Duty Tripod Dolly with alternate low-level pan head mounting.



Vinten 580 Light-weight Tripod for C.C.T.V. use. Capacity 100 lbs.

Vinten 514 Lightweight Tripod Dolly.



Vinten 729 Remote Field Dolly with air counterbalanced elevator and separate folding base. Capacity 200 lbs.

Broadcasters on the move...

PEDESTALS

Vinten 741 Pedestal. Air counter-balanced design with Standard 20" range. Capacity 250 lbs.



Vinten 677 Intermediate Lead counterbalanced Pedestal for C.C.T.V. use. Capacity 150 lbs.



Vinten 715 Lightweight Lead counter-balanced Pedestal for C.C.T.V. use. Capacity 100 lbs.



Vinten 702 Delux Fulmar air counter-balanced pedestal with 38" extended range. Capacity 350 lbs.



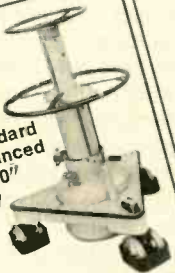
T.V.P. P-50 Super-Ped air counter-balanced Pedestal with 36" extended range. Capacity 250 lbs.



T.V.P. P-30 Lightweight air counter-balanced Pedestal featuring 30" extended range. Capacity 100 lbs.



T.V.P. P-10 broadcast standard air counterbalanced Pedestal with 30" range. Capacity 250 lbs.



T.V.P. P-20 Lightweight air counter-balanced Pedestal with standard 20" range for broadcast and C.C.T.V. use. Capacity 160 lbs.



CRANES

Vinten 743 Kestrel Crane for studio/remote use. Two-man operation with manual or powered jib elevation. Capacity 500 lbs.



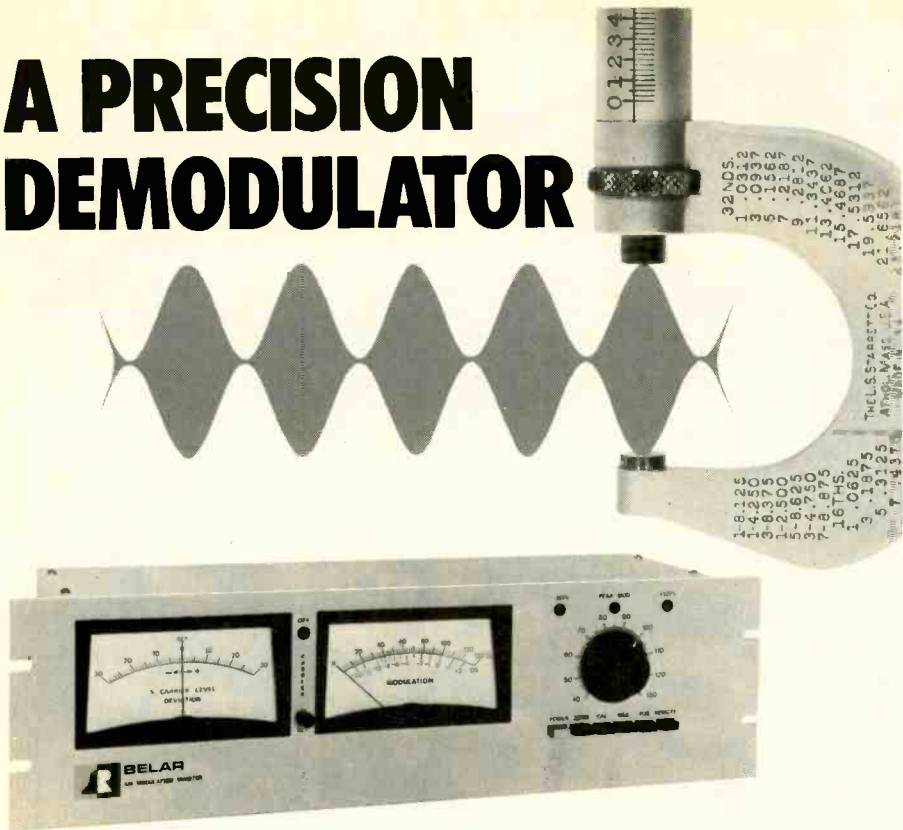
Listec

Listec Television Equipment Corporation

35 Cain Drive ■ Plainview, New York 11803 ■ (516) 694-8963

Agents for: W. Vinten, Ltd. and Television Products Co., Inc.

A PRECISION DEMODULATOR



The AMM-2 AM Modulation Monitor

- RF frequency range — 200 kHz to 160 MHz
- 100% negative peak modulation light — independent of input carrier level
- 125% positive peak modulation light — independent of input carrier level
- Peak modulation light adjustable from 40 to 130%, calibrated in 1% increments — independent of input carrier level
- True peak reading modulation meter — responds to shortest duration program peaks
- Carrier level meter — indicates true carrier shift
- Phase-linear filter — no overshoots from clipped modulation peaks
- Remote outputs — outputs for both meters and peak lights
- Built-in modulation calibration
- Built-in carrier-off alarm
- Outputs for listening as well as test functions
- 115/230 volts, 50/60 Hz operation
- FCC Type Approved

The AMM-2 Modulation Monitor sets new standards in accurate AM monitoring — the first AM monitor to incorporate true ratio-type peak indicators. The AMM-2 contains a unique modulation cancellation scheme to recover unmodulated carrier to reference the modulation peaks to. Thus the instantaneous program peaks are referenced to the instantaneous carrier without the need of time-constants, as with AGC devices. True carrier is indicated even with the asymmetrical modulation encountered in today's high positive peak modulation, and the peaks are automatically referenced to this true carrier to give the most accurate indication of program peaks.

The AMM-2 incorporates a phase-linear filter that does not produce overshoots when a negative peak clipper is used in the transmitter. The true modulation peak is measured instead of a false, higher peak introduced by the non-linear phase filters found in other monitors.

With the AMM-2, you can turn up your level to where it belongs for maximum loudness.

\$850 DELIVERY FROM STOCK

There are well over 3000 Belar AM, FM and TV monitors currently in use worldwide.



BELAR
ELECTRONICS LABORATORY, INC.

LANCASTER AVENUE AT DORSET, DEVON, PA. 19333 • BOX 826 • (215) 687-5550

Where Accuracy Counts . . . Count on Belar

Circle 103 on Reader Service Card

NEWS

Representatives to television and radio, under rules worked out by Congress and the broadcast industry;

- Giving substantially increased public funds to public television on a five-year grant basis, with funds coming from other sources on a two from outside to one from Government basis, to free public television from Government control and give it the level of operation it should have;
- Gradually phasing out restrictions on movies and series programs on pay cable, while monitoring the effects on "free" television; anti-siphoning rules on sports programs to be retained, but modified to allow cable carriage of events not regularly televised;
- Establishing a two-tier system of cable regulation, with the federal government and the states both included;
- Relieving the FCC of judicial functions by establishment of a new Communications Court.

The report emphasized the need for comprehensive research and experimentation. It also emphasized the grave importance of proper policy in the whole telecommunications field, saying that television, through the events of the last few years, had become far more important than ever in the interchange between Government and people, in public understanding of vital issues, and in educating Americans during a time of rapid change.

The report is titled *Broadcasting and Cable Television: Policies for Diversity and Change*, and is available from CED at 477 Madison Ave., New York, at \$2.50 in paper, \$4 in hardcover.

New Rules For Pay TV, Pay Cable, Give A Little

The Federal Communications Commission in late March issued new rules on programming rights for pay TV and pay cable which gave a little more to the pay operators, but not much. The avowed purpose, said the FCC in the announcement, was to "... insure that the public's access to programming now delivered by conventional television is not diminished by subscription operations." In line with that, the FCC kept a strong release-date rule on feature movies: they are prohibited to the pay operator unless they are less than three years old, or more than ten years old, with no showing on conventional television in the market during the last three years. This applies only to American films; foreign-made films are freely available to the pay operator.

Live coverage of "specific" sports events—the Super Bowl or the World Series—is out for pay operators if the

continued on page 12

Circle 104 on Reader Service Card →

The new Volumax[®] Model 4300.

Anything else is a limited limiter.

When it comes to automatic peak controlling, the new Volumax is the smoothest operator around! It's the latest in our quest for the ultimate AM limiter. The only similarity between the Model 4300 and conventional peak limiters is that they both prevent overmodulation. And here the similarity ends!

Volumax patented control action assures maximum utilization of each watt of carrier power, without overmodulating the transmitter and with absolute minimal signal distortion. The Model 4300 features: more precise limiting at maximum allowable limits, easier set-up and proof-of-performance procedures, and extended control range of over 15dB, with less than 1% harmonic distortion.

With automatic peak phasing, negative speech asymmetry is silently inverted for positive modulation to the maximum allowable limit of 125%.

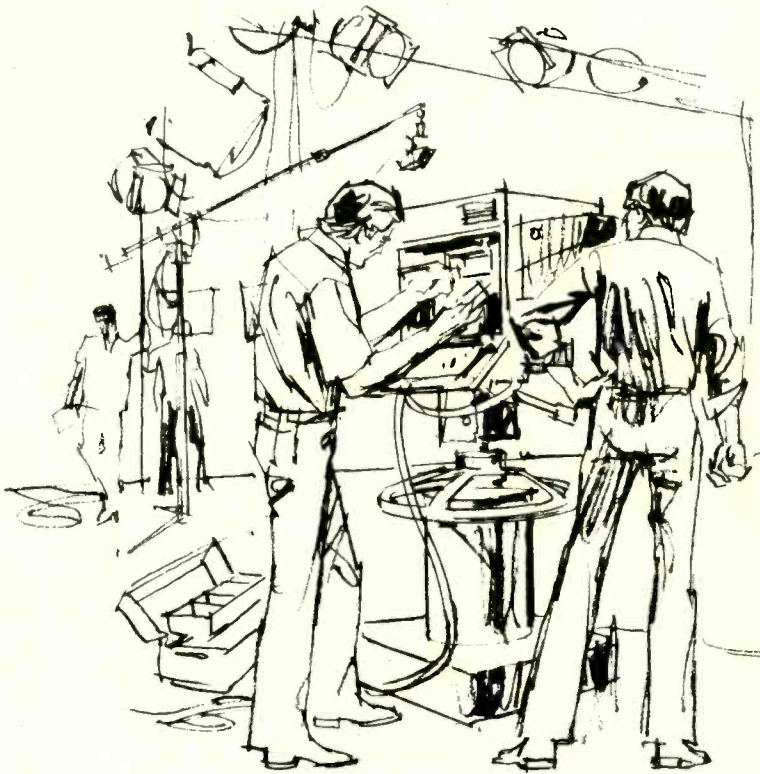
Try a 4300 and listen. You'll see why other limiters are limited. And why we think the new Volumax Model 4300 is the ultimate limiter.



CBS LABORATORIES

A Division of CBS Inc.

227 High Ridge Road, Stamford, Connecticut 06905



**Some day,
somebody
may imitate
the Product...**

...but nobody will ever duplicate the Service!

And in TV Broadcasting, it's the service behind the product...that keeps the product out front

On the way to selling more than 30,000 Plumbicon* TV camera tubes, we learned how important Service is to the broadcaster. The first thing we learned was about availability — No TV station, commercial or educational, can ever afford to shut down an operation while "waiting for parts." Plumbicon tubes are instantly available, at all times, through local franchised distributors and through Amperex factory sales representatives.

And we learned the importance of the name Plumbicon to TV stations who have come to depend on it as their assurance of consistent performance and quality.

Because no product is ever "good enough," we taught ourselves to build smaller and smaller Plumbicon tubes that provide performance standards similar to the original (we're down to $\frac{2}{3}$ inch tubes now,) and we learned to produce tubes with reduced comet tailing, with higher resolution and modulation depth, with extended-red response, and with minimum lag. Contemporary camera tubes outperform the original Plumbicon by a wide margin.

We learned that the TV camera user is concerned about the operation of his camera . . . not merely about the performance characteristics of our tubes. So we provide him with a wide range of expert and valuable information, in print and via our field engineers, to help him get the most out of his TV camera-system. Plumbicon users who are about to install a new camera need only give our

field engineering staff a call and we'll have an expert there to help with the job.

Our franchised distributors, (your own local businessmen,) are carefully selected for their ability to support Plumbicon TV camera systems with on-the-spot customer support and service. We, in turn, support our distributors with two kinds of "seminars" for Plumbicon camera users. One is on video tape, the other is presented "live" by an Amperex field engineer. The purpose of both is to maximize the value of Plumbicon camera systems.

Finally, we learned that the best way to deal with warranty questions was to design the warranty for the customer's benefit — not to protect ourselves . . . and even then, to interpret the warranty in the customer's favor whenever possible. For example, a customer may return any Plumbicon tube for testing (even one that's technically out of warranty) and we'll subject it to a complete technical evaluation at our expense . . . and send the customer a detailed engineering report on the tube.

Yes, we've learned a lot about the importance of Service in the ten years, in the more than 30,000 tubes sold, in the 600-plus TV stations served, since the Plumbicon tube won the Emmy award. Little wonder, then, that the Plumbicon, after all this time, still offers the best all-around package of performance, price, reliability and service available. Little wonder, then, people keep on saying, "There's only one Plumbicon."

Electro-Optical Devices Division, Amperex Electronic Corporation, Slatersville, Rhode Island 02876, Telephone: 401-762-3800

Amperex®

A NORTH AMERICAN PHILIPS COMPANY

There is only one Plumbicon

* Reg. T.M. of N.V. Philips of the Netherlands



Jack Hansen, WFMD, Frederick, Md.

Directional Antenna Monitoring Simplified

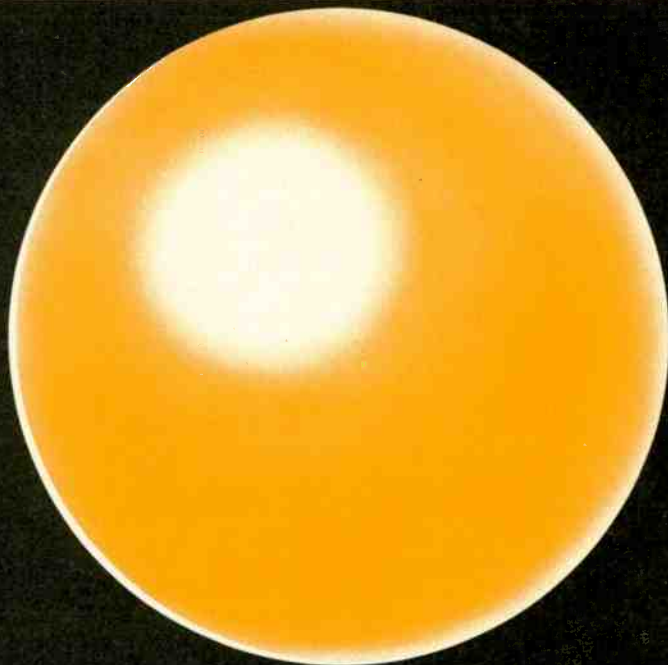
With the Model AM-19D (210) Digital Antenna Monitor, accuracy is assured and operating cost savings are realized. Now antenna phase angle and loop current ratio readings can be taken by lesser grade operators. The easy-to-read numeric readout provides exact readings and eliminates interpretation errors common with conventional meters. Resolution is 0.1° for phase angle and 0.1% for current ratio.

Contact us now on this and other FCC type approved Antenna Monitors.

POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.
SILVER SPRING, MARYLAND 20910 (301) 589-3125

Circle 106 on Reader Service Card



Tough & Juicy THE ORANGE COUNTY AMPLIFIER

The Orange County Corporation, Box 369, Pembina, N. Dakota. Phone: (204) 475-1026.
In Canada 1079 Autumnwood Drive, Winnipeg, Man.
Monitor Amplifiers, Monitor Speakers, Audio Switchers, RF Amplifiers.



Circle 107 on Reader Service Card

NEWS

event has been live on conventional television during any of the preceding five years. On regular sports events—season baseball, etc.—the pay operator can get a number in any season that does not exceed the number not broadcast by conventional television, in the year among the last five of heaviest coverage of that sport, if conventional television did 25% or less; if conventional television did more than 25%, the pay operator gets only 50% of the “left over” games.

On series-type programs, the rule is simpler and tougher—they can be used by pay operators if they “have not been carried over conventional television.”

These can be called pretty much “status quo” rules, not designed to make the cable industry happy, or to quiet down controversy over pay cable.

Baruch of NCTA Hits New Pay Cable Rules

As expected, the NCTA attacked strongly the FCC's new pay cable rules (preceding story) as totally unresponsive to the needs of cable and the public. Ralph Baruch, chairman of the NCTA Subscription Cablecasting Committee and President of Viacom, Inc., issued a statement after the new FCC rules were announced that went, in part: “The FCC's new rules show a thorough disregard for the public's desire and right to obtain new communication services . . . serve primarily to perpetuate the network oligopoly” . . . “the cable television industry intends to challenge the decision.”

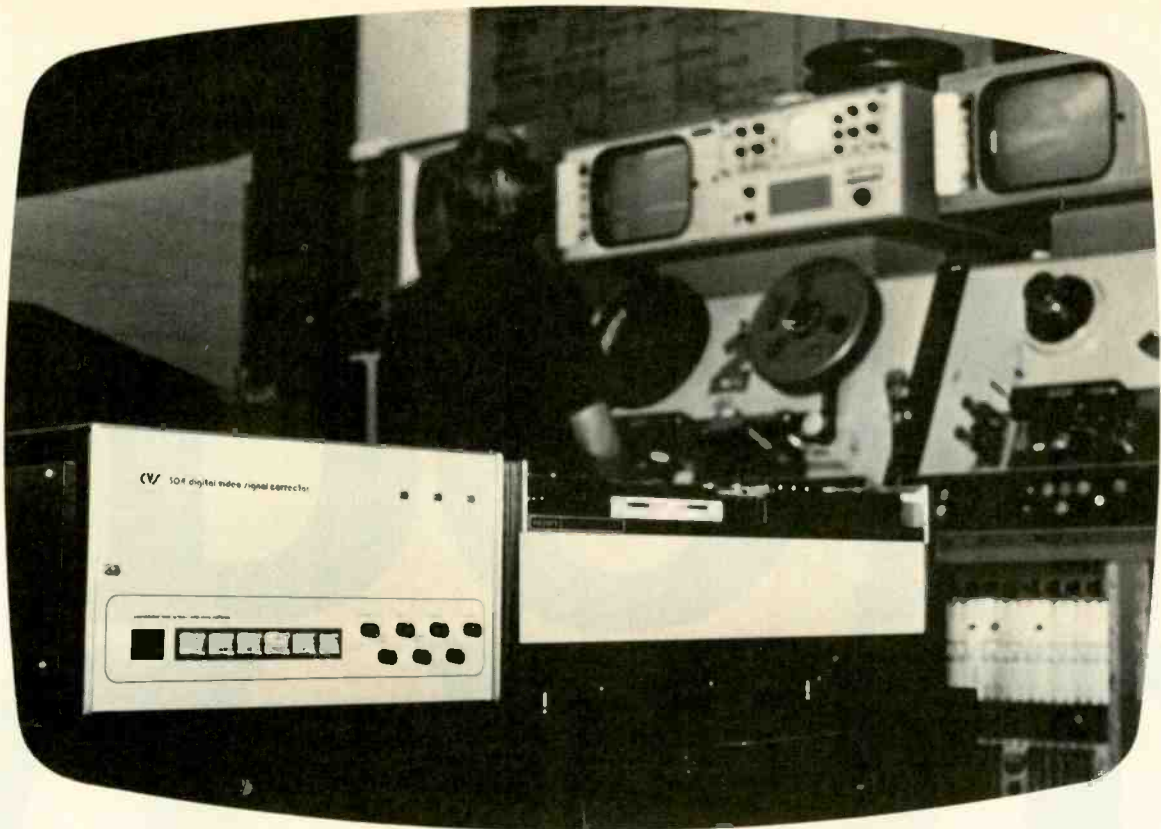
No Refund Other Than Cable Fees FCC Says Again

The FCC has restated in firm tones refusal to consider the refund of any broadcast industry fees, other than the fees the Supreme Court specifically ordered paid back to the cable industry. The FCC said, as it had in earlier response, that the Supreme Court decided the validity of the cable fees only, and did not indicate application of the decision to any other fees.

Public TV Not Under Prime Time Rule

The FCC has clarified its recent revision of the prime time access rule to affirm that public and educational stations do not fall under the rule. The Public Broadcasting Service, in a petition for clarification, pointed out that the new rule, as written, seemed to cover public TV. The FCC has now

continued on page 16



Some informed people in broadcasting suggest that our 80% share of the TBC market has set the standard.

We can't disagree.

Digital video signal correction really came of age when CVS introduced a wide, wide window of correction of more than 90 microseconds in either direction.

Look what's happened since then.

All networks now employ CVS "Universal" TBC's in electronic news gathering using direct or heterodyne color signals generated from capstan or non-capstan servoed VTR's. Incidentally, CVS was their first choice.

Many local video news teams throughout the country utilize some form of digital time base correction . . . mostly from CVS.

NASA recently used three CVS 504's to process the Jupiter color video pictures back to earth.

What's new is an impressive 57db signal-to-noise ratio in the 504A plus an optional improvement which totally corrects velocity errors from either heterodyne or direct color VTR's.

It's what you would expect from the leader and there's yet much, much more to come from CVS.



Consolidated Video Systems

3300 Edward Avenue
Santa Clara, California 95050
(408) 247-2050

Circle 108 on Reader Service Card

**YOU
TOLD
US
SO**

AVR-2 one year later: over 200 in use.

Last year, we introduced AVR-2 at NAB, and industry response was startling.

You told us things that made us cross our fingers and hope you were right.

First comments came from broadcasters. Who would know more than they about what a VTR should be?

They told us AVR-2 probably would become an industry workhorse. Because it has something for everyone, regardless of need, objective, budget. At the right price.

They said it looks like a solution (finally) to their spiraling price/performance squeeze. Top quad performance at 1/3 less than the cost of a bigger machine. 15 or 7.5 ips. One second lockup for crisp cueing in tight situations.

Plus a wide-window digital time base corrector to give them a better on-air look. Even from those tapes that might otherwise frustrate their best operators.

Smaller broadcasters told us we must have designed AVR-2 just for them: a reliable, no-nonsense machine. You just plug it in and let it go to work. Low-cost operation, right from any

standard AC outlet. Easy maintenance, even in operation.

Big or small, many buyers told us they were glad that somebody (finally) had designed a modular VTR. So that each could put together the configuration best suited to his own need—in the van or the studio—with any combination of features and accessories he likes.

Production houses told us AVR-2's modular design would be ideal for all kinds of recording, mobile or studio. They particularly liked the additional capability of editing, if required, and studio-quality playback on location. And, that same AVR-2 is compatible with their studio editing systems, no matter how sophisticated.

A few people were wrong.

They didn't believe us when we promised immediate delivery, but we delivered. Today there are over 200 AVR-2s in use, worldwide.

We're still taking orders for immediate delivery. Call your Ampex Sales Engineer for details.



AMPEX

Ampex Corporation
Audio-Video Systems Division
401 Broadway, Redwood City, CA 94063

P.S. Thanks for being right.

BL-40 MODULIMITER

The Automatic AM Broadcast Limiter With Tweak-ability

Unlike other broadcast limiters that are factory-set automatic, our Model BL-40 MODULIMITER offers front panel adjustments and separate meters for output level, peak limiting and RMS limiting. No matter what your format, hard rock to classical, MODULIMITER is readily adjustable to maximize transmitter efficiency and extend coverage. Our patented electro-optical attenuator provides unobtrusive, smooth, true RMS limiting. An ultra-fast F.E.T. peak limiting section prevents unwanted overmodulation with no peak clipping. Our "Phase Optimizer" maintains most favorable signal polarity permitting up to 125% positive modulation without negative undershoot. The BL-40 MODULIMITER offers all state-of-the-art automatic features plus complete adjustability not available in others. UREI quality, of course.



11922 Valerio Street, No. Hollywood, California 91605 (213) 764-1500

Exclusive export agent: Gotham Export Corporation, New York

NEWS

made clear that it does not.

Home Box Office Sues To Prevent "Piracy"

In a move that will win approval from cable operators in similar trouble, Home Box Office, pay cable outfit headquartered in New York, has started an action in New York State Supreme Court to prevent piracy of its programs by the installation of "remote control" devices, that provide viewers with a "free ride" on the HBO programs. Joining HBO in the suit is Ceracche Television Corp., cable operator in Ithaca, N.Y., among whose subscribers the alleged piracy took place. The defendants are Varaxon Industries, Inc. of Ithaca, and two individuals associated with that company, Gary Loomis and Richard Henry. The suit seeks an injunction against further use of the devices, plus damages to cover the HBO losses from the "thefts." No action was planned, initially, at least, against cable subscribers who used the devices.

NAB Asks Extension of 3rd Class License to 3 Years

The National Association of Broadcasters has asked the FCC to extend the life of the provisional third-class operator's license from one year to three years. NAB said extension is needed because of the "increased complexity of the present examination, the shortcomings of the government—published study guide and the difficulties faced by the provisional license holder in obtaining a regular five-year license within the allotted one-year period."

Data On Public TV Programs To Come From New Group

A centralized source of data on programming of public and educational TV and radio stations will be set up by the National Association of Educational Broadcasters, that organization has announced. To be called the "NAEB Program Information Clearinghouse," the activity will be financed by grants from the National Home Library Foundation, the Exxon Corporation, the Markle Foundation, and the National Foundation March of Dimes. The NAEB called it the first complete index of information about public programming, and it will include data beyond program titles, including the success or failure of various program efforts, the people involved, etc. It will be administered by the NAEB staff;

continued on page 18

Are you a recording engineer? Entertainer. Concert Manager. Audio Consultant. Disc Jockey. Doctor. Lawyer. Indian Chief... whoever you are, you can find an AKG condenser, electret, dynamic, dynamic "two-way": omni, cardioid, figure-eight, hyper-cardioid patterns and a shot gun mike to satisfy the most particular requirements. There's even a sawed-off shot gun module available.

Studio on a budget? The AKG electret condenser system gives the versatility of interchangeable capsules: lavalier, omni, cardioid and cardioid/wind screen, on a hand held power supply.

Professional applications? We present the AKG C-140. It's a compact yet rugged cardioid dynamic that's designed to take rock sound pressure levels and give wide-range impeccable performance on the stage or in the studio.

Then there's the AKG "two-way" mikes. They're so unique they're patented. Each mike has a high frequency transducer and a low frequency

transducer optimally combined. They give smooth bass response without annoying proximity effects. There's a complete choice of two-way mikes to meet the needs and the budgets of just about every recordist.

Rock? We have the right mikes for soul, progressive, and downhome country. There's even an AKG guitar pickup.

The professional C-451 interchangeable condenser system, C-414 preferred studio condenser, and the stereo concert C-24 condenser mikes provide the quality standards all AKG mikes live up to.

Come out, come out whoever you are to your AKG dealer for details.

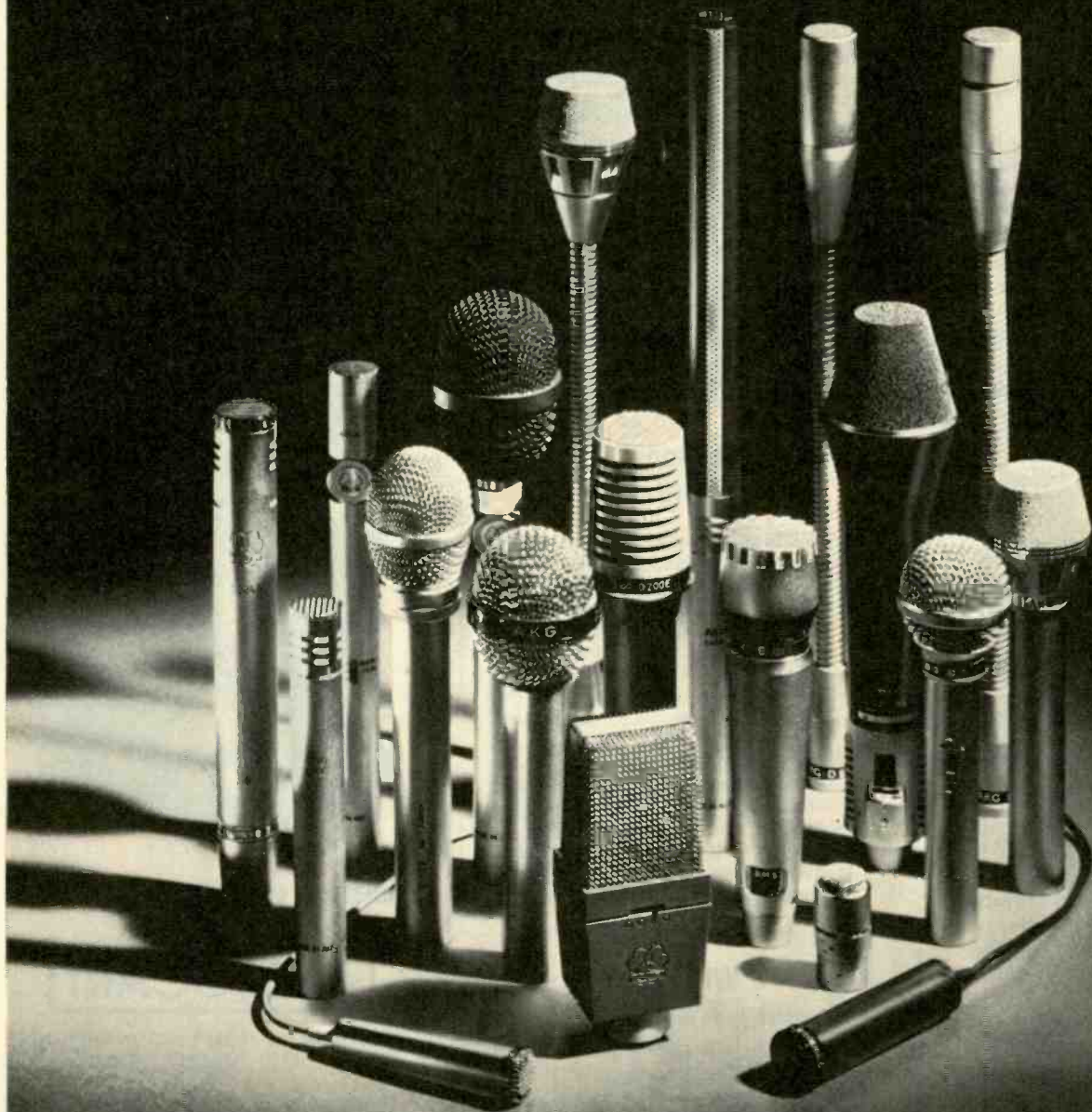
Or write us.

AKG MICROPHONES • HEADPHONES

distributed by:
PHILIPS AUDIO VIDEO SYSTEMS CORP.
AUDIO DIVISION
91 McKee Drive, Mahwah, New Jersey 07430
A North American Philips Company



AKG has the right microphone for you. Whoever you are.



Circle 111 on Reader Service Card

Big Markets

Colorado Springs, Fort Myers, Sarasota, Tallahassee, Columbus, Elgin, Springfield, Belleville, Elkhart, Peru, Owensboro, Golden Meadow, Shreveport, Lewiston, Beacon, Jamestown, Utica, Asheville, Greensboro, Bismarck, Medford, Salem, Lebanon, Scranton, Wilkes-Barre, Austin, Everett, Fond du Lac . . .

Small Markets

Los Angeles, San Francisco, San Jose, Hartford, Miami, New Orleans, New York, Raleigh, Tulsa, Portland, Seattle, Toronto, Windsor/Detroit, Sydney, Australia.

BAT Systems Are Working!

They do all the Billing, Accounting, Traffic and Payroll work for AM's, FM's, AM/FM's, TV's, Radio/TV's, and Groups. And they do it faster, more accurately, and at less cost.

Get more information on these in-house, complete mini-computer systems. Write or call . . .

PBI PAPERWORK SYSTEMS INC.

P. O. Box 38 2000 "A" St., Bellingham, WA 98225 (206) 733-8510

Circle 112 on Reader Service Card

NEWS

inquiries should go to NAFEB at 1346 Connecticut Ave., NW, Washington, D.C. 20036.

NAFMB Asks for Change of "Standard" to "AM"

The National Association of FM Broadcasters petitioned the FCC to drop the terms "standard broadcast" and "standard broadcasting station" in favor of "AM broadcast" and "AM broadcasting station." The petition called the current practice of calling AM stations "standard" misleading and "confusing to the public." The practice is also derogatory and discriminatory to FM radio, said the NAFMB.



Best Station Award Winner

BM/E editor Jim Lippke congratulates Richard L. Gelganda, general manager of WNHU upon having won a 1974 Best Station Award. WNHU's unique studio console (BM/E page 38, December) won the most reader votes in the FM category in the Best Station Award Contest balloting. Not pictured, but present for the presentation of the plaque, were Vincent Berluti who was chief engineer and primary designer of the console and Paul G. Price, station manager. WNHU is a three year old station, licensed to the Univ. of New Haven, West Haven, Conn. It is supported by funds provided by the student union.

SMPTE Will Hold Annual Meeting in Los Angeles

Instituting new policy for holding one Technical Conference per year instead of the two held for many years, the Society of Motion Picture and Television Engineer has chosen September 28 through October 3, 1975, as the time continued on page 20

We guarantee

the unique individually tested

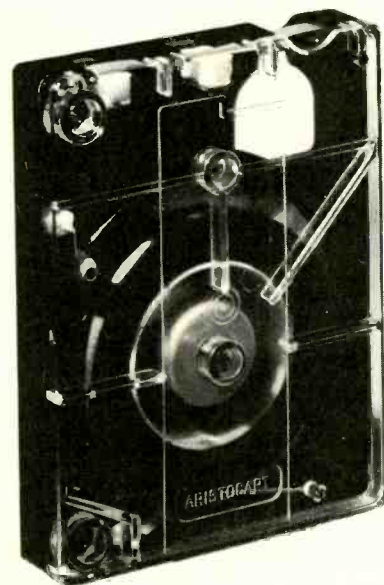
ARISTOCART

will deliver a consistently higher standard of voice and music reproduction than you'll get from any other cartridge on the market.

SPECIFICALLY:

Aristocart's exclusive internal guidance system delivers reel-to-reel fidelity — 20Hz to 15kHz — for the life of the tape. Phase stability is better than 90° to 12.5kHz with any properly aligned machine. Wow and flutter have been minimized.

Every Aristocrat cartridge is factory tested before shipment for phase and frequency response. We replace at our expense any cartridge which fails to perform within areas indicated.



believe your own ears

Switch to

ARISTOCART

A DIVISION OF WESTERN BROADCASTING LTD.
505 Burrard Street, Vancouver, Canada V7X 1M6
Tel.: (604) 687-2844

Distributors: U.S.A. — McCurdy Radio Industries Inc., Buffalo N.Y. — IGM, Bellingham, Wash. CANADA — McCurdy Radio Industries Ltd., Toronto, Ont. — L. A. Varah Ltd., Vancouver, B.C. GREAT BRITAIN — Selkirk Communications Limited, London, Eng. AUSTRALIA — Syntec Electronic Distributors, Pty., Castle Cove, N.S.W.

Circle 113 on Reader Service Card

MAY, 1975—BM/E

Now you can make Sony U-matic Videocassettes anywhere. Anywhere!

Now, all the ease and advantages of videocassette recording go portable.

Because Sony is introducing the VO-3800 VideoRanger™, the first portable ¾-inch U-matic Videocassette Recorder. For both color and black and white.

Shoulder strap it. Or back-pack it. Take it anywhere. Use a portable camera. (Ours is the Sony DXC-1600 color camera.) Play back the compact 20 minute cassette on the VideoRanger itself or any U-format machine. Edit, if you want, on the Sony VO-2850 ¾-inch U-matic Editor. Everything in one format. No generation gap!

If you're already using U-matic equipment, you'll really appreciate the broadened capability the VideoRanger gives you. If you're not, this gives you another good reason to start.

The VO-3800 VideoRanger is ideal for sales and personnel training. For product presentations. For field trips and special research projects. For reporting and electronic news-gathering, it has the Sony quality and reliability you know you can count on.

And Sony quality means you get features like:

NTSC Color and EIA monochrome standard signals.

A dropout compensator that corrects for tape flaws.

Automatic power shut-off when tape run is finished.

Audio-dub facilities.

Freeze-frame capability.

Remote control operation.

60 minute rechargeable battery. Also works from AC or external DC sources.

Playback capabilities through any TV set.

The Sony VO-3800 VideoRanger. Once you see it, you'll want to take it with you anywhere. Everywhere! Send the coupon today for all the details.

Sony. The proven one!



Sony Corporation of America SN-202
Video Information Center B.M.E-055
P.O. Box 1594, Trenton, N.J. 08607

Gentlemen:

- Please send me more information on the Sony VideoRanger.
 Please arrange a demonstration.

NAME _____

TITLE _____

ORGANIZATION _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

PHONE (AREA CODE) _____

TYPE OF BUSINESS _____

**Sony® U-matic® Color
Videocassette System**

Circle 114 on Reader Service Card
for a demonstration
Circle 115 on Reader Service Card
for literature



FIDELIPAC[®] Broadcast Tape Cartridges



... the standard of the industry for quality, durability and flexibility are now obtainable worldwide. Available in three size configurations:

- ▶ Model 300 (NAB Type A) in lengths to 10½ minutes @ 7½ ips (19.05 cms)
- ▶ Model 600 (NAB Type B) in lengths to 16 minutes @ 7½ ips (19.05 cms)
- ▶ Model 1200 (NAB Type C) in lengths to 32 minutes @ 7½ ips (19.05 cms)

Heavy-duty tensilized Polyester Tape used throughout. Compatible with all standard Broadcast Cartridge Recorder/Reproducers.

For complete information, contact your Fidelipac Distributor or

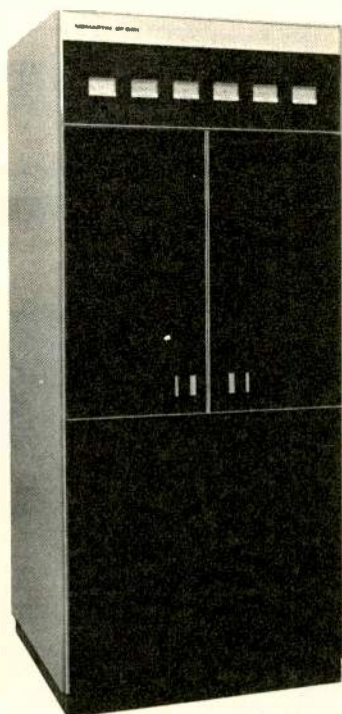


FIDELIPAC[®]
A Division of TelePro Industries Incorporated
109 Gaither Drive • Mt. Laurel, NJ 08057
(609) 235-3511

© Trademark of TelePro Industries Incorporated

Circle 116 on Reader Service Card

the NEW McMARTIN FM TRANSMITTER • BF-3.5K



traditionally, McMARTIN engineering has supplied the AM/FM broadcaster with the finest professional equipment. The new BF-3.5K is one of those products.

excellent efficiency for power output levels from 2000 to 3500 watts.

the high performance solid state B-910 exciter, is the heart of the system

superb bandwidth characteristics and operating stability

optimum stereo and SCA performance — zero bias, grounded grid PA — no neutralization . . . no screen grid or bias voltage supplies are needed

standard features include illuminated pushbutton switch controls, output reflectometer, memory-type LED status indicators, built-in harmonic filter, remote control capability of metering and operating functions

McMartin.

McMartin Industries, Inc. 4500 South 76th Street, Omaha, Nebraska 68127 (402) 331-2000

Circle 117 on Reader Service Card

NEWS

for the 17th Technical Conference and Equipment Exhibit. The place will be the Century Plaza Hotel in Los Angeles. Julian Hopkinson, of Agfa-Gevaert, was named Program Chairman; Robert Gustafson, Consolidated Film Industries, is Local Arrangements Chairman; and Warren Strang, Hollywood Film Company, is Exhibit Chairman. Inquiries go to SMPTE at 862 Scarsdale Ave., Scarsdale, N.Y. 10583.

Uses Satcom for Stereo Radio Transmission

Working in collaboration with the National Public Radio, RCA Corporation has demonstrated stereo radio programming transmission using the Satcom domestic satellite system. National Public Radio put on the demonstration at the Public Radio Conference held in Washington March 24 to March 28, to show that high quality music programming could be sent via satellite to small earth receiving stations. The demonstration "hop" was from the RCA Satcom earth station in Valley Forge, Penna., to the Anik II Satellite, put up for the Canadians to a 10-foot receiving antenna on the NPR roof in Washington, D.C.

News Briefs

The Magnavox Company, CATV Division has announced the signing of a turnkey contract with Citizens Cable of Allen County (Ind.), Inc. for the construction of a bi-directional 157-mile cable TV system in the Fort Wayne, Indiana suburbs including the City of New Haven and unincorporated areas of St. Joseph and Adams Townships A \$300,000 order for a mobile color television van has been received by International Video Corporation from KVIE-TV, Channel 6, Sacramento, Calif. . . . Delivery of the 200th Ampex Corp. AVR-2 quadruplex videotape recorder/reproducer was made recently to the Canadian Broadcast Corporation. They are the single largest customer of the AVR-2, having 32 machines so far . . . Editel Communications, Montreal, Canada, has announced that Hubbard Broadcasting has ordered their fourth ENC-1 handheld color camera.

Videomovil of Venezuela will handle exclusive representation of Image Transform in all South American countries except Brazil The Kuwait Ministry of Information has placed an order with Marconi Com-

continued on page 22

ALL SOLID-STATE AURAL STUDIO-TRANSMITTER LINKS



- Model PCL — 505 Monaural or dual stereo
- Model PCL — 505/C Composite — a single link for stereo
- Model PCL — 101 Monaural for AM

■ OPERATION STL BANDS —

- 148-174 MHz
- 200-240 MHz
- 300-340 MHz
- 450-470 MHz
- 890-960 MHz

All solid-state aural STL's to fulfill almost every requirement. Moseley Associates has pioneered many STL concepts — **solid-state systems**, **true direct FM modulation**, and **composite operation** (FM stereo on a **single link**)... just to name a few. Front-panel metering of all important parameters is included on all Moseley STL transmitters and receivers. Subcarrier capability enables wireless remote control, secondary program service, or orderwire service.

TRANSMITTER REMOTE CONTROL SYSTEMS

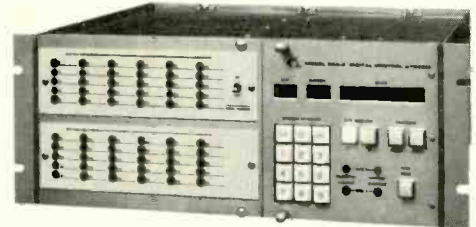


ANALOG

Fifteen telemetry and thirty command functions are provided by the TRC-15A. The **Model TRC-15AR**, when used in conjunction with a Moseley STL, or other radio link, will provide total wireless operation. The **Model TRC-15AW** is for use on leased telephone, or other wired circuits.

DIGITAL

Fully digital remote control of a remotely located transmitter point is provided by the **DCS-2 Digital Control System**. Multiple transmitter site operation — a standard option. **Command, telemetry, and status** provided in groups of thirty channels. **Automatic parameter logging** available. Computer-assisted operation of the DCS-2 is another standard option, and can provide **totally automated plant operation**. The **Model DRS-1 Digital Remote System** provides many of the features of the basic DCS-2 at an affordable price. Up to 30 telemetry functions and 24 status channels to a single transmitter site.



REMOTE PICKUP LINKS

Models RPL-3 and PRL-4 Remote Pick-up Links provide unsurpassed audio performance for remote broadcasts. Two full-time microphone and high-level line audio inputs are standard. The RPL-3 and RPL-4 Transmitters are only 4 inches high and weigh a mere 16 pounds — complete with audio mixing and AC/DC power supplies. For 148 to 470 MHz operation.

OTHER MOSELEY PRODUCTS . . .

- FM SUBCARRIER GENERATORS AND DETECTORS
- STEREO GENERATORS
- STL ACCESSORIES
- REMOTE CONTROL ACCESSORIES

For complete details on any of our products, please contact our Marketing Department, or visit us in Stand 401 during the International Television Symposium.



MOSELEY ASSOCIATES, INC.
SANTA BARBARA RESEARCH PARK

111 CASTILIAN DRIVE
GOLETA, CALIFORNIA 93017 U.S.A.
TELEPHONE (805) 968-9621
TELEX 658448 CABLE: MOSELEY

COMTEC**COMMUNICATIONS
TECHNOLOGY, INC.****ROUTING SWITCHERS FOR
EVERY REQUIREMENT****15X****REPLACES PATCH PANELS
VIDEO/AUDIO**

- ★ Plug-in Construction
- ★ Local or Remote
- ★ 12 or 15 Inputs
- ★ LED Status Indicators



12x6	\$2535	15x6	\$3075
12x12	\$4485	15x12	\$5440

RX**REMOTE CONTROL FOR BROADCASTERS
VIDEO/AUDIO**

- ★ Plug-in Modular Const.
- ★ Momentary Pushbuttons
- ★ LED Indicators
- ★ Input-Output Amps
- ★ Optional Vert. Int.



12x5	\$3747	16x5	\$4470
12x10	\$5630	16x10	\$6740

20X**THE ULTIMATE**

- ★ 20x10 Matrix W/P.S.
- ★ 5 Level Switching
 - 1—Video, 2—Audio &
 - 2—bi-directional auxiliary
- ★ Breakaway Audio
- ★ Memory — CMOS Logic
- ★ Any Type Control



20x10 Audio/Video
W/P.B. Control \$10,560

DUAL CHANNEL SWITCHERS

15X2	12 or 15 Inputs Video/Audio	12X1	\$695	15X1	\$795
		12X2	\$1020	15X2	\$1190
20X2	20 Inputs-Vert. Int.-Custom Control Similar Features of 20X P.B. Remote Control	20X1	\$1395	20X2	\$2295
AX	Audio Switchers as Low as		\$12.00/Xpt.		

QUALITY AT A PRICE EVERYONE CAN AFFORD!*Send For Brochures & Price List***COMMUNICATIONS TECHNOLOGY, INC.**

4306 GOVERNORS DRIVE S.W. • HUNTSVILLE, ALABAMA 35805

205-837-7340

NEWS

munication Systems, Ltd. for the supply and installation of four Marconi Mark VIII color television camera channels **Western Communications** has purchased the cable TV system serving the community of Las Cruces, New Mexico. The Las Cruces system passes 16 500 homes with 180 miles of plant **Harris Broadcast Equipment Division** recently completed two additions to facilities in Quincy, Ill. One is a complete TV studio for demonstration purposes, the other a warehousing addition brought by the acquisition of General Electric's television broadcast equipment division.

Volume production and a direct-sales policy enables **Recortec** to sell their Video Tape Timer for \$560, including the power supply. Customers may call Recortec's toll-free number, 800-538-1586, from 8:30 a.m. to 5:30 p.m. Pacific time Edward J. Glener, **National Communications Forum** President, has announced that the 1975 Annual National Electronics Conference and Exhibition will be held concurrently with the 1975 National Communications Forum. The two technical meetings will be presented at Chicago's Hyatt Regency O'Hare, October 6-8, 1975 **Editel Communications** has announced the availability of a 27-foot-long custom mobile unit. The front-wheel-drive vehicle comes equipped with automatic transmission, power steering, twin rear axles, air conditioning, and an optional auto levelling system.

Calvert Electronics International Inc., New York, N.Y., announces the establishment of a Broadcast/CATV/CCTV Division. Address is 220 East 23rd St., New York, N.Y. 10010

Rank Precision Industries has opened an Eastern Lens Sales Service Center at 12-90 Plaza Road, Fairlawn, New Jersey **Byron Motion Pictures, Inc.**, is planning a second building adjacent to their present one at 65 "K" Street, NE, Washington, D.C.

Ampro Corp. has appointed H.N. Larkin to the newly created post of Vice President for Marketing. Edward N. Mullin, also of Ampro, has been promoted to Vice President for Engineering **RCA International Ltd.** (United Kingdom) has established a new regional office in the London area.

The office, headed by Patrick J. Murrin, is located at Lincoln Way, Windmill Road, in Sunbury-on-Thames.

CDI Services, a division of Cable Dynamics Incorporated, will offer repair service for all CATV component devices. The plant is located at 501

continued on page 24

"Whose equipment did I look at when I was spec'ing recorder/reproducers?"

Everyone's.

Whose equipment did I buy?

Electro Sound's ES-505."

As chief engineer for one of the nation's oldest and most respected stations, Dave Finley's primary concern is quality — both in equipment and over-the-air product.

Here's what Dave told us about the ES-505:

"My business is to compare equipment. When we had an opportunity to use an ES-505 against two XXXXXX's* in our production room, I was

very, very impressed — not only with the machine's quality of reproduction, but with its ease of operation and unique features.

"Our particular application for the four-track ES-505 is in radio production, where recording with a great deal of creativity in mixing is needed. If there's a lot of editing involved, the third reel offered on the ES-505 is an especially nice concept.

"The emitter follower on the playback head to minimize noise and hum vulnerability is an unusually clever idea. In fact, it's one that's been long overdue in the industry.

"Some exceptional human engineering went into the ES-505. It's not only well built and simple to maintain, but it's completely operator-oriented. For instance, the disappearing head gate which makes for easy editing and head cleaning; and the built-in test oscillator which speeds and simplifies calibration.

"A definite plus is Electro Sound's replaceable capstan idler, which allows you to instantly change the tire and not the entire assembly. We used to spend \$35 for replacement assemblies on our previous machines. Now we only pay \$8.50 for a spare tire.

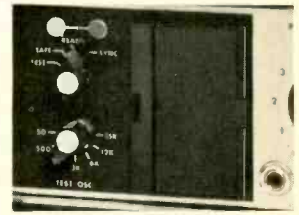
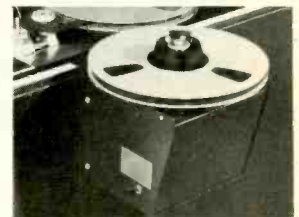
"All in all, the ES-505 is a highly professional recorder/reproducer with a very competitive price tag that makes it a most important addition to our production facility."

That's what the man said. He looked. He compared. He bought. We rest our case.

But don't rest yours. Call or write us today for complete details on the ES-505 and Electro Sound's other professional broadcast products.

*competitive brand name on request.

Dave Finley
Chief Engineer, KSL-AM/FM,
Salt Lake City



ELECTRO SOUND®

725 Kifer Road
Sunnyvale, CA 94086
Phone (408) 245-6600
Telex 34-6324 LECTROSND SUVL

CLEAN UP YOUR AUDIO



WITH 30 DB NOISE REDUCTION AND 10 DB EXTRA HEADROOM

With dbx Model 142 noise reduction in the rack, you can:

- Nearly double the usable signal-to-noise ratio of your cartridge chain, studio master recorder, line and program amps, full-frequency land lines, and micro-wave links.
 - Make original tapes completely free of hiss or background noise on open reel, cartridge, or cassette format.
 - Duplicate tape through three or more generations without audible noise build-up.
- dbx noise reduction linearly compresses audio signals by a 2:1 ratio at the front end and produces an exact mirror image 1:2 expansion at the terminus of the audio chain.

True RMS level sensing circuitry insures perfect encode/decode tracking over a dynamic range well in excess of 100 dB irrespective of phase shifts in the transmission or storage medium. There is no breathing, pumping, or other coloration of the sound with dbx noise reduction, and there are no pilot tones or calibration levels to worry about.

dbx Model 142 provides two channels of broad-band audio noise reduction in excess of 30 dB coupled with an additional 10 dB increase in headroom for all components and lines included within the noise reduction loop.

For complete product information and list of demonstrating dbx dealers, circle reader service number or contact:

dbx dbx, Incorporated
296 Newton Street
Waltham, Mass. 02154
617/899-8090

Circle 121 on Reader Service Card

NEWS

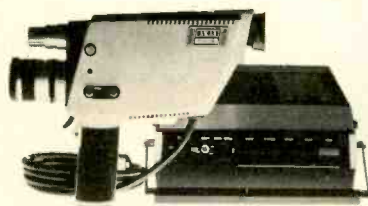
Forbes Building, South San Francisco, Calif. . . . **Electro Sound, Inc.**, has announced that it will issue a full two-year warranty on its ES-500 Series of recorder and reproducer products. The new warranty also includes a full 90-day labor warranty, starting from the date of actual end user purchase

DuPont has a new line of polyester film specifically designed for video tape applications. Designated Type VB, the film is available in 0.75-mil, 0.83-mil and 0.92-mil film thicknesses Quality control and troubleshooting are two of the topics to be covered in a workshop for processing Kodak Ektachrome films being offered by the **Eastman Kodak Company**. The workshop, intended for employees of processing labs or TV stations using reversal color film processes, will be conducted at Kodak's Marketing Education Center in Rochester, N.Y., December 1-5 **Jerrold Electronics Corp.** has expanded its Parts & Repair Departments and has relocated both of them to 1322 Atlantic Avenue, North Kansas City, Mo. 64116. Hap Wampler is the Service Manager.

People

Robert K. Schwartz has been appointed Vice President of Development for Channel 100 of Northern California **David G. Cowden** has been appointed General Manager of the CATV Equipment & Installation Operation of GTE Sylvania Incorporated. Mr. Cowden is responsible for all activities of the operation which manufactures wideband cable communications equipment and offers turnkey installation services to CATV systems operators

Harold L. Kassens, former Assistant Chief of the FCC Broadcast Bureau, has become a partner in the consulting engineering firm of A.D. Ring & Associates, Washington, D.C. Mr. Kassens was employed by the FCC in 1941, and was with the Commission continuously from that date until his retirement. During his career, he held numerous Broadcast Bureau positions including Chief, Rules and Standards Division **Donald G. Chandler** is now the General Manager, Electronics Operations, Anaconda CATV. Chandler was co-founder and Executive Vice President of EIE prior to its acquisition by RCA Corp. More recently he served as President of Delta-Benco-Cascade, Ltd., and was a consultant for the Chase Manhattan Bank.



AKAI™

2139 East Del Amo Blvd., Compton, Calif. 90220

Here are thousands of reasons to go from film to the Akai VTS-150. All of them dollars.

Tony de Haro, KRIS-TV

"We feel we got our 3 VTS-150 systems and Time Base Corrector for nothing because of the \$40,000 they saved us in film costs last year. And they'll continue to save us about \$3,000 a month."

James E. Mays, WTAR

"I project, on a conservative estimate, a 15 percent or \$9,000 a year cut in film costs by using just two Akais."

Richard Spratling, KUTV

"We're going to get out of the film business as soon as we can. By the end of 1975, there should be a 20 to 80 percent cost reduction by switching from film to the Akai."

James S. Fleming, WLOX

"The savings with Akai video equipment over film is about \$2,000 a month. In a year's time, it will average out to that."

David Daughtry, WSM

"We are using one unit at the moment, and thus far saving about \$140 a month. In the future we will be going more and more into video tape — and away from film."

Emerson A. Ray, WTOG

"We went right to the Akai, bypassing film. We are consequently not having to spend the \$3,000 a month on film and chemicals."

Gordon F. Galbraith, WXLT

"We're really a very small news staff. However, we are saving \$100 to \$200 a week using the Akai instead of film. We're just about to phase out film completely."

Larry Estepa, WLYH

"We'll be saving about \$11,000 per year in film costs with the Akai VTS-150."

C. Stephen Currie, WCBD-TV

"On film costs alone we're saving about \$15,000 a year with the VTS-150."

Arnell Church, WOAY

"I'm looking forward to a tremendous savings by using Akais instead of film; it will save us many thousands of dollars this year."

(213) 537-8765

Call Akai Monday through Friday, 8:00 am to 4:30 pm Pacific Coast Time. We'll be glad to talk about what the VTS-150 can do for you.

Circle 122 on Reader Service Card

INTERPRETING THE **FCC** RULES & REGULATIONS

Commission Rules Frequently Violated By Broadcast Stations

The Commission's Field Operations Bureau has recently prepared a list of frequently violated broadcast rules uncovered pursuant to station inspections or measurements from mid-1973 to mid-1974. The list was compiled in response to numerous inquiries over the past several years by broadcasters seeking to determine what areas of station operation should receive special attention with regard to Commission Rules compliance. The Bureau emphasized that its violations listing was by no means definitive. Neither did the order in which violations were listed indicate their relative frequency.

