

MAY 1973

BME BROADCAST MANAGEMENT ENGINEERING CME CABLE MANAGEMENT ENGINEERING

INCLUDING: CABLE MANAGEMENT ENGINEERING



TERRY W DENAROOK PD/ENG
 PACIFIC LUTHERAN UNIV CCTV
 4617 NORTH GRACE/KPLU
 TACOMA WA 98407

NAB SHOW -IN- PRINT ISSUE

Turning Point in Technology and Regulation
 Helical VTRs challenge quad for first time
 Automated audio delivery systems go pocket-sized
 Era of digital transmission coming
 On the regulatory front, it's all roses

"Cartridges are our lifeblood. We have some of the most sophisticated cartridge-handling equipment in the country. We are converting to the Audiopak® Model A-2 cartridge exclusively."

—Eric Small,
Chief Engineer,
WXLO 98.7
stereo New York.

"We've tested other cartridges. A lot of other cartridges. Our tests showed no cartridge superior to the Audiopak A-2 in ruggedness, mechanical design, or (most important of all) consistency in phase stability."

"What you're looking at here is what we call the DTC. That's short for Disc Tape Cart Transfer system. It's as close to completely automatic cart making as the state of the art permits. Control logic is solid state."

"We make 50 to 150 carts a week. We've got to be able to rely on them. That's why we have standardized on the Audiopak A-2."

"Since all our music is on carts, they must be dependable. Without a doubt, the A-2 gives us the reliability we need."

IMPORTANT

Contact your local Audiopak distributor or Audio Devices regional office and ask about our spectacular Broadcast Cartridge "Buy Back" program.

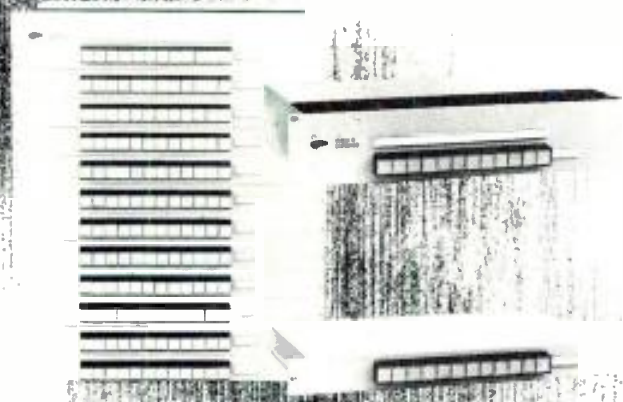
Shown here with Mr. Small is
John Bailie, Maintenance Supervisor.

New Audiopak® A-2 Broadcast Cartridges

Circle 100 on Reader Service Card

Audio Devices, Inc.
A Capitol Industries Company,
100 Research Drive,
Glenbrook, Conn. 06906

DYNAIR's price catalog describes these new products and over 150 others.



NEW "PATCH CABLE ELIMINATOR"

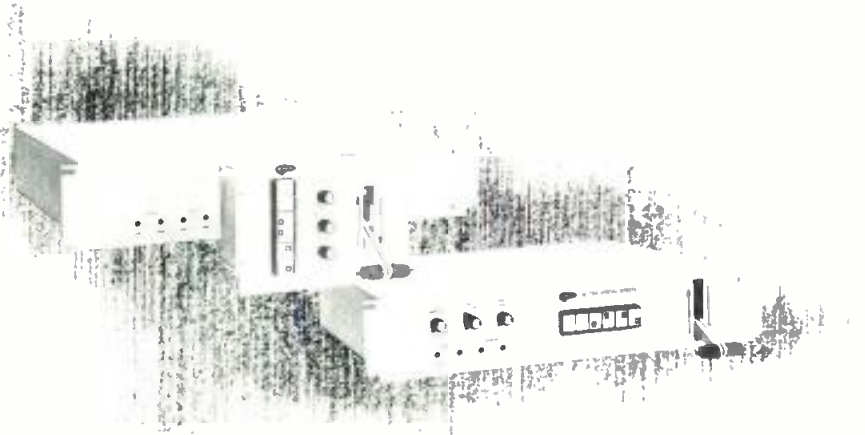
DYNAIR's new Series-X Video-Audio Switchers eliminate the custom fabrication usually required for routing switchers. These units are totally modular, allowing off-the-shelf assembly of almost any input-output configuration, either video-only, or audio-follow-video. And, expansion is easy too . . . you simply add input or output expansion modules as required.

The basic unit is video only, with options including audio, sync-mixing and tally provisions. Illuminating pushbuttons are standard, with provisions for easily labeling the individual inputs and outputs. The new Series-X provides exceptional performance at prices which are, in many cases, much less than our earlier version of the Series-X.

NEW SPECIAL EFFECTS GENERATORS

DYNAIR's new SE-70A and SE-70A-R Special Effects Generators allow basic effects to be easily and inexpensively added to any television system. These broadcast quality units operate equally well on color or monochrome signals, with either broadcast or industrial sync. A quality locking-type gear-driven effects mechanism is used, allowing effects to be easily implemented.

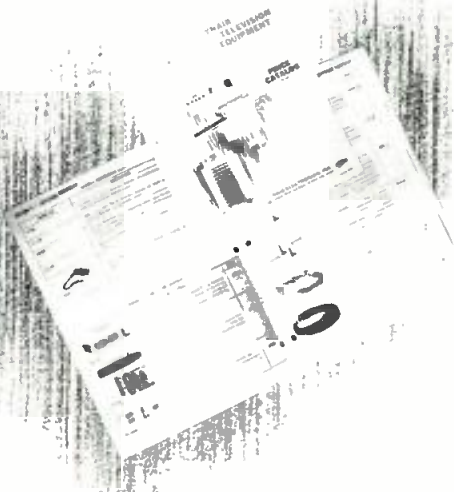
The units provide horizontal and vertical wipes, inserts from any corner with diagonal expansion, and internal and external keying and matting. The SE-70A is self-contained for console mounting and the SE-70A-R is an electrically identical remote-controlled unit, the control panel of which may be easily mounted in custom panels.



NEW DYNAIR "PRICE CATALOG"

DYNAIR's new price catalog has been designed to provide you with a quick look at the large variety of equipment we manufacture and our current price on each item. We think that you will appreciate the convenience of this new catalog/price list combination . . . it's a very handy reference guide to DYNAIR's world of television.

Request your copy today . . . we think you'll like what you see.



DYNAIR ELECTRONICS, INC.

6360 FEDERAL BOULEVARD
SAN DIEGO, CALIF. 92114 U.S.A.
TELEPHONE: 714-582-9211



MAY 1973/VOLUME 9/NUMBER 5

- 6 **Broadcast Industry News**
Stations cut sex shows; CPB and PBS fight continuance
- 18 **Interpreting the FCC Rules and Regulations**
TV/Cable Cross-Ownership



Literally hundreds of products at this year's NAB Convention are described and illustrated in BM/E's NAB Show-In-Print issue, starting on page 26.

NAB SHOW-IN-PRINT

- 26 **Largest-Ever NAB Convention Witnesses Turning Point in Technology and Regulation**
 - Helical VTRs star 26
 - More deregulation promised despite pressures to curb freedom 27
 - Quad still predominates 28
 - A new "digvid" world coming 28
 - Automatic systems prevalent 29
 - Transmitters: reliable and automatic 29
 - Compact tape carts 31
 - Color cameras go hand-held 35
 - Tape: count the drop-outs 37
 - Inexpensive videotape editors 38
 - Switchers feature new special effects 38
 - Character generators: developments minor 40
 - Film telecine: new RCA cart 40
 - Automation/computer business services 48
 - Here and there on the exhibit floor 52
 - Audio at the NAB 57
 - Open-reel machines: at the top 58
 - Consoles—you name it 62
 - Microphones, pickups, auxiliaries 65

BROADBAND INFORMATION SERVICES, INC.
274 Madison Ave.
New York, N. Y. 10016
212-685-5320

Editor
James A. Lippke

Associate Editor
Robin Lanier

Contributing Editor
M. L. H. Smith

Assistant Editor
A. E. Gehlhaar

Art Director
Gus Sauter

Production Manager
Arline G. Jacobs

FCC Counsel
**Pittman Lovett Ford
Hennessey and White**

Advertising Director
Charles C. Lenz Jr.

-
- 67 **Broadcast Equipment**
New and significant products for broadcasters
 - 70 **New Literature**
Useful reading materials

CM/E MAGAZINE: For those with cable interests/following page 66.

BPA 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.

Copyright © 1973 by Broadband Information Services, Inc., New York City.
Controlled Circulation postage paid at East Stroudsburg, Penna.

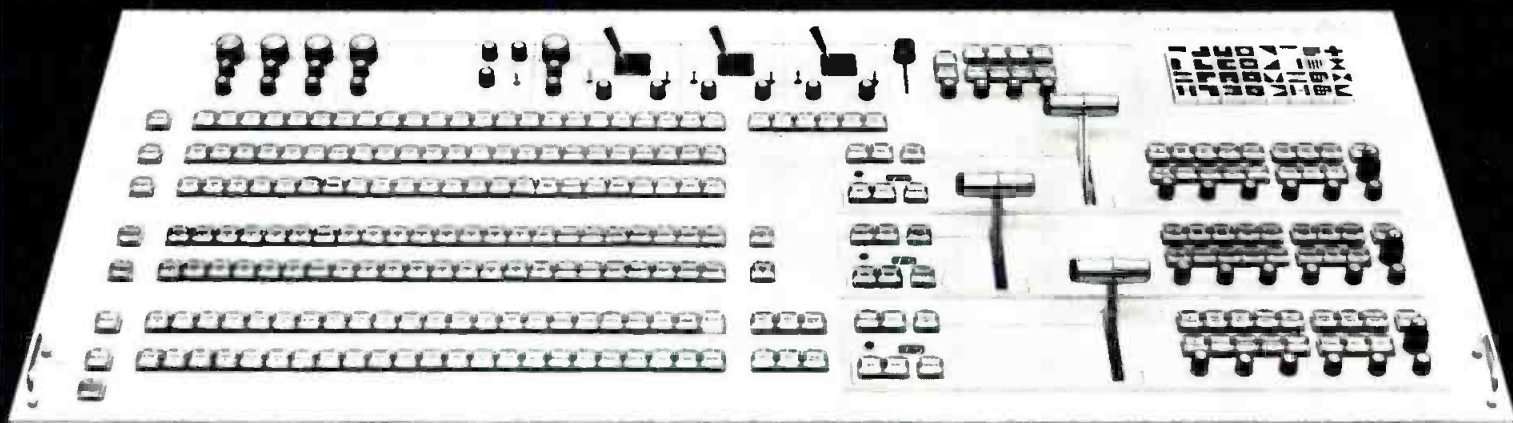
THE 1600 SERIES

LINEAR CHROMA KEY, SOFT WIPE, and ELECTRONIC VIGNETTE are some of the modern concepts in GVG's new 1600 Series television production switching systems. **LINEAR CHROMA KEYING** is a basic improvement in chroma key technique. Its effect is to virtually eliminate noise and tearing, even in the most difficult chroma key situations, such as keying through glass or smoke.

1600 Series systems are a second generation design which is based upon experience gained in the manufacture of almost three hundred 1400 and 3600 Series switchers. This new design is in direct response to customer requests for fundamental improvements in special effects capability, together with a high standard of electrical performance.

Some of the design concepts employed in the 1600 Series systems constitute an advance in the state of the art and, as such, are offered for the first time. These new concepts include both mechanical and electrical aspects of design and have led to the development of systems which are both compact and cost effective.

1600 Series switchers range in size from Model 1600-2A, with 16 input buses - 4 output buses and one mix/effects system, to Model 1600-7G (illustrated below), with 24 input buses - 7 output buses and three mix/effects systems -- each with separate pattern generator, color matte generator, and modulated positioner.



THE GRASS VALLEY GROUP, INC. 

SOLD EXCLUSIVELY BY GRAVCO SALES, INC.

6515 Sunset Blvd.
LOS ANGELES, CALIF.
(213) 462-6618

Station Plaza East
GREAT NECK, N.Y.
(516) 487-1311

125 South Wilke Road
ARLINGTON HEIGHTS, ILL.
(312) 394-1344

Redbird Airport
DALLAS, TEXAS
(214) 330-1245

1644 Tullie Circle, N.E.
ATLANTA, GEORGIA
(404) 634-0521

OVERSEAS - GRASS VALLEY INTERNATIONAL - BOX 1114, GRASS VALLEY, CA 95945 - USA

NEWS

**NAB CONVENTION:
SHOW IN PRINT (See page 31)**

**FM Station Cuts Raw Sex
After FCC Hits "Obscenity"**

The Federal Communications Commission has apparently won without a court fight what was widely regarded as an almost-sure obscenity test case, in an action against WGLD-FM, Oak Park, Illinois. Sonderling Broadcasting, the licensee, announced that material cited by the FCC would be dropped, and there were indications that Sonderling would pay the \$2000 fine, assessed by the FCC, without contest.

The material cited was in a so-called "topless radio" format with the announcer taking calls from the audience. Responding to "How Do You Keep Your Sex Life Alive,"

some callers very explicitly described oral sex and were coaxed by the announcer for details and their feelings about them. Most observers believe the material would have been adjudged obscene in court.

The FCC's authority to move against obscenity was questioned by Commissioner Johnson, who thought the matter should be left to the courts.

Meanwhile, the FCC has opened an inquiry into obscenity on cable, in response to complaints from the viewing public (Docket 19716). And Chairman Burch of the FCC blasted titillating sex talks as "electronic voyeurism" at the recent NAB Convention, while the NAB has strongly urged members to drop such material. Storer Broadcasting, in apparent response, dropped its syndicated program, "Feminine Forum." Storer said its material was in

good taste, blamed imitators for the vulgarity that riled the public.

**Round X: CPB and PBS
Are Still In The Ring**

The battle between the Corporation for Public Broadcasting and the Public Broadcasting Service over control of programming in public television went through several more turns, with more still likely by the time this sees print. Developments up to press time included a restructuring of PBS to make it the national negotiating body for the 250-odd local public television licensees around the country, able to give the ideas of the locals proper weight in national programming and use of network facilities. At the end of March, CPB and the new PBS sat down together and reached an apparent compromise on outstanding issues. But then the board of CPB, reportedly under pressure from the White House's Office of Telecommunications Policy, rejected the agreements and appointed a new negotiating team to get "tougher" with PBS, Thomas B. Curtis, president of CPB and principal architect of the agreements, resigned. Which puts us right back where we were. Watch out for Round X!

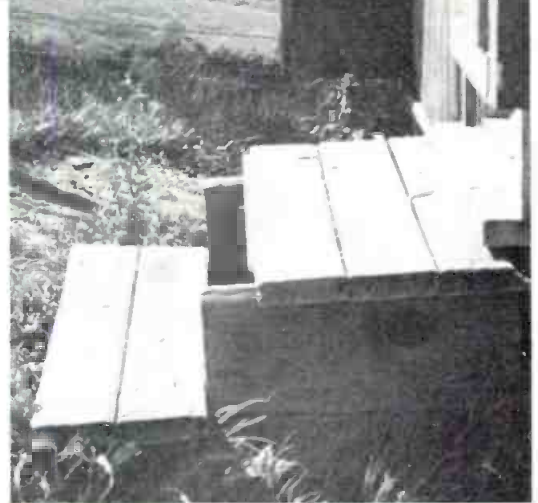
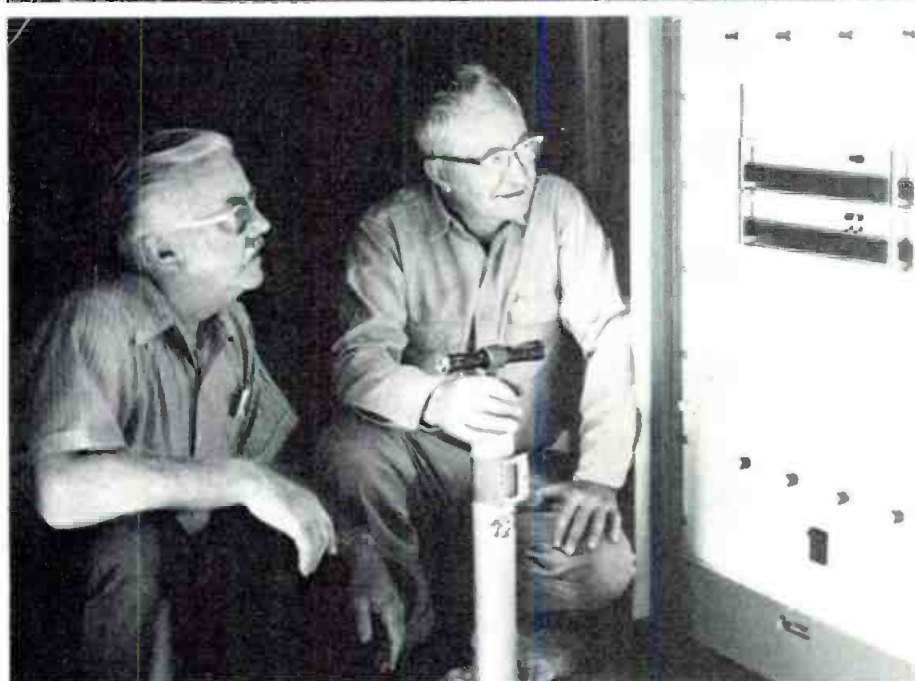
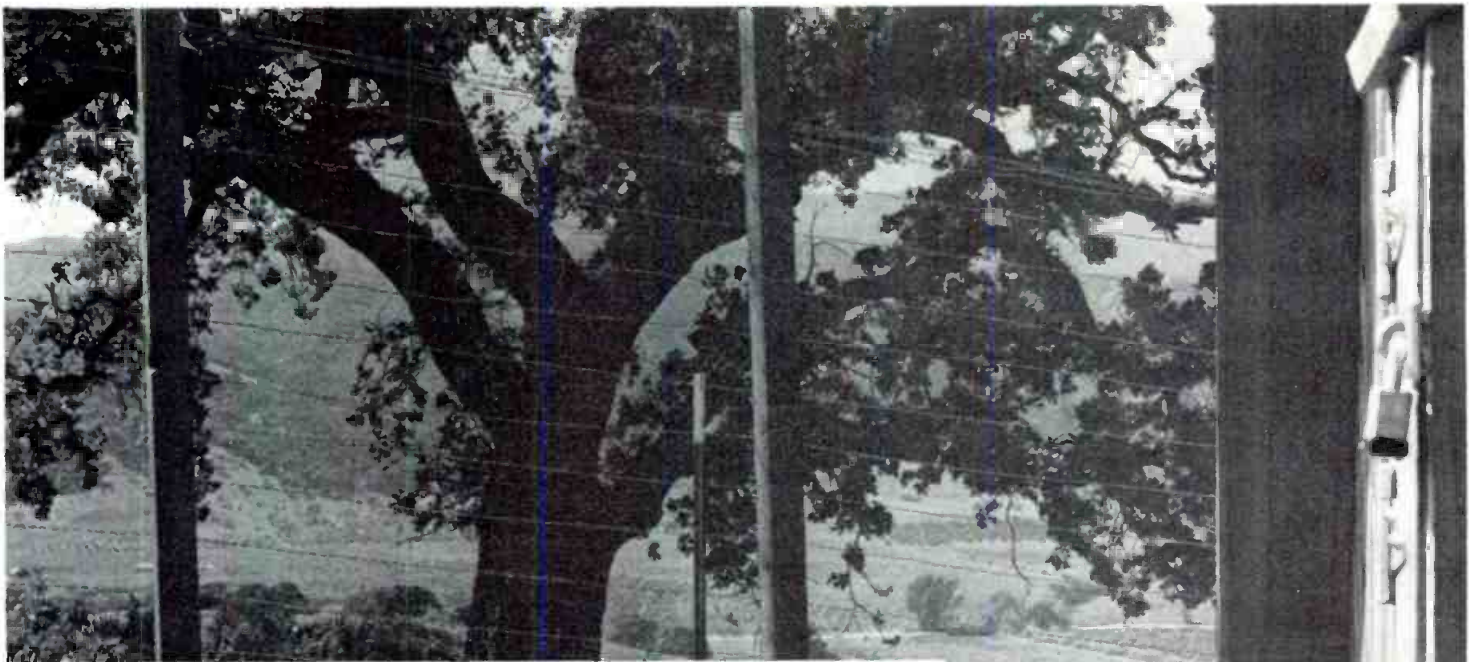
**TPT, Scientific-Atlanta,
To Show Satellite Link**

The TelePrompTer Corporation and Scientific-Atlanta, Inc., will join forces at the National Cable Television Association meet in Anaheim, California, June 17-20 to demonstrate, if the FCC approves, satellite distribution of program material to cable systems, according to announcements from both companies. The receive-only earth station to be used has been designed and built by Scientific-Atlanta; it is mounted on a trailer-truck and, following the Anaheim meet, will travel around the country for other similar tests and demonstrations. The Anaheim demo, according to the plan, will use the Canadian domestic satellite, ANIK-1, to relay signals from east-coast U. S. to the mobile earth station

continued on page 8



Canon k-35 Macrozoom lens wins Academy of Motion Picture Arts and Sciences Award Citation because of its ability to permit extreme close-up photography in addition to normal and extended zoom functions. Perspective control of foreground and background is possible. Posing at the award reception are Dr. Takeshi Mitaria, chairman of the board and president of Canon Inc. (center right), Keiichiro Ryu, exporter of the lens (center left), Wilton Holm, Motion Picture and Television Research Center (far right), and Ed DiGiulio, Cinema Products, U.S. distributor (far left).



BUSY BEAUTY SPOT FOR SPARTA

The sunny, oak-clad Vaca Hills surround this transmitter site, but there's nothing else sleepy about this bustling area between San Francisco and Sacramento. Within view of the Sparta 602A FM Transmitter lies Travis AFB, where our returning Vietnam POWs first touched their native soil. The Sierra Nevada brings heavy San Francisco Bay Area traffic to I-80, below, both summer and winter. This area is growing, and builder Don Reeves (left) is planning for the future.

Don has been associated with construction of ten stations in his nearly 30 years in radio, and was given the huge Broadcast Coordinator's job for the 1960 Winter Olympics. Consulting Engineer Cecil Lynch has worked with Don on many of those projects, including the mammoth Squaw Valley one.

Yes, these men know radio, and its future in busy Northern California. After five years exper-

Circle 103 on Reader Service Card

ience with Sparta equipment at KPOP-KPIP in Roseville, Don and Cecil picked Sparta again for this new venture ... complete Showcase studio outfitting and the 602A Transmitter with the all new 680 Exciter and 682 Stereo Generator.

To their listeners they're KUIC. To us they're Don and Cecil.

SPARTA, the 'just right' company. Small enough to be first name friends ... big enough to offer EVERYTHING. Call us. Collect.



SPARTA
ELECTRONIC CORPORATION

5851 Florin-Perkins Road, Sacramento, Ca. 95828
916 383-5353 TELEX 377-488 CABLE SPARTA
A DIVISION OF COMPUTER EQUIPMENT CORPORATION

Dear Gabby:

"How can a wife compete with a \$10,000 Video Tape Editing System featuring Jam-Sync?"



Datatron's Girl Gabby

DEAR GABBY: My husband returned from the NAB show singing the praises of a \$10,000 Video Tape Editing System which features something called 'Jam-Sync'. Since he seldom praises my homemade jams, or notices the hours I slave over the kitchen sink, I need help in winning him back.

frame! This saves hours of time, and head wear on expensive video recorders too.

But don't fret. Once your husband's Datatron Model 5050 is installed, he'll have more free time to sing the praises of your jams and jellies.

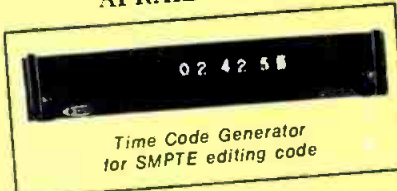
GABBY



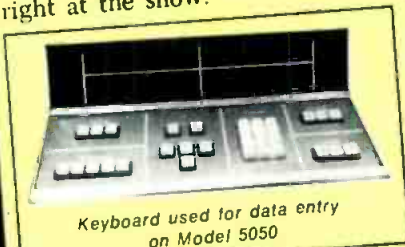
DEAR NEGLECTED: Many NAB visitors fell in love with Datatron's Model 5050 - a Video Tape Editing System with keyboard entry which works with helical or quadruplex VTRs, yet is priced at \$10,000, thousands under competition. In fact, a number of TV stations placed orders right at the show.

DEAR GABBY: How can Datatron sell a SMPTE edit code reader for \$1500 and a generator for \$1750 when competitive models go for over \$2500?

AFRAID OF BARGAINS



Time Code Generator for SMPTE editing code



Keyboard used for data entry on Model 5050

The jam-sync feature is important since it eliminates the need to pre-record the SMPTE time code on tapes for add-on editing from masters or live sources.

Instead, during pre-roll, the built-in time code generator is set & sync'd so that time picks up exactly where it left off - to the

DEAR AFRAID: Don't be afraid of these bargains. Datatron's edit code reader & generator are fallouts from their Video Tape Editing System project. The low prices reflect simple construction and dedicated design. Actually, they cost less than capstan revolution counters which aren't nearly as accurate.

GABBY



Send your questions - either straight or humorous - to Gabby. We'll mail a Flair pen for all received and pay \$100 if we use question in future ad.

datatron inc.

1562 Reynolds Ave / Santa Ana, Calif. 92711
(714) 540-9330

moving up fast in...



Microelectronic Testing

Timing Instrumentation

Shelly Indicators and Products

NEWS

tion. The station includes the electronics for processing and feeding the material into a cable system, as well as a 25-foot maneuverable dish antenna.

TPT Chairman R. P. Shafer said: "Early use of the domestic satellite system is essential to the cable industry's ability to realize . . . its great potential . . . satellite communications offer economic advantages over means presently available."

NCTA, NAB, TIO Ask For Strong Newsmen's Shield Law

In representations to Congress and in public addresses, industry leaders are supporting enactment of a "shield law" giving newsmen in all media an uncontested right to keep news sources confidential. David Foster, president of NCTA, urging enactment of such a law for cable newsmen as well as those in other media, said: "The real issue is ensuring that the existing constitutional protections encouraging free flow of information to the American public are upheld." The National Association of Broadcasters, in a filing with the House subcommittee considering the law, said it "strongly urges passage of unqualified newsmen's privilege legislation." NAB said it knows of no cases in which newsmen impeded justice by withholding information. Rather the opposite has been true; newsmen, able to protect sources, help ferret out crime. Roy Danish, director of the Television Information Office, in a speech marking the 20th anniversary of KOLN-TV in Lincoln, Nebraska, predicted that, unless a shield law is passed, "we will see much less of investigative reporting . . . the news will, more and more . . . be a warmed-over hash of the government releases on the other."

TV Advertising Hit A \$4 Billion Record in 1972

Advertisers paid the television industry \$4,110,000,000 in 1972, an all-time record, according to Television Advertising Bureau, summarizing figures released by McCann-Erickson. That was 14% over 1971's \$3,590,000,000, and the first year the total topped \$4 billion. Every segment of television was up: network by 12%, spot TV by 14%, and local TV by 20%. Most other major advertising media were also

continued on page 10

Circle 104 on Reader Service Card

You may not know us . . .



but you do know them!

Bartell Broadcasting • Metromedia

McLendon Broadcasting • Sparks Broadcasting

WXON-TV Detroit • WWJ-FM Detroit

These well known broadcasters have reputations to maintain . . . reputations built on solid service. They can't afford second best when it comes to engineering. That's why they've turned to ASI for the kind of engineering excellence they demand . . . an excellence born of our commitment to the broadcast industry in seeking new, imaginative and effective approaches to its problems. ASI is unique in that it was founded by a group of people like you . . . people who are broadcasters themselves . . . people who are conversant with the problems you face every day. That's why ASI takes the total approach when it comes to the design of its products and services. Whether it's one of our standard units, or a custom designed system, all ASI products have been created with both the engineer and the programmer in mind.

No product is added to our line unless and until we are convinced of its operational ease as well as its technical excellence. Our engineers speak the programmer's language too. So you won't get a lot of double talk . . . what you will get is straight answers. This philosophy has led us to some rather unique solutions to some pretty perplexing problems . . . So is it really important that you may not know who we are? You know our clients and now you know our philosophy which, if you stop to think about it, probably parallels your own ideas about what a company like ours should be. When you get right down to it, you've known us all along. Now we'd like the privilege of knowing you. Call us in Detroit at (313) 353-7555 and get a company of broadcasters to solve your problem.

- **Equipment Design**
- **Custom Systems**
- **Installation and Maintenance**



26935 W. ELEVEN MILE • SOUTHFIELD, MICHIGAN 48076
(313) 353-7555

Circle 105 on Reader Service Card

At **DSC**® we would like to sell you test slides ... but we can't!

It's against "Company Policy"

"Company Policy" states that the accuracy and integrity of DSC test materials must be beyond question—that DSC slides incorporate current industry standards—that DSC slides only be distributed on a lease basis and that they be analysed regularly and substandard slides removed from circulation.

When you think about it, our "Company Policy" is in your company's interest.

- Simple display for fast efficient line up
- Dye images of telecine slides have similar spectral characteristics to programming materials
- Economical – supplied on lease basis
- Free replacement – broken or damaged slides replaced at no cost.



When in Toronto, visit our new Laboratory by the International Airport.

For more information, please contact

DSC Test Slides,
D and S Corley Limited,
80 Galaxy Boulevard, Unit 3,
Rexdale, Ontario, Canada, M9W 4Y8
416-678-0511

Circle 106 on Reader Service Card

Fidelipac® Automatic 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®

3 Olney Avenue • Cherry Hill, New Jersey 08034 • (609) 424-1234
Fidelipac is a registered trademark of TelePro Industries Incorporated

Circle 107 on Reader Service Card

NEWS

higher in 1972, with newspapers up 11%; business papers, 7%; radio, 6%; magazines, 6%—but none topped television's 14% increase.

Armstrong Awards Go To Eight FM Stations

The annual Armstrong Awards for excellence and originality in FM broadcasting, presented March 24 at the National Association of FM Broadcasters Convention in Washington, divided \$4000 in prize money among eight FM stations. In the commercial division the winners were: WFMT, Chicago, for "The Studs Terkel Program;" KHQ-FM, Spokane, for "An American Youth Culture;" KSAN, San Francisco, for "Fillmore Weekend;" and WBCN, Boston, for "The Election: Nixon 49, America 1."

Non-commercial winners were: WMUK, Western Michigan University for "Abortion Special;" CBL-FM, Toronto, for "The Oceans;" WITF-FM, Hershey, Pa., for "RVW—A Musical Biography;" and WBUR, Boston University, for "Kids Talk," a series.

ABC Buys Four RCA Video Cart Machines

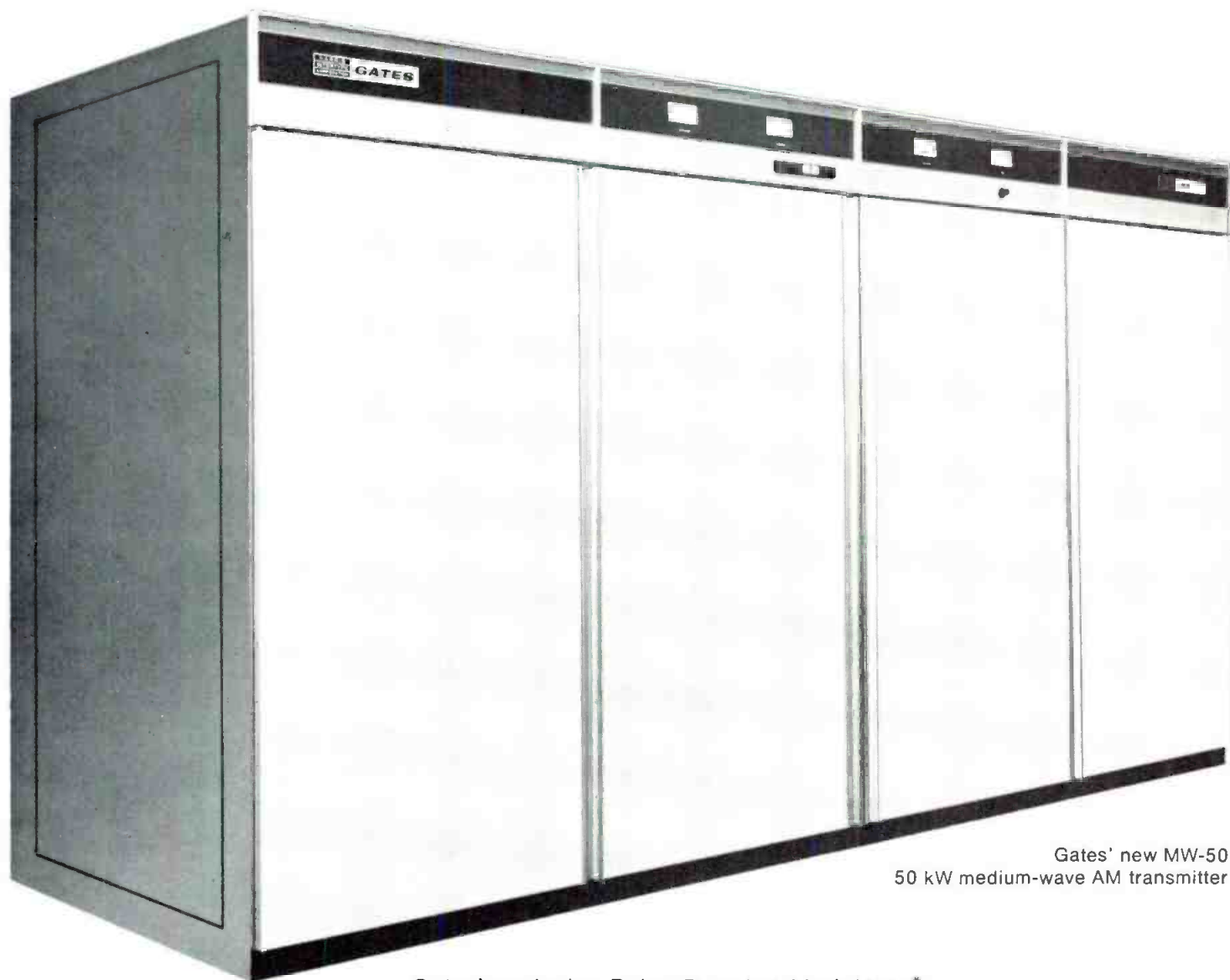
RCA announced that the American Broadcasting Company has signed up for four of the RCA TCR-100 automatic video cartridge systems, an order totaling approximately \$900,000. Two of the machines are for WABC-TV, New York, and one each for WLS-TV, Chicago, and WXYZ-TV, Detroit. RCA also said that shipments of the TCR-100 reached 100 units early in the spring.

CBS Prexy Taylor Hails Radio's "Genius For Change"

Radio has "... a really irrepresible capacity to adjust to new circumstances, new interests, new conditions," said Arthur R. Taylor, president of the Columbia Broadcasting System, in an address at a New York meeting at which station KCBS, veteran San Francisco broadcaster, got the Mike Award of the Broadcast Pioneers group. "Today radio is still the most ubiquitous and the most immediate of media. . . more news and discussion programs . . . more community service . . . and a healthy pluralism . . . It has

continued on page 13

We threw away the 50 kW modulation transformer and reactor... With PDM*, who needs them!



Gates' new MW-50
50 kW medium-wave AM transmitter

Gates' exclusive Pulse Duration Modulator* System is 90% efficient. That's why Gates' new MW-50, 50 kW medium-wave transmitter operates at greater than 60% overall efficiency. With greater reliability, greater frequency response, and lower power consumption than any other AM broadcast transmitter in the same power range.

There are other reasons why the MW-50 is superior. Like the use of only 5 tubes (in just 3 tube types) in the entire transmitter. And 130% positive modulation capability.

If you'd like to hear the whole story of the MW-50, write Gates Division, Harris-Intertype Corporation, Quincy, Illinois 62301.

HARRIS
 **GATES DIVISION**
Quincy, Illinois 62301, U.S.A.

Circle 108 on Reader Service Card

With our mono recorder you get the low end of our line. Not the short end of the stick.

If you've heard our 24-track recorder, you've heard our mono, two and four track units—they're like peas in a pod.



Because while our new low end Series 79 mono, two and four track Professional Audio Recorders are priced like the competition, they're built like our high end eight, sixteen and twenty-four track machines.

You get the same IsoLoop® differential drive transport, with its extremely low flutter and wow, automatic tape tensioning and easier editing.

The same electronics, with built-in overdub, three selectable speeds and state-of-the-art signal-to-noise ratios and frequency response.

The same dc servo capstan with external input to enable the use of synchronization and resolving equipment.

Even the same convenient, high-performance options: A synchronizer/reader for instant sound sync. Selectake® for automatic tape positioning. Remote transport

controls. A 5 to 45 ips variable speed control. And an update kit for adding more tracks to the mono or two track units.

At their new prices, the 3M Series 79 mono, two and four track recorders are more than competitive for mastering, mixdown, editing or station automation. We don't give you less machine when what you want is fewer tracks.

For the full price and performance story, contact one of the listed dealers or Professional Audio Products, 3M Company,



300 S. Lewis Rd., Camarillo, CA 93010. Ph: (805) 482-1911. TWX: 910-336-1676.

**We've been there.
And brought the answers back.**

3M
COMPANY

Circle 109 on Reader Service Card

Give a listen at any
of these 3M dealers:

Dealers:

- Accurate Sound Corporation
2702 National Circle Road
Garland, Texas 75041
- Aengus Engineering, Inc.
50 Oak Hill Road
Fayville, Mass. 01745
- Audio Designs & Mfg. Inc.
16005 Sturgeon
Roseville, Mich. 48066
- Audio Recorders of Arizona
3830 No. 7th St.
Phoenix, Arizona 85014
- Automated Processes, Inc.
80 Marcus Drive
Melville, N.Y. 11746
- Fidelity Sound Company, Inc.
GSA Dealer
1200 18th St., N.W., Suite 105
Washington, D.C. 20036
- Gill Custom House, Inc.
8813 W. 95th St.
Palos Hills, Illinois 60465
- High Fidelity Showroom
6383 Clayton Road
Clayton, Missouri 63105
- Houston Electronics
5709 Savoy Lane
Houston, Texas 77036
- Jackson Sound Productions, Ltd.
1403 So. Lipan
Denver, Colorado 80223
- Martin Audio
320 W. 46th St.
New York, N.Y. 10036
- The Maze Corporation
1900 First Ave. No.
Irondale, Birmingham, Ala. 35210
- Milam Audio Corp.
700 West Main St.
South Pekin, Ill. 61564
- Pams, Inc.
4141 Office Parkway
Dallas, Texas 75204
- Sound Specialties
2009 Naudain St.
Philadelphia, Pa. 19146
- Westlake Audio, Inc.
6311 Wilshire Blvd.
Los Angeles, Calif. 90048

Sales Offices:

- 3M Company
P.O. Box 76
West Caldwell, New Jersey
- 3M Company
P.O. Box 28158
Dallas, Texas
- 3M Company
220 E. 21st Street
Chicago, Illinois

International Sales Offices:

- Sumitomo 3M Ltd.
3M Building 1-21 Akasaka 7
Chome Minatoku
Tokyo, Japan
- 3M Canada Ltd.
Mincom Products
P.O. Box 5757 Terminal "A"
London, Ontario, Canada
- 3M U.K. Ltd.
3M House
Wigmore Street
London W1A 1ET England
- Mincom Products, Sales and Service
410 Taunton Road
Greenford, Middlesex, England
- 3M France
135 Boulevard Serurier
75019 Paris, France

NEWS

been the genius of radio to recognize quickly the need to change and when to change."