Following is a listing of frequently violated Rules along with brief comments as to the specific nature of the infraction.

Operator Requirements: (A) AM - §73.93; FM - §73.265. The Bureau noted violations whereby stations employed radiotelephone or radiotelegraph operators with Third Class permits that were *not* endorsed for routine station operation of the transmitting system.

Such Third Class operators with endorsed permits may be employed only if: (a) a station with a non-directional antenna with 10 kilowatts or less power employs a First Class radiotelephone operator on at least a part-time basis; (b) a station with a non-directional antenna with 10 kilowatts or more power employs a fulltime First Class radiotelephone operator; and (c) a station with a directional antenna system, that does not require maintenance of close tolerance phase and current relationships, employs a fulltime First Class radiotelephone operator. Additionally, some employed operators were found to have expired licenses or permits.

Another violation involved the failure of transmitter operators to have sufficiently "adequate visibility and accessibility to metering and control equipment from their places of duty."

(B) TV - §73.661. The Bureau noted that, similar to AM's and FM's, television stations sometimes failed to provide operators with correct access to and visibility of metering and control equipment.

EBS Radio Monitoring: AM, FM, TV - §§73.932 and 73.961. Some broadcast stations had inoperative Emergency Broadcast System (EBS) monitor receivers. Some stations failed to operate their receivers as required during station operation hours. Others failed to conduct off-the-air monitor tests. Such tests must be conducted weekly between 8:30 a.m. and local sunset. The EBS Checklist, which should be on hand at all stations, specifies procedures to be followed in conducting these tests.

Equipment Performance Measurements: AM - §73.47; FM - §73.254. The Bureau noted that AM's and FM's sometimes failed to conduct equipment performance measurements each year (and not more than 14 months after the prior year's measurements).

Operating Power: AM - §73.52; FM - §73.267. Some AM and FM stations were found to have operated "for extended periods with power levels greatly in excess of authorized tolerances." Broadcasters should note that acceptable tolerances are a floor of 90% and a ceiling of 105% of authorized antenna input power. Operation at less than 90% power is permitted (1) only in an emergency for not more than 30 days (without formal Commission permission), and (2) if the Commission is notified within 10 days of the low power operation.

Certain AM stations have been discovered operating at full daytime power during pre-sunrise or nighttime periods. At least some of these violations may be due to confusion generated last year by year-round Daylight Saving Time (YRDS). This year, of course, Congress failed to renew YRDS. However, the nation returned to Daylight Saving Time in March, rather than April as is normal. It is by no means inconceivable that some broadcast stations may again have failed to maintain operation at specified power levels during all portions of the broadcast day.

Modulation Levels (Aural): AM - §73.55; FM - §73.268; TV - §73.687(b)(7). The Bureau cited violations wherein station modulation levels were "consistently in excess of 100% on peaks (on AM-negative peaks) of frequent recurrence. The percentage of modulation for AM's should at no time exceed 125% on positive peaks, and for AM's, FM's and TV's, should generally not fall below 85%. However, the degree of modulation can be reduced below the minimum level to avoid objectionable loudness.

Modulation Monitors (Aural): AM - §73.56; TV - §73.691. Certain AM's and TV's were found to have defective peak indicating devices. Should a modulation monitor become defective, the station need notify the Commission of the defect if repair will take in excess of 60 days. Regardless of the period of time needed to effect repairs, maintenance log entries must be made "to show the time and date that the equipment was removed from and restored to service."

Remote Control Operation: AM - §73.67; FM - §73.275; TV §73.676. Violations included continued

continued on page 28

The New First Family

We've a new family of cameras we would like you to meet. Not one new Philips color camera, but three. They were made for each other. More important, they were made for you.

They are the culmination of an innovative heritage unmatched in our industry. There was the original three Plumbicon* tube camera. Sealed beam-split prism. Modular, all-solid-state design. Contours-out-of-green. Extended-red Plumbicon tubes, and anti-comet-tail Plumbicons. Then man-carried cameras of uncompromising quality, opening the doors to "electronic journalism." Digital control and triaxial cable—the icing on the cake.

This time, we wanted to gather all the great features, precisely mix them in cameras for specific purposes and requirements, add a number of new and worthy features, and offer you a family of studio and remote cameras exactly as you want them.

Stable, Reliable

In the LDK-5, the LDK-25 and the LDK-15 you have an uncommon commonality of components—modular design with a high degree of interchangeability between systems. They share an improved prism and optical assembly enhancing sensitivity and accuracy of alignment. Electronic color temperature control reduces filter requirements, and the extensive use of ICs and OP AMPS contribute to the family's notable stability and reliability. The cameras are designed to take full advantage of XQ1080 anti-comet-tail Plumbicon tubes with bias light, the rear-loading XQ1070s, and 41XQ image-intensified Plumbicons for remarkable low-light performance. CLUE (color line-up equipment) means fast, efficient set-up. Of course, you have a variety of zoom lenses.

Successor to the PC-100, the LDK-5 is the ideal remote camera, operating on triax with automatic cable compensation eliminating timing problems even beyond a mile. Its built-in memory maintains settings for up to a week without external power, and a narrow-band data channel provides for control via a standard telephone pair or narrow-band radio link.

Like the LDK-5, the LDK-25 has the same low-profile, tough but light (and we might add, elegant) head castings that distinguish the PC-100, with tiltable, rotatable and remotable viewfinder. Lower in cost than the LDK-5, the LDK-25 is ideal for field, studios and production firms where the sophistication of triax is not required or TV81 is already installed. Automatic correction cir-

*TM N.V. Philips of Holland



cuitry takes care of iris, white and black balance and centering; variable matrixing is optional.

Then, the portable LDK-15 affords complete flexibility as it interfaces with either the LDK-5 or the LDK-25 C.C.U. with *absolutely no compromise in performance*. With a small portable processing unit, it will even operate independent of either C.C.U.

That's only the beginning. We want you to meet the family in person and see exactly why Philips continues to be recognized, worldwide, as the ultimate in broadcast cameras. Write or telephone.

BROADCAST EQUIPMENT DIVISION
PHILIPS AUDIO VIDEO SYSTEMS CORP.

A NORTH AMERICAN PHILIPS COMPANY

One Philips Parkway, Montvale, N.J. 07645 • Tel: (201) 391-1000 TWX: 710-990-7301

Circle 123 on Reader Service Card

Cooke DYNA-MITES

VIDEO ● AUDIO ● PULSE
DISTRIBUTION MODULES

Broadcast quality performance and reliability for the most advanced studio.

Economy for the smallest CCTV installation.

Plug-in modular construction with self contained power supplies.



SIX DYNA-MITES

- **VDA 1-4 Video Distribution Amplifier**
Bridging, loop thru input and four isolated outputs.
- **VEA 1 Video Equalization Amplifier**
Corrects amplitude and frequency response up to 4,000 feet RG 11/U or 124 ohm balanced cable.
- **PDA 1-4 Pulse Distribution Amplifier**
Equivalent to all broadcast type PDA's, 1 in, 4 out, regenerative.
- **APA 1 Audio Preamplifier**
Input - 70 to +10 db, 250 ohm or high impedance, 70 db gain, 600 ohm + 10 dbm output.
- **AMA 1 Audio Monitor Amplifier**
Balanced bridging input, 10 watts RMS output, extremely low distortion.
- **ADA 1-6 Audio Distribution Amplifier**
Balanced bridging input, 6 balanced outputs at +20 dbm, low distortion, flat response.

RMH 1-4 Rack Mount Housing



Permits mounting of any combination of 4 units in 1-3/4" x 19" of rack space.

Cooke Engineering Company

Division of Dynatech Laboratories, Inc.
900 Slaters Lane ● Alexandria, Va. 22314 ● 703/548-3889

Circle 124 on Reader Service Card

FCC Rules & Regs

remote control operation with defective power adjustment control circuits or with uncalibrated indicating instruments. Some broadcasters failed to terminate remote control operation when malfunctions caused inaccurate meter readings or improper control. TV violations also included failure to generate, insert and properly utilize test signals "in the vertical interval of the visual signal at the remote control point."

Remote Reading Antenna Ammeters: AM - §73.39(d). AM stations' remote ammeters have at times not been calibrated to "indicate within 2% of main meter for each power mode of operation."

Other Requirements: (A) FM - §73.317. FM's have sometimes failed to "maintain transmitter and associated equipment such that noise and frequency response requirements are met." Disregard for relevant equipment and wiring installment standards has come to light at several FM stations, too.

(B) FM - §73.322. The Bureau stated that some FM's failed to keep the transmitting pilot subcarrier at 19 KHz (plus or minus 2 hertz) to frequency modulate the main carrier within limits of 8 and 10%.

(C) TV - §73.699 (Figure 6). TV's have at times neglected to maintain pulse durations within Commission tolerance standards.

(D) TV - §73.682(a)(9), (12), (13), (17). TV's have violated Rules requiring proper peak video modulation level, blanking level ($75 \pm 2.5\%$ of peak carrier level), reference white level ($12.5 \pm 2.5\%$ of peak carrier level) and reference black level separation from blanking level by the proper setup interval ($7.5 \pm 2.5\%$ of the blanking level to reference white level video range).

Sanctions

Needless to say, the Commission is in earnest in requiring strict adherence to its broadcast station operating rules. The *Communications Act of 1934, as amended*, provides an array of penal provisions to be levied against the errant broadcaster.

Forfeitures can be imposed in an amount of up to \$1,000 per single violation (up to \$10,000 for multiple violations) upon broadcast stations that "willfully or repeatedly" fail to comply with Commission Rules. Such forfeitures are especially effective because daily Rule violations constitute separate offenses subject to separate \$1,000 forfeitures.

Broadcasters should note three restrictions upon the Commission's power to impose forfeitures. First, the Commission must send the violator a written "Notice of Apparent Liability" and must permit the broadcaster a "reasonable period" in which to respond in writing as to why it should not be adjudged liable for violation of the Commission's Rules. Second, the Commission may not impose a forfeiture in excess of \$10,000 in any notice of apparent liability. Third, the Commission is estopped from imposing any forfeiture liability for a Rule violation which occurred more than one year prior to the notice of apparent liability.

Conclusion

The Field Operations Bureau listing of frequently violated broadcast rules calls the attention of station operation personnel to all such Commission Rules. Realization that the Bureau's listing is only a partial record of the violations that it uncovered should spur station personnel to make a comprehensive review of all Commission operating requirements. Today is the best time to begin your review.

BM/E

If you can't bring your troubleshooting into your lab, roll Tektronix TM 500 to the problem.

- digital multimeters
- counters
- generators
- amplifiers
- power supplies
- oscilloscopes
- a blank plug-in for your own circuitry
- and more



The TEKTRONIX Rollabout Configuration of TM 500 modular instruments helps you conveniently take your test and measurement "laboratory" right to the problem . . . whether it's routine maintenance, calibration, repairs, QC or production testing, or whatever. TEKTRONIX TM 500 modular instruments are designed to fulfill your needs in such widely divergent areas as: computer circuitry and data handling equipment, numerically controlled machines, laboratory instrumentation, communications equipment, and medical instrumentation.

The modular Rollabout Configuration provides up to six operating test and measurement instruments, which you can tailor from a growing line of 29, plus the TEKTRONIX portable or plug-in oscilloscope of your choice . . . all on a SCOPE-MOBILE[®] cart. TM 500 modular instruments can work together through a common interface circuit board within their mainframe enclosures, and they can also function totally independently. Some are general purpose, such as DMMs, some are highly specialized, such as those for oscilloscope calibration. They comprise a test and measurement system that is difficult to duplicate with "monolithic" instruments.

The TM 500 Product Line is a growing, compatible family of 29 plug-in modular instruments, accessories, and one,

three, four, and six-compartment mainframes providing the common power supply. The modular Rollabout Configuration can accommodate two TM 503, 3-compartment mainframes. Select the plug-ins from 11 signal sources, 5 counters, 2 digital multimeters, 5 power supplies, 3 signal processors, 1 oscilloscope, and an X-Y monitor. There's also a blank plug-in kit to make it more convenient for you to assemble the specialized circuits you require. A TM 500 modular Rollabout Configuration lets you take the instrumentation you need where you need it.

Find out what TM 500 instrumentation can do for you. Send for the TM 500 Booklet A-3072 with full specifications and suggested selections of instruments for typical applications. Or contact your local Tektronix Field Engineer for a demonstration of how TM 500 instruments can solve your needs. Write to Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97077. In Europe write Tektronix Limited, P.O. Box 36, St. Peter Port, Guernsey, Channel Islands.



TEKTRONIX[®]

committed to
technical excellence



Circle 125 on Reader Service Card
For demonstration Circle 126

On "C-Day" In Australia, 120 Stations Turned On Color At The Same Time

Australians are strong for color: they responded with a rush to buy color receivers when the entire Australian broadcast industry cut over to color on March 1st, in spite of the highest prices in the world for color sets.

Australia went to color television on March 1st, 1975, and there is no approximation of any kind in that statement—the changeover was a total and simultaneous one for the entire broadcast industry in the great southern continent.

The Australian Government has long been committed to giving every part of the country equality in broadcast services. Thus conversion to color could not be contemplated without preparing for and carrying through, a country-wide changeover. With a few very minor exceptions, the changeover was made literally on the minute of midnight, February 28.

The preparation period, extending over a year and more, and the changeover itself, were burdened by problems probably different in some respects, from those in any other country. In the United States and most of Western Europe, color has come in stages, with only a few stations in the "first wave," and with ownership of color receivers building up rather gradually. Additional stations converted according to their own resources and the look of the viewer market for color programs. In a number of countries with relatively small, government owned television systems, color conversion has been easily carried out on the government's schedule.

Australia has a government-owned television system with 70-odd stations, plus three commercial networks with a total of 48 more stations. The first problem obviously is finding the capital for a color conversion of this magnitude. The Government held off for a time, and committed the country to color only when the political portents seemed right for use of that much public money—variously estimated from \$75 million to \$125

million dollars. This, a government spokesman told BM/E, is the major reason color television has come in Australia far later than it did in many other "developed" countries.

The private television industry, required to convert to color at the same time, of course raised its own capital, thereby apparently putting some stations in an exposed position financially. As the head of the broadcasters association put it in a recent speech, the public has to respond by buying quickly a substantial number of color receivers, or some of the commercial stations will be in financial trouble.

But getting the viewer onto color is clearly another operation of burdensome magnitude. There are about 3 million TV viewers in the country, nearly all of whom must be licensed to own their receivers, at fees up to \$19 a year. Color receivers had been available in small quantity during most of the preceding two years and about 70,000 had been sold. During the half-year or so before the March 1st deadline, retailers began to increase their color stock sharply, and by the time color came, the retail end of the business was at land-rush levels.

Viewers were buying color sets in impressive quantities, apparently at a rate high enough to realize the hopeful projections of 400,000 to 600,000 sales in the first year of color. This was especially impressive in the face of the prices of the sets. According to press reports, prices were then running \$750 to \$1000 and more for sets 18-inches and up, and these larger sets were in a majority among those sold. Smaller sets in large quantity were not yet available: a few 14-inch portables were priced at around \$500.

These prices, and the relation of the Australian television industry to foreign suppliers, are the subjects of intense controversy in the Australian press. An import duty of 35% had been imposed by the Government on foreign-made color sets brought to Australia. As color day neared, the union organizations and representatives of the local makers began asking for an increase to 65%, blaming their request on the fear of Japanese competition. If the Japanese color sets came in quantity, the local industry claimed, there would be a loss of 12,000 to 18,000 jobs in the Australian industry. It is an issue with obvious political clout.

Up to the time this was written, the Government had not moved toward higher protection, and responsible officials had said that careful examination had, so far, not sustained the claims of impending disaster. However, protectionism traditionally has a way of bowling

Australia's Color Gear Comes From The US, the UK, and Europe

Color equipment installed by the Australian Broadcasting Commission, the government-owned television net, in major production studios in seven capital cities, included the following principal brands:

- Color cameras: Marconi Mark 8; Fernseh KCU and KCN; Philips LDK-5; Ikegami HL-33.
- Videotape recorders: Ampex, updated 2000; AVR-1; AVR-2; ACR-25.
- Video switchers: Grass Valley; Central Dynamics Ltd.
- Mobile color vans: Marconi, Philips, and Fernseh cameras.
- Telecines: Multiplex Cintel photoconductive chain; Fernseh flying spot; Cintel flying spot.
- Routing Switchers: TeleMation.



COHU IS more than cameras

For those who don't already know it, besides manufacturing color and monochrome television cameras for a variety of end-user markets for nearly a quarter century, Cohu also produces a broad line of Studio Processing Equipment including—Sync Generators • Dot Bar Generators • Pulse Distribution Amplifiers • Video Distribution Amplifiers • Subcarrier Distribution Amplifiers • Video Encoders

**You expect
more From**

COHU
INC
ELECTRONICS DIVISION
SAN DIEGO, CALIFORNIA

**and you
get it**

• Encoder Enhancers and Video Switchers.

Let us serve your processing equipment needs as well as provide you the TV camera to do the job.

For further information please contact your local Cohu Sales Engineer or Cohu, Inc., Electronics Division, P.O. Box 623, San Diego, California 92112, Telephone: (714)-277-6700. TWX: 910-335-1244.

COHU SALES OFFICES:

NEW ENGLAND Bedford, MA 617-275-0370 • **NEW YORK** Florham Park, NJ 201-377-6636 • **WASHINGTON, DC** 301-856-3061 • **GREAT LAKES** Des Plaines, IL 312-824-4422 • **NORTH CENTRAL STATES** Lincoln, NE 402-467-2900 • **SOUTHEAST** Orlando, FL 305-896-4881 • **ROCKY MOUNTAIN** Denver, CO 303-573-8835 • **TEXAS** Arlington 817-461-1707 • **NORTHWEST** Mercer Island, WA 206-232-3550 • **CALIFORNIA** San Diego 714-278-8931, Thousand Oaks 805-492-1896, Cerritos 213-926-7002, Palo Alto 415-326-0280

Circle 127 on Reader Service Card

TV INTERNATIONAL: AUSTRALIA

over logical arguments.

Other voices in the press were pointing out forcefully the negative side of high protection: the very high prices of color sets in Australia. The two major local producers are Philips and Amalgamated Wireless of Australia, both evidently owned mainly by foreign capital. As one irate letter-writer put it, higher tariffs would perpetuate and strengthen the "cushy enclave" within which these foreign-owned producers could profit from the highest prices in the world, roughly double those in the US and the United Kingdom, at the expense of the Australian people.

Other set makers whose products are being offered in

quantity are PYE, HMV, Rank, Blaupunkt, Sharp and JVC. American standard sets are not salable in Australia because the color system there is PAL.

Latest in equipment

On the technical side the Australian industry had benefited, of course, from the advances of the last decade. Studio equipment in the main production centers, most of which are in the large southern cities, is on a par with the top color installations in other parts of the world. The Government-owned Australian Broadcasting Commission (ABC) has several color vans for mobile pickup, and has lately bought the first of the light-weight "ENG" color cameras in Australia, an Ikegami portable. The accompanying box shows the

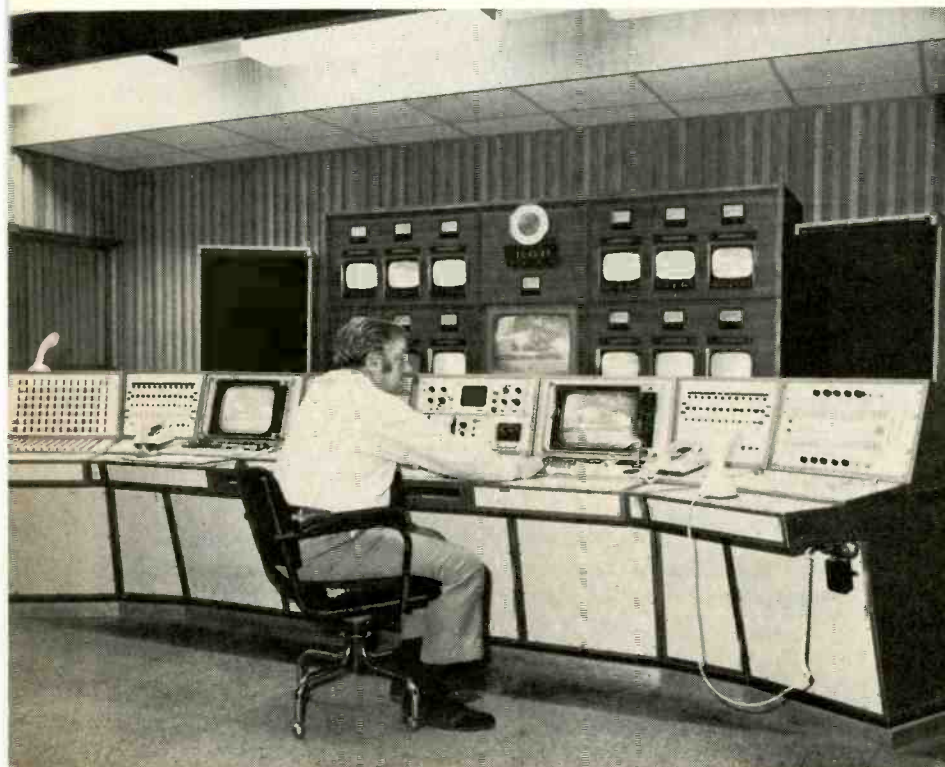
continued on page 34



Videotape room at Sydney studios of Australian Broadcasting Commission, government's TV net, has Ampex VTRs installed in the changeover to color.



"Vision control" for large studio shows new cold switching equipment.



Production control room of new color operation at Sydney studios.

Master control and network switching rooms was completely refurbished for the changeover to color. The ABC government net includes 70 stations, but many in the most remote cities are only occasionally tied into the country-wide net; most programming there is from film and tape.

Fernseh means television.

NBC has the picture. They've fielded the Fernseh KCN into their O&O news operations.

Which gives NBC the flexibility and portability to get to where the news is.

And television means some good news, and some bad news. All of which means being there.

So you've got to be flexible. You've got to be portable. And you've got to be ready to go.

The battery operated KCN (shown with the cameraman) is completely self-contained and can be used in conjunction with a portable VTR.

Fernseh handheld camera systems are lightweight and offer the speed and portability you need for electronic journalism, plus the video quality required for television production excellence.

The KCR-40 (shown front and center) is

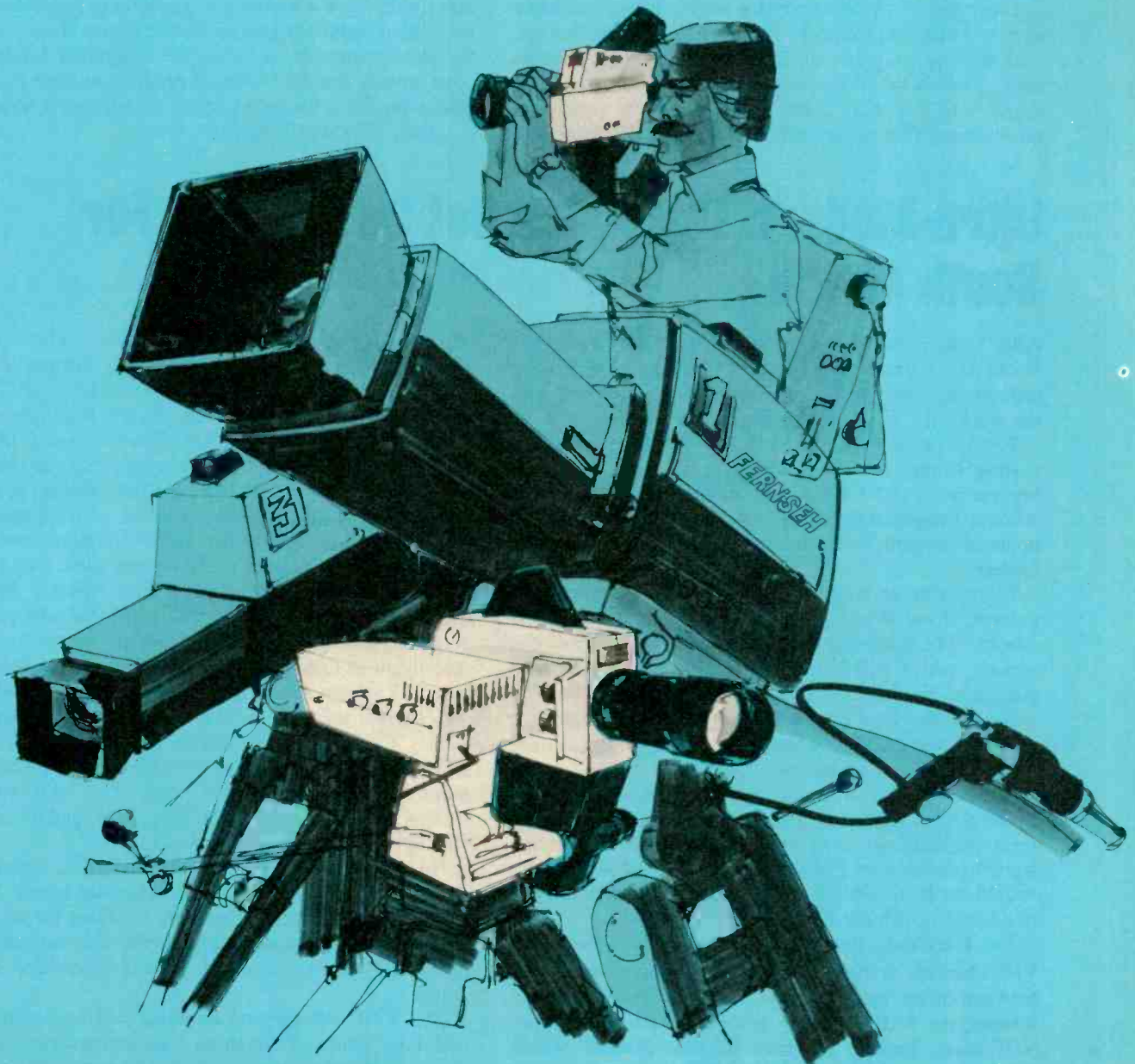
completely compatible with our standard KCU-40 and will operate from that system's electronics. You can roam 325 feet on a quarter-inch cable, 2600 on a half. With an additional 50 feet between the head and back pack.

Both KCR and KCN systems use the same camera head, which is the lightest in its class, weighing as little as a 16mm film camera.

Fernseh means television. Television good news.

We'd welcome the opportunity to demonstrate the superior capabilities of Fernseh television equipment. A call to your nearest office will bring any further information you require.

Saddle Brook, Headquarters (201) 797-7400
Chicago (312) 681-5000 Houston
(713) 688-9171 Los Angeles (213) 649-4330



FERNSEH Robert Bosch Corporation

TV INTERNATIONAL: AUSTRALIA

major brands of equipment used in the Australian color conversion.

The problems of national net-working in Australia are more extreme than those in almost any other country. The vast fabled "outback" lies between the urban, heavily-populated southeast, and a string of smaller population centers around the remaining perimeter. Until quite recently, getting programs to many of the northern and western cities was feasible only by bicucling tapes and film; investment in coaxial cable and microwave could not be justified. In the last few years, the Government has expanded the microwave routes substantially, and it is now possible, on special occasions, to tie very nearly the whole country together for "live" coverage. This was done, for example, on the recent visit of Queen Elizabeth to Australia. But the larger part of the programming in the northern and western cities is still from tape and film brought in.

Color has obviously stirred a very positive response among Australian viewers. The sports programs that are very high in program appeal there seem to gain especially from color: Australians are sent succrying to the retailers to get their color sets when there is an announcement that an important tennis or cricket match

will be televised in full color.

In fact, the responsiveness of the viewer in Australia to color led the Government to impose strict controls on color test transmissions, which obviously had to be carried out over a number of months prior to the all-industry turn-on. Stations were allowed a limited amount of test time each day, and the test material could not resemble a regular entertainment program in any way, to avoid disruption of carefully laid plans by broadcasters and set retailers by "remature" set demand. Starting in October, 1974, a limited number of "live" color telecasts were allowed.

The Australian industry thus becomes the equal of any in technical proficiency. On the programming side, it draws on the whole world, particularly the United Kingdom and the USA, with most program brought in on tape but an increasing number available "live" through satellite transmission.

However, very much in the same manner as the Canadians, the Australians are determined that a major part of their programming be locally created; and like the Canadians, they have a sort of quota system to make sure that Australian creativity gets on the air waves. This is costly for the broadcaster: a half-hour Australian production costs several times a half-hour program on tape from the UK or the USA but to broadcaster and viewer alike this is a price they willingly pay. **BM/E**

Ultra-Modern Television Net On The Way For South Africa

After being about 20 years behind the television times, South Africa catches up in style in January next year by introducing a national, color TV network which will lead the world in a number of respects.

From its new R63-million (R1 = 1.5 dollars) Broadcasting Centre in Johannesburg—eventually to be the biggest radio and TV complex in the world—the South African Broadcasting Corp. will transmit an initial five hours of program material a day to all of the main urban centers.

Eighteen main transmitters will reach a potential 80 percent of the White population and 39 percent of the Blacks. The total cost of setting up Phase One of the service, which will broadcast in the two "White" languages of English and Afrikans, is R106-million. The same sum has been earmarked for Phase Two, a service for Black viewers due to start in about 1980. Excavation work for Phase Two has just begun.

South Africa's TV frequency plan dates back to 1957, as the SABC wanted to reserve frequencies and register them internationally. At the same time, the corporation started planning an FM radio network, and when work started on it in 1960 it was decided to co-site the TV transmitters with the FM transmitters.

For television, it was decided not to use the lower VHF channels as there was too much mutual interference between transmitters in tropical and semi-tropical areas. Instead, the SABC is using extra channels in the upper VHF band. There is provision for nine channels which fall between 174 MHz and 254 MHz.

A regional international co-ordinating conference was held in June 1972 at which South Africa and all the

neighboring countries (including Zambia, Mozambique and Angola) agreed on the use of these channels for TV transmission. These have been approved by the ITU.

At the same time as planning its TV frequencies, the SABC was keeping a close eye on developments in color TV. The preference for the PAL system was first mooted in 1960 and finally accepted by the Government in 1972.

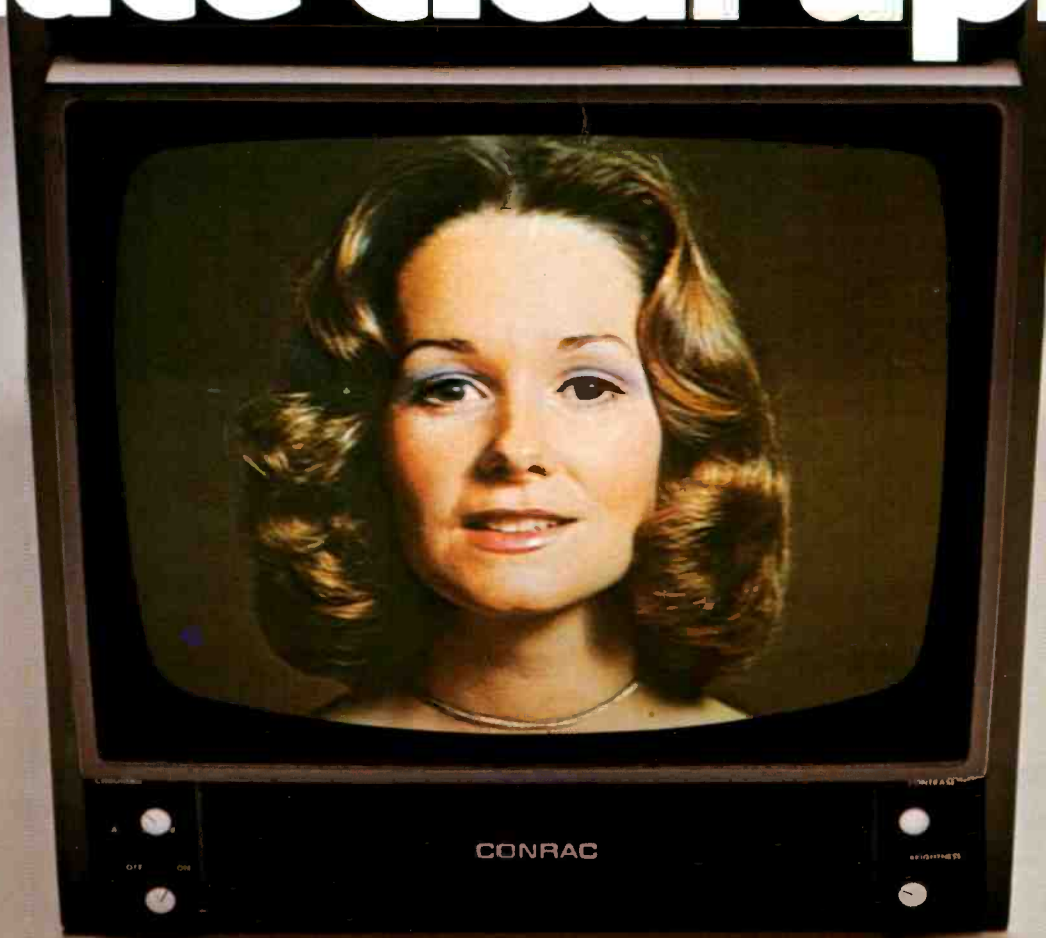
The new broadcast center consists of a 32-story administration block, a radio studio complex and a TV studio complex. The TV studio complex has a total ground area of 45,000 square meters (nearly 500,000 square feet) and is built almost completely of pre-cast concrete. Studio floors are of reinforced concrete and specifications called for a surface tolerance of about 1.5 mm on 3 meters, which is an exceptionally fine tolerance for concrete work by regular construction standards.

The TV complex for Phase One consists of seven studios all on the same level and all abutting on an enormous scenery preassembly area. The two smallest studios are 250 sq meters (2750 sq. feet), and the biggest 900 sq. meters (about 10,000 sq. feet).

Heart of the complex is the electronic spine—six above-ground stories and two basement levels. These will house the VTR and telecine facilities for all seven studios. It is here that the high level of automation puts the SABC ahead of developments elsewhere in the world.

The VTR and telecine facilities will be available to individual studios through an "assignment switcher" in the main electronic center. This will normally be under computer control, the computer being programmed with the operations schedule for the whole complex.

“From those wonderful folks who made my face clear up.”



In 1965, 3M introduced a quad-uplex color drop-out compensator that has since become the standard of the industry. Today, all three networks and thousands of television stations across the country rely on 3M Brand color DOC's to bring viewers better picture quality.

But what have we done for you lately?

Watch 3M's Bicentennial television series "From Sea to Shining Sea." Consult local listing for time and channel.



We don't quit when we're ahead.

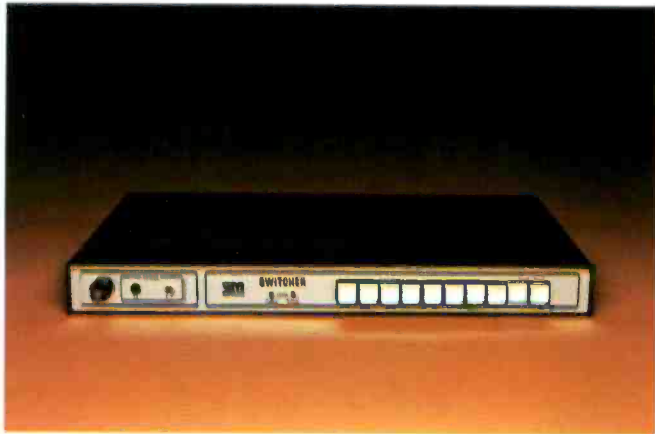
Introducing five new video products for broadcast, educational and industrial uses.

We could have rested on our laurels after developing our quad color DOC. But we didn't. Instead, we've developed five new low-cost products to help you produce the very best professional-quality video with your existing equipment.



3M Mini Processing Amplifier

This unit, designated P-50, has an important exclusive feature: A built-in pulse-cross generator with automatic brightening that allows the use of any inexpensive monitor to examine the critical head switch area for tracking and skew adjustments during on-line operation through an auxiliary monitor output. Other features include front panel controls for six video signal parameters; horizontal and vertical blanking generator for precise timing, plus a reconstituted sync system to allow stable operation with random interlaced video; operation with both color and monochrome inputs. Burst or chroma can be switched out to accommodate unacceptably noisy color recordings; and input clamping for excellent low frequency and 60-cycle hum rejection.



3M Bridging Video Switcher

This is a broadcast-quality unit. It is a highly-sophisticated 10-input switcher with momentary-contact illuminated buttons. There is an audio D. A. to eliminate loading, and this unit also provides remote capability.



3M Color Bar and Sync Generator

Now your studio can have a color reference for a surprisingly modest cost. This unit produces an NTSC 8-bar pattern and all sync signals just like the very expensive units used in professional broadcasting studios.



3M Digital Video AGC

This digital unit is a new concept. There is none other like it. It can be used in any application where sudden and undesirable signal level changes occur without incurring the unacceptable effects usually associated with AGC circuitry. There is no overshoot with large duty cycles. And calibration/setup is simple and straightforward. Other important features include a peak white or VIR reference signal; fade-to-black recognition circuit for gain memory; selectable attack and release time; and a total AGC range of 15 db, with unity gain under no-input conditions. Suitable for broadcast, industrial, educational and cable TV applications.



3M Video Distribution Amplifiers

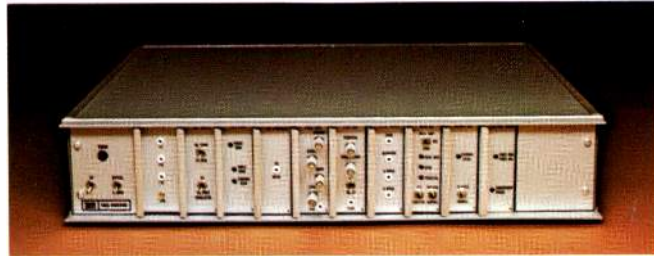
This complete line of products suitable for any video application includes a Pulse D. A. that reforms distorted incoming sync pulses, and if your application requires, will accept composite video and separate and distribute sync as needed. Then mate this unit with our Subcarrier D.A. that has four independently phase-able outputs, and our totally reliable four-output Analog D.A. with cable equalization.

Turn the page for six more 3M professional-quality products.



Quadruplex Color DOC

The 3M dropout compensator is the industry standard for broadcast VTR use. It replaces color dropouts in videotape recordings with the correct color video, avoiding the problems of other types of signal compensation.



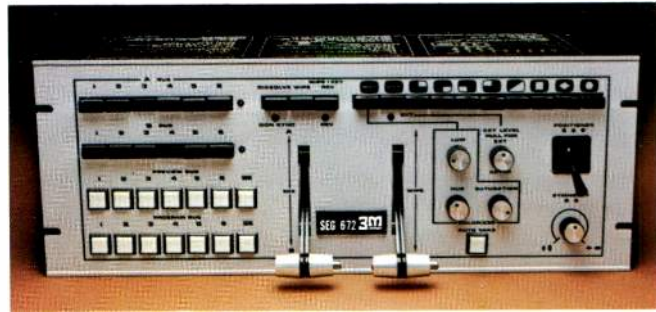
Helical DOC and Processing Amplifier

Our 3M DP-100 is a complete video processing system designed to clean up, correct and stabilize helical scan VTR signals for any VTR format. Corrects for high or low contrast, inaccurate or washed-out colors, picture jump and roll.



Video Source Identifier

The VSI inserts a preselected, 8-character identification code into any 525/625 composite video signal which appears on your picture monitors to help keep your switching straight and locate video path failures.



Special Effects Generator and Program Switcher

This 3M SEG 672 performs vertical interval program switching, dissolves and wipes between six video inputs. The key and mat key feature can be used to produce many imaginative special effects. Joy-stick positioner. Many features of more expensive units.



Dropout Profile Recorder

The DPR evaluates video dropout rate and annoyance factor during normal on-line playback, and provides a permanent strip chart of the resulting profile. The logical companion to the 3M dropout compensator.



Color Video Encoder

This supplies a standard NTSC color signal from either a three or four-channel camera source, and is compatible with live color cameras and film chains. The resulting signal meets all applicable EIA and NTSC specifications.

We don't quit when we're ahead.

Your dealer is:

Attn: Bill Curtis, Mincom Division, 3M Company,
350 South Lewis Rd., Camarillo, Calif. 93010

Please send me more detailed information, including
technical specifications, about your video products.
I am interested in _____ applications.

Name _____

Title _____

Address _____

City _____

State _____ Zip _____

Phone number (_____) _____
Area Code

VIDEO PRODUCTS
Mincom Division **3M**
COMPANY
350 SOUTH LEWIS RD. • CAMARILLO, CALIF. 93010



the ultimate in **Turn-Key** construction

The McCurdy approach to engineering and construction of a packaged system allows the user to easily locate his new equipment without the added burden of wiring to auxiliary equipment.

All aspects of the broadcast function, from news booth to music production center, can be assembled into a unique and functional package.

Each system is fully pretested as a total functional unit and will meet or exceed all broadcast specifications.

FEATURES OF THE SYSTEM SHOWN ABOVE

- All inputs and outputs to the system are normalled through jacks and wired to blue ribbon connectors, (for convenience of service and transportation).
- Audio and D.C. interface to an automation system.
- Remote control of reel, turntable and cartridge machines.
- Program routing switcher to delegate audio to telco lines.
- Switchable A.G.C. control on all microphone mixers.
- Equalization can be delegated to any mixer or program channel.
- Included in the package are tone and digital information generators which are used in the production of tape and cartridges for playback in automation systems.

McCURDY RADIO INDUSTRIES INCORPORATED

1051 CLINTON STREET, BUFFALO, N.Y. 14206 (716) 854-6700

108 CARNFORTH RD., TORONTO, ONT. M4A 2L4 (416) 751-6262



The Video Disc Looks Ready For The Consumer

All the important technical problems have been solved, leaving the two main developers, RCA and Philips/MCA, one big problem to solve before the disc can really take off: which of these two incompatible systems will be the standard?

Since BM/E's last report on the video disc (March, 1974), the sweepstakes have narrowed to a two-entry race: RCA, and a combine of Philips with the American entertainment conglomerate, MCA.

In demonstrations in New York just before this report was written (attended by BM/E), both showed systems with technology firmed up, with excellent picture quality, and with every indication of readiness to move into the home entertainment arena. Both contenders, however, plan on the fall of 1976 as the time for market introduction—Philips/MCA made a definite commitment, RCA said they would be "ready" then but would decide later whether or not to go.

The TED system, product of TelDec, the combine of German Telefunken and English Decca, actually went on the market in Germany on March 17th. But TelDec has set no date for entry into this country, and the shorter playing time of the disc—10 minutes against the half-hour or more of the RCA and Philips/MCA system suggest that TED will not have large impact on the American market, if it ever comes here.

RCA gave the first reasonably detailed public account of their technology; this is summarized, along with the Philips/MCA technology, on following pages of this report. It is more certain than ever that the video disc has far-reaching implications, not only in entertainment but in a wide spectrum of information storage and retrieval

Will a Broadcast Video Disc Player Evolve? If the consumer video disc player becomes a reality, could a professional version be far behind? "Probably not," says John Auld, president of the Broadcast Equipment Div. of Philips Audio Video Systems Corp., and he envisions a deck of low-cost video disc players that would replace existing video cartridge or video cassette players in TV stations. Of course, a master recorder to produce the video disc would have to be located at each station but the cost of such a machine might not be more than that of TR-100s or ACR-25s. Alternatively, teleproduction houses could own such master recorders and send out commercials to stations in video disc form.

applications.

Both contenders also described their programming plans, and this information will allow the broadcaster to make a first tentative assessment of the impact of the video disc on the television viewer. Program plans are also summarized below.

The pricing plans of the two outfits, as announced at the demonstrations, also fit into the picture of two systems ready to battle for consumer dollars. The players will sell for "about \$400" (RCA); and \$500 (Philips/MCA). The programs—and incidentally, both firms indicated they would price *by the program*, not by the number of discs—will be priced from \$2 to \$10 (Philips/MCA); about \$12 "and down" (RCA). The industry has thoroughly absorbed the lesson of the magnetic tape cassette. Programming at \$30 and up for a half-hour is now universally acknowledged to be far overpriced for the consumer market.

Picture quality—"best television"

BM/E found the picture quality of both systems very good and about equal. It is at a level we can call "best television." This is what the television viewer would see with a top-grade receiver in good adjustment, with a signal totally free of snow and ghosts, with technically top-grade program material at the broadcast end, properly put on the air. It is a quality that a lot of television viewers miss, too much of the time. The disc can bring many such viewers a quality boost.

This means that the quality available in the video disc system is already as good as, or better than, that of the receiver through which the disc signal will be displayed. The disc designers obviously have no incentive to go beyond that as long as the disc is tied to television broadcast standards through use of the TV receiver for display.

However, the basic technology breakthroughs of the video disc give it a long-range potential to go beyond television broadcast quality. After the industry is fully established, some outfit might try for a "high resolution" system. This would have to mesh in some way

The Technology of The Video Disc

The RCA System

Recording—RCA uses an electron beam in recording—no available light source could be focused finely enough for the detail needed at the rotation speed of 450 mp. Four complete frames are coded into *each turn of the record*. The pitch is 5555 grooves to the inch.

The recording is in the form of transverse slots across the groove; the slots are from 0.1 to 0.2 micron across. (See greatly enlarged sketch at left.) The coding is by FM, using the zero crossings as points to turn the electron beam on and off. The beam hits a material sensitive to electron exposure; further processing leaves a slot in each area struck by the beam.

The coding systems, using signals as high as 6.3 MHz, results in a composite video signal with a total bandwidth of 3 MHz. As shown in the spectrum diagram, peak whites are 6.3 MHz, black at 5.0 MHz, lower sync tips at 4.3 MHz. The color subcarrier is included within the 3 MHz composite signal by a novel method using comb filters. The luminance comb filter has peaks at multiples of the line frequency. RCA points out that a TV signal repeats to a large extent at line frequency, so that the filter makes little difference. Similarly, the color subcarrier goes through a comb filter with peaks at odd multiples of 1/2 the line frequency. The color information can thus be "buried" in the luminance band and RCA calls the technique "Buried Subcarrier Color Encoding."

Playback—The main thrust of the RCA design, according to their published material and spokesmen at the demonstration, was to put the sophisticated, delicate operations at the recording end and make the player as simple, rugged and reliable as possible. This was the reason for

choice of a comparatively low rotation speed (Philips, and most other systems in development, rotate at 1800 rpm).

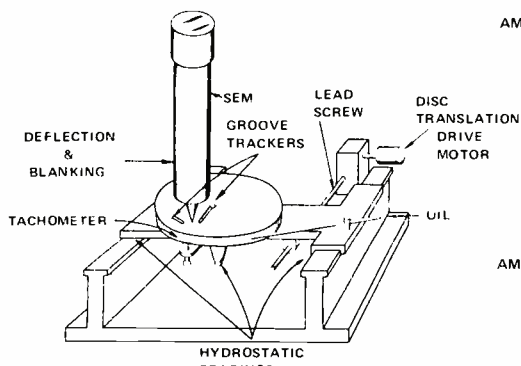
The pickup is by a stylus riding in the groove, and the system senses the change in capacity as each slot passes under the stylus tip. A servo system helps to keep the tip centered in the groove. (See enlarged drawing.) The resolving power of this system, according to RCA, is well below the wavelength of visible light.

Wear at the stylus point is very low because the stylus has a comparatively large surface in contact with the disc; pressure is actually lower than that at the point of a phono stylus. The records have run, in life tests, says RCA, for several hundred plays, many times the use a home viewer is likely to give them. The stylus, after several hundred plays, must be replaced; this can be done by the owner at a cost of less than \$10.

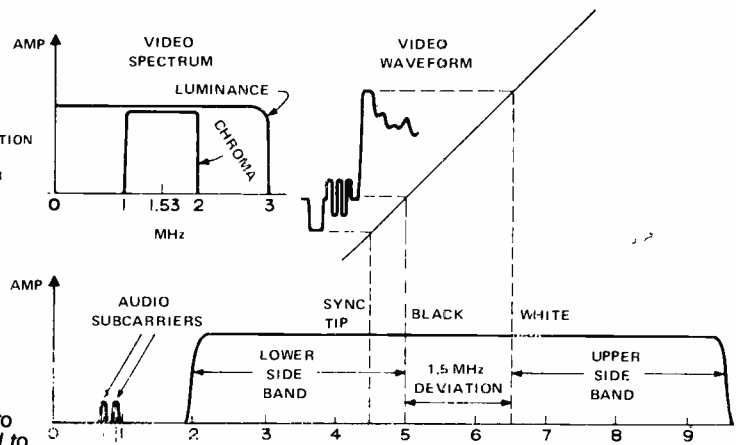
Time base correction, needed in all the video disc systems in one form or another, takes the form in the RCA player of an "arm stretcher"—the length of the playback arm is, in effect, changed by a servo system to offset any fluctuations in turntable speed.

The player provides fast forward and reverse, with the screen blanked out; a counter indicates the position in the program. Playing time is 30 minutes per side, both sides of a disc can be recorded. This puts a full-length movie, for example, on two discs. Selling price would be about \$12 or close to what a two-disc phono album sells for.

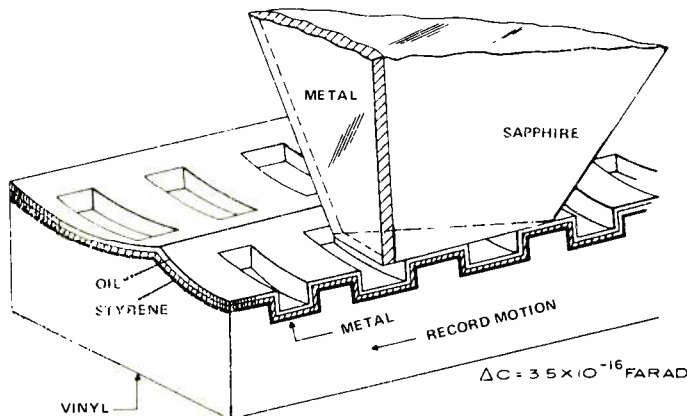
Discs will be duplicated by a stamping-molding process closely similar to that for phono discs. Dust will be no problem, RCA says, because dust particles large enough to settle out of the air are much too big to get into the slots—they ride on top and are simply pushed aside by the playing stylus. Grease on the surface must be avoided, though, for the same reasons that it is interdicted for phono discs.



RCA records with an electron beam focussed onto spinning disc surface. Master disc is pre-grooved to the 5555-per-inch pitch, and the groove filled with an electron sensitive material. Beam is kept in the right groove by a servo system, fed by groove-tracking sensors. Turntable is spun turbine-wise by a stream of oil, controlled by a tachometer and servo. Whole system is in a vacuum chamber.



Spectrum of FM coding system shows black at 5 MHz, white at 6.5, sync tip at 4.5; total luminance bandwidth is 3 MHz, with the color "buried" in it as described in story. Shortest recorded wavelength is about 0.6 micron; "slots" across groove are down to about 0.25 micron across.



RCA playback is with a stylus sliding through groove; stylus does not vibrate, but senses the change in capacitance as each slot passes under the tip. The capacitance changes are fed to an oscillator circuit, and a video composite signal derived from the changes in oscillator output.

VIDEO DISC

with the "standard" system and there would be many problems, but it does not seem impossible. The huge store of skills in the electronics industry make it a fair bet for the long future—assuming some marketing need can be ascertained, and this, of course, will be a totally unknown factor for quite a while.

The programs—"special interest"

The programs planned by the two contenders are not directly competitive with the main body of television programming. Both outfits have evidently been guided by the premises expressed recently by programming experts in various areas: most standard TV programming, no matter how popular on the air, has low "re-seeability"; moreover, even at less than \$10 apiece, recorded versions of such programs could not compete on the market with the steady flow of free programming.

Thus the videodisc planning embraces mainly "special interest" material, interpreting that phrase very broadly, and the disc appears to be mainly competitive with *pay cable*. In one area, all three media have heavy emphasis—movies, which are very big in the video disc planning of both RCA and Phillips/MCA. In current sports, the disc will *not* offer an alternative, according to present planning.

Beyond that, both disc developers will do every variety of music, from symphony to rock to pops; ballet, and opera, both of which gain tremendously from visualization; an extremely wide spectrum of informational and "how to" material, including instruction in many topics; training in repair and service; hobbies, sports, cooking, and a score more; children's programs.

Both plan to come on the market with a large quantity of ready material. RCA says they will kick off with about 500 titles, and Philips/MCA promises a similar initial catalog of general interest material, plus an immense one in movies. MCA's control of Universal Pictures, one of the largest Hollywood movie factories, gives them a huge backlog and an ongoing stream of new pictures. Their backlog, from more than 40 years of production, is said to include some 11,000 films. MCA has issued an initial catalog of some of these films, and it includes many classics, starting with Chaplin and W.C. Fields, and coming on down to Alfred Hitchcock, Clint Eastwood, and many more.

At their demonstration, Philips/MCA showed playback of excerpts from video disc versions of a number of current "hit" films—"Earthquake," "The Sting," "The Towering Inferno," "The Great Waldo Pepper." The quality was fine—broadcasters must be prepared for the fact that movies on video discs may look considerably better than they do over the air. Aside from the simple pre-emption of viewing time, it may be that the disc will have its greatest effect on the television audience with its super-rich movie offering. It is, of course, not only quality but access to top-run movies that will give the disc drawing power.

RCA, as already noted, is also planning a heavy movie catalog, and reports numerous negotiations with leading movie producers for rights to films. But both outfits admit they are sailing into largely uncharted waters with their video disc programming. They will be watching early sales like hawks to learn what the video

disc buyer wants.

The economics of the video disc relieves them, however, of the necessity of having a big "hit" with every disc. An RCA spokesman indicates that the break-even point for a disc is somewhere in the 10,000-20,000 sales range for many programs, and this total can be accumulated over a period of time. Thus a lot of specialized material may be kept in the catalog. Both say that the disc must appeal to a very wide spectrum of tastes if it is to succeed at all.

The Technology of The Video Disc

The Philips/MCA System

Recording—The basis for both recording and playback in the Philips/MCA system is a beam from a helium-neon laser, which is focused down to a spot about 1 micron across. The rotation speed is 1800 rpm, and one full frame is encoded into each turn. The coding system is, as in the RCA system, FM with the zero crossings used for turning on and off the laser beam. The luminance is on a carrier at 4.75 MHz, modulated 3 MHz both up and down; this leaves room below 1.75 MHz for the color and sound carriers. Color is on 1 MHz; sound on 250 KHz. The composite signal is sharply limited into near rectangular pulses; in these pulses the luminance is, in effect, encoded as frequency modulation, and the color and sound as duty-cycle modulation.

In recording, the pulses of light strike a photo-sensitive material, an extremely thin layer of metal over glass, and a small "pit" is removed by each pulse. Processing of the master disc, similar in many ways to phono disc processing, eventually produces a stamper with the pits as protrusions and playing copies with the pits as "holes." The copies get a coating of metal to make them highly reflective, and over that a protective coating of transparent plastic.

Playback—The playing disc, produced as described, will have spiral tracks about 2 microns apart, or 13,000 to the inch. With the pits averaging about 1 micron in length and spacing between them of roughly 1 micron, the rotation speed of 1800 rpm provides an overall bandwidth of about 8 megahertz; with the coding system described above, the luminance comes through with a 3 MHz bandwidth, and with the color at the lower end of that.

With about four inches of recordable radius, 13,000 turns to the inch provides "room" for the full 54,000 frames in a half-hour program.

The readout laser beam is reflected back to a photodiode from the record surface; because of diffraction effects reflection from a pit area is lower than from the "land," effecting modulation of the reflected light.

A major problem of the design is obviously keeping the read-out beam centered on the appropriate track. A mechanical "slow mover" carries the beam across the record for overall tracking. But unavoidable eccentricity of discs produced by the simple, inexpensive stamping process can be as high as 100 microns or more, and tracking tolerance is of the order of 0.2 microns. The beam is kept within that tolerance with a servo system driving a small mirror, similar to a galvanometer mirror, in the light path. The servo uses two spaced auxiliary beams on the track to derive an error signal.

This same servo system is used for several of the more attractive operation modes of the Philips player. The system can "freeze" a selected frame as long as it is wanted by kicking the beam back one turn at the vertical switching interval at the end of each frame. By kicking ahead or back an appropriate number of frames, the player provides slow motion forward or back. It also allows search, forward or back, through the program at very high

Technology—the enormous packing density of the disc

The diagrams and descriptions on the accompanying pages give a summary of the techniques used in the two video disc systems. It can be seen that both make use of the enormous packing density available with optical and pseudo-optical systems. These outdo magnetic tape by a factor of a couple of thousand, at least. The two systems do not push this to the limit by any means: this is one big

reason for believing that the disc is open to large future progress.

The difference between tape and the disc systems can be seen in a simple comparison. A half-hour program on 2-inch tape, at the new "slow" 7½ ips, takes nearly two hundred square feet of tape. The same program takes less than one-half of one square foot on the disc. The comparison is fair in the sense that the tape and the disc have approximately the same bandwidth, of 8 to 10 mega-

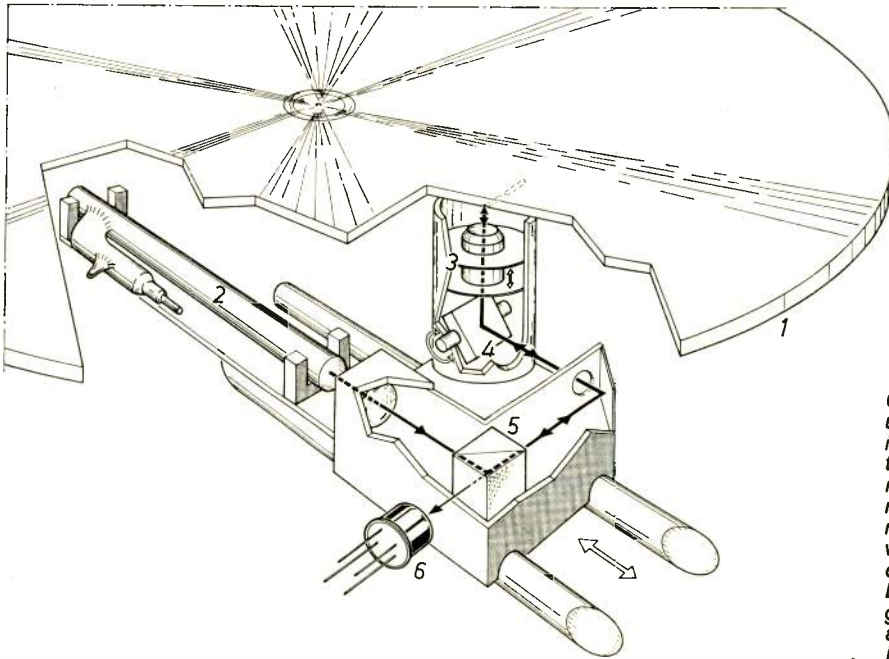
continued on page 44

speed, about 10 seconds for the whole program. The Philips/MCA programs will have a numerical index on each frame, visible on pushing a button. On the standard player, the user simply watches the numbers on screen to find the frame he wants; an optional added circuit gives fully automatic search, with push-button choice of the frame number.

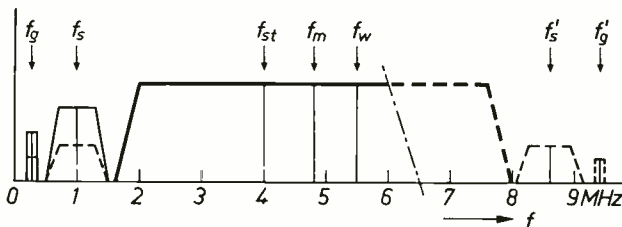
Similar servo systems provide time base correction, and keep the beam in focus. For time base correction a servo-driven mirror moves the beam along the tangent to the track, to offset speed variations. The focusing problem has an ingenious solution: the depth of focus of the read-out spot is less than 1 micron, and unavoidable record

"warping" can be expected to move the surface vertically up to several hundred times that much. The final, objective lens of the light system is mounted in a moving coil, closely similar to a loudspeaker voice coil, flexibly mounted in a magnetic field. The servo reads the distance from lens to record surface, moves the lens vertically to keep the spot in focus.

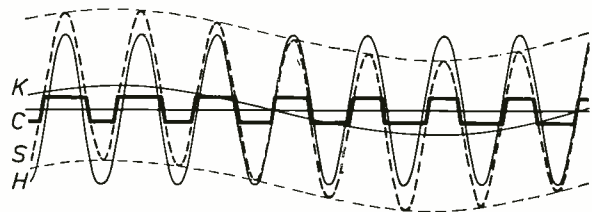
The extremely small depth of focus has one positive by-product; dirt, scratches, etc., in the transparent plastic coating are out of focus, and do not degrade the signal. This would seem to make the discs considerably more resistant to damage from mishandling than phono discs are.



Cut-away view of Philips playback unit shows laser and optical system in "carriage" that moves under turntable on guide rods. Light follows rectangular path, through tilting mirror (at base of vertical tube under record), up through voice-coil-mounted objective lens to disc, which faces down. Modulated beam, bounced back from disc, goes to photodiode (outside carriage at lower right) which recovers the FM-modulated composite signal.



Frequency spectrum of Philips MCA disc. Luminance is on a carrier at 4.75 MHz, frequency modulated for a bandwidth of 3 MHz, with the swings extending 3 MHz up and down. Color is below, on a 1 MHz carrier; and sound on 250 KHz.



Composite video signal is sharply limited before being applied to recorder, producing near-rectangular pulses that turn laser beam on and off at zero crossings. Luminance then appears as frequency modulation, color and sound as duty-cycle modulation.

VIDEO DISC

hertz, with about 3 megahertz coming through the coding as the luminance bandwidth. Professional recordings on two-inch tape are of course superior in quality to what the disc is doing right now, probably most noticeably in the handling of color. But the disc is close; and it has room to move ahead.

The disc, of course, can't replace professional tape because it does not provide easy recording and immediate playback, or the making of a few copies on the spot, or ready editing, etc. Master discs have to be made on expensive machinery in central plants, and further central-plant processing is needed before playable copies emerge.

By the same token, though, the very fast duplication on presses almost exactly like phono record presses provides a main reason for the cheapness of the disc. Philips says a single press will turn out a copy every four seconds, and that the total production cost of a finished copy (leaving out the cost of the program material) will be about 40 cents.

The importance of the extremely high packing density of the disc systems is really that all the information in a program is on a single small surface, with practically instant accessibility. Both systems make use of this accessibility. Philips has "freeze-frame" capability, (see technical description), and allows for a fast, or slow, run through the disc to find any frame wanted; maximum access time is ten seconds or less. Each frame can carry a numerical index, and a push-button accessory gives

automatic search, very fast, to any wanted frame. Slow motion play is also available.

RCA does not have a freeze-frame capability in its present form—Dr. James Hillier, RCA executive vice president for engineering and research, told BM/E this could be provided later. It does allow fast search forward and back, with a "counter" identifying frame position, much as a tape recorder counter identifies sections.

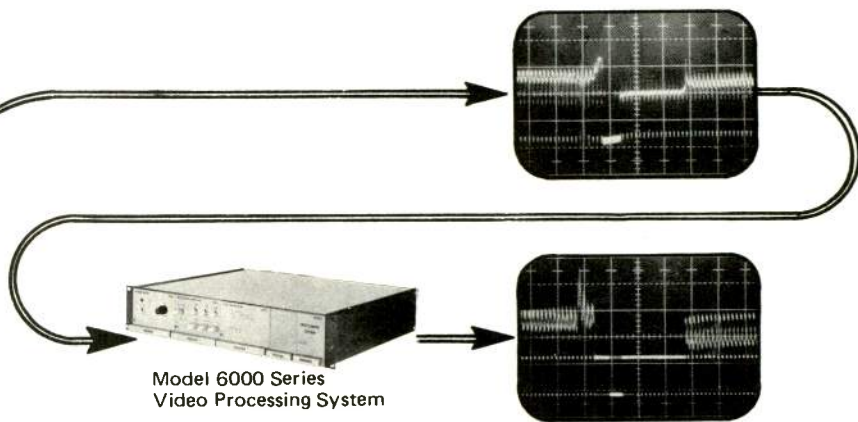
We might wonder why we waited this long for the video disc, when the high packing density of the methods used has been a known fact in science and engineering for many years. A team at the Stanford Research Institute, in fact, built an experimental photographic video disc system as far back as 1961, explicitly trying to use the advantage of film over magnetic tape. Dr. Albert Macovski, a member of that team, told BM/E that they needed an inexpensive laser, not then available, to make it work well enough for the consumer market.

Mr. Robert T. Cavanagh, vice president of North American Philips, main spokesman for the Philips enterprise in this country, told BM/E that similar thinking led workers in the Philips lab in Holland over ten years or more, to look for ways of using the high packing density of optical recording. They did finally get the laser, recognized early as essential, and other breakthroughs helped open the way.

Now that the way is open, we can expect video disc technology to become an enterprise of numerous electronic firms in this country and abroad. Other playback systems will be viable as long as they are compatible with the coming "dominant" system, whatever that may be.

BM/E

OUR PROC AMP WORKS WITH ANY COLOR OR BLACK & WHITE VTR... 1/2"... 3/4"... 1"... 2"... QUAD... HELICAL SCAN



Does yours? For more information, write or call:

DYNASCIENCES

video products

TOWNSHIP LINE ROAD • BLUE BELL, PA. 19422

Telephone: (215) 643-0250

Telex: 84-6358

EXTENDED RED

RCA Vistacons NOW!

The RCA-4593 and 4594 extended red Vistacons are now available as direct replacements for the XQ1023 and XQ1025. They complement the RCA-4592 which is directly interchangeable with the XQ1020. For improved resolution, an extended green version is also available.

The RCA square design eliminates "pin cushioning," and makes for easier, faster registration with better



tube-to-tube uniformity.

All RCA Vistacons have non-brittle base pins, and microphonic-free construction.

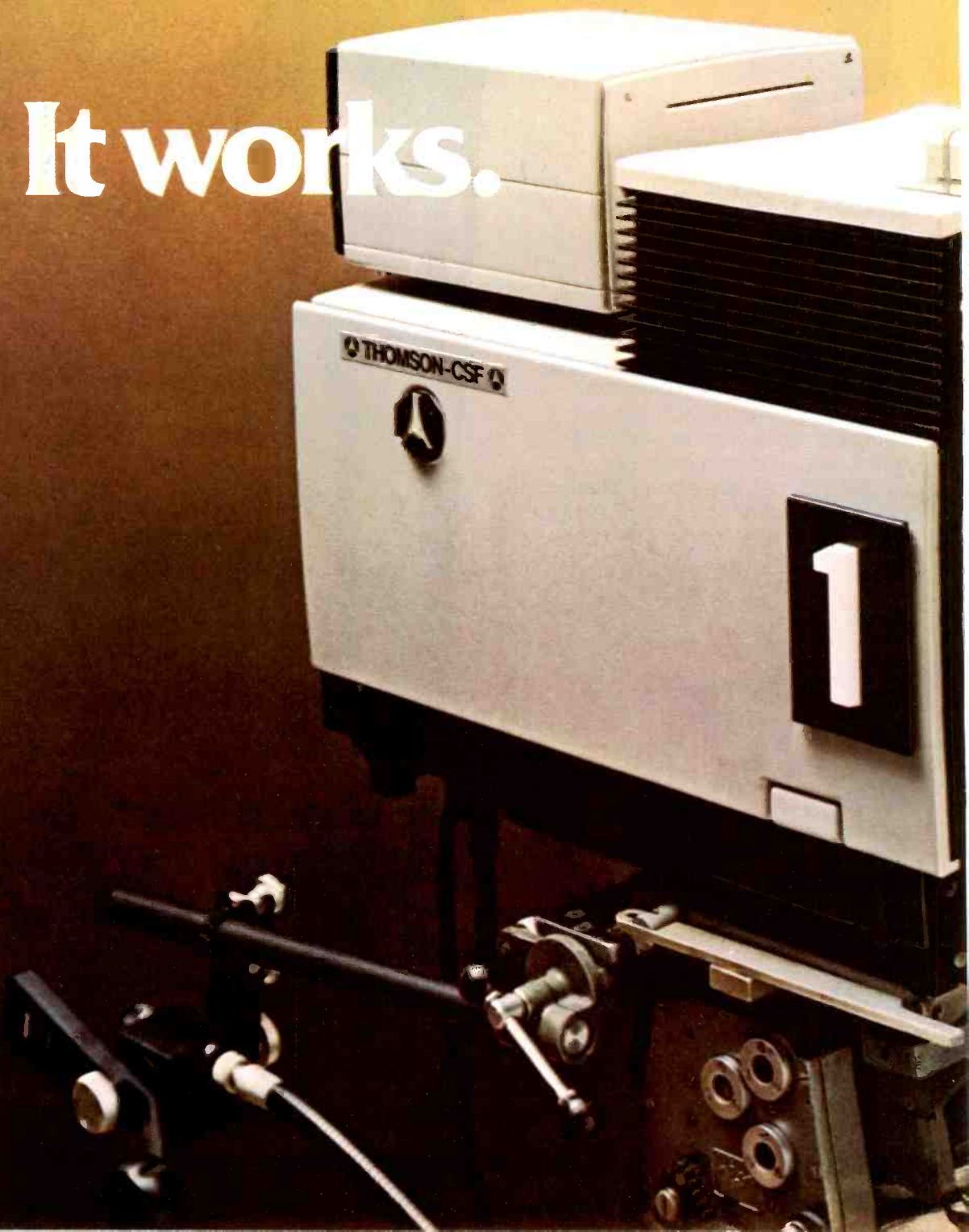
Use RCA Vistacons. You'll get the competitive value and the service you've a right to expect from the pioneering leader in TV camera-tube technology. For complete information call your RCA Representative or your RCA Camera Tube Distributor.

**RCA Lancaster — where
people and technology
make the difference.**

RCA Camera
Tubes

**Now, triax color
with one little
difference:**

It works.



THOMSON-CSF TTV 1515, Now used in CBS mobile units

Triax color cameras have promised you enormous savings in man-hours and cable costs. But it takes a really reliable camera to turn those savings into a practical reality. Now there is one.

The TTV 1515 has been delivering trouble-free service in the field ever since 1971. Over 300 are now in use. It's the triax color camera that proved it works.

Why it works Thomson patents on circuits on this camera go back to 1964. We've been perfecting it ever since. The TTV 1515 wasn't introduced until every last "bug" had been thoroughly eliminated.

We also made 99% of maintenance a matter of minutes. Nearly all circuitry is in plug-in circuit boards . . . changed or adjusted instantly, 100% solid state. And there are no multi-layer

circuits to frustrate maintenance technicians. All wiring is in the open.

Quietest picture yet

Perfected pre-amplifier designs advanced processing and contouring techniques, and the adjustable comb filter all cut noise. Time-proved 30 mm. separate-mesh tubes are mounted parallel to the optical axis. Head amplifiers surround the targets for full shielding. Result: to an exceptional degree, noise is eliminated at the source.

The thinking man's CCU

A real miniature sync generator is built into the CCU for automatic synchronization. It restores, from mixed sync only, all signals usually derived from external sync . . . blanking, drives, etc.

Also built into the CCU: contour correction, adjustable comb filter, color masking, amplitude modulated shading, automatic cable compensation. All these logically belong in the CCU (not the camera). Thomson puts them there.

More unique features

1) Built-in diascope eliminates front-of-lens "black boxes". 2) Superb low-light pictures due to built-in bias light. 3) Converts from triax to multiconductor cable with a five-minute switch of plug-in circuit boards. 4) Communication from camera head to CCU is maintained with power switch off. 5) Power supply is safe when shorted. 6) Viewfinder tilts, swivels, locks

and operates remotely. 7) Portable: camera 77 lbs., viewfinder 11 lbs. 8) Automatic continuous registration provided by optical markers in the optical assembly. 9) Ultra-stable digital multiplexing in 46 remote channels. 10) Separate multiplexed analog RGB outputs: compatible with existing Chroma-Key systems; permit use of NTSC, PAL and SECAM encoders.

Thomson-CSF: Leader in triax color

Since the early 1960's, the facilities of France's largest manufacturer of professional electronic equipment have been hard at work on triax color. Thomson-CSF has over 48,000 employees. The parent corporation, Thomson-Brandt, has over 98,000.

It all adds up to the most perfectly-developed camera in triax color TV. The field-proven one. The successful one. The one that works. TTV 1515 by Thomson-CSF.

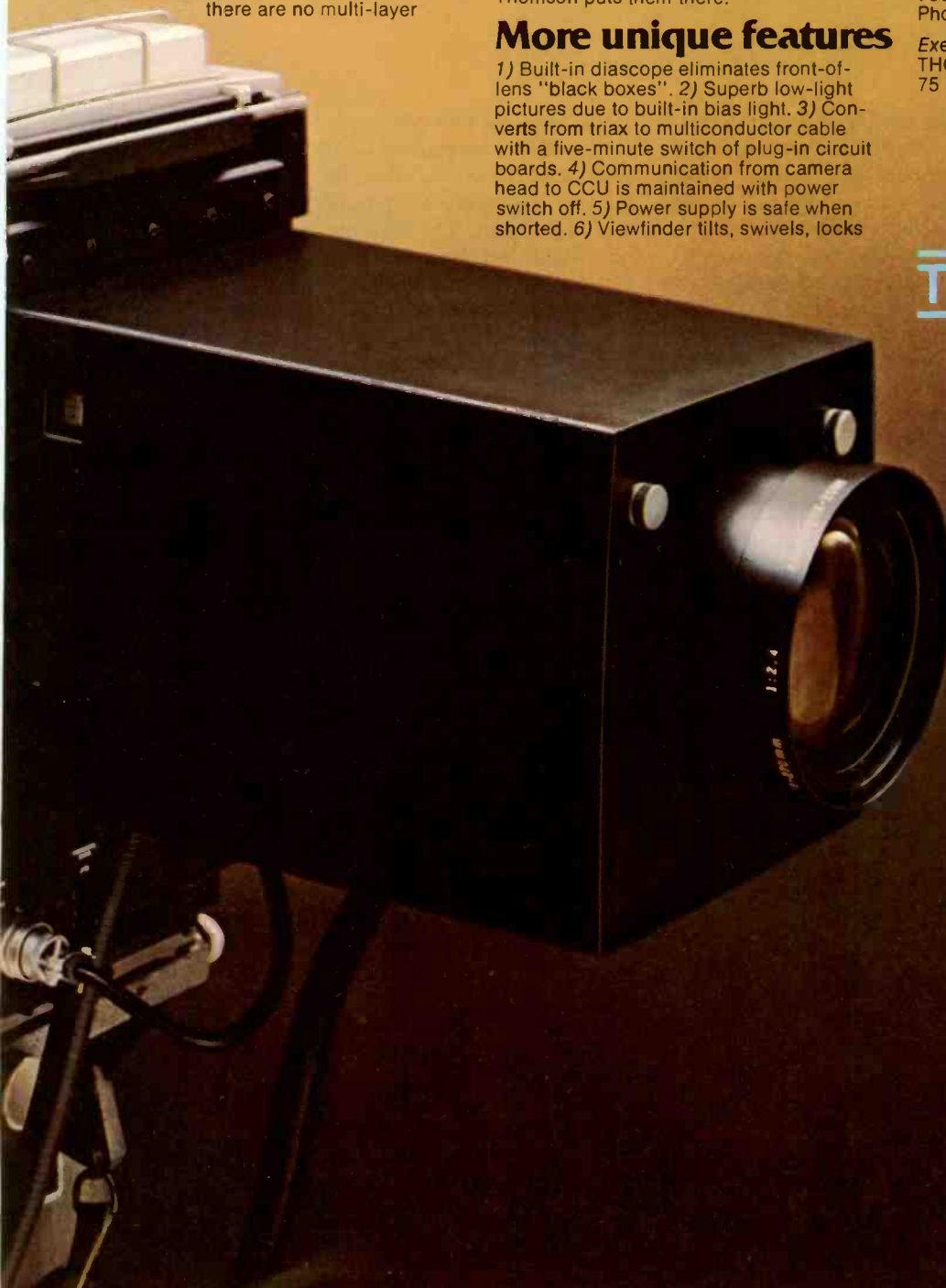
THOMSON-CSF, Inc.
Broadcast Products Division
750 Bloomfield Ave., Clifton, N. J. 07015
Phone (201) 779-0216

Executive Offices:
THOMSON-CSF, Inc.
75 Rockefeller Plaza, New York, N.Y. 10019



THOMSON-CSF

Circle 133 on Reader Service Card



Single-Tube TV Cameras: Now They Are Solid For Many Applications.

By Robert J. Schlicht

Advances in optical encoding, and precision manufacturing of relay and electron optics, gives single-tube camera competence for a very wide range of uses.

A relatively short time ago the choice of a color television camera was simple. The market offered one good quality, high-priced studio model and several lower priced, lesser quality models. A large segment of the industry, including Cohu, Inc., Electronics Div. of San Diego, had active development programs underway to produce a simplified and reasonably priced color television camera that would be suitable for both live action and film; a camera system with high reliability, low operating costs, and one that required operating personnel with only a minimum technical background; a camera system that would serve industrial educational, and cable television needs as well as those of the small broadcaster.

Basically, there are three types of color cameras: the

Mr. Schlicht is Vice President, marketing, of Cohu, Inc.

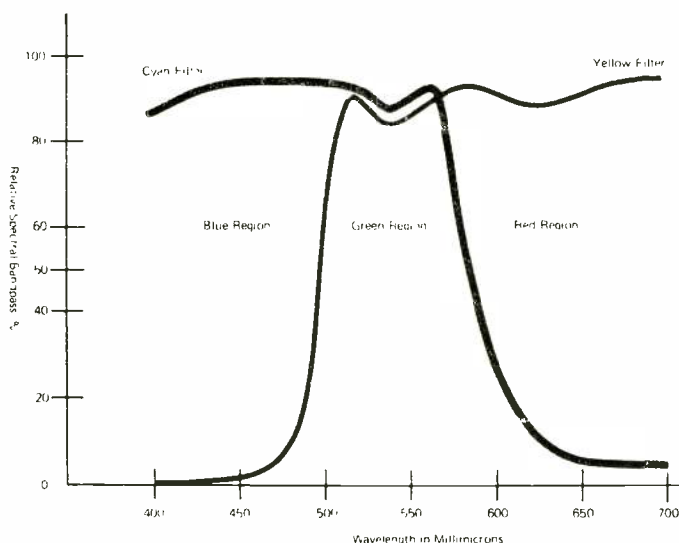


Fig. 1 Optical color encoder bandpass characteristics.

single tube, the two tube, and the three or four tube. The single tube configuration, when several disadvantages were eliminated, fulfilled the requirements of lightweight, low-cost, simple operation with no registration problem. The subsequent development by Cohu of a high performance, single tube color television camera represented a significant advancement in the state-of-the-art and provided the unique building block for a variety of color television systems. For example, in order to keep retubing costs minimal, the Cohu single tube camera uses a standard vidicon rather than an encoded vidicon.

An encoded vidicon has the optical color encoding filter built into the vidicon faceplate and costs approximately \$100 more than a standard vidicon. Separating the color optics and the image pickup tube makes it possible to use a wide range of image pickup tubes including lead oxide types.

The Cohu camera depends upon a spatial filter inserted in the optical path of the image. The image on the tube target comprises samples of luminance, cyan, yellow, and green information. The image of the televised scene is focused on the optical encoding filter (Fig. 1), by the camera lens. A block diagram layout of such a system is shown in Fig. 2. One filter is a cyan Ronchi grating, the other is a yellow Ronchi grating (Fig. 3).

The cyan grating samples the red image by stopping half of the red light, the yellow grating samples the blue image by stopping half of the blue light. When the light strikes the image tube target, scanning produces luminance information, minus red scene information at a specific time sample, minus blue scene information at a specific time sample, and a green sample. A color encoded pulse train is generated that represents the red and blue color information. Properly combining appropriately delayed pulse trains separates the three primary components.

After the video signal is decoded and separated into a red video signal, a blue video signal, a broadband luminance signal, these four signals are then fed to an encoder where the red and blue signals are matrixed with

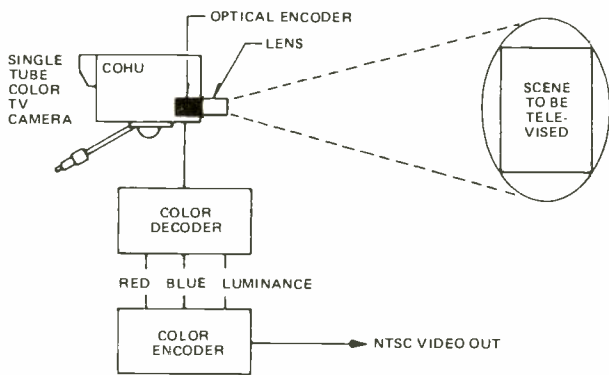


Fig. 2 The single tube system camera

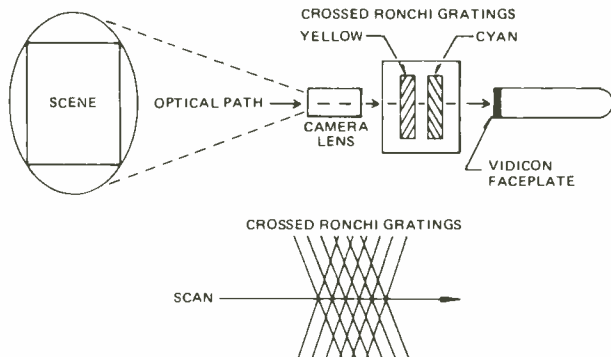


Fig. 3 A typical spatial encoding figure.

the narrow band luminance signal to form red-minus-luminance and blue-minus-luminance signals. These two signals then modulate subcarriers whose outputs are summed together to provide a phase modulated signal that is added to the broadband luminance signal to provide an NTSC color encoded video signal.

Early development work proved the single tube color TV camera feasible while increasing popularity and demand has resulted in steady improvement in operating performance. The Cohu Electronics 1200 Series is a prime example. The series features 300-line luminance horizontal resolution, 51 dB luminance S/N ratio, selectable gamma correction of 0.5 or 0.7 or 1.0, and geometric distortion of less than 2% of picture height. A lenticular filter placed in the optical path reduced the low frequency color beats on the edges of objects, a "shimmering effect," caused when the spatial frequencies of the scene and color filter coincide.

Automatic black level control, sensitivity control, and light control add range to the camera's usefulness and aperture correction improves detail contrast. For applications requiring low photo cathode lag, low dark current, and high signal-to-noise ratio, the camera will accept a Plumbicon image converter.

Single tube color TV cameras now compete with multi-tube cameras. They are designed to fill a void where potential application will not permit or does not warrant the use of larger, more costly cameras which require more technical "care and feeding." With refinement of design and precise manufacture of relay and electron optics and color filters, high quality video that satisfied most color television needs can now be obtained with single tube color television cameras.

BM/E

THANKS TO YOU — WE'RE MOVING!!!

Your demand for our products has grown so much we need more space in order to maintain our service to you.

May 1975 is the time - and our new 14,000 sq. ft. building is at:

701 Chestnut Street
(Trainer)
Chester, Pa. 19013
(a Philadelphia suburb)

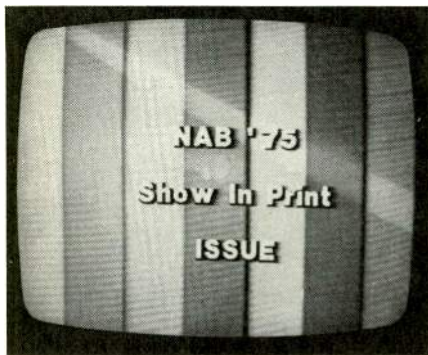
Telephone our
new number:
(215) 497-5100

WILKINSON
ELECTRONICS, INC.

Circle 134 on Reader Service Card

NAB Las Vegas Convention Is A Winner

Odds were that soft attendance and distractions would weaken value of the NAB 53rd Annual Convention. These predictions failed to materialize. Over 5215 broadcasters showed up to take in sessions and inspect exhibits. Manufacturers were delighted with the buying mood they sensed. Rapprochement with the regulators emerged.



The 53rd Annual Convention is now history. What were the surprises at the show? Of startling new devices on the exhibit floor, or startling revelations from the many podiums, there were very few.

Readers of this magazine knew from our February and March previews that electronic news gathering would be big, that two new solid-state transmitters would be on display and that there would be keen interest in circularly polarized antennas. What was surprising was the *deep* interest in these subjects, and other developments just around the corner—automatic transmitters and maybe AM stereo. Also something of a surprise was the number of new exhibitors on hand offering, among other things, new possibilities in video recording. More on this later.

Not particularly surprising was the industry's falling in line, officially, to accept family viewing television during prime time. With the networks already leading the way, and in view of the expectation by legislators and the FCC that such a change was good, perhaps the only surprise was that, by voice vote, broadcasters at first objected. But the verbal protest died down to final acquiescence, so there was no real confrontation.

Not surprising, either, was the continued promise of deregulation offered by FCC Chairman Wiley. But pleasantly surprising was the strong commitment by the FCC to work for a reasonable renewal bill and the very cooperative attitude shown by the FCC. Various FCC members on assorted panels even helped get across what public ascertainment is all about.

Highlights of the Exhibits

ENG: RCA announced a total system (a first) including a Teac-made portable recorder. New cameras were shown by Ikegami, Philips, Fernseh, IVC, Editel, Asaca, Hitachi, Sony and Akai. New microwave sources were Micro Communications and Ikegami.

Studio Cameras: On view for the first time: the Thomson CSF TTV1515, the new LDK series from Philips, the new KCK Pacesetter from Fernseh, the TC-50 from Harris, the 285 from CEI.

VTRs: A new slow motion/stop action disc recorder from Data Disc; a new direct R-G-B recording principle from TRI, a backpack quad from Asaca, a new Programmed Broadcast Recorder from IVC, a portable video cartridge unit from IVC, a new helical from Video Memory, remod units from Merlin Engineering.

Signal Handlers: a new synchronizer from CVS with compressed video output.

Editors: new and updated systems from CMX, TRI, Beta Technology, Sony, and Recortec augmented established systems from Central Dynamics and Datatron.

Monitors: New competition for U.S. manufacturers: Barco from Belgium and Electrohome from Canada.

Production Switchers: Computer

Image unveiled a full-capacity system. Another new company was Ross, American Data showed a new version; others added to their line. To add new life to old switchers was Sonex with stand alone units.

Distribution Switchers: Two new companies offered systems—Comptech and Vedco.

Video enhancers: A new image enhancer was shown by Corning Electronics; new automatic telecine correctors by CBS Labs and RCA.

Radio automation: An explosion in new multicart designs: SMC had the Caro-stat, a stand-still instant-access system; Schafer had a stand-alone control unit for the Audiofile; IGM had the GoCart, a moving-cart system; RCA introduced the Kartwheel, a carousel-type system; and Ampro brought in the Rotocart, also a moving-cart machine.

Radio transmitters: Two all-solid state AM units, Westinghouse's 5 kW and Harris' 1 kW. Also unveiled was Collins new Fourth Generation FM series, with models from 10 watts to 40 kW, using their new ultra-low-distortion exciter.

Time base correctors: Two new models (replacing older ones) from Television Microtime and new accessories from Consolidated Video Systems. A new exhibitor was Digital Labs.

Circularly-polarized antennas: RCA and Jampro showed systems and concepts—RCA a simulated model and demonstration of effects; Jampro a section of a real VHF section.

Film Gear: A new news camera from General Camera, an automatic cartridge projector from Ikegami, a sprocketless pull-down system from Hollogon, a printer from PSC Technology, an editor from Optasound.



NAB exhibit entrance was a busy crossroads.



Highlight exhibit was Westinghouse which featured the old and the new in transmitters.

EBS Two-Tone Signal Units: Even though the new two-tone interstation signaling for the EBS does not go into effect until January 15, 1976, three exhibitors had complete systems, including encoders, decoders, radio receivers: Audio Services, McMartin, and Time and Frequency Technology. Actual marketing is set for fall, after the FCC has presumably given type acceptance.

Audio miscellany: A new open-reel entry that looked interesting, the MCI JH-110, being sold now by Pacific Recorders and Engineering; new noise reduction systems especially adapted to broadcasting from DBX and Burwen; a swing to new very-high-performance direct-drive turntables, with Panasonic's SP-10 in the McCurdy exhibit, comparable tables promised soon by Sony and Pioneer.

Electronic News Gathering—new cameras but no total systems

Even if broadcasters had great reservations about getting into electronic news gathering, they nonetheless had to find out for themselves what was going on since the universal question

of the show (and indeed of the year), was (and is), "What are you doing in electronic journalism?" Anticipating the interest, the exhibitors did a lot of furious pre-show work to establish their positions as *the* bandwagon to ride. But despite efforts of various manufacturers to demonstrate their preeminence in the burgeoning field, no one was able to offer turnkey ENG. Thus, for each broadcaster, finding out about ENG became something of a treasure hunt. A few clues were offered at the Monday morning opening workshop on ENG. The equipment described was that previously discussed in BM/E. Names like Ikegami, Fernseh, Akai, Sony, Datatron, CVS, Nurad, Microwave Associates, popped up as the major suppliers to date. On the floor there were many more: Editel, Philips, IVC, RCA, Asaca, Hitachi, TRI, Micro Communications, and a host of TBC suppliers.

We said there were no turnkey suppliers to get you into ENG forthwith and painlessly. At the show, Ikegami came quite close, showing cameras (two levels of quality), a port-



Highlight event was Pres. Ford's visit who encouraged broadcasters by telling them there was too much regulation.



Busy man at NAB was BM/E's Show-In-Print photographer who shot most of the scenes on the following pages.

For more information on the following new products pictured, circle corresponding number on Reader Service Card.

able tape recorder identical with the Sony 3800 (but made by Teac) and microwave gear. But it had no TBC or editor. In terms of concept, RCA nearly had it all together. It showed new cameras (including an experimental color unit with solid state image sensors), a cassette playback unit with edit capability (our guess is Teac again, but RCA wasn't saying), TBCs (Television Microtime's new 640 series again with an RCA nameplate and tagged the TBC-100), microwave equipment, plus mobile communications gear for voice communications (18 oz hand sets now on the market as TACTEC). This complete package will cost \$65,085 as estimated by RCA. The only problem is much of the equipment is not yet available. The portable recorder, TBC and microwave gear will be ready in the third quarter of this year. The cassette player will come a little later in the fourth quarter. RCA's news camera, the TK-46 will not be ready for delivery until the second quarter in 1976.

RCA did have a working model at the show. It uses 3/8-inch pickup tubes

NAB SHOW-IN-PRINT

and weighs 17 lbs including a 10 × 1 zoom lens and viewfinder. The separate backpack weighs only 10 lbs. RCA's future TR-1000 videocassette recorder/player for all intents and purposes is the same as the Sony unit. The RF system RCA will use will be operated by batteries or ac.

With great showmanship Philips, IVC, and Fernseh demonstrated that these camera sources were not to be ignored. Fernseh following up on the KCN introduced last year at Houston, this year showed the production version with a few improvements resulting from NBC requirements and other broadcast customer inputs. The KCN is a high performance unit with good sensitivity exceeding 16mm quality which is the benchmark of electronic journalism broadcast quality—at least in the year 1975. Consequently the



New Ikegami HL 35 camera for news.

200



Two separate news groups with Sony ENG equipment showed up to follow the CMX "joggers."

201

Short Takes From Management Sessions: FCC

... License Renewal was the order of the day when Richard E. Wiley, Chairman of the FCC addressed the NAB. Echoing broadcaster's concerns precisely, Wiley identified license renewal as the foremost controversy, and offered a reprieve in the form of a vastly improved broadcast renewal program.

Wiley announced two recent actions: a new short form radio renewal proposal and the adoption *in principle* of a continuous community ascertainment process. The new renewal form for commercial radio stations is four pages and contains only 33 questions. A sidenote relative to this was another FCC action, the initiation of a proceeding to permit automated transmitters systems for radio and TV stations.

The new ascertainment process, if implemented, would eliminate the formal process 6 months prior to renewal. Additionally it would provide for the fact that ascertainment for renewal application should be different from that required of new applicants. Greater flexibility is anticipated: non-management level personnel may participate in community leader interviews, leader-station dialogue can take place in informal settings, including "on-air ascertainment"; and group and telephone interviews will be approved. Finally an experimental exemption for radio stations in communities under 10,000 population is anticipated.

Wiley recognized the FCC's problem of backlogged petitions to deny. To deal with this, he announced his recommendation to the Commission of a monthly "Petition to Deny" day. On this day, every new petition will be examined by the Commission to determine if an easy, almost immediate decision can be made. It is expected that this will reduce petition resolution time to weeks or months rather than years.

Wiley left his audience with a promise that "nothing will be more important to me than to develop a rational and coherent renewal policy, one which will be fair to you, fair to your critics, and fair to the public at large."

... In a separate address to the Small Market Radio Session, Wiley called for a "continued dialogue between the FCC and broadcasters." He cited as an example of such cooperation, the recent FCC decision to exempt stations in markets under 10,000 from the ascertainment rule. Other FCC representatives present at the session noted the following:

- A foreign language broadcast station need not have a full-time employee fluent in the language, provided management has an understanding of what is being broadcast.
- Action is expected shortly on daytime-only stations applying for night time broadcasts. Power increases may be feasible by existing stations that meet technical rules.
- One delegate representing a number of stations in a community is not sufficient to determine area problems, by talking to community leaders.
- Unsigned letters of complaint against stations, if assumed to be valid, are checked out and account for renewal delay.
- Broadcasters should take care to file renewals carefully as incorrect preparation is the number one reason for deferral of license renewal.

KCN can be used in the studio as well. Among the improvements over the prototype are changes in cable configurations, fool-proof indicators for monitoring test signals, several automatic adjustments including an iris setting to assume correct "on-air" video output, fully-synchronized NTSC output, two hours of shooting time per battery charge, etc. The KCN head weighs 15 lbs and a complete system about 50.

Philips came on strong with a new name, a new line and a new look at NAB Las Vegas (see studio camera section for details) and included in this big picture, which included five new cameras, was a 15 lb unit designed for news called the Nomad LDK-11. Actually the LDK-11 is not precisely part of the new Philips "family" but is a hybrid consisting of an Asaca head modified to Philips specs. The Nomad includes an electronic viewfinder in its backpack and is a light 16 lbs. The camera uses three 2/3-inch Plumbicons and has bias light to minimize lag at low light levels. Output is NTSC encoded and is contour enhanced. The built-in sync generator can be gen-locked. Among other features are two-communication mike channels, automatic white balance, automatic iris and remote-start-stop control.

IVC came on strong with a system which it billed as suited both for ENG and high quality remote production. The camera was the IVC-7000P which was performance equal to the IVC

continued on page 56

HARRIS LEADS THE WAY . . . AGAIN.



**THE WORLD'S
FIRST
FCC TYPE
ACCEPTED
100%
SOLID-STATE
AM BROADCAST
TRANSMITTER!**

From the power amplifier/modulator to the oscillator and audio driver, the one-kilowatt MW-1 is *totally transistorized*, for the ultimate in performance and reliability!!

Another first—the Progressive Series Modulator (PSM)* is brand new, combining the operating simplicity of conventional

series modulation with greatly increased modulator efficiency. Overall transmitter efficiency is greater than 50%!

Add to this a 125% positive peak modulation capability, and you have the most exciting, broadcaster-oriented AM transmitter to be introduced in many years.

MW-1, from Harris—the pioneers with Direct Carrier

Frequency Modulation, with the Pulse Duration Modulator, with IF Modulation . . . and now with total solid-state design and PSM.

For more information, write Harris Corporation, Broadcast Equipment Division, 123 Hampshire Street, Quincy, Illinois 62301.

*Patent Pending

HARRIS



**COMMUNICATIONS AND
INFORMATION HANDLING**

TKP inside



Inside the studio the TKP-45 can give you an extra dimension.

That's because the TKP-45 can match the picture quality of its famous big brother, the TK-45.

And because the TKP-45 is more versatile. Put it on a tripod and you have a broadcast quality camera that's unmatched for mobility.

Add the remote pan and tilt system and it does everything, minus the cameraman.

Now add its small price to its small size and you have a color camera that will neither cost you an arm and a leg nor strain one.

And that's only the half of it. Because when you take the TKP-45 outside the studio, you'll have what you've always wanted in a portable color camera.

For more inside information on the TKP-45, write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

45 out



Outside the studio, you'll find that the TKP-45 isn't a lot of problems like many other color portables.

Some of which are either too big in size (back-breaking).

Or, not big enough in quality (heart-breaking).

The TKP-45 weighs only 22 pounds (with the lens). And doesn't require a heavy backpack or large bulky cables that trip you up.

Also, there are fewer controls to manipulate. Because the TKP-45 has all the famous automatic features of the TK-45.

Features like automatic white balance. Automatic black balance. And automatic iris.

That all works out better for you because it's less work for you.

All for more convenience. More operational simplicity. And greater performance.

The TKP-45. Another reason why users of high

quality color cameras buy RCA more than all other makes combined.

For more outside information on the TKP-45, write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102

RCA



**Authorized
CP-16 Dealers
and Service Centers**

**North American
LISTING**

D — Dealer S — Service D/S — Dealer & Service

CALIFORNIA

Alan Gordon
Enterprises, Inc. D/S
5362 N. Cahuenga Blvd
North Hollywood, Ca. 91601

Adolph Gasser Inc. D/S
181 Second St
San Francisco, Ca. 94105

F&B/Ceco, Inc. D/S
7051 Santa Monica Blvd
Hollywood, Ca. 90038

San Diego Camera
Exchange S
1071 Sixth Ave
San Diego, Ca. 92101

COLORADO

Stan Phillips & Associates/
Camera Service S
2245 W. 30th Avenue
Denver, Colorado 80211

DISTRICT OF COLUMBIA

Brenner Cine-Sound D/S
5215 Wisconsin Ave. N.W.
Washington, D.C. 20015

FLORIDA

Image Devices, Inc. D/S
811 N.W. 111th St.
Miami, Fla. 33168

GEORGIA

Atlanta Film
Equipment Rentals D/S
1848 Briarwood Rd., N.E.
Atlanta, Ga. 30329

HAWAII

Pacific Instrumentation D/S
5388 Papai Street
Honolulu, Hawaii 96821

ILLINOIS

Victor Duncan, Inc. D/S
676 St. Clair St.
Chicago, Ill. 60611

LOUISIANA

Pan American Films D/S
822 N. Rampart St.
New Orleans, La. 70116

MASSACHUSETTS

Sanford Camera &
Projector Repairs S
1054 Massachusetts Ave.
Arlington, Mass. 02174

MICHIGAN

Victor Duncan, Inc. D/S
11043 Gratiot Ave.
Detroit, Mich. 48213

MINNESOTA

Galaxy Film Service D/S
3000 France Ave
Minneapolis, Minn 55416

MISSOURI

Calvin Cinequip, Inc. D/S
215 W. Pershing Road
Kansas City, Mo. 64108

NEW YORK

F&B/Ceco, Inc. D/S
315 West 43rd St
New York, N.Y. 10036

The Camera Mart D/S
456 W. 55th St
New York, N.Y. 10619

NORTH CAROLINA

Standard Theatre
Supply Co. D/S
125 Higgins St.
Greensboro, N.C. 27420

TENNESSEE

Bill Billings Photo D/S
129 South Front Ave
Rockwood, Tenn. 37854

Motion Picture
Laboratories, Inc. D/S
781 S. Main St.
Memphis, Tenn. 38102

TEXAS

Victor Duncan, Inc. D/S
2659 Fondren Ave
Dallas, Texas 75206

UTAH

Stockdale & Co., Inc. D/S
200 E. First South
Salt Lake City, Utah 84111

WASHINGTON

Glazer's Camera Supply D
1923 Third Ave
Seattle, Washington 98101

Phototronics S
223 West Lake North
Seattle, Washington 98109

CANADA

Cine Audio S
10251-106 St
Edmonton, Alberta

Alex L. Clark Limited D/S
3751 Bloor Street West
Islington, Ontario M9A 1A2

Branches:

1070 Bleury Street D/S
Montreal 128, Quebec

7104 Hunterwood Rd., N.W. D/S
Calgary 51, Alberta

Steve's Camera Service S
189 East 28th Ave
Vancouver, B.C. V5V 2M3

MEXICO

Alan Gordon
Enterprises, Inc. D/S
c/o R.E.C.E.S.A.
Rio Amazona 85
Mexico 5 D.F.

Listing as of: Mar. 1, 1975



Circle 138 on Reader Service Card

NAB SHOW-IN-PRINT

7000 studio camera (1-inch Plumbicons; prismatic optics). To make up a system, IVC also introduced the VCR200 a cartridge loading VTR unit which featured 5 MHz bandwidth. Although the camera head weighs just 14 lbs (less lens) and the backpack 17 lbs, (without batteries), the unit was somewhat larger dimensionally than other cameras designated for news use.* The camera head can operate 200 feet from the backpack. The combo has matrix color correction, contour enhancement, bias lighting, auto iris, auto color balance, etc. The system is extremely flexible; the backpack can feed a microwave unit through 300 feet of cable, or, if ac power is available, it can be connected to a CCU 3000 feet away with standard cable (and further with triax).

Asaca was unique as an electronic journalism system supplier, by virtue of offering a one-inch quad (four head) portable VTR, the AVS-3200 to work with its ACC-3000 camera.

Asaca's camera is equipped to accept C-mount lens for quick field changes. The ACC-3000 is completely different from the LDK-11 Philips unit described earlier as being made by Asaca. The ACC-3000 used Chalnicon tubes (three) rather than Plumbicons. In other respects, features are about the same as other broadcast quality cameras. Viewfinder is adjustable. Asaca also showed a slightly heavier head unit, the ACC-5000 offering high sensitivity.

Asaca's journalism recorder was a brand new device never before shown. It was described as a one-inch high band unit. The compact package weighed 35 lbs and its 6-inch reels handle 30 minutes of recording. The four heads are ferrite. Asaca also had its own time base corrector, the ATC-300 for on-air playback.

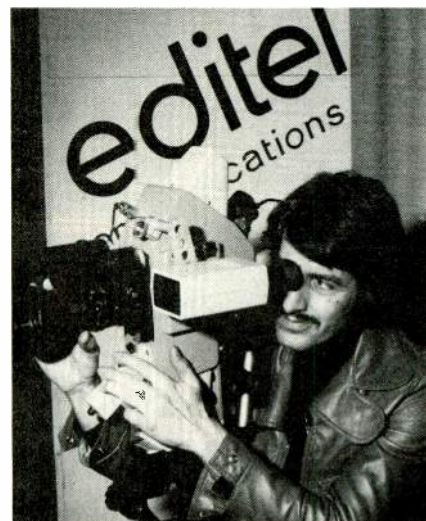
One of the most interesting never-seen-before cameras was the modular SK-70 shown by Hitachi Shibaden. Hitachi referred to the unit as a third generation color TV camera since it actually was convertible into both a studio camera and a portable camera.

**It's hard to draw distinction between a news camera and a portable. CEI for example does not refer to its portable 290 as a news camera partially because it cannot be separated more than 30 feet from its backpack. Likewise RCA, Philips and Fernseh make distinctions between portable product units and more compact news cameras.*



The ACC 3000 from Asaca.

202



New Editel ENC-II.

203

The "backpack" was configured to be carried separately or mounted and interlocked with the camera head unit to make an integral studio unit. The camera used three 3/8-inch Saticon tubes which afford high sensitivity (f4 at 200 ft-candles) good signal to noise (50 dB), high resolution and low lag. Cameras are also capable of remote control operation up to 3000 feet by digital control on coax. The Saticon, incidentally, is a new tube characterized as a heterojunction target between tin oxide layers and selenium-doped with arsenic and tellurium.

We mentioned Ikegami as having almost a complete system on the floor by virtue of its tape recorder and microwave gear. There was no literature available on the former (we learned it was a Teac unit) but the PF-71S microwave field pickup unit was described as exclusively for electronic journalism. When connected to a camera, the PF-71S multiplexes audio and video on the SHF band. With the attachment of a 460 MHz receiver, it is possible for the camera

continued on page 58

Trade up to a CP-16/A and save \$1225.

Within three short years, the CP-16/A has become the most preferred 16mm sound camera in the TV-newsfilm/documentary field — with many of the larger stations standardizing their entire newsfilm operation on the CP-16 camera system.

No matter what new equipment developments may be in the offing for TV-news, our non-reflex CP-16 and CP-16/A camera models continue, and will continue, to make good equipment sense. Especially for those who operate "one-man-band" style.

A special offer from Cinema Products and your local CP-16 dealer.*

Even though upgrading TV-newsfilm equipment is relatively inexpensive, there are stations that may find it increasingly difficult to do so — what with ever tightening budgets and the shrinking purchasing power of the dollar.

And so, to introduce you to the CP-16 camera system, a system fully supported by an extensive, well trained dealer/service network, we are pleased to offer you, for a limited time only, a unique opportunity to acquire a CP-16 or CP-16/A at fantastic savings!

Here's all you have to do. Trade in any 16mm newsfilm-type camera you presently own — whatever its condition, no matter how old — for a brand new, *all new* CP-16/A with built-in Crystasound amplifier.

Your authorized local CP-16 dealer will give you \$1225 off list price on any CP-16/A camera package. Or \$1000 off on a standard CP-16. (Of course, this is

in addition to the savings you normally get if you also buy the zoom lens for the

CP-16 or CP-16/A at the same time.)

Plus two-year warranty and free "loaner."

Its proven performance in the field has established the CP-16 as the most reliable and dependable camera system, least likely to break down in the day-to-day grind of newsfilm work.

As part of this special offer, we take great pride in extending our factory warranty to a full two years on all mechanical and electronic components. *Provided* you purchase your camera from your authorized *local* CP-16 dealer.

And, should your CP-16 or CP-16/A require any repairs covered by this special two-year warranty, your local dealer will provide you with a free CP-16 "loaner." This is but one example of the outstanding after-sales service and total back-up you can expect from your authorized local CP-16 dealer.

But you must act now!

With savings and benefits like these, why risk your precious equipment dollars on yet another "re-manufactured" conversion?

Move up to a brand new, *all new* CP-16/A, the uncontested leader in the TV-newsfilm/documentary field. You owe it to yourself.

But remember, this unusual offer is good only from March 1st to July 1st, 1975. So hurry. See your authorized local CP-16 dealer now.

*See adjacent page for listing of authorized North American CP-16 Dealers participating in this special offer.



"MERCY, what in the world of television do you say after an N.A.B. like this, Max?"

"Say thanks, Maxine, just thanks."

"Max, did we sell many heads?"

"A lot, Maxine, a lot."

"Why Max?"

"Well, we tell it like it is—solid quality, best price and warranty."

"Say thanks Max."

"Thanks Max."



For information about our "Better than New" Ampex and RCA refurbished quad heads contact:

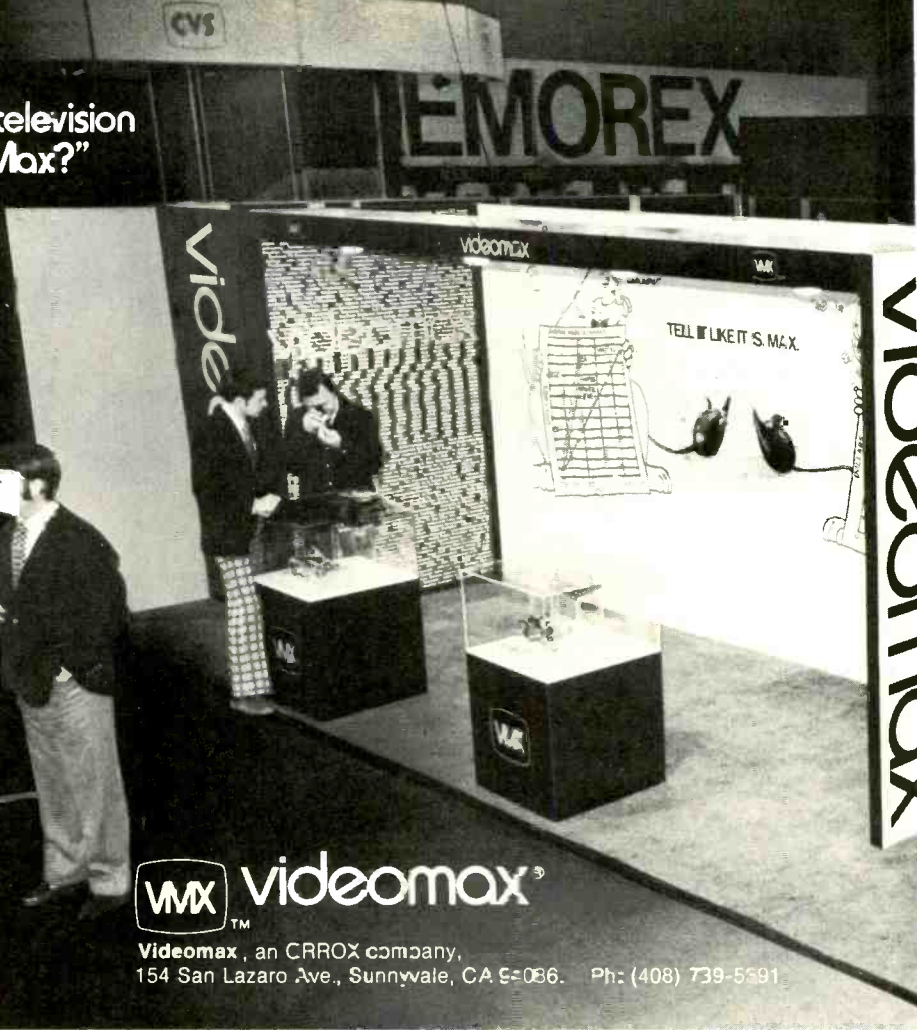
SALES & SERVICE

New York **Los Angeles** **Washington, D.C.**
 (212) 947-8031 (213) 980-7927 (301) 384-4733



videomax™

Videomax, an CRROX company,
 154 San Lazaro Ave., Sunnyvale, CA 95086. Ph: (408) 739-5591



Circle 139 on Reader Service Card

NAB SHOW-IN-PRINT



TK-76 Newsmaker mini is totally new.

204

New Hitachi Shibaden news camera 206



Akai's updated VTS-150 B, the "Hustler."

205





NAB '75... what a great, curious, friendly, purposeful group of television professionals.

We met old friends.
 We made many new friends.
 We sold systems.
 We couldn't hope for more.
 CMX thanks you all.

If we missed you, or if you missed the N.A.B., and you need information about the state-of-the-art of electronic video editing, contact us, there's a lot to be said.

SALES AND SERVICE

New York	Los Angeles	Dallas
(212) 371-1122	(213) 980-7927	(214) 242-2690

cmx systems

CMX Systems, an ORROX company,
 635 Vaqueros Avenue, Sunnyvale
 California 94086, (408) 245-8450

Circle 140 on Reader Service Card

unit to receive and command controls from a base station. One light coax connects the transmitter to the sound multiplex command demodulator. It has its own self-contained battery system.

Ikegami's claim to fame has been its HL-33 "handy-looky" camera used by CBS networks and many others. At the convention, however, Ikegami showed a new system called the HL-35. It uses 3/8-inch Plumbicons and is more compact than the HL-33; signal to noise is given as over 50 dB. New unit can send signals via coax up to 1500 meters.

Last year Editel announced the ENC-1 as a hand held camera applicable for ENG use. This year it showed ENC-II as a new light-weight rugged unit eminently suited for news. The head weighs 12 lbs 4 oz; the viewfinder adds another 1 lb 4 oz. Backpack weighs out at 23 lbs 4 oz. Tubes are one-inch Plumbicons. At f2.8 and 124 ft-candles of illumina-

tion, the S/N is 45 dB.