News Briefs

Cox Broadcasting—For the year ended December 31, 1972, record revenues of \$77,281,437 and earnings of \$10,101,587—the latter up 24% from 1971 . . . **Zenith Radio Corporation**—Sales for 1972 were a record \$796 million, 30% over 1971, and earnings also a record at \$48.6 million, up 55% from 1971. . . **San Juan Racing Association**—For the third quarter ended January 31, 1973, revenues of \$5.4 million and earnings of \$914,000, including both broadcast and racing operations . . . **CCA Electronics Corporation**—For the year 1972, sales \$5.8 million, earnings \$610,000, against \$5.4 million and \$661,000 in 1971. . . **Gulf and Western Industries**—For six months ended January 31, 1973, record sales of \$893 million and earnings of \$42.2 million, the latter up from \$33.2 million a year earlier.

Telcom, Inc.—For six months ended December 31, 1972, revenues of \$3.3 million and earnings of \$90,104, up from \$2.6 million and \$75,575 a year earlier . . . **Fairchild Industries**—For year ending December 31, 1972, sales of \$229,986,045, and earnings \$6,187,112 . . . **Theta-Com** announced agreement to supply KCA Cable TV Industries, Puerto Rico, with bill of materials covering about 1000 miles of cable plant . . . **RCA** will build for the U.S. Air Force an airborne TV system that can freeze individual frames, provide data for instantaneous inflight analysis . . . **Ampex Corporation** sold to WCKT, NBC affiliate in Miami, two AVR-1 VTRs and two ACR-25 video cassette systems.

Broadcast Products reported installation of their AR-2000 automation system by WMAL-FM, Washington, and WVIA-FM, Scranton . . . **C-Cor Electronics** moved executive and research functions to greatly expanded facilities, totaling 10,000 square feet, in Science Park, State College, Pa. . . **Times Wire and Cable Company** announced building of two new manufacturing plants, one of about 100,000 square feet in Meriden, Connecticut, and one a 40,000-square-foot addition to their Phoenix facility.

Century Strand, Inc. has moved headquarters to an expanded plant continued on page 14

Get
a better
Bang
for
your buck!

Colortran.
Pro-kit IV



a
complete
light kit
for
\$398.

Berkey Colortran Berkey Photo Inc.
1015 Chestnut St. Burbank, Ca. 91502 • 213 843-1200

Circle 110 on Reader Service Card

NEWS

at 5432 West 102nd St., Los Angeles . . . **Net Television, Inc.** reported a plant production record for one week with duplication of 611 hours of TV programming.

People

William H. Willis joined Jerrold Electronics Corp. as MSO account executive . . . **Dean A. Bussart** was named general manager of Gulton Industries (Canada) and its subsidiary, EV of Canada . . . **Brian Wills** became manager of Cetec's new European branch, with headquarters at High Wycombe, near London.

James M. Rupp will become vice president and general manager of Cox Broadcasting Corporation's

broadcast division, on the retirement of **Frank Gaither**, June 30th . . . **William Siemering** was appointed station manager of public radio station KOCM-FM in Moorhead, Minnesota . . . **Jack L. Williams** became vice president in charge of programming for Television Communications Corporation.

Michael D. Barnett was advanced to vice chairman, and **Robert B. Pfannkuch** to president, of Primary Medical Communications, Inc. . . . **Ed Aiken** went from his job as program director, WNEM-TV, Saginaw, to be program manager at KPHO-TV, Phoenix; both are Meredith stations . . . **Frederick P. Cahill** has joined Warner Communications, Inc. as manager of special projects.

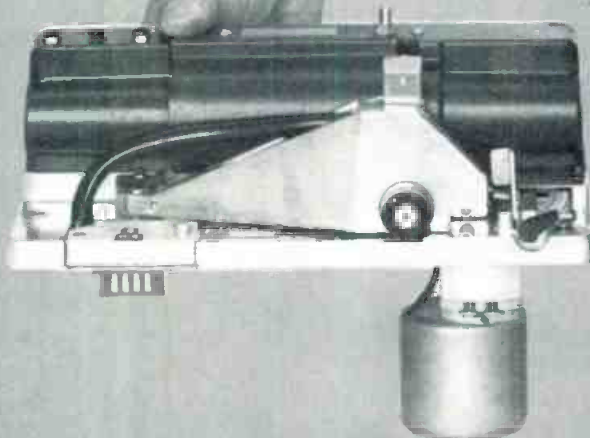
David Freese, formerly director of engineering for Watermark, Inc.,

has joined Audio Industries Corporation . . . **Jack D. Cox** became manager of Suburban Cablevision, Inc. at Morganton, North Carolina . . . **Robert E. Dod** will move up to general manager of the Alabama Educational Television Network, on the retirement April 1st of **Raymond Hurlbert**.

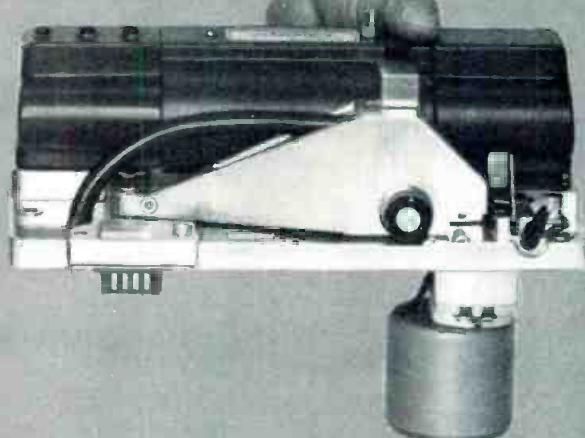
R. Wayne Wilson was appointed regional community development director for TelePrompTer, for the Northwest region, with headquarters at Bellevue, Washington . . .

Edward J. Kuhlmann, formerly general counsel of the Cable Television Information Center, became a member of the law firm of Renouf, McKenna and Polivy, in Washington . . . **Lary L. Lindsey** is the new national sales manager for duplicator products of Consolidated Video Systems.

The choice is yours



**Ampex-rebuilt
VTR quad head.
Good as new.
125 hour warranty.
\$810.00**



**Videomax-rebuilt
VTR quad head.
Better than new.
150 hour warranty.
\$750.00**

Compare and you'll choose Videomax for Mark III and Mark X head rebuilding. A *Certified* Videomax-rebuilt head will actually perform better than when you bought it — on your recorders, by your own standards. That's why networks, independent stations, and major teleproduction facilities are now using Videomax. And as an extra bonus, you get the extended warranty and lower price.

Write or phone (collect) today for details about our NO-RISK trial offer.

videomax™

Corporation—subsidiary of ORROX Corporation.

154 San Lázaro Avenue

Sunnyvale, California 94086

Phone: (408) 739-5391 Telex: 346-459

Canada: Glentronix, Ltd., Toronto

South/Central America: Telemation International/TeleMerica, Inc.

Circle 111 on Reader Service Card

A GREAT NEW VIDEO PACKAGING PACKAGE THE VPM-41

FROM

RICHMOND HILL LABORATORIES

— THE LATEST IN THE VPM
SERIES . . . MODEL VPM-41
PORTABLE VIDEO
PRODUCTION SWITCHER.



- Color Capable
- 12 Effects
- 9 Inputs + Black
- Self-contained, including power supply
- All electronics integrated

The Model VPM-41 Video Production Switcher offers all of the most wanted features and options, packaged in a smart, functional, rugged case. RHL tops this all off with the high reliability of MICRO SWITCH totally solid state video switches from Honeywell.

This entire switcher package is backed by the Full Three Year RHL Warranty and is available at a very attractive price.

BE SURE. BUY RELIABILITY. SPECIFY. . .



RICHMOND HILL LABORATORIES INC.

142 Central Avenue,
Clark, New Jersey — 07066

EASTERN U.S.
142 Central Ave.
Clark, N. J. 07066
(201) 381-5955
Telex: 138245

MIDWEST U.S.
370 Nottingham Lane.
Hoffman Estates,
Ill. 60172
(312) 882-4622

CANADA
1240 Ellesmere Rd.
Scarborough, Ont.
M1P 2X4
(416) 291-7921
Telex: 02-29803

ENGLAND
Pinewood Studios
Pinewood Rd.,
Iver, Bucks.
SLO ONH
Telex 847505

U.S.A. DISTRIBUTORS
Telemation Inc.
P.O. Box 15068
Salt Lake City
Utah 8419

Circle 112 on Reader Service Card

The New CP-16/A (with Crystasound)

RADIO 970

POST OFFICE BOX 1000

WAVE

LOUISVILLE, KENTUCKY 40201

TV CHANNEL 3

(502) 585-2201

October 6, 1972

Mr. Norman L. Bleicher
Operations Manager
Victor Duncan, Inc.
11043 Gratiot Avenue
Detroit, Michigan 48213

Dear Norm:

Thank you for your letter of September 13, 1972.

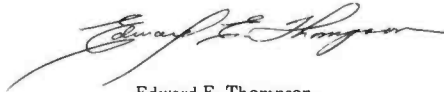
You mention four areas for information relative to news work, using the CP-16/A, and they are as follows:

1. I feel that the CP-16/A is the best news camera on the market today. All of our news reporters feel the same way. It is extremely portable and we are able to shoot pictures much as we do with our Bell & Howell or Bolex cameras.
I have designed a small "U" shoulder pod of aluminum, padded with rubber, for use with the camera. The light weight of the camera, "U" pod and magazine make for quick and easy shooting, with comfort and ease for the cameraman as well.
2. As to use under adverse conditions, the camera has performed very well in inclement weather and I see no reason why it should not be the same in the winter as in the summer.
3. Service has been the best. Both you and Cinema Products Corporation have been in close touch with us and we are very pleased with the quick service we are getting.
4. News of Interest: In addition to the shoulder pod, I have installed a Sennheiser MKH-815 shotgun microphone, with a shock-proof mount, on top of the CP-16/A camera. The camera is so quiet that the 815 mike does not pick up any camera noise. With no cables and no power pack to get in the way or restrict your movement, the cameraman can really move in and around, getting the right position to get the best picture. He becomes a part of it all.

The enclosed photographs may be of some help to explain the "U" pod and the shotgun mike. The cameraman is Larry Sales, a reporter here at WAVE News. The other guy holding the camera and mike happens to be me.

In summing up, I am happy to say that we are very pleased with our two CP-16/A cameras (even the price) and I am looking forward to getting another in the very near future.

Sincerely yours,



Edward E. Thompson
Newsfilm Director
WAVE-TV

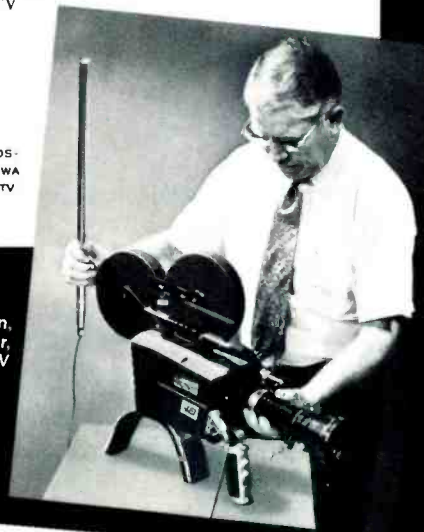
EET:jk
Enclosures



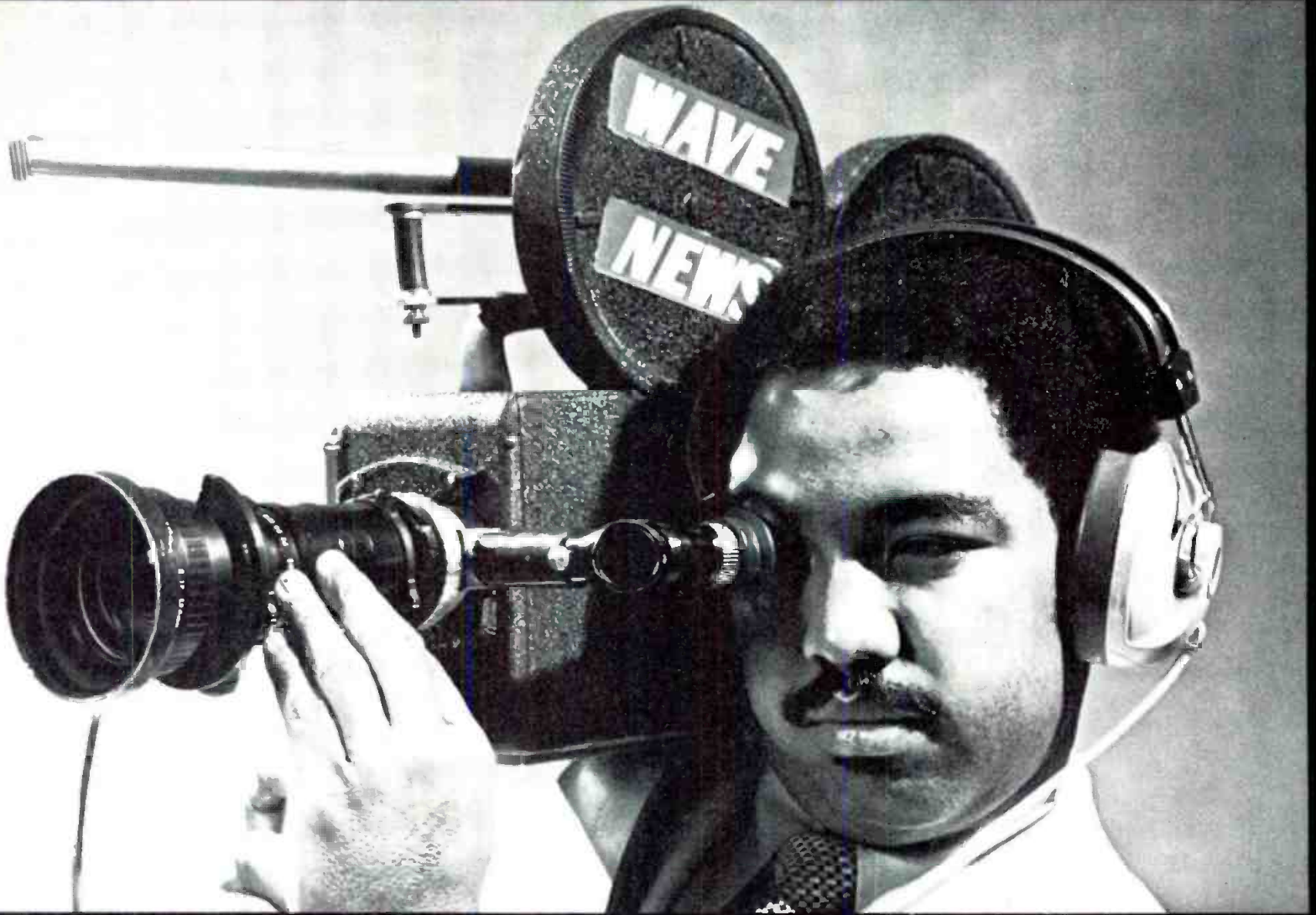
BROADCASTING, INC.

LOUISVILLE, KENTUCKY	EVANSVILLE, INDIANA	GREEN BAY, WISCONSIN	ESCANABA, MICHIGAN	CEDAR RAPIDS- WATERLOO, IOWA
WAVE-AM-TV	WFIE-TV	WFRV-TV	WJMN-TV	WMT-AM-FM-TV

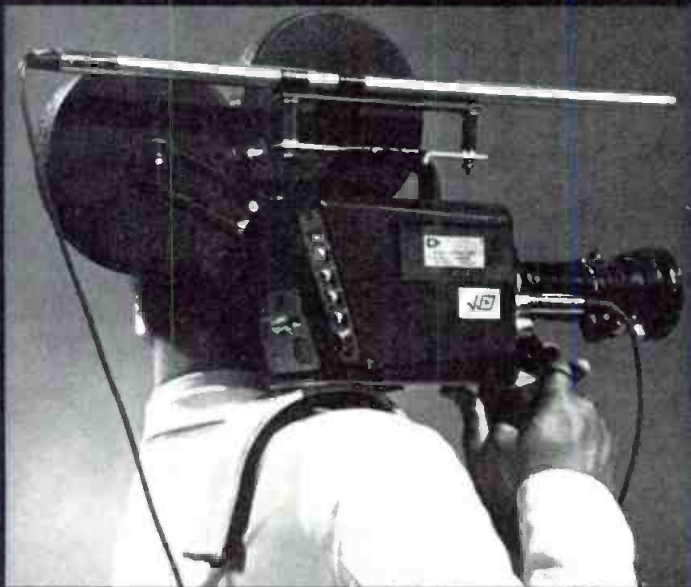
Mr. Edward E. Thompson,
Newsfilm Director,
WAVE-TV



A Cameraman's Kind of Camera.



Mr. Larry Sales, TV-Newsfilm Cameraman, WAVE-TV



To arrange for a demonstration of the all new CP-16/A (with Crystasound recording system) or CP-16 cameras, contact your local professional sales/rental dealer.



CP-16



CP-16/A

For further information, please write to:

cinema E products
CORPORATION

Technology In The Service Of Creativity

2044 Cotner Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 ■ Telex: 69-1339 ■ Cable: Cinedevco

Circle 113 on Reader Service Card

www.americanradiohistory.com

INTERPRETING THE **FCC** RULES & REGULATIONS

TV/Cable Cross-Ownership

In a lengthy "Opinion and Order," reconsidering its *Second Report and Order in Docket No. 18397* (released June 24, 1970), the Commission reaffirmed its intention to actively effect the provisions of Section 76.501 of its February 1972 Rules prohibiting broadcast-cable cross-relationships. In effect, these provisions do two things. First, they prohibit *ownership, operation, control, or interest* of a cable television system with 1) a national broadcast television network; 2) a co-located television broadcast station; or 3) a co-located translator station. Second, they require divestiture of such prohibited cross-relationships by a date certain.

Specifically, Section 76.501 reads as follows:

(a) No cable television system (including all parties under common control) shall carry the signal of any television broadcast station if such system directly or indirectly owns, operates, controls, or has an interest in: 1) A national television network (such as ABC, CBS, or NBC); or 2) A television broadcast station whose predicted Grade B contour computed in accordance with Section 73.684 of this chapter, overlaps in whole or in part the service area of such system (i.e., the area within which the system is serving subscribers); or 3) A television translator station licensed to the community of such system.

b) The provisions of paragraph (a) of this Section are not effective until August 10, 1973, as to ownership interests proscribed herein if such interests were in existence on or before July 1, 1970 (e.g., if a franchise was in existence on or before July 1, 1970): *Provided*, however, that the provisions of (a) of this Section are effective on August 10, 1970, as to such interests acquired after July 1, 1970.

Responding to Petitions and informal requests for reconsideration of Section 76.501 of its *Second Report* by some 25 broadcast interests, the Commission divided its discussion of such pleadings into two parts. First, it challenged and refuted contentions by TV interests that *subsequent acquisitions* of cable interests should be allowed. Second, it appeared to be more responsive to claims by TV interests that their *currently-owned* CATV interests should not be subject to mandatory divestiture.

Subsequent Acquisition of Cable Interests

The Commission appears to be taking a hard line against subsequent acquisition of CATV interests by the networks, co-located TV stations, and co-located translator stations. Premised in its belief that diversification of control of the channels of mass communication is manifestly in the public interest, the Commission asserted that its cross-ownership Rules should continue in force. Citing *Television Factbook* (1972-1973 Edition, p. 75-A), it found that broadcasters held ownership interests in some 37.9% of the country's 2839 cable systems as of March 30, 1972, and seeks to arrest this growth. In effect, the Commission is working to avert the problem it heretofore incurred in its treatment of cross-ownership issues re: 1) radio/television/national broadcast networks, and 2) newspapers/broadcast stations in the same communities and market areas. The Commission appears determined not to let history repeat itself. It posits its strong posture against further cross-relationships on the premise that, although temporary exceptions are occasionally warranted, cross-media control is *generally undesirable*. Based upon the past history of other media, it feels that the trend is, and will continue to be, inexorably towards cross-media control of cable television. As such, the Commission feels that the time to halt this trend is *now*, lest TV interests become entrenched with cable ownership and operations to the point that cross-media control would become irreversible.

Moreover, the Commission refuted contentions by TV interests that, in terms of services and financial assistance, TV stations could greatly assist in the development of CATV. In particular, it came down hard on what could well develop as an incestuous relationship between co-located cable systems and television stations. The Commission feels that the implementation of cable's vital services—"to carry

continued on page 20

for consistent colorimetry



Why all the splash about this newest feature of COHU's Model 1500 Color Film Camera? Instant Black Paint is the broadcast engineer's indispensable assurance for consistent video excellence and that's a resource of quality worth recommending. When film or source colorimetry requires refinement, COHU Black Paint allows the option of fingertip accessibility to program temporary adjustments. Convenience is the key and preset color balance is restored for normal operation by only the touch of a button.

The Model 1500 is already recognized as a popular standard for reliability and color fidelity. The addition of Black Paint is COHU's way of delivering to you the best in broadcast performance at no increase in price. You expect more from COHU, and you get it.

For further information, contact your local COHU Sales Engineer or COHU, Inc., Electronics Division, P. O. Box 623, San Diego, Calif. 92112. Phone 714-277-6700. TWX 910-335-1244.

COHU
INC
ELECTRONICS DIVISION
SAN DIEGO CALIFORNIA

Circle 114 on Reader Service Card

Serious about support equipment? Get involved with VINTEN, the complete line available only from LISTEC.



NEW for '73—Mark V Light-weight Cam Head, Capacity 175 lbs. Every feature for superior performance.

NEW and improved Mark IIIA Heavy Duty Cam Head now available with external drag controls.



Versatile Tripod/Dolly combination Type 718/719. Lightweight but sturdy, capacity 200 lbs.



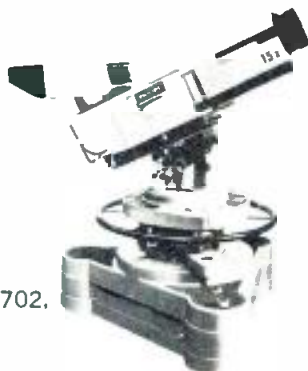
Air counterbalanced Dolly Pedestal Type 729 for studios or remotes. Weighs only 100 lbs. assembled, capacity 285 lbs.



Low Angle Dolly Type 723 for those "impossible" shots. Counterbalanced arm has range 4½" – 25½", capacity 350 lbs.



Exceptional low-level Studio Pedestal Type 702, range 21" – 58½", capacity 350 lbs.



Listec Television Equipment Corporation

35 Cain Drive, Plainview, New York—11803
tel: (516) 694-8963, 8973 & 8976

FCC Rules & Regs

or not carry certain distant stations, to offer program origination or not, to move speedily or at the slowest pace permitted to develop access channel facilities and encourage their use"—all could affect the audience and earnings of co-located television stations. Also, it is not convinced that financial investment by co-located stations is either necessary or beneficial for the development of cable. In brief, the Commission sees the growth of cable systems, in both size and services, to more likely be inhibited than enhanced via common control with co-located television stations.

The Commission also refused to exempt UHF television stations and ETVs from the general applicability of Section 76.501. Regarding UHF's, the Commission stated that its sole basis for relaxing the cross-ownership ban rests on the *contribution* that broadcasters could make to the development of cable in their service areas. As such, it felt that a Rule which would permit the class of TV stations with the *least* to contribute to such development, but which would preclude entry by those TV licensees with the *most* to contribute, would confer an undue competitive advantage to the "Us" over the "Vs." In addition, the contention by certain struggling UHF stations that cable ownership would buoy them financially is chimerical. With the great financial unknowns in the development of major-market CATV cable ownership may well become a drain, rather than a source, of funds for UHF services. The Commission states that, if the UHF station enjoys the resources to contribute to the development of cable services, it, therefore, should be accorded no preferential treatment over VHF stations of similar financial standing.

Neither does the Commission see any reason for deleting the present ETV-cable local-cross-ownership ban of Section 76.501. It regards the contention by ETV interests that cross-owners could coordinate the programming activities of the ETV station and the cable system to be specious. For justification, it cites the same "service" arguments it utilizes in its cable/local commercial television cross-ownership statement. It also appears to feel that like UHF's, ETVs entering cable ownership would be taking grave financial risks that could adversely affect their current operations.

In sum, the Commission is standing firmly behind its cable/TV cross-ownership provisions in Section 76.501. It reaffirms the basic precepts of same and appears particularly adamant upon arresting any *further* acquisition of CATV properties by TV interests.

Mandatory Divestiture of CATV Interests

The Commission is clearly less adamant in rigidly enforcing its requirement of mandatory divestiture (see Section 76.501 (b)) of existing cross-relationships than it is in enforcing its Rules prohibiting the subsequent creation of such cross-relationships. Indeed, it cites *Timken Roller Bearing Company v. U.S.*, (341 U.S. 593, 603 (1951)), which states:

Divestiture . . . is not to be used . . . where other effective remedies, less harsh, are available.

continued on page 22

You can save a big piece of your bleach costs and a small piece of our environment



with the **Hunt Cine Color Bleach Regeneration System.**

Would you believe over a 20% saving on bleach costs? You should, because Hunt has developed the unique, low-cost Hunt Cine Color Bleach Regeneration System. It's reliable, easy to use and completely free of complicated procedures.

The system is based on reuse of your Hunt Cine Color Bleach overflow. By restoring the active bleaching agent. And that means your need for "new" bleach is drastically reduced.

Pollution abatement is another valuable benefit you get from the exclusive Hunt Regeneration System.

Professional laboratories and TV news departments will probably find that the most satisfying part of the Hunt System is its simplicity. All you need is a collection tank for the bleach overflow, the Hunt Cine Color Bleach Test Kit and Bleach Regeneration Chemistry.

This "uncomplicated," low-cost bleach regeneration system is only one reason why you should join the ranks of professionals using Hunt Cine Color Chemistry for processing Ektachrome films.

If you want to do something about lowering your bleach costs, and saving a piece of the environment, you should call a Hunt branch or sales office.

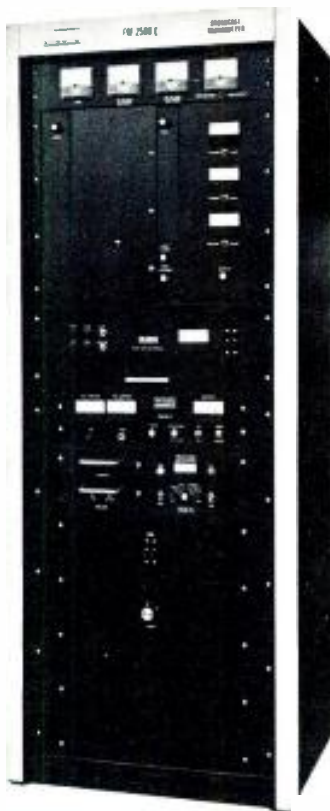


Imaging Specialists in Photographic and Platemaking and Reprographic Chemical Systems
PHILIP A. HUNT CHEMICAL CORPORATION
PALISADES PARK, NEW JERSEY • PHILIP A. HUNT COMPANY (CANADA) LTD., TORONTO

Circle 116 on Reader Service Card
www.americanradiohistory.com

WORLD'S BEST 2.5 KW FM TRANSMITTER USING ONLY ONE TUBE

- USES (1) 5CX1500
- SOLID STATE EXCITER
- SOLID STATE IPA
- SOLID STATE SUPPLIES
- SOLID STATE CONTROL
- FM NOISE, -65 db
- ¼ db, 30 H -35 KHz
- VAC.CAP. TUNING
- VAC CAP. LOADING
- NO SLIDING CONTACTS
- NO NEUTRALIZATION
- 2750 WATTS AVAILABLE
- NEEDS ONLY 5¼ sq. ft.
- COMPLETELY ACCESSIBLE
- FCC TYPE-ACCEPTED



ONLY THE WILKINSON FM-2500E HAS ALL THESE FEATURES YET IS PRICED LESS THAN \$9,000.00.

WILKINSON ELECTRONICS, INC.

1937 MacDADE BOULEVARD
WOODLYN, PA. 19094
TELEPHONE (215) 874-5236 874-5237
Circle 117 on Reader Service Card

FCC Rules & Regs

It also cites Section 76.251 of the February 1972 Cable Rules (*Cable Television Report and Order in Docket No. 18397*, 36 FCC 2d 143), which requires all major-market cable television systems to provide, by March 31, 1977, 1) public access; 2) education access; 3) local government access; and 4) leased access non-broadcast channels on a non-discriminatory, no-control-over-content basis. Said the Commission:

Although this recent development is not sufficient to alter our basic view regarding the provisions of Section 76.501, it does suggest that there may be several more station-system local-cross-ownership situations than we had previously anticipated in which the balance of relevant considerations now weighs in favor of a waiver of the mandatory-divestiture requirement.

Consistently, it invited petitions for waiver of the mandatory-divestiture requirement (fully supported by pertinent facts, views, arguments, and data) from all cross-owners et al of co-located television stations and cable systems that believe "grandfathering" would be appropriate in their case. The final date for filing of said petitions is June 1, 1973. In effect, the Commission is seeking information upon which it can formulate a "rational and consistent" policy for issuance of such waivers. Although it did not specify the grounds for waiver which it would find acceptable, the Commission did state that a finding which would both 1) serve the underlying objectives of Section 76.501, and 2) avoid unnecessary hardship upon the TV interests would be sufficient to warrant waiver.

More specifically, the Commission indicated the relevant criteria which it would consider in justifying a waiver. They include:

- 1) The extent of financial loss the cross-owner would suffer as a result of mandatory divestiture; 2) The impact of the station/system cross-relationship upon economic competition of media in the service areas of the station and systems in question; 3) The impact of such cross-relationships upon diversity of control of media of expression in the service areas in question; 4) The quality of service which the system has been providing (regarding broadcast signal carriage, local origination programming, technical quality and reliability of the system, etc.), and the extent to which such system has been enhanced or impaired, by the cross-relationship.

The Commission asserts that these criteria are merely illustrative, not exhaustive, of relative criteria it will consider. Note: Where a waiver of the mandatory-divestiture requirement is granted, the petitioner's interests in the affected television station and cable television system may not subsequently be transferred to a new holder without prior Commission approval.

Perhaps most importantly in this "reconsideration," the Commission has *extended* the grace period for divestiture of prohibited cross-ownerships, et al, from August 10, 1973 until *August 10, 1975*.

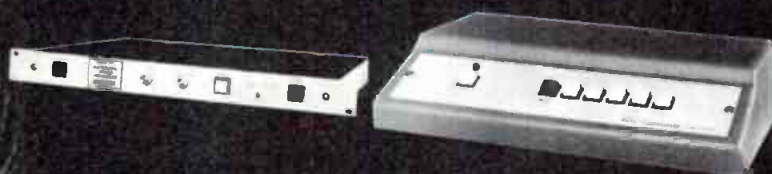
Clearly, the Commission, in reconsidering its *Second Report and Order in Docket No. 18397*, is taking a firm stance against future development of TV/cable cross-relationships. Yet, in doing so, it indicates a certain relaxation in its treatment of the mandatory-divestiture requirement of such existing cross-relationships.

BM/E



Yesterday's Prophet and today's Profits

DYNASCIENCES
"PROFIT PROPHET" PREDICTS
THE YEAR OF THE
NEW AUTOMATICS



Michaelangelo's "MOSES" - CA. 1513 - 1515, S. Pietro in Vincoli, Rome

Automatic Image Enhancer Model 875

DEFINITELY NOT A PRODUCT OF THE PAST . . . Automatically maintains picture sharpness . . . comb filter . . . coring . . . threshold control on front panel permits adjustment of amount of pre-enhancement required to inhibit local signal enhancement . . . may be used as Automatic or Standard.

Auto-Controller Model 1100

PROFITS! . . . An adjunct to Dynasciences Editor-Programmer . . . minimize and simplify the repetitive operations involved in tape-to-tape editing . . . save time . . . reduce operator errors . . . permits tape editor to focus attention on the critical selection and refinement of the edit point locations . . . augments centralized remote control of recorder and playback VTR's, automatic rewind to pre-roll position on both machines, remote control of tone pulse recording, and automatic preview of edit points.

IF . . . you would like to know more about how our "Profit Prophet" can help you, write:

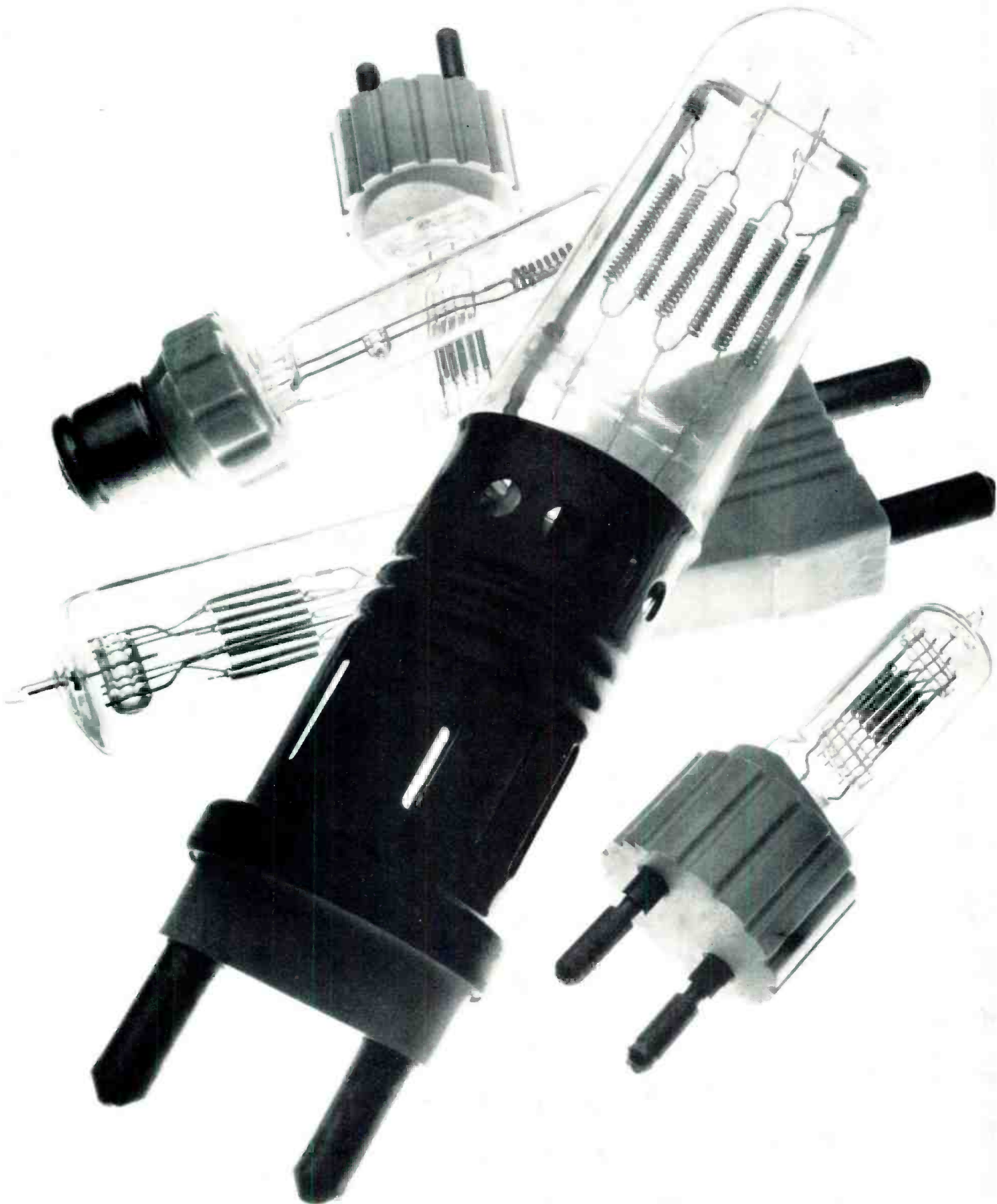
**DYNASCIENCES
CORPORATION**

VIDEO PRODUCTS

TOWNSHIP LINE ROAD • BLUE BELL, PA. 19422
Telephone: (215) 643-0250 • Telex: 84-6358

Circle 118 on Reader Service Card

**Some of our substitutes
for those big, fat incandescents.**



Some of our substitutes for our substitutes.



Those big, fat incandescents blessed the world with a lot of big, fat fixtures and sockets.

So after we came up with our skinny, little tungsten-halogen lamps, the first thing we had to do was set them up on big, fat bases so that they'd fit the old sockets.

Which meant developing a complete line of Substitution Lamps. (You see some of them at the left.)

But soon new fixtures arrived on the

scene. These took full advantage of the inherent small size of Sylvania tungsten-halogen lamps.

(Which, by the way, outlast the fat incandescents about 3-to-1, don't blacken and lose brightness with age, and don't fall off in color temperature.)

For the new fixtures, we developed a complete new Standard Line of tungsten-halogen lamps, like the ones on the right.

Whenever studios replace their old fixtures with new ones, they can substitute

our new lamps for our Substitutes.

Which is OK with us.

Because both of these lines are so much better than the old lamps, that no matter which our customers use, we feel we've done them a world of good.

And there's just no substitute for that.

We have a brochure on each line. For your copies, write to: Sylvania Lighting Center, Danvers, Massachusetts 01923.

GTE SYLVANIA

Circle 119 on Reader Service Card

www.americanradiohistory.com

Largest—Ever NAB Convention Witnesses Turning Point in Technology and Regulation

- Helical VTRs challenge quad for first time as digital time base correction technique leapfrogs mechanical transport limitations.
- Digital techniques are used in special effect generators and dominate control circuitry.
- Era of digital transmission coming.
- Workable business programming coupled with computer nets give management access to digital computers; bandwagon rolls.
- Automated audio delivery systems go pocket-sized; consoles stress flexible modules.
- On the regulatory front, it's all roses. Radio deregulation already begun, TV next; complete overhaul of Parts 73 and 74 promised.

"A DIGITALIZED VIDEO SIGNAL CORRECTOR that will enable reproduction of broadcast quality signals from relatively inexpensive helical videotape recorders" was the way the announcement read. Savings of over 70% on tape equipment was hinted at. But to see it, you had to go to Suite K708; Consolidated Video Systems applied too late to get a booth. The K-wing in the Sheraton Park is not the easiest place to find, but soon all one had to do was follow the crowd. Word spread quickly—"it's revolutionary," "mind boggling," "biggest thing since the introduction of the VTR itself,"—it was certainly the hottest item since the cartridge VTR unveiling in 1969.