Marconi showed a portable Mark VIII last year and was back again this year with a production version. We didn't get size and weight specs. It appeared to us a little larger than other news cameras but it does connect to a standard CCU and boasts the features of automatic alignment and automatic color balance, to name two.

Akai, whose \$6995 VTS-150 camera-recording system got many broadcasters into ENG instantly (over 50) and inexpensively, introduced at the show an upgraded system for broadcasters. The VTS-150B Hustler offered new convenience. A servo vertical lock enables the unit to be locked to ext. vertical sync in playback. The reproduced signal could be synchronized to station master sync (with a TBC). Other features were an exposure indicator, a battery condition LED, a pulse output for DOC, and an internal color bar generator. The system stays with the two vidicon

tubes but an option for increasing sensitivity at low light levels is available. Akai also showed a playback deck the VT 150EP (\$4395) which included an interface to the TRI EA-5 editing control system. A line for educational and industrial use called the CCS-150S was also shown by Akai. A part of this equipment is the CCU-150M which makes it possible to use two or more cameras.

Sony, which helped make ENG practical for the three networks by virtue of its portable video cassette player, the 3800, the 2850 recorder/player, and an editing system to go along with it all, came to NAB for the first time and announced a new broadcast system group within Sony to serve its customers. Sony, of course was the scene of much attraction by virtue of its demonstrations of this equipment which also featured the DXC-1600 single-tube camera.

Somewhat conspicuous by not showing ENG equipment, was

NAB SHOW-IN-PRINT

Ampex. Some broadcasters remembering Ampex's demonstrations a few years back of a portable cartridge loading VTR for industrial use, thought Ampex might show up with a portable VTR. It didn't. Thus Ampex's only product to fit in this area was its time base corrector the TBC-800. Ampex spokesmen hinted that it might be revealing more ENG products at the forthcoming International Television Symposium in Montreux later this month.

Two other new ENG exhibitors which helped usher in the ENG were Nurad and Micro Communications Inc. Both showed four-mode polarized antenna systems making it possible to



The IVC 7000P portable.

207



New Philips LDK 11 news camera.

208



Improved Fernseh KCN news camera. 209

get the signal through better in large cities where there are many physical obstructions. With these systems, you can change the polarization until the

best signal strength is obtained. Nurad has been well known for its capability. Micro Communications was a new
continued on page 63

Short Takes From Management Sessions

... TV broadcasters in the smallest markets chewed over problems of cable TV incursion and doing news and public affairs programming on a limited budget. On the subject of cable, cooperation between cable and TV broadcasters was declared as in the best interests of everybody. With respect to the problem of exclusivity, the consensus was that each station should monitor on their own and report violations to the cable company involved and to the FCC only when violations persisted.

Programming news and public affairs on a limited budget will get a break by virtue of the new portable cameras which feed directly to portable tape recorders—this, all agreed, would account for great savings, financially and time-wise.

... President of NAB, Vincent Wasilewski, lambasted the federal government for what he termed a "widespread effort to inhibit broadcasters and the communications media in general." In his address at the opening general assembly of NAB's 53rd annual convention, he remarked that "there seems to be a determined and unremitting search for ways to get at broadcasting—to cut it down, tie it up, restrict it and inhibit it." Wasilewski called on the First Amendment and asserted that "If it does not apply to broadcasting, then it will not apply to anybody."

Specifically he noted the following examples of recent government interference:

- Congressional ban that removed cigarette advertising from the broadcast media.
 - Federal Trade Commission proposal that ingredient and nutritional information be included in virtually every radio and television food commercial.
 - Continuing demands to do away with all commercials on children's programs.
- Wasilewski also criticized pay cable television, maintaining that cable TV will become a device for siphoning away other free broadcast programs that will be offered for a fee to those who can afford to pay—"That is a perverted definition of free competition and a far cry from the honest competition of the free enterprise system."

... In the form of a one-act, five-person play, with a guest appearance by FCC Chairman, Richard E. Wiley, the Small Market Radio session presented their message: applications for renewal should be prepared correctly to avoid delayed renewal and excessive material should not be included when filing.

These important points were made:

- Do not include excessively long documents regarding public ascertainment surveys—the point is to show that you surveyed a broad segment. Do not submit extraneous documents.
- Be sure your public affair programming deals with genuine issues.
- When making technical alterations, the FCC must be informed.

The panel/cast included Dick Painter, KYSM, Mankato, Minn.; John Summers, NAB general counsel, Wallace Johnson, FCC Broadcast Bureau chief, and Richard J. Shiben, chief of the FCC's Renewal and Transfer Division. Note was also made that present rules do not recognize the use of automatic transmitters and final approval by the FCC is not expected in the immediate future. However, in an address given by Mr. Wiley the next day, he announced that FCC proceedings began last week to permit such systems.

... No startling predictions were made by the panel on The Future of Radio Broadcasting. From Congress, reasonable license renewal legislation. From the FCC, some easing of regulations and soon automatic transmitters. From the Army, advertising dollars. From merchants and national accounts, more revenues. From equipment manufacturers, more automation formats. From record companies, quadruphonics. From committees, standardized rate cards. From the RAB, continuation of the successful Adflation campaign.

... A panel of top-level producers and buyers of television programs could reach no conclusive agreement on their discussion of the "family hour" concept in programming. There was concurrence that it is necessary to lessen the amount of violence seen on television and that the public is ready for more quality programming with more drama, and less action conflict.

However, it was obvious that the audience present felt negatively towards the family hour concept—booing broke out when the panel voted three to two in favor of incorporating such a rule into NAB's Television Code.

At a later meeting, the full NAB TV Board approved the FV concept by a more representative vote of 12 to 3. Nevertheless, it was apparent that much dissension still exists on this topic and concession was made to delay enactment until 1977 or until shows already filmed and under contract are aired.

Mr. Wilson Wearn, TV Board chairman, was quoted as saying, "The final vote certainly isn't truly representative of the thinking of the Board . . . many were acting out of fear of the government."

Any editor, film or video, can master our EA-5 helical VTR editing system in less than 15 minutes. That's a fact!

Furthermore, we will install the EA-5 system in less than an hour. And that's a fact.

How does it work?

In some respects, TRI's film

approach to video tape editing will remind you of a film editing table. You edit, in a "hands on" technique, picture by picture. The electronics? 12 fool-proof buttons run the whole show. No time code. No tones. Just normal off-the-shelf tapes.

Availability? Well, we've already delivered more than 200 systems

around the world and, we can deliver your EA-5 system in 30 days.

The price? \$4,900.00. Complete. Total. No add-ons. Period. Seems fair to us.

Want more information? Contact us or the best video systems distributor in your area. Chances are he's our distributor.



TELEVISION RESEARCH INTERNATIONAL, INC.

"Manufacturers and distributors of Creative Freedom."

Take two helical VTR's,
add our EA-5, and you can
make precise frame
accurate edits
and much,
much, more.



TELEVISION RESEARCH INTERNATIONAL, INC.
1988 Leghorn Street
Mountain View, Calif. 94043
(415) 961-7475

Circle 141 on Reader Service Card

**THIS IS THE TUBE-
THE ORIGINAL 1¼ INCH PLUMBICON®
THAT WAS IN THE CAMERA
THAT REVOLUTIONIZED TV BROADCASTING
TEN YEARS AGO...**



**THIS IS THE 2/3 INCH VERSION
OF THAT PLUMBICON TUBE...
IT WILL CHANGE THE ENTIRE COURSE OF
AND ADD IMPORTANT NEW DIMENSIONS
TO ELECTRONIC JOURNALISM.**



Amperex®

TOMORROW'S THINKING IN TODAY'S PRODUCTS

Sold through
North American Philips Electronic Component Corporation



If broadcast journalism is distinguished primarily by its "immediacy," why should your viewers have to wait until color film is processed before they see your news telecasts?

Until now, they've had to wait because there was no TV camera tube made that was small enough for a really portable color camera capable of producing broadcast quality pictures in broadcast quality color.

The new 2/3-inch Plumbicon camera tube is now available for a new generation of portable, hand-held color cameras which will provide the same startlingly realistic color and dynamic resolution that revolutionized color telecasting ten years ago when its big brother was originally introduced.

With the 2/3-inch Plumbicon tube you'll get quality, and you'll get it without the delay and logistical complications of film.

The Amperex 2/3-inch Plumbicon TV camera tube offers:

- Better dynamic resolution than any other TV camera tube in the 2/3-inch category.
- Obviously superior color rendition.
- Excellent highlight-handling capability.
- Essentially zero lag over a wide range of lighting conditions.
- Low (and stable) dark current, combined with high signal-to-noise ratio for sharp, clean, noise-free images.
- Stable operation over a wide temperature range.

For additional information, contact Amperex Electronic Corporation, Electro-Optical Devices Division, Slatersville, Rhode Island 02876. Telephone: 401-762-3800

Amperex

TOMORROW'S THINKING IN TODAY'S PRODUCTS

Sold through
South American Philips Electronic Component Corporation

NAB SHOW-IN-PRINT

source. Both of these companies' products are also available through Microwave Associates which was strong at NAB showing complete microwave systems for ENG. Microwave Associates used its 13-CP system to beam live signals around the convention center to several other exhibitors. Biggest concern on use of microwave turned out to be lack of FCC approvals for ENG service—a growing bottleneck in the race to ENG.

Comrex showed an automatic remote pick up relay system to facilitate ENG operations. In operation, the newsmen can take a portable, wireless, ½ watt transmitter microphone into a crowd several feet ahead of his camera man. Back at the van, a high power transmitter is automatically keyed by signals coming in on the microphone receiver.

Radio and TV transmitters

The industry has been long alerted to the great advantages that would accrue from the all-solid-state transmitter, but the industry has also been well aware of the engineering difficulties facing the designers of such a unit.

Thus our hats are off to the two firms that actually did it: Harris and Westinghouse did produce the first medium-high power all solid-state AM units, and the results so far are extremely positive for a full realization of the expected benefits. Both transmitters have been performing in extended, all-day, regular on-air use, with near-perfect records.

Both obtain their output power with many solid-state units in parallel in the output stage. Harris uses six power amplifier modules of two transistors each. The circuit is so designed that a module can fail without interrupting or even reducing output. A new module can be inserted in a few seconds; a signal light on the front panel for each module alerts the operator to any failure.

The transmitter, the MW-1, (now in regular production), has been in use at station KXEO in Mexico, Missouri, since last October with no failure of any kind. Transistors are going to prove ultra-reliable here, as they have everywhere else they are used in properly designed circuits. KXEO's management is delighted with results and

← Circle 142 on Reader Service Card

NAB SHOW-IN-PRINT

reports substantially improved coverage, better S/N ratio over most of its area.

Harris developed a new high-level, series modulation scheme which combines high efficiency with the simplicity of the series circuit. The efficiency of the output stage and of the transmitter as a whole are extremely high: Class D operation is used in the output.

The Westinghouse FQM-5 is an AM unit rated 5 kW. The output stage is made up of 32 plug-in "trays," each holding six transistors, all in parallel. Again, as in the Harris, up to 20% of the transistors can fail with no deterioration of transmitter output; a new "tray" can be inserted quickly. For both transmitters, it is proper to say that the output transistors are in effect removed as a probable cause of fail-

ure. Westinghouse enhances the reliability of its unit by using 240 volts on the collectors of the output transistors, allowing the current to be well below any dangerous level. Class D operation is used; the efficiency of the output stage, says Westinghouse, is well over 90% and of the transmitter as a whole, over 70%.

The Westinghouse transmitter has been in regular on-the-air use since early April at Westinghouse station WIND, in Chicago, with results paralleling those for the Harris transmitter—simply no problems. We can conclude that the great reliability and long life of transistors have at last been harnessed fully to the broadcast transmitter.

Collins stirred the transmitter waters with its new line of FM transmitters, "Generation 4," all using a new Collins stereo exciter, the "Phase 4," with most outstanding characteristics. The exciter moves into the top-quality



Westinghouse all-solid-state 5 kW AM transmitter. 210



RCA demo of AM stereo, new BW-51 AM modulation monitor. 211

ENG Workshop Plays to S.R.O.

The Electronic News Gathering workshop at NAB had standing room only, as broadcasters squeezed their way in to hear the latest on this fast-growing segment of the industry.

Five panelists gave examples of their own experience with this new form and the theme that seemed to emerge is that "If you're not already into electronic news gathering, get your toe in the water." Julius Barnathan of ABC, New York, voiced that opinion, and remarked that it wasn't essential to make immediate major investments, but that some entrance into the field was advisable. He pointed out that the key to ENG is its ability to go live, which in the case of news, is an obvious asset.

Thomas M. Battista, KMOX-TV St. Louis, Mo., presented a video-tape tour of his all electronic news operation via monitors in the auditorium. He reports that his station is covering 20% more news over last year. He has been able to affect a cost savings by reducing his technical staff from 56 to 50 and by airing superior quality news programming—which of course will increase profits.

Unlike KMOX-TV, WLAC-TV, Nashville, Tennessee hasn't made a total switch. Ralph L. Hucaby, vice president and director of engineering for WLAC-TV, was however, specific on cost saving data: He reported a \$300,000 investment, and a six times reduction in costs after the switch. WLAC-TV's present ratio of tape-to-film is 7 to 3. Hucaby reiterated the desirability of going live, and the added quality factor of having more material shot and thus more and better news to work with.

Though some of the new converts still maintain film services for stringers, documentaries, etc., the movement to live, on the spot coverage is real. The few reservations voiced by the panelists were on achieving technical quality comparable to 16 mm film, and converting ENG from its "mobile" state to a true "portable" capability—both seem possible, it's just a matter of time.

In terms of the state of the art, no standards are yet set. But certain tendencies are apparent. At the top of the line are Ikegami or Fernseh mini cameras (about \$40,000). More moderate alternatives are the Akai or Sony models (about \$5,000). These are generally coupled with portable VTRs, the helical-scan variety. Here the choice consists of Sony ¾-in. cassette, IVC 1-inch reel-to-reel* or Akai's ¼ inch style. These units run approximately \$3,000.

Electronic News Gathering requires a crew of 3, two technicians and one reporter. A panel truck, van or station wagon is required to transport the top-mounted microwave dish. Back at the studio, editing units are required, and they run about \$13,000. Sony's VO-2850 is commonly used. CVS and Television Microtime offer top-of-the-line capability in time base correctors, running anywhere from \$8-10,000. The microwave link will cost upwards of \$20,000. As was noted above, there are no standards yet, and the above will certainly change as more and more companies get into the ENG field.

*IVC introduced new automatic threading cartridge unit, the VCR-200 on the exhibit floor. The exhibits also revealed other new VTRs, cameras, TBCs and microwave gear as other sections in this report reveal.

FM age with IM distortion guaranteed under 0.5% in stereo and other characteristics to match. The transmitter line includes models for 10 watts, 1 kW, 2.5 kW, 5 kW, 10 kW, 20 kW and 40 kW.

Collins has also taken over sales of the Sequerra Model BR-1 FM monitor receiver, an all-out design that is advertised to allow a whole range of measurements and observations on the FM signal—separation, harmonic distortion, peak deviation, presence of 19 kHz pilot, and many more.

RCA brought in two new AM transmitters, the 5 kW BTA-512 and 10 kW BTA-10L2, using an improved version of RCA's Amplitude Modulation method. The main design effort seemed to be toward a "better," more hi fi sound, further evidence that the push for better sound is becoming more general and widespread.

A new RCA FM transmitter shown was the BTF 1.5E1, 1.5 kW model, a self-contained grounded-grid design, solid state except for the final tubes. RCA also had on display a demonstration of its proposed AM stereo
continued on page 66

Farinon Makes It...



Portable, Tunable and Superior

The new FV Portable Microwave Series for Video Transmission from 1.99 to 13.25 GHz

- **Tunable across the band without narrow-band preselection** — For example, the FV(13)P system for TV broadcasters is tunable from 12.7 to 13.25 GHz, with up to 12 crystal-referenced operating frequencies, with no filter changing.

- **Direct frequency-generation at output frequencies** — No energy-wasting, noise-producing multiplier stages.

- **Plug-in units provide baseband options** — Up to three subcarrier channels, clampers, video monitors, modulators and demodulators.

- **Up to 500-foot cable separation of RF and remote units at each end** — without video roll-off or need for equalization.

and these performance characteristics:

- **±.002% frequency stability**
- **60 dB signal-to-hum ratio from dc to 10 kHz**
- **70 dB signal-to-noise ratio from 10 kHz to 5 MHz**
- **1 watt RF output from 6.875 to 13.25 GHz;**
5 watts output from 1.990 to 2.110 GHz

Farinon Electric (DISC), 1691 Bayport Ave., San Carlos, CA 94070, U.S.A. Tel. (415) 593-8491. Telex 34-8491.

... in Canada: Farinon Electric of Canada, Ltd., 657 Orly Ave., Dorval, P.Q. H9P 1G1, Canada.

Tel. (514) 636-0974. Telex 05-82-1893.

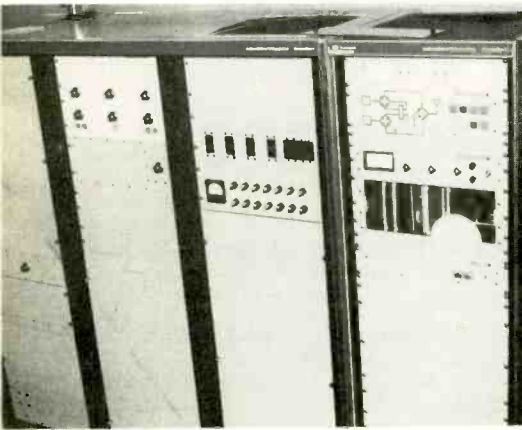
Circle 143 on Reader Service Card

NAB SHOW-IN-PRINT

system, which uses simultaneous AM and FM modulation, AM for the L + R, FM for the L-R, which can be matrixed much as they are in FM stereo, to recover the two channels, RCA suggested the system first as far back as 1960; there are no pressing plans to develop the hardware, mainly a hope that some of the industry will swing over, push a petition to the FCC for consideration of the system.



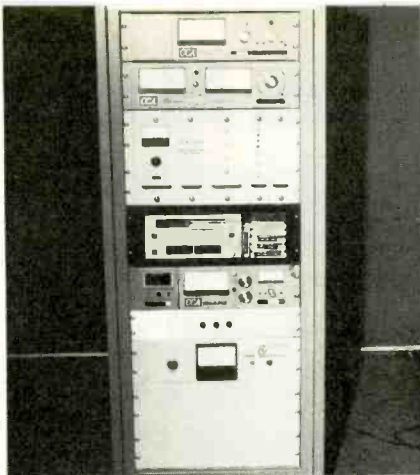
CSI's new 3 kW FM transmitter. 213



One of Collins' new line, the 831H-2 FM transmitter 215



The Harris 18 kW low-band VHF transmitter. 214



CCA's new FM exciter, Model FM-40E. 212



Sparta's 250 W solid state transmitter. 216

Belar, monitor maker, was also demonstrating the RCA AM stereo system, with objectives somewhat similar to those of RCA.

RCA also had, as at Houston last year, a demonstration of its proposed discrete four-channel FM system using RCA's discrete four-channel discs as program material. Sansui showed its matrix encoder, QS-500GE.

Other firms with new transmitters were: McMartin, the BF-3.5K, and 3.5 kilowatt FM transmitter; Sintronic, new 12 kilowatt FM (DFM-12K-B) and 25 kW (DFM-25K-B) CCA Electronics showed a new FM exciter of advanced characteristics that can be used to convert many FM transmitters to stereo. CCA also had on hand their regular line of FM transmitters.

But a brand-new firm, CSI Electronics, Inc., was touting a very complete line of AM and FM transmitters, covering the whole range of power in each case: CSI was formed by personnel who left CCA during or after the recent change of management there.

A new 35 kW FM transmitter, Model 635, was brought in by Sparta. American Electronic Labs was another firm with a new FM exciter, Model FM-20E; and showed in addition their line of AM and FM transmitters. Wilkinson Electronics had their very complete line on display, most shown in earlier years, beginning with the FME 10 stereo exciter, to the 10 watt FM 10, on up to the 25 kW FM-20000-E.

Continental Electronics showed 5 kW, 10 kW and 50 kW AM transmitters, continuing their tradition of special competence in high power rigs. And finally, Nodak, a new brand name associated with Rodelco, showed a 50 kW AM transmitter.

This was a quiet year in television transmitters. On display were familiar models from RCA, Harris, CCA, Aerodyne. Emcee introduced a 1000-watt

UHF unit, Model TTU-1000B. It has low-level IF modulation, 100 watts average audio output.

Antennas and towers

Real excitement was attached to the movement toward circularly polarized TV transmission. The expected important benefits: reduction in ghosting, increase in signal for vertical antennas without loss for horizontal antennas, a more "solid" signal through the coverage area, and other benefits.

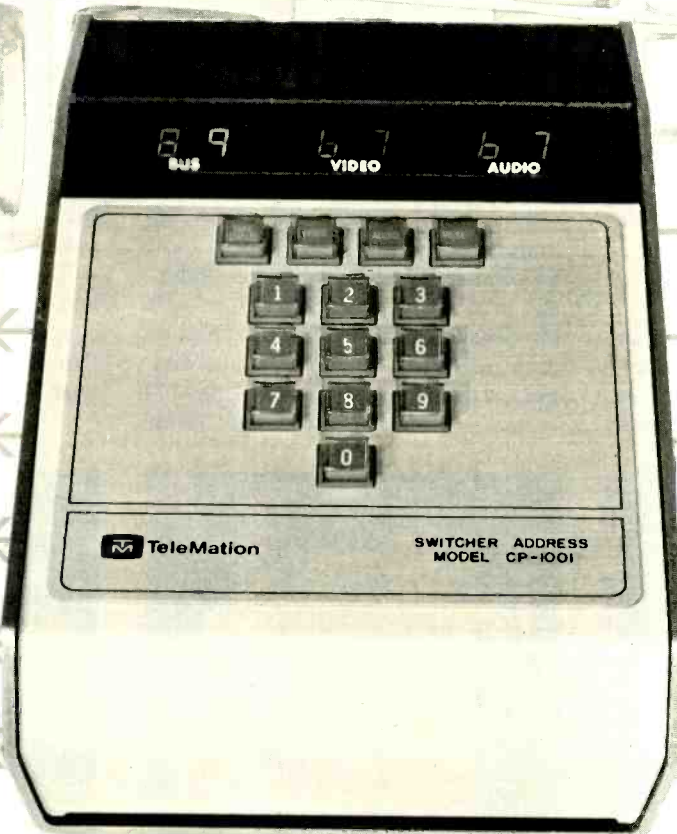
RCA and Jampro have done most of the work in developing the circularly polarized TV antenna, and both had exhibits devoted to the subject. RCA has installed an experimental antenna system of the type at station WLS, on the Sears Tower in Chicago; tests started in mid-1974, with the results highly positive so far. A report on the WLS tests was made at an engineering session by Fred L. Zellner of ABC, who owns the station; Dr. Matti Siukola of RCA gave a paper on the technical background, and on RCA's antenna field tests of prototype antennas.

RCA had a "live" demonstration of the reduction of ghosting with circular polarization, with an A-B check between horizontal and circular transmission to a receiver on the exhibit floor, in range of a strong reflected signal. The strong ghost dropped below visibility when the signal was switched to the circularly polarized antenna. The fact that the sense of rotation reverses at reflections, and that the receiving antenna is designed for maximum response to the original direction, is the basis of the reduction.

Jampro showed a high-power circularly-polarized antenna using spiral radiators around a cylindrical core, developed through about 5 years of design work and testing. A model is

continued on page 68

SIMPLIFY.



with TeleMation's TVS/TAS-1000 Video and Audio Distribution Switcher—single coax controls up to 100 inputs x 100 outputs

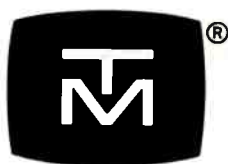
Why tolerate a bulky, complex routing switcher that is difficult to install and inconvenient to control. TeleMation's remarkable TVS/TAS-1000 switcher is the simple solution.

The compact TVS/TAS-1000 features a single coax control cable — up to 2000 feet long. All desired control units may be tapped on the single cable. Control methods available range through 10-key, thumbwheel, pushbutton or EIA RS-232C interface to computer control. Within that broad selection, control units can be supplied that allow either separate or audio-follow-video

switching. Each crosspoint is computer-tested in fabrication to ensure performance within specifications.

A "refresh memory" option restores crosspoint selection in the event of power failure. The TVS/TAS-1000 is equipped with conventional driven, vertical interval switching . . . or choose optional self-synchronous, vertical interval switching. Status monitoring of the switcher is afforded by an optional character generator display.

For detail information, contact:



TeleMation

P. O. BOX 15068, SALT LAKE CITY, UTAH 84115, (801) 487-5399

Circle 144 on Reader Service Card

NAB SHOW-IN-PRINT

in regular on-the-air use at KLOC in Modesto, California, under special temporary FCC authorization. Testing is continuing with an elaborate field set-up, allowing A-B comparisons with a special horizontally polarized antenna with the same aperture and ERP as the circularly polarized model. Switching is automatic and the test uses, among other techniques, coded slides, which viewers were asked to evaluate.

At the conclusion of the tests Jampro will submit a full report to the FCC, along with a petition for a rule-making. It is expected that RCA will similarly petition the FCC.

Another series of CP television antennas was shown, this one by Micro Communications Inc., of Manchester, New Hampshire. The various models use

arrays of crossed broadband dipoles in front of ground screens or panels. MCI has sold several of the antennas for foreign use, and like RCA and Jampro, is hopeful that the FCC will soon open the way to US marketing.

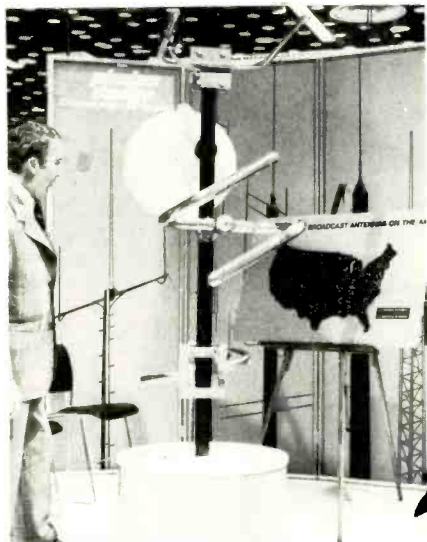
A second area of intense antenna interest was in the microwave types for electronic news gathering. As described in detail in BM/E's January report on ENG, Nurad has a strong position in this area at the present time with their "selective polarization" antenna system, which allows the operator to choose any of four polarization patterns.

A similar system has been introduced by Micro Communications, and was on display. It has four antennas in a quadrant configuration, with the antennas and the polarization of each antenna selectable by remote control, as does the Nurad. Thus, the MCI system allows, like the Nurad, signal

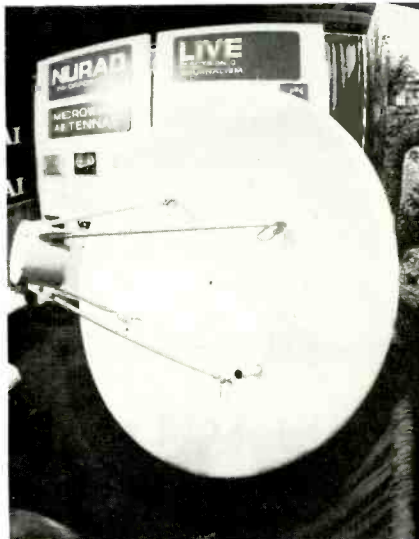
maximization by antenna and polarization selection "on line," without interrupting the program—an aid to speed that is important in electronic news gathering. MCI reports that a number of the antennas are already in regular use, at the Empire State Building, and on Mt. Sutro and Mount Wilson in California, among others.

A number of firms showed "standard" antennas for AM, FM, and television. Jampro, MCI, and RCA all had extensive lines of broadcast antennas, as did Alford, Andrew, Collins, CCA, and Harris. Phelps Dodge introduced a new series of FM antennas. MCI showed a new horizontally polarized VHF antenna.

Towers were exhibited by Allied and Utility Tower of Oklahoma City. A spokesman there proudly told BM/E that Utility was celebrating its 30th year of continuous presence at the
continued on page 70



Phelps-Dodge's new line of high-power FM antennas. 217



Nurad's microwave dish for ENG remote-studio links. 218

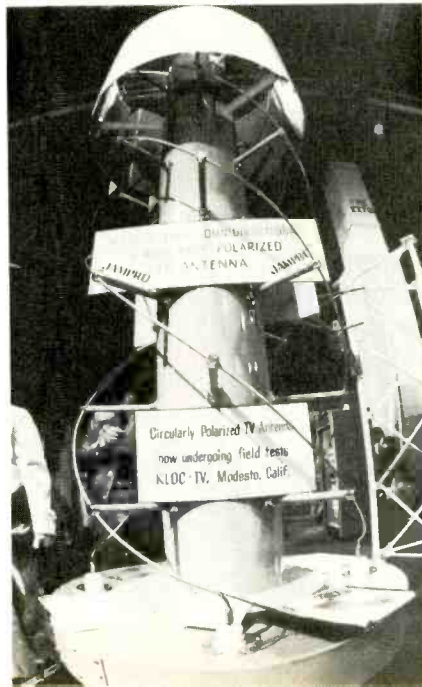


RCA TV antennas used in demo of circular polarization.



Allied Tower emphasized their Western home base.

Jampro showed actual section of circularly-polarized television antenna. 219



Flash Technology's high-intensity strobe light for antenna towers. 220



Buy JVC's Color Portable 4800 System Complete or... Just Buy the Camera...

Either way you'll get a portable color camera that takes true to life pictures in available light under conditions previously not possible and a camera control unit (CCU) that adjusts to a wide range of lighting conditions with a flick of a switch. Some professionals have compared the quality of this small camera (weighs less than 8 pounds) to studio cameras costing many times more.

Of course when you buy the entire system, you also have a 1/2" EIAJ-1 standard color tape recorder including: an AC adaptor, RF converter, Battery, Car Battery cord, tape all the cables, filters, etc. and two especially designed metal carrying cases to keep components together for protection in transit or storage. JVC took special care to design this video equipment to be reliable so not just any ordinary cases would do. JVC thinks of everything.

Get all the facts about this unusual color camera system that can be purchased any way to fit your budget situation.

JVC Industries, Inc. In Chicago: 3012 Malmo Drive, Arlington Hgts., Ill. 60005, 312-593-8997. In Los Angeles: 1011 W. Artesia Blvd., Compton, Calif. 90220, 213-537-8230.

Lens of the small hand held color camera, model GC-4800U, shows the complete system that may be purchased separately or as a unit.

BUY A JVC COLOR PORTABLE NOW!
CASH REBATES
 FOR NAME OF LOCAL DEALER CALL
 NEAREST JVC OFFICE OR USE COUPON
 offer expires May 31, 1975



Metal VTR case has room for: video tape recorder, battery pack, AC adaptor, tape reels and all connecting cables.



Metal camera case, with casters, holds: camera, CCU, RF converter, car battery cord, remote cable, camera adaptor, neutral density filters, earphone and cleaning kit.

JVC
 JVC INDUSTRIES, INC.

JVC Industries, Inc.,

50-35 56th Road, Maspeth, NY 11378
 (212) 392-7100

- Please send information on complete system on camera system on VTR
- Name of nearest dealer
- Please arrange a demonstration.

Name _____

Title _____

Organization _____

Address _____

City _____

State _____ Zip _____

Phone Number _____

NAB SHOW-IN-PRINT

NAB show; certainly very few manufacturers in the field can match that.

An antenna accessory that has become important with the FCC's recent ruling on the subject is the strobe warning light. Two firms showed complete strobe light systems for antenna towers: Flash Technology, of Nashua, New Hampshire, and Dielectric, division of Sola. Both were on demonstration and provided some eye-boggling moments, pointed toward the trussed-filled ceiling of the exhibit hall. The change from day to dusk to night intensity is automatic in both systems.

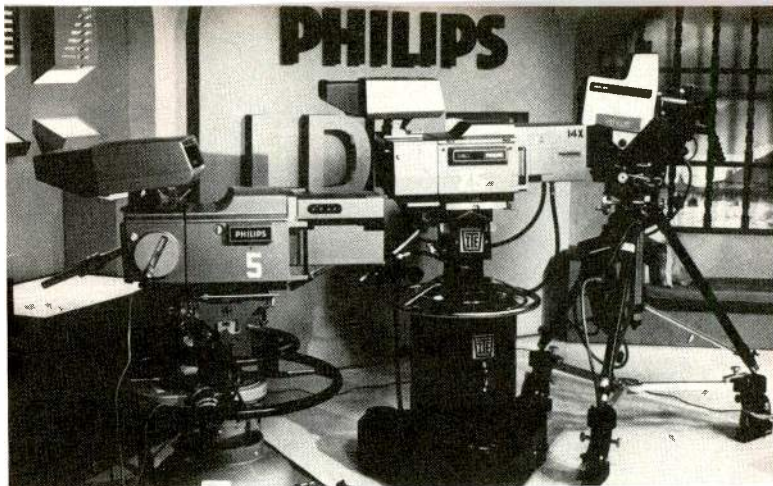
Studio cameras everywhere

One of the surprises at the 1975 NAB convention was the fact that there were so many fine studio cameras shown. In fact they were so numerous one wonders if there are enough customers out there to support the many suppliers: Thomson-CSF, Fernseh, RCA, Harris/Gates, Ikegami, Ampex, IVC, Hitachi, CEI, Editel, and Marconi—not to mention slightly lower quality closed-circuit cameras which are near-broadcast quality in performance.

Prior to the show we would have been tempted to say that Thomson-CSF would get the lion's share of attention due to its first appearance at NAB since 1964. Riding high on the acceptance of its TTV-1515 studio camera by CBS Television network for mobile use, Thomson declared it had



The new Harris TC-50 color camera. 222



Two studio and one field camera in Philips' new line up.

221

the most modern and reliable triax cable camera on the market. Use of triax between camera and the control unit speeds setup and tear down at remote locations.

The TTV-1515 boasts continuous automatic registration, automatic synchronization, excellent pictures down to 10 ft-candles, contour correction with an adjustable comb filter (leading to a quiet picture), easily removeable pickup tubes and a conversion feature which allows use of triax and a multiconductor cable. The CCU is small and compact.

But Thomson was not alone in all of these claims. Obviously getting the message was Bosch Fernseh. Fernseh unveiled at the show its new KCK Pacesetter studio/field broadcast TV camera. According to the company, the new camera was designed expressly to meet the operational requirements of the American major networks. Like the Thomson-CSF camera, it can operate either as a multiconductor or cable unit or on triax. With multiconductor cable, the KCK can operate ½ mile from the CCU; with triax, the camera head can be 1.5 miles away.

Like the Thomson-CSF entry, the CCU is small. Fernseh's unit requires only 7-in of rack space and the CCU contains a host of automatic features: H and V aperture correction, encoding (NTSC, PAL OR SECAM), and color bar generator-split field with I and O. One man camera registration is offered. Stressing ruggedness and light weight, Fernseh said the case of the KCK is cast aluminum and the chassis magnesium alloy.

As announced prior to NAB time, a whole new generation of cameras was available for inspection by Philips Audio Video System Corp., a new corporate entity which now includes Philips Broadcast Equipment as a divi-

sion. Top-of-the-line for studio use was the LDK-5. As a digitally-controlled camera operating on triax, it was described by Philips as the successor to the PC-100. The LDK-5 is not exactly new however—it was shown at the International Television Symposium in Montreux in 1973. Complimenting the LDK-5 studio unit is the LDK-15 portable color camera which is comparable to the studio unit but divided into three parts: the camera head, hippack and a portable processing unit.

A third new camera, and the newest in the family was the LKD-25. This is a lower-cost intermediate camera which doesn't use digital multiplexing control techniques. Thus it is a conventional multiple conductor cable unit. Many of the modules used in the 25 are similar to those in the higher performance camera. It does contain many automatic features, with variable matrixing as an option. Other studio cameras in the Philips booth included several LDH models, the distinction being that K stands for broadcast quality and H for closed circuit quality.

Another top-of-the-line camera on display at Las Vegas was the Ikegami TK-355. It is a studio unit but, because it is compact in size and light in weight and features easy set up procedures, it can be used in the studio or in mobile trucks. The unit was considered by some to be the most advanced camera on display by virtue of a built-in microprocessor in the CCU which facilitated simple fast set-up and alignment. Through advanced circuitry, the stability of registration, video level and black level were very high.

Yet another brand new camera was the Harris TC-50—the first to be "Harris-designed." Using one-inch Plumbicons and prismoptics, its design incorporates remote control op-

continued on page 72

Fewer parts... fewer problems with **audiopak® A-2** broadcast cartridge

*Ribs are molded into the flange—
no pencil leads
to break and jam.*

*No top wire.
Reloading's easier.*



*Tape guide is
an integral part of
the cartridge base
— not glued in —
to insure accurate azimuth control.*

Try one free

In the broadcast cartridge world, the simpler the better. That's why the design of the audiopak A-2 eliminates parts that can give you trouble.

The lessons learned from our years of experience developing the world's leading 8-track cartridge have been applied to our audiopak A-2. The result is a more durable, more reliable broadcast cartridge. And because we manufacture the entire product—from tape to packaging—we can assure you of the highest possible quality control.

We're so sure we have the best product on the market, we want to prove it... at no cost to you. For

your free sample and more information on the audiopak A-2 broadcast cartridge, write on your company letterhead to: Capitol Magnetic Products, Division of Capitol Records, Inc., 1750 North Vine St., Los Angeles, Calif. 90028. Attention: Marketing Manager, Professional Products.

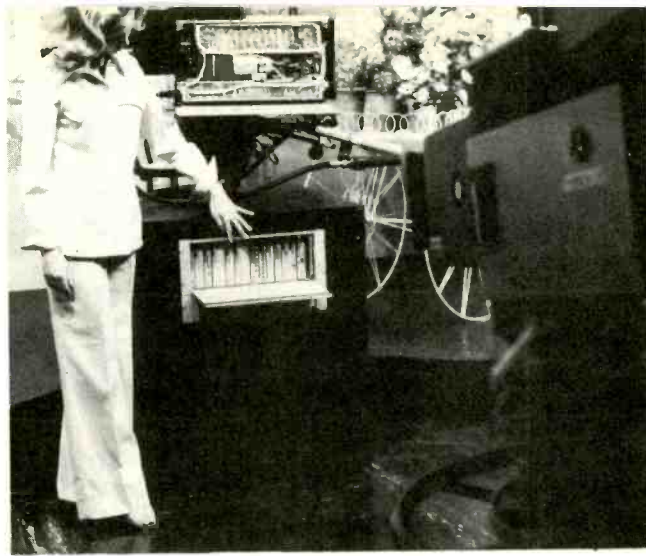


CAPITOL MAGNETIC PRODUCTS
A DIVISION OF CAPITOL RECORDS, INC.
LOS ANGELES, CALIFORNIA 90028
A MEMBER OF THE EMI GROUP





Fernseh introduced the Pacesetter field/studio unit. 223



Thompson-CSF TTV-1515 unveiled at NAB. 224



Hitachi modular SK-70 in studio configuration. 225



New Commercial Electronics Inc. Model 285. 226

eration. It offers many features and is designed for easy serviceability, yet is moderately priced.

In the intermediate range was a new CEI 285 camera. Commercial Electronics described the improvements of the 285 over the 280 as "more operator-oriented features." This included a tiltable viewfinder and a camera remote control system.

In the new studio camera category we should mention the Hitachi SK-70 described earlier under ENG cameras. Since its processing unit can be modularly integrated with the camera head it is also a studio camera. Hitachi also showed a new FPC-1000P three-tube 2/3-inch Plumbicon camera.

Aside from ENG entries, neither IVC nor RCA showed new studio cameras—though the colorimetry of the IVC 7000 first unveiled at Houston looked improved. IVC deliberately included delicate shades of color in the exhibit-floor studio to show how discriminating and flawless the camera was. Both IVC and RCA talked about flexibility particularly with their portable versions of studio cameras—the

IVC 7000P and the RCA TKP-45—when used with triax adapters.

RCA did lighten the control unit of the TKP-45. Typically the camera head can move 1500 feet away from the CCU unit. With the addition of optional triax cable adapters, the cameraman can range up to 5000 feet from the video taping point or the microwave station. The TKP-45 can also handle a 30 to 1 zoom lens.

The IVC unit also could move up to 5000 feet away from the base station by virtue of triax. In effect *all* the, major camera manufacturers tried to show the same distance capabilities in 1975 through triax.

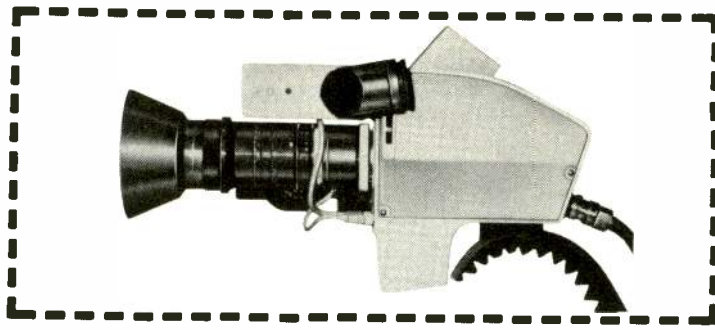
Marconi was at NAB with its MARK VIII-B studio camera which allows automatic line-up and color balance in three minutes. Marconi has added a lithium-niobate delay in the aperture corrector resulting in pictures better than 50dB. Over 250 cameras have been sold world-wide.

Ampex devoted none of its exhibit space to the BC-230B broadcast camera, but had five on location at other exhibitor's booths.

Camera lens keep pace with cameras

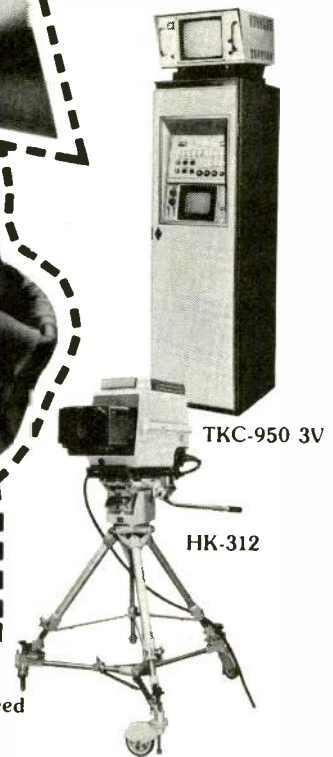
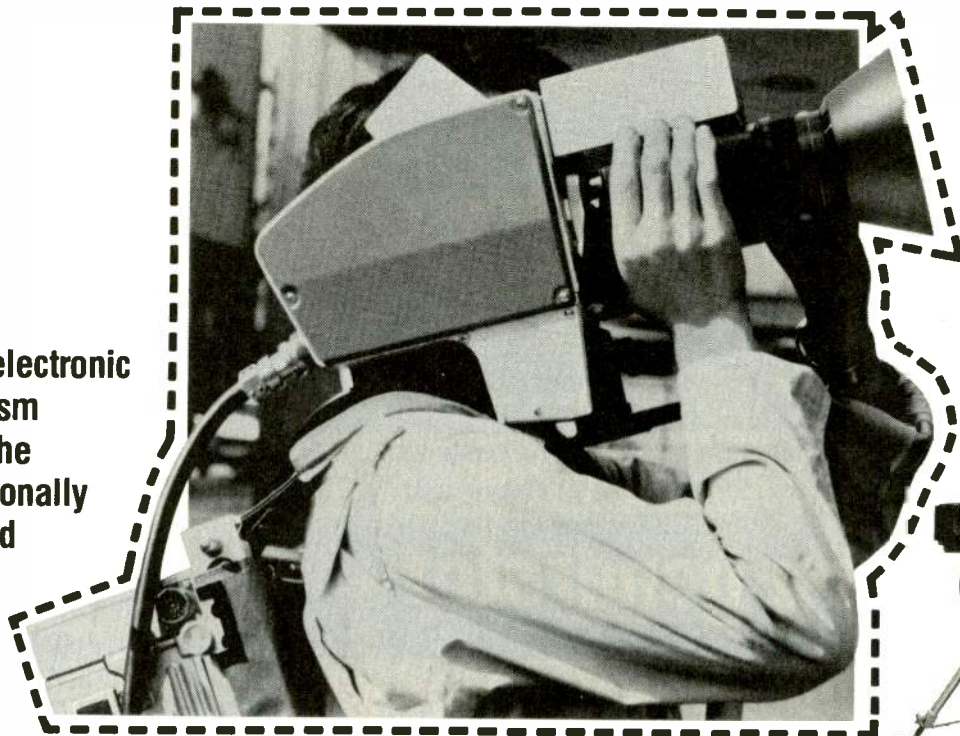
Perhaps the biggest lens news at NAB 1975 was the number of big lenses adapted to fit the growing number of portable cameras. It looks a bit incongruous seeing lenses bigger than cameras, but that's what it will take to cover sporting events. From our observation, Tele-Cine has moved most aggressively into this area. We saw the Schneider (sold by Tele-Cine) 30 to 1 zoom on an RCA TKP-45 and Fernseh KCP 40 unit (which is slated for use by the Canadian Broadcasting Co. in covering the Canadian Olympics in 1976). Brand new at the show was a 20 to 1 zoom by Schneider and it was on cameras in the exhibits of RCA, Philips, and Fernseh. Both the 20 to 1 and 30 to 1 zooms from Schneider are continuous (not range change) zoom types.

Canon, as in previous years, had a huge display. New zooms this year were a super wide angle 10 × zoom
continued on page 74



Introducing the high sensitivity Ikegami HL-35: The broadcast industry's smallest portable professional color camera.

For high
quality electronic
journalism
rely on the
professionally
designed
HL-35.



Presidential conferences. Sports events. Crime. Entertainment. National disasters. Human interest.

News won't wait. When it happens . . . it happens fast. And you've got to get to the story just as fast.

That's why the new Ikegami HL-35 is so important in Electronic News Gathering. It's small. It's flexible. It's reliable. So it gets in quick, gets in close and gets the coverage with the quality you'd expect from a studio camera.

The Ikegami HL-35 is fantastically lightweight too . . . the head is under 12 pounds and the backpack only 22 pounds. It's

completely self-contained. It can feed a VTR or go direct to air . . . or a combination of both modes.

Today Ikegami Portable Professional Broadcast Color Cameras are used by all four networks and many Independents throughout the country.

Ikegami also manufactures the HK-312 three-tube type high quality Studio Color Camera featuring the 1 1/4" Plumbicon tubes and the TKC-950 3V Color Telecine Camera for professional filmchain.

For more information or a complete demonstration write to Ikegami today.



IKEGAMI ELECTRONICS (USA) INC.

29-19 39th Avenue ■ Long Island City, New York 11101 ■ Telephone: (212) 932-2577

Circle 147 on Reader Service Card

NAB SHOW-IN-PRINT



One of the many new Schneider lenses. 227

(12mm to 120mm f2) for the one-inch hand held camera, a new mid-price 25x double zoom for 1-in tube cameras and its 34 × 1 field zoom for both 1 and 1½-inch tubes.

Angenieux continued to feature most prominently its 15 to 1 zoom which it claims to be the most popular broadcast lens in the world. It also showed the 18 to 1 turreted remote lens, i.e., three 8 to 1 zooms in one unit.

A surprise in the lens category was the impressive display by Fujinon Op-

tical Inc. Fujinon was there with a full line of lenses used extensively in Japan but less well known in the States—in



Comquip showed a new fixed lens adapter. 229



New Fujinon lens now available in U.S. 228

fact, they weren't available until recently.

Fujinon's principal claim to fame is its electron beam coating process (EBC) which minimizes ghosts and flare but has 99.8% light transmission. The company coats up to 13 layers in its zoom line. Among the lenses from Fujinon was an image rotation lens for special effects.

Camera Stands, Accessories

Innovative Television, Quick-Set, and Listec were at NAB 1975 showing everything from camera heads and simple tripods to cranes (the Vinten Model 743, Kestrel Camera Crane in Listex's exhibit). Innovative had two new products, a studio pedestal and H-3 cam head.

Power Optics, as in previous years, featured a digital remote camera control system for broadcast camera. This year the company also showed how telemetry control over long distances would work.

Several pieces of prompter equipment used standard typewriters—not oversize type faces. An intermediate

continued on page 76

introducing...

Datatek

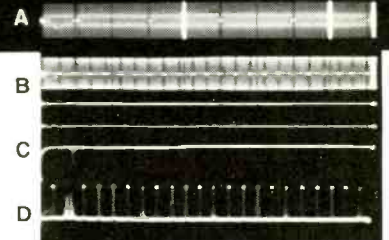
video sweep generator

TYPE D-630



Features:

- Self contained video sweep generator with internal or external sync and blanking
- Wide sweep range, variable up to 10-0-20MHz or 20-0-10MHz. Excellent linearity
- Variable sweep rates from 20 sec. to 1/60 sec. Fixed rates at power line and video field (locked) frequencies. Manual sweep.
- Sweep range set by separate start frequency and finish frequency controls. Sweep reversible.
- Built in frequency readout, switchable to show start, finish, variable marker and sweep output frequencies.
- Comprehensive marker facilities. Fixed markers at 1MHz and 5MHz intervals, color and aural subcarrier frequencies. Two continuously variable stop markers. External marker input.
- Symmetrical marker blanking in sweep output. Separate marker pulse output.
- Internal or external sweep modulation, for applications including envelope delay measurement, detected amplitude displays, etc.
- Conveniently small unit, with signal connector facilities for either front or rear access.



- A. Modulated sweep, non-comp., 2-0-20MHz, marker blanking 5MHz intervals, variable stop markers at 7.5 and 17.5MHz.
- B. Composite video sweep, 2-0-20MHz, marker blanking at 1MHz intervals.
- C. Detected non-comp. sweep, variable stop markers at 7.5 and 17.5MHz.
- D. Marker pulses output, 1MHz intervals (5MHz intervals evident).

DATATEK

CORP.

1200 W. Chestnut St.
Union, N.J. 07083 (201) 964-3656

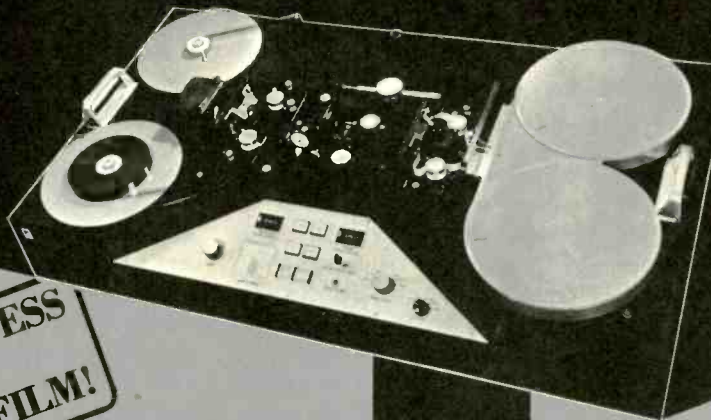
PSC "PROFESSIONALIZES" . . .

SUPER 8

. . . announcing
our new

ACME MINIPRINTER

PSC now brings low
cost, professional
quality optical
printing to Super
8 mm and 16 mm film
duplicating with
the
**ACME
MINIPRINTER**



**OUR BUSINESS
IS
MOVING FILM!**

FEATURES

- Camera/Projector Forward Reverse
- 1200' Camera Magazine Capacity
- 1000' Projector Magazine Capacity
- Variac Lamp Brightness Control
- Lamp Meter in Amperes
- Stop Motion
- Fréeze Frame
- Speeds from 80 to 960 Frames/Minute
- Interchangeable Movements & Lenses
1-1, Blow-up & Reduction
- Eyepiece for Camera Line-up
- .001 Dial Indicators for Focus Placement
- Daylight Operation
- Professional Quality Lenses
- Filter Holder for Color & Density Correction
- 5-Digit Frame Counter, Camera & Projector
- Fades & Dissolves
- Operates from 115 volt, 10 amp Circuit
- Portable
- Ruggedized for Heavy Use

ADVANTAGES

- Professional quality prints.
- Low cost, easy to operate.
- Does not require dedicated space.
- Has same features as most \$45,000 optical printers.
- Excellent return on investment.
- Perfect as a teaching tool in colleges and universities.
- Within budgets of colleges & universities.
- Excellent unit for labs and special effects houses which specialize in Super 8mm.

Want more information?

*Call, cable or write to D. E. Stults
or N. J. Mastrogiovanni.*



PSC (formerly Producers Service Corporation)
**TECHNOLOGY
INC.** Acme Products Division

1200 Grand Central Avenue,
Glendale, California 91201

(213)245-8424

Cable: PRODUSERV Telex 69-8231

NAB SHOW-IN-PRINT

camera aimed on the VPS-100 or VPS-300 transmitted the script to the prompter/monitor mount on the camera aimed at talent.

At the Listec booth, a light Portaprompt for mobile van use was shown. The unit comprises an overhead projector with the base removed, to which is added the EDS transparency drive unit. Script is typed on special transparency paper and loaded beneath the Portaprompt. Image is projected onto a small screen beneath the camera lens.

The editor explosion

VTR editing equipment was prevalent and prominent for several reasons—manufacturers were on hand to aid and abet electronic news gathering, by offering editing equipment for that requirement, editing manufacturers to aid and abet the takeover of film by tape offering more versatile equipment, and manufacturers demonstrating new philosophies to production ala video tape. In the first two of these categories there was a mixture of the sophisticated and the simple; in the later, Television Research Inc. stood alone offering a new direct Trichroma III scheme.

Editing demonstrations were different from previous years in two conspicuous ways—both involved the actual production, on the exhibit floor, of a finished video tape TV segment. First there were the "joggers." These were a group of six young men who jogged around the convention floor



New Prompt system from Q-TV/Telesync and new pedestal from ITE.



New pedestal by Quick-Set.

249

being taped on Sony ENG equipment ending up at the CMX exhibit. There, their purpose became clear—to call attention to a new jogging feature of the CMX System/50 editor—the ability to "jog" through a scene virtually on a frame-by-frame basis. Sony supplied the ENG crew because Sony 2850's are a part of the CMX/50. At the CMX booth some 13 minutes of footage was quickly edited into a 60 sec news special that an hour later appeared on the 6 PM news of a local Las Vegas station.

The CMX/50 system, first shown last year at NAB, had some new features added by the time production units began to get delivered in October of last year. Principal among these was a longer memory storage—in the minicomputer up to 999 events. This increased capacity meant that complete TV shows could be edited as single segments. Half hour shows typically contain 125 to 150 edit decisions. A one hour show might have 500 edit decisions or transitions.

Throughout the show, CMX demonstrated sophisticated editing often using a guest editor from a production company. Workprints were produced on videocassette which, in practice, get submitted to the producer, director, or client for review and approval. If modifications are required, the CMX/50 system has a function which permits the operator to scan a list of edit decisions. This speeds up any re-editing. The 2850 recorders allow stop action to permit inspection of a frame of information.

The second live edit demo was the "dramatic" production at the TRI booth of one person, Las Vegas Sally, playing two parts. The complete skit (humorously understaged) was assembled using the EA-5 editing system which operates like film Movieola equipment, i.e., tape reels can be

rocked back and forth until the right scene is found. Up until now, TRI has relied on counting VTR cue or audio track pulses. At the convention, TRI also revealed a SUN I TM series of time code equipment which encodes and reads standard SMPTE time code in the video (which can be displayed on any monitor). When SUN I is used in connection with the EA-5 editing control system, edit point decisions are automatically logged on the tape. Virtue of the pulse counting scheme, of course, is its low cost.

But TRI was demonstrating more than editing equipment. The primary objective was to demonstrate a new video tape recording technology, Trichroma III TM. Trichroma III refers to direct R-G-B recording on tape with NTSC encoding added after recording. Essentially, TRI took IVC one-inch tape decks, added their own electronics, and consequently, layed down a full video bandwidth track with signal to noise ratio better than 50 dB.

Two 15 kHz audio channels (with a noise reduction system) offered independently editable audio channels with a S/N better than 60 dB. The way TRI put it, the recording system is now an integral part of the camera with NTSC encoding taking place after the VTR. Normal color degradations such as moire, differential phase and gain are introduced only by the output encoder's performance. By not encoding before recording, there is minimal degradation in getting from master raw tape to an edited dub. This permits on-line editing with no loss of 2-3 dB as a result of re-editing or dubbing a copy.