Those superlatives describe a time base corrector with an exceedingly wide window—one about 30-times greater than other TBCs. Thus it can work with a wide variety of VTRs. The only connector between the recorder and the CVS 500 TBC is the video output of the recorder. How does it work? The composite video signal from the VTR is converted to digital pulses and stored. It is subsequently processed *in time* against "house" sync (or the built-in EIA sync genera-

tor), and *in quality* by stripping and reinserting burst information. It locks up in milliseconds. Remarkably, it does this entire analog-to-digital conversion and the signal processing at a cost of \$8750.

That the industry is indeed moving into the era of the helical recorder, and that the quad is no longer the only recorder that can be used by broadcasters, was in ample evidence at the 1973 convention. IVC has already penetrated the quad market for several years with its IVC-960 NTSC color recorder/reproducer with insert and assemble editor, etc. During 1972 it announced the VCR-100C NTSC vidcotape cartridge recorder and demonstrated it at the NAEB Convention in Las Vegas last November. Extending this cartridge technology, IVC hit the NAB show with a complete broadcast cartridge system, the BCR-200, which includes up to ten playback decks and two record/playback units along with a 12-event programmer and other accessories (including IVC-4102 NTSC color time base corrector). This system was ready to compete with the RCA TCR-100 vidcotape cartridge recorder and the Ampex ACR-25. In fact, it can do more

since one-hour tapes can be played. The 12-deck system (with TBC) is priced at \$99,000; the six-decker at \$66,000. This is less than the quad system and the tape cost is less. Head wear is guaranteed for 2000 hours.

Topping the introduction of the helical automation unit was a special evening presentation by IVC which announced the forthcoming IVC-9000 helical scan VTR for full broadcast applications. This new system, being jointly developed with European partners—Rank in Britain and Thomson CSF in France—is expected to replace quadruplex transverse VTR as the universal standard.

The IVC-9000 is described as combining in a single machine all of the best features of the helical transport and current electronic circuitry. Result is a full broadcast standard in a package that is less expensive initially and one with a far lower operational cost. The unit uses two-inch tape for its strength and transverse rigidity. By using two heads, scan length is only 5¼ inches, compared with the usual 30 inches. Guiding and tracking is easier to accomplish with existing edge-slitting tolerances. Further, because

the tape wrap is 180 degrees, tape-to-head contact at entry and exit points is less abrupt and much longer head life is expected—up to 3000 hours. The 19-degree track angle segments the video image into approximately 42-line increments, compared to 16 for the quad VTR. This reduces the visibility of “first-line velocity errors.” Hot-pressed ferrite heads are used, giving a flat response of 18 MHz. The unit operates with a tape speed of eight inches per second, and yields a video writing speed of 1500 inches per second. Use of extra-high carrier and deviation frequencies in mod and demod reduces moiré characteristics on PAL and SECAM. The flat response helps in getting a good linear transfer of FM signals to and from the tape medium. Although the first units will be delivered in Europe, the IVC-9000 presages a new role for helical in the U.S.

Helical for broadcast use was not being played down at the Ampex exhibit as it had been in the past. Formerly signs carefully pointed out that the top-of-the-helical-line, the 7900, was for “closed-circuit applications.” This qualification has been removed and Ampex officers report that sales of the 7900 for broadcast use have been substantial, particularly in Europe and Canada.

Offering broadcast level performance on one-inch tape with a helical format was Echo Science Corp. The company showed both a table-top console unit and a portable backpack unit that has been used successfully by the military for three years. Echo Science Corp. is something of a reincarnation of the old Westel Co., which showed promising units at the 1969 NAB Convention and before that in 1965. Under the Echo Science banner, these interesting products may get into the broadcasting mainstream. The WR 201C is a field-proven 38-pound (including batteries) backpack unit that measures 15-in. by 11½ in. by 6.5-in. It’s a 30-minute high-band NTSC recorder with a writing speed of 1470 ips. Video scanner assembly is a plug-in module. Response goes to 4.2 MHz. Diff phase is less than two degrees; diff gain is less than 2%. Relative chrominance/luminance delay is less than 15 ns and time base stability is ±3 ns. Unit has

one active audio head, but a second head is included for use if auxiliary electronics are added.

The above specs are based on playback on Echo Science’s table-top unit, the 411C recorder/reproducer. This broadcast level performance unit includes standard

time base correction, continuous velocity correction, insert and assemble editing, and output sync processing. Recording format uses twin heads with a 13-degree scan angle and a 3.7-inch track length.

Promising the ability to convert many helical machines to a quality



FCC Commissioner Wiley meets broadcasters.

More Deregulation Promised Despite Pressures to Curb Freedom

Big issues, or “challenges,” as NAB President Vincent Wasilewski referred to them, faced broadcasters at NAB 1973. Sex talk programs, advertising of non-prescription drugs, counter-advertising, freedom of speech, re-regulation, and license renewal topped the list.

There was movement: the First Amendment got spirited defense as broadcaster after broadcaster affirmed that license security should not be brought by silencing the critical microphone. No one, however, wanted to defend the right to air frank sex talk shows under protection of the First Amendment. The Radio Code Board had recommended “that broadcasters take into account the sensitivities of the community they serve in determining when and how to air such programs,” but after FCC Chairman Dean Burch said he had no taste for aural discussion of oral sex or other “electronic voyeurisms”—and intimated a court test over purient trash—there was no waiting to see what the polls would yield—executives immediately ordered sex talk shows off the air.*

Stiffened rules for commercials on drug remedies were proposed and favorably accepted. The prescription of counter-advertising was declared bad medicine; diagnosis was it would kill the broadcast industry.

And, although Chairman Burch seemed resigned to the fact that American broadcasters were not really very good public trustees, particularly regarding children’s programming and fairness, the FCC promised more deregulation: first radio and then TV. Commissioner Richard Wiley and other FCC staffers appeared at both Management and Engineering sessions seeking broadcasters’ inputs and promising action. Wiley said the objective is to make rules “simpler, direct, and pragmatic.” Wallace Johnson, Broadcast Bureau chief, promised support and not harassment on the part of the Field Engineering Bureau in interpreting the new rules. To the extent that equipment can be demonstrated to do a job, the demands on operators can be relaxed, Johnson and his assistant chief, Harold Kassens, intimated. “Keep those cards and letters coming,” the FCC staff pleaded, in an effort to get more feedback.

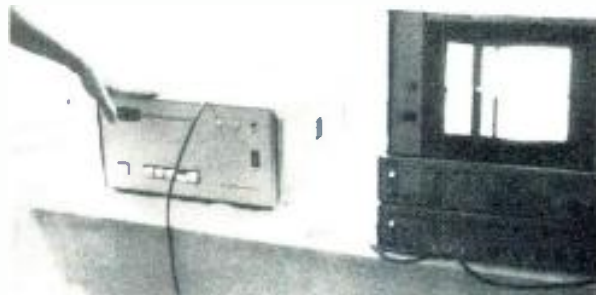
*Later the FCC slapped a \$2000 fine on Sonderling station WGLD-FM for discussing oral sex. The station was in no mood to go to court, however, and paid in silence.



IVC's automatic cartridge player, the BCR-200, uses a helical format.



Television Microtime demonstrated how its TBC can work with various V-lock helicals.



Show-stopper was Consolidated Video's digital approach to time base correction for helical VTRs.



Echo Science gets broadcast quality from its new helical VTR system.

acceptable for broadcast use was Television Microtime Inc. who have been developing circuitry to adapt various helicals to work with the company's Delta 44 Time Base Corrector. Putting out signals for broadcast use were the Ampex 7800 and the Sony 3650.

Quad still predominates

Lest we give the impression that helicals have literally taken over, we hasten to add that quad was still very much in control at the 1973 convention. Both RCA and Ampex conducted little theatres starring the TCR-100 and the ACR-25 respectively. RCA boasted that cartridge units in the field now number 100, and that total savings (in labor and headwheel reconditioning) from use of the cartridge may run in excess of \$18,000 annually. Ampex demonstrated the 11 o'clock news show using the ACR-25 and AVR-1.

At NAB 1973, representatives of

Deutsches Olympisches Zentrum (DOZ)—the 1972 German Olympics' Committee—presented an award to Ampex for its contribution to the outstanding TV coverage of the Olympics. Some 80 Ampex quad machines were used.

Quad machines were the cornerstone of camera exhibits and of tape manufacturers—3M, Memorex, and Coltape. Developments in quad are continuing. Ampex announced a new accessory for the AVR-1, namely an Editec system that handles all of the editing functions previously done by the Mark IV Editor, such as single-frame insertion, use of cue tones, and the rehearsal mode that improves edit accuracy. Three modes of operation are provided: cue read, cue rewrite, cue erase. Further, entrance and exit cues can be shifted easily. Cost: \$7500.

A \$9500 Identification Data Accessory (IDA) was also introduced by Ampex as an accessory

for the ACR-25. Unit permits messages identifying spot announcements to be recorded on the cue track of the cassette. Message is entered via a keyboard. The identification eliminates confusion between similar spots and the message generated can become the station's FCC log—and proof of commercial play.

A new "digvid" world coming

The inexpensively priced analog-to-digital converter and processor introduced by Consolidated Video is a harbinger of an oncoming era of helical VTRs since time base errors can be corrected simply. More significantly, it is a concrete example of the fact that digital techniques may some day replace analog completely. There were other examples of this new technology at the convention. Most notable was that provided by the Comsat exhibit.

Comsat showed a digital tech-

nique for transmitting standard audio and video programs. Called DITEC, for Digital Television Communications System, the method promises substantially lowered transmission costs while retaining the high quality required by broadcasters. The convention demonstration consisted of a digitally encoded live and videotape program being transmitted from the Andover, Maine, earth station to the Intelsat IV satellite located over the Atlantic Ocean some 22,300 miles distant, and then to a 15-foot antenna located on the lawn of the Sheraton Park Hotel. After being decoded digitally, it was fed to monitors in the exhibit hall. DITEC-1, compared to the FM transmission systems now in use with satellites, offers up to a 10 dB saving in power or a 50% saving in bandwidth. Basically, after conversion of the analog video signals into digital form, a single digital carrier is transmitted. A 33.6 mega-bits-per-second bit rate is used. This is a lower bit rate than that required for pulse-code modulation. Actually, differences between adjacent samples are encoded; thus small sample-to-sample changes require less encoding. Both big sample differences (edges of pictures) and small differences can be accommodated with an efficient bit rate. (Actual bits/samples used in DITEC are: Y, channel 5; I, channel 4; Q, channel 4; audio, 12.) By employing digital transmission techniques, better control can be attained over transmission distortion problems such as differential phase and gain. When DITEC-1 is used on microwave relays, two channels can be carried over a 20 MHz system. Repeater hops do not degrade the signal. The digital system can also work with band-limited cables.

Another example of the impact digital techniques are having on TV could be seen in the new Sarkes Tarzian digital special effects generators. A dramatic circular wipe stopped many broadcasters in their tracks in front of the Sarkes Tarzian exhibit. (More about this unit is contained in the section on video switchers.)

Digital control has been present at NAB for years as a means of simplifying camera control (the PC-100A and the Fernseh cameras, for example), and as a means of simplifying switching in video produc-

tion switchers, routers, radio automation systems, etc. Instead of discrete wires running to every switch or relay, a multitude of code signals can be sent down one wire. Both VTRs and editing equipment use digital techniques in control. Character generators are built around digital concepts. In fact, the Television Microtime TBC uses digital techniques to switch analog-stored signals about. The difference in 1973, indicated particularly by the Consolidated Video Systems and Comsat exhibits, is that the analog signal may some day disappear. Once cameras are available to convert live pictures to a digital form directly, the new millennium will have arrived. Even audio may some day be processed digitally.

Automatic systems and easy-to-use products more and more prevalent at NAB '73

Whether as a result of the digital revolution, or as a result of sophisticated analog feedback circuits, automation in broadcasting continues to increase. 1973 NAB Convention visitors saw more business automation systems, more radio automation, more sophisticated remote control systems, and more automation in general than ever before. RCA, for example, stressed automated operation of its new TK-45A camera, automatic radio transmitters, a new automatic film cartridge projector (a first), and automatic radio programming—in addition to the automation in its TCR-100 automatic cartridge player. Both CBS Labs and Tektronix showed automatic video transmission corrective systems. Examples of automation will be apparent as we examine other products exhibited. However, auto-

mation, per se, is not the reason for its being. Ease of operation, or more flexible operation is the key characteristic sought, and many exhibits stressed the point.

Transmitters stress reliability, automatic operation

Spurred by FCC indications that it does indeed recognize that equipment is so reliable today that it might out-perform operators assigned to monitor performance, there is a trend to more remote control and automation. RCA stressed at its booth that the company's AM and FM equipment, with only minor modifications and additions, provides a transmitter that will operate within FCC rules, switch to an alternate auxiliary transmitter, or shut itself off. It demonstrated a transmitter system that provides an alarm at local and remote points in case of performance deviation. The BW-75 FM Frequency and Modulation Monitor, for example, gives an alert if the transmitter drifts by 1000 Hz and will shut off should the transmitter exceed the FCC limits of ± 2000 Hz. Another control unit monitors power to $\pm 3\%$ or -7% and makes corrections in power.

Collins showed a new dual arrangement for its 40 kW FM transmitter. If one unit should drift out of tolerance, the unit would automatically shut down and the other would take over.

A digital control system that can automatically operate the transmitter plant was shown by Moseley Associates. The company's new Model DCS-2 system has three levels of capability. The first level is an operating remote system that can handle 120 channels; 30 channels are provided as standard. System has



The quality of quad VTRs was attested to by the 1972 German Olympics' committee which presented an award to Ampex during the 1973 NAB.

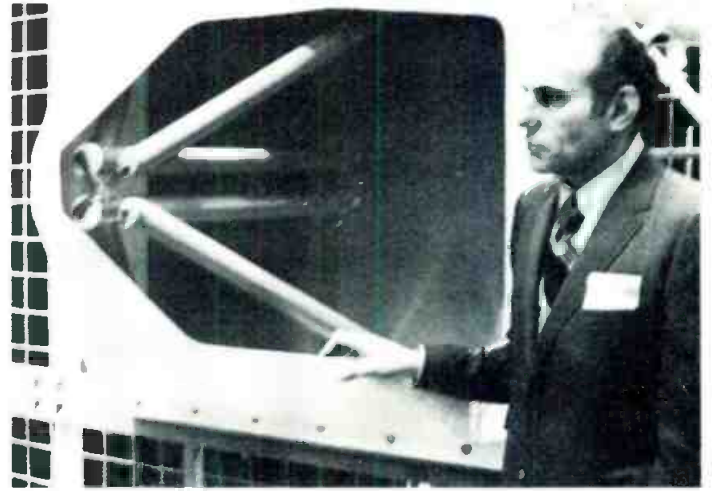
NAB SHOW-IN-PRINT



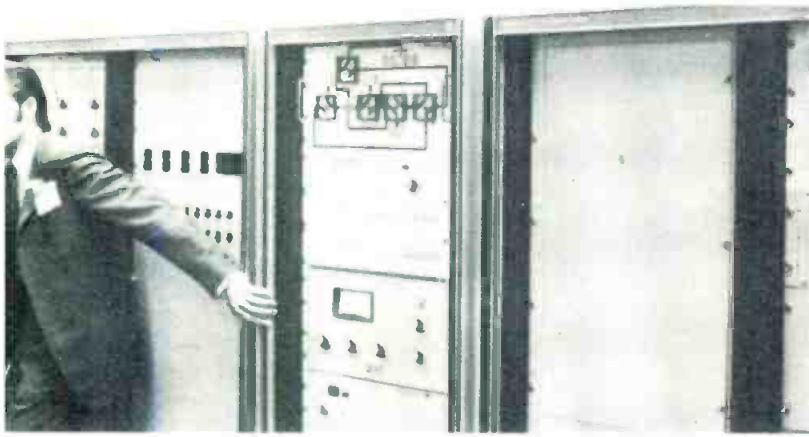
Wilkinson's new FM 2500E transmitter.



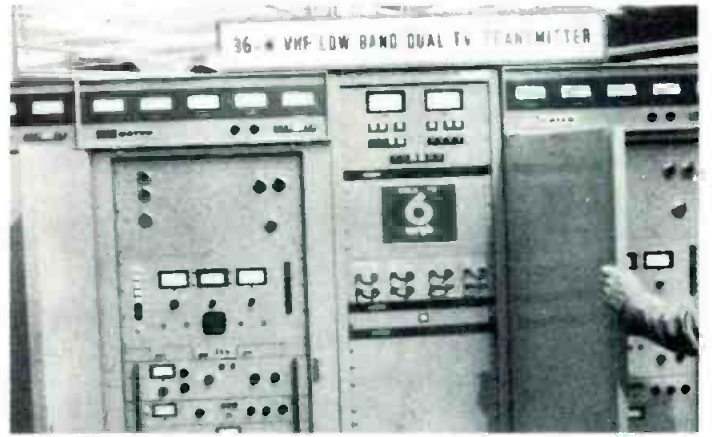
Section of Andrew Corp.'s heliograph transmission line.



Close-up of new high-power FM antenna by Jampro for European market.



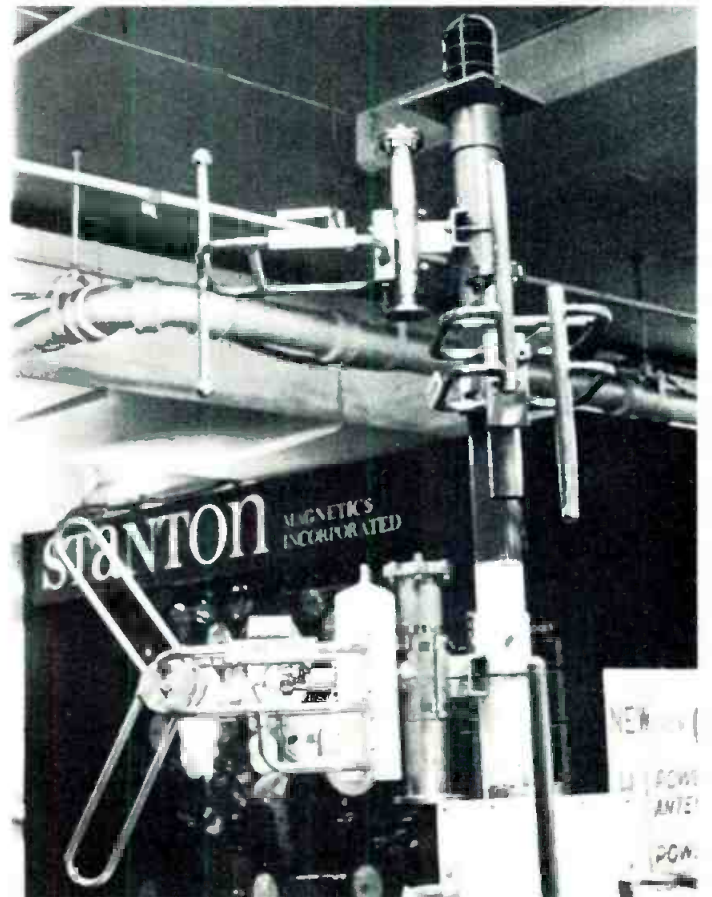
Collins showed automatically-controlled dual 40 kW FM transmitter.



Gates 36 kW dual VHF transmitter.



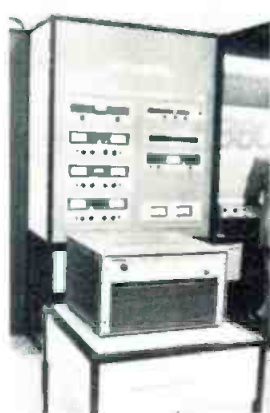
Continental 50 kW AM rig with plastic doors.



A variety of Shively antennas.



New digital remote control system from Moseley.



McMartin entered the FM transmitter field with this new 10W unit. ▶

120 channels for status and alarm and does automatic parameter logging. The second level accommodates a CRT display to preset simultaneously 30 parameters. Software provides established upper and lower limits on each channel. Readings outside limits can flash on the screen, set off aural alarm, etc. At the third level, a computer program is supplied to operate automatically a remote control such as a power level, plate voltage, etc., pending FCC rules revisions.

The control panel includes a keyboard for channel selection and a read-out of channel selected, channel shown, and parameter values (four-digit LEDs). All telemetry inputs are sequentially sampled every 1.5 seconds. Response time is 200 milliseconds. System works with either radio or telephone circuits. A Bell series 3002 unconditioned two-wire circuit is required. Command and telemetry functions are transmitted as audio frequency-shift keyed (AFSK) signals. Fail-safe features are included.

Another digital remote control system was on display in the Telemet booth. Telemet is now the sales arm for the Spantronics system introduced last year at NAB. Brand new in this area was the McBee Labs Automatic Digital Logger. Shown in the Landy Associates exhibit area, the new V11/21 system is completely self-contained and includes a printer which displays and prints date, identification, time, channel number, and meter readings. The system can sample a number of sources.

Among the new transmitters shown was a 10-watt FM transmitter/exciter—the B-910—from McMartin. The modularized B-910 system uses a phase-locked modulated oscillator operating at one-half the output frequency. The output frequency is sampled, divided down to the .8 to 10.8 KHz range, and compared with a frequency in the same range derived from a highly stable temperature controlled crystal oscillator operating at 1/10th the output frequency. Any difference in the phase of the two frequencies is detected to produce a correction voltage to the modulated oscillator. An alarm is triggered if the unit is not in a phase-lock condition. Center frequency stability is given as 1.0 KHz; FM noise, 68 dB

below 100% modulation. With the B-110 stereo generator, separation is 38 dB; stereo crosstalk, 43 dB; and FM noise, 60 dB. A low-pass output filter converts the exciter to a transmitter. Prices start (monaural) at \$1995.

RCA showed a new 5 kW FM transmitter which includes a built-in harmonic filter. In the AM area, the company stressed the superior audio quality of the 5 and 10 kW units, using the no-modulator Ampliphase system. Ease of lining up and monitoring the two-phase modulated carriers was demonstrated.

Sparta showed two new items: its model 680 FM exciter, and the 701B 1kW AM transmitter. The exciter is billed as so simple and foolproof that field adjustment is never needed. Digital AFC control circuitry is used, and no oven is necessary.

Sparta pushed its 701B AM 1kW unit as the only one-kilowatt with all the important features: 125% positive modulation capability; oil-filled modulation transformer; vacuum capacitor final tank tuning; built-in dummy load, and low-cost 4-500 tubes.

AEL promoted 50kW units: Its recent FM-25/25 approach and a brand new AM-50KD unit which uses only four tubes—a pair of 4CX15000A modulators; a 4CX-35000C PA and a 4-400C IPA. Possible peak modulation up to 130% is claimed. Solid state logic circuits are used.

In the TV area, RCA showed new 30kW and 60kW UHF units which were completely solid state except for the power klystrons. By using four-cavity 30kW klystrons, the intermediate power amplifier can be transistorized. If the IPA fails, the exciter drives the transmitter at reduced power.

One of the most striking exhibits was Continental's 50kW unit with translucent doors.

Among the new products at the Wilkinson Electronics booth were a new all-solid state 60W FM transmitter and a 2500W FM transmitter. The final is a 5CX-1500 pentode rated at 3200W. Gates showed many transmitters but none was more prominent than the 36kW low band dual TV transmitter which occupied considerable space. CCA also showed a broad line—including a UHF transmitter

acquired from Ampex. To keep transmitter manufacturers honest, Bird Electronics showed components for RF power measurements—along with some new air-cooled loads.

In the peripheral area, EMCEE showed a 2150-2160 MHz Multi-point Distribution Service (MDS) transmitter which has been FCC type accepted. The newly-created MDS service was the focal point of an inaugural public demonstration on the last day of the NAB convention. The occasion was the meeting of the International Industrial Television Association Convention, held in conjunction with the NAB. Acrodyne showed a 100W TV transmitter using a single tube along with various translators.

Rodelco showed an FM translator. Microwave Associates exhibited a line of microwave equipment. Marti stressed STL and Inter-City Link equipment—all solid-state. Communications Carrier Inc. drew interest to its "Straight-thru" microwave transmission system—so called since all amplification occurs at microwave frequencies in the 7-15 GHz band. The system is fail-safe inasmuch as failure of any component does not cause loss of service. It is also distortion-free since very broadband circuits are used, and it is simple because of the few parts used.

Compact tape cartridges; radio program automation

There was plenty of radio program automation to choose from—Broadcast Products, CCA, Collins, Gates, IGM, Sono-Mag, Schafer, and Sparta had numerous systems on display. Approaching programmed automation systems have been the banks or decks of miniaturized cartridge systems, assembled by Broadcast Electronics and Broadcast Products in particular, so that a series of carts can be played in sequence. Miniature cart systems have been growing in popularity and some have been stacked for continuous playing.

At the 1973 convention, a new approach (shown in demonstration form last year) burst forth. Rapid-Q displayed a series of products that could use the miniature 1/8-inch continuous loop tape cartridge called the CARTRETTE. The

continued on page 34



When we say interchangeability we mean interchangeability.

You can take one, or all, of the twenty modules and interchange them between cameras and maintain picture quality without additional adjustment, balancing, or fine tuning.

Our cameras were truly designed with interchangeability in mind.

You can take a module from one camera and put it in another camera. Or you can take a module from your parts stock and plug it in a camera. In fact, you can take a camera "shell" and put together a fully operative camera in about twenty minutes. The amount of time you save in adjustments and maintenance is remarkable.

Interchangeable modules are only a part of the Fernseh story. We have some other amazing features, too. For example, when you receive one of our cameras, it's ready for operation as soon as you unpack it. And, it'll perform to all specifications because each camera we make is pre-tested. We do something a little extra. We record actual performance characteristics for chromatic response and frequency response on each camera system.

There are a lot of things you should know about Fernseh cameras. Get detailed information by contacting your nearest Fernseh division representative at one of the offices listed below.

Chicago Headquarters
(312) 681-5000

Houston (713) 681-8461

Los Angeles (213) 649-4330

New York (516) 921-9000

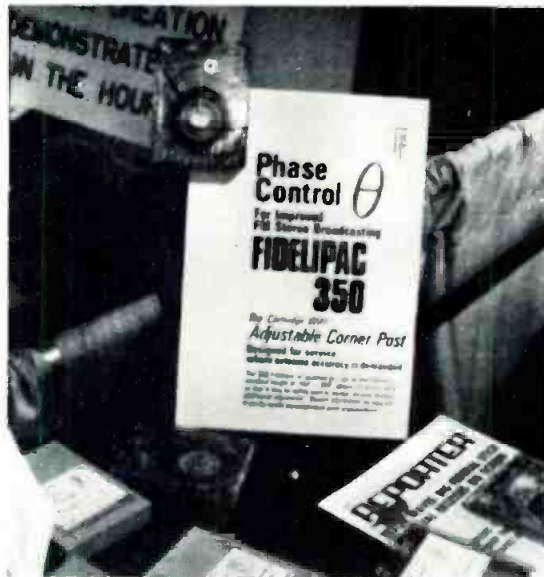
Ramsey, N.J. (201) 825-1550

San Francisco (415) 583-9470

**Robert Bosch
Corporation
Fernseh
Division**  the wings
of vision

Circle 120 on Reader Service Card

www.americanradiohistory.com



Fidelipac showed a new stable cart.

small CARTRETTE, which measures 2¼-in. by 2¼-in., is a significant product in and of itself. When put together in a system, they create a new automation system. CARTRETTEs can be used to supplement or replace the ¼-in. cartridge system. The continuous loop units operate at 3¾ ips and are available in loads from 20 seconds to 10½ minutes. The small format became possible because of advances in high energy tape. Lubricated tape is used. CARTRETTE prices range from \$1.00 for a 20-second unit to \$2.80 for a 10½-minute unit. A unique precision module tape guidance system is used and tape path accuracies are maintained so as to preclude phasing problems in stereophonic systems.

In a multiple playback system, Rapid-Q (Garron Electronics, Inc., Sub. of Visual Electronics) has a system consisting of eight independent playback modules in a 5¼-inch rack frame that includes the power supply and audio switching. This system, with full local control, is priced at \$1900 for monaural.

Rapid-Q also displayed a "Full 40" system, providing 48 CARTRETTE playback decks. It can be fully loaded and ready for instant access by a ten-key desk-top control. The system is priced at \$8200 monaural. Each deck contains its own motor.

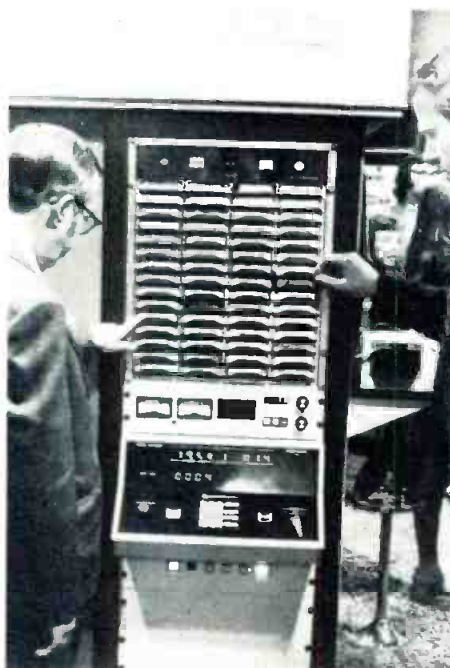
A compact 60-cart instant access system using conventional carts was displayed by Broadcast Products Inc. Separate pre-amps are used and all heads are adjustable from the front. Any cartridge can be monitored while the system is on the air. A front panel control allows selection of any cartridge. A six-event MOS preselect memory is available.

Tapecaster displayed its new series X-700. The playback unit only is priced at \$395. Tapecaster showed literature covering a new Mark IV broadcast cartridge—one heavily rigged for maximum rigidity, including a precision machined metal corner post guide to accurately control the tape in both vertical and horizontal planes. Production models were not available by show time.

Lines shown by Broadcast Electronics and International Tapetronics were those that have been on the market for some time. International



Econo cart player from Tapecaster.



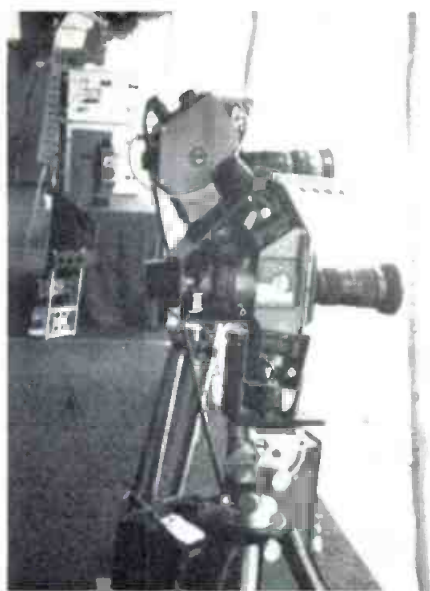
Multi-cart player from Broadcast Products.



Rapid-Q's CARTRETTE system.



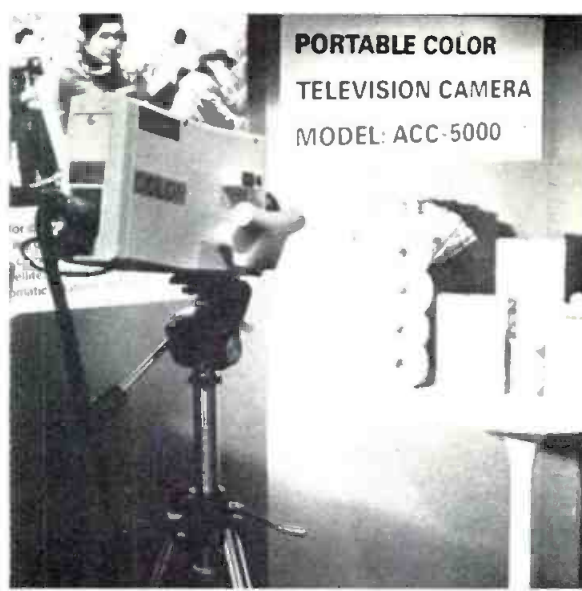
New cart machine from CCA.



Editel showed several compact TV cameras.



Norelco unveiled the PCP-72.



Miniature camera from Asaca.



Fernsch miniature camera looking at Insta-key girl.



Shibaden camera goes portable.

Tapetronics showed a cassette player, but it was obvious at this NAB that the industry has not figured out how to fit the cassette into a largely cartridge world.

The new "Citadel" cartridge units by CCA, which are only 5 $\frac{3}{4}$ -inches wide, were of more than usual interest since CCA is now an additional source. Although Broadcast Electronics had no new cartridge equipment, the company had a new image: it was in the turnkey studio business. Part of BE's exhibit was a complete studio.

Audio Devices featured its new Audio-Pack cartridge as the most stable cart available and one that would prevent tape skew and, therefore, stereo phase distortion. See *BM E*, October 1972, for details.

To overcome phase shifts introduced by some of the older carts—or new ones that show great wear—Rapid Q introduced a stereo phase enhancer. This unit, the STE-100, was called the electronic answer to FM degradation due to phase discrepancies between the Left and

Right channel signals. The unit is a solid-state 1 $\frac{3}{4}$ -inch rack mount unit that accepts Left and Right channel signals, analyzes them relative to phase, and dynamically enhances the signal to provide output signals that are of the same phase. This minimizes nulling that occurs from out-of-phase signals and also the "mono-sum" (L + R) signals. The STE introduces no degradation and acts only on signals above 3KHz. The effect was clearly demonstrated as one misadjusted the playback head and switched the enhancer in and out. The unit is priced at \$795.

Color cameras: Emphasis is on hand-carried units

The spectacular pictures were produced by top-of-the-line cameras featuring many automatic capabilities, but the most amazing pictures were those produced by hand-held cameras.

Miniature cameras were shown by Asaca (of Tokyo, Japan), Fernsch, and Philips. Compact units were displayed by Editel, RCA,

Philips, Gates, and Fernsch. A new compact single-tube camera was shown by Cohu.

The Asaca model, ACC-5000, got perhaps the most attention since it was the most unfamiliar. It produces a high-quality NTSC output and can be directly connected to a VTR without going through a base station. The camera head, using three $\frac{3}{8}$ -inch pick-up tubes plus four filters, was ultra compact. Electronics consisted of pre-amps and deflection drive circuits. A 1.5-inch CRT viewfinder is incorporated and a 6X electrically-operated zoom lens is included. It weighs 11 pounds. The backpack contains all camera control functions including auto-white control, process amplifier, color encoder, sync and test signal generators, image enhancers, mikes, and power supplies. It also weighs only 11 pounds. A control box carries batteries and a stabilized power supply for AC operation. Cable length between camera head and backpack is 10 meters; between backpack and control box,

NAB SHOW-IN-PRINT

it's 300 meters. Unit will be available in the U. S. by August and will sell for \$30,000.

Norelco showed several new things in portables: a PCP-90LLL (low light level) version of the PCP-90B and a modified PC-72, called the PCP-72. The PCP-90LLL produced a bright full-color picture in minimal light—less than ½-foot candle. The prototype unit actually produces pictures at levels as low as ¼-foot candle. The camera uses special Norelco "SIT" (Silicon Intensified Target) imaging tubes. Unit also works in full light.

Norelco got a lot of attention for its new PCP-72 with a mini-hip-pack weighing six pounds. The head

configuration, weighing 19 pounds, is similar to the PCP-90B, which is the most widely used broadcast portable to date. The PCP-72 requires a camera control unit.

Editel Production Ltd. (Montreal), which has for years modified existing field cameras for portable work, came to NAB with a Portable Color Television News Camera to sell to others. The unit has been designated the ENC-1. It features one-man operation, minimum set-up, battery operation, NTSC or PAL operation direct from the backpack. It's also rugged. Unit uses three standard separate mesh one-inch Plumbicon tubes. Operation from the backpack or a remote control unit is possible. In the latter mode with triax cable, range is up to 3000 feet. Registration ac-

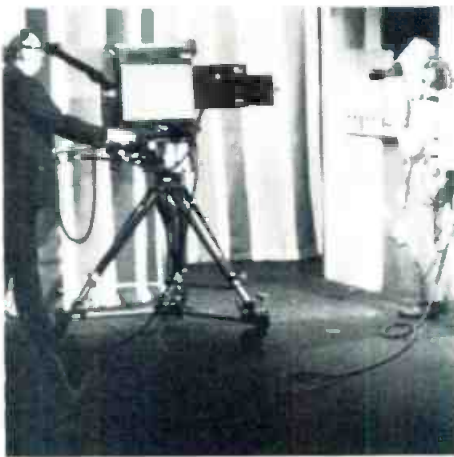
curacy and stability is high. Editel also showed its 20 pound Mark III hand-held camera.

RCA demonstrated a portable color camera that can be converted from a standard studio camera and offered a kit for conversion. Priced at \$12,000, it includes two kit housings—one for the camera head optics and another backpack unit for electronics. A camera lens, four-inch electronic viewfinder, intercom, and tally lights are built into the kit housings. The camera head is connected by a 15-foot cable to the backpack which in turn is connected by a cable to a camera control unit. Modules from the TK-44 or TK-45A can be used.

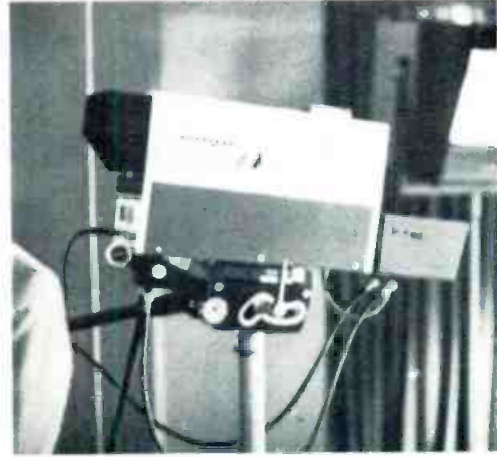
A very conspicuous camera at NAB was the compact Fernseh KCP-40—mainly because Fernseh



Doing a camera line-up on the new Norelco PC-72.



The new RCA TK-45.

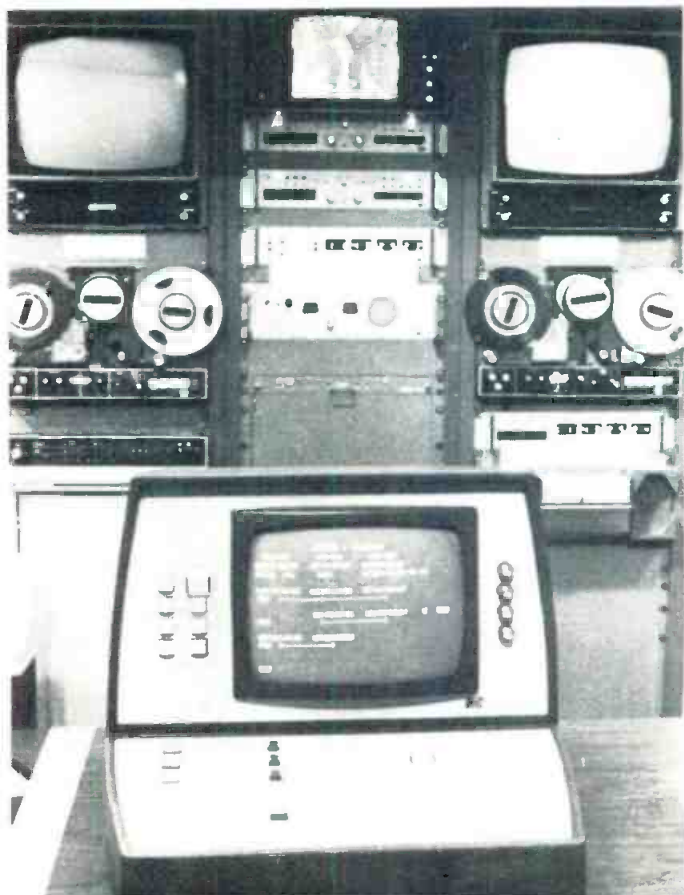


New Cohu single-tube color camera.



CMX had editing setup on floor.

View of CDL's PEC-102 editing system.



loaned many of them to production switcher people who wanted to show chroma key, lens manufacturers who wanted to show lenses, and pedestal manufacturers who wanted to show camera mounts. Using three one-inch Plumbicons, and a WRB optical system, the camera gives a maximum sensitivity for low-light-level use. Its ease of operation was demonstrated by the fact that units, wherever they were, worked well. Registration controls are available on the camera head to adjust size, linearity, and skew. Camera can be set up without an oscilloscope because of built-in test signals. A wide range of lenses are available.

In the studio camera category, RCA featured a camera with a new designation, the TK-45A. It's the successor to the TK-44 and in-

cludes many of the modifications made on that camera. But, the TK-45A contains more automated operation than has been possible before. There's automatic adjustment to variation in outdoor lighting, an automatic centering control to adjust picture registration, an automatic lens iris adjustment, and a push-button system for maintaining white balance. Black balance is achieved automatically. The camera also has other features.

Ampex introduced a new BC-230B camera as an advanced version of the BCR-230. The camera featured automatic centering—a feature that last year was offered by Marconi's Mark VIII. The BC-230B is priced at \$60,000.

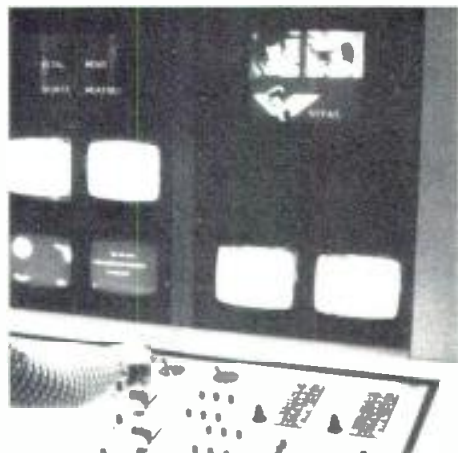
Cohu unveiled a new single-tube color camera, the 1200 series. A

special filter optically encodes color information. Unit is not intended for broadcast use, but camera contains many operational features making it a flexible CCTV unit. One version (121 0A) is designed for color film chain use.

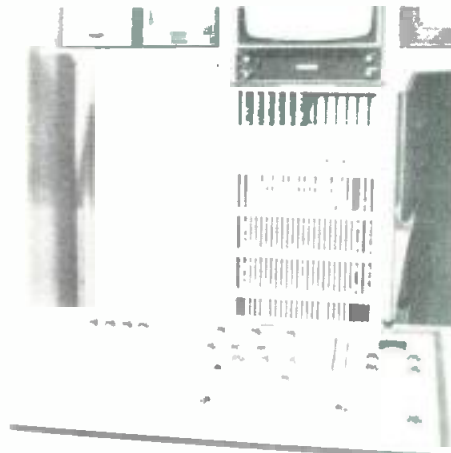
Norelco, Gates, Marconi, and IVC showed studio cameras but, for the most part, models were the same as those shown before.

Tape: count the drop outs

Drop-out rates were the focal point of videotape manufacturers' exhibits. Ampex announced at the convention that it is now providing an individual dropout profile with each reel of its 175 series highband color videotape. Profile follows SMPTE recommended practice counting dropouts of five-micro-



Vital stressed Random Production Programming.



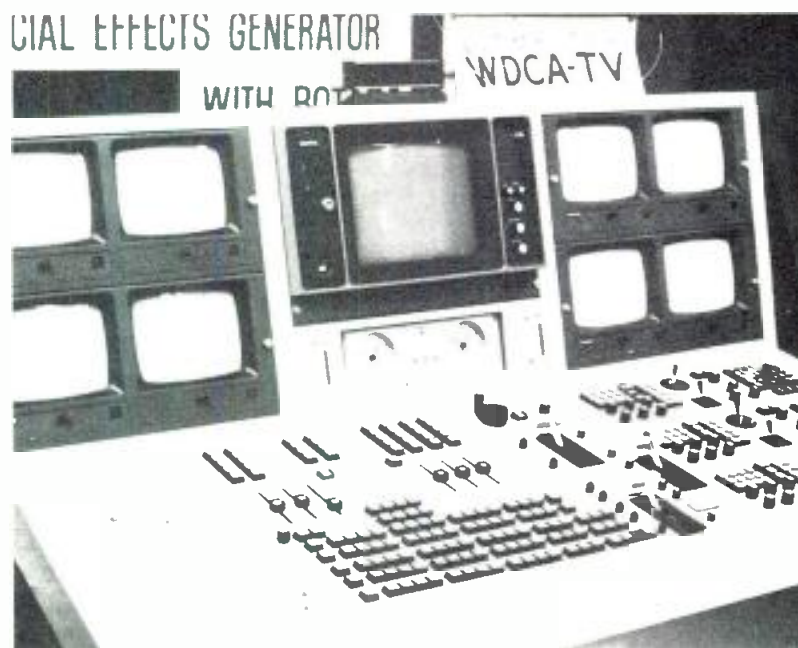
Richmond Hill's VPM-2000 switcher.



Chromatron electronic palette.



American Data production switcher includes preset control.



Emphasis of this switcher by Visual Electronics for WDCA-TV is special effects.

NAB SHOW-IN-PRINT

seconds duration. A dropout is any defect causing a 1/6 dB reduction from reference. Ampex also said it was including a safety band (to protect edges), and a solid-back flange on every reel of 175 tape.

Memorex was counting dropouts of Chroma 90 in its exhibit. It claimed its new back counting reduces dropout to the industry's lowest level. Memorex claims ten per minute maximum average throughout the reel; 15 maximum in any one minute tested in high-band color at 75 to saturation color bar. To demonstrate Chroma 90, Memorex played promotional tapes with solid red backgrounds to also provide a subjective evaluation. Micro dropouts, sometimes noticeable as noise, were not apparent.

Coltape stressed quality tape at reasonable prices. 3M continued to pack in the crowds by showing humorous clips from old Johnny Carson shows—these classics must have had well over 3000 passes, and they're looking better than ever!

But just in case there were dropouts, 3M was there with its Color Dropout Compensator for highband (lost video information is replaced with full color) and, for helical scan recorder users, 3M was promoting the DP100 Dropout Compensator Processing Amplifier. The hottest accessory module to be added to DOC/PROC/AMP is a 3.58 MHz subcarrier regenerator. The output provides synchronization for special effects switching and NTSC color encoding of a camera to provide inserts for helical editing.

In the audio tape area, 3M introduced a new line of acetate-base magnetic recording films—Scotch Brand 337, 338 and 339. An improved oxide coating makes this film comparable to the polyester-based tapes 340 and 341. The acetate backing facilitates edge numbering and additional markings and has better resistance to wear and scratching than previously available acetate-based films.

Videotape cleaners were shown by Recortec and Television Equipment Associates.

Inexpensive videotape editors

Last year rather elaborate computer-controlled editors were in the

limelight. This year, exhibitors stressed inexpensive approaches as well. CMX Systems stressed the 300 off-line system which utilizes three one-inch IVC helical units. There is no need to tie up on-line quadruplex machines. Editing was done right on the exhibit floor. (Once editing is completed, automated assembly is done from the original two-inch program from the one-inch workprint.) Datatron showed its \$10,000 system using helicals first introduced last year. Central Dynamics showed its PEC-102, introduced last year, but also came up with an inexpensive EDS-200 which requires only two VTRs. EECO equipment was demonstrated by Telemet.

Switchers

Video production boards always draw a crowd the minute someone starts playing with the special effects. This year was no exception. Grass Valley unveiled a 1600 series production switcher which it said represents a second generation design (based upon experience gained in the manufacture of almost three hundred 1400 and 3600 series). It represents new possibilities in special effects capability. The mix effect signals are applied to the input terminal of a new type control element which sums the outputs. The control elements are, in effect, voltage controlled video amplifiers. To obtain a crossfade or wipe between two sources, the gain of one amplifier channel is increased while the gain of the opposite channel is reduced. Mix or fade transitions constitute DC control of the variable gain elements. Wipe transitions employ control signals in the form of variable-width pulses determined by control lever position and type of effects pattern.

In the case of keying or matting operation, the gain of the background channel is reduced in direct proportion to the keying signal amplitude, while the gain of the insert video course is increased in direct proportion to the keying signal amplitude. The effect of this linear type of control is greatly reduced noise in keying situations, compared to conventional electronic switching methods. The improvement in keying is particularly noticeable when using the chroma key. Grass Valley also says matted

inserts have considerably less color crawl since the background and insert channels are turned off or on by signals having rise times comparable to normal video transitions. Soft wipes are easy to produce. The new switcher will be available in September.

Vital Industries has impressed NAB audiences in the past with big-capacity switchers—some with three mix-effect systems such as the VIX-100-4. Vital expects the future to require ever more sophistication in production, calling for more and more switching, inserting, chroma keying, wiping, and dissolving. When all are done simultaneously, preset switching is necessary. This year Vital introduced the concept of Random Production Programming, which means combining all video switching functions such as direct cuts, dissolves, wipes, quad splits or eight splits, key inserts, and chroma keys into one operation. How? By using a small programmable controller, the RPP-100, which Vital promises soon.

Preprogramming special effects with digital control was also discussed at the RCA exhibit. RCA said its efforts were tentative—it was seeking advice from attendees as to what they would like.

Central Dynamics showed a new production switcher, the VSP-1250, and one of its features is soft wipes—of which Grass Valley also boasted.

Softwipe was the main feature of another special effects switcher, this one from a new company, Beston Electronics Inc. (Prairie Village, Kansas). Beston's Model 650 Special Effects unit (\$4000) permits the soft wipe on all patterns that use horizontal only, or for horizontally and vertically added patterns. It uses an internal additive mixer allowing multiple mixing productions.

New from Richmond Hill Labs is the VPM-41 production switcher—a fully portable color broadcast unit priced at \$5000. The VPM-41 is described as an expansion of the VPM studio unit, the VPM 2000 shown last year.

Visual Electronics showed a custom switcher built for WDCA. It stressed a human-engineered layout and unique special effects.

Despite the heavy competition in the switching and effects field, the item that was closest to a show stop-

continued on page 40

Canon offers the perfect zoom lens for the camera of your choice

P10 x 20B1



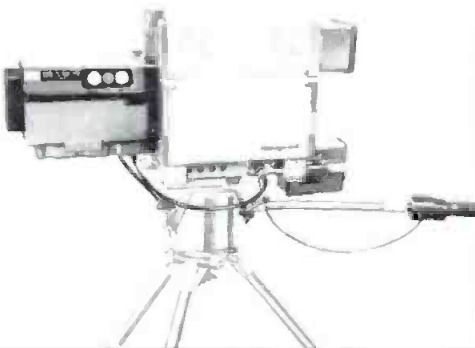
P17 x 30B1



P17 x 30B2



PV10 x 16B



PV17 x 24



PV10 x 15



More and more people are discovering how significantly superior Canon Zoom Lenses are for TV broadcasting purposes. Their outstanding color characteristics, even in dim light, is one of the many reasons why Canon was chosen for telecasting the Munich Olympics.

Canon's wide range of excellent zoom lenses encompass three types of operation control—all-servorized, via flexible cables and by effortless push-pull rod control. And it can be attached to

fit and operate with any make of TV camera.

Shown on this page are only a few examples of the quality lenses Canon has available to more than meet your particular demands. Specify Canon to stay ahead.

The following are Canon TV Zoom Lenses for the Plumbicon® color cameras currently available on the market:

Size of image tube	Lens	Image format covered
1 1/2" Plumbicon® color camera	P10 x 20B4	17.1 x 12.8mm (21.4mmφ)
	P17 x 30B1	
	P17 x 30B2	
1" Plumbicon® color camera	PV10 x 16B1	12.8 x 9.6mm (16mmφ)
	PV10 x 15B2	
	PV17 x 24B1	
	PV 6 x 18B1	

® Reg. TM N.V. Philips of Netherlands.

The Canon TV Lenses Naming System



Applications	Image Format	Pick-up Tubes
P	21.4mmφ	1 1/2" Plumbicon
PV	16mmφ	1" Plumbicon

Apart from the above, Canon has available TV zoom lenses for 3" or 4-1/2" image orthicon cameras and can also build special lenses to fit your requirements.

Canon

● CANON U.S.A., INC.: 10 Nevada Drive, Lake Success, Long Island, New York 11040, U.S.A. (Phone) 516-488-6700 ● CANON U.S.A., INC.: 457 Fullerton Ave., Elmhurst, Illinois 60126, U.S.A. (Phone) 312-833-3070 ● CANON OPTICS & BUSINESS MACHINES CO., INC.: 3113 Wilshire Blvd., Los Angeles, California 90005, U.S.A. ● CANON AMSTERDAM N.V.: Gebouw 70, Schiphol Oost, Holland ● CANON LATIN AMERICA, INC.: Apartado 7022, Panama 5, Panama ● CANON INC.: 9-9, Ginza 5-chome, Chuo-ku, Tokyo 104, Japan

NAB SHOW-IN-PRINT

per was the Sarkes Tarzian Cinematte II rotary digital effects device. Hundreds of transitions are possible from patterns generated by digital logic circuits. A rotating wipe was one of the more eye-catching effects shown. One of the virtues of digitalized special effects generators is the stability offered. A circle never turns into an ellipsoid—unless you want it that way.

One of the more unusual products was the Chromatron, called the Electronic Palette. It is a small self-contained device to produce controllable animated patterns in motion and in full color for backgrounds, attention getting purposes, etc. System is made by BJA Systems, Inc., Oreland, Pennsylvania, and was shown by Landy Associates, Cherry Hill, New Jersey. Demo we saw was noisy and the patterns didn't have good stability, but the product should be investigated further. Although TV station automation systems were prominent last year, we saw little new in this area this year. CDL, Grass Valley, and Vital showed pretty much the same systems as last year—some of which are just now being installed.

Spotted everywhere at the show—encoded chroma keyers. CDL and Richmond Hill had new ones. Others showing such units were Telemet and TeleMation.

Audio/video routing switchers

were exhibited widely. Dynair drew attention to its simple modular (6 x 10 or 12 x 1) expandable unit by calling it the patch cable eliminator.

Datatek showed the D-400 video-audio routing switcher incorporating 20 x 10 or 20 x 15 (in x out) matrixes as building blocks. A variety of control systems are available: momentary, pushbutton, thumbwheel, rotary, telephone pushbutton, telephone dial, BCD data.

A distribution switcher expandable between 10 x 10 to 1000 x 1000 was featured by American Data Corp. A single 5¼-inch rack drawer houses up to 200 crosspoints (audio or video or both). Each drawer is further subdivided into 10 x 10 or 10 x 1 matrixes. The 10 x 1 format is compatible with BCD data. BCD decoders are used to reduce the number of control wires. American Data boasts construction that eliminates ground current and crosstalk, although all manufacturers list very acceptable specs in this area.

Telemet showed its 7930 A/V switching system which works on 30 x 4 frames. Control features are similar to those described for Datatek.

Distribution amplifiers were plentiful. Datatek showed a differential input unit to avoid time modulation of the output pulses and spurious signals. Lenco also had a differential input unit to meet various system requirements. Distribution amplifiers with a variety of features (subcarriers, continuous phase con-

trol, breezeway clamp, regenerator, etc.) were shown by Lenco.

Among several new pieces of video processing equipment was the NTSC chroma keyer decoder (Model 4706) by Telemet. Using new circuitry, this unit is designed to put an existing RGB chroma keyer in the line to provide zero horizontal delay chroma keying. The unit works from differently encoded sources (cameras, VTRs, remotes). A comb filter eliminates chroma crawl.

Character generators

There were no new developments in character generators to stand out this year. CBS Labs did have a new bulk storage system to enhance its Vidifont capabilities. Systems Resources Corp. showed Chiron II, first introduced last year. Broadcast Electronics showed two models of Titlemaster gear—the model 1500 and model 2400. Datavision was part of the Television Equipment Associates booth. TeleMation expanded its election display system to work in a more universal mode. New in the field was Beston Electronics which showed an inexpensive system with storage capability for election vote display.

Film telecine

There is usually something new and interesting at the NAB Conventions in the telecine area—in the past years we've described instant-start telecines and automatic 16mm cassette-loading units such as the Hokushin in 1971. Years before that there was a Fernseh flying spot scanner slide unit. But none of this equipment has ever made it in the U.S. market for one reason or another. The usual reasons are cost and changes needed to adapt the equipment to U.S. commercial station operation.

This year there were two unusual telecine products: the RCA automatic 16mm film cartridge player (TCP-1624), and the Marconi "integrated" telecine which wraps many features into one compact unit.

The RCA unit was a demonstration model designed to get attendees' reactions. It can play an uninterrupted sequence (up to 24) of 16mm film cartridges playing commercials, newsclips, or other short subjects. Each cartridge contains

continued on page 42



RCA film cartridge player.



New TeleMation telecine control.



Neve Consoles cost less than you think.

You're looking at a Neve PSM (Portable Sound Mixer), fully fitted with 12 input channels. Cost? Only \$10,650. If it's partially fitted, the price drops even lower.

In fact, you can buy a Neve Broadcasting Sound Control Console for as *little* as \$5,500.

Flabbergasted? Probably — if you know what goes into any Neve Console, and what you'll get out of it.

A money-saving suggestion: compare broadcasting consoles — feature by feature. You'll find that Neve actually costs less than most.

Don't just compare price. Compare performance and quality. For example, any Neve Console (small, large or in between) gives you a total harmonic distortion *guaranteed to be less than 0.075%*.

What's more, typical certified tests have shown less than 0.02% on every channel.

Neve equips broadcasters with everything from compact portables and circular DJ desk installations to giant, ultra-sophisticated TV and radio consoles. R.F. interference? Not with Neve. Our consoles are designed to block it, even in intense fields such as those in Chicago's Hancock Building and the Empire State Building in New York.

Need a customized console? Regardless of the size, we'll install it in your studio *in hours* — not weeks. We'll do it on the day we promise. No waits. No frets. No bother with in-studio modifications later. Before it reaches you, a Neve Console is thoroughly tested, totally perfected.

The sound of Neve is worldwide. Our audio control consoles are now used for broadcasting, music recording, ad commercial and motion picture production in major studios in 27 countries. Why not find out exactly what we can do for you — before you pay too much for too little?

Neve

Rupert Neve Incorporated, Berkshire Industrial Park, Bethel, Conn. 06801. (203) 744-6230
 Hollywood: Suite 616, 1800 N. Highland Ave., Hollywood, Ca. 90028. (213) 465-4822
 Rupert Neve of Canada, Ltd., 7528 Bath Rd., Malton, Toronto, Ontario, Canada. (416) 677-6611
 Rupert Neve & Co., Ltd., Cambridge House, Melbourn, Royston, Herts, England.

Write for Bulletin B-2



World Video's 17-inch Trinitron monitor.



Telemet had a new NTSC decoder.



Digital clock sync system from Time and Frequency Technology.



Monitor combinations from SC Electronics.

two minutes of film. Cartridges are loaded into a 24-section circular magazine. It contains two film transports—in effect, two individual projectors—so that while one projector is running a film the other is rewinding the previously shown film and cueing up the next one. Start-up is instantaneous, with no pre-roll of the film and transition from one cartridge to another occurs in 200 milliseconds (which is nearly imperceptible to the TV viewer). Production is planned for late 1974.

The Marconi unit was described in some detail in *BM/E*, March 1973, page 36. The unit is impressive in its capability and compatibility with U.S. practices. It remains to be seen if Marconi feels it can establish a U.S. market.

A new telecine, highly competitive to the Cohu 1500 introduced two years ago and the RCA TK-28 introduced last year, was unveiled by TeleMation. The three separate-mesh vidicon TVF-3000 features automatic black level, horizontal and vertical aperture correction (as optional plug-ins), gamma correc-

tion, built-in waveform monitor, built-in servoed neutral density wheel with AGC, remote color balance control, and the ability to operate with TeleMation's digital encoder.

We aren't sure whether the servoed neutral density wheel in combination with AGC provides the same degree of automatic white level as does the Cohu, for example. The latter maintains peak video level by changing both target voltage control and the neutral density filter which controls light levels and resets them when picture fades to black. The RCA TK-28 also operates to correct, automatically, color errors in the original film.

Spindler & Sauppé showed a variety of selector-slide projectors and dissolve combinations.

Measuring, monitoring, correcting

There were plenty of solutions to quality problems at the 1973 NAB Convention. On display for TV were VIR correction systems, automatic differential phase and gain correctors, phase equalizers, and

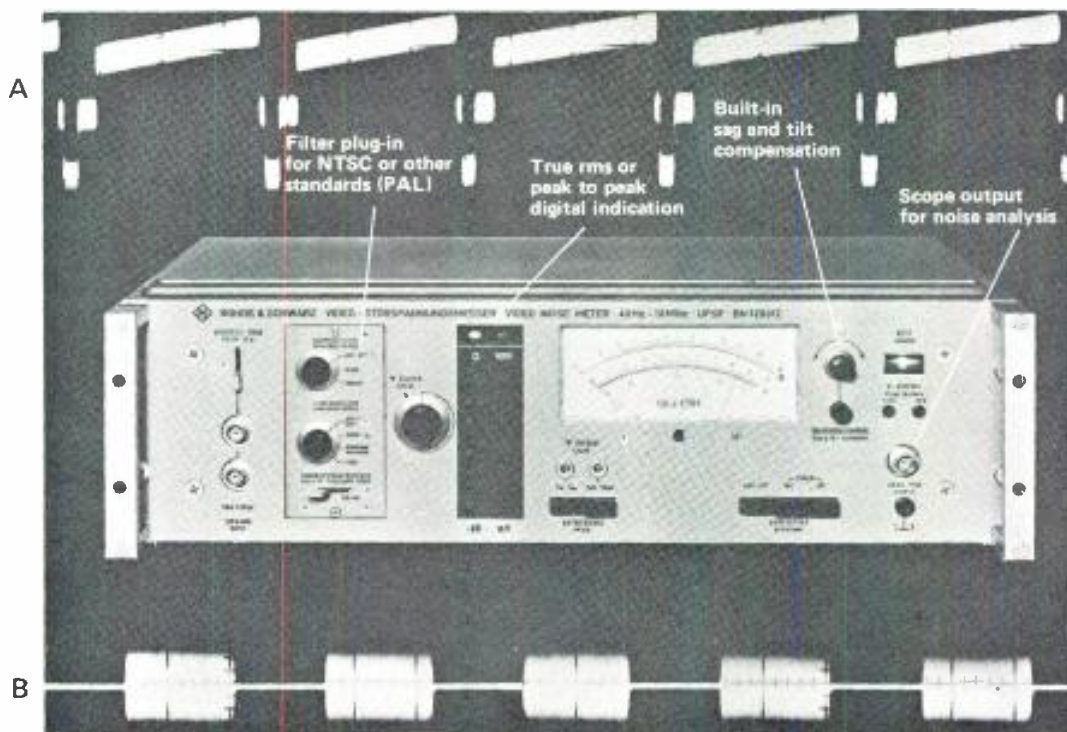
waveform correctors, color matched monitors, and a variety of sophisticated measuring equipment including frequency monitors and sensitive RF amplifiers.

Dozens of exhibitors had digital clocks which often doubled as some kind of a time reference. The most sophisticated was the Digit-Sync Clock System shown by Time and Frequency Technology Inc. It is a master-slave digital time keeping system. The Master Clock (Model 720) keeps the time and synchronizes remote clock timers, large LED time displays (for program control), event timers, etc. Numeric time data can be fed into video monitors. A master oscillator with a time error of less than three seconds a year can be used. Or, a TFT Model 735 WWV/WWVH Time Code Receiver can be used as a source of precise time information. Remote clocks can operate as bi-directional timers for count-down purposes. TFT has several proposed radio and TV station installation arrangements to show how this

continued on page 44

Measure and analyze video noise accurately

(0.5 dB)



Video Noise Meter UPSF

40 Hz - 10 MHz (± 0.2 dB) / 10 Hz - 17 MHz (± 3 dB)

Oscilloscope at A shows presence of noise in sync and video together with tilt. After passage through UPSF, signal is shown in oscilloscope at B. Sync, blanking and part of video have been gated out. Remaining video shows noise clearly without any trace of tilt.

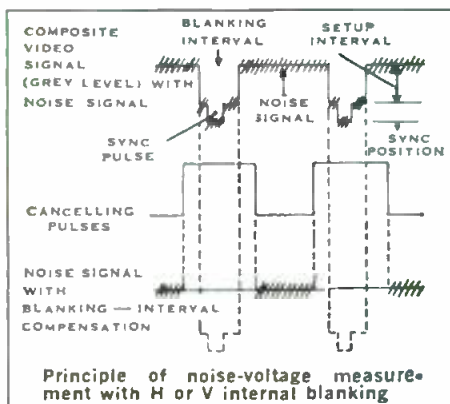
Features

- Meets requirements of all U. S. black and white and NTS color systems
- Measures noise voltage in the presence of sync and blanking pulses
- Can measure down to -85 dB S/N
- True rms measurement using semiconductors — no thermocouple, no thermistor; thus instantaneous indication
- Easy to read linear scale for both peak to peak and rms modes of operation
- Same instrument can be used for NTSC or PAL by changing plug-in filter
- Input impedance: 1 M Ω shunted by 30 pF, or 75 Ω bridging
- Completely solid state
- High accuracy (± 0.5 dB) and repeatability

Applications

Measure video noise voltage on:

- TV Cameras
- Film Scanners
- Video Tape Recorders
- Radio Links
- Coaxial Lines
- TV Transmitter
- TV Receivers
- TV Translater



The UPSF Video Noise Meter is designed to measure the unweighted and weighted noise voltages occurring in 525-line or 625-line TV transmission systems. It has the unique advantage of measuring low level components in the presence of high level horizontal or vertical sync and blanking pulses (see line drawing). The same instrument can be used for the NTSC and other TV standards by changing the filter. These plug-in units contain a bandstop filter as well as the color subcarrier filter, preventing any residual color subcarrier in the test signal from being picked up. High and low pass filters are selectable to assist in analyzing the video noise. The UPSF can also be used as a true rms voltmeter over its frequency range. This improved solid state model is completely free from drift. Built-in sag and tilt compensation eliminates error sources. Built-in calibrator.



ROHDE & SCHWARZ

111 Lexington Avenue, Passaic, N.J. 07055 · (201) 773-8010

NAB SHOW-IN-PRINT

system can be used. TFT also showed its complete line of frequency and modulation monitors for radio and TV.

One of the more interesting developments was the introduction of almost identical VIR correction systems by two companies: CBS Laboratories and Tektronix (*BM/E*, March 1973, page 32). Both insert a Vertical Interval Reference signal at a point in the transmission link where the video signals can be verified. The corrector can be located at the receiving site and it will adjust the signals to match those which existed at the point of verification. Systems are ideal to correct distortion caused by transmission lines. The approach can be applied to monitor what happens in a station, i.e., before and after the

transmitter. At NAB, the Tektronix demonstration showed three color monitors. One reflected the desired signal parameters; the second showed what the picture looked like with burst-to-chroma phase shifts, reduced burst amplitude, etc.; the third showed the picture after the automatic correction which, of course, matched the first monitor. The most discernable difference between the CBS Labs system and that of Tektronix was that the former includes adjustments for four factors plus an option, while the latter has six. CBS adjustments: burst vs. chroma phase, burst amplitude, overall gain, chroma gain, and optional set-up. Tektronix includes these five plus sync gain.

Another new item shown by CBS Labs was the Automatic Differential Phase and Gain Corrector. The DPT Model 2300 removes these distortions from color pro-

grams automatically, much as manual corrections have been made in the past, but it updates the corrections more often. Samplings of the VITS stairstep are made every frame and corrections are continuously made during all of the picture-video time. CBS has received a patent on the technique.

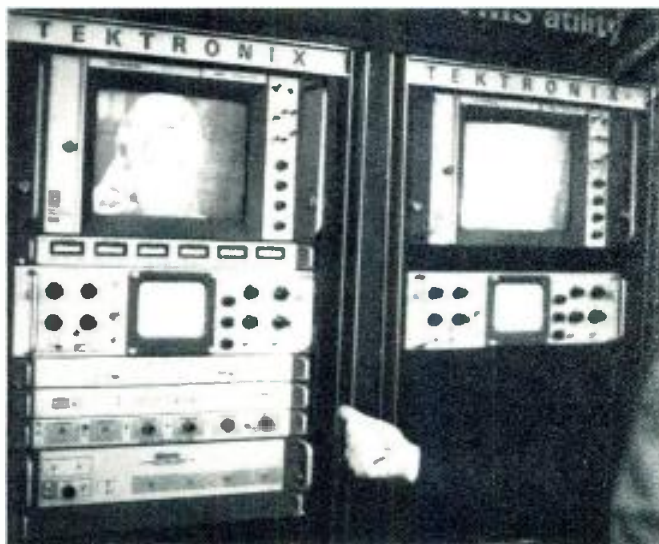
The Matthey Chroma Corrector, shown by Television Equipment Associates, drew special attention. The unit not only monitors color pictures, but corrects amplitude variations within $\pm 40\%$ and delays up to ± 100 ns. Price is \$1575.

The color on color monitors was the subject of interest at the Conrac and Tektronix exhibits. Conrac set up a display to demonstrate how matched color can be obtained on professional monitors. Precision colorimetry is possible by using matched phosphor CRTs.

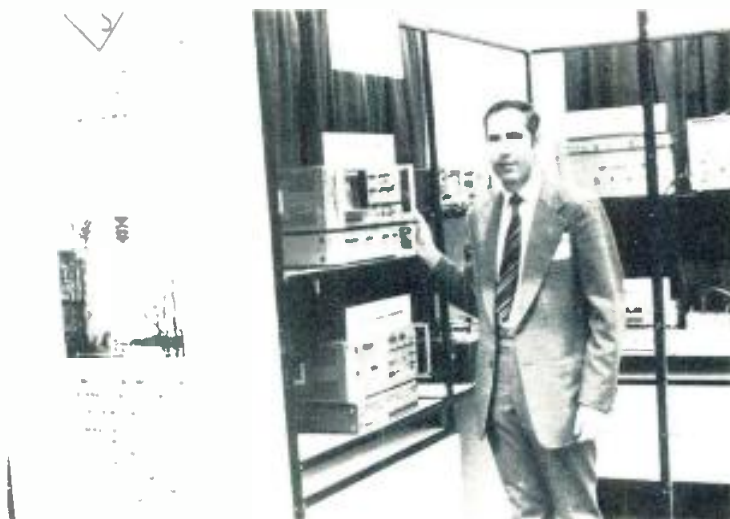
continued on page 46



New CBS Labs VIR Correction System.



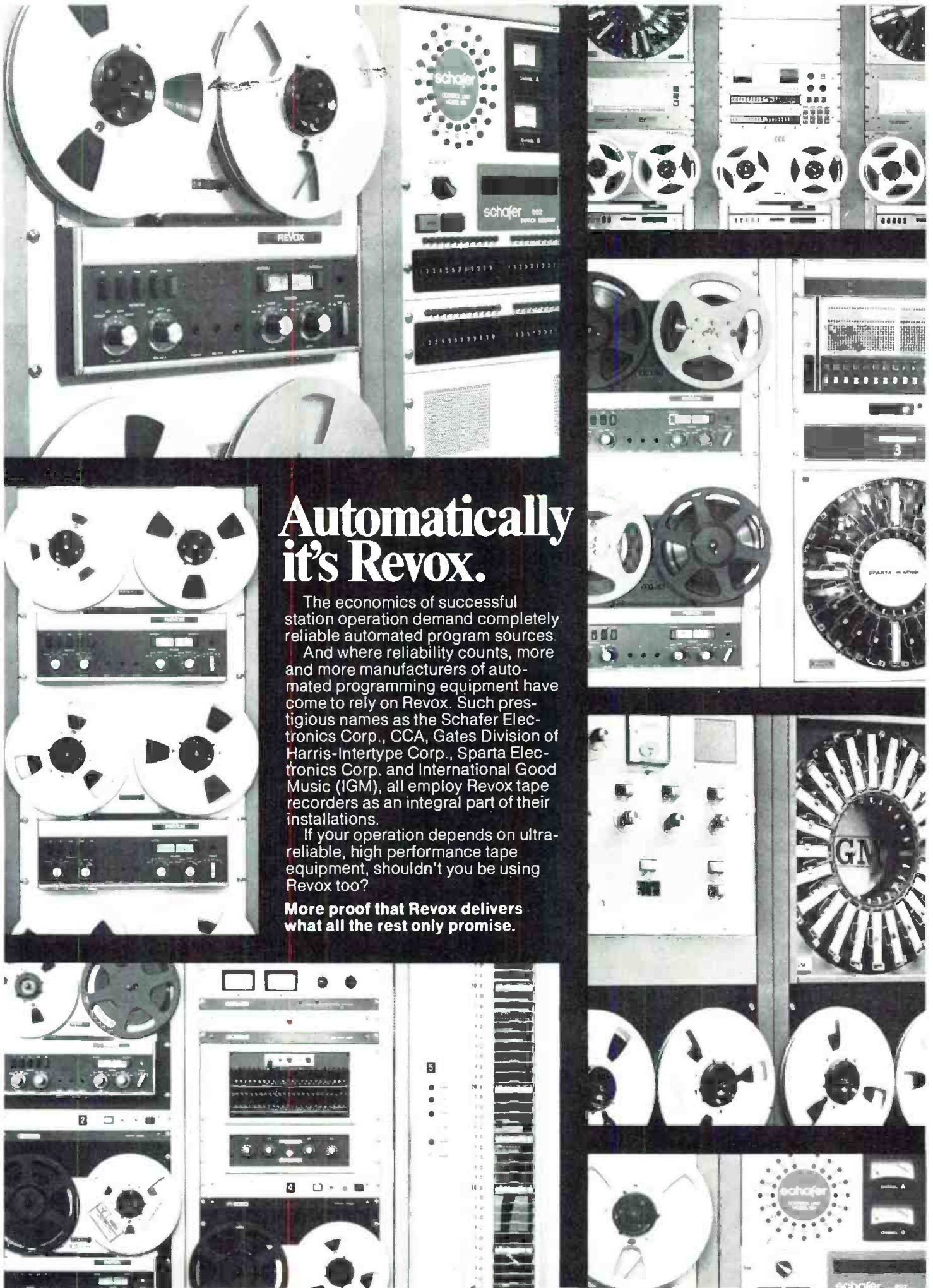
Tektronix VIR Correction System.



Rohde and Schwarz includes new sweepers.



Belar demonstrates modulation monitoring.



Automatically it's Revox.

The economics of successful station operation demand completely reliable automated program sources.

And where reliability counts, more and more manufacturers of automated programming equipment have come to rely on Revox. Such prestigious names as the Schaefer Electronics Corp., CCA, Gates Division of Harris-Intertype Corp., Sparta Electronics Corp. and International Good Music (IGM), all employ Revox tape recorders as an integral part of their installations.

If your operation depends on ultra-reliable, high performance tape equipment, shouldn't you be using Revox too?

More proof that Revox delivers what all the rest only promise.

Revox Corporation, 155 Michael Drive, Syosset, N.Y. 11791. Calif.: 3637 Cahuenga Blvd. West, Hollywood 90068
 England: C.E. Hammond & Co., Ltd., Lamb House, Chiswick, London W4 2PB. Available in Canada.

NAB SHOW-IN-PRINT

Tektronix also talked about selected phosphors in its Trinitron tubes. Phosphors used in the Tektronix 650 and 670 monitors fall within the chromaticity range specified for CCIR or PAL, but not

NTSC (as do home receivers). However, professional monitors have maintained NTSC standards and matrixing. Tektronix now incorporates a correction matrix which allows viewing programs with chrominance characteristics more in keeping with modern home receivers. The 670, incidentally,

uses the 17-inch Trinitron. The single-gun Trinitron has been selected as the CRT for a new series from Conrac, the 5000 Color Monitor. It is available in the 12-inch size at \$1295; larger units in the 5000 series—19-inch and 25-inch—use negative black matrix
continued on page 48



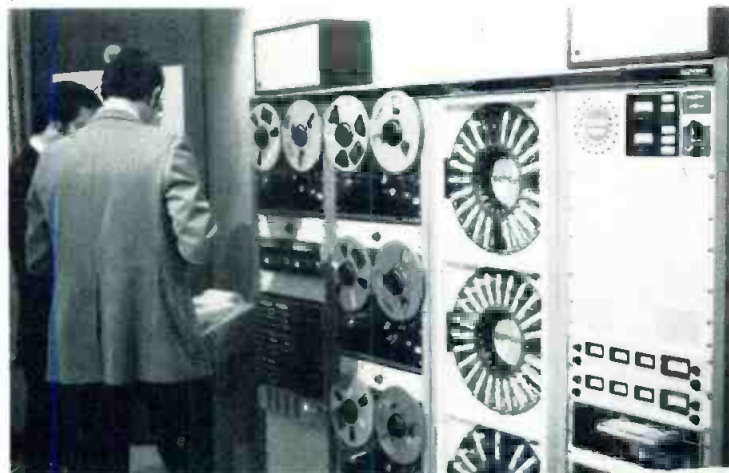
Business automation systems were prevalent.



IGM introduced the BAT system.



Sono-Mag's Alpha programming automation.



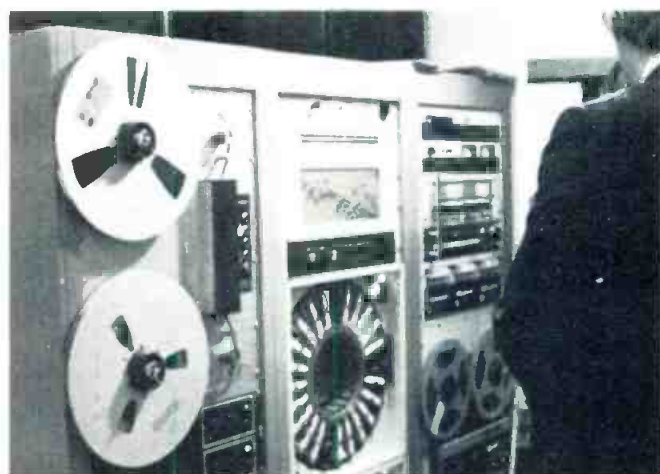
Schafer's 902 system has switch memory.



Close-up of IGM's Insta-cart.



Grass Valley's TV switching automation system.



Sparta radio automation comes in modules.

Ain't nobody else can give you an S/N ratio up to 72 dB. Nobody.