Two editing systems were operating in the Central Dynamics booth. One was the computer controlled Tape Editing System, PEC 102, controlling

continued page 78



Portaprompt system at Listec exhibit. 250

PEC-102

A Complete System Approach to Computer Controlled VTR Editing... by Central Dynamics

A frame-accurate editor for creative people, designed for your present and future requirements... with outstanding features including:

- Mimic CRT diagrams for Off-Line and On-Line edit modes graphically display current status of all operations including data entry, scene location, edit rehearsals, and automatic assembly.
- A control panel designed for the editor.
- Instant "call up" and control of all computer programs.
- Edits on any frame... with accurate color framing.
- Continuous SMPTE Time Code recovery and display for faster and more reliable editing.
- Audio edits can be offset from video and executed in the same pass.
- Edit-on-the-Fly.
- Performs open ended edits.
- System stores up to 600 edit scenes. Any edit scene can be called up, displayed, rehearsed, and changed at any time.
- Automatic control of audio/video switcher with full Mix/Effects capability.

- Interfaces to Quad, helical, multi-track audio machines and SLO MO's.
- Hardcopy output of edit decisions printed on demand.

The PEC-102 is an example of our "Total Design and Manufacturing Approach" to video tape editing systems... Hardware, Software and Service... all by Central Dynamics.

If you need more convincing, send for our PEC-102 and editing equipment brochures, or ask to see the PEC-102 in action. They are operating in most major cities across the country.



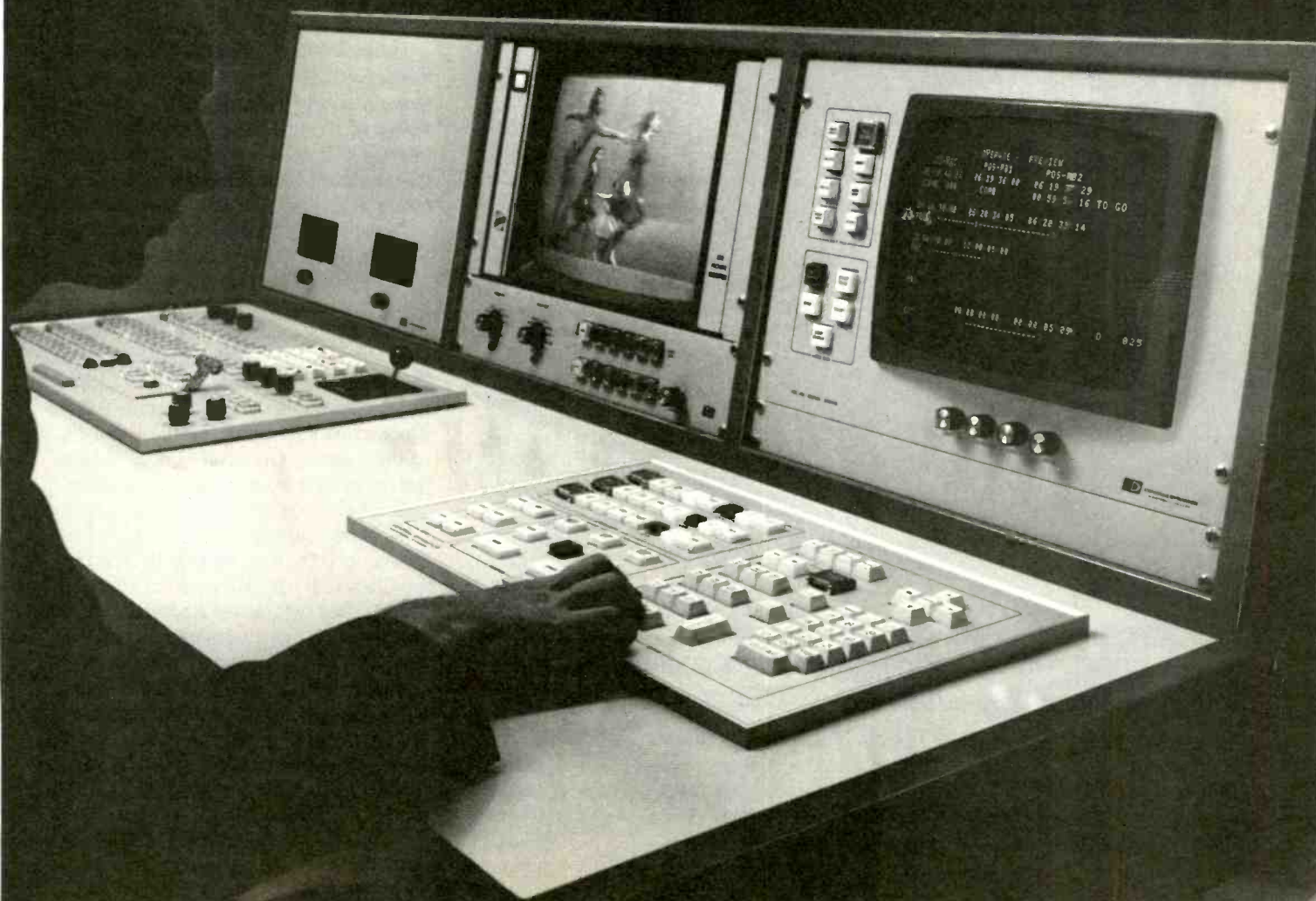
CENTRAL DYNAMICS LTD

Canada:

147 Hymus Blvd., Montreal, Que., H9R-1G1
514-697-0811

U.S.A.

230 Livingston Street, Northvale, N.J. 07647
201-767-1300



NAB SHOW-IN-PRINT

three Ampex AVR-2s. This system is designed for TV station editing requirements and can control quad and helical machines. It edits automatically and accurately to a single frame. Both of these editing systems were displayed last year at Houston. A professional editor was on hand to demonstrate on-line editing.

The major editing theme at Datatron was modular flexibility. Datatron of-



CMX highlighted System 50 for off-line editing.

251

Reel-to-reel... for real



Exciting things are happening in the reel-to-reel market. And it's all caused by a new machine called the ITC 850 Series. Here is the result of a long series of consultations with broadcasters to determine what they most desired in a reel-to-reel machine. Then we added a few innovations of our own. Truly, the 850 Series is equipment designed specifically with the professional broadcaster in mind. Some 850 features: motion sensing, multi-function edit mode, super quiet operation, automatic tape lifters, TTL logic circuitry, capability of handling dissimilar size reels. . . and more too numerous to mention here. If you're in the market for something new and vastly improved in reel-to-reel, a **collect** call to us will reveal an interesting story that you may have been waiting to hear. Make the real move to reel-to-reel. . . ITC. Collect number 309-828-1381.



INTERNATIONAL TAPETRONICS CORPORATION

2425 South Main Street • Bloomington, Illinois 61701

Marketed exclusively in Canada by McCurdy Radio Industries Ltd., Toronto

Circle 151 on Reader Service Card



Recortec's low-cost editor.

252

ferred full SMPTE time code editing system with the option to purchase only as much as currently needed. The system could be expanded without obsolescing any initial investment. Expansion includes adding complete automatic computer controlled capabilities. Datatron's three-machine editor could work with either quad or helical VTR's.

Datatron also displayed a typical ENG editing system—the type which has received so much attention by virtue of its installation in several stations. The ENG system consisted of a two-machine SMPTE electronic editor controlling Sony 2850 VTRs.

In the strictly ENG editing category, Sony showed its pulse counting editor system for assemble using U-matic 2850 recorder/players.

Editing equipment that has been available before was displayed by Dynasciences and Video Aids of Colorado. These units precisely control the moment of editing by applying pulses to the existing cue head. These pulses are later retrieved to perform switching functions.

A new low cost editor, the Edimatic-100, was shown by Recortec. This unit uses pulses from an electronic timer such as the Recortec video tape timer. It can automatically control quad VTRs in a master-slave editing configuration. It permits rapid assembly of a sequence of selected segments of the master onto the slave. Zero slip-page is attainable if the VTR has a buf-

continued on page 80

Grand color monitors...Great dollar savings!

Anyway you look at them, Unimedia's SMT color monitors are good news! Professional quality . . . affordable prices.

The SMT Line is a complete family of one-gun color monitors, from 9-inch portables and rack models through 12, 15, 17, up to 19-inch rack-mount models. All share the same clean styling, single gun color tube picture quality, and blue-gun only set-up convenience. Professional options include pulse-cross, A-B input, external sync, switchable underscan, and tally-light features. Most are priced right around \$1,000. Some higher . . . some considerably less.

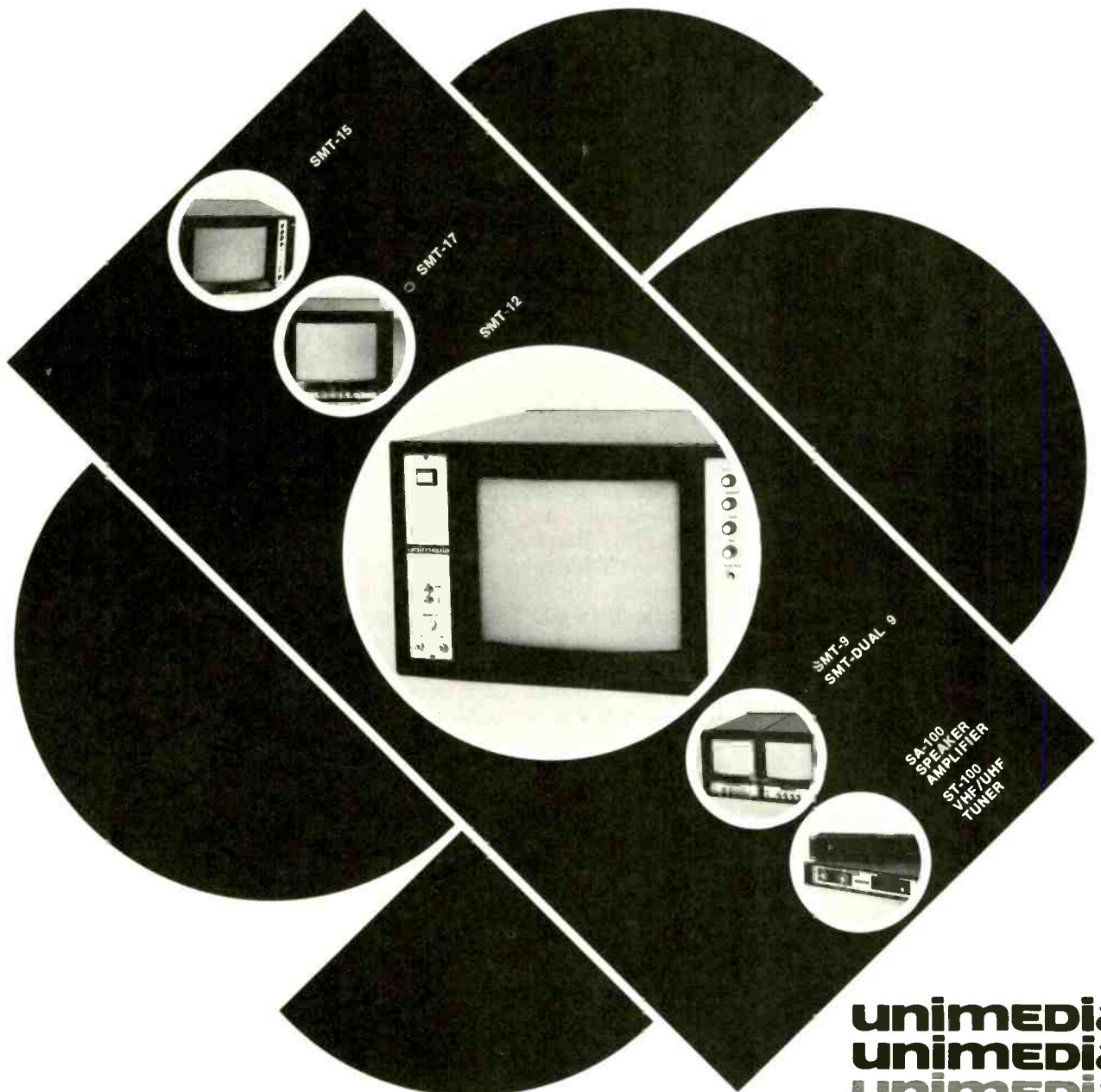
If you're a broadcaster, CCTV or Cable operator, or production studio operator you can share in the dollar savings inherent in Unimedia's simple, straightforward SMT design. Now you have a golden opportunity to replace obsolete monochrome models with new SMT color monitors at attractive prices. Or replace temperamental large-screen color jobs with SMT 12s, 15s, 17s, or even the new 19s.

If you're starting a new facility, Unimedia monitors can save enough to buy you an additional piece of needed equipment.

And Unimedia SMT Color Monitors are professional in every sense of the word. Their long-term dependability is the result of engineered design simplicity and quality components. We've delivered over four thousand units to satisfied customers in the last four years. You'll find NTSC and RGB models. In the nine-inch line you'll choose from singles, duals, and combination models with waveform monitors, vectorscopes, or audio speaker-amplifiers. Or combine a color nine with a high resolution monochrome nine for camera focus and registration.

You really owe it to yourself to check out the complete Unimedia line before you install another monitor in your facility. Write . . . or phone today. Remember . . . saving money isn't all that bad!

UNIMEDIA, Lake of The Pines, Auburn, California 95603
Telephone: (415) 782-2600.



unimedia
unimedia
unimedia
unimedia

Circle 152 on Reader Service Card

NAB SHOW-IN-PRINT



Central Dynamics editing demonstration



Datatron showed several editing systems.



TRI created a production on the spot.

ferred tape drive such as is attained with AVR-1s or those older machines modified with Recortec R-Mod. Unit is available for only \$1750 to those who have VTRs equipped with R-MOD.

Another low-cost editor was shown by Beta Technology (in the World Video booth). The Beta Editing Timing Control Unit is designed for operation with video tape machines equipped with Splice Control and Splice Logic. It provides for accurate frame timing of ADD-ONS and INSERTS along with advance and retard capabilities of the edit point in one-frame increments. The unit will make an Audio and Video or an Audio only edit. The timing of the incoming material is not controlled by this unit; only the point on the tape to be edited is controlled.

The unit is designed to make an accurately timed video switch, eliminating the 18 frame delay between the time when the record button is depressed and the time that the video switch occurs. Price is \$3100.

Super Signal Handlers—more on the way

Last year we called them super time base correctors. We are referring, of course, to those A/D-D/A devices that could digitize incoming TV signals, store over a field of information and then read it out in synchronization with station sync. These wondrous devices exhibited by CVS and Nippon Electric Corp. (in TeleMation's exhibit) meant one could lock (and therefore mix, fade, or wipe) non-synchronous incoming signals with local sources. During this past year, TeleMation captured most of the sales for this device. Its synchronizer, which could store a full frame, was quickly ordered by NBC and ABC networks—events which promoted public contract signing and much picture taking. At NAB 1975 it was CVS's turn.

CVS returned with a perfected CVS 600-2 which could, *one*, synchronize and *two*, compress incoming signals. Synchronization meant storage of a field; compression meant clocking out the video data so that the resultant is not only locked to a reference input but is reduced 2 to 1 (half-size in optical terms). That reduced picture can be positioned into any one of six positions and keyed into any other standard signal. This feature, openly impressed the CBS network and the other net engineers were looking closely, too, at the CVS 600-2 shown on the exhibit floor. Back at the Hilton, in a private demonstration before officials of all three networks, CVS unveiled other tricks that could be done with these super signal handlers. CVS said it was looking for inputs on just what features to incorporate into a package. Although mum about what will come next, CVS was naturally, beaming.

While CVS stole the show to the extent that it was the only manufacturer to demonstrate some of the future potential for super signal handlers, Ampex, for one, broke its enforced silence in regard to not talking about future products until in production and intimated to BM/E that it, too, would soon be showing something. Ampex considers its time base corrector technology to be in the vanguard and it expects to be a part of the



Example of CVS video compression. 253

digital signal handling revolution that is in the making.

Production switchers—a few surprises

The surprises in production switchers category at NAB 1975 were the demise of several formerly important exhibitors—Sarkes Tarzian and Visual Electronics (V.E. showed only cart machines). Richmond Hill wasn't present due to the fact that RCA buys its switchers from that company. Sarkes Tarzian, quietly folding its tent, left Vital Industries as the sole producer promoting digital techniques.

Equally surprising were the new sources of switching. Among them Computer Image (a lot of switcher for a low dollar), Industrial Science Inc. (Gainesville, Fla., which last year was part of the World Video booth) and Ross Broadcast Products Inc. (a new source which this year got exhibit space in the World Video booth.) ISI, incidentally, showed a Visual switcher in its booth but word is that ISI won't build the same unit—only service existing Visual switchers. Why doesn't ISI intend to make the unit? That's partly the reason for the new entries. If you design a switcher using 1974-75 electronics you can do more for less. That kind of leaves the older companies holding the bag on price and in some respects, features, such as compactness.

Not that Grass Valley, Central Dynamics or Vital are fazed by all this. These companies feel that their latest generation systems are still state-of-the-art. For Central Dynamics this meant the VSP-1260 with encoded chroma keying was still king. For Vital it is the VIX-114 series with its digital effects and digital control. Grass Valley, incidentally, continues to add to its latest 1600 series and introduced at the show a new model 1600-7J. This switcher accepts 24 inputs and has 8 output busses: three

continued on page 82



For TV Sound
at its very best...

Audio Designs NEW TV 32 Broadcast Production Console

Stringent electronic specifications Flexibility for expansion

ADM's all-new TV 32 Consoles are engineered to meet the most exacting requirements for television production. They are modular, multi-input (up to 32) by 4 submaster busses, TV Studio and Production Center units that will professionally handle any program material in large or small stations.

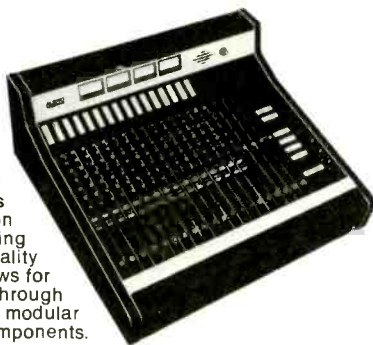
These full-featured, floor standing consoles incorporate the latest audio production philosophies into broadcast parameters. They are skillfully engineered to provide the professional broadcaster with the most demanded features. TV 32 Series Consoles offer exceptional flexibility for future expansion by plugging in additional modular components. Chances are one of our "stock" units will meet your requirements. If not we will be glad to design a custom console tailored to your exact needs.

ADM is a leading producer of highest quality professional audio consoles. Our key people have had impressive studio broadcast experience, and all of their expertise has been applied to our consoles.

An all-inclusive 5-Year Warranty covers parts and labor, and back-up technical assistance is always available from the factory. Write for Technical Brochure detailing all of the important features of ADM consoles.

BC-5 Broadcast Production Consoles

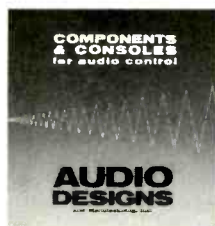
A table-top version of the TV 32 using the same high quality components. Allows for future expansion through the choice of modular plug-in components.



AUDIO DESIGNS AND
MANUFACTURING, INC.

16005 Sturgeon
Roseville, Michigan 48066
Phone: (313) 778-8400, Cable: AUDEX

In Canada: TELAK
Scarborough, Ont.
(416) 436-3804



Circle 153 on Reader Service Card

NAB SHOW-IN-PRINT

complete mixing and special effects systems plus program and present busses. Each of the three mix/effects channels provide mix or wide transition to a keyed-in or preset pattern.

Grass Valley staged a show on production techniques to demonstrate the virtue of analog borderline, matte key and shadow key. The latter, with improved linear chroma key, made it possible to achieve great spatial realism. For example, G-V showed how shadows of the person on camera made it appear that this person was actually touching or holding objects on the keyed insert.

Other established switching companies showing their products were Telemet (celebrating its 25th year at NAB) and American Data Corp. Telemet's new production switcher the 7960 is an expandable type. Each option (chroma keying, positioner, downstream keying, color matte, black bust generator, soft wipe, etc.) can be added at a later date. The 7960 is a remote control unit using dc to control rack-mounted electronics. Circuitry uses the latest ICs for good reliability and low cost.

American Data showed a new (but not operating) production switcher the 558. It featured 20 inputs and five busses—four are mix/effect keyer and the fifth is a special split preview/key bus. (A and B channels for two busses). A feature of the 558 is a dual key processor which allows chroma

luminance or primary keys, and A/B transitions, to be accomplished simultaneously on a single M/E system. Most of the other features are those offered by other switchers as standard.

A unique feature of the ADC switcher is the quad EVVA element for each mix/effect/dual key system. Quad EVVA, standing for four elec-
continued on page 84



New American Data 558 switcher.

254



Central Dynamics VSP-1260.

**STONE ARMS
TURNABLES
PREAMPLIFIERS
STUDIO FURNITURE
TAPE CART RACKS
ANTENNA HEATER
CONTROLS**

**THE WORLD'S MOST WIDELY USED
TONE ARM MICRO-TRAK 303**

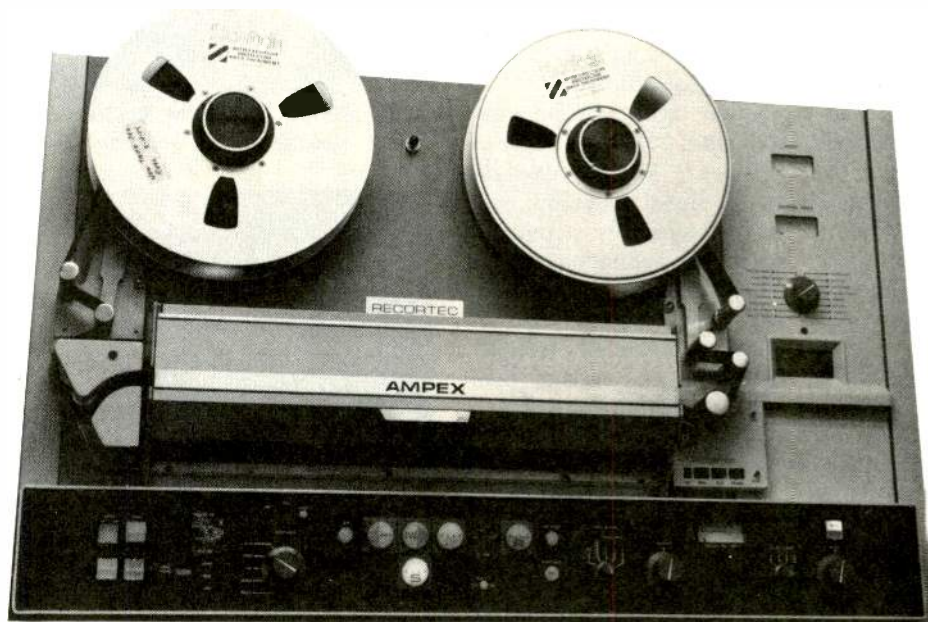


MICRO-TRAK CORPORATION

620 RACE STREET, HOLYOKE, MASSACHUSETTS 01040 413 536-3551

Circle 154 on Reader Service Card

put a **NEW ENGINE** *in your* **VTR**



Are you impressed
with the superior
tape handling of a
vacuum buffered VTR?

**For 6% of its cost
Recortec R-Mod will
Upgrade your present
VTR to provide**

- RELIABLE REMOTE OPERATION
- ELIMINATION OF TAPE STRETCH
- HANDLING OF TWO HOUR REELS
- CONSTANT SHUTTLE SPEED
- FRAME ACCURATE ELECTRONIC TIMER
- ACCURATE PLAYBACK OF CUE SIGNAL
- AUTOMATIC END-OF-TAPE SENSOR
- CONSISTENT LOCK-UP TIME

R-MOD is a modification package which can be easily installed in the field to provide constant tension for your quadruplex VTR.

R-MOD is derived from reliable hardware used in other proven Recortec products such as

VIDEO TAPE CONDITIONER
VIDEO TAPE EVALUATOR
VIDEO TAPE TIMER

Recortec has handled your tape cleaning for years—now, with R-MOD on your VTR, we'll handle your tape cleanly for years.

See us at
International TV Symposium
at Montreux in May

RECORTEC, INC.

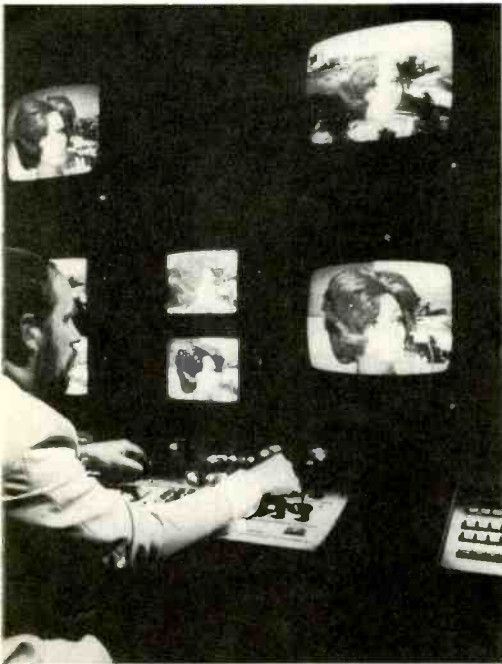
777 PALOMAR AVENUE • SUNNYVALE, CALIF. 94086 • PHONE (408) 735-8821

Circle 155 on Reader Service Card

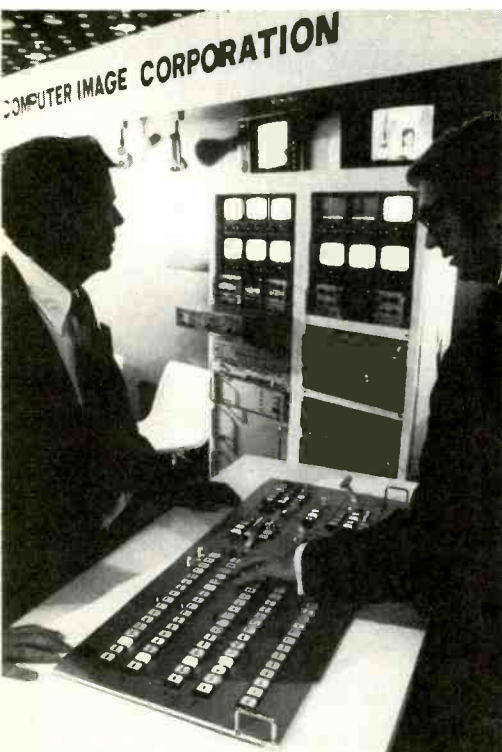
NAB SHOW-IN-PRINT

tronic variable video attenuators, allows many features to be accomplished. The switching matrix of the 558 uses ADC's special integrated circuit for these applications. ADC also showed its 556 switcher.

Industrial Science Inc. described a number of production switchers but



Vital Industries VIX-114 going through its paces. 256



New Computer Image switcher pre-wired for ads. 256

the largest it demonstrated and put a price tag on was the 611 starting at \$7200. This was a 10-input four output bus unit.

Another 16-input four output switcher featuring a low price was the Ross RVS 16-4 (displayed in the World Video area). It was described as a non-compromise system starting at \$17,950. As a compact unit, it was touted as extremely valuable for mobile vans. It has some subtle features to make it goof proof.

The promotion piece at Computer Image's booth reads "Who's The New Kid On The Block?" But as a result of many years of signal handling and video processing capability stemming from its computer animation work, Computer Image claimed it was selling the best video switcher on the block.

The virtues it claimed for its switcher are latest IC circuits that create custom results at minimum cost, mix-effect amplifiers in pyramid format (more about that later), parallel video processing, linear keying and a unique pattern generator of 105 effects each further shaped by a 15-button control panel.

Computer Image's biggest switcher, the 742, starts with 24 inputs, 7 busses and four M/E systems. But for \$10,000 you can get a board that is



Sonex standalones to enhance switchers. 255



Shadow realism with Grass Valley 1600-7J switcher. 257

expandable into a bigger one—it comes prewired for later options.

continued on page 86

Automatic Transmitter Will be a "Quantum Jump" for FCC, Says Johnson on FCC Panel

At the FCC technical panel session in Las Vegas, broadcast engineers got their annual chance to beef directly and publicly to the FCC. Wallace Johnson, chief of the Broadcast Bureau and some of the panelists, called the current FCC inquiry on automatic transmitters the opening of a "quantum jump" in the technical rules. The notice of inquiry, issued April 1st, had not been seen by most of the broadcasters before they came to the Convention. It asks for industry advice on a very large number of questions that have to be settled before automatic transmitters can be allowed on the air.

A few of them, mentioned by Johnson, are: what about operators—should we abandon human monitoring, since the automatic transmitter is a "go-no-go" system? What about manual override? Metering? How about stations with directional antennas? The notice throws in many other questions: BM/E will return to it in an early issue. Comments are due July 11, 1975. The automatic transmitter will be one of the most popular rule changes ever made by the FCC.

Another topic that stirred the audience was the new two-tone signalling system for EBS. The main question was, since dealers now have some equipment for this service, what happens between now and when the FCC gives type approval—which may take a while? Should broadcasters buy now? The panelists said there were some "hairy" problems to solve in laying out the equipment rules, but the consensus was that buying equipment now would probably be all right: certification would probably come through before the January 15th kick-off date. The FCC members also pointed out that a broadcaster can build his own EBS system without any need for type approval. It would, of course, have to meet the specifications set out in the FCC ruling on the subject.

One complaint from the floor that got obvious support, was on the exceptionally long period it takes to get microwave frequencies for television remotes, particularly hard on the station trying to get started in electronic news gathering. The FCC members pleaded overloaded manpower (as they had last year on similar complaints), but promised that the situation would get better soon.

Some other topics that got useful going over were: day time stations (they can't be given unlimited time); FCC field inspectors (they do not, repeat, *not* have a quota); the case of Station KGBS in Los Angeles, given a clear channel (there is no precedent here—the case was very special).

What you should know about what it takes to rebuild an Ampex video head

For starters, it takes skill, technological know-how, worldwide facilities, and years of experience.

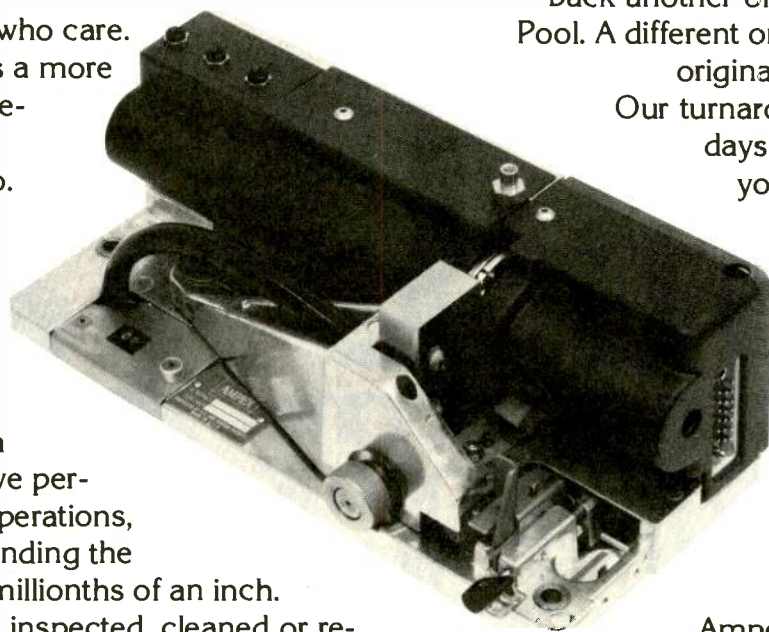
Plus people who care.

No one does a more thorough job of rebuilding Ampex heads than we do.

Nothing is missed. Rotary transformers. Air bearings. Transistors, Transducers. Motors.

On the drum assembly alone we perform countless operations, replacing or regrinding the female guide to millionths of an inch.

Every part is inspected, cleaned or replaced, reassembled, and given the original specification warranty. It's an exhaustive process, but worth it.



Actually, when you send your video head to us, we take no chances. We send back another one from our Refurbishing Pool. A different one. Totally rebuilt, with all original Ampex parts it needed.

Our turnaround time is normally 10 days to 2 weeks. So next time you think of trying a second

source—think first of Number 1: Yourself.

After all, we designed that head. We know how it should perform. Who would know more about it, or care more, than the people who built the head to begin with.

Just contact your local Ampex Broadcast Video Sales Engineer or write for full information.

AMPEX

Ampex Corporation
Audio-Video Systems Division
401 Broadway, Redwood City, California 94063

Circle 156 on Reader Service Card

NAB SHOW-IN-PRINT

The pyramid format, as opposed to sequential format, permits Computer Image to simplify the delay line requirements and at the same time not to tie up busses when a signal is switched into a second M/E amplifier. This is achieved by wiring from one amplifier to another directly rather than through a switch point.

A new company on hand not to sell you a new switcher but to make your present one more versatile was Sonex International Corp. The R-matte offered by Sonex is a travelling matte system that mixes a foreground camera signal with video background to give you shadows, reflections, natural edges and the ability to handle translucent objects. The unit has a green or luminance tie. Sonex also showed a Lum-A-Key which gets around the problem of people who wear blue. With Lum-A-Key, you light the talent or art work and forget about its background. A third product by Sonex was a digital dissolver to do a cut or dissolve at a video edit decision point.

Chromatech, introduced last year at

NAB by American Astrionic (Technicolor) was back again in the American Data Corp. booth. Chromatech produces soft chroma keying directly without the use of a switcher.

Grass Valley showed an NTSC encoded chroma keying system for its 1600 series switchers. All three versions could be field installed and all employed comb filters. All key signal outputs were linear allowing users to key through smoke, glass, and other translucent materials—the same as with RGB chroma keyers.

Routing switchers get big push

There were many companies promoting routing switchers at the convention and several brand new sources, Vedco of New Orleans and Comtec (Communications Technology Inc.) of Huntsville, Alabama were among them.

The old timers stressing routing switchers were TeleMation with its new ultra compact video and audio distribution switcher, the TVS/TAS-1000, Dataek showing the D400 system, American Data Corp. with its 900 series switching matrix (and the

580), and Dynair with a new series, the 1400.

A/V routing switchers were stressed by Telmet and were also a part of the exhibits of Central Dynamics, Vital and Grass Valley, though not prominently displayed with the later three. (G-V did include in its literature a list of 26 customers for its 1400 series.) Dynasciences also showed routing switchers.

Both Vedco and Comtec have taken the submodule/motherboard approach. The Vedco system, which we inspected first, keeps audio and video systems separate. Each motherboard accepts two input amplifier modules and twelve crosspoint submodules, to make a 2×6 matrix.

Vedco stresses flexibility: if the initial system is 10×3 , a fourth bus can be added by inserting 10 crosspoint modules onto the motherboard and 10 output amplifiers. Each crosspoint module is complete containing latch, tally and video switch (which is a T configuration for maximum isolation when off). A single wire, momentarily grounded, latches the crosspoint in and provides tally at the pushbutton.

continued on page 88

show me a need for graphic arts characters at economic prices...and I'll show you DATAVISION D-3000.

Here is a Video Character Generator that costs thousands of dollars less. Yet, has graphic arts characters with 1120-element resolution equal to the most expensive equipment. Available with two keyboard selectable type fonts. Use the D-3000 alone (internal memory); with low-speed audio tape interface; or with our Model D-4000 "floppy disc" high speed, random access storage system.

- OTHER FEATURES** ● COMPACT, SELF-CONTAINED, PORTABLE
● 2 CHARACTER SIZES ● 2 INDEPENDENT OUTPUT CHANNELS
● 3 SPEED ROLL AND CRAWL ● CHARACTER EDGING
● WORD FLASH ● AUTOMATIC CENTERING

Write or call: Datavision Video Products,
15932 Shady Grove Road, Gaithersburg,
MD 20760. Telephone: (301) 948-0460.

DATAVISION VIDEO PRODUCTS
Mincom Division **3M**
COMPANY



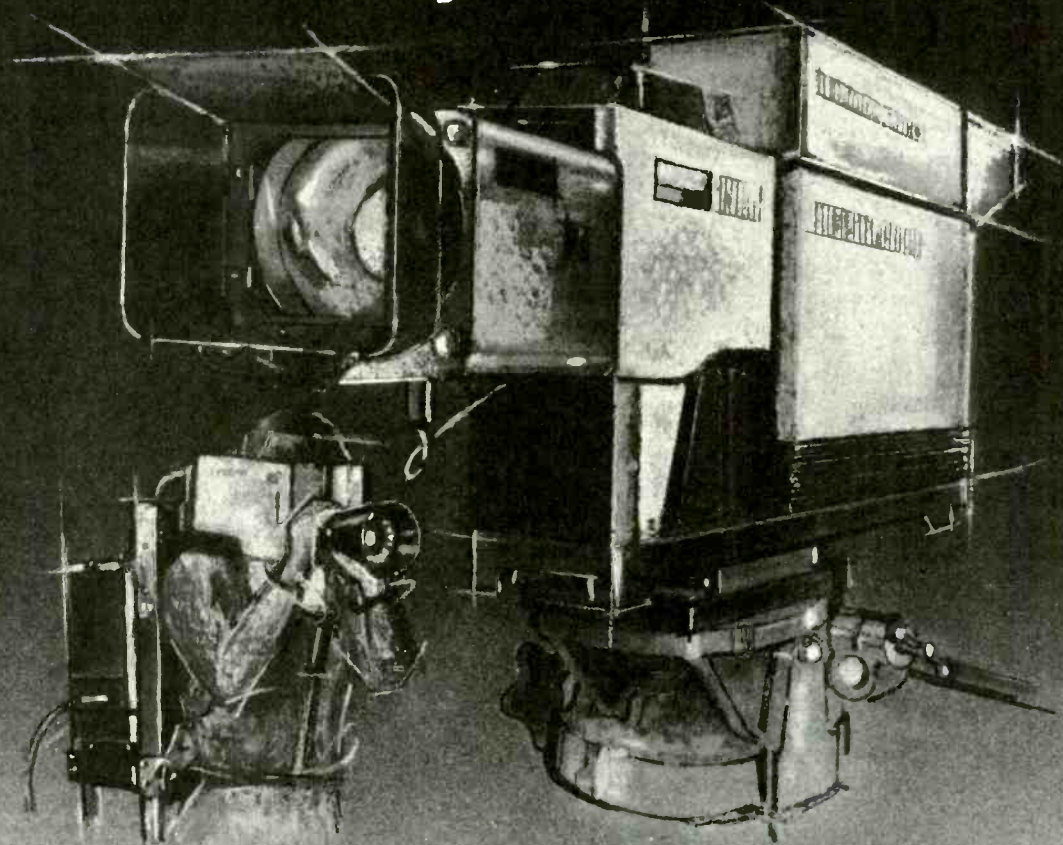
Call or write today.
Just say "Show Me"
and we'll give you a
free on-site
demonstration.

You'll Love It, Too!

Circle 157 on Reader Service Card

Who but HITACHI...

Could Put This Broadcast Studio Camera Comfortably On Your Back?



Introducing...

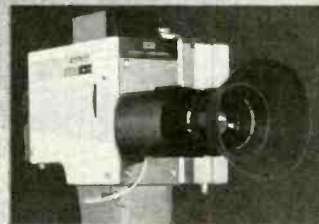
The Hitachi SK-70. A superb 2/3" Saticon three-tube studio camera and portable/remote color camera in one modular package.

FOR THE STUDIO: The 13-pound camera head accepts the following add-on modules to make up a full N.T.S.C. studio camera: process pack, AC Power Pack, 5" viewfinder, and studio lens on a unified base plate.

FOR MOBILITY: The same camera head mounts onto a shoulder harness with a 1-1/2" electronic viewfinder and a 10:1 zoom lens; the process pack with DC power pack rests comfortably on operator's back.

DIGITAL COMMAND CONTROL: Audio, video, and digital command signal share low cost coaxial cable.

The picture quality of the new SK-70 is truly exceptional. Now the enterprising broadcaster has an opportunity to fill the four most important camera requirements of his station (self-contained, studio, remote, and portable) with one reasonably-priced purchase.



HITACHI SHIBADEN
Corporation of America

Exec. offices: 58-25 Brooklyn-Queens Expressway, Woodside, N.Y. 11377
Offices in Chicago, Los Angeles, Dallas, Toronto, Atlanta

NAB SHOW-IN-PRINT

Crosstalk of video is -62 dB below 0 dBv. Audio is below noise rated at -70 dBm. Another feature of Vedco is that motherboards can be extended in the frame while the system remains in service. Vedco also offers audio and video distribution amplifiers built on the same submodule/motherboard construction principle. Units slide out of the cabinet for in-service testing.

Comtec, which starts with a bigger motherboard than Vedco, talks about five level matrix switching with everything plugging into one board. A $20 \times 1 \times 5$ routing switcher is claimed to have every conceivable function engineering into it—for now and five years hence.

The motherboard is a 20×1 building block which accepts five 4×1 crosspoint boards, video output amplifiers, two audio output amplifiers, logic control board and auxiliary tally crosspoints. The printed circuit back-plan interface keeps video paths short and uniform and eliminates coaxial jumper cables.

Five level matrix means five paths can go through the switcher simultaneously: video, two audio, and two bi-directional paths for auxiliary functions. The circuitry uses low power CMOS logic which can operate in noisy environments.

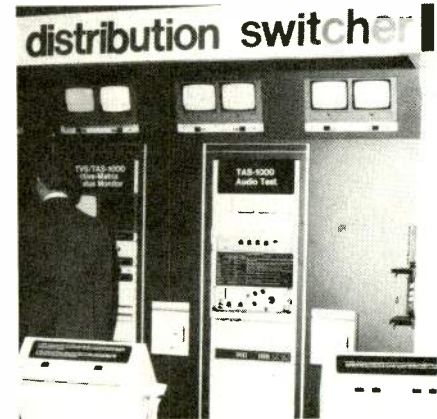
The new Dynair series 1400 video switcher is described as a unit to provide high quality switching at an economical price. In conjunction with the company's series 8100 audio switcher, simultaneous A/V switching is provided. The basic mounting frame takes up 14 inches of height on a 19-in rack. A hinged door provides access. The frame provides space for 10 or 20 video input modules and 20 video outputs (one for each input). All modules are FET transistors, for a bounceless switch and high isolation.

Control of the 1400 can be a variety of means including the acceptance of an optional binary decoder system and memory system allowing switching to be controlled by 0-5 V logic ICs.

Dynair also showed a touch pad master control panel, the CD 8083A for digitally controlling routing switchers such as the 1400 and 8100.

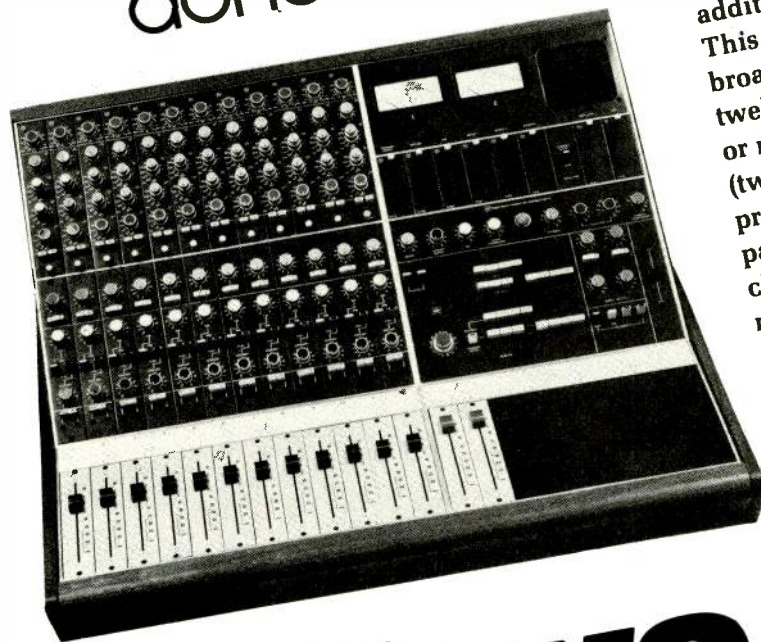


Telemet A/V routing and production switchers. 258



TeleMation TVS/TAS-1000 routing switchers. 259

Neve has done it again!



Introducing Melbourn — the newest addition to the Neve family. This compact console provides the best in broadcasting and recording facilities. With twelve mic or line input channels for stereo or mono mixing, two program mixing buses, (two auxiliary mixing buses are also provided), a selection of equalizers, blank panel space for special facilities of your own choosing, Neve has once again designed a most flexible console. Its size 32" wide and 32" deep makes it attractive for both studio and remote use. The Melbourn is a highly reliable and comprehensive mixing console built, of course, to the highest standards, easy to maintain and backed by worldwide service. All at an amazingly low price. Call for further information.

Rupert Neve Incorporated, Berkshire Industrial Park, Bethel, Connecticut 06801 Tel: (203) 744-6230, Telex: 969638
Rupert Neve Incorporated, Suite 616, 1800 N. Highland Ave., Hollywood, California 90028 Tel: (213) 465-4822
Rupert Neve of Canada, Ltd., 2717 Rena Road, Malton, Ontario L4T 3K1, Canada Tel: (416) 677-6611
Rupert Neve & Company Ltd., Cambridge House, Melbourn, Hertfordshire, SG8 6AU England, Tel: (0763) 60776
Rupert Neve GmbH, 6100 Darmstadt Bismarckstrasse 114 West Germany, Tel: (06151) 81764

Neve



Basic module of Comtec switcher. 260

One 16-bit word controls a 100×100 matrix. ADC also showed more conventional distribution switchers.

TeleMation's 1000 series, essentially the same as introduced last year and described in BM/E's March issue, follows a high density approach and was designed for larger capacity systems. Circuit boards are larger than others—and more expensive. However, for larger systems a spare repairable board adds very little incidental cost.

In short, there are many trade offs in the designing and buying of routing switchers and broadcasters in 1975 had plenty of options.

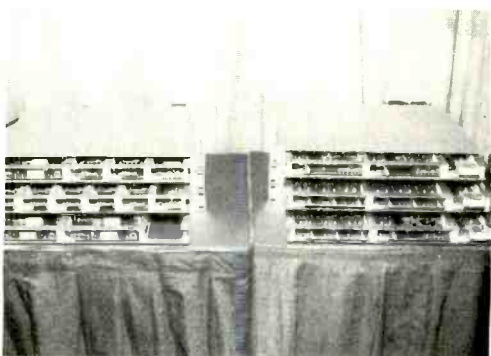
Video systems, processors

In the preceding section on routing switchers, two new companies, Comtech and Vedco were mentioned. Both have devices which fall within the video system umbrella and they reflect a specific design philosophy approach to packaging—modular, plug-in easy access, etc.

Going further than anyone else in what it called a "truly universal television system approach" was Lenco Electronics. Key to the new approach was a new universal rack mounting frame which included a constant voltage power supply and inter-



New Dynair A/V routing switcher. 261



Vedco's modular approach (extended for service). 262

By a touch pad entry, the four push-buttons control: I/O video only, audio only, A follow V and A/V split (audio breakthrough). Preset selections are displayed on a LED. Up to 100 inputs are handled.

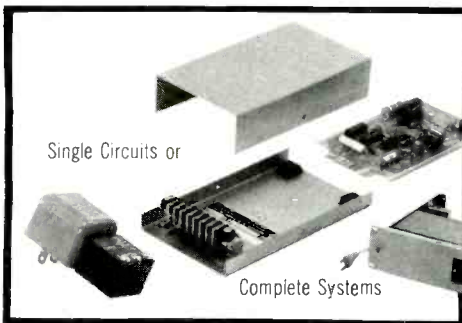
The American Data series 900 switcher system described in the 1974 Show-In-Print issue employs a single IC to discretely switch video and audio and two levels of tally. This approach allows compactness and a 10-in high frame only $5\frac{1}{2}$ in. deep can take 600 crosspoints along with control logic and output amplifier. Each crosspoint card is associated with only one input so that removal of a card will affect only one input. The 900 logic is designed for computer control if desired.

control by phone

Use a regular touch button telephone to control:

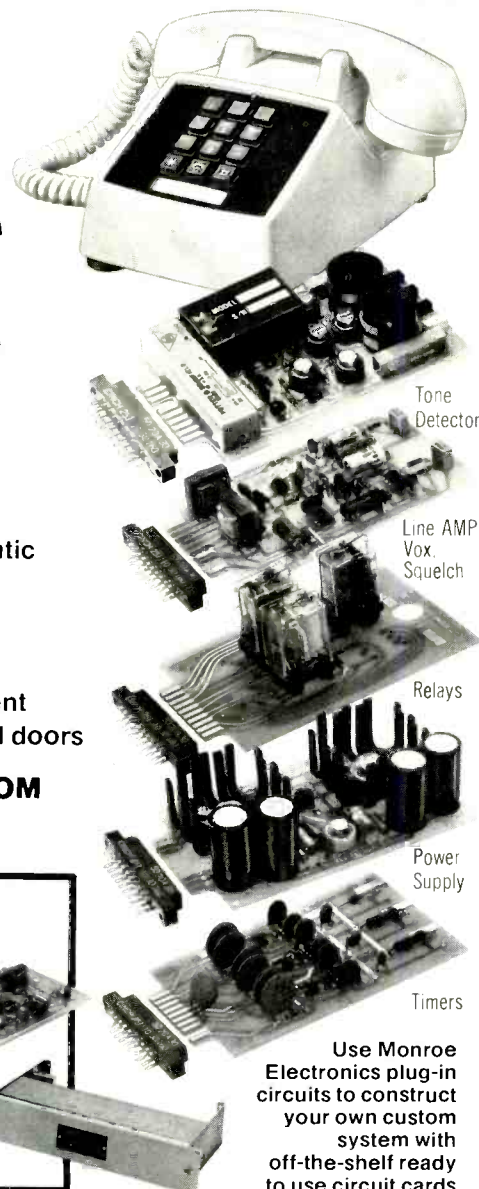
- Cable TV circuits
- Pollution sampling equipment
- Microwave transmitters
- Call diverters and automatic answering devices
- Antenna systems
- Telephone equipment
- Radio/telephone interconnection equipment
- Pumps, motors, overhead doors

**CIRCUIT CARDS FROM
\$49 TO \$99**



Single Circuits or

Complete Systems



Use Monroe Electronics plug-in circuits to construct your own custom system with off-the-shelf ready to use circuit cards

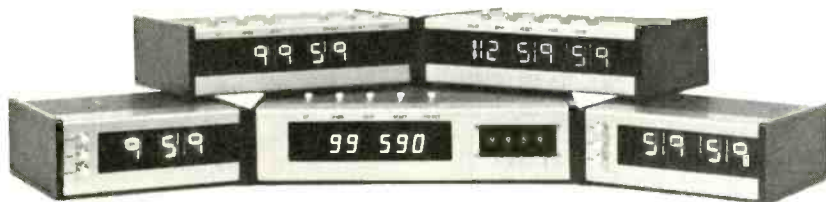


MONROE ELECTRONICS, INC.
INSTRUMENTS & SYSTEMS

100 HOUSEL AVENUE • LYNDONVILLE, N. Y. 14098 Area Code 716 765-2254

PERFECT TIMING

Low Cost ESE Right On Timers



- ES-300: Four digit incandescent display, one hundred minute timer (99:59) with six controls: Count Up, Count Down, Min-Set, Sec-Set, Stop, Reset. **\$168.00**
- ES-301: Identical to ES-300 except with planar, gas discharge display. **\$185.00**
- ES-302: Equivalent to ES-301 plus fast-set lever wheel programming. **\$238.00**
- ES-400: Three digit ten minute timer (9:59) with Start, Stop, Reset. **\$ 98.00**
- ES-510: Four digit sixty minute timer (59:59) with Start, Stop, Reset. **\$125.00**
- ES-500: Six digit, twelve hour combination clock/timer with five controls: Start, Stop, Reset, Fast Advance, Slow Advance. **\$150.00**

STANDARD OPTIONS AVAILABLE: Kit; Slave; BCD Output; Remote Connector; 6' Remote Cable and Pushbutton Set; 220V A.C., 50Hz; 9" or 19" Front Panel 3½" high; 3 Wire Cord and Molded Plug. Tenths of seconds are available on all timers except the ES-500. Relay Contact Closure at Zero and/or Stop at Zero available on ES-300, 301, and 302. Crystal Timebase available for ES-500. Custom options and special orders available.

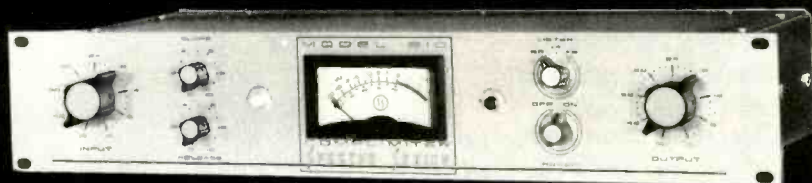


WRITE, WIRE OR CALL TODAY

505½ Centinela Avenue • Inglewood, California 90302 • (213) 674-3021

Circle 161 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, functional styling, the Model 610 is in stock for immediate shipment.

Specifications are available from:

SPECTRA SONICS

770 WALL AVENUE, OGDEN, UTAH 84404
(801) 392-7531



Circle 168 on Reader Service Card

NAB SHOW-IN-PRINT

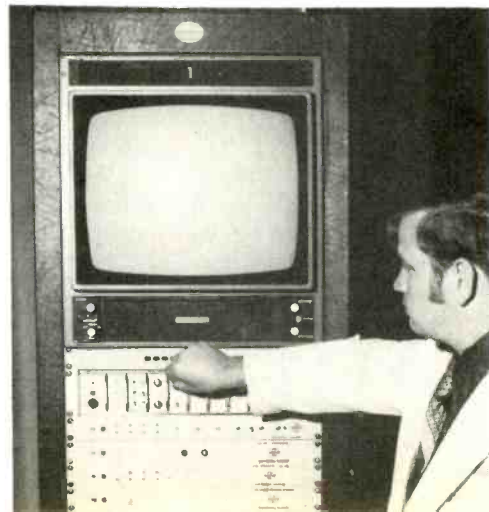
connection system to accommodate virtually any possibility. Called the PFM-300, the rack height is 3½ in. One 14 in. rack houses nine modules. At NAB 1975, Lenco described eight new modules for the system and identified 19 others soon to become available. Claiming the utmost in reliability and ruggedness, Lenco's modules did not rely on p-c boards for structural integrity: each board was attached to an aluminum chassis.

Among the state-of-the-art modules announced for the new line were sync generators (with standard genlock and helical genlock), a complete I-Q color bar generator, black burst and color background generator, bar dot and visual reference generator, fan-out modules, delay modules and a stair-step/ramp generator. In each case Lenco compared its products favorably against other standards such as G-V or Tektronix. It declared several modules as new and unique; the bar dot and visual reference generator and the system delay module.

The visual reference generator is unusual in that it serves as a production and technical aid by virtue of producing diagonal lines from corner to corner of picture blanking. An adjustable rectangle identifies the safe title area. The system delay provides a



New image enhancer from Corning Electronics. 263
Lenco's new video system package. 264



composite delay for all pulses required by video sources—one knob keeps everything uniform except for a second knob which handles subcarrier phasing.

Grass Valley displayed a new line of pulse equipment, the 3250 series Sync Pulse Generation System. It includes master and slave sync generators for use in single line pulse distribution systems, both NTSC and PAL. The slave unit operates from the reference provided by the master but contains a crystal oscillator to assure continuity in the absence of a reference signal. Since the generators employ digital circuitry they are free of the many adjustments associated with conventional sync generators.

Stand alone image enhancers were to be found in CBS Labs and Dynasciences booth (which had three) and in the booths of a new exhibitor, Corning Electronics. Corning claimed the highest signal to noise ratio offered—65 dB (rms noise referred to 1 V p-to-p signal). Among the other features were an exclusive bypass which permits servicing the module or replacing it without program interruption, automatic power supply bypass, automatic control of detail level in presence of incoming enhanced signal, automatic shutdown of detail generator if incoming signal exceeded selected detail level.