We call it the Scully 280-B Professional Recorder/Reproducer. Not a very fancy name. But it's so new, we haven't had time for anything else but a number.

Briefly, here are the high points, new electronics for up to 72 dB S/N ratio on full track .25" tapes. And a greater dynamic range than you've ever been used to.

Two-track quarter-inch and four track half-inch 280-B lays on a crisp, clean 69 dB on an NAB weighted basis.

We've built in some other choice features, too. Like an OPTAC™ optical motion sensing system that gets rid of deck plate sensor mechanisms. Plus a new mother-daughter board architecture for super easy maintenance.

The spec sheet has all the details.

For more information contact your Scully Distributor or write direct to Scully/Metrotech.





Tele-Cine's 30 to 1 Schneider lens was a first.



Rank showed new flexible Varatol lens.



Angenieux lens for 16mm film cameras.



New Canon dual zoom lens has 34 to 1 ratio.

shadow mask CRTs.

World Video introduced at the show a 17-inch color monitor using the Trinitron. SC Electronics introduced a series of triple-six monitors and 12-inch units (monochrome). The company also showed a new moderately-priced TV tuner and demodulator.

On the broad instrumentation front, Tektronix, Rohde and Schwarz, Marconi, and Telemet had impressive exhibits.

Tektronix showed, in addition to the VIR correction system and the picture monitors mentioned, a full line of NTSC generators, vectorscopes, waveform generators, CATV monitoring equipment, general purpose items useful to broadcasters such as oscilloscopes and digital frequency counters. R&S showed a number of products covering transmitter performance measurements, VTR performance, RF sweeping, VSWR test and field strength measuring. Most of the instruments had been around previ-

ously except for the type HFV (VHF and UHF) field strength meter, and a tracking unit working with the Videoskop III video sweep generator to measure frequency response of systems.

Telemet's line included for the most part equipment introduced before: VIT kit sets, demodulators, NTSC generators, etc.

Among equipment for measuring radio performance was a digital antenna monitor (to measure digitally phase and current ratio) from Delta Electronics, as well as that company's impedance bridge. Potomac Instruments Inc. showed field strength meters. Techniques for measuring modulation (AM and TV) were demonstrated live using off-the-air signals at Belar's booth.

Automation/computer business services

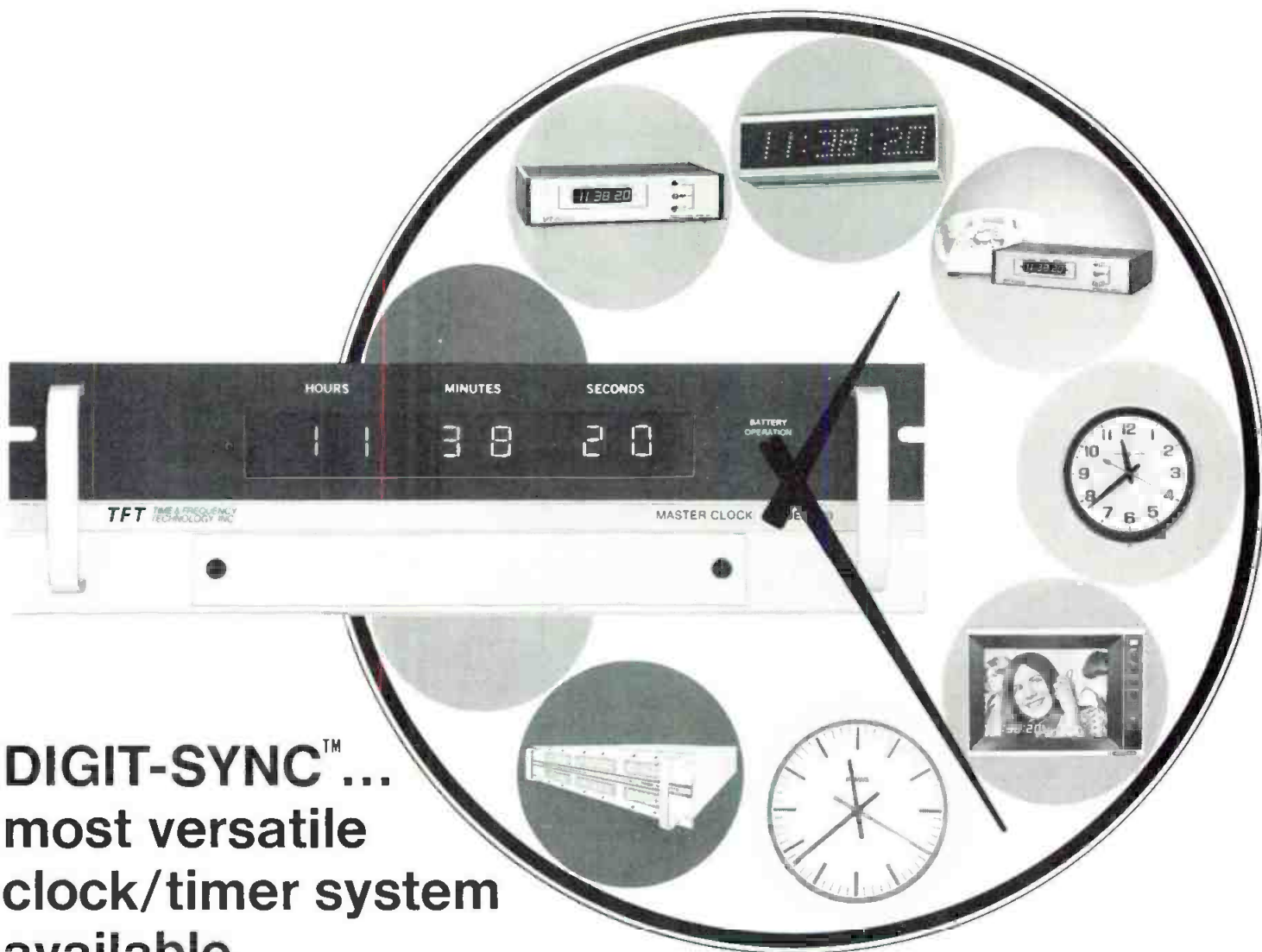
Reports of stations reverting from automation to live personalities are frequent as talk-radio grows in popularity. Actually, these reports

aren't quite precise: a station may cut back on, or drop, a programmed music format, but it's not likely to abandon automation gear completely. Judging from equipment available at the NAB Convention, one could get into automation to any degree desired—there's no need to be all or nothing.

Thus, one could buy a simple rack of automatically-operated Carousels or reel decks for programming sequences or, on the other hand, a multiple cart player to play commercials, IDs, time and weather, etc., between live studio segments. We've already mentioned the compact multiple carts displayed. Let's look at the systems offered.

Reflecting the options available in automation is the Schafer 900 series. The 902 is a relatively simple system using a switch memory. This provides a standard format of 24 events or two-12s. A digital clock provides the time base for controlling formats. Additional

continued on page 50



DIGIT-SYNC™ ... most versatile clock/timer system available

Now, with TFT's DIGIT-SYNC clock/timer system you can synchronize any number of remote digital clocks, impulse clocks, event timers and synchronous motor clocks, and impose time data on a video signal, with an accuracy of one second per month. Or, as an option, three seconds per year.

And installation is easy. Unlike other systems that need more than 20 conductors for remote time display, DIGIT-SYNC uses a single pair of shielded wires to transmit time data and supply DC power to auxiliary units.

In addition, serial time data can be sent over voice band channels,

or recorded on tape for time coding of information.

What's more, you can expand DIGIT-SYNC into a system of virtually any size or complexity. Power failure protection is provided by a 12-volt back-up battery.

... plus the growing line of TFT frequency and modulation monitors

Since the first TFT monitor was introduced in 1971, TFT has become the standard of technical excellence in frequency and modulation monitoring: more than 350 radio and TV stations now use TFT instruments, with good reason.

For example, all TFT monitors give you remote monitoring without an RF amplifier on the front end. This means less interference from the intermodulation products of unwanted signals. You also get digital frequency readouts, digitally settable peak flashers, exceptional long term accuracy, and unequalled solid state reliability.

TFT monitors comply with all relevant FCC requirements for local and remote monitoring.

For more information about DIGIT-SYNC and TFT's growing line of

monitors (more are on the way), call your local TFT sales representative. Or contact us at the address listed below.



TFT TIME AND FREQUENCY TECHNOLOGY, INC.
3000 OLCOTT STREET, SANTA CLARA, CA 95050 (408) 246-6365

Circle 126 on Reader Service Card

NAB SHOW-IN-PRINT

memory panels can be added for additional formats. The 902 can be expanded to become the more flexible 903. This system includes MOS memory and a keyboard display system. Unlimited mixing of sequential and time-oriented events is possible. For a complete computer-controllable system, Schafer has the 8000 system.

Some of the features of the IGM 400 pre-packaged time-insertion audio control unit reflect the flexibility available. The audio controller of the 400 permits talk features to be scheduled on a real-time basis with music automatically filling the balance of the time. It is unnecessary to estimate in advance the number or length of musical selections. The 400 has six inputs, four of which are used for talk features and two for music. The unit, with two reel-to-reel decks and a 24-cart

Carousel, sells for \$9256. The IGM exhibit also focussed on the 500 system for overall flexibility and a new unit, the 740. The system runs two 48-tray Instacarts. A computer-like programmer holds up to seven days of programming—63 inputs are possible.

Sparta stressed that part-time automation is possible and promoted the Spartamate I as the way to do it. This unit, as an expandable starter, includes in one rack the 1052 automatic program controller (12 inputs, 52 events); two Revox A77 Mark III decks; three Century carts; a digital clock, plus interface gear. Spartamate II includes two Carousel players and a random-access selector, the RS 250.

As an economical approach to full or part-time automation, Broadcast Products showed two compact programmers, the AR-100 Mini-Mate and the AR-10 Micro-Mate. The former has 8 inputs and programs spots in sequence or time in-

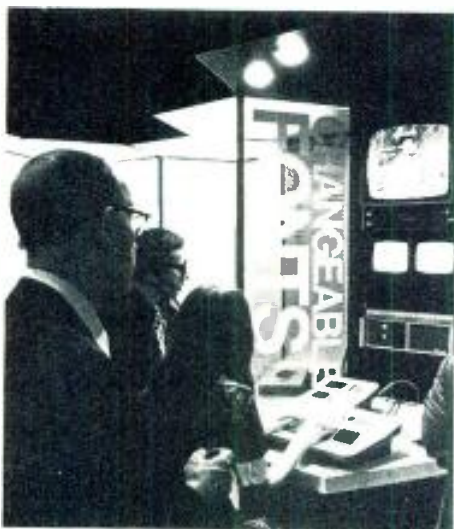
sertion. The latter, for more limited automation (or SCA), accommodates five sources; it can time-insert IDs, but not commercial spots.

Full automation systems, in addition to those mentioned, above were shown by CCA, Gates, RCA and Sono-Mag (Systems Marketing Corp.).

CCA stressed mini-units (\$6800) and maxi-units (\$15,000). Sono-Mag's Alpha system featured an English display on a CRT and the ability to program up to 10,000 events. Most automation systems were, of course, connected to logging systems.

In the area of communications loggers, one of the new wrinkles this year was the use of time code generators to encode time without requiring an extra recording track. This was the approach taken by Metrotech. Its new logger, the 400, stores 600 hours on a single

continued on page 52



CBS Vidifont generator has new bulk memory.



High-style enclosures from Emcor.



New prompter from Cello-matic.



Low-dolly by Vinten at Listec booth.



Subscription TV system from Blonder-Tongue.

WHERE ACCURACY COUNTS ... COUNT ON BELAR **AM FM TV**



FM Monitor, FMM-1



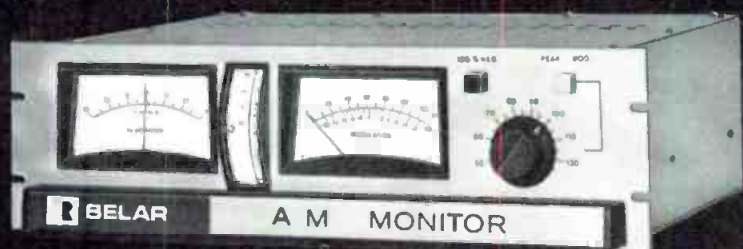
Stereo Monitor, FMS-1



SCA Monitor, SCM-1



FM Amplifier, RFA-1



AM Monitor, AMM-1



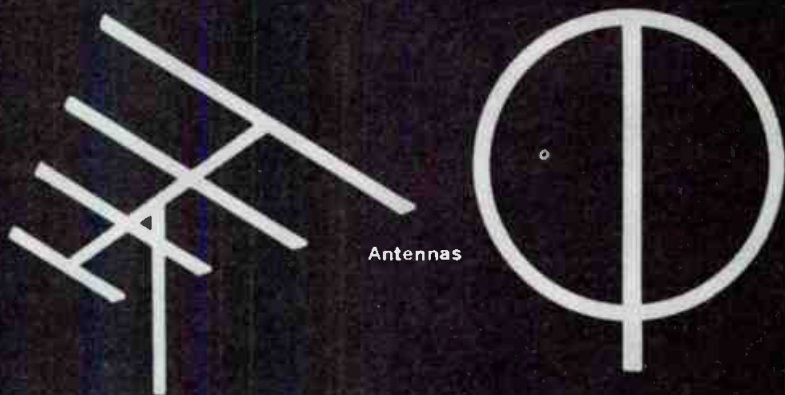
TV Amplifier, RFA-3



TV Frequency Monitor, TVM-2,3



TV Monitor, TVM-1

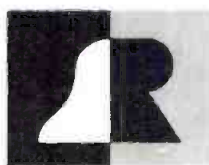


AM Amplifier, RFA-2

The secure feeling that you have purchased equipment that will accurately do the job you intended it to do is most comforting. When you buy Belar AM, FM, or TV frequency and modulation monitoring systems, you'll know that feeling. You'll know that you have the right equipment that will give you ease

of operation, functional checks and unquestionable ACCURACY. And you'll measure all your program material, including the peaks accurately.

Call or write today for more information. We know you'll make the right decision and BUY BELAR.



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

Where Accuracy Counts . . . Count on Belar

Circle 127 on Reader Service Card

www.americanradiohistory.com

NAB SHOW-IN-PRINT

7200-foot reel of .5 mil triple-play tape. The TCG model 4400 multiplexes an encoded time on the recording track which is seen visually on the digital reader on playback. Tape-Athon also showed new loggers.

Both IGM and Sono-Mag showed business automation systems as well as program automation. Business automation was the exclusive service offered by Broadcast Computer Services, Compu-Net, Data Communications Corp. (BIAS), and IBM. The activities of the first three companies are well-known in this field. The 1973 Convention marked the first time that IBM arrived with what it called a Radio Station Management System. This system uses the low-cost IBM System/3 Model 6 computer. The program shown was designed for CBS. It will be available for shipment to others by July 6, 1973. The radio station management system is divided into seven interrelated sections: sales order entry and modification, availabilities, scheduling logging airtime entry, billing and accounting, sales analysis, control, and maintenance. The control section provides automatic procedures for keeping track of all commercial announcement transactions.

The IGM BAT 1000 System gets its name from *billing, accounting, and traffic* system. BAT 1000 gives

the broadcaster an in-house mini-computer with cathode ray tube inquiry display imprinter; a complete system including software and a turnkey-type of installation including all the training that is necessary to run the equipment and operate the software. The BAT 1000 stores a week's schedule in the memory with any or all items available for inspection. When orders reach their end dates, they are automatically deleted from the program schedule by the computer. The system can be run by one person. The basic unit sells for \$22,950 or leases for \$527.85 a month.

A system for keeping track of vertical and horizontal spot rotation for optimum mixing was shown by a new exhibitor, Raymar Associates, Inc. from San Francisco. Raymar showed paper and display systems for instant data retrieval for traffic/sales programming/accounting/studio operations.

Here and there on the exhibit floor

The NAB Convention had its riddle product: what item was most ubiquitous yet practically unseen? No, it was not camera dollies or lenses or lights, but Insta-key. Insta-key, a synthetic, non-reflective, bonded fabric, distributed by American Scenic Company (Greenville, S.C.), was that invisible blue stuff wherever you saw chroma-key demonstrations. Miss Insta-key cloaked in a full-length cape appeared "bodiless" on cameras at

booths of Gates, Philips, Fernseh, RCA, and others.

Lenses didn't exactly go unnoticed at this convention. The biggest news was the Schneider lens at the Tele-Cine booth. A new 30 to 1 zoom series was available to fit most RCA, Fernseh, Philips, Ampex, Gates, and Commercial Electronics Inc. cameras. The 30 to 1 is unusual in its small size (see picture) and weight and reasonable cost. It can operate both as a studio camera or in the field. It's the longest continuous zoom range of any announced so far. Tele-Cine also showed a new 10 to 1 TV-30 series which fits smaller cameras.

A new generation of lenses for portable or hand-held TV cameras was also shown by Rank Precision. The new series, called the Cook Varitol, makes it possible to shoot right angles from very close-up situations. Another feature of the Rank exhibit was the Varitol 30 television lens which combines an 18-inch minimum optic distance from the front of the lens, a 16mm-160mm focal length, and a keystone of 2.2. It utilizes new glass formulas and improved coatings and is available for all major broadcast cameras.

Canon showed a 34 to 1 double zoom lens: the front zoom portion gave a 17-times ratio and the rear zoom, a 2-times ratio. It is available for all one-inch Plumbicon TV cameras. The range of focal length is 24/800mm. For 1¼-inch Plum-
continued on page 54

STEREO PHASE ENHANCER

MODEL
STE-100

DOES YOUR MONO-SUM (L+R) SIGNAL SUFFER FROM PHASE DISTORTION?



STE-100 INPUT

SEE WHAT THE STE-100
STEREO PHASE ENHANCER CAN
DO FOR YOUR STATION!

(ACTUAL SCOPE PHOTOS OF L+R SIGNAL)



STE-100 OUTPUT

- Enhances Discrete Stereo Signals
- Affects Only Phase—No Signal Degradation
- Place Before Stereo Generator
- Fail-Safe Bypass
- \$795.00

FROM THE MAKERS OF RAPID-Q™ CARTRIDGE TAPE EQUIPMENT

GARRON ELECTRONICS INC.

1216 KIFER ROAD SUNNYVALE, CALIF. 94086 (408) 736-8737

Circle 128 on Reader Service Card

FASTEST HANDLING SINGLE SYSTEM SOUND CAMERA IN THE WORLD.

Canon Sound Scoopic 200. A single system sound-on magnetic news documentary camera. Designed for the TV news cameraman. Without compromise. And with features long demanded . . .

REFLEX VIEWING through a 135° rotating mirror shutter. No beam splitter. No loss of light at the film plane.

FULLY AUTOMATIC THRU-THE-LENS METERING with manual override control. F stops visible in the viewfinder. Instant open and return diaphragm for fast focusing.

FILTER SLOTTED 12.5-75mm Canon zoom lens. Filter changeable in seconds.

REGISTRATION PIN MOVEMENT. Assures perfect framing.

ELECTRONICALLY GOVERNED MOTOR. Insures accurate sound speed.

MODULAR TWIN SOUND HEADS. Snap in and out in seconds.

LIGHT WEIGHT. 12 lbs. 6 oz. Including body with film chamber, lens, exposure system, sound heads and take-up spools.

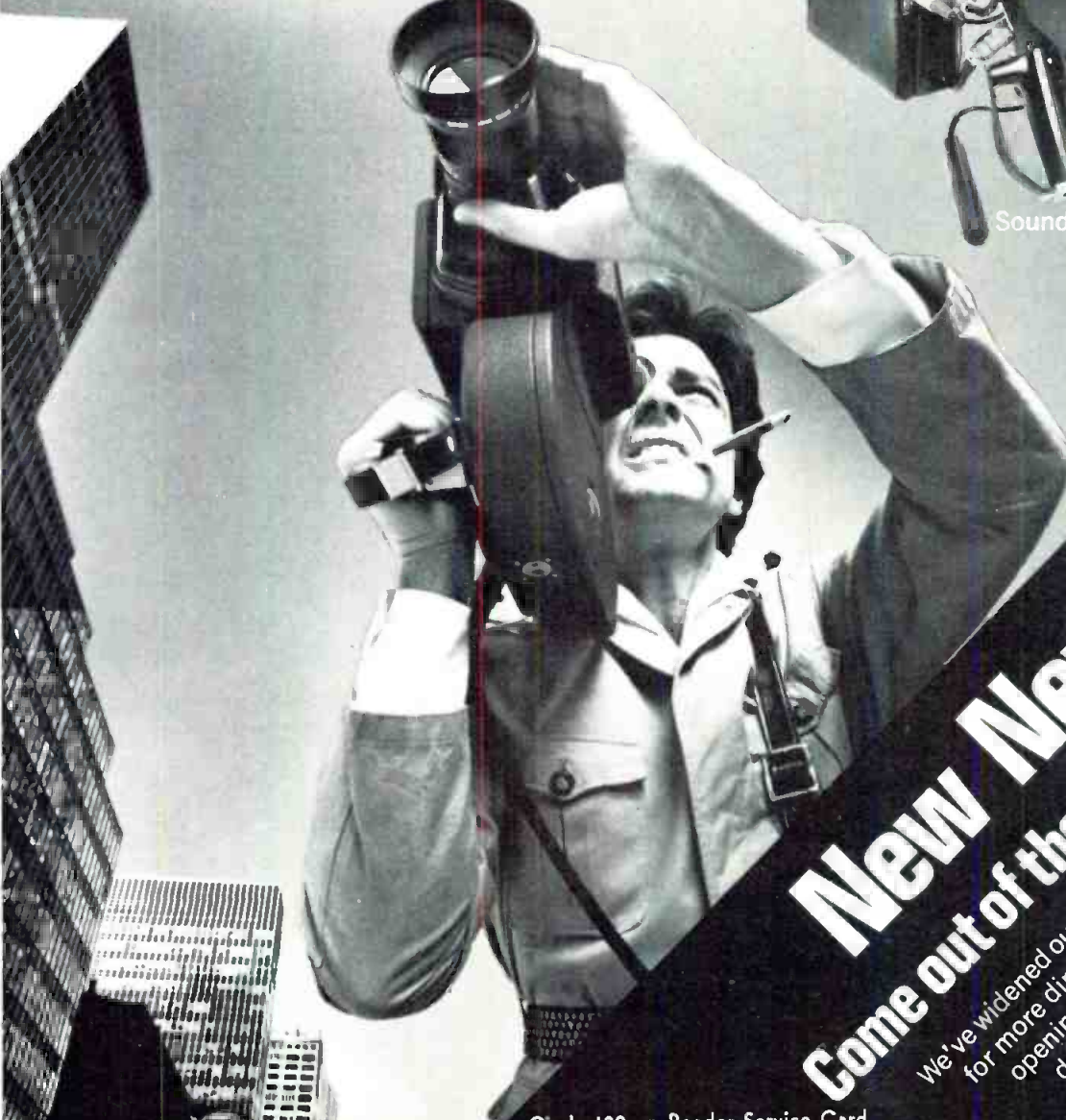
LOW PROFILE bottom load design for 200 feet daylight spools. Shoot from cars, doorways . . . anywhere.

AND MORE. A 6 lb. 14 oz. over-the-shoulder amplifier/camera power pack in a single unit. With advanced automatic gain control with manual override. VU meter. Dual mike input. And a fast rechargeable battery that powers the camera, meter and amplifier through 2000 feet of film. Recharges in under 5 hours. Batteries interchange in seconds.

Feature for feature, Canon Sound Scoopic 200 adds up to getting the news faster than ever. See it in action at your Canon dealer. Or write us for more information.



Sound Scoopic 200



New New New
Come out of the dark with great shots!
We've widened our rotating mirror shutter angle from 135° to 170° for more direct light to the film. And we've changed the lens opening from 2.5 to 1.8. Now you can shoot in much darker areas than ever before.
At Canon we make good things even better.

Canon
SOUND SCOOPIC 200
Canon USA, Inc.
Nevada Drive, Lake Success,
New York 11040

Circle 129 on Reader Service Card

bicon color TV cameras, Canon showed a new 12X TV zoom lens.

Angenieux showed its 15 to 1 TV lens with an extremely wide angle and close focusing feature. The majority of its display, however, was given over to lenses for 16mm motion picture cameras. Among the new lenses shown was an automatic iris zoom lens—the 10 x 12 AV30DA.

There was also some new prompting equipment about this year. Cellomatic Production Corp. (London) showed the Autocue unit described as the only flare-proof prompter in the world. That's because there are no lights shining on the script sheet. Autocue is a CCTV system—a vidicon picks up the script and it is projected on a monitor which is hung onto the studio camera lens. Cellomatic, with sales offices at 1546 Broadway, New York City, also showed a caption card scanner (feeding into a studio camera) and an interesting animation projector. Animation is created using still photography—a dual 1000-watt light optical system allows projection of composite images by superimposing one light source over the other. Eight optical effects are possible with the system.

Q-TV showed an economical CCTV system, the VPS-100. The monitor image, like the Autocue, could be superimposed over the optical axis of the taking lens.

Fax-Net Inc. demonstrated radio for the deaf. As you might guess from the name, the system uses facsimile equipment.

Among the more interesting unusual displays was a demonstration of BTVision Inc.'s over-the-air subscription TV system. Price, program, and a "barker" channel are separated from the program channel in the BTV system. If you like what you hear, you press a switch and the decoder unscrambles the program sound and picture. At the same time, a thermal printer within the unit prints the price and program number on a ticket. At the end of the month, you mail in the tickets purchased along with your payment and nobody will take away your decoder.

A frame-freeze video storage

continued on page 56



Panic Buttons for Video Tape Reels

Whenever you run out of video tape reels, it's always the worst possible time. When you can't do anything but panic.

Call us.

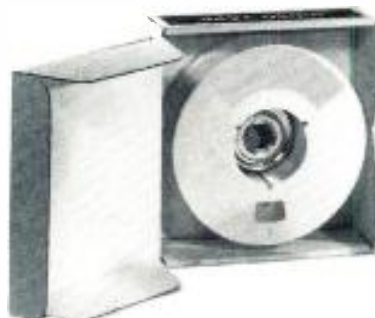
We have every size reel you need, ready to go: 1/2", 1", 2". They're made of rugged Plio-Magic to resist bending, cracking, breaking, even under impact. They're competitively priced.

Next time you get in a bind on video tape reels, hit our panic buttons: 201-933-9125. We'll give you the fastest service in the business.

Send for our new Video Tape Catalog today.

PLIO-MAGIC

Plastic Reel Corporation of America
Subsidiary of Williamhouse-Regency Inc
Dept N5, 640 South Commercial Avenue
Carlstadt, New Jersey 07072



Change is in the air.



Now you can get more from your telephone. In the studio. On location. In the office.

For example, either our 30A Voice Coupler or our versatile 50A Portable Conference Telephone now allows you the flexibility of using regular telephone lines for remote broadcasts.

In addition, “hot lines” to the police and other news sources give you the news as it breaks.

And new compact switching equipment makes it easier for callers to reach your station, and makes communications more efficient for all your staff.

But with all our increased flexibility and innovative service offerings, one thing hasn't changed: Bell System dependability. Automatic test equipment monitors performance at our place, and we correct most troubles before you notice them at your place. And if you do need to call for help, it's never Long Distance. With us, it's always a local call.

For the whole story of how modern communications can help broadcasting performance and profits, telephone your Bell System Communications Consultant.

AT&T and your local Bell Company.



Listen to the Sound of Freshness

Test tapes deteriorate, for a variety of reasons... including use, magnetized heads and the presence of random magnetic fields. High frequencies are the first to go and, before you know it, you are in an area of distortion all your own... completely at odds with the rest of the industry.

If your test tapes are a year old or older, get your system back in order with precision STL test tapes... internationally acclaimed.

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
Stamford distributor: Audio techniques, Inc.

Circle 131 on Reader Service Card



\$1,895

... for LPB's S-15, 8-Channel, Dual-Output Mono Signature Line Audio Console with 19 inputs. In addition to moderate price and excellent performance, the S-15 features:

- Step attenuator mixers.
- Plug-in fiberglass printed circuits.
- Telephone type switches.
- Individual plug-in program, 12-watt monitor, cue and headphone amplifiers.
- Remote line talkback.
- Input transformers.

There are many other plus features you'd expect to find in only higher priced units. LPB also offers the S-14, 5-Channel, Dual-Output Console, with 15 inputs, at only \$1195. Other LPB consoles from \$325.

LPB offers a complete line of broadcast audio equipment. Call or write us for all your audio needs, from tape recorders to frequency and modulation monitors.



LPB Inc.
520 Lincoln Highway, Frazer, Pa. 19355 (215) 644-1123
In Canada: P.O. Box 669, Orleans, Ontario (613) 824-3232

NAB SHOW-IN-PRINT

tube was an attraction at the RCA Electronic Components display. Two black-and-white TV monitors were refreshed 30 times a second with a signal captured by a vidicon tube and stored on the RCA C22041 silicon target storage tube. The storage tube holds a picture for



Lighting row: Colortran and Sylvania



Kliegl demonstrated its Q memory control system.

about ten minutes. The Components group was also stressing a way to reduce "cavity inventory." Called the "tube and cavity" approach, the idea is to match a Cermolox power tube to a cavity. By so doing, you don't have to worry about filament resonances.

For the most part, the exhibits of Innovative Television Equipment and Quick-Set looked a lot like previous years since it's hard to come up with something new in camera mounting equipment. Listec did catch attention, however, with its new low-angle dolly made by Vinten. Vinten also had some new pedestals on display at the Listec booth. Power Optics also had an unusual item: a X-Y coordinate system for moving cameras over scale models.

Among the other items on display at the 1973 NAB show were a silver, fixer, and bleach recovery system to make money out of photographic processing waste. The system was shown by Profit Recovery Systems. A series of attractive rack

systems for consoles and other equipment was shown by Amco. Amco's line was "standards with styling at a price you can afford."

In the area of lighting, memory systems, large and small, were in vogue. Kliegl Bros. demonstrated its Q-file Memory, as well as a two-scene preset system. Skirpan Used CRT/light pen control and stressed solid state dimmers, as did Berkey Colortran. Century Strand and Mole Richardson stressed lights rather than control.

Audio at the NAB

The center ring, of course, was taken up by the bevy of very pretty girls bathing in studio lights in front of video cameras. The scene was replicated on monitor screens in exhibits throughout the convention hall. Between the cameras and the monitors were often VTRs or video cart machines. Also near center-stage were giant transmitters and impressive video switchers.

Audio equipment was rarely in the center ring for understandable



3M Series 79 Synchronizer for editing.



New ITA professional reel recorder.

continued on page 58

Two Brand-New, Invaluable Books For Broadcasters

How to Prepare A Production Budget for Film & Video Tape—By Sylvia Allen Costa

A complete guide to determining finances for any video tape or film production, from TV commercials to feature-length films.

For anyone connected with film and video tape production, including students who want a firm grounding in the economics of budgeting funds, here's a new book jammed with facts covering every aspect of estimating costs.

Before a producer can begin hiring a cast and crew, he must know what his costs will be in a wide range of functions. In addition to personnel, he must know approximately how much the equipment will cost, the cost of raw stock, scenic elements, editing, special effects, and a myriad of overhead items. This book tells how to estimate every cost associated with any size production.

Beginning with a detailed explanation of the duties of an estimator, the author tells how to go about determining the cost of the production location—whether it's a studio or an outdoor or remote site. After location expenses are figured, you'll learn how to estimate the costs needed for cameras and accessories, sound equipment, lighting gear, other equipment, raw film stock or video and sound recording tape, lab developing, printing and processing fees, sound recording fees, etc. One of the biggest cost items in any production is personnel—creative, technical, and talent; the author explains the many ramifications involved, with attention to the rules of the major unions. Other areas fully covered are the cost of scenic elements (sets, props, etc.), location expenses, surveys of remote shooting locations, film and tape editing, optical effects and animation, plus a host of miscellaneous expenses such as writer fees, animals, special effects requirements, and insurance. Also included are typical rate listings and eight sample budgets, representing TV commercials, documentaries, and feature-length films. 192 pps., 17 chapters. Glossary. Index.

CONTENTS: The Function of an Estimator—Studios & Locations—Equipment—Raw Stock—Laboratory Charges—Sound Costs—Production Personnel—Talent—Scenic Elements—Location Expenses—Surveys—Editing—Opticals & Animation—Miscellaneous—Overhead—Nonunion Production—Sample Budgets—Index

SAVE \$300

How to Prepare A Production Budget For Film & Video Tape

PREPUBLICATION PRICE ONLY \$9.95

- List Price \$12.95
- 224 fact-filled pages
- Hardbound Volume
- Literally an all-in-one Handbook
- Only \$9.95 if you order now

This book is published to sell at \$12.95, but if you order now, you can save \$3.00. Prepublication price prevails through June 30, 1973.

Passive Equalizer Design Data—By Ralph Townsley

The first NEW book on the subject in nearly a decade—modernizes the techniques of designing passive equalizer networks by "cook book" procedures backed by precise computer data.

For rf, audio, or broadcast engineers, this indispensable guide should be constantly at your side if you are involved in any type of equalizer design. The tedious task of designing networks for individual systems has been enormously simplified to provide greater accuracy than ever before possible. In step-by-step detail, the author shows you how to observe the characteristics required for equalizers: how to select and design equalizers specifically tailored to individual cases; how to read charts, graphs, and the computer-generated data—all in this one huge volume—to arrive at specific values of R, L, and C for the actual devices you need. Previous data and charts for the design of RLC attenuation vs frequency networks covered a span of only two decades of frequency, usually spaced to 1 dB increments and standard values. The computer-tabulated data in this handy new reference work consists principally of the values which would be read from the graphic curves if the curves could be read to extreme accuracy—to seven decimals and over FOUR decades of frequency. The tabulations also provide k-factor values used in the calculations of the equalizer circuit constants. Even those who are unfamiliar with the subject can benefit from the content, which includes a brief history of the uses of passive attenuation equalizers. Included are charts to show how to use the tabulated data and to provide a graphic concept of attenuation vs frequency for eight types of equalizers. 65 illus. 496 pps., 8 1/2" x 11", 60 charts.

CONTENTS: History of Standardization Attempts—Design Considerations—Measurement Procedures—Construction of Sawtooth Oscillator for Comb Generator—Actual Design Data (350 pages of computer-tabulated data)—Examples of unusual equalizer designs—Index

SAVE \$400

Passive Equalizer Design Data

PREPUBLICATION PRICE ONLY \$15.95

- ENGINEERS—Belongs in every station library!**
- List Price \$19.95
 - GIANT 496-page book
 - BIG 8 1/2" x 11" pages
 - Hardbound volume
 - Only \$15.95 if you order now!

Order either or both books today at our risk for 10-Day FREE examination. SEND NO MONEY! Simply fill in and mail the handy NO-RISK coupon to receive your own copies of these helpful volumes.

PUBLISHER'S GUARANTEE

Put the information in these books to work for you for 10 days. If they don't prove to be worth several times their cost, return them and we'll cancel invoice.

NO RISK COUPON—MAIL TODAY

TAB BOOKS, Blue Ridge Summit, Pa. 17214

Please send me _____ copies of How to Prepare A Production Budget for Film & Video Tape at the Special Prepublication price of only \$9.95 (10 percent additional discount on 3 or more copies)

Please send me _____ copies of Passive Equalizer Design Data at \$15.95 (10 percent additional discount on 3 or more copies).

I enclose \$_____ (Postage & handling prepaid)

Please invoice on 10 day FREE trial

Name _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

SAVE POSTAGE by remitting with order. Foreign add 10%. Pa. add 6% B 53

Circle 132 on Reader Service Card

NAB SHOW-IN-PRINT

reasons, but it was in the show and showing a lot of life. Many station engineers today, particularly in radio stations, believe that the audio section is now (or should be) a focus of technical advance (the other side of the coin is that it is a focus of trouble and dissatisfaction). It is clear from the earlier part of this report that transmitters, for example, are by and large stabilized in design, reliable in operation, and reasonable in price. Audio has, to

some extent, missed that kind of shakedown. This is partly the result of the steady upgrading in audio standards, and partly a hangover from the old AM engineer and management attitude, now fading away, that the audio chain couldn't be less important.

Whatever the reasons for the state of audio broadcast equipment, the station operator or engineer who is in a replacement mood, whether to catch up with the progress of the art or to reduce trouble from the aging of his equipment, can plug

two character generators for the price of one?



Absolutely—and only with the DATAVISION Model D-2400 Character Generator, performance-proven in worldwide broadcast use for:

- Title Inserts • News Flashes • Station I.D.'s • Announcement Crawls • Video Production Work
- The D-2400 gives you two complete character generating capabilities for

the price of one. Its unique 2-channel output lets you display any one of 4 stored title pages on the "program" channel while you simultaneously compose or edit any other page on the "preview" channel. And, it lets you pre-compose program information on AUDIO TAPE for instant display.

Each D-2400 page displays 8 full rows of clear/highly visible characters. The characters are 32-scan lines high, and easily read as far as 30 feet away from a 21" TV screen.

That's not all—the D-2400 has plenty of other *Standard* features, too: 2-speed Horizontal Crawl, Controlled Word Flash, Handy Lower-Third Title Insertion which allows random access and display of up to 32 single-row titles, an easy-to-use Alpha numeric keyboard, Instant keyboard entry, Internal Non-additive Video mixing, and a Data Output Connector that really lets you talk with computers. Plus—a host of useful, optional features you can add to meet specialized requirements.

That's the DATAVISION D-2400. One character generator that does the work of two! Yours for only \$4,500. To learn more, or to arrange a free on-the-spot demonstration, just write or give us a call:



DATAVISION, INC.
15932 Shady Grove Road
Gaithersburg, Maryland 20760
(301) 948-0460

Circle 133 on Reader Service Card



Lineup from Revox.



New Electro-Sound ES-505 professional recorder.



New logger from Tape-Athon.

holes in his system, or start all over, at a wide range of prices. The most interesting new items at the NAB show were in the areas of tape recorders and consoles. The other audio elements were there too, and the total effect gave assurance that the audio section can be raised to the state of the art in a variety of ways, a matter of special interest to FM station operators who are competing for the young public with its high audio expectations.

Open-reel machines: At the top

The general level of open-reel tape performance has shot up in re-

cent years, and the show gave us another look at the fairly familiar top-grade machines of Ampex, 3M, and RCA. Aimed straight at the broadcaster was 3M's new M79 Series of machines using 1/4-inch tape and available in 2- and 4-track configurations. The control system on these machines looked extremely well throughout and adaptable to day-to-day broadcast routine.

Also on display were some multi-channel machines designed primarily for recording studios. Such machines, especially up to the four-channel level, are beginning to attract good-sound-minded broadcasters who like the audio creativity possible with multi-channel mix-down. The latest big-firm machines give the station operator full assurance of audio at the top.

The number of smaller firms bringing out high-performance tape machines aimed specifically at the broadcaster, like the 3M series noted above, is an important sign of the times. New machines were put on view by Electro-Sound, International Tapetronics, Scully-Metrotech, L. J. Scully Manufacturing Co., Sparta, Telex, Tape-Athon, Studer (new to U.S. and available here through Gotham Audio of New York), and Revox who was on hand with its not-brand-new but important machine. Any one of these machines is likely to make a dramatic improvement in radio station audio quality, if the machines now in use are matching (or perhaps no longer do match) the standards of seven to ten years, or more, back.

Beyond performance standards, these machines, almost to a man, are remarkably well engineered for easy, strain-free day-to-day use. They have reduced the chances for operating goofs or tape mishandling to the lowest level ever, and in general give the operator a breeze of a task.

For example, Electro-Sound's new ES-505 series has a built-in test generator for quick daily check-out. It also has motion sensing of the tape; push the play button when the tape is in fast motion and the machine brings the tape to a stop, goes into play with no snaps or jerks. The same effect is provided on the new Scully-Metrotech 280B series with an optical motion sen-

continued on page 60

The V11/21 Automatic Digital Logging System



from the industry's Creative Product Innovators.

The V11/21 Automatic Digital Logger records and prints out all necessary meter readings, saves valuable engineering time and assures total accuracy.

Here's a complete, self-contained system, including a printer which can display and print-date identification, time, channel number and meter readings in volts, amps, watts, etc. The system is capable of sampling, measuring, displaying and

recording analog inputs from single or multiple sources, and is equipped with a real-time, solid state, 24-hour digital clock. Precise time can be displayed visually and also printed out.

This compact unit is only 7" high. Virtually maintenance free, it utilizes plug-in printed circuit cards for quick and easy replacement. Optional elements and equipment can be added for even greater versatility.

\$6975

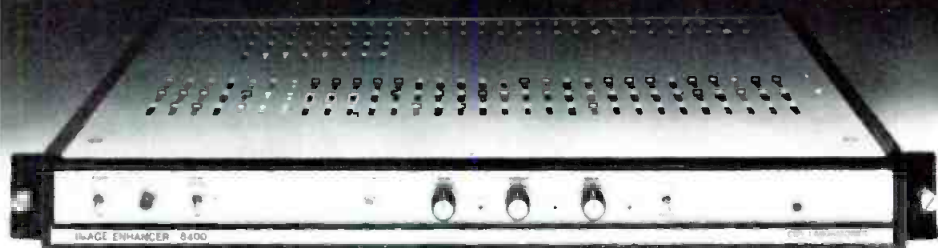
McBEE LABORATORIES

Special Electronic Equipment -- for
Government, Industry & Institutions

5151 WISCONSIN AVENUE, N.W.
WASHINGTON, D.C. 20016
(202)244-2345 (202)244-5535

Circle 134 on Reader Service Card

Send only
the best.



CBS Laboratories Mark III Image Enhancer is preferred by most TV stations. Because it sharpens both vertical and horizontal detail automatically. And improves picture resolution as well as color fidelity. The Mark III, with unique "crispended-comb" filter, separates chrominance from luminance, providing sharper contrasts with more defined picture detail. Available for all monochrome and color cameras. From CBS Laboratories, of course.

CBS LABORATORIES

A Division of Columbia Broadcasting System, Inc.
227 High Ridge Road, Stamford, Connecticut 06905

Circle 135 on Reader Service Card

Matthey Video Delay Lines

PULSE DELAY

Type: P5/47014

Delay range:

100-1500 ns. in 100 ns. steps*

Equals:

66 to 975 ft. of coax cable

Max. rise time: 200 ns.

Dimensions: 2.8"x.65"x.45"

Impedance: 75Ω

*Other taped pulse delays reduce error to 2.5 ns.

Price	Quantity
\$44.75	1-10 units
40.25	11-49 units
37.50	50 plus units
Small metal boxes with BNC connectors for above \$10.00	

You can forget about whittling coax cable to correct phase and timing errors. Matthey video delays have better performance, are easier to install, don't change with temperature or humidity, and are less expensive than cable. They don't take up space: in one hand you can hold video delays equivalent to thousands of feet of coax cable.

Matthey fixed and variable video delays can be cascaded for a maximum delay of 4,000 ns. (2500 ft. of cable). Matthey video delays are available in PC modules, in metal boxes with BNC connectors, infinitely variable with switches and vernier, and rack-mounted. Try one without obligation.

Details from

Bill Pegler

phone (516) 628-8068

Television Equipment Associates

BOX 1391 BAYVILLE, N. Y. 11708

Circle 136 on Reader Service Card

Loaded with Schafer value.



Schafer's new Model RP720.2 professional tape recorder and reproducer provides excellence in craftsmanship and performance at an unbelievably low price. Value-packed features include:

- 3 speeds • Ferrite heads • Positive reel locks
- Hysteresis synchronous capstan motor • Plug-in head assembly • Tape index counter

For details on the remarkable performance-to-price ratio of this new tape recorder, contact Schafer Electronics Corp., 75 Castilian Dr., Goleta, Ca. 93017, (805) 968-8755. In Canada: Schafer Electronics Ltd., 5824 Burbank Rd. SE, Calgary, Alberta, Can. T2H1Z3, (403) 253-0351.

schafer Electronics Corporation

Circle 137 on Reader Service Card

"a complete monitoring system"

FM • STEREO • SCA

TBM•3700 this is FM MONAURAL

- internal calibration •
- measures internal S/N •
- carrier failure indication •
- full remote metering available •



TBM•2200 add this for FM STEREO

- simultaneous left/right •
- reading of modulation •
- metering function on one switch •
- direct reading of •
- separation and crosstalk •



TBM•2000B add this for SCA

- internal calibration of •
- SCA injection, •
- frequency and modulation •
- plug-in modular design •
- NEW for NAB/73 •**



TBM•2500C add this for OFF AIR monitoring

- excellent sensitivity •
- superb selectivity •
- 45 dB AGC range •
- phase linear for •
- excellent stereo/sca recovery •



monitors

For complete information, please contact: Director of Sales (402) 342-2753

McMartin

605 n. thirteenth street • omaha, nebr. 68102 • (402) • 342 • 2753 • telex 048 • 485

Circle 138 on Reader Service Card

NAB SHOW-IN-PRINT



New Scully-Metrotech 280B series.



Systems from United Research Labs.

sing system the maker calls "Optak." The 280B machines are particularly compact, easy to get into, easy to use.

L. J. Scully's new LJ-10 has motion sensing built into its mode logic circuits, as has the Studer A80, with a memory bank in the completely solid-state motion control system that stores, commands, and issues them in a logical order for safe and easy tape handling. The motion sensing system on the Studer A80 is also opto-electronic, scanning the rotation of the right-hand tape guide roller. This highly sophisticated machine, widely used in Europe, has electronic control of the torque on both reels, fed by tape tension sensors, to keep tension on the tape constant and proper in all modes.

Most impressive about the new machines are the performance specs; for several years the best professional tape recorders have

been pushing against performance limitations in an area where further advance comes hard. But the latest high-quality machines have, in many cases, managed substantial advances.

For example, RMS flutter is becoming available in a number of machines in the range below about 0.07%, and that is excellent. Frequency specs, of course, cover the entire audio range within a dB or two. Signal/noise is in the 60-70s.

The Revox A77 has carved out a niche of its own in FM broadcast stations. Less expensive than the others mentioned, it has supplied many smaller FM stereo stations with a very high-quality per-dollar ratio. Though obviously not as sophisticated mechanically or electronically as, for example, the far more expensive Studer A80, the Revox has satisfied the audio need in many cases. Tape-Athon's new Model 1001 demonstrated outstanding good motion by playing a music program at 15/32 ips, without obtrusive flutter. This makes



New Centurian console from Sparta.



Consoles galore from CCA.



Custom console from McCurdy.

continued on page 62

All New and Improved Ferrograph RTS-2

Simple to operate

- Learn to use in minutes
- Minimum set up time
- Only two leads necessary
- Pushbutton activation

Versatile all-in-one

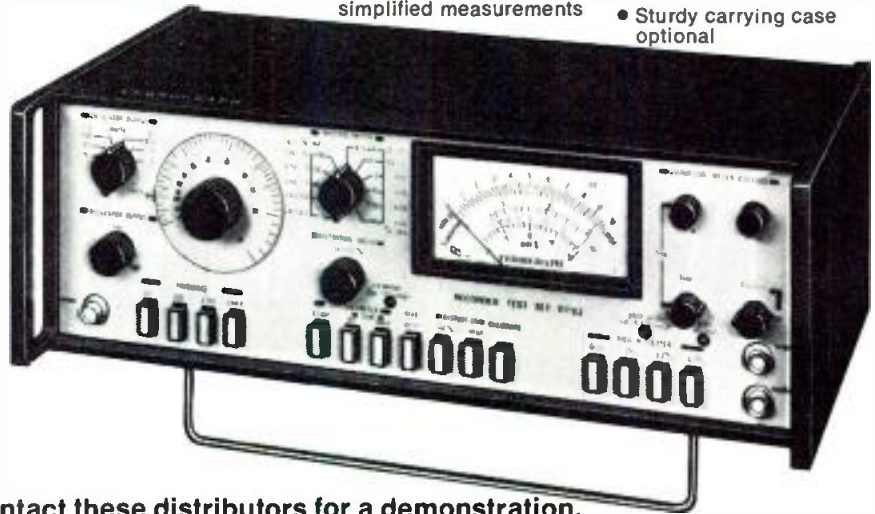
- precision test unit**
- Sine Wave generator
- Millivoltmeter
- Wow & Flutter bridge with expanded range
- Harmonic distortion analyzer with greatly simplified measurements

Use it anywhere

- Recording & broadcasting studios
- Testing laboratories
- Service Shops
- Compact, lightweight, portable

All this for only \$1450

- Sturdy carrying case optional



Contact these distributors for a demonstration.

- | | | | | |
|---|--|--|--|---|
| Birmingham, Ala.
Maze Corp.
1900 1st Ave. North | Mountain View, Calif.
Scully/Metrotec
475 Ellis St. | Ft. Lauderdale, Fla.
Broadcast
Automation Assocs.
3101 N. Federal
H'way | Grand Rapids, Mich.
Audio Distributors
2342 Division Ave., So. | Hendersonville, Tenn.
Studio Supply Co.
112 Cloverdale Court |
| Los Angeles, Calif.
Westlake Audio
6311 Wilshire Blvd. | Stamford, Conn.
Audio Techniques
121 Hamilton Ave. | Chicago, Ill.
B. W. Assocs.
415 W. Fullerton
P'kway | New York, N.Y.
Harvey Radio
444 Madison Ave.
Martin Audio
320 W. 46th St. | Dallas, Texas 75240
Mill-Tronics, Inc.
4304 Beltwood
Pkwy No. |

ELPA MARKETING INDUSTRIES, INC., New Hyde Park, N.Y. 11040 / 7301 E. Evans Rd., Scottsdale, Ariz. 85253
Circle 139 on Reader Service Card



Only the best is good enough. And that's exactly what you get with CBS Laboratories power twins, Audimax and Volumax. Audimax delivers a distortion free signal by eliminating thumping, background "swish-up" and audio "holes." And Volumax prevents overmodulation and permits maximum per-watt coverage power. The power twins! From CBS Laboratories, of course.

CBS LABORATORIES

A Division of Columbia Broadcasting System, Inc.
227 High Ridge Road, Stamford, Connecticut 06905

Circle 140 on Reader Service Card

NAB SHOW-IN-PRINT

the machine usable for high-density storage, as well as for high-grade playback at standard speeds.

Mention of the "L. J. Scully Manufacturing Co." above needs comment. It signifies the re-entry into tape-recorder making of Larry Scully, a long-standing pioneer of the industry in disc cutters and tape machines, who, some years back, sold his line of tape machines to Metrotech. The excellent new machines bearing the Scully-Metrotech

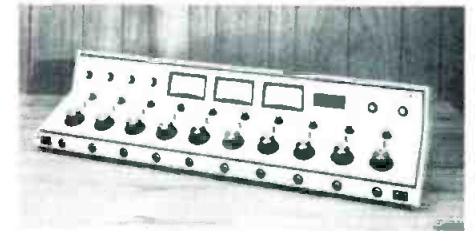
brand, noted above, indicate that we are going to have a bit of a "Scully vs. Scully" battle, with both sides having plenty on the ball. The "original Scully"—or L. J. Scully Manufacturing Company—has been set up in Bridgeport, Connecticut, and the first model in the line, the LJ-10 mentioned here, cues us to expect state-of-the-art machines from this source. Nagra was on hand with its long-established portables, including the more recent miniatures that cram high quality into two-hand size.



Pick-up equipment from Micro-Trak.



Fairchild/Robin economy console.



New stereo unit from Collins.

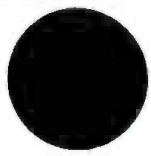


Turnkey systems from Broadcast Electronics.

Consoles—You name it

If tape machines are pushing hard on the performance frontier, consoles are pushing a little harder (and, lacking the inherent slippage of the tape recording process itself, a console can be just a little more "state-of-the-art" than a tape machine).

Besides the advances in performance specs, there is the broad widening of console versatility, in the sense that a console can now be found that fits just about any operation need, without extra, unneeded



Spotmaster®

Space Setter



5 3/8"

5 5/8"

Three/70™ Cartridge Playback Deck

Meet our midget. And don't be fooled by its modest exterior. The new Spotmaster® Three/70 packs the performance of its big brother—the incomparable Ten/70—into a pint-sized package at a pint-sized price.

Standard features include the Ten/70's direct drive synchronous motor, all silicon solid state circuitry, high output (+8 dbm) and plug-in modular construction. Deck operation is pushbutton-quick, with instantaneous response.

Now look what happens when you put a trio of Three/70s together. They fit side by side in a single rack mount. The whole thing takes up just 7" of rack space.



Three/70s accept all Type A cartridges, playing up to 10½ minutes at 7½ ips. Options include 3¾ ips operation, as well as 150 Hz and 8 kHz secondary and tertiary cue tones (to augment the 1,000 Hz primary stop/re-cue tone).

Good things do come in small packages. Learn more about the Three/70—contact us today.

BROADCAST ELECTRONICS, INC.

A Filmways Company

8810 Brookville Road, Silver Spring, Maryland 20910 • (301) 588-4983

capability that adds unnecessarily to cost.

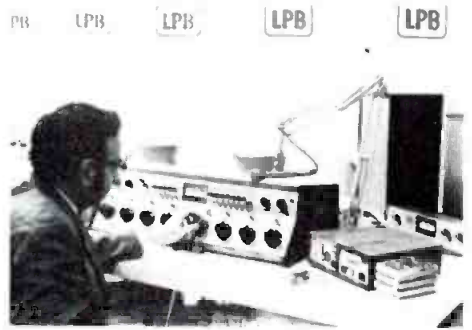
For example, there is the brand-new Fairchild/Robins Model 30001, a five-channel economy monaural console, priced at \$750, but built with many of the same modular units that go into the top-of-the-line stereo model, the 30082. Both are in Fairchild/Robins new 30000 series introduced at the show, and available *off the shelf*. This modular approach, now fairly widespread as *BM/E* noted in the December audio issue, gives the simpler consoles essentially the same performance quality as the more complex and expensive ones. *One set of specifications covers the whole line.* And very good specs they are.

Similar versatility, with uniformity of performance, was evident in Collins Radio Company's brand new line of consoles. In two configurations, ten-channel and six-channel, the eight models in the new line can be converted from mono to stereo at any time by adding plug-in amplifiers. Collins, like all the others noted here, has thought hard about what a broadcaster needs to perform all the console functions. The result is a very complete set of monitoring, cueing, and other operational features.

Portable consoles have usually suffered, as far as quality goes, in comparison with the larger desk or cabinet units. That is not true any more, at least for a number of the newest portable units. Take the Neve PSM series of portables, introduced at the show. These units are a totally different breed from what we used to accept as a "portable." Specs of the PSMs match this maker's large cabinet models—and those are specs very close to the technical limits of the art, distortion all the way through of 0.02% at 20dBm output, for example. Again, the modular concept is used to excellent advantage; you can buy as few or as many channels as you need, up to the maximum for which the unit has physical space. In the case of the PSM, the total is 8 or 12 stereo or mono channels, depending on the model. Each channel has adjustable equalization, with a "presence" control and high and low filters, plus a dazzling set of control facilities, including output



Audio at RCA.



Economy systems from LPB.

selection switch and pan pot, fold-back mix, auxiliary mix, phase reversal button, fader, and others.

Also in the "portable" but high-

quality category were the Lamb control units, from England, demonstrated in a mini-studio set—continued on page 64

**NEW
ALPHA**



ultimate in "live" automation complete AM/FM in a single system

With more than 10,000 programming events, ALPHA has the capabilities to provide complete programming for an AM/FM operation or a single station for weeks in advance. ALPHA automatically programs: reel-to-reel equipment, automatic cartridge machines, live station equipment, news rooms and any additional audio sources you may select up to 20. The ALPHA will interface to a computer accounting system.

There's a full English display on the CRT control screen — full hard copy printout of all availabilities — full verified English logging. The ALPHA provides more built-in functions than any other system. Complete manual remote control backup is provided for the entire system including random select. The control console manages the entire ALPHA programmer. Event typed on the keyboard is displayed on the screen. Absolutely quiet operation. All solid state with disc and core memory. For details phone us now at 309-829-6373. No obligation of course. We will gladly survey ALPHA's applications to your particular station's programming.

the
COMPUTERCASTERS
from



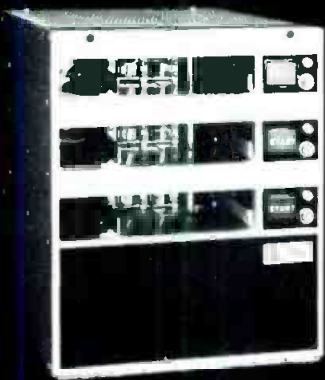
SYSTEMS MARKETING CORPORATION
309-829-6373
1013 W. Washington Street
Bloomington, Illinois 61701

Send complete information on "live" automation with ALPHA programming.

Name _____
Station _____
Company _____
Address _____
Zip _____

Circle 141 on Reader Service Card

**No. 1 number for
tape cartridge
equipment
309-828-1381**



3D SERIES REPRODUCER

A collect call to the above number will bring you all the facts you need to know about tape cartridge equipment. One call will establish a working relationship between you and our broadcast oriented people...a relationship that delivers dependable performance at a truly competitive price. The relationship will last as long as you use ITC equipment...In the selection of equipment, proper servicing, and adaptation of machines to your broadcast requirements. If you're thinking tape cartridge equipment, find out why hundreds of stations depend on ITC.

WRA SERIES RECORDING AMPLIFIER



**Call collect for
information on
free trial and
leasing plans**

IT INTERNATIONAL
TAPETRONICS
CORPORATION
2425 South Main Street,
Bloomington, Illinois 61701

NAB SHOW-IN-PRINT



Custom consoles were promoted at Neve.

up by Revox, along with Beyer microphones and the Revox tape machine. The listen-back, when *BM/E* visited the "studio," was highly satisfactory, and the whole operation took up one corner of the area.

Also new at the show was Gates' Stereo 80 console, with 18 inputs switchable to eight mixing channels and, again, a full complement of switching facilities and extremely low distortion.

The spectrum of console choice was further widened by a number of other excellent, but somewhat

different, approaches to console design, like the McMartin series, well-laid-out for applications where a desk-top unit with large, vertically-mounted rotary fader controls, is wanted. McMartin's specs are up to top with the rest of the best. Spotmaster's Model 8M20 looked similar in external design philosophy.

McCurdy Radio's line was there to show another approach to styling, with low, nearly horizontal panel for slide or rotary faders. Again, performance was not a main factor in choice, since splendid performance was available here too. Another console maker using the low sloping panel approach was United Recording Electronics Industries, showing a modular line with a great many features aimed carefully and thoughtfully at broadcasting.

And a third new line in this very-low-profile, very compact console category was introduced by the new "conglomerate," Cetec, with its Langevin Series 10 Audio Control Center; it has ten stereo inputs (20 individual inputs), switching to one or two output channels, and the other operational features needed

**This is the most expensive
turntable you can buy.**



Also the cheapest.

It's a simple matter of economics. And quality. At \$1650, the EMT-930st Turntable costs considerably more than any other turntable. But, for your money, you get a precision-made turntable that really slashes maintenance costs because it's virtually trouble-free. ("Still in excellent condition despite ten years of hard use," says one pleased radio station.*)

Typically, you get $\pm 0.035\%$ rms flutter; low, low rumble; and you can cue to any beat or syllable with a wow-free start from the world's only remote-controlled turntable.

A lot of broadcasters must think the EMT-930st is a smart investment. Right now, there are more than 10,000 in use throughout the world. We know of only one greater value: our brochure. It's free. Send for it today.

*Name of this and other station users on request.

GOTHAM
AUDIO CORPORATION

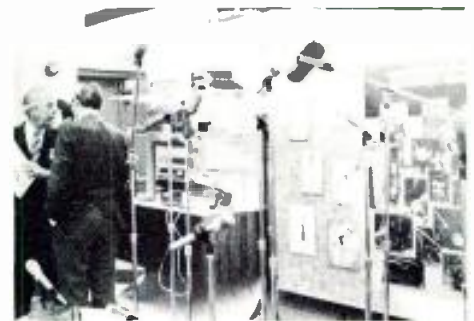
741 Washington Street, New York, NY 10014 (Tel: 212-741-7411)
1710 N. La Brea Ave., Hollywood, CA 90046 (Tel: 213-874-4444)



Preamplifiers from Micro-Trak



Turntables from Gotham



Microphones from Shure

for broadcast use. Cetec products were shown at the TeleMation booth. In the same stylistic vein was a new console from Sparta. It is so new specs aren't available—you'll hear more about it in the future.

At what must be near the bottom end of the console price (but not quality) scale was the new S-9B shown by LPB Inc. and quoted at \$475, with eight inputs, four controlled, and a very compact form which ought to make it attractive for many smaller operations. LPB also showed its larger consoles, including the S-15, with 19 inputs, eight mixed, two output lines.

Microphones, pickups, auxiliaries
The trend in microphones toward

the higher-quality designs was most evident at the show. Gotham Audio showed the Neumann condenser and dynamic models. AKG's line was supplemented by the new CK-8 short-shot-gun condenser model, for high directivity, and the new C412, one of the first condenser microphones with four switchable patterns: omni, figure 8, cardioid, and super-cardioid.

Revox, as noted already, showed the Beyer microphone line, and new there was the very compact M301 dynamic with super-cardioid pattern, intended specifically for broadcasting. Shure Brothers had on display many models from its very extensive line.

Microphone quality is hard to

demonstrate under show conditions, but a rising emphasis on quality is emerging unmistakably according to conversations with the microphone makers. Sales to broadcasters are clustering more and more in the upper part of the quality spectrum. All the microphone exhibitors at the show had a range of models that included a number at the top of the quality scale.

Disc pickups were covered by two firms that make what are surely the main workhorses of broadcast disc playing: Shure and Stanton. The current models of both makers are pretty familiar; it would be very hard to beat either the Shure V-15

continued on page 66

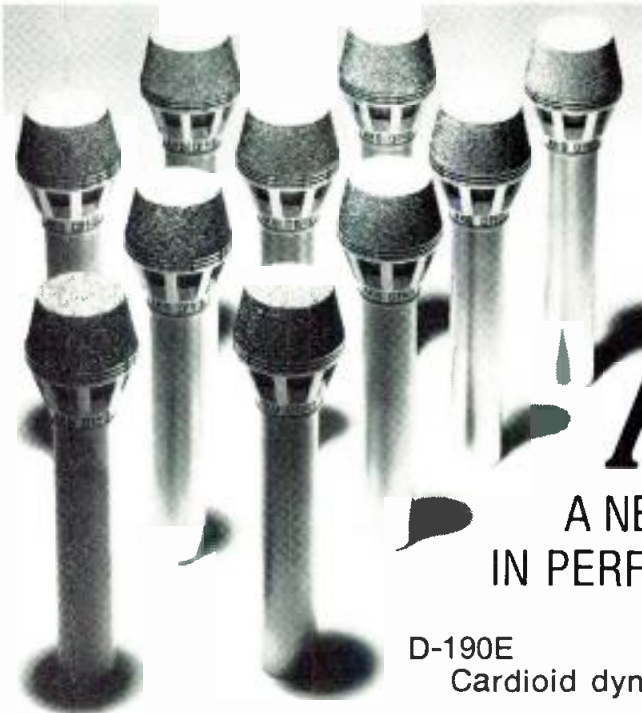
Spotmaster

AD1B Audio Distribution Amplifier



The solid state AD1B distributes audio signals to five separate points within a studio system or to telephone lines. Output level controls are individually adjustable. Adding our AD1B-X channel extenders allows up to 25 channels to be accommodated, with input metering and audio monitoring for all 25 provided by the AD1B. Both units meet traditional SPOTMASTER standards of performance and reliability. Response is essentially flat from 40 to 20,000 Hz with low distortion and noise and 60 db channel isolation. Input transformers are standard; the user may specify either balanced output transformers or unbalanced emitter follower outputs. Write for details.

BROADCAST ELECTRONICS, INC.
A Filmways Company
8810 Brookville Rd., Silver Spring, Md. 20910




AKG

A NEW STANDARD IN PERFORMANCE

D-190E
Cardioid dynamic microphone.

For information on the entire AKG product line call or write



MICROPHONES • HEADPHONES

DISTRIBUTED BY
NORTH AMERICAN PHILIPS CORPORATION
100 EAST 47th STREET, NEW YORK, NEW YORK 10017

AKG CANADA • DIVISION OF DOUBLE DIAMOND ELECTRONICS • SCARBOROUGH, ONTARIO

NAB SHOW-IN-PRINT

or the Stanton 500 or 681 series. Although neither firm was saying anything for publication about future models, there are rumors that both are well-advanced on new designs that cover comfortably the range up to 40 or 50 KHz, in anticipation of use with the discrete four-channel disc system. Such pickups will naturally be splendid performers on two-channel discs too. Thus it seems likely that when, or if, a discrete four-channel FM system comes into use (an event now shrouded in uncertainty), the disc playback equipment will be available from a number of best-known sources: Panasonic and JVC have already announced pickups for the system.

In the area of studio equipment—arms, turntables, preamplifiers, etc.—Micro-Trak showed a very complete line. This includes the new "F" line of loudspeakers, with models designed for different monitoring applications.

In sum: Audio is alive and well

The fact that the audio side of the show had so much life and thrust, even under the shadow of the much more exciting and important video and transmitter exhibits, demonstrated again the upsurge of maker and consumer interest in sound quality, evident at so many of the recent consumer and industry trade shows. An exploration of NAB '73 was completely convincing of the fact that the industry is responding to a strong audio interest. The broadcaster who wants good audio can get it—in fact, by reasonably easy choice, and by spending what are small sums compared to the cost of most video and transmitter equipment, he can have superb audio.

For more information on selected new products at NAB 1973:

Consolidated Video time base corrector	350
Television Microtime time base corrector	351
Echo Science portable helical VTR	352

IVC BCR-200 automated cartridge player	353
RCA TK-45 color camera	354
Ampex 230 studio camera	355
Asaca miniature camera	356
Norelco PCP-72 miniature camera	357
Editel news camera	358
Grass Valley 1600 switcher	359
TeleMation telecine	360
Electro-Sound audio recorder	361
Scully-Metrotech 280 recorder	362
IGM BAT system	363
Rapid-Q CARTRETTE system	364
Rapid-Q stereo phase enhancer	365
CBS Labs VIR corrector	366
Tektronix VIR corrector	367
Schafer 902 system	368
Sono-Mag Alpha system	369
Schneider 30 x 1 lens	370
Rank Varitol 30	371
Canon 34 X 1 dual lens	372
Collins console	373
Gates Stereo 80 console	374

only from **Cetec**

SERIES 10 LANGEVIN AUDIO CONTROL CENTER

VIDEO/AM OR STEREO/FM CONFIGURATIONS

FEATURES

- 10 Stereo Mixing Channels
- Two Monitor Amplifiers
- 5-Position Monitor Select
- 26 Stereo Inputs including 8 Remotes
- Conductive-Plastic Faders
- Separate Program, Audition & Cue Outputs with individual channel assignment
- Redundant Fail-Safe Power Supplies

Cetec INC
a subsidiary of Computer Equipment Corp

Main Office:
13035 Saticoy Street
North Hollywood, California 91605
Phone (213) 875 1900
TWX 9104992669

European Office:
Cetec U.K.
Shaftesbury Street
High Wycombe Bucks England
Phone: High Wycombe 37326
Telex: 778200



List \$5,365.00

Circle 145 on Reader Service Card



CME

CABLE MANAGEMENT | ENGINEERING

MAY 1973

**Maintenance & Calibration of the Low-Cost
Color Teleproduction Center, Part I**

**U-matic Proves Easy to Operate, Economical,
for Meadville CATV**

**Canadian Cable Meet Will Dig Into Management,
Programming, Technology, and Show the Latest
Equipment**

State of the Cable Union

**Kodak Shows Improved Super-8 Videoplayer;
Says It Will Be On Market This Year**

**University Originates Programs for Local
Cable Companies**

**All You Ever Wanted to Know About Production:
Program Syndication**

The Industry Prefers

JERROLD 30-CHANNEL SET CONVERTERS!

(53,267 delivered in 90 days)



WIDEST DYNAMIC RANGE*

Input Level, dBmV	0	15
Second Order Distortion, dB	-81	-66
Cross Modulation, dB	-94	-64
Carrier-to-Noise, dB	45	60

PLUS:

- ▶ Remote control
- ▶ 30-channel pushbutton selection
- ▶ Varactor tuning
- ▶ Rugged design
- ▶ Attractive walnut finish
- ▶ UL approved

*Outstanding performance with wide input-level variations.

Write for specs and data sheet.

DB11-1

JERROLD ELECTRONICS CORPORATION / CATV Systems Division, 200 Witmer Road / Horsham, Pa. 19044. (215) 674-4800.



JERROLD

a GENERAL INSTRUMENT company

EASTERN OFFICE: 1 Fairway Plaza, Suite 212 / Philmont Ave. & Red Lion Rd. / Huntingdon Valley, Pa. 19006 / (215) 674-4800

SOUTHERN OFFICE: 1 Perimeter Place, Suite 101 / Atlanta, Georgia 30339 / (404) 432-3102

MIDWESTERN OFFICE: 1334 Atlantic Avenue / N. Kansas City, Mo. 64116 / (816) 842-1130

WESTERN OFFICE: 1255 Veterans Blvd. / Redwood City, Calif. 94063 / (415) 365-5200

NORTHEASTERN OFFICE: 850R Providence Hwy. U.S. Rt. 1 / Dedham, Mass. 02026 / (617) 329-4790

Circle 175 on Reader Service Card

Maintenance & Calibration of the Low-Cost Color Teleproduction Center, Part I

by Oliver Berliner

Do yourself a favor and (if you're a cable operator) provide a desperately needed additional service, that CATV subscribers will bless you for, with the procedures suggested here.

HAS IT OCCURRED TO YOU that most people have no idea how to set the *brightness, contrast, color intensity* and *hue* of their television receivers? (Do you know . . . for sure?) With test equipment every cable operator should possess (and every sophisticated CCTV colorcaster, too), the CATV system can make possible the "calibration" of every subscriber's receiver. Not only will this provide the obvious benefits of greater television enjoyment, but it will reduce complaints of "poor picture" from subscribers.

Why not transmit on a spare channel, or on your origination channel, a half hour (for example) of test signals to permit subscribers to set up their receivers? These transmissions could take place at say, 9 a.m. and 9 p.m. daily. They might consist of a ten-step staircase followed by NTSC colorbars alternating in five-minute increments for a half hour. Superimposed over the "step" pattern for the first minute out of each five-minute segment might be a "billboard" as shown in Fig. 1. For the first minute of each five-minute colorbars transmission, you might superimpose the description shown in Fig. 2.

"But these test generators are expensive!" you cry. Well, if you're a cable operator doing program origination, surely you'll want to calibrate your *own* studio monitors . . . unless you want to look as *bad* as possible in comparison to the commercial stations you carry. Believe it or not, monochrome monitors are used for the bulk of camera setup work, and *they* must be calibrated *before* you set up your color cameras. Then, your (calibrated) color monitor is used for precise camera-matching comparisons. In most instances you needn't purchase a colorbars generator because your camera's encoder already contains one.

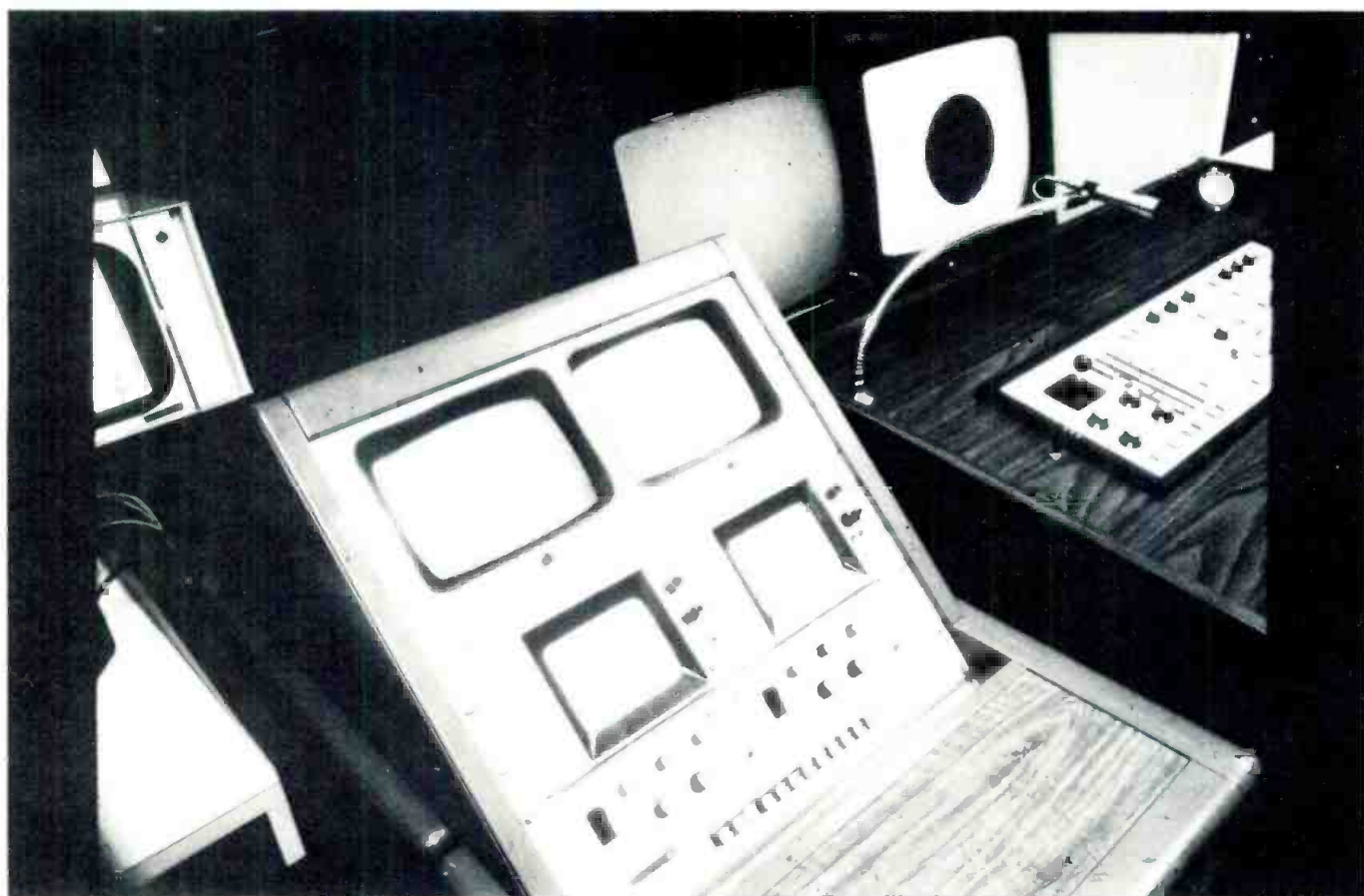
Your local newspaper should be only too glad to mention in each daily or weekly TV program listing the service that you offer your viewers. It goes without saying that you will find it worthwhile to

transmit these patterns, along with multiburst, throughout the day to test system quality at whatever points your technicians require. Multiburst is a beautiful quick-check on your studio's and transmission system's frequency response, the pattern displayed being that of Fig. 3A. The burst pattern usually consists of a white flag followed by short-duration oscillations at .5 MHz, 1.25 MHz, 2 MHz, 3 MHz, 3.58 MHz and 4.1 MHz.

Using a monitor of bandwidth known to be flat far higher than these frequencies, the display will then quickly indicate the system's frequency capabilities. The burst wherever you cannot differentiate the white from the black vertical lines is the bandwidth maximum of your system. Fig. 3B is a waveform display of the multiburst. Note that the waveform monitor shows a slight falling off of linearity at the higher frequencies (wedge-shaped instead of rectangular-shaped display). It is not recommended that multiburst be used by cable subscribers for they may very well end up blaming the cablecaster for their receivers' bandwidth limitations. Fig. 4 shows both waveform and picture display of the previously described "step" pattern.

The waveform monitor is your best friend in the television studio. It tells you things that a video level meter either cannot reveal or discloses very inaccurately. Quick confirmation of this may easily be achieved by setting a camera's iris or target control to "automatic" and observing picture quality (on your color monitor) and output level (on your waveform monitor). Compare your waveform monitor's indication with that of the meter on the camera control unit. Most likely their indications of picture intensity will be quite divergent. Then, turn the camera's control to "manual." You will no doubt be able to manually improve picture quality to a very noticeable degree—as observed on your color monitor and in reliance upon your waveform monitor. In addition, the WFM will display picture disturbances and "spikes," not shown on any meter, sync-pulse intensity, some scene lighting deficiencies, picture strength in *each* portion of the scene

Mr. Berliner is president, Telsudio Centre, Burbank, California.



and, of course, *true* video output level of the camera, program line or videotape recorder to which it is connected.

Whereas there are now WFMs inexpensive enough to permit you to buy one with *each* camera and another for the program line, you may wish to augment them with one of the more costly units that is capable of displaying Vertical Interval Test Signals (VITS). One of the niceties of television is that it permits system testing during program transmission without interference. The networks are virtually always transmitting VITS, and many local stations transmit them via their microwave from studio to transmitter to test transmitter quality (as received back at the studio). These VITS are available to you, the cableman. Use them! They are customarily transmitted simultaneously on lines 18 and 19 of the *odd* fields, and also on the same lines of the *even* fields. Furthermore, there is nothing to prevent transmission on lines 16 thru 21 . . . or any of the first 21 lines which comprise the vertical blanking interval. (These lines are not displayed on the TV screen.)

A WFM equipped for VITS display permits you to select any line, from 16 to 21, of either field, and

to see what is being transmitted at those times. You will be amazed to see multiburst, \sin^2 pulse, "window," staircase, 2T bar, 12.5T bar, and (oh, my gosh) VIR signal. To prevent these innumerable simultaneous tests (inserted by an inexpensive VITS Inserter device) from "splattering" into the program area, they are transmitted at reduced intensities. Let's look at some of them.