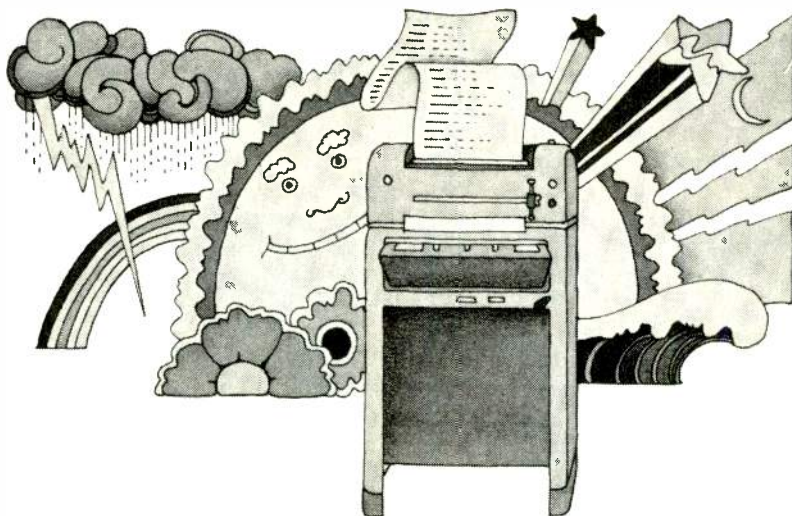
Video processing equipment, and other video, pulse, and sync generators and amplifiers were on display in many booths. Color correctors were shown by CBS Labs and RCA and these units are described in the film chain section. Matthey demonstrated an automatic video equalizer in the Television Equipment Associates booth. It is described under test equipment.

A miscellaneous piece of equipment was an automatic assignment control unit shown by Beta Technology. The unit would read sync and switch to another unit in the event of a failure. A new range of video delay lines were shown by Matthey.

Videotape recorders—new configurations

There were several surprises in videotape recorders: a new broadcast slow motion video recorder from a new manufacturer, Data Disc; a one-inch quadruplex portable high band VTR from Asaca; a new automated
continued on page 92

And now the weather...



Get your weather forecasts via a teleprinter from RCA. Teleprinter, including maintenance, on a lease basis — just \$63 per month. Also available on outright purchase.

The teleprinter prints out the weather forecast automatically, and we make sure it keeps running reliably. Maintenance is prescheduled and automatic. Installation and service are fast, because RCA data communications specialists are based in over 140 cities, and our warehouse network is nationwide.

The weather changes, but RCA reliability stays constant.


Call us at (609) 779-5087.

RCA Service Company, A Division of RCA
Technical Services, Bldg. 204-2, Camden, N.J. 08101

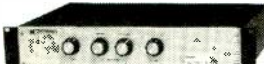
RCA

WE GIVE YOU MORE OF WHAT YOU'RE LOOKING FOR.

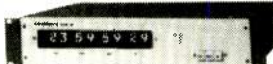
Circle 162 on Reader Service Card



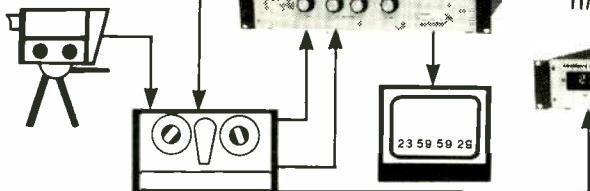
TIME CODE GENERATOR
TCG-80



VIDEO CHARACTER GENERATOR
VCG-85



TIME CODE READER
TCR-81




SMPTE EDIT CODE EQUIPMENT *

- Off-line previewing for daily program planning.
- Scene logging and sequence logging.
- Time referencing and footage counting with frame accuracy.
- Frame indexing for data information storage and retrieval in video format.

High Quality; Low Cost; Prompt Delivery

* Substantial Discounts on Combination of Units.



KAITRONICS CORPORATION

870 Mahler Road, Burlingame, Calif. 94010
Tel: (415) 697-9102

Circle 163 on Reader Service Card

NAB SHOW-IN-PRINT

broadcast videotape system from IVC; a new direct approach to recording (R-G-B) by TRI; a direct substitute for the Sony portable—the Teac available from RCA; and a new videotape remod company, Merlin Engineering Works.

\$9400



Video Memory's vacuum-buffered helical deck. 265

There were two other new VTRs on display and operating but both were previously announced. RCA highlighted its low cost, "low profile" TR-600 unit introduced last year at Houston, but now in full production. Video Memory was there with a low cost but high performance helical VTR, featuring a tape deck with vacuum control for gentle tape han-



Sony's portable cassette VTR, the 3800.

dling. (This unit was previously announced in BM/E in February.)

The new slow motion video recorder, the BDR 500 is a disc machine that will do everything the Ampex HR-100 will do. Its manufacturer, Data Disc, a long time computer video disc manufacturer, says the BDR 500 will offer greater reliability and lower cost. It is a more compact unit—only 30 inches high. The BDR 500 is a broadcast outgrowth of a recorder designed to store pictures of Jupiter, taken by Pioneer 10 and 11.

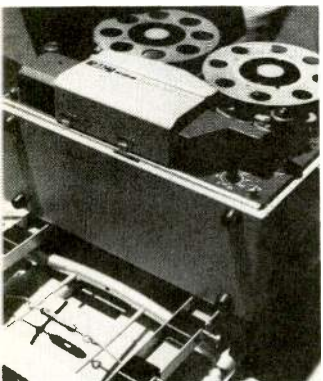
The BDR 500 offers forward and reverse playback with multiple fixed speeds as well as continuously variable slow motion from stop action to real time. In freeze mode a single frame is continuously repeated. Or the operator can advance action one frame at a time. Any portion of a recorded program can be searched within four seconds through the use of fast search mode.

No head lifters or special start-up precautions are required with the BDR 500. Normal operation is achieved within minutes after the push of a single button.

Data Disc says it knows its mean-time-to-failure is superior to the competition—based on user's input on head life—but it did not itself specify head life. The BDR 500 can also double as a slide storage and playback device and a digital frame counter identifies where slides are filed.

The new back pack quad highband VTR by Asaca, the AVS-3200, incorporates four heads to transverse scan one-inch tape. Together with a heterodyne system modulator and low-impedance driving video recording amplifier, the AVS-3200 has a built-in video preamplifier playback system. The portable VTR playback adaptor APA-300 enables full demodulator output. By adding an Asaca time base corrector (ATC-300) to the demodulator output, perfect color reproduction is obtained. All the functions of the servo system are housed in the portable VTR. Using a 6.5-inch reel (with NAB hub), the device permits 30-minute video recording. Power is supplied by a battery unit or by an ac pack. Unit has fast forward and rewind and it stabilizes in three seconds or less. Unit also features several automatic features.

The Programmed Broadcast Recorder (PBR) introduced by IVC is designed to handle both commercial spots and full length programs. The



Backpack quad unit from Asaca. 266



RCA's "low profile" TR-600 quad unit.

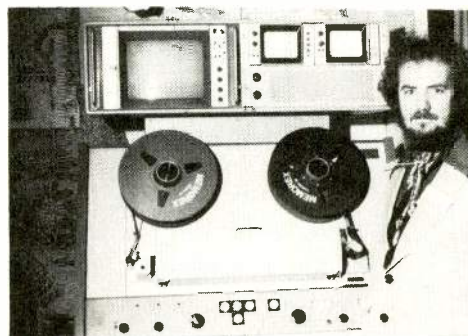


New disc system BDR 500 from Data Disc. 267



TRI's new Trichroma III (RGB) recording system. 268

Programmed Broadcast Recorder from IVC. 270



Remod unit from Merlin Engineering Works. 269



system is offered with six or twelve decks each offering one-hour of playing time. The transports are IVC 825 and 870 one-inch units which work in conjunction with IVC's time base corrector, the TBC-2000. A six-deck system contains two IVC-870s thus permitting assemble and insert editing. All VTRs are integrated with a simple automatic programmer. Spots as short as three seconds in duration can be randomly or sequentially selected.

IVC claims the PBR offers cost advantage over automated cartridge systems both in initial cost and tape cost. Head life is guaranteed for a minimum of 1000 hours. Tapes recorded on the PBR can be played back on any IVC format recorder including the IVC-960 system. A six-deck PBR costs \$109,000; a 12-decker, \$145,000. The unit is in production (first unit went to CKOS-TV, Yorkton, Saskatchewan).

Among the new exhibitors were Merlin Engineering Works, an imaginative group whose product has been inspired by Merlin the magician. Merlin takes old "show-and-tell engines" (Ampex and RCA VTRs) and converts them to new. Among its products are the auxiliary transports, ME 18-20, to add to the existing electronics of VR-1100, -1200 or -2000's; high band mod kits; a reworked Ampex TBC-800 to work with quad; and a complete modular VTR which consists of the three separate units: a reworked transport, a TBC, plus new electronics. This complement is compact enough for mobile use. While Merlin buys reconditioned VTR heads from VideoMax it does the other work itself.

Recortec, a well-known remod house (as well as manufacturer of tape reconditioners and evaluators and new editing equipment), was also stressing modifications to existing VTRs. Its featured product was the R-Mod (constant tension kit) which offers tape handling characteristics similar to vacuum chamber buffered VTRs. Recortec also promoted its video tape-programmer which, in conjunction with two VTR equipped R-Mods, becomes an inexpensive substitute for cartridge machines.

VTR head refurbishers (aside from VTR manufacturers themselves) vying for attention were Videomax and a challenger—Computer Magnetics Corp. VideoMax stressed leadership in cost-per-warranty hour. As a newcomer CMC stressed matching product

excellence with the best delivery service in the industry—namely one week for Mark X assemblies and two weeks maximum for Mark XX.

With so much emphasis on lower cost approaches to video taping (RCA's TR-600, Ampex's AVR-2, IVC's emphasis on one-inch, and the modified machines), nobody came off better than a brand new company: Video Memory. Video Memory exhibited a one-inch machine with broadcast specs at prices starting below \$10,000. Key feature of the

transport was a single capstan servo system with vacuum columns to provide gentle tape handling. In conjunction with a Ampex TBC-800 and the high band electronics developed by Video Memory, the system put out remarkable pictures and captured a lot of attention.

It is difficult to do a section on video tape recorders without discussing Ampex. Surprisingly, Ampex, which stole the show last year at Houston with the AVR-2, showed nothing this year that was new. To avoid being left

Prove to yourself what other broadcasters already know.



RP Series Recorder/Reproducer

SP Series Reproducer

Hundreds of broadcasters are using ITC tape cartridge equipment daily and find it delivers outstanding performance . . . such as the compact SP Series Reproducer and the RP Series master recorder/reproducer shown here. And this experience has brought our attention to an interesting fact. Our tape cartridge equipment does an excellent job of selling itself. So, the problem was how to get the equipment into your studios where you could test it fully under actual broadcast conditions. The answer is our **30 day guarantee of satisfaction**. Just issue an order and we'll send the equipment you want. If for any reason it fails to perform up to your expectations, send it back within 30 days and you don't owe us a cent. It's a sure, painless, no-risk way to prove to yourself what other broadcasters already know . . . ITC tape cartridge equipment is the answer to a broadcaster's prayers. To put things in motion, call us collect at 309-828-1381.



INTERNATIONAL TAPETRONICS CORPORATION

2425 South Main Street • Bloomington, Illinois 61701

Marketed exclusively in Canada by McCurdy Radio Industries Ltd., Toronto

Circle 164 on Reader Service Card

NAB SHOW-IN-PRINT

out in show coverage, Ampex issued a flood of press releases which talked about last year's outstanding sales. At the show's end, Ampex issued yet another release mentioning \$3 million worth of equipment being shipped from its exhibit floor to customers including 14 AVR-2, 3 AVR-1s, 4 AVR-25s.

The VTR news made by Sony and TRI has already been covered elsewhere in this report under electronic news gathering and videotape editing. See those sections for details.

Videotape highlights—tape and tape holders

U-matic cassette tape made the most news at NAB 1975. This is not surprising in view of the keen interest in ENG. Increasing use of one-inch tape by broadcasters, made 1-inch tape of more than usual interest this year.

The Video Tape Div. of Fuji Film introduced what it called a revolutionary U-matic. Using Beredox iron oxide, Fuji claimed improved color performance, high resolution for sharp images, low head wear, and outstanding stop-motion performance. Designation is KCA. In the quad sector, Fuji stressed its H 701 tape



271 Fuji's Beridox cassette tape.



272 New VTC 1000 tape from Video Tape Co.

which has enjoyed exceptional acceptance this past year.

In the cassette category, 3M introduced a head cleaning cassette (which ends its job by showing color bars) and a unique tension gauge. The tool quickly diagnoses tension problems in U-matic recorders. The company also showed a self-threading videotape reel compatible with Sony's portable Rover recorder for ENG, and a 20 minute cassette for ENG use, VCA-20. 3-M also showed an improved shipping/storage case for video cassettes.

In the one-inch category, 3M announced a special helical type, Scotch brand 455. This type features a 650 oersted iron oxide for an improvement in S/N of 3 to 5 dB.

Last year 3M revealed a developmental premium quad tape—420. This tape is now available for general use. Among other new products were respoolable cartridges featuring the new 420 tape. Both take-up and supply spools are removable, meaning programs can be changed without having to rewind. Also shown was a light weight case to lower postage costs of mailing 2-in tapes.

Offering tape bargains was Video Tape Co. which sells reprocessed videotape (\$145/hr., Scotch 400 or Chroma 90). This year Videotape introduced "quality and economy" tape built to its specs. It was called VTC 1000 and described as high band color videotape. On a first time purchase only, of six hours, tape was being offered at \$142.42.

Memorex exhibited a full line tape for broadcast and closed circuit use, including tape for cassettes. Ampex demonstrated at NAB for 1/2 and 1-inch users, a full line of high performance tape, the 190 series, as well as tape for cassettes and quad.

Offering savings in reels and cassettes was Vidreel, Inc. Self-shipping cases were designed to save postage—up to 80¢ on every cassette, said Vidreel.

Time Base Correctors

They are plentiful and they are better. Television Microtime, who started the stand-alone time-base corrector excitement three years ago, have replaced their multiplicity of models with just two brand new ones, the digital 640 and the analog 610, and this seems to make sense from both a technical and a marketing point of



273 New 640 TBCs from Microtime.

274 CBS Labs TBC.



275 TBC systems from Digital Video Labs.



276 CVS showed 504A "universal" TBCs.

view. TM issued a highly informative Application Note headed "TBC'S—Analog or Digital?". This made clear some facts in an area that is still not totally staked out for many people.

Consolidated Video Systems showed an improved version of their 504A TBC, and also introduced two new options for it: the Model 5042 Velocity Corrector, designed, says CVS, to correct errors remaining in signal from a direct color VTR when played through a 504A. The second option is the Model 5044 Heterodyne Phase Corrector, which is added to the Model 5042 when the signal is from a heterodyne color VTR. TM also brought out the 710 line-by-line Velocity Error Corrector, a stand-alone unit which reduces hue shift caused by velocity error.

CBS showed their Model CLD-1600 in a "live" demonstration, with before and after on a split-screen monitor. Digital Video Labs calls their unit a "Digital Video Processor," Model DVL 2002, and, as described in our January report, it claims a 6-line "window," automatic color-monochrome mode switching, and other

very advanced characteristics. It will be available in the US at the end of May.

Ampex had their TBC-800 on demonstration, along with the optional add-on for heterodyne color capability.

Kansas State Network had their "Signal Master" TBC in a live demo. It is fully available and on delivery now.

Character Generators

Before the show, this active and popular category seemed to have settled down to about four suppliers, covering a range of prices. But what we found on the floor were no less than seven brands, with such a range of choices that it seems safe to say every class of character generator need is now served. Prices range from the \$2000-\$2500 of some basic units of CBS, Kansas State Network and Laird Telemedia, up to the \$40,000-\$50,000 of the top systems of CBS, Chiron and RCA.

The CBS showed their Vidifont, a pioneer system for modern character generation, with new flexibilities in price and in operation. New is a low-end unit (around \$2,000) called a "Two-liner" which can store up to eight precomposed titling messages, for instant use. Storage, effected by CBS or by the station, is on plug-in IC

chips; the operator can keep as many of these as he wants on hand for instant change in the eight in the machine. Various options extend the flexibility of the unit.

At the other end of the price scale (about \$40,000) is a Vidifont system with greatly increased flexibility in preparing and storing font types or graphics for instant display. A "menu board" copying camera allows any font style or graphics to be entered onto the "floppy disc" storage system; the material to be stored can be edited extensively—moved, changed in size, parts eliminated, etc.—as seen on monitor screens, before it is entered into storage. When that material is wanted, it is transferred from the disc to the RAM in the Vidifont unit, and is then instantly available on screen. The system then provides all the manipulations of the material we have become used to in top-bracket CG's—crawls, rolls, flashing, movement of individual letters, edging, etc. etc.

Chiron had hands-on demonstrations of their two main systems, with a new dual channel preview-edit option that gives the operator more control of material he is putting into the memory. Also new as an option is a Model 201 Type Font Compose interface which allows the composition and storage for instant use of

continued on page 96



Chiron character generator.
CBS-Labs Vidifont system.



Low-cost character generator from Laird.
Datavision's units get close inspection.



never give a silkworm an even break

Poor Silkworm . . .

She doesn't have a chance
against **Colortran's**
remarkable new **Supersilk**.

Supersilk is a
continuous weave
glass fiber that's as
smooth as real silk and
absolutely will not irritate
your skin like other glass
fiber diffusion
materials.
Its diffusion quality
will remind you
of real silk too.

You can put Supersilk
in front of the hottest lights
and it will not turn brown.

It will not fray.

It's easy to handle.

Available in convenient
48" rolls.

For information and a
free swatch, write to
Super Silkworm

at

Berkey Colortran®

1015 Chestnut Street, Burbank
California 91502 • 213 843-1200

A DIVISION OF
Berkey
Photo Inc.

Circle 165 on Reader Service Card

NAB SHOW-IN-PRINT

new fonts or graphics. Chiron's manipulation of the screen message parallels that of the CBS, allowing for a tremendous variety of effects on screen.

RCA's Video IV Graphics System has the capacity to "compose" graphical material from a keyboard; the material is then stored on a magnetic disc, for instant use. Demos of the RCA system consistently drew heavy crowds, watching the operator literally create "scenes" from the system keyboard. Again, the display has the greatest flexibility in special effects applied to the on-screen material.

Telemation showed its low-cost Model TCG-1432, and the more elaborate TCG-1425B, both with many operational flexibilities, options for increased storage, etc. Datavision (now part of 3M) had new capacities for their excellent D-3400 series: a 1000-page random access memory on floppy discs, and multiple style fonts. Datavision's system, at middle prices, has sold extremely well in the last year.

The two new brands came from Kansas State Network and Laird Telemedia. KSN offered a series of machines, two designed to work from weather bureau and newswire input, at \$2500 each, with optional memory storage up to 28 pages at a complete price of \$5000. A third KSN unit is for general character generation, the "Message Master," at \$3000 with ten-page built in storage; with additional 10-page storage segments at \$1000 each. The Message Master can display 12 lines at a time, and can manipulate them in a number of ways.

Laird Telemedia's system range in price from \$2500 to \$10,000; they have been available during most of the past year, but were not previously

shown at the NAB. Display accommodates up to 10 rows of 25 characters each. Again, memory is expandable: storage is on standard audio cassette tape. The handling of material on screen has extensive flexibility.

Picture monitors

Precision in color monitors has become an accepted fact. Resolution is in the range of 600 to 800 lines for the center of the screen, for nearly all professional color monitors.

Steady refinement could be seen in the picture monitors displayed. A brand new one to the show (and to the US) is Barco, made in Belgium and handled in this country by Barco U.S., of Los Angeles. It was a "hit" at the Montreux exhibit in Switzerland in 1973. There are three sizes, 15 inches, 20, and 26. The series has many excellent facilities which make them easy to use; resolution is very high, at more than 600 lines. Prices are \$3700 to \$3900, approx.

Conrac had a complete Colormatch Theatre in operation, with a videotaped show to demonstrate differences in CRT colorimetry. The differences in color between standard NTSC phosphors and those in common receiver use were demonstrated, along with the effects of Conrac adjustment circuits. On display was Conrac's very well known line of monitors, with emphasis on the new RHB model.

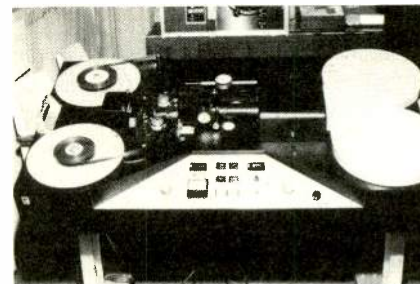
Ball/Miratel introduced their "Centennial 200" series, calling it "a new color monitor for less money." Used is a new ultra-rectangular high brightness black matrix CRT; optional is a CRT with color-controlled phosphor for critical studio applications. Another option is a pulse cross display for sync examination.

Also new were the Modtec color monitors now being marketed by Broadcast Electronics. These are rated at 800-line resolution, come in CRT



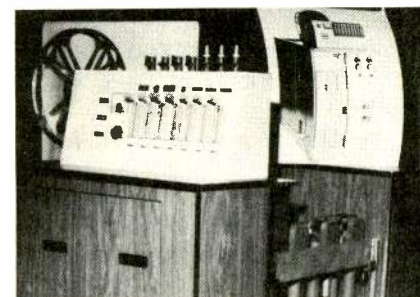
Estec editor for super 8.

280



PSC Technologies' Acme printer.

281



Versatile film processor from Jamieson.

282

sizes from 9 inches to 23 inches; there is switchable DC restoration, regulated power supplies for stable color and picture placement, video response to 12 MHz. Special phosphor, pulse cross delay are options.

Electrohome showed a very complete line, too, with similar advanced characteristics: resolution at 850 to 1000 lines in center screen.

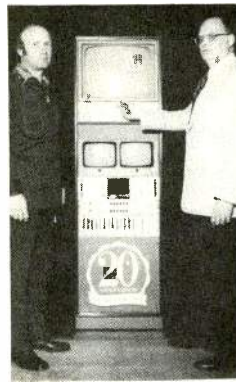
World Video introduced their dual rack-mount 9" monitors, which can be put two at a time across a standard 19" rack. They also showed their line of larger monitors. All include DC restoration, pulse cross delay, and other features used in current high-quality monitors for picture analysis.

Film equipment at NAB

While ENG may have been the topic of most interest at the show, film and film advances were not eclipsed. Eastman Kodak, with a choice location in the center of the first hall, stressed film as a television medium and film news in particular. This included describing its new Ektachrome 7240 film with its choice of index ratings.



World Video compact monitors.



New Ball Centennial 200 unit.



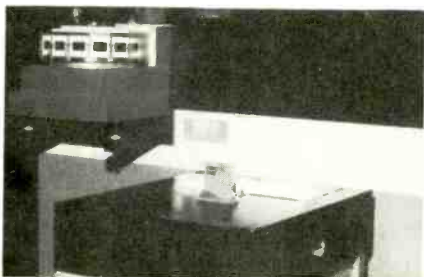
New Barco import.



Cinema Product's CP-16 news camera.



RCA's TCP-1624 cartridge projector.



Cohu multiplexer.



New news camera from General Camera. 283

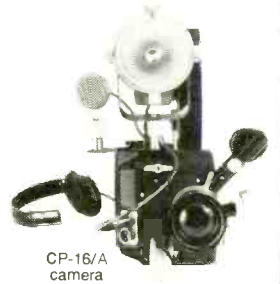
Ready to shoot with the new film, or with existing product for that matter, was a new news camera, the TGX-116, billed by General Camera as the cine sound system "that advances film to the 21st century." The small unit (8 lbs. and less than 15 fully loaded and lensed) had a low profile and "perfect balance." Case is described as virtually indestructible. A 400 ft cassette is encased within the unit as part of its configuration. Camera operates singly or as part of a double system. Electronics weighs but one pound yet offers filters, squelchers, VU selectors, etc. Viewfinder also has unusual features.

General Camera will be taking out

continued on page 98

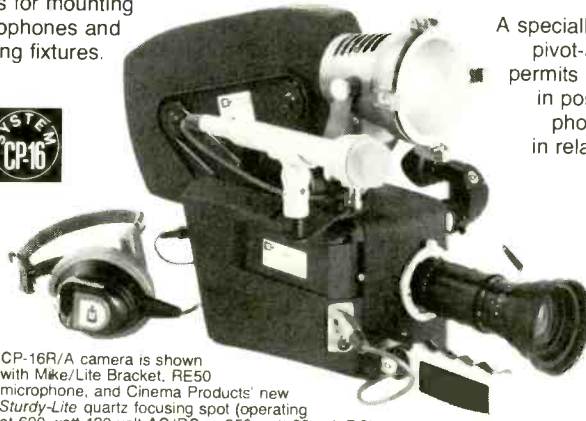
Mike/Lite Bracket for CP-16 Reflex and Non-Reflex cameras.

An ideal accessory for the "one-man-band" TV-newsfilm/documentary cameraman. The new Mike/Lite Bracket is easily mounted on all CP-16 camera models, and is supplied with interchangeable 1/2" and 5/8" studs for mounting microphones and lighting fixtures.



CP-16/A camera

A specially designed locking pivot-arm on the bracket permits maximum flexibility in positioning the microphone and light fixture in relation to each other.



CP-16R/A camera is shown with Mike/Lite Bracket, RE50 microphone, and Cinema Products' new Sturdy-Lite quartz focusing spot (operating at 600 watt-120 volt AC/DC or 250 watt-30 volt DC).



For further information, please write to:

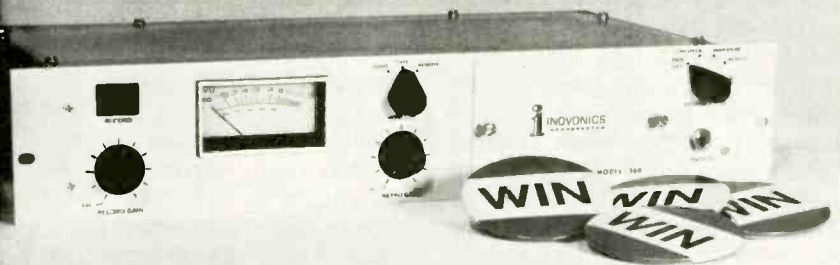
Cinema E products
CORPORATION

Technology in the Service Of Creativity

2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 ■ Telex: 69-1339 ■ Cable: Cinedevco

Circle 166 on Reader Service Card

For Ampex owners only:



inflation fighter

Don't spend \$3000 or more to replace that old reliable Ampex tape recorder. Save money with Inovonics' Model 360 Tape Recording Electronics. A mere \$690 for the Model 360 gives you plug-for-plug replacement of the Ampex tube electronics.* And brand new performance equal to (and in some cases better than) many new recorders. Features of the Model 360 include fully regulated internal power supply; reliable solid-state circuitry; remote control options; and plug-in cards to simplify maintenance.

*Plug-for-plug replacement for Ampex 350/351 and 354. Adaptable to Ampex 300 and most other professional recorders.

i INOVONICS
INCORPORATED

1630 Dell Avenue Campbell, CA 95008 (408) 374-8300

Circle 167 on Reader Service Card

NAB SHOW-IN-PRINT

after Cinema Products, the only other news camera manufacturer at NAB. Cinema Products has captured a good part of the TV news camera market with its CP-16. CP isn't phased by the competition. It feels it has many features that make it an outstanding camera. At the show it stressed, among other things, its fiber optics viewing screen which permits critical focusing. CP also showed a handy wireless receiver.

A new all-purpose film processor, the M-14 was shown by Jamieson Film. Built on a modular design, it offered considerable flexibility. It was designed to handle numerous kinds of film including the new Kodak 7240.

On hand to promote the benefits of Super 8 was Optasound Corp. with its ESTEC (Electronic Sound Transfer and Editing Console) system. The new system aids sound editing in particular. Filmmaker sits at the ESTEC console with all sound sources and can come away with edited film, fully mixed, dubbed, including a balanced and edited sound tract (without splices). Optasound was also passing out helpful material on using Super 8. Also in the area of Super 8, Eastman Kodak was showing its new projector, TV-M100a and the Supermatic film videoplayer.

Another new piece of film equipment at NAB, was a new optical printer from PSC Technology, for 16mm and Super 8 blow-up, 1-to-1 and reduction. The unit was very compact and simple to operate. While designed as a professional unit for the lab, its flexibility made it of keen interest to broadcasters for newsfilm duplication (after color correction) and making sportsfilm prints. It's also good for special effects. The Miniprinter will do fades and dissolves, subtractive density and color correction and freeze film printing—all at prices for super 8 users. The basic printer started at \$13,500.

There were a variety of telecines on display. The feature attraction at Cohu was its 1550 Performer which had some additional automatic features to distinguish it from the earlier 1500 which has enjoyed unusual industry acceptance. TeleMation, eager to get across the virtues of its TCF-3000 color film telecine, used SMPTE slides to test parameters of gamma range, tracking, colorimetry, shading, noise

enhancement and auto level control. Marconi again showed its versatile B3404 telecine system first shown at NAB in 1973. There were also elements of telecines: Eastman Kodak included in its exhibits, the CT-500 projector; Beston Electronics displayed an automatic light control system for film camera chains.

Bosch Fernseh introduced a new OMY integrated telecine system. Featuring a full multiplexer capability for four inputs and two outputs, the OMY can air two line programs simultaneously. The second output can be used for previewing. Circuitry includes variable gamm correction, auto b/w balance, and aperture correction. Thomson-CSF discussed a color slide scanner, a high resolution unit that handles 80 slides.

Ikegami also showed a quality color telecine chain, but the product that drew most attention was the COM-ATOP standing for Commercial Automatic Threading and Operating Projector. This unit could be loaded with 100 cartridges for automatic playing. It has been in use in Japan since 1974. 1975 was the year also, that found the RCA film cartridge projector in full production.

With everybody discussing many automatic features in telecines, it was hard to stand out. Both RCA and CBS Labs gained unusual attention however by the promotion of their automatic color correction systems. RCA called its unit the Video Processing and Color Correction accessory, designed expressly for TK-28 and the cartridge player, the TCP-1624. The accessory includes circuitry that automatically detects and corrects differential gamma errors, sometimes called mid-tone or mid-gray errors. A line-by-line analysis of the signal is made. Demonstration showed how off-color or aged films could be made suitable for TV.

The CBS Color Correction System can be used with anyone's telecine and corrects deficiencies due to exposure, and/or developing errors. Color mismatch due to different films being spliced together can also be corrected. The most troublesome colors are generally at the extremes of the B-Y axis—either deep dark blue or high pastel yellow, colors that have chrominance components at a very low of very high luminance level. More details on this unit are contained in the March, 1975 issue of BM/E.

Yet another film device at NAB was the tri-optical telefilm recorder from



Berkey Colortran's lensless spot.

284



Skirpan light-pen controlled memory system.

285

Teledyne. The new unit uses compressed air to quickly pull down and stabilize the film. It also uses three tubes and dichroic optics to assure that all information on tape is present on film.

A brand new, and radically different film item at NAB, was a shutterless, flickerless projection system developed by Hollogan Optical Systems Corp. System will take all film formats. Using a rotary system, lap dissolving from frame to frame without flicker is possible. Registration better than 0.0003-inch from frame-to-frame is claimed. Optical system will stay permanently aligned, developer says.

Lights and lighting

The prestige was in memory systems and many exhibitors featured them: the Memory Center from Berkey Colortran; the Q-level from Kliegl; Autocue and Astral from Skirpan; the Modular Memory System from Strand Century.

In terms of impact, the new lensless light called Colorspot from Berkey Colortran struck us as important. By replacing the lens with a Schmidt reflector, about twice the light is obtained. This means less power consumed for the same amount of light—a significant feature in these days of an energy crisis.

Strand Century introduced a new Ianiro HMI metal halide Fresnel. The significance of it was that it could duplicate the wavelength of sunlight without the need for gels. Unit has high efficiency—85 lumens per watt compared to 20 lumens for incandescent fixtures. New Fresnel was also featured by Kliegl along with a

portable lighting kit. Mole Richardson offered several new focal spots.

Most of the memory systems on display had been shown before. New this year was a modular memory system from Strand Century. The solid state modular lighting control console is capable of holding up to 320 lighting channels and 400 lighting cues. Timing is all pre-programmed, but of course, can be overridden manually. Skirpan gained new attention for its Autocue system by virtue of its acceptance for installation in a major ABC studio.

On hand to show new filters was Rosco. Its new product was a new material called Roscolux, which can last longer under intense heat. GTE Sylvania showed a full line of lamps for studio lighting.

Imero Fiorentino Associates handiwork was in evidence in many exhibits since IFA designed many of the sets at the convention, and arranged lighting for President Ford's visit. But IFA also offered several products: A TV monitor analyzer and a liquid



PSI systems described.

286



BCS showed new BCS 1100 system. 287

Cox Data shoed minicomputer system. 288



software projection system.

Business automation systems—moving toward total automation

Business automation systems, which stress the capability of handling traffic as well as billing and other accounting functions, are penetrating the industry more and more. There are still some ups and downs as various suppliers try to settle on the right service at the right price. In the process, those serving TV stations are moving into the radio market and those primarily in radio are moving into the TV field. And there is a trend for both to be talking about interfacing business systems with technical switching systems—total automation, as BCS puts it.

Suppliers offering automated business services at NAB 1975 were BCS (Kaman Sciences), BIAS (Data Communications Corp.), Compu/Net (Control Data Corp.), Cox Data Systems, Jefferson Data Systems, Paperwork Systems, Inc. (PSI), and a newcomer, RaDoniC, a div. of Unidyne Co. In this line-up, we should mention Central Dynamics, Ltd., a technical hardware manufacturers bridging the gap between switching equipment and business automation via software programs that permit interface.

In terms of computer trends, several movements were noticeable. Those offering on-line time-share services are getting bigger computers. BIAS claims its newly acquired Burroughs 6700 computer permits enhancement of existing programs and the development of new ones such as BIAS 2 for radio. Compu/Net, now part of the Control Data Corp. Data Network, stressed *local* "dial-up" service in 70 markets. Compu/Net asserted that it will always have the very latest computer technology at hand.

Those promoting in-house computers find it possible to offer more and more services because mini-computers increasingly offer more capacity at lower costs. Cox Data Systems has recently shifted to in-house computers. RaDoniC expects to become a competitive force in the outright sale of systems because it will use a Lockheed computer similar to IBM's System III, but cheaper. PSI leases or sells systems.

Because computers can talk to computers, and because data links extend to wherever telephone lines go, dis-

continued on page 100

ELECTRONIC JOURNALISM

IS LIVE

AND WORKING WITH NURAD ANTENNAS

FOR TV STATIONS IN 18 MAJOR CITIES.

Albuquerque

Atlanta

Charlotte

Chicago

Cleveland

Columbus

Dayton

Houston

Los Angeles

Nashville

New Orleans

New York

Philadelphia

Pittsburgh

St. Louis

St. Paul

Washington D.C.

Wichita

Each of the cities listed above has one or more Nurad Quad Polarized 2 GHz Antenna Systems in operation. Find out how this unique microwave antenna equipment can work for you. Write or call Nurad for detailed information.

NURAD

INCORPORATED

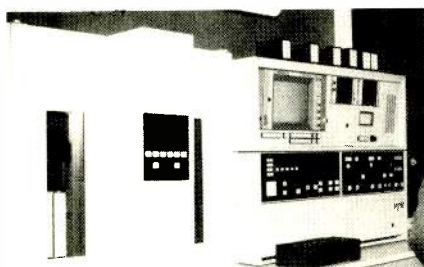
2155 DRUID PARK DRIVE
BALTIMORE, MARYLAND 21211
AREA CODE 301-462-1700

Circle 169 on Reader Service Card

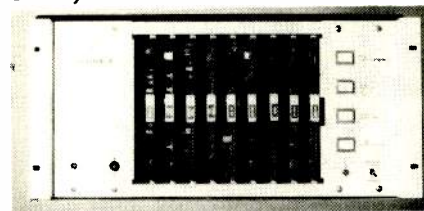
NAB SHOW-IN-PRINT

tinctions between on-line central computers and off-line central computers and in-house computers, blur. Thus BCS talks about computers and CRT terminals anywhere being interconnected even though BCS is essentially an off-line service, as far as its central computer is concerned (and in-house to the extent that mini-computers are also used).

In brief, here's what was promoted at Las Vegas: BCS: the ability to interface between business systems and technical operations. At the show, BCS announced its BCS 1100 system could now interface with the Grass Valley APC-2000 system. It already had the capability of interfacing the CDL-610/200 and System 100. BIAS: improved service as a result of its large Burroughs 6700 system. This meant offering a radio service and expanding its TV operations. At the convention, BIAS announced a contract with Forward Communications to provide automation for six Forward TV stations—bringing the total for this system to 116. BIAS also talked interface with electronic switching equipment. COMPUT/NET: a large-computer system that permits radio broadcasters to get more flexibility in daily



Ampex ACR-25 set up for interface with CDL System 100.



Ampex "ADA" interface unit applied CDL "ARCH" program to ACR-25. 289



Central Dynamics' System 100 in live demo controlling Ampex ACR-25.

logs thus permitting late selling, and over selling through priority pre-empting, etc. TV broadcasters should look into Compu/Net because of its sophisticated way of handling orbits, rotators and run-of-schedule. COX: use of dual large minicomputers (Nova 4s) with four disc storage units. System offers back up and everything its former large central computer could do. JEFFERSON: a central computer in Charlotte backed up with two mini-computers at the station. PSI: four systems BAT 1000, 1250, 1500, and 2000. Newest is BAT 1500, ideal for large radio and small or medium TV stations, which provides full availabilities for 52 weeks and fast process speed at an economical cost. Company distributed check-off sheets which clearly described capabilities of different systems. PSI also talked about interface with technical operations. RaDoniC: the SMART system (Station Management and Accounting for Radio and Television) in about two months hence. Equipment will be Lockheed System III.

TV Technical automation— progressing but slowly

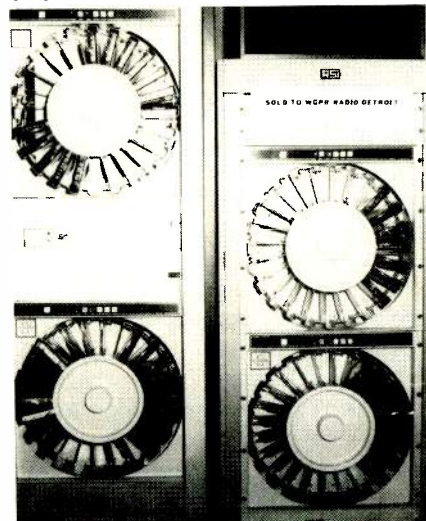
There were few surprises at Las Vegas in terms of new hardware or systems for TV technical automation save for IVC's introduction of the Programmed Broadcast Recorder which really is an alternative to the video cartridge player rather than an approach to station automation. Central Dynamics did demonstrate the full capability of its System 100 automation system but the system itself was announced last year.

Perhaps the biggest surprise was that not more was shown. The explanation? The availability of video cartridge players (TR-100s), automatic videocassette players (ACR-25) and now the IVC PRC. These equipments make it possible to play commercials, promos, and station IDs without computerized automatic switching.

However, progress in the technical automation area was the major theme of Central Dynamics' exhibit. In a new brochure, "Future Shock . . . NOW!" CDL said "We are rapidly approaching a new situation where more people regardless of skill, will not solve the problem of responding quickly and accurately. . ." CDL promoted the system 100 as a good way to avoid the problem. Grass Valley again showed its APC-2000 system which is slated for several



Harris' new System 90 for total radio automation. 290



Audio Services radio automation system, with computer control. 291

more installations. Vital showed some computer terminal equipment which ties in with its switching equipment. As we have already noted, interface between business automation and technical automation systems was promoted by BCS and BIAS. (BCS announced specific interface capability with the CDL system 100 and the G-V APC-2000.)

The most recent CDL automation gear System 100, is a modular design which permits update and expansion. Designed and built with experience gained through successful installations of the company's larger system, the APC-610/200, the 100 performs complicated A/V switching sequences, and offers features which bear on increasing efficiency in Sales, Traffic, and Accounting.

Schedules from traffic can be loaded automatically, edited, and last minute changes made easily. Traffic entry errors can be caught. An accurate "as-aired" log is printed automatically. Machine assignments can be made automatically.

Announced at Houston, but fully developed this year was ARCH—CDL's software program which, through System 100, ran Ampex's

ACR-25. The system fully exercised the random access capability of the ACR-25 using Ampex's accessory systems IDA and ADA. (This liaison spawned the "Arch Loves Ada" buttons seen everywhere.)

The System 100 uses the PDP/11-05 computer. The CRT D display terminal shows the on-air event and the next 11 preset events. Among the options that could be added to the basic System 100 were extended core memory dual floppy discs and a material verification accessory.

Radio automation

As already noted, an explosion in multicart machines gave the special flavor to the radio automation arena. All the established makers of the larger, "complete" program automation systems were there with well-proven systems providing up to a couple of thousand controlled "events." Schafer with the 900

series and the computer-controlled Schafer-NTI units; SMC with their DP series; IGM with their 300 and 400 series; RCA with their DAP complete systems; Autogram with their complete systems; Control Design with their CD series.

A newcomer in the complete automation arena was Audio Services, who showed a system using the Control Design rotary cart machine, plus computer control of cart selection. An old-timer with a brand new system was Harris, who called their new entry "System 90," an elaborate system with 16 inputs (expandable to 32) and

storage for up to 1200 events (expandable to 3 thousand). System 90 provides all the amenities of the "complete system"—random access to all the "events," displays to tell current and next events, and unusually flexible control methods.

Ampro introduced their Rotocart, a 24-unit wheel, generally standard in dimensions for the "carousel" type of unit. Carts are removed from the wheel to a stable platform during play; the unit uses Ampro's own cart and cart play system, claims electrical characteristics of a high order. Ampro says the random select access time is a

Cool kits for hot camera crews.

Only famous Janiro lighting fixtures, (the ones you get in Strand Century lighting kits), give you cool-to-touch fiber glass housings, for safe, comfortable handling at any time. And only Strand Century kits give you superbly rugged carrying cases for years of trouble-free use.



Strand Century kits offer the best kit value available anywhere. Light weight. Sturdy, durable stands. Easy to adjust during use. Smooth, even light distribution. Quick heat dissipation for fast pack up.

For use on location, and in the classroom, or wherever rugged portables are needed, insist on Strand Century lighting kits. Write for details to National Director of Television/Motion Picture Sales,

Strand Century Inc
20 Bushes Lane,
Elmwood Park, N.J. 07407.

STRAND CENTURY INC

A COMPANY WITHIN THE RANK ORGANISATION

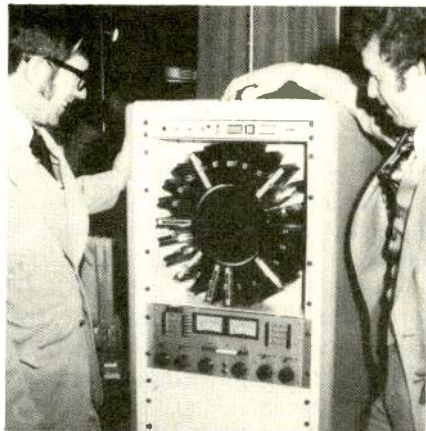


Circle 170 on Reader Service Card



New Caro-Stat multicart machine introduced by SMC.

196

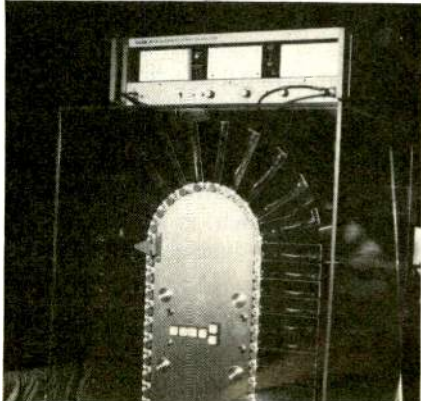


Ampro's new Rotocart, rotary multicart player.

292

Go-Cart is new rotary cart player from IGM.

293



NAB SHOW-IN-PRINT

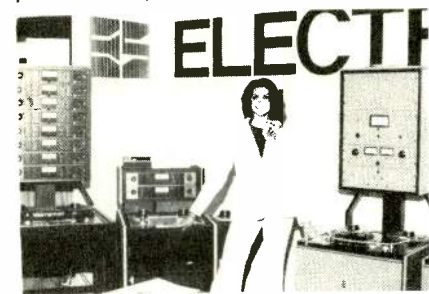
maximum of 7 seconds after tape "stop." Prices run from \$1795 for a mono system to \$2290 for a stereo system with fast forward, Dolby noise reduction, and trip cue.

The RCA "Kartwheel" is another 24-cart rotary mechanism with rather similar characteristics: random access time is a maximum of seven seconds, audio characteristics are excellent. The wheel is removable, for storage of the carts or reloading. There are vernier adjustments for head zenith and azimuth, head-tape parallelism, tape guides before and after the heads. Start-stop cueing system is included. The price is \$2100.

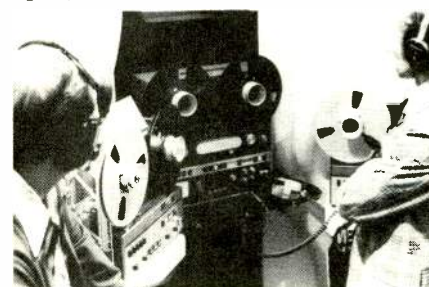
Schafer, SMC, and IGM introduced multicart machines of other kinds. Schafer showed a new system for stand-alone operation by a disc jockey or other announcer of the Audiofile, separate from any automation system. This has proved to be a successful operation mode at, for example, station KVOO, Tulsa, as described in BM/E



Studer's A-80 open-reel tape recorder was opened for inspection.



Electro Sound showed recorders, new high-speed duplicating system.



Revox showed A77 recorder with new voice-controlled unit.

in December.

SMC showed an "instant play access machine," the Caro-Stat, which comes in versions holding either 12 or 24 stationary carts, standing vertically like books on a couple of shelves. There is a complete playback system for each cart; a solenoid-operated rocker pulls the cart to be played up to the drive line in the rear, a movement of about 1/16 of an inch that takes a fraction of a second. Since one cart can go up as the preceding one comes down, "instant access" is real. Electrical characteristics are way, way up.

IGM calls their new unit a "Go Cart"; it will be sold as an alternative to their very popular Instacart. Again, the cartridge to be played is pulled out of the carrier for secure positioning. Each carrier holds 42 carts, but can be extended to 100 by adding more "links." A second play position can be added to speed access; a micro-computer decides how to move the train for fastest access.

IGM also introduced a new random access memory system, with 2048 events as standard, expandable to 4096. IGM calls it the first "static type, read/write memory system for broadcast automation use." Each event has a source (up to 19) with a sub-source within that source (up to 48 sub sources per source). It uses an Audabus chassis technique—any board in any socket. It can be used as the main control center of an automation system, or as a subcontroller. Price is \$4250.

Some other new pieces of equipment were Control Design's CD80L English-print-out logger; an IGM FSK encode-decode printed automatic logging system; and a reel-to-reel tape machine designed specifically for automation systems by Control Design, with motion sensing, cueing filters and sensor, 3-motor transport.

In a relaxed vein, Control Design had "on show" a phono-disc carousel machine from 1921, built by Mills in Chicago, found recently on a restaurant back porch in Ironton, Missouri, and restored to "quasi" operating condition by the Control Design R&D department using the patent drawings. The theme is obviously "there's nothing new under the sun"—the twelve discs rotate in carriers around a central shaft, with the one cued up stopping at a playing position. Frequency response: 200 to 1850 Hz; harmonic distortion: 78%.



Otari had line of new medium-priced recorders.



MCI JH-110 recorder has many automatic features.



Pioneer was new exhibitor with recorders, turntable.

Open-reel tape recorders

Most evident on the floor was the strong trend to more automation, higher electrical performance, in top bracket audio recorders, noted in our February report on these machines. It could be seen in, for example, a new machine for the NAB, the MCI JH 110, with automatic return to zero, other advanced aids to the operator. The JH 110 is now being marketed by Pacific Recorders and Engineering Corp., of San Diego. It comes with three speeds, and with tape tension control servo on both sides of the capstan. The dc capstan motor has a ground-in ceramic shaft; the servo can be had with crystal oscillator time reference or external synchronizer or resolver. The real innovation, pointed out in our February report, is the "joystick" tape motion control, which lets the operator move the tape forward or back at a touch, at any speed. The price is upper bracket: \$3685 for a

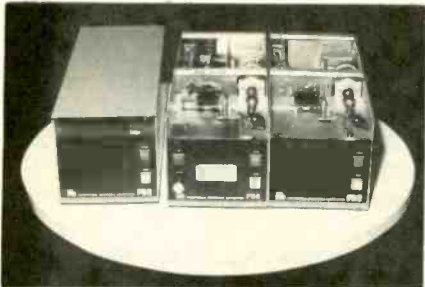
two-track, two channel version.

Also impressive in this bracket are the models in the Autotec series, which have similar state-of-the-art construction and features. Electro-sound's ES-505 looked better than ever, too, with its third-reel editing provision, remote control, and other "easy operation" features. And another machine in the upper-bracket, all-out category is a new import, Telefunken's Magnetophone, shown by Gotham Audio of New York, which seemed to have particularly impressive mechanical solidity and smoothness of motion, as well as top-end electrical characteristics. Scully/Metrotech had their very well-liked 205 series, on a par with those noted. Another is the Studer A-80, extremely smooth, mechanically.

One more machine completely at home in this class was International Tapetronics Series 850; the maker has emphasized ruggedness and durability



Rapid-Q's new Elite series of cart players. 235



International Tapetronics had new economy cart line, the PD-II. 236

Broadcast Electronics showed new heavy-duty cart players in Spotmaster line. 237



for the heaviest broadcast use. ITC's innovation was a new high-speed duplication system for program synchronizers.

The broadcaster who wants absolute tops in audio recording and playback characteristics combined with extreme durability and ease of operation thus has at least a half-dozen choices. And he has plenty of choice if he wants to pay in the range of 15% to 40% less for performance, practically indistinguishable from the top bracket,

plenty of automaticity, perhaps statistically reduced chances of reliability. Otari showed a whole new series at a large range of prices, including dc capstan servo, three-speed operation, synchronous reproduce. Especially attractive on the basis of remarkable operating flexibility was the Revox A700, big brother to the ever-popular A77 (also on display). The A700 is newly available with optional self-sync, at \$229 more. Some new options for the A77 were also introduced by

AUTOMATIC RELEASE



Series 3000
CART MACHINES

Spotmaster®

Series 3000 — an automatic release tape deck with features never before available in this type machine.

Low Power Consumption — less than 45 watts; coolest running unit in the industry; no excessive heat build up; no damage to your tapes.

Advanced Design — all performance specifications exceed present and proposed NAB standards.

Quality Construction — *Spotmaster* quality, rugged machined deck, gold plated connectors, new higher efficiency, direct-drive motor, maximum transient noise suppression, massive air-damped solenoid with excellent reserve capability.

Unique Stereo Head Bracket — phase lok III, the only head bracket with an independent azimuth adjustment — assures extremely tight control of stereo phasing.

Full Range of Models — available in mono and stereo, record and playback, all cartridge sizes, desk and rack mounting.

Standard Features — include mike input, headphone jacks, transformer output, FET switching, remote control socket; mating connectors are supplied.

Options and Accessories — all tape speeds, secondary and tertiary Cue tones, fast forward, 50 or 60 Hz, 115 or 220 operating voltages. Accessories include splice/fault detector, delay machines and remote control.

Reliable — careful design and cool operation assure long trouble-free life. The use of readily available multi-source components, accessible adjustments and modular construction (including plug-in motor and transformer) simplify maintenance.



BROADCAST ELECTRONICS, INC.
— A FILMWAYS COMPANY —

8810 BROOKVILLE ROAD • SILVER SPRING, MD. 20910
PHONE 301-588-4983 • CABLE "SPOTMASTER"

Circle 171 on Reader Service Card

NAB SHOW-IN-PRINT

Revox: an endless-tape delay-echo unit and a voice-activated version.

Others roughly in this category with similar high operating flexibility were the English import by Elpa, the Ferragraph Studio 8; a whole new series from Telex, the 1400; and a series from a newcomer in the field, Pioneer.

In more specialized vein was a new series from Nagra, maker of top-bracket battery portables: the IS Nagra's are intermediate in size and price between the "standard" SL and the miniature SNN.

Cart machines, and carts

All the established makers of cart machines were on hand, and several had innovations. International Tape-tronics added to its full line the PD-11 series of "economy" cart players. Broadcast Electronics showed the new 3000 and 4000 series, very heavily made, for extreme long life, with automatic release. Ampro introduced

the Model 3547DNR with Dolby decoder built in; in a live demonstration the Dolby's well-known effectiveness in knocking tape noise out could be sampled. Garron Electronics had a new series, the Rapid Q Elite, with electronic solenoid damping for quiet operation. Tape-caster showed their X-700 series of cart machines.

There were two new species of carts that promised new, better performance. Fidelipac's Master Cart has a tape path past the heads controlled, the maker says, primarily by the cart machine; this neutrality of tape flow comes from a completely new tape wind path, and precision cart dimensions. This provides extremely stable operation, particularly in stereo. The new Master Cart reaches all Fidelipac distributors about June 1st, the company said.

A new Audiopak from Capital Magnetics also claims rather complete redesign for more stable performance in mono and stereo.

Audio consoles

As in all recent NAB shows, audio consoles were the most wildly competitive class of gear, with enough machines in similar categories—including quite a few new ones—to make the observer wonder what their market research has been telling the developers. There is a steady refinement of technology, particularly in the circuitry of individual units like equalizers. Modular construction is nearly universal. The spread of the elaborate switching of recording-studio machines into broadcast consoles, underway over the last five years or so, is also continuing.

The large equipment makers—Harris, RCA, Collins,—were on hand with consoles more in the traditional broadcast vein, familiar and well-proven from earlier years. Consoles of very advanced flexibility in switching, many-channel mixing, innovations in circuitry, top-of-the-art specifications, came especially from Dipol, Spectra Sonics, Automated Processes (a new console exhibitor at NAB), Auditronics, Cetec, Neve (a pioneer in applying recording-studio techniques to broadcast consoles), Audio Designs, Ward-Beck.

Robins/Fairchild had production units of their Model 1632, shown in prototype last year, a sixteen-input totally modular console in the medium-price bracket, about \$11,500, with a generous complement of highly ad-



Cetec's 10-channel console has slide faders. 232



Auditronics showed multichannel console, new program equalizer (right). 233



Neve had audio console integrated into desk. 234

vanced features and circuitry. Ampro showed a new series, the "B" version of their lower-priced 6 to 12 channel consoles. Autogram introduced 10-channel stereo and 8-channel mono boards.

At the low end of the price range was LPB's new 8-channel mono board, at \$1995 (off the shelf). Some-

Ward-Beck showed 18 channel console.



Robins/Fairchild had production model of new 1632 console. 230



Spectra Sonics showed multichannel console. 231



Automated Processes showed new multichannel board. 231

what above this was probably the smallest board shown with some recording-studio flexibilities: the Lamb four-channel PML422, imported from England by Revox.

Sparta showed a new series of 10-channel mono and stereo consoles, in the traditional rotary-fader, sloping channel configuration. In this case, some marketing research did explicitly go into the design choices: Sparta says that a study showed a "hole" in the availabilities for boards of the capacities and prices developed. Dyma Engineering showed a fourteen-mixer audio board with three output busses designed specifically for remote TV applications. Built-in is remote control capability for audio-follow-video operation, plus a defeat switch so the board can be operated on its own.

McCurdy showed its very popular line of mono and stereo consoles, with several integrated into a complete operating control room, with other elements of the McCurdy audio line in operating positions. The whole most attractively styled "room" constituted a live, hands-on demo very close to a high-quality operative studio. (See under "Miscellaneous Audio" for other units in the McCurdy demo).

Need a console? A high proportion of the engineers interviewed for our pre-show "Panel of 100" survey said they were looking for consoles. They found them—no question of that.