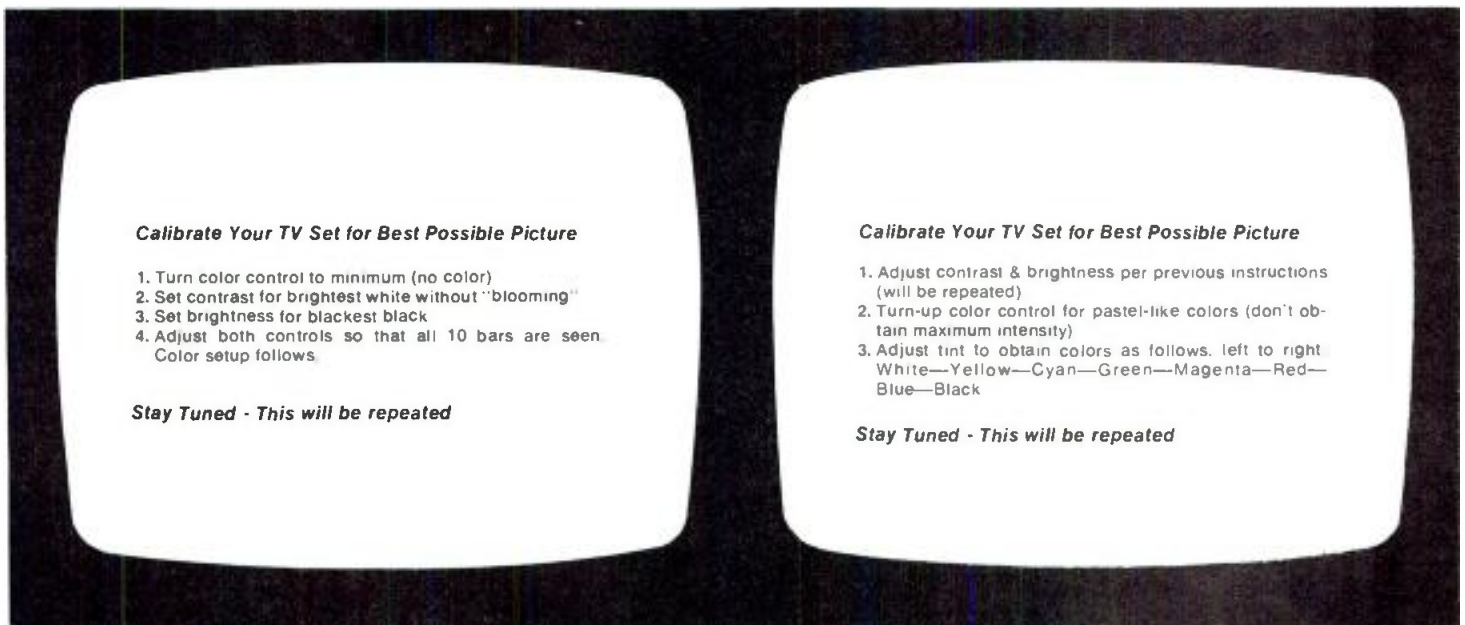
Instead of full-intensity transmission, the multiburst usually consists of a 100 IRE-units *burst flag*, whilst the multiple bursts are at only 70 IRE intensity. You might look for this on line 18 of field one. On the corresponding line in field two, you should expect to see colorbars saturated 100% but of 75% amplitude. Now, if at the same time you were to look at line 19, field one, you may see (the ever-present color reference burst plus) modulated five-riser staircase followed by 2T \sin^2 bar (.25 microsecond duration) followed by 12.5T modulated \sin^2 pulse (1.571 microseconds), all this preceding 18 microseconds of white ("window") at full level. The *modulated* staircase can measure burst phase errors in stabilizers and clampers, plus incorrect white-clip level. The 2T pulse is useful in checking frequency response by comparing its height with the height of



Control room of United States Gypsum Co.'s TV production center is good example of a well-equipped operation. Photos top and left show TV switching and audio control areas. Three large monitors are line, camera 1, and camera 2. The small monitor, next to the larger ones, is a cross-pulse monitor for checking tape tracking, tension, and overall VTR stability. The camera control unit shows monitors for each camera and two Tektronix 528 scopes. Gray box behind turntable in audio area is a tone oscillator for setting audio levels.



Audio and visual rack is shown in photo below. (It's located behind the audio console.) The video rack contains, below the VTR monitors, a 3M drop-out compensator, a Dynascience image enhancer, a Tektronix test set 146 including sync generator, stair step, bar dot, and color bar generator. There's also a Tektronix oscilloscope between the VTRs.



Calibrate Your TV Set for Best Possible Picture

1. Turn color control to minimum (no color)
2. Set contrast for brightest white without "blooming"
3. Set brightness for blackest black
4. Adjust both controls so that all 10 bars are seen.
Color setup follows.

Stay Tuned - This will be repeated

Calibrate Your TV Set for Best Possible Picture

1. Adjust contrast & brightness per previous instructions (will be repeated)
2. Turn-up color control for pastel-like colors (don't obtain maximum intensity)
3. Adjust tint to obtain colors as follows. left to right
White—Yellow—Cyan—Green—Magenta—Red—Blue—Black

Stay Tuned - This will be repeated

Fig. 1. Superimposed viewer instructions over first minute of staircase pattern transmission to help subscriber set his receiver luminance.

Fig. 2. Superimposed viewer instructions over first minutes of colorbars pattern transmission to set receiver chrominance.



Fig. 3A. Multiburst test signal gives quick check on system's high frequency response.
Photo courtesy Ultra Audio Products.

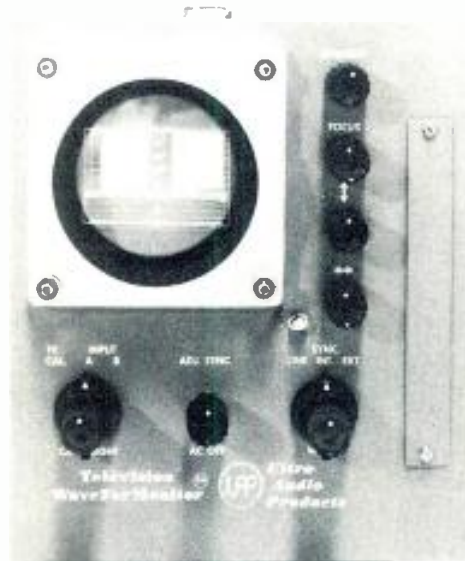


Fig. 3B. Waveform monitor display of multiburst. Note slight high-frequency roll-off creating wedge pattern.
Photo courtesy Ultra Audio Products.

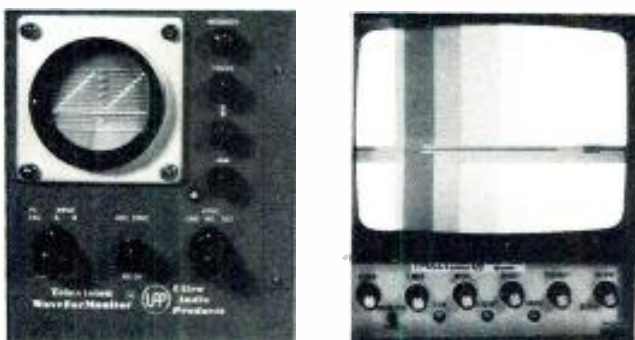


Fig. 4. Waveform and picture display of ten-step staircase pattern. Video monitor in pulse-cross mode shifts display, shows horizontal blanking and equalizing pulses from the sync generator.

the window, but this is usable only in response to 3 MHz. Beyond this frequency, we must use the 12.5T pulse as we enter the "chrominance area" to check relative chrominance/luminance gain and delay which cause saturation errors and color registration problems. Delay distortion, such as observed when colors "bleed" to the right side of the screen, means chrominance delay . . . and color misregistration.

The 18 microseconds of bar signal is under the control of a 2T sin-squared filter. If it is undistorted the system can be deemed free of "tilt" (low-frequency distortion), smear, and streaking. There is a special graticule useful in checking 2T and 18-microsecond signals. It is called the *K graticule* and, in the case of the former pulse, it allows comparison of the rise and fall times of the 2T pulse against the gradations printed on the K-factor scale. If the slope(s) of the pulse does not parallel the printed slope, meaning the rise and fall times are not symmetrical, quadrature distortion is present.

Truly, the waveform monitor is your best friend . . . and your best investment. Here's food for thought: One of the reasons that multiburst is transmitted in both fields during VITS-casting is that, if it were inserted in only one of the two fields, certain receivers might show *flicker*—very low-frequency fluctuations—because of AGC level changes from field to field (30Hz).

To conclude Part I, let's return to VIRS . . . Vertical-Interval Reference Signal, which are proposed to be transmitted on line 20, both fields. It consists of the customary 12 microseconds of horizontal blanking with color burst. Then the reference signals begin: (1) 24 microseconds of 3.579545 MHz at zero degrees phase (the same as the color burst should be) and with the same 40 IRE units of amplitude, but beginning at the luminance reference point on the graticule (50 IRE, known as "Y-level"). To put it another way, the chrominance reference bar is of 40 IRE amplitude modulation and is generated at the 70 IRE level. Equipment in the system that shifts the phase relationship of color sync and chroma-bar will be exposed via the VIRS by comparing the burst phase of these two.

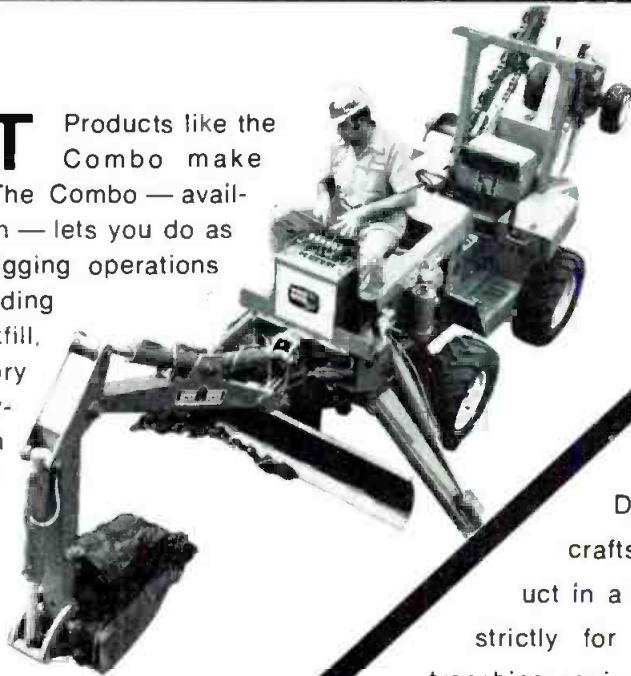
Next follows 12 microseconds of Y-level at 50 IRE intensity. Now, if the chroma-bar is not sitting precisely at this Y-level point, the luminance/chrominance relationship is upset and must be corrected. Finally we observe 12 microseconds of black-reference (7.5 IRE level), and with this at 7.5 and luminance-bar at 50, luminance level is normal. Added to all this is 3.5 microseconds of "front porch" going into horizontal blanking and we have the total time of one TV line—63.5 microseconds. In closing it must be pointed out that distortions observed via the VITS may be caused by the television stations and not the cablecaster's equipment. But you won't know it until you've compared various stations as seen on your system.

This series will continue with Part II . . . covering, among other things, all the equipment you need for studio-equipment repair and maintenance—and the way to go about it. **CM/E**

WHAT MAKES **DITCH WITCH** THE LEADER?

PRODUCT

Products like the Combo make Ditch Witch the leader. The Combo — available only from Ditch Witch — lets you do as many as five different digging operations without changing or adding attachments. Trench, backfill, do backhoe and vibratory plowing operations or hydraulic boring — all with the same machine. The Combo is available in 30-HP, 37-HP and 65-HP models. All its components are tried and proven and each incorporates design superiority which enables Ditch Witch to out-sell all its competition combined. The Combo lets you keep equipment costs down by doing more jobs with one machine. Let us show you what a Combo can do on your job site. There's no better way to see why Ditch Witch is the leader.



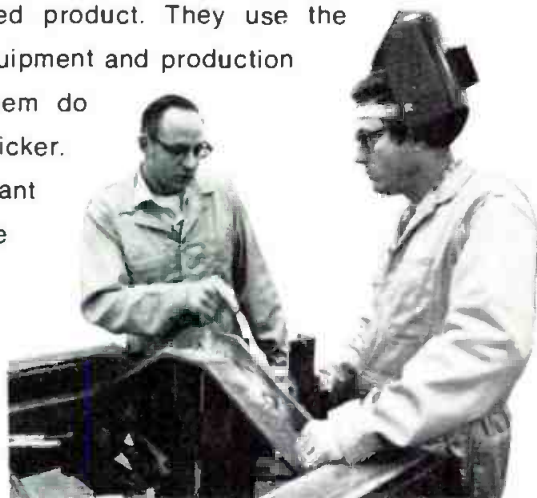
PEOPLE

Ditch Witch factory workers are craftsmen who build a quality product in a large, modern plant designed strictly for the efficient production of trenching equipment. Starting with top-quality raw materials and components, Ditch Witch experts shape the parts and carefully assemble them into the finished product. They use the most up-to-date equipment and production

techniques to help them do their job better and quicker.

But there's another all-important element necessary. It's a genuine concern for doing their best — a conscientious attention to every detail.

And it shows in every Ditch Witch trencher. With people like these on the Ditch Witch team, it's not surprising that Ditch Witch is the leader.



FOLLOW THE LEADER!



... offering a full line
of trenching equipment from 7-HP to 65-HP.

CHARLES MACHINE WORKS, INC., P. O. Box 66, Perry, Oklahoma 73077

Circle 176 on Reader Service Card



Introducing: The new Sony DXC-5000B color video camera.

It really puts you in control.

Meet the color video camera that gives you life-like pictures . . . right out of the packing carton! We call it the Sony DXC-5000B Color Video Camera . . . you'll call it great!

This is the color camera that gives you professional results . . . first time out . . . whether you're an old timer in VTR or just getting into this dynamic business. Fits right into just about any application like business, industry, CATV, medicine, science and any educational TV system. With its Tricolor Balanced Two-tube System featuring a Color Dissector Tube Assembly, the Sony DXC-5000B delivers faithful color signals . . . always.

Hook up the DXC-5000B and you'll quickly appreciate its features like the manual and automatic gain control, the master and individual white balance controls (with meters), the master

and individual pedestal controls, the master and individual level controls, and a special aperture control, which we call an image enhancer.

Pound for pound . . . and the DXC-5000B weighs only 27 pounds . . . you'll find this color camera a rugged, compact, reliable performer under just about any and all operating conditions.

If you're thinking about the next step after black and white VTR, the obvious answer is color. And if you're looking for a color system that delivers quality, look into the new Sony DXC-5000B Color Video Camera . . . it's the one that gets you operational just as soon as you get it unpacked!

For more information on the Sony DXC-5000B Color Video Camera, mail the coupon today. It'll get you right into the picture.

SN-103A

SONY®

Sony Corporation of America
Video Products Dept. BME-053
47-47 Van Dam Street, Long Island City, N.Y. 11101

Gentlemen:
Please send me more information on your DXC-5000B color video camera.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

PHONE (AREA CODE) _____

CITY _____ STATE _____ ZIP _____

See us at NCTA Show

Circle 177 on Reader Service Card

For demonstration:
Circle 178 on Reader Service Card

U-matic* Proves Easy to Operate, Economical for Meadville CATV

Pioneer in local cable programming switches to Sony videocassette equipment

ONE OF THE NATION'S FIRST cable television companies to initiate its own programming has added Sony U-matic videocassette equipment to record and cablecast a wide variety of events for four hours each day.

Meadville Master Antenna, Inc., serving the television needs of over 8000 families in the hilly Meadville area of northwestern Pennsylvania, has

*Trademark of Sony Corp.

been in operation since 1953. The cable brings 12 channels, including its own daily programming on CTV-13, Channel 13. It began programming over five years ago.

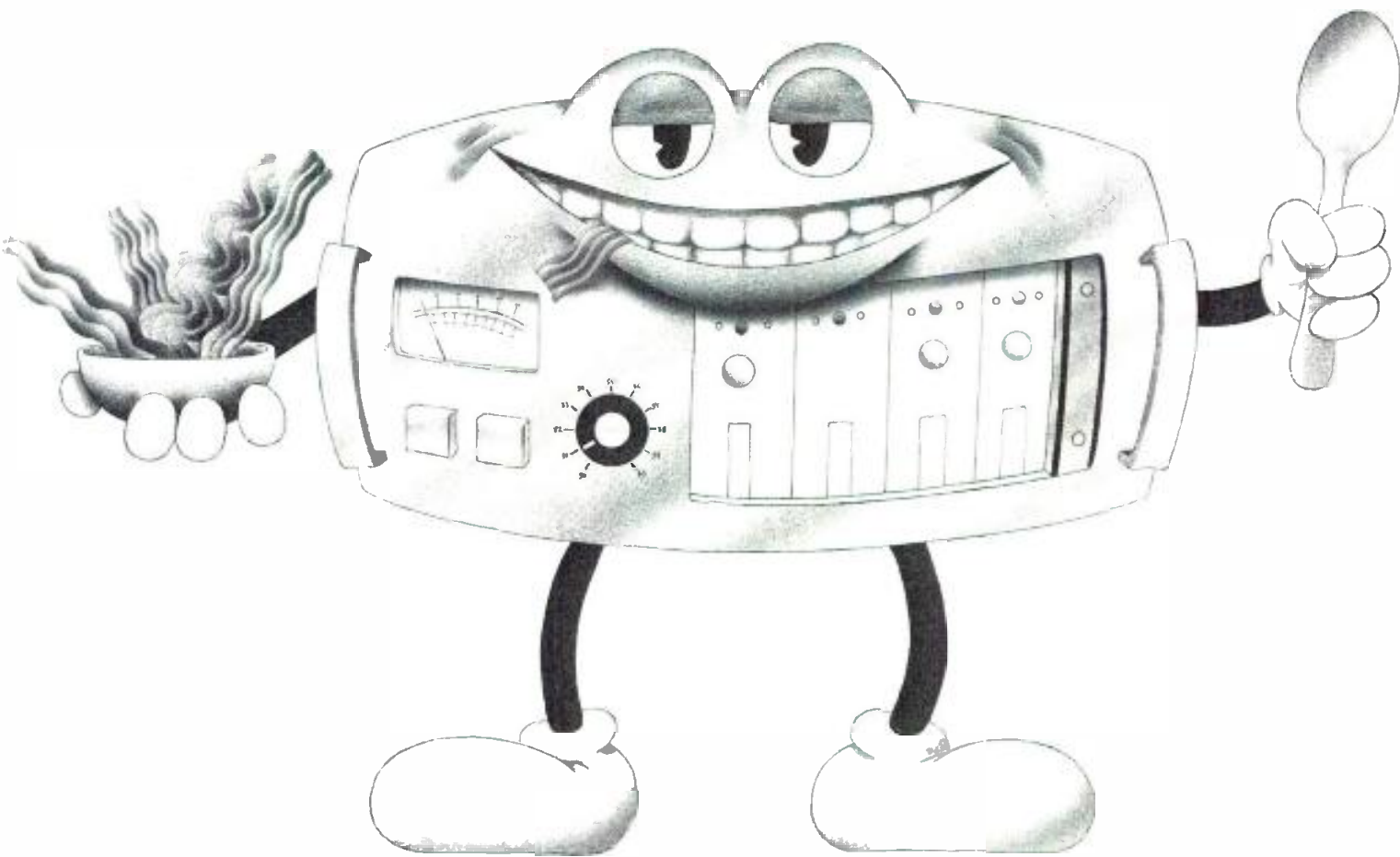
Jim Strickler, the knowledgeable, straight-talking Meadville cablecasting director, admits he selected Sony U-matic because of the economics. "The U-matic is one of the easiest, most inexpensive means continued on page CM/E-12



Meadville's Sony U-matic videocassette system is located in a special drawer/cabinet in the modern control room, so that it can be conveniently pulled out when operational.

Maintenance cost has been insignificant, despite the fact that 20% of the programming and all of the commercials are currently on videocassettes.

Have You Met Our Co-Channel Beat Eater?



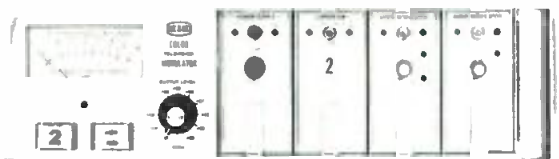
It's EiE's phase-lock color television modulator, a very important unit in your CATV system—important because it eliminates the co-channel beats which result from direct “off-air” pickup in strong signal areas. By synchronizing the modulator output to the interfering broadcast signal, our CTM2 Phase-Lock Modulator allows you to “reclaim” and utilize those cable channels which have been vacated.

The model CTM2 is only one in a series of broadcast quality EiE color television modulators which includes: the CTM1 standard modulator; the CTM3, for microwave applications; and the CTM4, a phase-lock version of the CTM3.

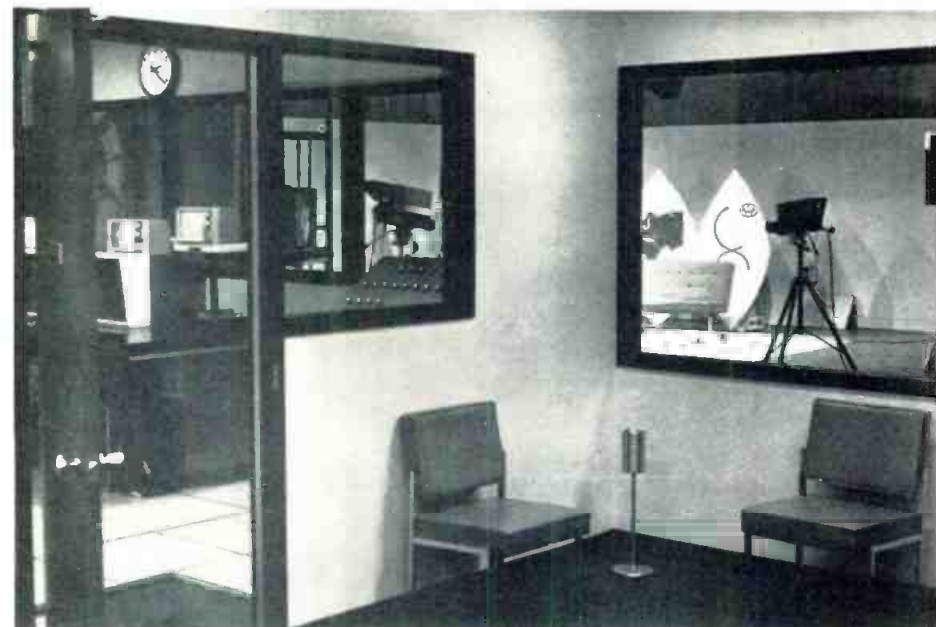
All CTM series color television modulators feature

modular design, low differential phase and gain distortion and minimum group delay. Spurious beat suppression on all channels is in excess of 60 dB below visual carrier at +60 dBmV (maximum output) without the use of external bandpass filters. An optionally available network provides group delay predistortion characteristics which conform with FCC transmitter requirements.

Call or write today for more information on EiE's complete line of headend equipment. Electronic Industrial Engineering, A Division of RCA
7355 Fulton Ave., N. Hollywood, CA 91605
(213) 764-2411



**Electronic
Industrial
Engineering**
A Division of RCA



Organized in 1953, Meadville Master Antenna, Inc., including CTV-Channel 13, is one of the cable television pioneers. They have led the way in such developments as the increase from three to five channel capacity in 1957; utilization of aluminum sheath cable to provide 12-channel capacity in 1963; and system extensions in 1964 and 1965, establishing the feasibility of long distance 12-channel service. The studio is attractive and well equipped.

Jim Strickler, left, Meadville cablecasting director, meets with B. J. Smith, host of Channel 13's "World Wide Travel Show" on one of the company's expansive sets. The CATV company has been presenting highly successful regularly scheduled programs for five and one-half years.



of initiating program origination. It gives cable companies in the small, less populous areas of the country a way to start without the huge capital investments that would take many years to recover.

Strickler moved into videocassette equipment cautiously, with limited enthusiasm. "We had been working with quite complex and quite expensive equipment. Each unit** costs five to six times as much as the U-matic. Our problems were continual hooking, flagging, and an occasional vertical bounce. Everything would work fine with a unit, and then a mechanical problem would put it on the shelf for a week or more. The U-matic now provides many of the same features as the complex equipment, costs significantly less, and has eliminated many of these problems."

**Ampex helical VTR models 7800 and 5800. Meadville also has an older 7500 unit.

No hooking and flagging with U-matic

Strickler estimates that the yearly maintenance cost for one unit of his older equipment is almost as much as the total cost of one U-matic unit. "We could use the Sony for a year and throw it away for the same money," said Strickler, who has no intention of throwing it away. "The hooking and flagging are virtually nonexistent, and maintenance has not cost a significant amount, despite the fact that 20% of the programming and all of the commercials are currently on videocassettes.

"Furthermore, an important plus is the fact that a system with existing equipment can add a U-matic unit for backup, which brings much needed stability to the overall operation."

The U-matic has, of course, limitations. One can't do assembly edits. In fact, it's not easy to cue at all accurately with the U-matic, and the cue time varies

continued on page CM/E-14

AMPEREX PLUMBICON*
TV CAMERA PICKUP TUBE



*This is the tube
that was in the camera
that revolutionized TV broadcasting
seven years ago.*

INTENSIFIED
SILICON-VIDICON

SILICON-VIDICON



VIDICON

PLUMBICON

**This is the line,
the only line
that includes all four types
of one-inch camera tubes
currently used in
today's TV cameras.**

Amperex, who gave the TV industry the Plumbicon camera pickup tube seven years ago, is the only manufacturer of all of the four types of one-inch pickup tubes used in today's TV cameras.

Recognizing the obligations that have accrued to us as the number one source for the component that is the heart of the TV camera, we extend an invitation to anyone who is contemplating the purchase or the design of a TV camera system to discuss his specific requirements with us, with complete confidence in the objectivity and validity of our recommendations. Whatever the application — color or black and white, telecasting or video-taping, CCTV or CATV, industrial, educational or medical, surveillance security or military reconnaissance.

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



Amperex

TOMORROW'S THINKING IN TODAY'S PRODUCTS

Sold through
North American Philips Electronic Component Corporation

*Trademark of N.V. Philips of The Netherlands

Whatever happened to Craftsman?

Everything....We Grew!

I've watched us grow to be Magnavox' CATV Division with the most useful spectrum of passive cable TV products available. I'm Bob Greiner, general manager of passive operations and your needs are my first priority. You need a full and complete line of specialized passive products for specific system jobs! That's what we have and will continue to provide: from transformers to splitters to taps, even the "F"-connector has more special varieties here.



We're set up to give you personal service whether you want ten connectors or thousands of taps. With Eastern and Western distribution centers we can fill your requirement faster and at more competitive prices.

This is our team, they're here to serve you....

Just tell them how!

Call us toll free

Dan Delbene Alan Devendorf Bob Emmerty John Gary Joe Gibbs Prent Hednck Corbett Herck



George Kazacos Larry Kincaid Tom Malkon Tom Olson Joe Proietto Harold Senkel Ken Siegel

In the East

In the West

800-448-9121

800-448-5171

In New York, (315) 682-9105 Collect

Magnavox

catv division

Circle 180 on Reader Service Card

areas sell to advertisers who are comfortable with television. "However, it's not so easy in most CATV markets," says Strickler. The local car dealer or men's store owner is used to looking at his message on the printed page. You can't blame him; it has been his whole orientation until recently.

"He can sit down with the local newspaper people and design an ad, then pin it on his bulletin board and look at it for a couple of days. You can't do that with the cable TV commercial—it's all over in 60 seconds or less. It's a whole process of education, and we're coming along nicely," Strickler reports. His objective is for advertising to cover the costs of local programming before too long.

Despite the ever-present technical and cost problems, CTV-13 has continually expanded its local programming, and recently has decided to acquire other available programs to balance its total program schedule; a feature-length movie is now shown four days a week.

Ultimately, Meadville Master Antenna will convert to 27 channels and expects to add special educational and other programs for its viewers. The Meadville system has already been the subject of several complimentary stories in *Life*, *TV Guide*, and various industry magazines, pointing to the progressiveness of its operation.

Prospects are bright for Meadville Master Antenna's cablecasting operations to play a big part in the fast developing cablecasting field. **CM/E**

A Successful Telephone Game Show

One of the most successful long-run shows is CTV-13's "Lucky 13," a television viewer interaction game show featuring prizes and cash for participants. Although "Lucky 13" started out as a two-week gimmick show, it became a success immediately and was extended to 13 weeks—then 26 weeks. It now looks like it will run forever. Strickler is a little embarrassed by its success and he takes greater pride in some of CTV-13's other programming efforts. But viewers like it—and the show produces much needed advertising revenue.

Briefly, "Lucky 13" offers a cash jackpot to the viewer if he knows the exact amount in the pot when called. Subscribers to be called are picked randomly. The jackpot is not large—it is increased one or three dollars at a time. But the winner gets a crack at bonus prizes of merchandise. This merchandise is not bartered in exchange for commercial plugs; CTV-13 buys all merchandise outright. It does sell commercial time. Strickler figures viewership is extremely high since 70 to 75% of the time those called know the answer (this percentage may drop to 60 in summer months). The show goes on twice a day at 3:30 and 6:05 p.m. Strickler suspects some housewives have a party line going to share information on the jackpot's amount. If a pot goes uncollected at 3:30, it rarely goes past the evening show. Strickler doesn't mind one bit, he's glad to be able to give away 10 to 20 prizes a day. It means no trouble selling ads.

Fiddle-free picture quality for your subscribers. Fewer service calls for you.

The Oak V-26 CATV Converter with AFC and varactor tuning.

No need for a fine tuning knob on the Oak V-26. The automatic frequency control (AFC) ensures drift-free, stable reception on each channel. The varactor-tuned channel selector provides maximum reliability with little or no maintenance. Oak warrants the V-26 against factory defects for one year. And it's both UL and CSA listed.

The all solid-state V-26 is manufactured by Oak in the U.S. This assures constant and reliable quality control; quick reaction time on orders, repairs, and assistance; and—*very important*—stable pricing which will not be subject to later increase due to currency revaluations.

Over the years, Oak converters have scored a superior record of trouble-free operation. There are more Oak converters in the field than all other brands combined—*overwhelmingly so!* One look at all of the features of the V-26 and you'll see why. Call or write for our detailed brochure.



DAK Industries Inc.

CATV DIVISION / CRYSTAL LAKE, ILLINOIS 60014

TELEPHONE 815-459-5000 ■ TWX 910-634-3353 ■ TELEX 72-2447

Circle 181 on Reader Service Card

Canadian Cable Meet Will Dig Into Management, Programming, Technology, and Show Latest Equipment

OPENING TUESDAY, MAY 22, at the Four Seasons-Sheraton Hotel, Toronto, and running through Friday, May 25, the 16th Annual Convention and Exhibit of the Canadian Cable Television Association will offer registrants a very full program of sessions, panelled by outstanding Canadian and American experts, and scrutinizing the most important aspects of cable management, programming, and technology. In addition, an equipment exhibit will let registrants see the latest products from about 50 Canadian and American manufacturers who constitute a roster of top-line cable equipment makers in both countries.

Registration for the meet opens at 10 a.m. on the 22nd, and the first public activity is the opening of the trade show and reception for registrants from 5:30 to 8:00 p.m. that day. Convention sessions on subsequent days will generally consist of a business meeting, a programming meeting, and a technical meeting, running concurrently morning and afternoon.

The business session on May 23 is a joint meeting with the Law Society of Upper Canada, at which registrants will be informed about the jurisdiction, licensing policies, practices, and procedures of the Canadian Radio and Television Commission and the Department of Communications.

The concurrent technical session will cover the technical problems of program origination; and the programming sessions will be called "How To," with a high-talent panel of film makers and cable programmers to offer advice.

Guest speaker at the luncheon on the 23rd will be Dr. Eugene V. Rostow of Yale, who prepared the Rostow Report on Communications for then-President of the U.S., Lyndon B. Johnson.

Registrants who have specific questions they would like to ask CRTC or DOC can go to Information Centers set up by both organizations, staffed by department heads and other officials, and open from

2:00 to 4:00 p.m. on the 23rd and 24th.

There will also be a Group Insurance Information Center and a CCTA Information Center, both also open from 2:00 to 4:00 p.m. on the 23rd and 24th.

Business session on the afternoon of the 23rd will include a lecture by Mr. Chris Johnson of the Ontario bar, Legal Counsel, CRTC, on procedure at CRTC hearings; a lecture by Mr. J. W. Lawrence of the Quebec bar, General Counsel, CTRC, on the regulatory and licensing power of the CRTC, followed by a panel discussion on issues in CRTC administrative practice.

A concurrent technical session will include a talk on two-way terminal services by Mr. John J. Sie of Jerrold Electronics, followed by a panel discussion on the state of the art in converters, with personnel from Jerrold, Oak, Magnavox, and other engineering sources.

The programming session will consist of a series of workshops, each with an outstanding program professional as group leader, which will consider the following topics: technical problems in programming; how to encourage the public to perform; program budgeting; stimulating community groups to use cable; and advertising, pros and cons.

May 24

A Thursday morning plenary session will have a panel of cable and broadcast executives to respond to the question, "How Is The Marriage Working?" Later in the morning, the business session covers cable marketing; the technical session will consider transmission methods, with speakers on use of satellites by CATV, and on microwave surveys and techniques.

Of important interest is the programming session Thursday morning on controls on political or controversial broadcasting and cablecasting. Among the panelists are John D. Hulton, managing director of CRTC; Murray Chercover, president and general manager of the CTV television network; and Henry Geller, special assistant to the Chairman, FCC.

Guest speaker at the May 24 luncheon will be the Honorable G. Carton, minister, Department of Transportation and Communication of Ontario.

Highly interesting on the technical side are a series of discussions and demonstrations set for the afternoon of the 24th on test procedures for cable, including showings of spectrum analysis, and tests for envelop delay, frequency, cross-modulation, etc.

May 25

A "hot" topic will take up the final session of the convention on Friday, May 25, at 2:00 p.m.: subscription TV, with suppliers of various pay systems describing their equipment.

CM/E

NCTA Announces Program For Annual Convention, June 18-20, Anaheim, California

Under the general theme, "CATV, The Choice Medium," the National Cable Television Association has announced a full slate of technical and business program topics for its 22nd Annual Convention, which will run June 18 through 20 at the Anaheim Convention Hall, Anaheim, California. Advance of the technical program indicates over 40 technical papers. Full advance information on the show will appear in the June issue of CM/E. Registration forms and program information: NCTA, 918 16th Street, NW, Washington, D.C. 20006.



“All of a sudden our day-to-day work turned out to be something special.

“Of course, our job is to make improvements. But we didn’t realize how successful we had been until we stepped back and took a look.

“Take super 8 for example. Eastman Kodak Company made better and better super 8 film to meet the increasingly critical requirements of the market. At first, it was an innovation for the general consumer. Then we realized how important it could be in other applications. So we supplemented it with special cameras and projectors for use in television and even CATV.

“Or take our exciting new film stocks in 16 and 35mm. Generations of development continue to give birth to entirely new emulsion technologies.

“Better films need more flexible, more useful projectors. So our company developed the Eastman 16mm television projector, model CT-500. It fills the need for a fast-forward, fast-reverse machine...the first projector designed for truly efficient film use in television.

“That’s where we are right now, and we’re anticipating a lot more. We’ve set our goals very high.

“We’ve found the best way to make the future happen is to work hard at it today.”

Judith Schwan. Superintendent of Emulsion Research
At Eastman Kodak Company.



EASTMAN KODAK COMPANY
Atlanta: 404/351-6510/Chicago: 312/654-5300/Dallas: 214/351-3221
Hollywood: 213/464-6131/New York: 212/262-7100/San Francisco:
415/776-6055/Washington, D.C.: 202/554-9300.

STATE OF THE CABLE UNION

By Dean Burch

Address of the chairman of the Federal Communications Commission before the Southern Cable Television Association, Mobile, Alabama, April 2, 1973.

(Italics were added by editors)

I will talk today about recent developments and problems in the cable field—a sort of State of the Cable Union speech.

In our 1972 Report, the Commission sought to blueprint a communications structure in which cable would play a vital role in supplying new, local, different material. Broadcast television will continue to be supported by advertisers and will go on providing the kind of mass appeal programming that attracts large audiences. In my judgment, it will remain both an economically healthy and powerful communications force.

As to cable, the *Commission is looking to the larger operators to originate their own programming*, the expectation being *that the product will be different* from that presented on broadcast television. The door has been conspicuously opened wide for cable to get into subscription or pay—the hope being that somehow again new choices will be provided for those willing to pay for something not available on regular TV. And, by requiring systems to provide access facilities and channels, *cable is being nudged into serving as a significant voice of the local com-*

munity. We have perhaps used regulation to compel the provision of services that do not pay their way, but we have also cleared the way for the development of services that will be profitable. Finally, there will be a satellite in your future that may—with increasing numbers of cable homes—make possible cable networks.

Viewed in this light, the *distant-signal limitations in our 1972 plan* take on new significance. They are part of the *larger plan* to move the cable industry away from conventional television and into the role of *innovator*.

I'm not suggesting that the Commission's package ought to send you to dancing in the streets. But it is an act of genuine creation—a new industry has been conceived.

And it is something you can take heart from. It is a whole brand new ball game. Cable has broken out of the deep freeze and has been certified as a separate communications force in its own right.

But this is clearly the beginning, not the end, of the cable story. Very little has been settled completely or for all time. There are lots of *issues that are open and other problems that are hanging over*. Looking down the road, I see no let-up in cable's *fight for position*.

This past year the industry probably experienced a slower growth rate than many of us would like. The reasons for it are varied. For one, big city franchising has been very slow. The Bostons, Detroit, Clevelands, and Chicagos are now caught up in a tangle of confusion. They seem not to know which way to go. They are pulled by system operators, plagued by local citizens' groups, adrift in a sea of pamphlets and studies.

On top of this, we are witnessing more state regulation. Maybe in the long run this will work to your benefit because state cable commissions may *turn out to be advocates of broadband communications networks*. But it will slow things for the short term. In New York, New Jersey, and Massachusetts, for example, the initial response of the state boards has been to declare a moratorium on cable activity. The cable industry continues to expend resources and energies fighting state regulation. Maybe state *regu-*

Stop the bull. Everyone ships a bad reel occasionally.

Including us:

Very infrequently, to be sure. But cable-making is *not* quite an exact science yet. So absolute guarantees are worth about as much as the paper they're written on.

Now let's get on to the important thing: what do we do if you *do* get a bad reel? Talk it over at length? Painstakingly re-check the cable? Start negotiations on complicated adjustments?

Yes, all that.

But *later*. What we do right away is re-ship. That's right away.

When cable perfection can be absolutely guaranteed, we'll be the first to do it. Meantime, we simply promise not to leave you hanging. Ever. And that *is* an absolute guarantee.



**SYSTEMS
WIRE & CABLE
INC.**

Phoenix, Arizona Rome, N.Y.
(602) 268-874 (315) 337-7080
TWX-910-951-1533

**PLEASE
MAKE NOTE
OF OUR NEW
PHONE & TWX
NUMBER**

All we make is cable . . .