Turntables, microphones, headphones, and speakers

Audio studio gear is not spotlight-quality as far as the NAB exhibit is concerned, but it is a cornerstone of every station's operation, nevertheless—and it was solidly in the show. This year's main interest among audio items seemed to be in turntables, and this gives added emphasis to BM/E's brief report in the October issue on the widespread problem of high turntable rumble in FM stations.

The top-of-all-lines turntable was, as it has been for quite a few years, the EMT 930, available in the US through Gotham Audio of New York. At around \$1600, the EMT 930 is a market bracket almost by itself. And its performance, too, has been pretty far above most of the field.

Now we may be developing a new breed of very-high-performance tables with prices well under \$1000, using the direct-drive dc motor.

As we reported in October, several stations have knocked out their rumble

problem with the Panasonic SP-10, one of the new breed using the radically different dc direct drive-motor with servo speed control. McCurdy Radio, as part of their "complete studio" exhibit on the floor, had two SP-10's installed in a typical control desk, all in a live demo.

Some other makers have put direct-drive turntables on the "hi fi" market, including Dual and Sony, but until recently these have not been aimed at the broadcast market. At the

show, however, Sony showed an advance model of a new direct-drive machine, the PS-8750, just introduced in Japan at a price of \$580. Sony says it will be sold in the US in 1976—price not yet established. The early information suggests a turntable with basic performance characteristics in the same general league as those of the EMT 930. The direct-drive system is stabilized by a crystal oscillator—details not yet given—for a speed accuracy set by Sony at 99.997%. If that

AUTOMATIC RELEASE PLUS

*Series 4000
CART
MACHINES*



Spotmaster®

Series 4000 — *Spotmaster's* new machine with a new look; featuring a long, low profile - and an exceptionally rugged mechanical design.

Automatic Release — with low power consumption; no excessive heat buildups, no damage to your tapes. Coolest running machine of its kind.

Advanced Design — All performance specifications *exceed* present and proposed NAB standards.

Full Range of Models — Available in mono and stereo playback or record/playback models for all size cartridges; also available in space saving mono and stereo playback for A and B cartridges; desk and rack mounting.

Sophisticated Options — Include diagnostic metering; built in splice/

fault detector; and encoding/decoding circuits for use in automation systems.

Quality Construction — *Spotmaster* quality, rugged machined deck, cast and machined frames and panel, gold plated connectors, new higher efficiency, direct-drive motor, maximum transient noise suppression, massive air-damped solenoid with excellent reserve capability.

Unique Stereo Head Bracket — PHASE-LOK III, the only head bracket with an independent azimuth adjustment — assures extremely tight control of stereo phasing.

Reliable — careful design and cool operation assure long trouble-free life. The use of readily available multi-source components, accessible adjustments and modular construction (including plug-in motor and transformer) simplify maintenance.



BROADCAST ELECTRONICS, INC.
— A FILMWAYS COMPANY —

8810 BROOKVILLE ROAD • SILVER SPRING, MD. 20910
PHONE 301-588-4983 • CABLE "SPOTMASTER"

Circle 172 on Reader Service Card

NAB SHOW-IN-PRINT

Pioneer announced early availability of another radical turntable, with radical specs promised. The Pioneer machine uses Hall effect semi-conductors as drive elements in the dc servo-controlled motor. The projected characteristics show wow and flutter at less than 0.03%, close to the total vanishing point.

QRK, which has taken over all the former audio products of the CCA Corporation, showed their turntables, arms, preamplifiers, and related accessories, which include the tables sold for many years under the Rek-O-kut brand. Russco also had a full line of turntables, exceptionally rugged and well designed.

Microphones—The finest microphones available from the well known firms—Beyer, Neumann, Shure, Electro-voice, AKG,—were on display. AKG introduced a new line: the C-500 series of electret condenser mikes that include hand-held cardioids, an omni capsule, a lavalier. Neumann (shown by Gotham Audio) emphasized their "Phantom powered" condenser microphones, which include several types widely used in broadcasting, among them the U-87 and U-47. Electro-voice showed a new miniature electret condenser omnidirectional mike which is in capsule form (13/32" across), easily attached to any part of the clothing. The "backing" device, hidden under the clothes, holds the electronics. Electro-voice also introduced a very small hand held omnidirectional dynamic, D-54, and a similar electret condenser model, the CS-15.

Shure put emphasis on their new hand-held Model SM82, which has a line-level amplifier built into the handle, including a peak limiter and battery.

Vega, part of the Cetec complex, showed their wireless microphone systems. They introduced a new receiver, Model 58, compatible with the rest of the line, with wider frequency response than earlier counterparts: 40 - 15,000 Hz \pm 1 dB. A helical resonant front end gives high discrimination against spurious and image response signals. With an ac Gel Cell battery, the receiver operates 16 hours on an 8-hour charge, a four-fold improvement.

There were two artificial reverb systems on the floor: the EMT Reverb

Foil, Model 240, from Gotham; and the MicMix Master Room systems which use a patented delay-line technique. Both systems supply artificial reverb of high quality, in easily used form, and at comparatively moderate prices.

Headphones—There were plenty of headphones on the floor. The trend to the very light weight, foam cushion style, which is rather open to external sound, could be seen in units from Beyer, who also showed a very complete line of headsets in more conventional form. AKG and Telex showed extensive lines. Pioneer had a new version of their piezo-electric polymer design, which uses the peizo-electric effect in a special polymer material for transduction.

Finally, a variety of audio control, line, and distribution amplifiers came from a number of firms, including Shure, Russco, and a new exhibitor from Canada: Orange County, with amplifiers, and audio switchers that looked extremely well designed.

Audio processing gear

The main topic could be called "limiting (compression) without pain." Two clashing trends are keeping up the pressure in this area: the push for the highest possible level of modulation; the push for higher fidelity in both AM and FM.

Some of the more subtle causes of serious overmodulation in FM, at

modulation levels that seem acceptable, arising from inadequacies in limiter filter design and other limiter system faults, were described in a technical paper by Eric Small and Robert Orban. They also described a new limiter aimed at overcoming the faults and allowing a very high level of FM modulation with good fidelity. Orban Broadcast of San Francisco has developed the limiter, called the "Optimod 8000," for marketing, and it was on display. BM/E will present the paper in an early issue.

Another new approach to level control was embodied in the RCA model BA-145, AGC amplifier, on live demonstration in the RCA booth, which is designed for use in AM, FM and TV. RCA calls it "a new-generation gain controlling device" since it makes gain changes, not simply by riding gain, but under a set of logical conditions. The logic system is aimed at eliminating pumping, up-swish and other undesirable side effects. The unit offers maximum compression of 24 dB and maximum expansion of 16 dB. It comes in mono and stereo versions, and there is a sync unit for linking two stereo units for quad broadcasting.

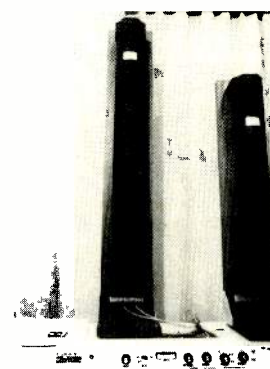
A third gain-control system introduced at the show was the "Multi-limiter" of Pacific Recorders and Engineering Corp., which has low-band RMS limiting, high-band RMS limiting, with feed-forward circuitry; and a fast peak limiter. Plug-in function cards change the unit from AM to



Russco showed turntables, arms, mixers.



Collins had operating display of turntables, console.



Micmix showed new units in reverb line. 235



Reslo wireless microphone was shown by Television Equipment Associates. 236



Shure featured new microphone with amplifier in handle. 237



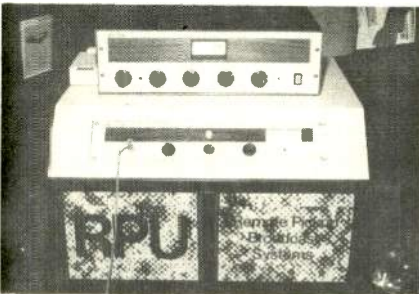
Orpan showed new Optimod 8000 FM limiter. 238

FM/TV application; the AM card includes an automatic polarity correlator to switch signal asymmetry for highest modulation. The FM card has pre-emphasis and de-emphasis switchable for 25 microsecond and 75 microsecond operation.

The more familiar gain-control units on the floor included the CBS Volumax and Audimax; the Wilkinson GCA-1/S AGC amplifier;

The Expanding movement toward the use of noise reduction devices in broadcast audio chains, described in some detail in our October issue, could be seen on the exhibit floor. Burwen Laboratories showed their series of variable-

continued on page 108



McMartin showed transmitter and receiver for remote radio pickup. 239



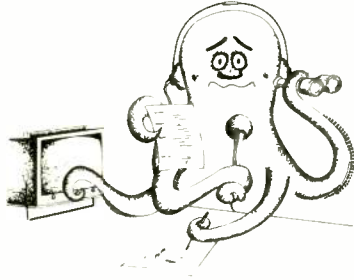
Digital remote control system was introduced by ESE. 240

Marti had new transmitter and receiver for radio remote pickup. 241



SPORTSCASTERS —

ISN'T IT TIME YOU GAVE YOURSELF A HELPING HAND ???



Hands-free communication is within your reach. Television Equipment's well-proven Sportscaster headset, with integral dynamic boom mike, gives you complete freedom of movement — just right for those tense moments when you need to consult your references.

The headset has a . . .



Price: \$ 75.00
Delivery from stock

Dynamic Boom Microphone: 400 OHMs, frequency range 50-15,000 Hz, sensitivity 2mV (loaded) for close speech.

Double Headphones: independently wired, 200 OHMs each, frequency range 50-15,000 Hz.

Ventilated foam cushions eliminate perspiration and let you hear ambient sound (optional ear-enveloping cushions).

Weight: 6½ oz. Practically unbreakable components. Optional cough switch.

For your helping hand phone today. . .

In Canada call:

Conway Electronics Enterprises, Ltd.
416 • 742-6631

Television Equipment Associates, Inc.

BILL PEGLER 516 • 628-8068

Box 1391 • BAYVILLE, N.Y. 11709

Circle 173 on Reader Service Card

MCMARTIN / BA-1K

1000/500/250 watt AM

BA 1K—the perfect transmitter for your new AM station or updating your existing operation

•
FCC TYPE ACCEPTED

•
unique interior accessibility front and rear

•
all solid state except for four 4-500A power tubes

•
125% positive peak capability

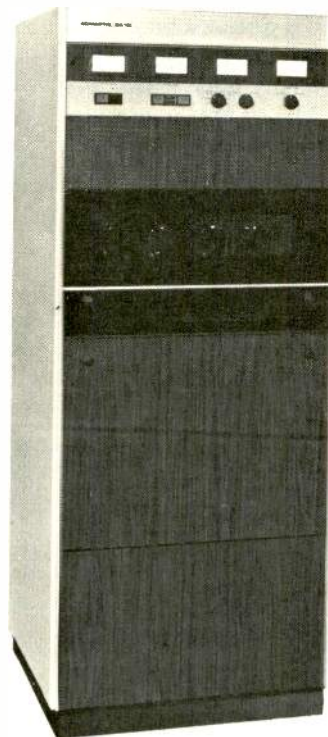
•
pushbutton Hi-Lo power operation

•
full remote control/metering capability

•
power driven vacuum variable tuning/loading controls

•
built-in dummy load

•
from the "FULL-CHOICE" line



transmitters

McMartin.

McMartin Industries, Inc. 4500 South 76th Street, Omaha, Nebraska 68127 (402) 331-2000

Circle 174 on Reader Service Card

NAB SHOW-IN-PRINT

bandwidth filters for broadcast applications, including the 1500A and 1500D for remotes at two quality levels; and the Model 1100 for in-station high-frequency noise reduction.

DBX brought a new packaging of their encode-decode system, called Model 142, designed specifically for broadcast use, embodying all the main features of the DBX system—a 2:1 compression ratio, rms level sensing, 30 dB of noise reduction, etc. The 142 is a two-channel device, with the channels independently switchable from encode to decode. DBX pointed out that there is a large variety of applications for the system in broadcasting, among them noisy line feeds; microwave links; older open-reel machines used in production; and especially cartridge systems, in which the large noise reduction of the Model 142 can be applied to make cart reproduction sound practically "live." Price of the Model 142 is \$750.00.

Radio remotes, STL's and control systems

The trend toward use by radio stations of their own remote pickup or STL linkage with microwave radio, will certainly be encouraged by a new system Moseley Associates brought to the show—the PCL-505. It is available for all the commonly used bands, 148 MHz to 960 MHz. The transmitter uses direct FM modulation, developed by Moseley. For stereo, the whole composite signal including a 67 MHz subcarrier can be put on one RF channel; or the station can use two channels side by side, opening up room for additional coverage by the microwave link. Frequency response, distortion, S/N are at new levels of high precision.



Belar demonstrated new AM modulation monitor. 242

Another new unit from Moseley was their DLS-1, digital logging system which can be added to their DRS-1, digital remote system, or used independently. The logger produces a columnar print-out, with 21 columns, on a teletype board.

Marti showed a new portable remote pickup transmitter operating in the 150-170 MHz band. It runs on batteries, has a built-in charger, a whip antenna, and weighs 5¼ pounds. Included is a compressor-limiter to control signals of too much dynamic range. Frequency response is excellent, distortion very low. Output is a maximum of 1 watt.

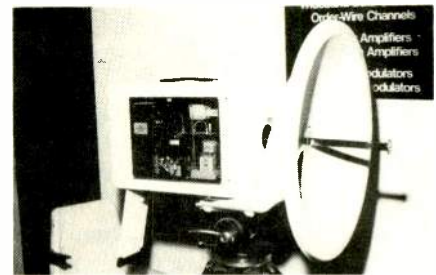
Marti also brought a new digital remote control system "surprise" unveiling, the model DRC-24. It has single button direct channel selection, can be had with 8, 16, or 24 channels, has a telemetry accuracy of 0.1%, allows for all functions of a complete remote control, telemetry, and status/alarm system. The electronics is nearly all in eight 40-pin identical integrated chips developed for the system. Plug-in modules will add FSK frequency change. The system is readily adaptable to multiple transmitter control from multiple control points. Marti also showed their complete line of accessories for remote control and STL service.

Comrex had a series of handheld broadcast remote systems for news gathering and similar applications. A 450 MHz system includes a transmitter and a receiver, each 3" x 5" x 1"; the transmitter has 100 mW output. A remote pickup automatic relay system, for either the 150 MHz or the 450 MHz band, is designed specifically to operate news car high power transmitters remotely. The transmitter, model RTA, has output switchable between 100 mW and ½ watt. The relay receiver automatically keys a newscar transmitter. With these systems, a Comrex spokesman pointed out to BM/E, a crew in electronic news gathering can get the mike up near the sound source, avoiding the very poor aural S/N ratio that often prevails at the camera location.

A system of quite similar design and applicability was shown by Television Associates, U.S. representative of the maker, Reslo of UK. It operates, again, in the 450 MHz band; transmitter output is 40 mW, frequency response within 3 dB, 75 Hz to 15,000 Hz; microphone input impedance, 200 ohms; battery, 12 volt (MN2400 or



Microwave Associates 13-GHz remote system. 197



Farinon's new portable microwave unit. 243

equivalent AAA size). Receiver sensitivity is better than 10 microvolts.

Monitors, transmitter and antenna

A new high precision in AM transmitter modulation monitoring was evident in the new AMM-2 introduced by Belar, a prime source of monitoring equipment for a number of years. The AMM-2 covers the range 200 KHz to 160 MHz, and reads modulation to 133%, with indicator lamp for 100% negative modulation and a separate lamp for 125% positive, both independent of carrier level. The meter accuracy is 2%. A companion unit, the AMM-3, soon available, will have the ability to track carrier changes up to $\pm 50\%$ without loss of accuracy. This includes sharp transients in carrier level producing step-like changes. The prices are AMM-2, \$850; AMM-3, about \$1300.

RCA introduced an AM modulation monitor, the BW-51, that appears to be identical to the Belar AMM-2. In any case, the specifications are the same, indicating that the broadcaster has a choice among monitors at the new high accuracy for AM monitoring.

Time and Frequency Technology had their Model 723, FM frequency and modulation monitor, with the Model 724 stereo add-on for the Model 723, introduced last year. New in this line from TFT is a series of TV monitors. The Model 701 reads frequency and modulation, displays frequency errors digitally, needs cali-

bration about every 6 months for the UHF band and every 18 months for VHF. It can monitor off the air or by direct connection. It has two flashers that indicate plus and minus modulation peaks simultaneously. The frequency function is available alone as Model 709, and modulation only as Model 702.

CCA Electronics showed their Model FMM-1T FM baseband modulation monitor, to which the Model MPX-1T is added for stereo service. The FMM-1T has a peak flasher adjustable from 50% to 120% modulation, meter switchable from one polarity to another, push-button reading of AM, FM and internal noise.

Delta, who brought out their new all-digital directional antenna monitor, the DAM-1, last year, this year added to it the DAMA-1 base-current adapter, which provides remote digital readout of antenna base currents. Delta also showed their digital remote control systems for directional antennas and for transmitters, and their line of accessories for these systems.

Potomac Instruments had their line of well-known antenna monitors. The AM-19 has push-button tower selection, direct meter readout of phase angle and loop current ratio. The AM-19D is identical but has digital readout. The PMA-19 can be added to either of the others for close monitoring of very critical arrays. Its "current deviation mode" is a measurement showing directly the deviation of the current from the licensed ratio.

Microwave for video

Microwave systems for video STL's, intercity links, and regular networking service have been coming on stronger all the time for several years; electronic news gathering is starting another boom for microwave video, this one for easily portable systems.

Microwave Associates had on display not only their portable 3 and 13 GHz systems that are so popular for ENG, but also their 2 GHz STL systems and 13.5 GHz intercity systems. They were putting heavy emphasis on the 13 GHz portable, equipped with small horn antennas, as a "cable eliminator" in the short haul from a news event to a nearby video van.

Farinon unwrapped their FV-P, a frequency-agile portable for the 2, 7, and 13 GHz bands, all solid state, dual conversion, Farinon says one person

can set up and operate the system. It has a 70 MHz interconnect for up to 500 feet of remote-to-RF head separation. Many other features make it highly flexible and easy to use; it appears exceptionally well adapted to ENG. Farinon also introduced their new FV41 FM transmission channel system which puts one or two sub-carrier frequencies above the video in a microwave or video cable link, for program audio, FM stereo, voice-frequency multiplex, wideband data, express wire, or other "extra" information-carrying service on a video

channel. The extra channels can have 15 KHz or 100 KHz bandwidth, and are totally "transparent" to the main video channel.

Test systems and test equipment

Automatic monitoring, measuring and correction systems for TV came from several of the leading test equipment makers, clearly stimulated by, and supplying force to, the trend toward automatic transmitter operation.

Marconi unveiled an automatic TV

THE NEW GENERATION . . .

the **MCI** JH-110

- 3 speeds • solid state transport logic — NO RELAYS • individual bias and equalization automatically selected for each speed • DC capstan servo with built-in variable speed control • fast wind control "Joystick" • digital real-time tape time • constant tape tension system on both reels • plug in head assemblies • fully modular construction of electronics and transport logic • ¼ and ½ inch tape drive • return to zero search (optional) • full track \$3245 • two track \$3665 • four track \$5225 •



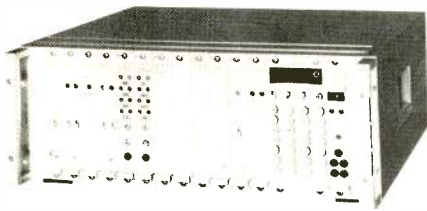
If you missed it at the NAB . . .
Ask for our brochure



PACIFIC RECORDERS AND ENGINEERING CORPORATION
11760 SORRENTO VALLEY ROAD, SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255 TELEEX 695008

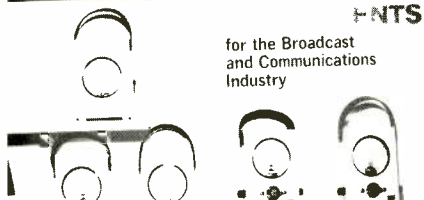
Circle 175 on Reader Service Card

NAB SHOW-IN-PRINT

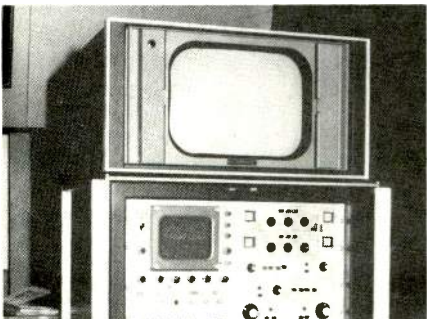


Rohde and Schwarz showed new distortion meter for VIT testing. 242

DIELECTRIC a New Line of



DIELECTRIC for the Broadcast and Communications Industry **FNTS**
Dielectric, division of Sola, had directional RF watt meters. 194



Tektronix demonstrated the new 1480 waveform monitor. 243



New Matthey automatic video equalizer was shown by Television Equipment Associates. 244

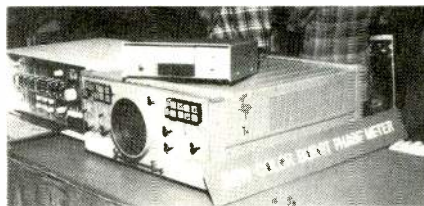
monitoring system which includes a VIP signal analyzer and a data selector unit allowing for interrogation, storage, and interface to a teleprinter for any of the measured parameters. Data can also be routed to a modem for remote control and monitoring. The data selection unit, Model TK2916, gives the whole operation very easy, quick access for the operator, speeds the monitoring and control process and gives it consistent high accuracy.

Marconi also showed their extensive line of test instruments, including a new series of TV picture monitors.

Philips brought out a new insertion test signal analyzer, designed to monitor continuously up to 21 types of distortion in a TV signal by analysis of the ITS (interfield test signals). The system, called PM5578, can activate

different alarm methods if any parameter is out of tolerance; it can feed a print-out device for keeping a record of the monitored parameters; and it has a special transmitter output for sending measurement results and alarm signals to remote points. The very extensive Philips line of TV test equipment on display, includes TV pattern, pulse, and signal generators, insertion test signal generators and readers, color pattern generators, video level meter, oscilloscopes, and much related equipment.

Tektronix gave live demonstrations of closed-loop correction systems which not only monitor important parameters but supply automatic correction of parameters that are out of tolerance. This, of course, is the essence of automatic transmitter operation. Among the loops set up by Tektronix was one that they said, included for the first time a VTR: the automatic correc-



Video Aids of Colorado introduced new color burst phase meter. 245



Bird Electronic introduced new air-cooled 5 kW dummy load. 246

Telecommunications displayed printed test patterns for TV adjustment.



tion was addressed to VTR parameters as well as those in the TV transmitter. Tektronix's system made use of the VIR signals as test factors. Tektronix also had on hand models from their extensive line of test oscilloscopes, and also their new Model 1480 waveform monitor, which provides high precision measurement of video lamplitude, as described in detail in BM/E's November, 1974 issue.

Television Equipment Associates showed the Matthey Automatic Video Equalizer, presently made in UK for the 625-line PAL color system, but soon to be available in the US with 525-line NTSC operation. It will operate on the VIR authorized by the FCC for use on lines 17 and 19, and will control ten different parameters, including burst phase, sync level, burst gain, overall gain, chroma gain, chroma delay, and others.

Rohde and Schwarz introduced an automatic video measuring system, shown in operation, based on a video signal generator, stabilizing amplifier, sync regenerator, VIT inserter and analyzer, with a TV transmitter in the measurement loop. The system can feed a teletype machine for read-out. Rohde and Schwarz also showed a number of new instruments in their very comprehensive line: among them was a new VIT distortion meter, TV monitoring receiver, TV relay receiver, and a complete transmitter test assembly in a wheeled double rack.

Datatek showed a transmitter color phase equalizer and waveform corrector system. Telemet highlighted their Model 4504 synchronous detector, Model 3706 sideband analyzer, and Model 3705 envelope delay test set. American Data Corporation showed their Series 1100 vertical interval/VIR test set.

Television Equipment Associates showed the Conway series of bench instruments, including several oscilloscopes of very advanced design, and a multimeter, the Master Ranger, with unusual flexibility and range.

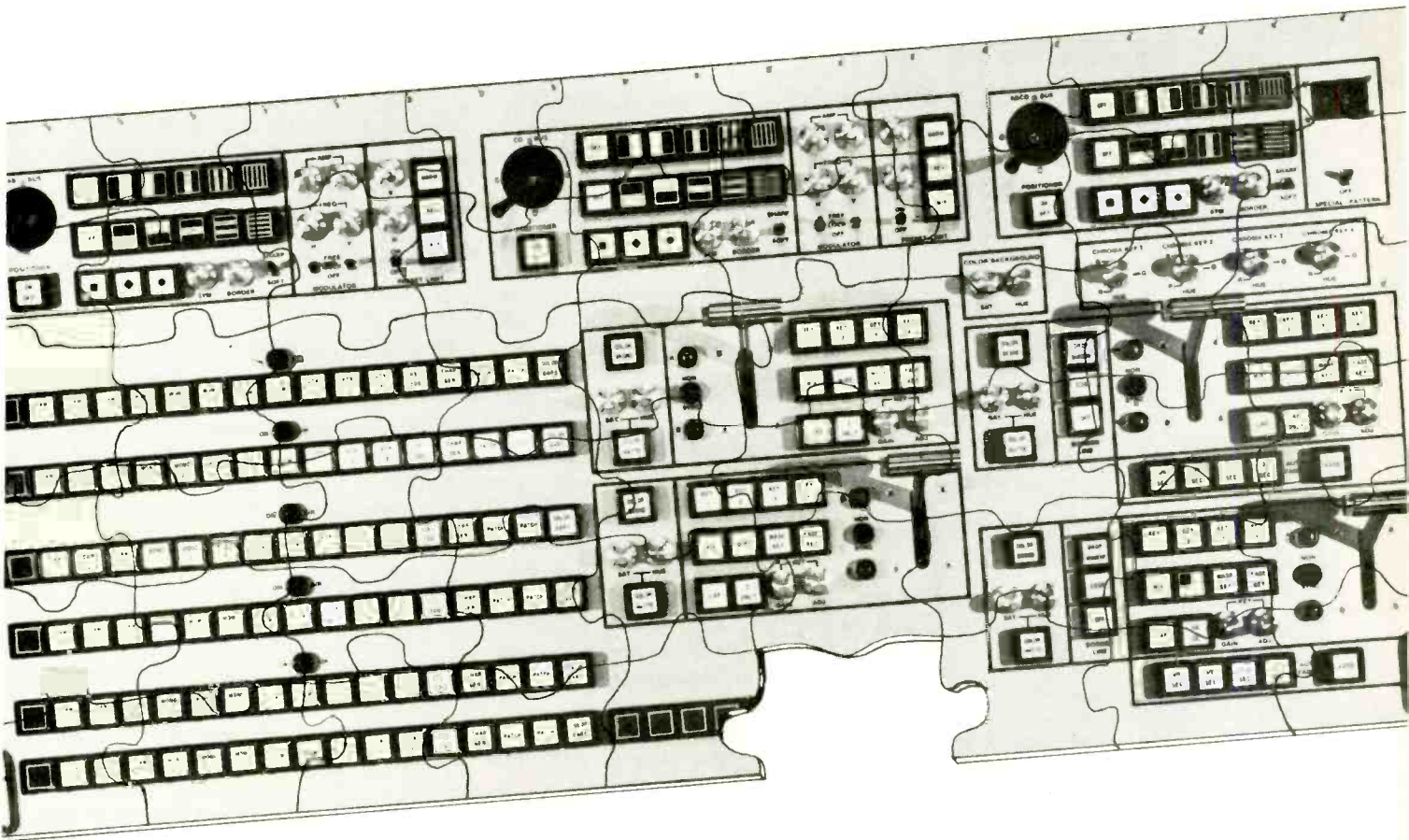
Telecommunications Industries had the "Porta-Pattern" test patterns for TV, which supply printed patterns that serve for pattern checks on camera and system operation.

Two firms, Bird Electronic Corporation and Sola Basics Dielectric division, showed extensive lines of directional RF wattmeters, dummy loads, RF load terminators, RF status alarms. Important trend here is to ready han-

continued on page 112

Puzzle:

How do you get a lot of SWITCHER for a little MONEY?



Answer: The Computer Image "Pre-wired" Modular Video Controller System.

Now there is a way to plan for the ultimate in switching potential with the least initial outlay.

If you can afford the industry's finest broadcast quality switcher with all the latest state of the art techniques and capabilities... fine! Computer Image will deliver a Model 7243 with 7 buses, 24 inputs, four mix/effects amplifiers, preview and program buses with computer compatible control, and save you money!

If however, your budget is tight, then you may choose a Computer Image Model for as low as \$10,000 — have it pre-wired for options you know you'll need and have a broadcast quality switcher today that will not soon be obsolete.

Computer Image Video Controllers are designed with circuit-element building blocks... to give you every advantage of add-on capabilities, and reliability of functions. Your basic purchase can be pre-wired for the options found in the most complete switching system.

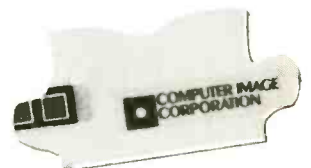
If your future requirements can be estimated at the time of ordering a basic unit, all the add-on options can be pre-wired for only 10% of each option. And, any options ordered within six months of initial delivery will be credited that 10% pre-wire charge! The installation of any option, because it's pre-wired and completely modular, is almost as simple as plugging in the morning coffee pot!

COMPARE THE VIDEO CONTROLLER WITH ANY OTHER SWITCHER... AT ANY PRICE! Ask about price, performance, versatility, reliability, guarantee and delivery... and ask about some very happy Video Controller users!

For further information call or write:
Vice President, Marketing, Video Controller Division



COMPUTER IMAGE CORPORATION
2475 West 2nd Avenue, Denver, Colorado 80223
(303) 934-5801



Represented nationally by:

Broadcast Communications Devices, Inc.
5526 East LaPalma Avenue
Anaheim, California 92807
(714) 528-9505

Broadcast Communications Devices, Inc.
1850 Warburton Avenue, Suite 203
Santa Clara, California 95050
(408) 954-6614

Didier Denver
P.O. Box 1599
Evergreen, Colorado 80439
(303) 674-6000

H. M. Dyer Electronics
31185 Ten Mile Road
Farmington Hills, Michigan 48024
(313) 478-2154

Landy Associates
12 Buxton Road
Cherry Hill, New Jersey 08003
(609) 424-4660

Landy Associates, Inc.
20 Winslow Street
Plymouth, Massachusetts 02360
(617) 326-6050

Radford Associates
3203 Lanier Drive
Atlanta, Georgia 30319
(404) 237-6097

The Gene Sudduth Company
2809 Raintree Drive
Carrollton, Texas 75006
(214) 242-2690



Computer Image, 1972 emmy winner for outstanding achievement in engineering development for its unique electronic animation systems for television.

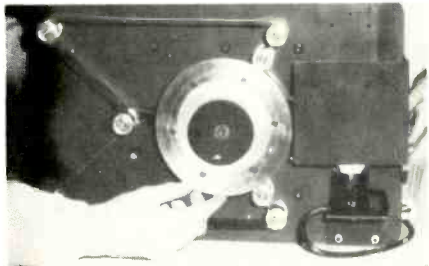
Circle 176 on Reader Service Card

NAB SHOW-IN-PRINT

dling of very high powers, in accurate, convenient instruments.

A miscellany of products and services

In the accessory area, too, there were two important displays of



Hologon showed prototype of shutterless, flickerless film projection system. 195



JVC introduced a color camera sync coupler. 247

cabinetry, rack mounts, etc. by Amco and Ingersoll Rand. Amco showed their very flexible user-assembled aluminum enclosure systems, together with a wide variety of standard racks, cabinets, and shelves. Ingersoll Rand also showed modular systems and a variety of racks, shelves and tables. Both firms ought to be able to supply just about any size or shape of enclosure a broadcaster needs.

American Electronics showed, as they did last year at Houston, their system for putting a microphone onto regular telephone lines for remote pickups at sporting events, with switch to regular phone use for talk-back, etc. Price is \$395 complete with microphone and 500-type telephone set with amplifier, switching etc. built in.

The "Video Pod" is a completely self-contained video production unit which can be easily air-freighted. In a small enclosure somewhat like a miniature Quanset Hut, the pod has control and switching equipment for two cameras, two vtr's, audio and monitoring equipment. It is for rent through John Lundberg, Ambassador College, Pasadena CA.

For wire and cable, the broadcaster could examine the most complete of-

fering of the Boston Insulated Wire and Cable Company, a long-time stalward of NAB exhibit floor.

Another broad line supplier of cable was Mohawk Wire and Cable Corp.

A brand-new exhibitor of cable connectors was Kings Electronics Company, of Tuckahoe, N.Y. Kings put emphasis on two main classes: their "K-Loc," high density locking connectors; and their "Tri-Loc," connectors for television triaxial cable.

Among the exhibitors offering services rather than products was Joseph M. Soll, Inc., who described themselves as ready with every kind of broadcast engineering and consulting—station planning, supervision of station construction, system troubleshooting, maintenance service, emergency service, proof of performance, design of custom control and switching systems. Soll is based in New York City.

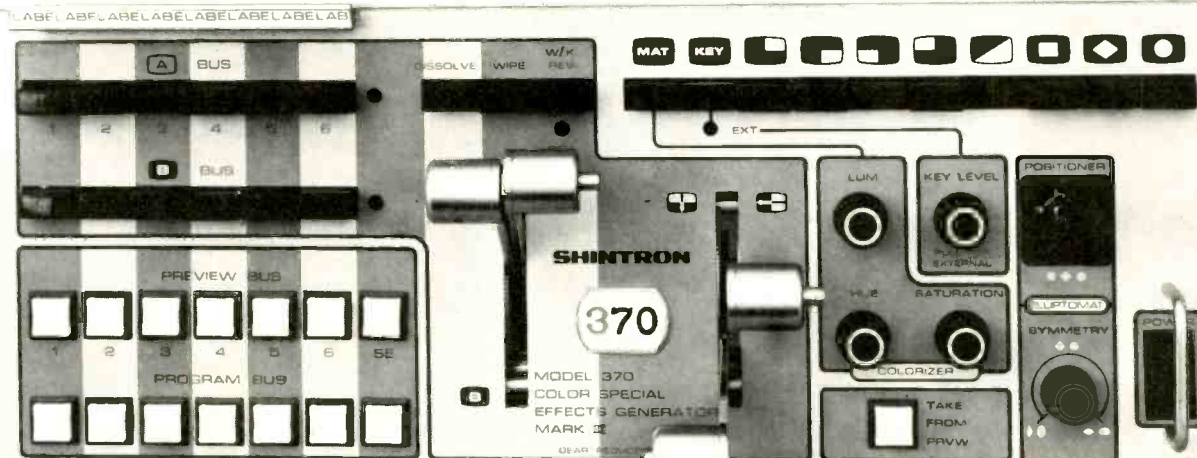
Getting ready for two-tone EBS

There was a flurry of response to the FCC's new EBS system which, starting January 15th, 1976, will be based on a two-tone interstation warning signal. Although no systems had been

There is only one Special Effects Generator in a system...

THE MARK III 370

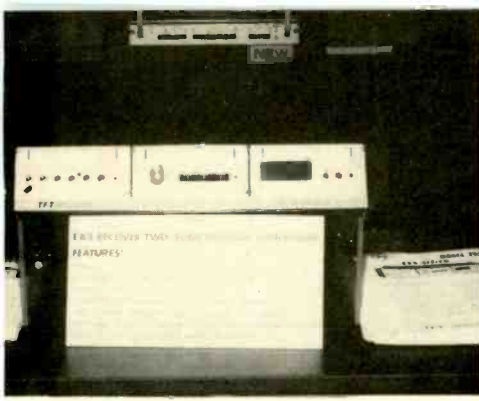
DO YOU DEMAND ENOUGH TO NEED THIS ONE?



SHINTRON

Cambridge, MA 02142 U.S.A. (617) 491-8700

...The Precision People



Time and Frequency Technology showed new receiver, two-tone generator and decoder for EBS. 248
Inquiries will be sent also to McMartin and Audio Services.

type-accepted by the FCC at the time this report was written, several have been submitted and action is expected quite soon from the FCC.

Three firms, Time and Frequency Technology, McMartin, and Audio Services Inc., showed EBS systems they have submitted for certification and will market later in the year, if they are accepted.

Time and Frequency Technology has developed four units: an AM receiver, an FM receiver, an encoder for producing the two tones, 853 Hz and 960 Hz, and a decoder for taking the tones out of the audio and using them for relay, warning light, and loud-speaker operation. The decoder has built-in the 10-second delay specified in the rules to prevent false activation. TFT says the units will be available "late September" with the expectation that FCC certification will have been received before that date.

Very similar design considerations went into the McMartin equipment, which includes a two-tone generator, two-tone "monitor" (essentially the same function as the TFT "decoder"), and receivers for both AM and FM. The generator uses a crystal oscillator with digital logic division to produce the 853 Hz and 960 Hz tones with the required accuracy of ± 0.5 Hz. The two receivers are the AMR-1 and FMR-1, single-channel AM and FM receivers, respectively, of very high selectivity.

Audio Services, Inc. showed an encoder and a decoder of quite similar design approach. As in the other units described, the required 23-second operation time is automatically built into the encoder and followed at one push of the "transmit" button. The decoder has its own power supply and built-in loudspeaker, plus output for relay activation to drive any chosen alarm system. Price of the encoder is \$250 and of the decoder \$125.00



THE INFLATION FIGHTERS

World Video Color Monitors

CR 6700 17" Rack Mount Color Video Monitor. Designed for broadcast applications. All Controls mounted on front panel including pulse cross, underscan, R-G-B switches, screen and drive controls, dual inputs, internal-external sync and keyed back porch clamp. Utilizes only 15 3/4" of vertical rack space. Price: \$1,700.00



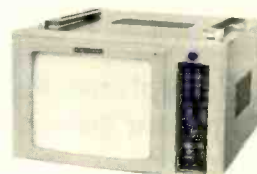
RK 6700 17" Rack Mount Color Video Monitor. A high quality utility monitor requiring only 15 3/4" of vertical rack space. Dual inputs, keyed back-porch clamp, internal-external sync. Controls conveniently mounted on front panel. Price: \$1,195.00



CR 6210 12" Rack Mount Color Video Monitor. Designed for broadcast applications. All controls easily accessible on front panel. Dual inputs, pulse-cross, keyed back porch clamp, underscan, R-G-B switches, screen and drive controls, internal-external sync. Convenient plug in modules for ease in servicing. Price: \$1,350.00



CB 6210 12" Cabinet Color Video Monitor. Convenient carrying handles for portability. All other features the same as the CR 6210. Price: \$1,350.00



CDR 9000 Single or Dual Rack Mount 9" Color Video Monitors. Utilizing only 8 3/4" of vertical rack space. CDR 9000 equipped with mounting provisions for a WFM or vectorscope. Controls conveniently mounted on front panel. Dual inputs, underscan, and internal-external sync provided. Price: CDR 9000 \$ 950.00
CDR 9900 \$1,750.00



World Video also manufactures CCTV Color Monitors and Receiver/ Monitors in screen sizes from 5" to 19". Information available upon request.

All World Video color monitors are 100% solid state and utilize single-gun CRTs.



WORLD VIDEO, INC.

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

Circle 178 on Reader Service Card

GREAT IDEA CONTEST

Share your good ideas with other broadcasters.
Win a Panasonic TV set, other prizes

6. Interphone Power Regulator Offers Wet & Dry Outputs.

David F. Miller, Design Engineer,
WMAQ-TV, Chicago, Ill.

Problem: To regulate the input power to a transistor interphone amplifier, regardless of line voltage fluctuation or power demand. Many of the new transistor interphone amplifiers

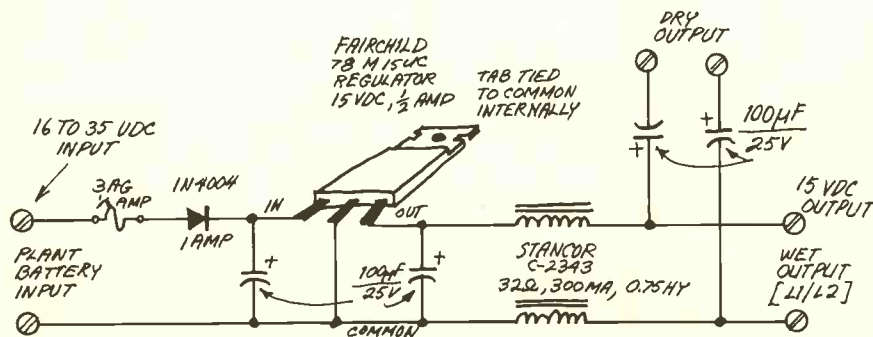
specify a maximum input of 15 VDC to the L1/L2 input terminals. Most stations power these amplifiers through the 24 V plant battery, dropping the voltage via a high-resistance retard coil. But depending on the ohmic value of the coil, and how many amplifiers are on the system, the voltage at the L1/L2 terminals can vary greatly.

Solution: The circuit shown automatically regulates interphone feed voltage to 15 VDC maximum, regardless of variations in plant battery input and output load conditions. The regulator

IC shown employs internal current limiting and thermal shut-down, making it virtually short-circuit and blow-out proof.

Two conditions, however, must be protected against: reversed polarity at the input, and application of a foreign DC voltage at the output of the chip. To cover these cases, a diode steers only the correct polarity to the input, and interphone system output coupling is through capacitors ("dry" or audio-only output). Dry coupling is the preferred method of linking stations in the system together anyway; P/R losses are eliminated, and relay and switch contacts are preserved.

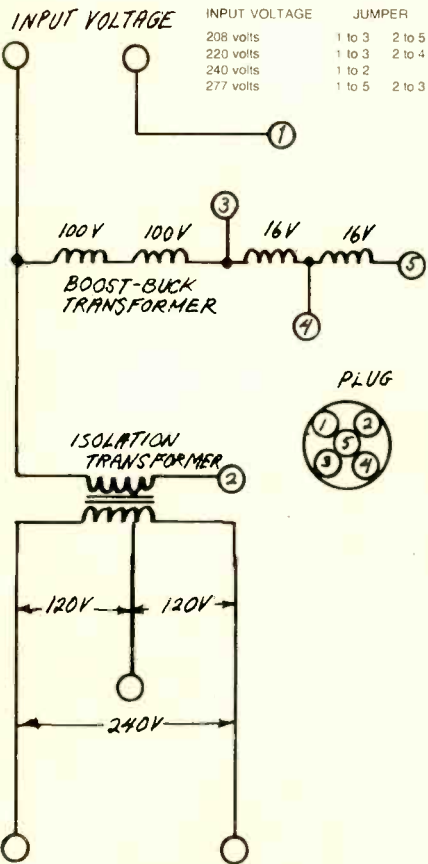
The two chokes shown act as retard coils to audio, but have very little DC resistance (32 ohms) and so maintain the DC regulation under various loads. Chokes of one ohm resistance are available at higher cost. The actual number of interphone amplifiers that can be powered by one regulator circuit depends on the DC current requirements of your amplifier. In our system, eight can be safely powered, but this number can be increased by a higher current IC and lower resistance chokes.



7. Hints on Equipping a Small- to Medium-Size TV Remote Truck.

Jerome Foreman, TV Technician, Maryland Center for Public Broadcasting, Owings Mills, Maryland.

Problem: To Supply AC power isolation and voltage selection to a remote truck. When designing a small TV remote truck, our objectives were: to provide electrical isolation for safety purposes and to prevent video and intercom ground loops; to allow operation of the truck on various voltages that might be encountered in the field; to install equipment in the smallest area possible since there was no room for a control panel.

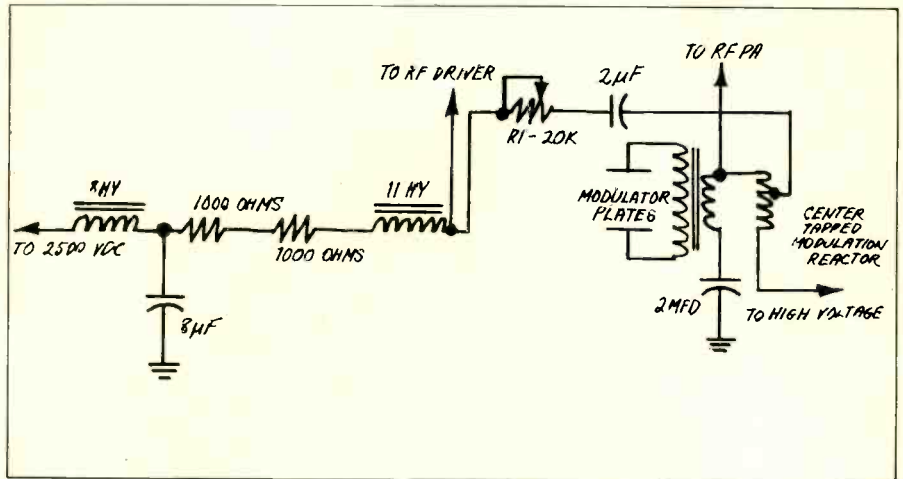


Solution: The first objectives were achieved by installing an isolation transformer at the input to the electrical system. The next objective was solved with a boost-buck power transformer.

By various combinations of connections, the boost-buck transformer can be made to operate on 208, 220, 240 or 277 VAC, single phase. (Using any two hot leads of three phase power will give you single phase.)

In order to expedite set-up, a five-prong female jack was installed on the transformer. Voltage selection can be made by using pre-wired mating plugs, one for each voltage. Care must be taken to select a plug with proper current carrying capacity. The KVA

rating of the boost-buck transformer can be considerably smaller than the isolation transformer due to the fact that maximum boost or buck is 32 volts. Even if the input to the isolation transformer is not exactly 240 V, it is well within operating tolerance.



8. A Low-Cost Bi-Level Modulation Modification.

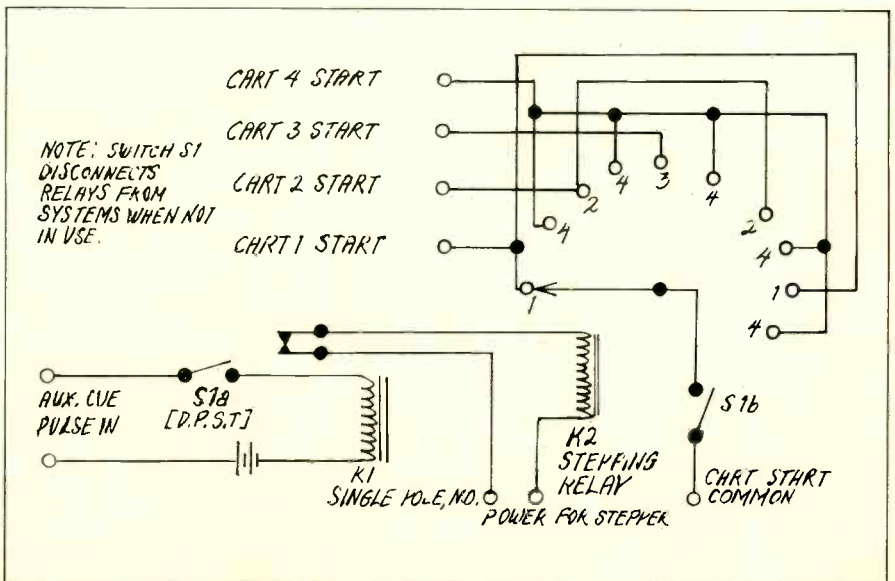
David P. Hebert, Chief Engineer, KXRO, Aberdeen, Washington.

Problem: To obtain the advantages of bi-level modulation without high cost.

Solution: I recently modified our Gates BC5-P2 transmitter for bi-level modulation. If I had used the factory modification, a modulation reactor with a secondary winding for the modulating RF driver, this feature would have cost \$800. I achieved the same

result for about \$45 in parts; no new modulation transformer was needed.

The standard modulation reactor is center-tapped; this can be used to suppress audio on the driver envelope. The modified circuit can be adjusted for the most satisfactory modulation level with the modifications shown. To adjust the transmitter, set R1 for approximately 15 percent modulation of RF drive with 100 percent carrier modulation. Response is -1.5 dB at 50 Hz; overall carrier shift is now -1 percent. The modified transmitter, in use for a year, results in a very loud signal, and has the capacity for a positive carrier shift.



GREAT IDEAS

9. Poor Man's "Automation" Sequences Cart Order of Play.

Gary Wachter, Engineer, KEYS, Corpus Christi, Texas.

Problem: To automate existing live studio facilities for several hours each night.

Solution: This simple control system enables the engineer to set up cart machines to start each other in a predetermined sequence. The major requirement in the existing "live" studio is that the machines have

secondary or "aux" cue tone sensing. A surplus stepping relay is keyed by the aux cue tone to start four cart machines in the sequence determined by the stepping relay. In our station, cart machines 1, 2 and 3 contain Series 1200 Fidelipac carts (40 minute) with many music selections. Cart machine 4 contains a variety of voice announcements and jingles.

Secondary cue tones have been recorded at the end of each selection on all in each of the four machines. At the end of the first selection on cart 1, the voice announce tape is triggered, which in turn triggers the second music cart and so on. For obvious reasons, the voice announce tape can not contain specific information such as time or temperature. This system will run for about two hours before repeating itself with the cart play times specified.

10. \$5 Slide Projector Cue Light.

Al Szablak, WKTV, Utica, New York.

Problem: To visually signal video operators whether or not they had advanced the slide in the projector. We run motion-picture films on the same island as the slide projector. Problem was, we couldn't see the status of the slide, and could go up to a half hour without a visual slide check. The video operator would have to go to black to check after the film ended, or go to the projector to check the slide.

Solution: The two film projector Show lights provide the power via the steering diodes D1 and D2. The capacitor holds circuit power when switching from one film projector to the other. The slide change pushbutton is

Enter Now Great Idea Contest 1975—More Prizes

BM/E continues the Great Idea Contest in 1975. Prizes are expanded—three Grand Prizes plus ten secondary prizes. Top prizes are 19-inch Panasonic color TV sets. Secondary prizes are Panasonic AM-FM Clock radios. A grand prize will be offered in each of the following areas: AM, FM and TV. There will be secondary prizes for the best audio, RF, or contest idea in each of these areas, plus one for the best video idea in TV.

To enter now use the entry form below.

Entry Form for BM/E Great Idea Contest—1975

Mall to: Editors, BM/E

274 Madison Avenue
New York, New York 10016

Name _____ Title _____

Station Call Letters _____

Address _____

City _____

State _____ Zip _____

Telephone No. _____

Licensee _____

Class of Station at which idea is used (check one)

TV _____ FM _____ AM _____

Category: Audio _____ RF _____ Video _____ Control _____

Objective or Problem: (in few words; use separate sheet for details) _____

Solution: (Use separate sheet—500 words max)

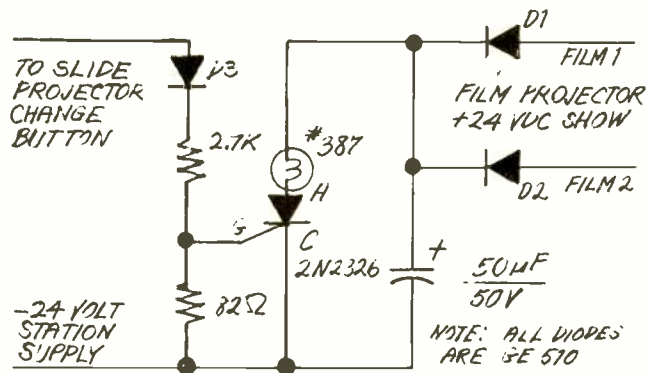
I assert that, to the best of my knowledge,* the idea submitted is original with this station; and I hereby give BM/E permission to publish the material.

Signed _____ Date _____

* If you feel credit for prior work or antecedents should be given to someone outside of the station, indicate to whom and when:

Rules for BM/E's Great Idea Contest

- Eligibility:** All station personnel are eligible. Consultants to the industry may enter if the entry indicates the specific station or stations using the idea or concept. Manufacturers of equipment or their representatives are not eligible.
- How to Enter:** Use the Official Entry Form on this page or simply send BM/E a description of your work. State the objective or problem and your solution. Include diagrams, drawings, or glossy photos, as appropriate. Artwork must be legible but need not be directly reproducible but not exceeding three in number. Camera reproducible material is preferred. Length can vary, but should not exceed 500 words. BM/E reserves the right to edit material. Entry should include: Name, title, station affiliation, and the class of station—TV, FM, AM. Indicate if idea is completely original with you.
- Material Accepted for Publication:** BM/E editors will make all decisions regarding acceptability for publication. If duplicative or similar ideas are received, BM/E editors will judge which entry or entries to accept. A \$10 honorarium will be paid for each item published.
- Voting:** Every reader of BM/E is entitled to rank the ideas published. This can be done on the Reader Service Card in the magazine or by letters or cards sent to the BM/E office. To vote, readers should select the three ideas they like best and rank them 1, 2, or 3.
- Winners:** Relative ranking of each month's entries will be published periodically. Top-rated entries for various categories will be republished in late 1975 for a second and final round of scoring. Final winners will be picked in February 1976 and notified by mail. Winners will be published in the March 1976 issue of BM/E.
- Prizes and Awards:** Three top prizes will be awarded: a color TV set for the entry receiving the most votes in the respective categories of AM, FM and TV. Ten AM-FM radios will be awarded as secondary prizes for the highest voted entries in the following additional categories (except the three top winners): audio (three prizes one each in categories AM, FM, TV); (three prizes one each in the categories of AM, FM, TV); Control (three prizes one each in the categories of AM, FM, TV); Video (one prize in TV).



connected to the slide projector relay coils. If the projector is changed locally or remotely, a DC voltage appears at diode D3. This diode attenuates transients, but may not be necessary for all projectors. The two resistors comprise a voltage divider that

supplies the SCR with the proper gate voltage to turn it on. The lamp goes off, when anode voltage is removed, by hitting the Show button on the slide projector. The lamp is located on the video switcher.

11. Fail-Safe Selection of Transmitter For Directional Arrays

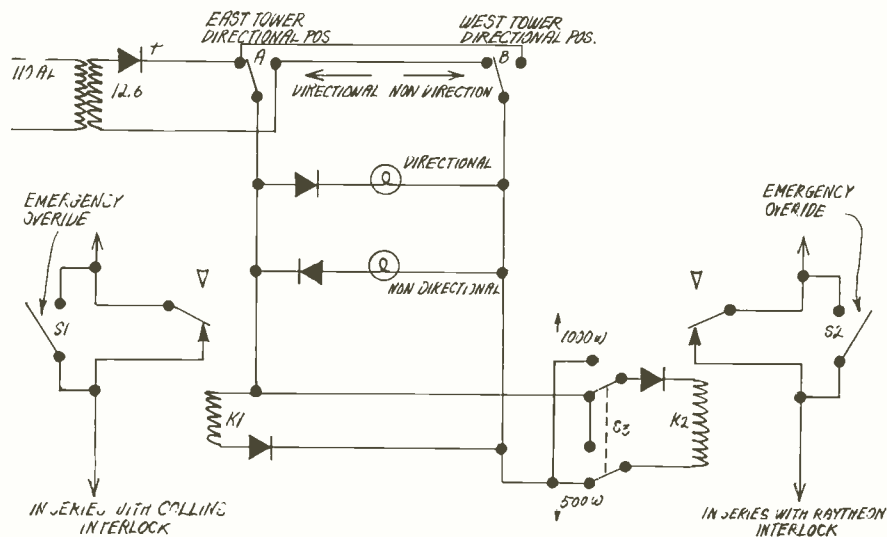
By Stuart A. Engelke, Chief Engineer, WMTR-QHDA, Morristown, N.J.

Problem: To prevent connection of the wrong transmitter to a directional array, with a 5000 watt Collins for daytime and a 1000 watt Raytheon, operated at 500 watts, in the same pattern; but at 1000 watts in summer as a non-directional auxiliary.

Solution: Micro switches on the transmission line relays at the two

towers (see schematic) reverse the polarity of a 16.6 volt dc supply driving two relays. With each polarity, one of these relays is open and the other closed. One is in series with the Collins interlock, the other with the Raytheon interlock.

In addition, the switch changing the Raytheon from 1000 to 500 watts output also reverses polarity of the supply to one relay. Thus, as the schematic shows, when the tower relays are set for directional use, only the Collins and the Raytheon at 500 watts will operate; in the non-directional position, only the Raytheon at 1000 watts can be connected.



Vote on Great Ideas Now. Turn to Reader Service Card. Send in your Great Idea.

Old good reasons

Most compact, most portable softlight anywhere: a full 23 x 21 x 7"; yet folds up into a 28 x 16½ x 4½" case for travel and storage.

Quick to set up, easy to rig in difficult locations. Still just 8½ pounds—light enough even to hand-hold!

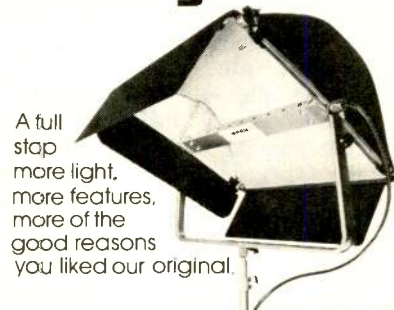
Provides 'round', smooth, relatively shadowless illumination over a wide area.

Accessory barndoors for shading subject, background or lens.

Convection cooling assures longer lamp life.

Versatile, with a wide variety of kits and accessories—compatible with Link components.

Introducing the lowel Softlight 1500



A full stop more light, more features, more of the good reasons you liked our original.

New good reasons

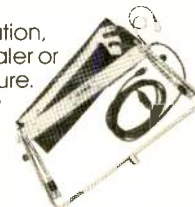
Improved output—thanks to new shell and increased capacity. Softlight 1500 is just as soft...but now, twice as bright. Brighter, in fact than most 2K softlights—125 foot candles at 10 feet, using just two 750-watt, 120V clear lamps. (Gets even more output with two 800-watt, 220/240V lamps.)

Improved reflector shell—textured foil bonded to space-age Nomex® fabric is 50% more efficient; won't scorch or discolor with temperature or age.

Improved efficiency—drawing just 12.4 amps, Softlight 1500 gives more light while conserving precious power on location.

For more information, see your Lowel dealer or send for our brochure.

*Softlight 1500 shell available separately, to increase capacity of original Lowel Softlight.



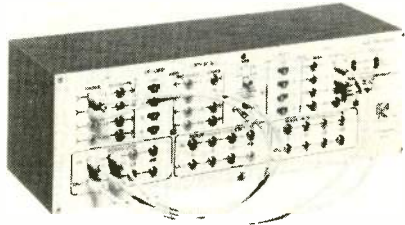
lowel 

421 W 54th Street, New York, N.Y. 10019 (212) CI-5-6744
West Coast: 3407 West Olive Avenue,
Burbank, Ca 91505 (213) 846-7740

Circle 179 on Reader Service Card

BROADCAST EQUIPMENT

Portable audio patching center, model QT-1, allows small studios and semi-pro recordists to connect accessory equipment together and to switch components for live recording, mixing, signal processing and dubbing up to four channels. The QT-1, with 72 RCA-type phono jacks on the back



panel, permits the user to simultaneously interconnect up to four tape recorders, plus noise reduction devices, graphic equalizers, matrix and CD-4 encoders and decoders, limiters and other signal processing units. Cost of the QT-1 is \$249.95. RUSSOUND/FMP 300

Insulated SMA bulkhead jack enables a coaxial outer circuit to be insulated from the grounded chassis, thus eliminating ground loops and common mode noise problems. This jack meets the requirements of MIL-C-39012, and is normally furnished in passivated corrosion resistant steel, type 303. TROMPETER ELECTRONICS 301

Digital automation system, the Digi-mation Series 2000, features solid-state audio switching and built-in 25Hz tone sensing. Up to eight tape sources may be connected. Its 16-event memory is non-volatile. Adjustable silence sensing, a priority interrupt function, an internal monitor amp and speakers, and bridging unbalanced inputs with 600-ohm balanced outputs are other features. Price is \$1950 (stereo) and \$1550 (mono). AUDIO/VIDEO PRODUCTS 302

One-thousand-foot capacity lightweight magazine for the Arri 35BL is now available for the first time in the U.S. Loaded with film, it's only 7 lbs. heavier than a loaded 400-ft magazine. Increased camera power drain is 0.10 amps. BIRNS & SAWYER 303

Video delay line for 19-inch rack panel mounting, the Series 3.5, is a plug-in 75-ohm unit designed specifically to meet the needs of color television broadcasters. The delay is fitted with rear-mounted BNC connectors and

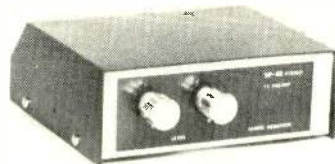
measures 3-7/16 × 3-5/16-in. The range provides delays from 10 nsec to 165 nsec in 5 nsec steps selected by switches, plus a fine-trim of ±4 nsec by screwdriver adjustment. Base video delays of up to 2.7 μsec can be customer-ordered. TELEVISION EQUIPMENT ASSOCIATES 304

Wireless control operates audio-visual and television equipment up to 500 feet away. The Model WR-410 consists of a transmitter and receiver used to control on/off and other functions. INTERNATIONAL VISUAL PRODUCTS 305

Variable analog filter covers the cutoff frequency range from 0.1 Hz to 111 KHz, and features roll-offs at 24 dB (Model 452) and 48 dB per octave per channel (Model 852), respectively. The filters consist of two identical channels, each having separate input/output terminals, high-pass and low-pass functions, and choice of 0/20 dB gain. Frequency selection is via three-digit resolution switches. Price is \$1175. ROCKLAND SYSTEMS 306

Pulse modulated digital control system for up to ten camera systems connected in parallel needs only a two-conductor cable or twisted pair. The V175PM offers remote control for motorized lens functions, housing, pan and tilt drive, and infrared illumination. Thirty functions are provided; 10 are address functions and 20 are command functions. VICON INDUSTRIES 307

Turntable preamplifier provides +4 dBm output with 0.5 mv input at 1 kHz. Adjustments are provided to enable the preamps to input up to 100 mv. The MP-8E (mono) and SP-8E



(stereo/dual mono) have rear terminals for remotely switching to one of three modes of operation: RIAA response; scratch filter; and brilliance boost. Signal-to-noise is -77 dB, distortion less than 0.05%, and greater than 70 dB channel separation. Units contain their own internal power supply and cost \$137 (stereo) and \$86 (mono). RAMKO

RESEARCH 308

RF rack-mounted modem is designed to take the output of data modems, slow scan TV converters, facsimile generators and voice multiplexers and deliver an FM-modulated signal at any frequency in the 2 to 300 MHz range. At the remote receiver terminal, an FM demodulator provides an output signal to various reproduction, storage and display devices. The model FMTT 2200 Transceiver System is available in two types: the series -A uses an FMX modulator for transmission in the 14-300 MHz range, while the series -B uses the Catel AM 2000 FM modulator for frequencies from 2-14 MHz. Both systems include a demodulator and power supply. CATEL 309

Tube type 8963, a broadcast power triode, offers a ripple fin radiator for lower internal temperatures and increased reliability. A 31,000 hour warranty is offered with the \$1,500 tube. EIMAC 310

A linear attenuator, called Slidex, converts rotary control to linear motion. The attenuator uses sealed construction, eliminating the need to clean wiper contacts. AUDIO DESIGNS 311

Broadband acoustic delay line, model 0.5 HM measures 1.375 × 2.50 × 0.450 inches, and is provided with pins for printed circuit board mounting. Nominal delay is 32,000 μsec with a delay tolerance of ±10 nsec. Center frequency is 30 MHz. Delay drift is ±5 nsec. 16 MHz is the specified 3 dB passband and passband ripple is 0.1 dB. Insertion loss is 34 dB maximum. WALTHER M.A. ANDERSEN & ASSOCIATES 312

Automatic color corrector makes continuous frame-by-frame corrections of lift, color balance and gain errors to the output signal of color telecine equipment. Local or remote control is possible. RANK PRECISION INDUSTRIES 313

Post-production switcher offers built-in helical genlock NTSC sync generator and a SMPTE edit code generator/reader. The model 367 color switcher circuit uses a 4-input 3-bus organization with vertical-interval switching. Its rear panel interfaces with UHF, BNC, Sony and Panasonic connectors. The sync generator is the

ratelock type, and has a front panel genlock indicator. An edit code generator/reader writes full edit code as well as reads incoming code from playback. The 367 lists for \$3780. SHINTRON 314

The Mobile Multiplexer, described as film chain without a dedicated camera, allows the user to switch the video camera from film chain to studio use in seconds. A pre-recorded videocassette demonstration shows how the MM interfaces audiovisual and video operations and a dub is available to interested parties. Send your own 3/4-inch 10 minute cassette to the manufacturer, and he'll dub the demo of the MM to your tape and return it postpaid. BUHL OPTICAL 315

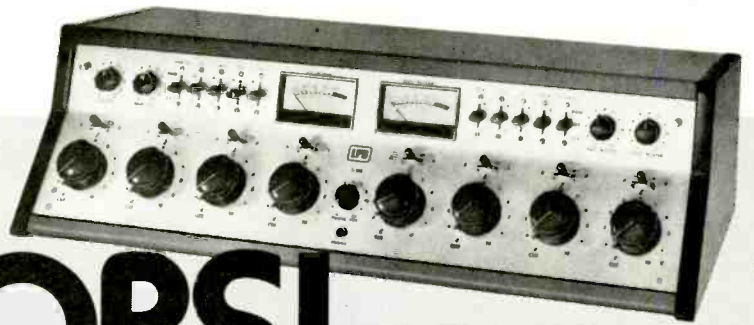
An aerosol spray containing very finely divided particles of pure iron, suspended in a volatile liquid, enables the user to see program patterns on magnetic tape. Called MagView, the particles form a residue clinging to the pattern of flux lines, making them visible as the liquid vehicle evaporates. MagView costs \$4.95 for a 4 oz. container, and is available from distributors. NORTRONICS 316

Portable, 3 1/2-digit DVM features multi-source power from 115/230 VAC, or standard or rechargeable-type batteries. An "Auto Off" circuit turns off the LED display between measurements on any range. A continuous display is available in the "On" position. In the Auto Off mode, the Model DVM-32 draws 15 mA between measurements. The DVM offers 0.5% DC volts accuracy with 1 mv resolution, and 15 megohm input impedance. Maximum basic response time is 1 sec. An accessory High Voltage probe extends the range to 40 kilovolts. The meter costs \$198. SENCORE 317

Motorized zoom lens, model V16-160M, offers f/1.8 aperture, 160 mm telephoto capability and 10X focal length range. This model features a molded urethane gear for variable speed operation. Motors are shock-mounted with factory-set slip clutch protection. The drive system has an RF ground through the control from all motors to provide RF noise suppression. VICON 318

Audio sine wave test oscillator, model 200, features 21 pushbutton-selectable frequencies ranging from 30 Hz to 20 kHz. Output levels are 0 dBm or -50 dBm with level tracking of ± 0.5 dB over the entire frequency range. The output is transformer isolated, balanced and floating, and presents an impedance of 600 ohms at the high level setting, and 150 ohms at the low level setting. Distortion is below 0.5% at all

continued on page 120



TOPS!

That's LPB's stereo S-13B console, our top-line audio control center. Features include:

- 18 stereo and 6 mono inputs.
- Step attenuator mixers.
- Telephone-type switches.
- Plug-in fiberglass circuits.
- Stereo 12 watt/channel monitor.
- Internal cue amp and speaker.
- All transformer input and output.

The features and quality of LPB's S-13B just can't be found in other consoles at comparable prices. Take a hard look at the S-13B before you make a mistake!

LPB has a complete line of mono consoles, too, and everything that goes with them. Call or write today for complete information.

LPB

LPB Inc.
520 Lincoln Highway, Frazer, Pa. 19355
(215) 644-1123

Circle 180 on Reader Service Card

Listen to the Sound of Accuracy

STL test tapes are rated tops for accurate Azimuth Reference . . . the most accurate and dependable tapes you can buy.

In addition, they are available in more sizes than that offered by any other manufacturer in the world.

Produced independently to the highest standards, STL test tapes are internationally acclaimed . . . accepted as basic reference tools of unexcelled quality.

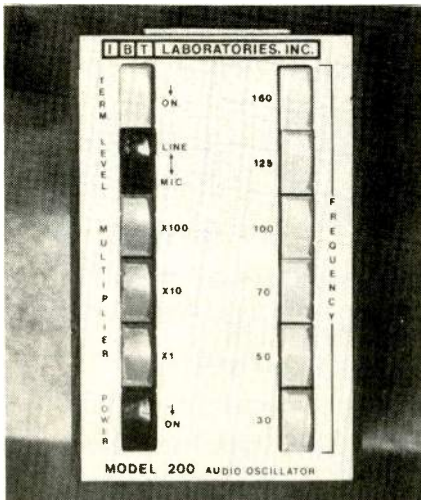
All audio widths from 150 mil. to 2-inch. Prompt delivery insures freshness.

For the distributor in your area—Call or write:

TABER Manufacturing & Engineering Company
2081 Edison Ave. • San Leandro, Ca. 94577 • (415) 635-3831
Minneapolis distributor: Sound 80, Inc.

Circle 181 on Reader Service Card

PRODUCTS



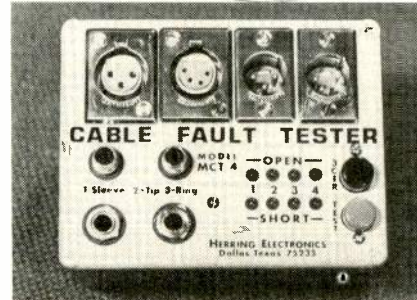
frequencies. Price is \$129.95. IBT LABORATORIES 319

Dual 8-track cartridge winder operates at 240 rps. The ES 100-811 Gemini provides two cartridge positions per unit, so that while one cartridge is winding, the other is ready for splicing. An accessory digital footage counter indicates tape lengths on blank cartridges. The system also offers two-button operation, a sub-sonic cue

signal for cutting between program elements on the reel, automatic 45° tape cut for splicing at the end of the winding cycle, and acceptability of all types of cartridge hubs and supply reels up to 14 inches diameter. The price is \$1850 with digital counter. ELECTRO SOUND 320

Quadruplex video tape, called Scotch Number 420 by the manufacturer, offers a 2 dB improvement in color noise and a 3 dB improvement in signal-to-noise, in comparison with the firm's type 400 video tape. It also has better dropout control. 3M COMPANY 321

Cable fault tester, model MCT-4, is a compact battery-powered unit that checks all conductors of common audio cables simultaneously in three- and



four-pin Cannon-type cables, as well as those equipped with three- and two-circuit phone jacks or RCA-type jacks. An IC logic circuit operates a LED display, indicating cable condition. Price is \$89.95 net plus postage and sales tax. The tester is available directly from the manufacturer. CROSSROADS AUDIO322

Time Domain Reflectometry (TDR) cable testers, models 1502 and 1503, resolve cable faults to within a yard as far away as 50000 feet. The 1502 uses 110-picosecond step-type excitation signals, which provide distance resolution power up to 0.3 inch. Resolution is accurate at distances up to 2 000 feet. The 1503 provides 10-volt sine-shaped pulses and is calibrated in decibels for direct reading of return loss. The 1503 works out to 50 000 feet and resolves faults to 3 feet. Provision is made for selecting impedance levels of 50, 75, 93 and 125 ohms. Price of either instrument is \$2750. TEKTRONIX 323

Broadcast color filter helps set up a monitor's chroma and phase to insure color fidelity. Called the Television Monitor Analyzer, it enables monitor color bars to be viewed through a specially designed filter, which only

PERFECT YOUR CCTV SYSTEM WITH COSMICAR® LENSES

A rich variety of COSMICAR CCTV lenses will ensure you to satisfy any of your technical purpose.

Be sure to get the finest image recording results with quality COSMICAR lenses.

EE lenses:

- F.L. 16mm F/1.6 for 2/3" Cameras
- F.L. 12.5mm F/1.4 for 1" & 2/3" Cameras
- F.L. 25mm F/1.4 for 1" & 2/3" Cameras
- F.L. 50mm F/1.8 for 1" & 2/3" Cameras

Also available are scores of other lenses, ranging from 4.8mm to 150mm telephoto, zoom and those motordriven among them, for immediate delivery after being tailored to your specifications.



COSMICAR OPTICAL CO., LTD.

424, Higashi-Oizumi, Nerima-ku, Tokyo, Japan

Cable Address: "MOVIEKINO TOKYO"

Representative & Service Office: Asahi Optical (America) Inc. 15 East 26th Street, New York, N.Y. 10010, U.S.A.

Circle 182 on Reader Service Card

permits blue light from TV phosphors to pass through. Full instructions explain how to use the analyzer and its



background theory. Cost is \$22.50 including postage. IMERO FIORENTINO ASSOCIATES **325**

Sound-on-film Super-8 camera, the Beaulieu 5008S, is available with the Beaulieu-Optivaron 6-66 mm (11:1) lens. The 5008S provides the user with four different sound options: single system sound; double system sound; single & double system simultaneously, and 1 pulse per frame sync filming.



In addition, the 5008S can also be used for silent filming purposes. The camera costs \$1660.10. CINEMA BEAULIEU **324**

Portable Microwave-for-Video Relay series is a family of tunable, all-solid-state, dual-conversion heterodyne systems for point-to-point video and subcarrier transmission in remote pickups, closed circuit TV networks, and other temporary transmission situations. The FV series is designed with a specific system for each band from 1.99 to 13.25 GHz. Each system may be dial-tuned across the appropriate band without preselecting filter. Features include direct frequency generation, $\pm 0.002\%$ frequency stability, 60 dB

continued on page 122

BULLETIN!!



UNITED PRESS INTERNATIONAL

If you caught this bulletin but are missing the ones from your teletype, we've got help for you. We call it Tel•alert. You'll call it wonderful.

Tel•alert is the first all solid state method of remote indication for news wire Bulletin or EBS transmissions. Instead of noisy steppers and relays, Tel•alert utilizes digital integrated circuits. And because of this all solid state design, Tel•alert is both quiet and compact allowing it to fit in anywhere — even right on top of the console close to live mikes.

So if your station is missing EBS tests because your news wire machine is out of the sight and hearing of your air people, you need Tel•alert. If your competition is scooping you because Bulletins go unnoticed, you need Tel•alert too.

Just circle the number below and we'll send you complete specifications. At just \$70.00 for the basic system, you really can't afford to be without Tel•alert. See why more and more stations are calling it wonderful and calling us . . .

THE INNOVATORS
AT



3140 EAST JEFFERSON AVE.
DETROIT, MICHIGAN 48207
(313) 567-0555
TWX: 810-221-1267

Canon IOX HAND-HELD CAMERA ZOOM

One-Inch Plumbicon Color Camera Zoom



PV 10X15

15mm to 150mm; f/2.0

- Wide Angle
- Small Size
- Lightweight
- Excellent Quality
- Operational Flexibility
- "Macro Focus" Operation
- Light Transmission Over 80%
- For All Cameras

Canon
BROADCAST OPTICS

CANON U.S.A., INC., 10 NEVADA DRIVE, LAKE SUCCESS, N.Y. 11040
(516) 488-6700

Circle 183 on Reader Service Card

Circle 184 on Reader Service Card

2" Video Tapes — \$2.19/hour

If you could buy a 1-hour quad tape, certified free of drop-out and edge damage, for \$2.19, you would be smiling!

That could be your out-of-pocket costs to clean, evaluate, and certify used tape currently gathering dust in your inventory with the Magnetek Tape Cleaner and Evaluator. It's like buying tape for \$2.19 per hour.

Customers report Magnetek cleaning removes up to 70% of video drop-out while it winds, repacks and tensions tape. You will clean and evaluate a 1-hour tape in 10 minutes without supervision: A three-pen graph recorder profiles video drop-out and audio and control track damage to facilitate extraction of damaged sections quickly and accurately.

Or for further information write:
Television Equipment Associates, Inc.
Box 1391 • BAYVILLE, N.Y. 11709

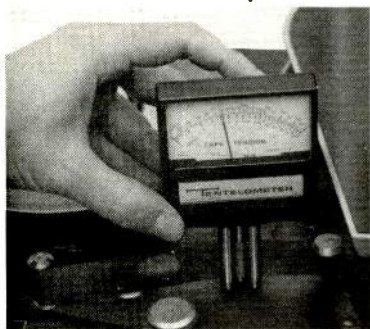
516-628-8068

* Includes Magnetek depreciation, materials, labor and production.

Circle 185 on Reader Service Card

VIDEO HELP!

Tape tension is the "pulse" of your video recorder/player. TENTEI has a tension gage designed for your application to provide a fast, accurate measurement of the tension with the machine "in operation."



TENSION PROBLEMS SHOW UP AS:

- **Interchangeability problems** between two or more recorder/players.
- **Horizontal time base instability** which causes flagging and picture distortion.
- **Premature headwear and tape wear** due to high tension.

Approved by Ampex, I.V.C., and Sony, (Great for U-Matics).

From \$179. Send for additional information or call today.

TENTEI (408) 377-6588
50 Curtner Avenue
Campbell, California 95008

Circle 186 on Reader Service Card

PRODUCTS



signal-to-hum ratio, 70 dB signal-to-noise ratio, 5-watt output in the 2 GHz bands, and 1-watt output in the 7-13 GHz bands. FARINON ELECTRIC 326

Radio remote control, the AR7-115, operates a two-way radio base station over a telephone type DC line. The



AR7-115 remote control unit is standard with speaker, volume control, LED transmit indicator, tone squelch defeat switch and intercom switch. The unit has a preset output impedance of 600 ohms, and a line output level of +4 dBm into a 600-ohm load. The maximum line loop resistance in the standard dual polarity configuration is 8 000 ohms. ALPHA ELECTRONIC SERVICES 327

Two-tone sequential decoder, the TT-83-345, measures 1½-in., and is tuneable over a frequency range of 250 Hz to 1600 Hz. No reeds or tone modules are necessary. Frequency stability is ±0.05% over the temperature range of -30°C to +100°C, at a supply voltage of 11-15 VDC. List price is \$115. ALPHA ELECTRONIC SERVICES 328

Remote TV and film portable lighting kit, model 4Q-TV, illuminates a 150 sq. ft. area. It contains two 1 000-watt focusing spotlights with lamps, three scrims, two 1 000-watt mini-fill lights with lamps and integral four-way barndoors, two four-way barndoors, four folding aluminum stands, and a carrying case. Power requirements are 120 V AC/DC at 33

amps. Weight of the kit is 64 lbs. KLIEGL BROS. 329

Lead calcium stationary batteries, called Tel/Cells, are 2-volt batteries offering a range of 685 a.h. to 1680 a.h. at an 8 hour rate. The TCC and TCCX series, respectively, uses a spark arresting ceramic vent and filling funnel for safer operation and ease of maintenance. Cases and covers are made with a high impact material. Covers are sealed to cases with a tongue-and-groove system. Two electrolyte withdrawal/maintenance tubes are provided. Plates are supported at both the top and bottom for extra strength. GLOBE-UNION 330

Zoom lenses are motorized, and feature a filter with increasing density toward the center of the optical path. As the iris closes, it subtends the area containing increasing light attenuation. At maximum iris opening, the effect of the spot filter is almost negligible. VICON INDUSTRIES 331

These four-track, quarter-inch record/reproduce magnetic heads meet the EIA response criteria from 70 Hz to 64 Hz at 15 ips. The heads offer track-to-track crosstalk isolation of 50 dB or better over the total bandwidth, and output uniformity of ±3 dB within the same stack. The heads use metal faces as standard, allowing for a life expectancy of up to 10 000 hours under normal operating conditions. Both the recording and reproduce heads can be manufactured to operate in a temperature range from -10°C to +71°C and withstand the shock, vibration and humidity requirements of MIL-STD-810-B. The price is \$107 (100 quantity). FERRAFLUX 332

TV titling and graphic materials printer produces pressure-sensitive letters, words and sentences in sequence on TV title cards and almost any surface without the use of ink or chemicals. Titles from 5/16 to 1½-in. and graphics in the Econ-O-Titler come in TV matte-finish white and black, plus red, blue, green, orange, yellow and brown. All words and sentences are automatically spaced and aligned. REYNOLDS/LETTERON 333

Video cartridge reloading service is offered to owners of 2-inch quad video tape cartridges. It is mainly intended for reusing cartridges or spools after the tape has degenerated beyond use for commercial recording and playback. A one-minute length cart reloaded 51 times and over costs \$7.85 per year. A three-minute cart reloaded the same number of times costs \$12.50 a year. For details and prices write to Calico Video West, P.O. Box 2405, Stockton, CA 95201, or Calico Video East, P.O. Box 91, River St., Dover, NJ 07801.

Sound-level meter for OSHA noise measurements, the 1983, meets ANSI standard S1.4 1971 Type S2A. The 1983 spans 70 to 120 dBA. The user turns it on and reads the measured level. There are no range or weighting selections to be made. The meter is marked in 1-dB increments. OSHA limits are printed on the meter face for reference to noise level compliance. The 1983 operates for up to 60 hours on a single 9-volt transistor-radio battery, and weighs 12 ounces. **GENERAL RADIO** 335

Desoldering tool, called the Universal Soldapullt, sucks up molten solder by a

thumb-released, spring-loaded plunger. The plunger movement is confined so that it does not extend beyond the



body length of the tool for safety. The desoldering tool is compact and weighs 1.6 oz. An integral plunger shaft extension self-cleans the desoldering tip each time the tool is reloaded. The high-temperature teflon desoldering tip is removable for routine cleaning or replacement. **EDSYN** 336

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

A free **high-frequency transistor primer** is a short course in transistor technology above 1 GHz. Part I of the two-part course covers transistor structures, maximum ratings, electrical and performance characteristics. Part II helps explain S-parameters and noise characterization. **Avantek**. 250

A 96 page **alarm equipment catalog**, designated A-75, describes and offers over 450 intrusion and fire alarm products. Major product categories include Intrusion Systems, Fire Systems, Fire and Intrusion Detectors, Remote Controls, Annunciators, Telephone Dialers, Lock Specialties, Tools and Books. **Mountain West Alarm Supply Co.** 251

A calculator application summary highlights the software package, **Microwave Pac Volume 1**. Nine **microwave circuit design programs** are contained in the Pac, and are detailed along with specific examples. This four-page calculator application summary 5952-8924, entitled "Microwave Circuit Design with the HP 9820A & 9821A" is available free of charge. **Hewlett-Packard**. 252

A data sheet, PSC-007, describes the Model ISD-1212 **isolated switch drive** for RF, IF, or video applications. The solid-state drive interfaces between timers or programmers and diode switches to provide local or remote switching of up to 12 channels. **PECA**. 253

A two-page, two-color bulletin, "**Frequency-Agile Phase-Locked Signal Sources**," describes a series of signal sources featuring completely automatic tracking of the input reference frequency, and very fast switching from frequency to frequency. The bulletin includes a table relating to the tunable frequency range to input frequency range, available output power, and FM residual noise for typical standard models in the series. **Continued on page 124**

Bulbs, Sockets to go.

Quartz, halogen or incandescent—every size and kind for film and TV studios—we serve the professional! If it's made by GE or Sylvania, we've got it in stock for immediate shipment.

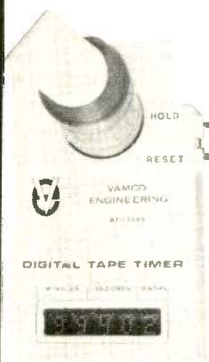
For every bulb, the matching socket.

Free! 108-pg. stage/tv Lighting Handbook.

Nationwide service for over 25 years.
Same-day shipment anywhere in US.
Rush delivery in Manhattan.

(212) JUDson 6-1620
BARBIZON ELECTRIC
426 W. 55, NYC 10019
Circle 188 on Reader Service Card

Digital Tape Timer



- Fits ALL 2" machines
- Optional remote display
- Power Supply included
- Field proven for more than 2 years
- The ORIGINAL exact-replacement timer; installs with one nut
- THE SAME LOW PRICE \$595.

OTHER VAMCO PRODUCTS

- Chroma key input switchers \$595
- Composite chroma key kit \$395
- Digital program Clock/Timers \$195
 - Routing switchers
 - 1 in 12 out Video DA
 - 1 in 20 out Audio DA
 - Color Monitors/Receivers



VAMCO ENGINEERING

Box 7512
Tulsa, Oklahoma 74105
(918) 252-4142, 747-0421

Leadership through creativity in design

A "SOUND" COMPETITIVE EDGE!

The **STE-100 STEREO PHASE ENHANCER**... can minimize "Phase nulling" in "Mono-sum" signals, and ensure your "Sound quality" in today's competitive markets!!!



GARRON ELECTRONICS, 1216 Kifer Rd, Sunnyvale, CA, 94086, Call (408) 736-8737

Circle 187 on Reader Service Card

Circle 189 on Reader Service Card

NEW LIT

munication Techniques Inc. **254**

An **audio tape head** replacement guide, designed for broadcast stations, recording studios, duplicators and other commercial audio recorder users will soon be available. The 24 page catalog contains about 350 heads with cross references for equipment produced by most major professional recorder manufacturers. The references list machine model numbers and

appropriate head numbers for each model. Nortronics. **255**

An 18-page catalog covers **light-weight relay and equipment racks** mounting hardware and available accessories. Dracon. **256**

A free 72-page book provides a better understanding of the **sampling oscilloscope** and explains how to derive a maximum benefit from its use. Application of a sampling oscilloscope is effected by applied exercises. For the reader who does not possess a sampling scope, the solutions of the problems posed in the exercises are explained at the end of the book together with explanations of how the results were obtained. The book is supplemented by circuit diagrams and printed circuit layouts in order to facilitate the construction of the test units needed for the different exercises. To obtain a copy of the book, write to Philips Test & Measuring Instruments, 400 Crossways Park Drive, Woodbury, N.Y. 11797

A free 6-page catalog describing 700 complete electronic **sub-systems** for the office, lab, field, or factory, and gives technical specifications on the Mod-U-Card product line and includes details on the more useful cards. Nationwide Electronic Systems. **257**

"**Signal Leakage and Interference Control**," a field-tested manual presenting information on good engineering practices, is now available from the National Cable Television Association. The 39-page booklet, edited by NCTA Vice President for Engineering, is designed for the CATV technician and gives step-by-step procedures for control of signal leakage. The booklet is available from the NCTA Engineering Department. Cost is \$5 for members, \$8 for others. **258**

This single sheet catalog illustrates the model 27-200, a **delay line** designed for use in TV broadcast equipment where high performance must be

achieved when operating under severe temperature conditions. For a copy, write: Model 27-200, Walther M.A. Andersen & Associates, Inc., 4 Main St. Ext., Tariffville, Conn. 06081.

A 21-page handbook, "**Klystrons For UHF-TV Transmitters**," is available. It contains an introduction, a section describing klystron operation, and a few paragraphs outlining variations in klystron features. The majority of the booklet lists the manufacturer's klystron tube offerings in detail. Thomson-CSF. **259**

The "**Power Grid Tube Selection Guide**" is designed for making tube selections by application rather than by tube type. Typical uses include broadcast, pulse modulators, switching, and industrial heating. The free guide saves time during initial tube selection for new equipment design. EIMAC **260**

A two-color data and specification sheet on T-100 Series **translators** (VHF & UHF, 1 watt to 1000 watts) is now available. This series covers the VHF and UHF spectrum in 20 models up to one kilowatt peak sync power. Acrodyne Industries. **261**

A **multi-image equipment** guide, available free on request, covers a wide range of programming equipment from economical magnetic tape programmers to sophisticated computer punch tape programmers. Multi-speed dissolve controls are detailed, as are multi-image package systems, synchronizers, and tape punch equipment. Spindler & Sauppé. **262**

A "**Meter Magic**" application note describes a simple method to monitor machine running-time and down-time. The note explains how to design this set-up, provides drawings, and gives an estimate of the cost to build the system. Copies of Meter Magic No. 2, or a subscription to the series, can be obtained by contacting Beede Electrical Instrument Co., Penacook, NH 03301.

A seven-page monograph explaining the factors which should be utilized by design engineers in selecting **semi-conductor fuses** is now available from the manufacturer. It describes the various parameters used to specify the fuses, and indicates the relative importance of each. International Rectifier Corp. **263**

A four-page catalog describes the Model SM62, a **unidirectional dynamic microphone**. Mic specifications are listed in tabular form; this includes a logarithmic frequency-response graph, and a polar pattern of sound pressure versus frequency. Shure Bros. **264**

Video Engineer's Timing "Tool"



In every TV station, remote truck, or audio/visual department the video engineer has video timing problems. When he has a Matthey "UN360" in his tool bag he can deal with video timing up to and beyond 360° of phase at color sub-carrier.

It's fast to plug into cables. It's quick to switch to the required delay and a screw-driver vernier gives ± 4 ns of fine trim.

The performance is suitable for full color timing and can be inserted directly into the video path without any extras. The equalizers are built inside the "UN360."

The "UN360" is in use by ABC, NBC and CBS and many TV engineers across the nation. Put one in YOUR tool bag — it's a real aid.

Television Equipment Associates, Inc.

BILL PEGLER 516 • 628-8068

Box 1391 • BAYVILLE, N. Y. 11709 

Circle 190 on Reader Service Card

the new TWO-TONE EBS generator

the TG2/EBS—available when you need it, meets the new FCC requirements effective January 15, 1976

Precise, crystal-derived 853 and 960 Hz tones, manual, or automatic 22 sec. output duration with remote "start" provision delivery late 1975



TG2/EBS

McMartin

McMartin Industries Inc., 4500 South Seventy-sixth Street Omaha, Nebraska 68127 Phone (402) 331-2000

Circle 191 on Reader Service Card

BM/E CLASSIFIED MARKETPLACE

CLASSIFIED ADVERTISING RATES

DISPLAY CLASSIFIED ADVERTISING: \$32.50 per inch 1x; \$30.00 per inch 6x; \$27.50 per inch 12x. ALL OTHER CLASSIFIED ADVERTISING 35¢ per word; minimum \$3.50. BLIND BOX NUMBER: \$1.00 extra charge. Replies sent to address below will be forwarded to you. PAYABLE IN ADVANCE; send check with order. CLOSING DATE: 5th of 2nd month preceding issue date.

BM/E, Monterey and Pinola Avenues, Blue Ridge Summit, Pa. 17214 Phone 717/794/2191

EMPLOYMENT OPPORTUNITIES

FIELD ENGINEER - BROADCAST AUTOMATION. Control Design Corporation is seeking an outstanding engineering candidate with state-of-the-art MOS digital logic and audio experience. Must be free to travel throughout the United States and overseas. You will be responsible for installation, training and continued support of our growing customer base. Broadcast background in engineering or programming helpful but not essential. Must be totally professional and customer oriented. Only candidates who believe "the customer is always right" need apply. Very attractive salary, expenses and profit sharing. Send resume with salary history to: Dave Hill, Control Design Corporation, 106 S. Pickett Street, Alexandria, VA. 22304.

FIELD SERVICE ENGINEER

Extensive Travel. All Benefits. Experience in Color video and switching systems preferred. Contact: **Mr. Buzan, Vital Industries, Inc., 3700 N.E. 53rd Avenue, Gainesville, FLA. 32601 Phone: (904) 378-1581.**

July 1, 1975 opening. TV Engineer. Salary \$15,000 plus. Eastern University desires person to assume operation, maintenance and supervision responsibilities for TV facilities which include studio and CCTV operation. First class license and experience in commercial and university TV work desirable. Send all applications by May 15 to William J. Judd, Director, Educational Communications, SUNY, Binghamton, N.Y. 13901.

Downstate Illinois. Maintain excellent facilities and do some production. Announcing ability helpful. Please send resume. Reply to box 575-1, c/o BME, Blue Ridge Summit, PA. 17214.

Studio Engineer . . . Audio processing experience necessary. Complete and finest equipment. Major Southwest market. Call Ray Gardella at (915) 544-7876.

POSITION WANTED

TV SYSTEM SPECIALIST. Professional experience in broadcasting and brand name manufacturing. Proficient in operation maintenance design and marketing of TV systems. College. First Phone. Reply Box 415C Dept. BM/E Blue Ridge Summit. Pa. 17214

Recent graduate in electrical engineering from Auburn University with first class in seeking experience in broadcasting. Will relocate. Rick Clecker, Rt. 2, Box 87B, Columbiana, Alabama 35051. (205) 669-9587.

EQUIPMENT FOR SALE

IRS 501-C-3 Corporation needs tax write off film chain, video, 1/2", 3/4", 1", character generator, what have you. Will pay freight needed for media project rural Alaska/ contact Martin Carvalho/ Bristol Bay Area Health Corporation/ Box 233/ Dillingham, Alaska 99576/ (907) 842-3322.

STODDART NM-30A radio interference-field intensity meter. 20-400 MHz. Like New condition—1966 Manufacture. Complete with AC PS, Dipole antennas, cables, tripod, and inst. book. Calibrated prior to shipment. \$1,595. Surcom Associates. (213) 382-6985.

AMPEX FACTORY PARTS and theatre equipment. Capstan drive motors for model 300, 3200 duplicators and penthouses 1800/3600 RPM \$140. Exchange. 80 watt solid state theatre amplifiers reduced 50% \$179.50. 35mm and 70mm Amplex heads. Exciter DC power supplies RM \$169.50. Tellel Communications, 8831 Sunset Blvd., W. Hollywood, Calif. 90069. (213) 652-8100.

EQUIPMENT FOR SALE (Cont'd)

Labow Labs. Inc.
56 Chestnut Hill Ave.
Boston, Mass. 02135

New England foremost Pro-Audio/ Video distributor, representing over 100 major manufacturers. Sales, consulting, design and service by expert staff. Broadcasting, industrial, educational and recording installations. Contact:

Frank Petrella, 617-337-6303/or 617-782-0600

Broadcast mixer for remote out of studio programming. Can be used as inexpensive second console for college and small radio stations. D.J.'s can now originate programming at home. Simultaneous mixing of two stereo phonographs, a tape machine and a microphone. Precue for all inputs with built-in monitor headphone amplifier. Send for literature. \$325. Professional discount, use letterhead. G.L.I. Box 2076, DEPT BM/E, Brooklyn, N.Y. 11201 Phone: (212) 875-6992.

BROADCAST AND RECORDING EQUIPMENT: Scully, V.I.F. International, Metrotech, Langevin, Electrodyne, Q.R.K., Micro-Trak, MRL, Nortronics, McMartin, U.R.E.I., E.V., A.K.G., Stevenson, Gately, D.B.X., Advent, Altec, Fairchild, Audio Designs, 3M, Magnecord, Telex, Inovonics, Nagra, Uher, Tape-Athon, Package Deals, Installations, Service, Request Flyer. Weigand Audio, Middleburg, PA. 17842. (717) 837-1444.

Solid-state audio modules-console kits, power amplifier kits, power supplies. Octal plug-ins -mic, eq, line, disc, tape play, tape record, amplifiers. Audio & tape bias oscillators. Over 50 audio products. Send for free catalog and applications. Opamp Labs, Inc., 1033 N. Sycamore Ave. Los Angeles, Calif. 90036. (213) 934-3566.

MAGNECORD-VIKING-TELEX PARTS: Largest stock in the country. Factory prices. Try us for hard to find items. Dept. M, DUNN INDUSTRIES, 12157 Valliant Dr., San Antonio, TX 78216. (512) 349-2953.

USED cart machines and turntables suitable for rebuilding. S.J. Broadcast and Program Service. Box 816, North Cape May, N.J. 08204. FCC first phone.

WANTED TO BUY — Equipment. WWCW requires new or used AM guyed tower 450 feet above base insulator. Contact Peter Marcus — (203) 758-2468 or (201) 944-8817.

2 — Norelco PC-70 cameras with Angenieux 10-180 type J1 lens, shot boxes and about 350' of cable good condition. Contact C.E., Springfield, Mo. (417) 862-7474.

AMPEX, SCULLY, TASCAM, all major professional audio lines. Top dollar trade-ins. 15 minutes George Washington Bridge. **PROFESSIONAL AUDIO VIDEO CORPORATION**, 342 Main Street, Paterson, N.J. 07506. (201) 523-3333.

MICA AND VACUUM transmitting capacitors. Large stock; immediate delivery. Price lists on request. **SURCOM ASSOCIATES**, 1147 Venice Boulevard, Los Angeles, Calif. 90015. (213) 382-6985.

AC power line lightning arrestors. 120 VAC 25.00 per leg. 220 VAC 27.00 per leg. Single phase to three phase converters, any size transmitter. G. DuVall Co., 6838 N. Ottawa, Chicago, Ill. 60631.

WHATEVER YOUR EQUIPMENT NEEDS—new or used—check us first. We specialize in broadcast equipment. Send \$1.00 for our complete listings. Broadcast Equipment and Supply Co., Box 3141, Bristol, TN 37620.

EQUIPMENT WANTED

WANTED

ZOOM LENSES with 400mm or over maximum range capability for 1" or 1 1/2" format

GBC Closed Circuit Tv Corp.
74 Fifth Ave., New York, N.Y. 10011
Tel: (212) 989-4433

EQUIPMENT WANTED (Cont'd)

WE NEED USED 250, 500, 1KW, 5KW AM Transmitters, 250, 1000 Watt FM transmitters. No junk. Guarantee Radio Supply Corp., 1314 Turbide St., Laredo, TX. 78040.

MODULATION TRANSFORMER for RCA BTA-1L AM transmitter. WBUT, Butler, PA. 16001.

FRANCHISES AVAILABLE

LEGAL NOTICE

The Town of Farmington in Ontario County, New York, invites applications for a cable television franchise. Applications shall be prepared and submitted in accordance with a "Request for proposals" available from the undersigned. Applications will be accepted until 10:00 a.m. E.D.S.T., July 1, 1975 by the Town Clerk at the Town Hall, 5630 Collett Road, West Victor, New York 14564. Phone (315) 986-5540, 289-9540, and (716) 924-7810. All applications will be available for public inspection at the Clerk's office during normal business hours.

by: Rose M. Kleman
Town clerk

LEGAL NOTICE PETERS TOWNSHIP

Sealed proposals for furnishing a cable television system in Peters Township will be received by the Board of Supervisors, Peters Township, Washington County, at the Municipal Building, 610 East McMurray Road, McMurray, Pennsylvania 15317 until 4:30 p.m. May 19, 1975.

Bids will be publicly opened and read on May 19, 1975, at 8:00 p.m. in the Fire Department Hall, 245 East McMurray Road, McMurray, Pennsylvania. Bidders are to utilize the License Agreement Guidelines available at the Municipal Building and identify the extent of deviation from the guidelines.

All bids must be sealed and addressed to the Peters Township Board of Supervisors, 610 East McMurray Road, McMurray, Pennsylvania 15317 and have the words "Proposal for Cable TV System" marked on the outside of the envelope.

Each bid must be accompanied by a Certified Cashier's or Treasurer's check or Bid Bond in the amount of \$200.00 payable to Peters Township

Madeline M. Farkas
Secretary

INSTRUCTIONS

First phone through tape recorded lessons at home plus one week personal instruction in Washington, D.C., Atlanta, Boston, Detroit, New Orleans, Minneapolis, Seattle, Denver, Portland, Los Angeles. Proven results. Our 17th year teaching FCC license courses. Bob Johnson Broadcast License Training, 1900 Duncan, Manhattan Beach, Calif. 90296. 213-379-4461

PROGRAM SERVICES

"FREE" CATALOG . . . Everything for the Deejay! Custom I.D.'s, Promos, Airchecks, Wildtracks, Books, FCC Tests, Comedy, and more! Write: Command, Box 26348-A, San Francisco 94126.

Deejays! New Comedy! 11,000 classified one-line gags, \$10. Catalog FREE! Edmund Orrin, 2786-M West Roberts, Fresno, CA. 93705.

PROFESSIONAL CARDS

COHEN & DIPPELL, P.C.
CONSULTING ENGINEERS
 527 Munsey Bldg.
 (202) 783-0111
 Washington, D. C. 20004
Member AFCCCE

RALPH E. EVANS ASSOCIATES
Consulting Telecommunications Engineers
 AM-FM-TV-CATV-ITFS
 3500 North Sherman Boulevard
 MILWAUKEE, WISCONSIN 53216
 Phone: (414) 442-4210
Member AFCCCE

McCLANATHAN & ASSOCIATES
Consulting Engineers
 APPLICATIONS & FIELD ENGINEERING
 TURNKEY INSTALLATIONS — RADIO & TV
Domestic and Foreign
 P. O. Box 750
 PORTLAND, OREGON 97207
 Phone: 503/246-8080

Midwest Engineering Associates
 Consulting Engineers
 F.W. Hannel, P.E.
 BSEE; MSEE
 7304 N. Oxford, Peoria, Illinois 61614
 (309) 691-3426

THORTECH, INC.
 —Serving the Broadcast Industry—
 Field Engineering, Frequency Measurements
 Turnkey and Antenna Installations
 13135 Ventura Blvd.
 STUDIO CITY, CALIFORNIA 91604
 (213) 986-1400

**Coming
 Next Month**

**BROADCAST
 MANAGERS'
 VIEWPOINT**

Beginning a new regular series covering opinions, advice, know how. From the industry's experts.

WATCH FOR IT.

ADVERTISERS' INDEX

AKAI America, Ltd. 25
AKG Div. Phillips Video Systems Corp. 17
Amperex Electronic Corp. 10, 11, 62, 63
Ampex Corp. 14, 15, 85
Aristocart 18
Audio Designs & Mfg., Inc...... 81
Audio Services 121

Barbizon Electric Co. 123
Belar Electronics Laboratory, Inc. ... 8
Berkey Colortran, Inc. 95
Broadcast Electronics, Inc. 103, 105

**CBS Laboratories, A Div. of
 CBS Broadcast Systems, Inc.** 9
CMX Systems 58
Canon, Inc. 121
Capitol Magnetic Products 71
Central Dynamics, Ltd. 77
Cinema Products Corp. 56, 57, 97
Cohu Electronics, Inc. 31
**Collins Radio Group,
 Rockwell International** Cover II
Communications Technology, Inc. ... 22
Computer Image 111
Consolidated Video Systems, Inc. ... 13
Cooke Engineering Co. 28
Cosmicar Optical, Ltd. 120

dbx, Inc. 24
Datatek Corp. 74
Datatron, Inc...... Cover III
Datavision, Inc. 86
Dynasciences Video Products 44

ESE 90
Eastman Kodak Co. 3
Electro Sound 23

Farlton Electric 65
Fernseh Group, Robert Bosch Corp. . 33
**Fidelipac, a Div. Telepro
 Industries, Inc.** 20

Garron Electronics 123
Grass Valley Group 5

SALES OFFICES

Broadband Information Services, Inc.
 274 Madison Ave.
 New York, New York 10016

EASTERN & MIDWESTERN STATES
 274 Madison Avenue
 New York, New York 10016
 212-685-5320
 Kenneth F. Luker, Jr.

WESTERN STATES
 1212 Hearst Building
 San Francisco, California 94130
 415-495-0990
 William J. Healey

P.O. Box 4902
 Los Angeles, California 90049
 213-476-6451
 Art Mandell

JAPAN
 Nippon Keisoku Inc.
 P.O. Box 410
 Central Tokyo, Japan
 Tokyo (03) 667-7681
 Yoshi Yamamoto

**Harris Corp. Broadcast
 Equipment Div.** 53
Hitachi Shibaden Corp. of America .. 87

**Ikegami Electronic Industries, Inc.
 of New York** 73
Inovonics 97
International Tapetronics Corp. ... 78, 93

JVC Industries, Inc. 69

Kaltronics Corp...... 91

LPB, Inc. 119
Listec Television Equipment 7
Lowell Light 117

McCurdy Radio Industries, Inc...... 39
McMartin Industries, Inc. .. 20, 107, 124
Micro-Trak 82
Mincom Div. 3M Co...... 35, 36, 37, 38
Monroe Electronics, Inc. 89
Moseley Associates, Inc. 21

Neve, Rupert, Inc. 88
Nurad, Inc. 99

Orange County Corp...... 12

PSC Technology, Inc...... 75
Pacific Recorders & Engrg. Corp. .. 109
Paperwork Systems, Inc. 18
**Phillips Audio Video Systems Corp.,
 Broadcast Equipment Div.** 27
Potomac Instruments 12

RCA Broadcast Systems 54, 55
RCA Industrial Tube Product..... 45
RCA Service Co. 91
Rapid Q 123
Recortec, Inc. 83

Shintron Co., Inc. 112
Sony Corp. of America 19
Spectra Sonics 90
Strand Century 101

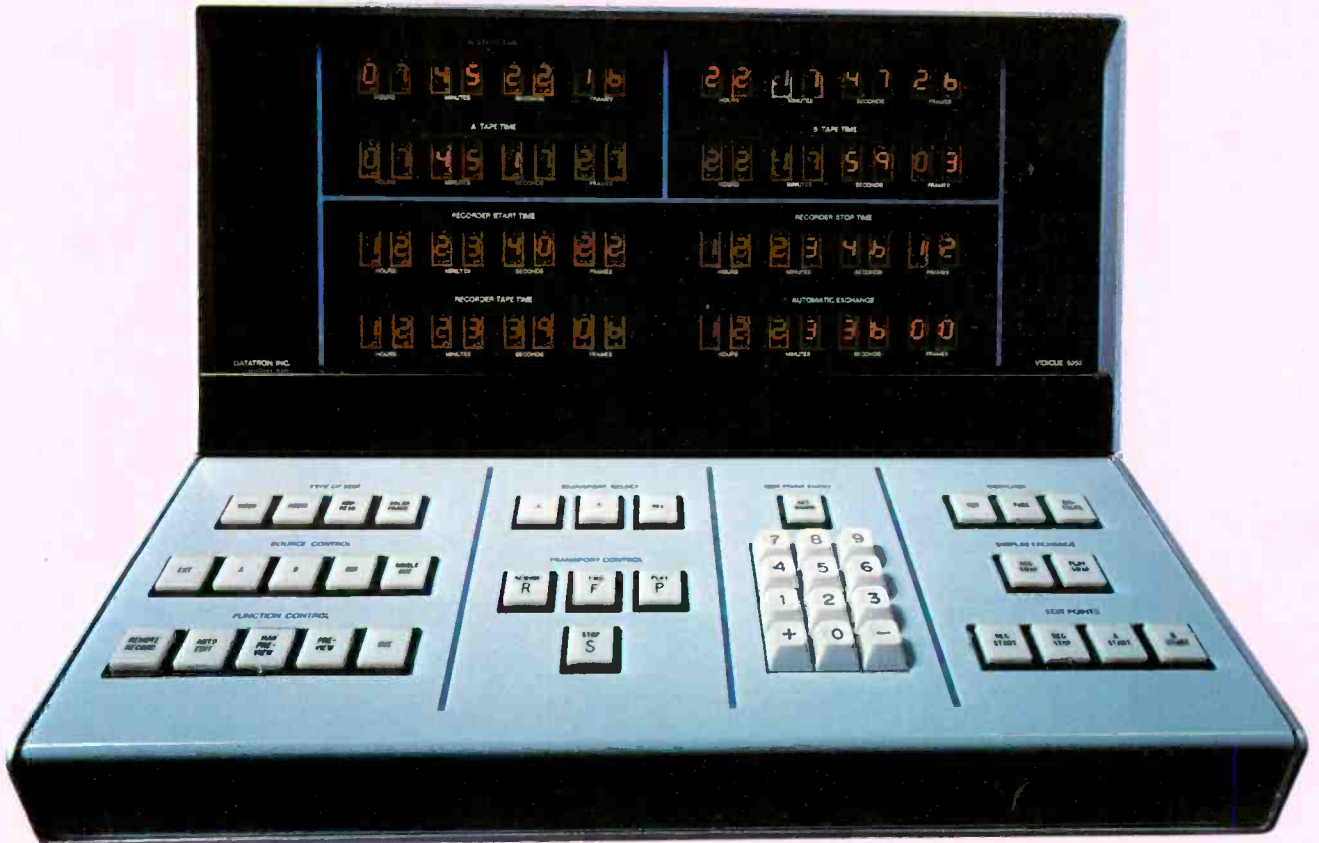
Taber Mfg. & Engrg. 119
Tektronix, Inc. 29
Telemation, Inc. 67
**Television Equipment
 Associates, Inc.** 107, 122, 124
**Television Research
 International, Inc.** 61
Tentel 122
Thomson CSF 46, 47

Unimedia 79
Urel 16

Vamco Engrg...... 123
Videomax Corp. 59

Ward Beck Systems, Ltd. Cover IV
Wilkinson Electronics, Inc. 49
World Video 113

The Editor-In-Chief!



Now you can economically edit on helicals and automatically transfer in minutes to quads

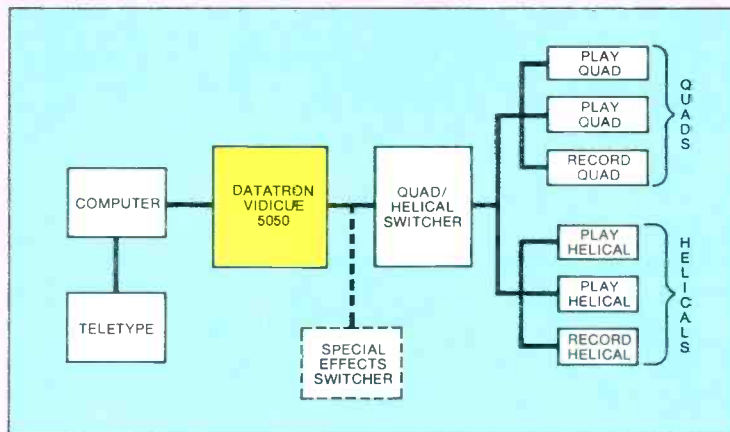
The editing system you've been waiting for.

Meet the Editor-In-Chief. Our thrifty new Vidicue 5050.

It defies obsolescence. You can expand from two to three machines at will. Or move up in logical steps to a completely automatic on-line, off-line system where editing is done on low cost helicals and transferred in minutes to quads.

Easy to learn, and to operate too. Simple keyboard entry. Visual display of tape position and all edit points. Exclusive jam sync, eliminating forever the need to pre-record SMPTE edit code on tape. A/B rolls, color framing, special effects switching, time base correction. The works!

Yet this remarkable video tape editing system is priced far below competition. In fact, there is none.



The importance of Jam-Sync.

Our exclusive jam-sync eliminates the need to pre-lay-down the SMPTE edit code on an entire length of fresh tape being used to assemble a show from other tapes. Instead, during pre-roll, the system time code generator is automatically set and sync'd so that time picks up exactly where it left off — to

the frame. This saves quad head wear. Tape wear, too. And is also a great time saver on stop-and-go live production by generating a continuous uninterrupted elapsed time on the tape.

Save your expensive quads for other jobs.

The block diagram tells the story. You can edit on-line or off-line. Do time consuming edits on low cost helicals. Edit event times are stored in the computer

and a punched tape prepared. Using this tape, a precisely edited show can be automatically transferred to quads in minutes.

Your quads have never had it so good. Or your pocketbook either. We'd like to tell you the whole story of our Editor-in-Chief. Why not write or phone today.

datatron, inc. EDITING SYSTEMS DIVISION

1562 Reynolds Ave., Santa Ana, California 92705 (714) 540-9330 • TWX 910-595-1589
Mailing Address: P.O. Box 11427, Santa Ana, California 92711

The Art of Sound

Experience new dimensions in sound. With console configurations embodying a comprehensive series of new high performance modules. Trend setting systems combining operational flexibility with aesthetic appeal.

Ward-Beck continues to move ahead with dynamic designs, performance standards approaching theoretical limits, and uncompromising quality, to bring you the kind of equipment that you always hoped might happen.



WBS

Tomorrow's Technology Today.

Ward-Beck Systems Inc.,
290 Larkin Street,
Buffalo, N.Y. 14210

Ward-Beck Systems Ltd.,
841 Progress Avenue, Scarborough,
Ontario M1H 2X4
Telephone (416) 438-6550. Telex 06-23469

Circle 193 on Reader Service Card