That's why we make it better.

Circle 182 on Reader Service Card

State of Cable Union

lation is unavoidable; maybe it would be better for the cable leaders to come to terms with it, work out the best conditions possible, and get on with the business *at hand*.

We at the federal level have done our share to keep cable from busting out—or, as we prefer to say, we have been keeping cable going at an orderly rate. No new system can get going, or an old one upgrade its signal lineup, without a license from us—called a certificate of compliance. The machinery allows time and opportunity for objection, and the process has not been disappointed. Broadcast objection has been the rule, not the exception. So, processing has at least been heavy, if not slow.

But the picture is not as bad as some in your industry would have you believe. And there is something to be said for orderly deliverance over pell-mell breakout.

For the first six months, the going was sticky; the last six has been a period of substantial advance. Anyway, here are the numbers, and you can judge for yourself: 2200 applications have been filed and put on public notice; 900 or so have been granted; and the next 100 look promising for a quick turn. More than that, the outlook is good for continuing upward movement because our Cable Bureau will get a start on doubling in size after July 1.

We think we have pretty much shown that we are, and mean to continue, delivering on our obligation. But we are much troubled by one crucial problem—copyright. Its importance is obvious. While your future in the long run may well depend on the development of new services, you rely heavily on the carriage of broadcast signals—particularly distant signals—to gain vital subscriber penetration during initial periods of operation. Your right to carry those signals must be secure. If it is not, the foundation for cable operation is shaky. And that is particularly distressing at this point in cable's history—when it needs lots of investment monies to build the big city franchises.

The solution cannot come from the courts. Cable would then be an electronic crap game subject to the vagaries of litigation and the whims of continuing court haggling. The courts can only say yea or nay—black or white. The courts cannot meld copyright with communications considerations. The results of copyright litigation can be a crazy quilt pattern patently against the public interest.

Just one example: Under *Fortnightly*, a cable system in San Diego can carry 14 Los Angeles signals so far as copyright is concerned—but not under the FCC's plan which greatly restricts the number of such Los Angeles signals. Under the FCC plan, a system in Riverton, Wyoming, markedly serves the public interest when it brings all the Denver signals via microwave to this underserved community; under the recent *CBS v. TelePrompTer* decision, the

system could be enjoined from carrying these signals without the consent of the many copyright owners of programs on the signals.

Nor can the courts be blamed for this situation. The court in the *CBS* case was at pains to point up its dilemma:

“The complex problems presented by the issues in the case are not readily amendable to judicial resolution. As the Supreme Court said in *Fortnightly*, ‘We must take the Copyright Act of 1909 as we find it’ and do the best we can. We hope that the Congress will in due course legislate a fuller and more flexible accommodation to competing copyright, anti-trust, and communications policy considerations, consistent with the challenges of modern CATV technology.”

We have made an all-out effort to secure such legislation. We broke the impasse over cable by fashioning a solution that would give all the contenders a fair shake—the cable industry: the right to carry some distant signals; the broadcasters: some assurance, by limiting distant signals, that their markets would not be inundated by large numbers of outside stations; the copyright owners: some payment for the use of their product by cable; the public: the best material that creative minds would be induced to provide for healthy broadcast and cable industries flourishing simultaneously.

Crucial to this agreement—the so-called “Consensus Agreement” of November 11, 1971—was the consideration that there would be validating Congressional action in the copyright field. By the terms of that agreement, the three contending parties—cable, copyrightowner, and broadcasters—undertook to support copyright legislation that contemplated compulsory licenses at a schedule of fees that you would all attempt to agree on. You also all agreed to compulsory arbitration if agreement on fees could not be worked out.

Negotiations looking to the possibility of agreement have not worked out. Nor have all sides been fully agreeable to arbitration. But it would serve no useful purpose to try to assign blame at this point. What is absolutely vital here is a breakthrough—an agreement among the parties that facilitates legislation.

I intend to do all in my power to effect a fair resolution of this knotty problem. I take heart from Senator McClellan's strong determination to move this matter forward.

But we need and must have the full cooperation of the industries. And . . . I take this opportunity to say: You *must* come to copyright terms. For that is what cable has agreed to do, that is what it is expected to do, and that is what it must do if it means to get into the fabric of American life. There is no other way to regularize your industry—to give yourselves the sound base for future growth. **CM/E**

Don't buy any CATV equipment before you get the Facts.

You can get the facts by contacting a representative of the EiE Division of RCA. Or by joining us in booths 85, 86 and 87 at the Anaheim NCTA Convention, June 17-20.

Then we'll have a chance to get acquainted with you. And acquaint you with what we have to offer.

And that's plenty.

You'll see *proof* of the profitable services our bi-directional cable tv systems can provide.

You'll see *proven* system components.

Complete from head-end to subscriber.

You'll see examples of our *proven* capabilities in two-way installations.

And you'll see what can happen when a company like EiE joins up with a company like RCA. In terms of total systems capability, technology, and stability.

We're the most experienced company there is in two-way cable tv. So don't sign anything until you've seen what we have to offer.

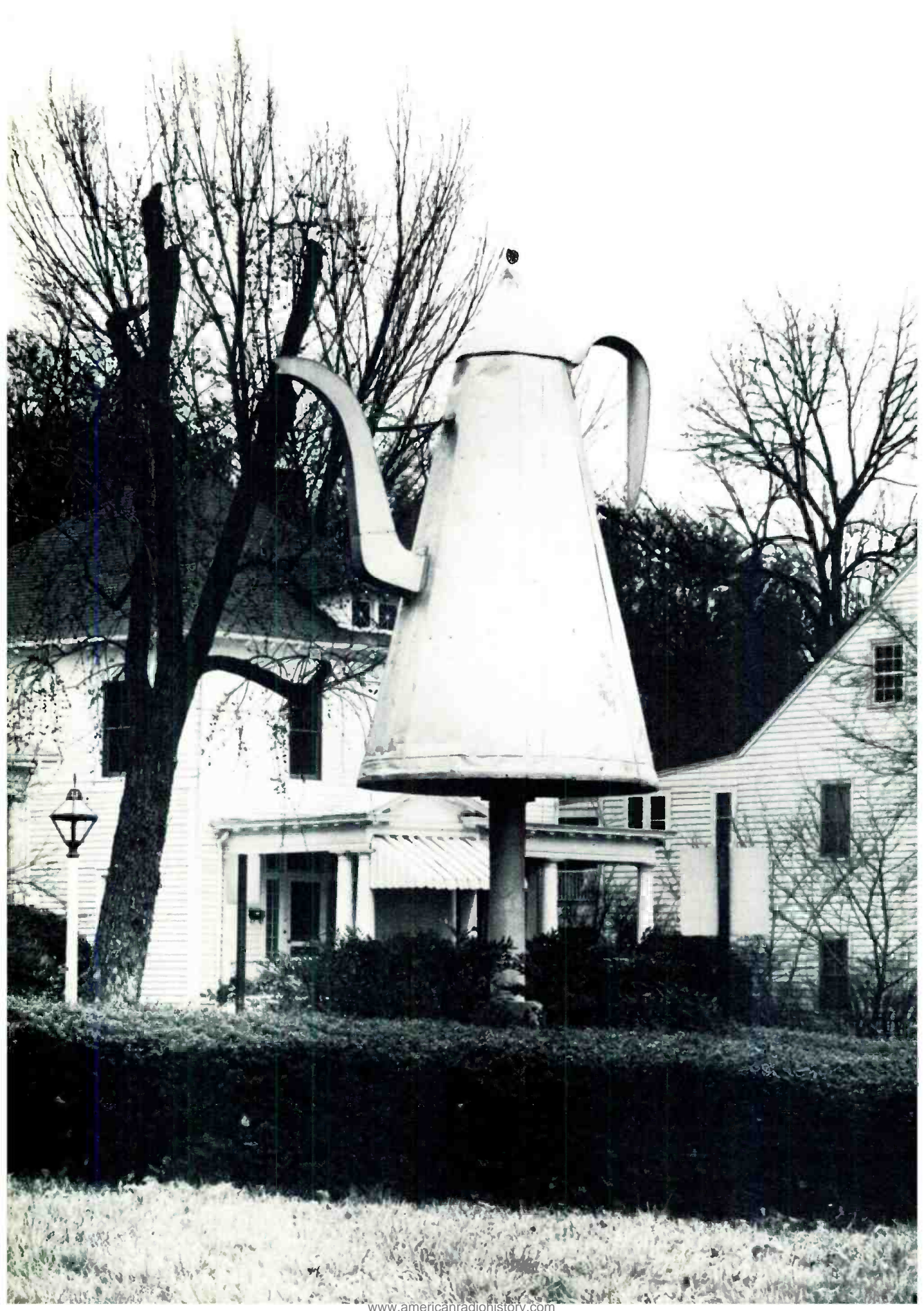
It's worth waiting for.



**Electronic
Industrial
Engineering**
A Division of RCA

7355 Fulton Ave., North Hollywood, California 91605. (213) 764-2411.

Circle 183 on Reader Service Card



We're into Winston-Salem. Systematically.

In the home of the tobacco industry, 12,000 homes can now tune into our new two way CATV system. Specially designed with a twenty-one channel capability, it's engineered not just for today. But for years from today.

Who did it all? Scientific-Atlanta. Systematically. We supplied the whole works. From head ends. To distribution systems. To active two way channels. Then, we put it all together. And up in the air.

We've been leaders in space engineering since 1953. We're in Cable communications. Telecommunications. Satellite communications. And we're systematic about everything. Our installations. Our service. Our systems.

In the industry we're known as the most talented innovators in CATV. One of the few full-line suppliers capable of creating a totally expandable two way system. So flexible, so far ahead—it's got the future built into it.

We've got a system for everything. And everything for your system. So if you're thinking systems, think Scientific-Atlanta.

For full details phone or write, Scientific-Atlanta, Inc., Atlanta, Ga. 30324. (404) 938-2930. Or call one of our regional offices in the following cities: Belleville, Ill. (618) 397-9251 □ Bladensburg, Md. (301) 779-1515 Burlington, Mass. (617) 272-1256 □ Dallas, Tex. (214) 357-1855 □ Leonia, N.J. (201) 461-5340 □ Long Beach, Calif. (213) 428-7515.

**Scientific
Atlanta**
We're systematic.

See us soon at the NCTA Show. Booth 73-74.

Circle 184 on Reader Service Card

Kodak Shows Improved Super-8 Videoplayer; Says It Will Be On Market This Year

It's real: The Super-8 videoplayer has moved from the "feasibility model" of October 1971 to a well-performing model that Kodak promises to sell in the fall of 1973.

VIDEO RECORDING TECHNOLOGY took an important new turn with the unveiling early in April of what Eastman Kodak described as a viable, soon-on-the-market Super-8 videoplayer, a device which accepts Super-8 film cassettes and turns out a video signal that can be fed to a standard television receiver, or into any video program channel.

The standard Super-8 cassettes used by the videoplayer are the same as those used on Super-8 projectors, which makes programming recorded in Super-8 form more flexible, as to distribution methods, than any other breed of recorded video.

The models demonstrated at a press conference on April 6 in New York, and at the SMPTE Technical Conference the following week in Chicago, performed far better than the "feasibility model" Kodak showed a year and a half earlier. *BM/E* found the resolution good, color fidelity excellent. A Kodak spokesman put the resolution at 280 horizontal lines, in color. The quality of the sound was very poor but this is, of course, more a question of philosophy than of technology: most makers of video program devices (including the standard TV receivers through which the videoplayer was being seen and heard) are united in the opinion that sound quality is of no importance in a video machine.

The one video fault evident was a slight tendency to jitter, and Kodak personnel said that this would very soon be eliminated. (Actually the problem was flicker which can be corrected optically.)

It seems likely, therefore, that the Super-8 videoplayer will become a genuine alternative for users of recorded video programming before the year is over. It is not intended for the home market; with a price of \$1195, Kodak is aiming it for the cast cable TV, school, business, institutional, and military markets. The machine will come into direct competition with, for example, Sony's U-matic and Norelco's cassette machines, and all the others out for the bucket of gold at the end of the videocassette rainbow.

Presuming that the first impressions of good quality hold up, and that no serious problems of durabili-

ty in use develop, the Super-8 player will have persuasive attractions for a variety of users. Business, military, and school "communicators" may find it handy to have a recorded video program that can be thrown on the cafeteria wall, or fed into a CCTV system, or bank of TV receivers, whichever is most convenient at any given location.

Usability as a program source in broadcasting or on cable, with the Super-8 player constituting a very inexpensive kind of telecine unit, depends on further modification promised by Kodak. In any case longer scrutiny of the *quality* is needed to help determine the suitability of the system for broadcast and cable origination use.

The essence of the system is a flying-spot scanner which is driven to follow the continuously moving film. There is no intermittent motion. The vertical drive is tied to the film motion by a sensor and electronic system that reads the speed of the film sprocket holes and continuously adjusts the vertical scanning to match. This also makes it easier to allow for different film speeds: readjustment of the scanning circuits is not needed when film speed is changed.

Threading is automatic, with a built-in take-up reel onto which played film winds. After a program is played it is automatically rewound back onto the cassette. The system uses 50-, 100-, 200-, and 400-foot cassettes.

The RF section provides a carrier on Channel 2 or 3 which is modulated by the program. There is also an output for the video signal, for feeding directly into a video program channel.

The unit is pleasantly compact at 8 inches high, 26 inches wide, and 15 inches deep, and weighs approximately 35 pounds. Using it is extremely simple: it has the operational virtues of cassette systems, with the cassette simply dropped into the mechanism and front-edge push-button control of all functions.

There is, at the least, a large promise here of a better way to handle some applications of recorded video programming.

CM/E

ONE NAME THAT GIVES YOU TWO ADVANTAGES IN CATV FINANCING

TAKE Walter E. Heller International Corporation.

One of the world's largest business finance companies experienced in all sizes and types of lending and leasing with annual advances exceeding \$5 billion.

ADD Oak Industries Inc.

A leading producer of CATV equipment with design, manufacturing, and research expertise serving the television industry for a quarter of a century.

YOU GET Heller-Oak Cable Finance Corp.

A very special finance company that has *confidence in cable* with funds and expertise to develop an individual financing program for any size cable need including systems, equipment, and expansion of services.

Ask for our "Confidence In Cable" brochure or for one of our representatives to call on you.



Call or write:

CABLE FINANCE CORP.

Samuel L. Eichenfield, Vice President
105 West Adams Street
Chicago, Illinois 60690
(312) 346-2300

OR

Loren N. Young,
Vice President
Crystal Lake, Illinois 60014
(815) 459-5000

University Originates Programs For Local Cable Companies

An unusual partnership between a state university and several area cable operators is producing a wide variety of local programs for cablecast, while giving students front-line experience in TV production.

IN WEST CENTRAL MISSOURI, Central Missouri State University is providing 15 hours of weekly programming to an audience of approximately 3900 homes in the communities of Warrensburg, Knob Noster, and Whiteman Air Force Base, Missouri. Programmed weekly from CMS-TV, university studios, are three hours of instructional programming for university credit, three and a half hours of children's programming, two and a half hours of news and sports, one and a half of "free" films, one hour of "Quiz Bowl," one-half hour public officials' forum. In addition to this, a half-hour community awareness program and a half-hour homemakers' program go on alternate weeks, as do two half-hour music programs, one contemporary and the other religious-folk. Area high schools alternate a half-hour slot on Fridays with their own programming produced at the university studio under the guidance of Mass Communication majors.

During the fall, all home university and university high football games were played on a three-day delay. The 1972 Homecoming Day Parade was cablecast live. All home university basketball games and wrestling matches were presented live, as well as women's basketball games and the Women's Basketball Regional Tournament.

Planned this summer are remote cablecasts from the community swimming pool, golf course, and tennis courts.



CMS-TV Sports Coordinator and Business Major Dave Jovanovic (center) interviews CMSU Head Football Coach Howard Mahanes (left) and CMSU Sports Information Director Dean Vogelaar on weekly "Sports Spectrum."

Officials who have appeared on public affairs programs have been the Warrensburg's mayor and city manager, the Chamber of Commerce head, Missouri Senator William Cason, Missouri Governor Christopher "Kit" Bond, the County sheriff, as well as others from the planning and zoning commission, and renewal associations.

This whole CMS-TV operation began less than four years ago, when the then-college programmed a half-hour of news and interviews daily over the Cypress Cable Company (of Warrensburg) Channel 7. Later a message wheel was added to fill the other channel time with 24 separate visual announcements about campus and civic events. The audio is provided by the university FM station, KCMW-FM. During the summer of 1972 plans were firmed up with the Telesis Corporation, cable systems owner, to provide programming to the Warrensburg Cable, Knob Noster/Whiteman AFB Cable, and Clinton, Missouri cable systems. The links to the Warrensburg, Knob Noster, and Whiteman systems were completed this winter. Clinton will be completed this summer. The Telesis systems are fed with CARS microwave. There is a hard line to the Cypress cable.

Plans are in the works for microwave expansion to other systems in the state, as well as bicycling of videotape to still other systems.

In addition to the special programming described, there is the responsibility for covering local events. The 40 university students in Mass Communications and other disciplines have already been working with the communities in programming of local interest. Daily news coverage, particularly, provides a great service to Knob Noster and Whiteman AFB, as both communities have only weekly newspapers and no radio stations.

More instructional courses for university credit through viewing television are on the way, providing the opportunity for the aged, mothers with small children and the invalids, as well as area citizens, to attend college at home.

The CMS-TV operation also provides excellent opportunity for university and high school students to gain production experience in television. These students are supervised by two graduate assistants and one full-time manager. **CM/E**

If your future depends on cable TV . . . there are a few things you ought to know:

Information about opposing forces and the moves they are planning. Information about your competition and the growth opportunities they're exploring. Information about your industry's fight for survival and profit. Information about local franchise bidding and negotiation, about regulatory trends, about new markets and equipment, financing and programming.

Now there's a way to get all this information—from *one* source, in *one* convenient format. It's all in **Broadband Communications Report**, the first truly comprehensive publication exclusively devoted to cable TV and broadband communications.

BCR comes to you from the publishers of Broadcast Management/Engineering and Cable Management/Engineering, the authoritative publications on broadcast and cable equipment. To create BCR, we brought together knowledgeable editorial people with experience in every aspect of the industry.

You get the news you need to know about current action in every broadband communication area. Not just about the FCC, but also about the latest developments on the local level. Not just about cable TV, but also about broadband nets, satellites, private channel TV, data communications, videocassettes. Not just about franchises, but also about new technology, new programming ideas, new forms of public access.

You get valuable insights and analyses that can help you make better decisions. What effect will political, social, legal and regulatory trends have on the broadband industry? What kind of cable franchise arrangements are working—and what kind are not? What are the intricate factors affecting the economic outlook of the industry?

You plug into a vast clearinghouse of information. BCR doesn't attempt to spell out every detail—but it makes a particular point of telling you where to go for more information. In every issue, we provide you with important new sources of data in specific areas that interest you—including names, addresses, prices. This unique service can save you or your staff valuable hours of research time.

How does BCR get all this information about an industry as fragmented as ours? Simply by exploring more extensively than anyone else. We review countless published reports. We cover local, state, and federal hearings and meetings. We scan news releases, local newspapers, speeches, academic papers. We prowl the corridors of Washington. We interview idea-makers and policy-makers in depth.



It's a job nobody else is doing. You couldn't do it yourself without an enormous investment of time and effort. Frankly, we think it's worth a great deal more than the modest subscription price we ask you to pay.

Right now, as a means of introducing you to Broadband Communications Report, we've temporarily made that price even lower. To take advantage of our special offer, mail the coupon today.

Broadband Communications Report
274 Madison Avenue
New York, New York 10016

SPECIAL INTRODUCTORY OFFER

Please enter my subscription to Broadband Communications Report for six months (12 issues) at the special rate of \$25—a substantial savings compared to the regular annual rate of \$60. I may cancel at any time and receive a pro-rata refund if I am not satisfied.

Payment enclosed Bill me later

Name _____

Title _____

Organization _____

Address _____

City _____ State _____ Zip _____

All You Ever Wanted to Know About Production—Just Ask

by Douglas Gratton

Part Fifteen of a series—Production for Syndication: Rehearsal on Live TV; Final Shooting on Film

YOU MAY RECALL that I concluded my last column by mentioning that I now planned to discuss “sound” or “audio” in all its dimensions—or should I say, echoes. Well, you will have to wait. I’ve just spent some time with an interesting and novel CATV production procedure here in the Big Apple, and I thought that you would be interested to hear about it.

The background to the project is that certain multi-system operators know not only that they have to get into the program origination business, but they also see it as an opportunity of deflecting into program syndication by selling their slightly-used shows to people like you! Sort of heating up cold coffee rather than brewing up a fresh pot. But, as we all know, there isn’t too much money in CATV production, so the producer has to aim for limited production values just as he has had to learn to settle for slightly muddy coffee. But the technical quality has to be good—and in glorious color! And there is the rub! Because, my friends, you can engrave this little syllogistic aphorism into your mind or onto the Control Room door:

≠1 There is good color!

≠2 There is cheap color!

≠3 But there is no such thing as good, cheap color!

So next time that you trip off to a trade show and see the “new, super-duper, low-cost, superb quality color camera at \$555.55,” the first step is to determine if there has been some kind of new technical miracle involved. If not—and miracles are not quite so frequent in this Age of Agnosticism—then ask the friendly salesman to see NOT the first generation control room monitor quality, NOT the second generation E.E. master quality but try looking at the quality of the third generation release dubs on a standard receiver. And bear in

mind that, if you need more than 50 release dubs of the EE master, you have to make some third generation dubbing masters which, in turn, will give you fourth generation release dupes. Now go back and try to find that friendly salesman who sold you that “low-cost, superb quality” camera. Like the flim-flam man of old, he has folded his booth and moved on to the next town of suckers. After all, you can only sell so much Panacea Snake Oil! So why not diversify in color cameras? People always want something for nothing and they won’t wake up to the fact that a cheap camera is a cheap camera until it’s too late! Now, before you start getting angry with me, don’t forget that my terms of reference are program production for eventual syndication. The low-cost camera is fine for live origination programs.

So how can you produce a low-budget, but high-technical quality, CATV program? Well, hang on to your hats, folks, but the answer is . . . film!

Here’s how:

≠1 The producer has a basic informational/service format program — hobbies, “do-it-yourself” home repairs, etc.

≠2 After pre-production, the show goes into principal production.

≠3 In a TV studio, the show is blocked and rehearsed by a three-camera crew of film and tape people all mixed up together.

≠4 The program is blocked and rehearsed on monochrome one-inch videotape.

≠5 The videotape is played back and closely viewed by one and all. (Even Frank, the coffee delivery man, stayed to watch!)

≠6 Without burning up the talent, the program is re-blocked and refined through the use of the re-

hearsal tape.

≠7 When the Director feels that the moment is nigh, the TV cameras are rolled out and film cameras are rolled in! Same crew, however!

≠8 The actual program is shot on 16mm reversal with double-system sound.

≠9 The Director wraps it up by doing any inserts, “reversals,” and “safeties”—but the shooting ratio still stays close to 1:1. Two to three shows a day can be shot in this manner.

≠10 The next day the film is edited single strand. No A and B rolls. And when I say “the film,” I mean the actual scene-exposed film. No workprints, no dailies.”

≠11 The double-system single-strand film is then transferred to two-inch high-band color. And, baby, when you’re there, you’re home. I suppose that you can make, what we kids used to say, a “zillion” copies from that. And, as for the quality of the color, well, Eastman Kodak has a certain degree of experience in this matter . . .

Time wise . . . I suppose that you could do the whole thing from a Monday to a Monday. Money . . . my guess is about \$3K for a 25-minute show, plus creative costs. Add these two items to the color quality, and it makes a good deal.

Next month, mics. But I would appreciate if you would send in your comments, questions, and criticism. This is the 15th article and all that has happened is that someone has written in from Missoula, Montana, and a high school student asked me about the slo-mo disc that is used for “instant replay.” As the life guard said while sitting 100 miles from the sea in the Sahara Desert, “Great beach . . . but it’s very lonely!”

CM/E

TPT Wins "Blue Sky" Boulder Cable Franchise

A cable franchise so loaded with prerequisites for the city of Boulder, Colorado, that a number of cable firms backed out of the contest, has been awarded to TelePrompTer Corporation, one of the two firms that stayed in. Here are some of the provisions the city asked for, and got, from TPT, in what the city's negotiator called "the best cable package in the country." Two percent of gross subscriber fees for the public access channel; renegotiation every three years; a channel for qualifying non-profit groups at \$1 a year; full public disclosure of finances; a subsidy for low-income subscribers; methods for arbitrating disputes.

The losing bidder, Community Telecommunications, Inc., set up a cry that TPT had "hornswoggled" the city with unrealistic promises, based on overblown income estimates. But, Boulder's officials seem happy with their deal.

Rand Issues Reports To Help Cities Set Up Cable

City officials involved in decision-making on cable are being offered aid by a publication of the Rand Corporation, "Cable Television: A Handbook for Decision Making," recently made available at nominal cost from Rand at 1700 Main Street, Santa Monica, California. "Cable . . . demands more decision-making by local communities than most technologies have required in the past," said Dr. W. S. Baer, leader of the team that produced the handbook. In addition to the handbook, Rand is issuing a number of more specialized report on various aspects of cable; a list is available there.

Report on Jacksonville Tells City's Cable Options

A report based on a six-month study of the outlook for cable in Jacksonville, Florida, prepared by the Cable Television Information Center, defines for that community the costs, income prospects, owner-

continued on page CM/E-32

Specs you expect at a price you don't.

Secondary controls and functions include:

Display Size (105% and 80% scan).
Internal/External sync. selector.
External sync. input (2) — looping.
Termination 75 ohms.

Input circuit

High impedance looping (1 meg OHM in parallel with less than 8 pf) via two rear-mounted SO-239 VHF connectors. (75 ohms when terminated by a built-in switch).

Input Sensitivity

.25 to 4.0 volts p-p sync. negative to give a minimum of 50 volts p-p signal at the kinescope.

Frequency and phase response

10 MHz bandwidth ± 3 db at 50 volt p-p output.

Linearity

Vertical: Better than 2%
Horizontal: Better than 3%
(Capability better than 1% vertical and horizontal).

D.C. Restored

Display Size

Switchable from 105% to 80% of full picture size.
Geometry ± 2%.

Resolution

Greater than 800 lines in central 80% of display area at less than 30 microamps beam current.

Standards

NTSC. CCIR

Models Available

9" single rack, twin rack or case.
11" single rack or case
14" single rack or case
23" case model with optional stand, ceiling or wall mount, speaker/amplifier pod, pulse cross kit and anti-glare treatment.



EVM9. 38 sq. in. screen.



EVM-11. 61 sq. in. screen. Also available in single rack mount.



EVM-23. 283 sq. in. Optional anti-glare picture tube.



EVM-14R. 82 sq. in. Also available in case model.



EVM9R2. Rack-mounted twin 38 sq. in. screens. Also available in single rack mount.

ELECTROHOME

... an extra degree of excellence in video equipment for every application.

809 Wellington Street North, Kitchener, Ontario.
919 North Michigan Avenue, Chicago, Illinois 60611.



Circle 187 on Reader Service Card

ship options, and other characteristics of cable systems on three levels—basic, intermediate, and advanced. Leaving the city to decide what kind of service it wants, the report nevertheless gives comprehensive insight into how each choice would be realized, and what its probable result would be. This includes much that should be useful almost anywhere. In two volumes totalling 319 pages, it is available from CTIC, 2100 M Street, N.W., Washington, D.C., at \$15 each.

Simulation Program Draws Cable Plans from Computer

A different kind of aid to planning a cable system is the simulation program developed by the consulting firm of Whitewood/Stamps, 55 Chapel Street, Newton, Massachusetts. The user puts on an input form the basic information: homes passed, subscriber rate and penetration, aerial miles built, etc. Run through a computer, the program prints out such information as: when does cash flow turn positive?, what is ratio of operating revenue to operating expense?, is the dis-

tribution of equity optimal? A complete print-out costs \$100—the whole thing can be done by mail.

Bill Seeks to Make Cable Public Utility, Under FCC

A bill introduced into the Senate by Sen. Williams (D. of N.J.) would make cable television a public utility under full jurisdiction of the FCC. This would avoid future challenges to the FCC's authority, liked by National Cable Television Association. However, NCTA is opposed to the public utility part of the proposal, wishing to avoid state regulation. Cities will also oppose the bill, which seems slated for an uphill fight.

Center To Help Minorities Get Into Cable

A new organization, Cablecommunications Resource Center, set up in Washington, will aid minorities to participate in cable by acting as adviser, clearinghouse for information, source of engineering, marketing, and economic data. Director is Charles Tate, editor and co-author

of the handbook, "Cable Television in The Cities."

Pressure to Get Cable TV Out of Programming Grows

On April 12, the Massachusetts State CATV Commission voted as a policy guideline, "the separation of ownership of cable from the ownership of programming and other services originating over the system." The guideline was adopted by a vote of 4 to 2 with one abstention. This does not mean that the state will adopt a rule to this effect immediately (extensive hearings are planned), but it does indicate movement in an area that is highly sensitive and controversial.

Speculation that the forthcoming Nixon cabinet-level Task Force study on cable TV would take a similar stand rose from an article to that effect in the *New York Times* on April 16. Later, the *NYT* published a letter from Sidney Dean, Jr., well-known cable TV consultant, which also supported separation of control of content of any sort from ownership. Dean argued the history of broadcasting proves that common programming-delivery ownership reduces diversity.

FCC Clears TPT

In granting TelePrompTer a CARS license for Elmira, N.Y., last month, the FCC said the way was clear to grant other TPT applications and certificates of compliance. The Commission observed that TPT's new management has taken measures to prevent a recurrence of past actions that had resulted in criminal convictions.

On October 20, 1971, TPT and its former president, Irving Kahn, were convicted of federal conspiracy and Kahn was convicted individually of perjury as a result of illegal payment to several Johnstown, Pa., city officials. The validity of the Johnstown and Trenton, N.J., franchises will be reviewed at a future date, the FCC said.

The FCC also cleared up the matter of unauthorized transfer of control when the new management took over. Due to the unusual circumstances, the FCC said the seriousness of the violation was mitigated to some extent. It noted the new group had kept the FCC advised of events from the beginning.

CM/E

Co-incident with our 20th Year in CATV-MATV

Sitco

announces a
NEW GENERATION of ANTENNA ARRAYS

Hi Band	Quads	Broad band
Low Band	Yagis	and
VHF	UHF	Cut-to-Channel

"Ask any of 1600 CATV Systems which use Sitco Antennas."




Write for Catalog



SITCO

Antennas

10330 N. E. MARX ST. • P. O. BOX 20456
PORTLAND, OREGON 97220 Telephone 503-253-2000

Circle 188 on Reader Service Card

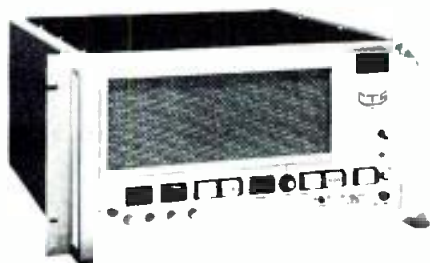
BROADCAST EQUIPMENT

Electronic timer for video systems puts high-definition numerical indications directly on a video monitor. Model G-77 accepts input from any video source, has a built-in time reference based on a crystal-controlled oscillator, superimposes exact time information



on the video program. Position of display, size, intensity, hold, start and reset are switch-controllable. ODETICS, INC. **275**

Video disc recorder will hold up to 570 frames, has variable recording and playback speeds from one to 60 frames a second. Model 9108 has one-frame freeze, can record fast and play slow or vice versa, is intended for instant



sports replay, record storage, mug shots, track photo finishes and other similar applications. Material is instantly erasable. \$18,000. MOXON, INC. **276**

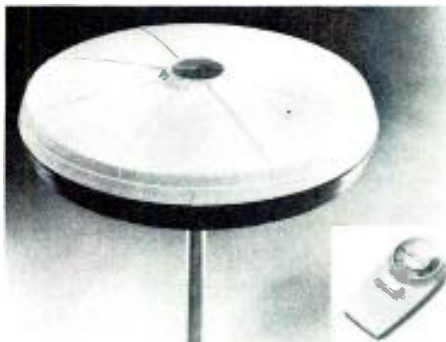
FM stereo modulation/frequency monitor has three meters for simultaneous monitoring of the left and right channels and the frequency deviation of the 19 KHz pilot carrier. Model TBM-2200A, in addition to basic modulation percentage of each channel, measures channel separation, main/subchannel crosstalk, 38 KHz carrier suppression, and s/n ratios. McMARTIN. **278**

Professional audio recorders operate



at 7½, 15, and 30 ips, but are capable of variable speeds by virtue of a new DC servo capstan assembly. The series incorporates features of M79 multi-track series, including the "Isoloop" drive. They are available in ¼-inch and ½-inch models, for one- two- or four-track configurations. 3M COMPANY. **279**

Miniaturized solid-state UHF/VHF home TV antenna is mounted in a circular "radome" only 21-inches in diameter, which is electrically rotatable through 360 degrees. Model 5MS440 includes a pre-amplifier with interference filters, and a remote-control unit allowing the antenna to be rotated



from the side of the TV set. Weighing less than six pounds, the antenna can be on the roof or in the attic or a closet. RCA. **277**

Video recorder care kit includes swabs and special spray cleaner for getting dirt off recording and play heads. Model QM-5 also has micro-wipes for cleaning capstan and control stack with complete safety, and static-free, lint-

free cloth for larger surfaces. NORTRONICS. **280**

Super-16 motion picture camera benefits from the 20% increase in picture area. Super-16 ACL comes with camera head, motor, battery, power cable and other accessories, and is ready for immediate delivery. \$8495. ECLAIR. **281**

Low-cost video character generator displays encoded messages, from any number of keyboard inputs, on a general message channel. Model D-100 Datacaster is intended for cable operators who maintain a general community message channel, has a memory holding eight full pages in color (over



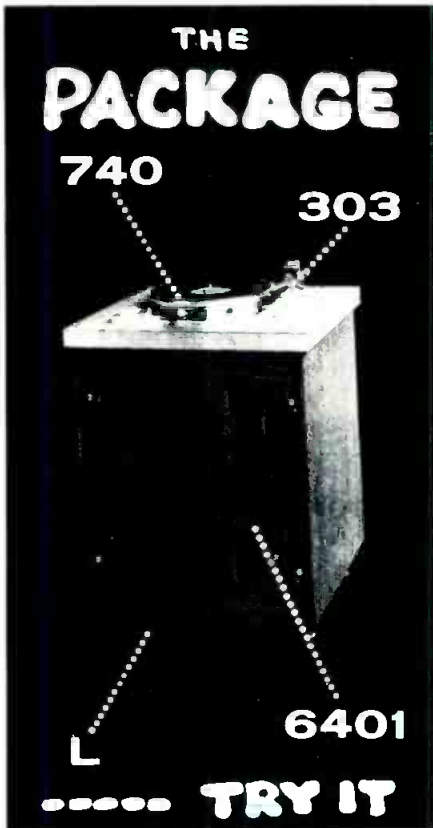
4000 characters). Each input keyboard can directly access the headend over a standard telephone line. METRO-DATA CORP. **282**

Uninterruptible power systems are available with ratings from 500 VA to 10 kVA. Each system includes battery charger, inverter, automatic relay or solid-state switch. Models up to 2000 VA have sealed, maintenance-free batteries, provide full-load back-up operation for up to 20 minutes. \$1825 to \$11,300. TOPAZ ELECTRONICS. **283**

Color genlock sync generator supplies horizontal and vertical drive, composite blanking, and composite sync, plus burst flag and color subcarrier. Model



continued on page 68



MICRO-TRAK
FORMERLY GRAY RESEARCH

HOLYOKE, MASSACHUSETTS 01040

Circle 146 on Reader Service Card

Replace your Ampex or Scully motor with a **BEAU MOTOR**

Hysteresis-Synchronous Motor

- ◆ Ball Bearing Construction for Years of Trouble-free Operation
- ◆ Electrolyzed Capstans for Longer Life
- ◆ 0.00015 Inches Max. TIR
- ◆ High Inertia Rotor
- ◆ Low Flutter & Wow
- ◆ Inside Out Construction

Tape Speed	Ampex Model	Scully Model	Beau P/N	Price
3¾-7½	440	270 275	43H-108	\$150.00
		280 282		
7½-15	440	270 275	43H-115	150.00
		280 282		
7½-15	350		54H-56	165.00
	351 354			
3¾-7½	350		54H-61	165.00
	351 354			



BEAU MOTOR DIVISION
UMC Electronics Co.
460 Sackett Point Road
North Haven, Conn. 06473
(203) 288-7731

Circle 147 on Reader Service Card

PRODUCTS

5000 will synchronize an entire video system to be an external source, is rated at ± 10 Hz NTSC stability over 30 days, less than ± 1 Hz/sec change. Phase lock ties in unit vertically, horizontally, and to the burst in less than one second. \$995.00. VACC. 284

Fused disc coaxial cable is available in .750 inch size, in addition to the previously released .412 inch and .500 inch sizes. Cable has guaranteed im-

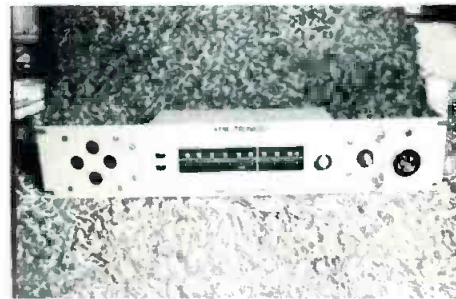


pedance of 75 ohms, SRL level no worse than 35 dB from 5 to 300 MHz, is available with copper or copper-clad center conductor. GENERAL CABLE CORPORATION. 285

Chrominance level corrector, used with 12.5 T or 20 T modulated sine-squared pulses, provides in-line manual correction for chrominance/luminance gain errors. Model 1478 has a program channel and a monitor channel; the latter allows corrections to be previewed before they are applied. Gain

errors are read directly from front-panel controls. TEKTRONIX. 287

FM EBS receiver has a built-in audible alarm with provision for additional external alarm. It has built-in monitor amplifier and speaker. The alarm is



switchable to operate only during carrier interruption, or to start with the first interruption of carrier and continue until reset. \$149.50. TRI-TRONICS PROFESSIONAL ELECTRONICS. 286

FM band dry termination uses a highly durable resistive element in a stream of forced air. Model DPTC-10KFM handles 10 kW, weighs 37 pounds, covers DC to 110 MHz, is available for other power levels up to 75 kW (larger sizes). \$1500 up. ELECTRO IMPULSE, INC. 288

High-power engine-generator sets are powered by v-12 diesel engines. Model DES-550 is rated at 550 kW standby and 475 kW continuous duty. Model DES-500 is rated 500 kW standby and 425 kW continuous duty. Both accept a load in 5 to 10 seconds, with output voltage regulated to $\pm 1\%$ from no-load to full-load. Momentary kVA generator rating covers starting inrush. ALLIS-CHALMERS. 289

Motorized zoom lens has 5 to 1 range, one-inch diameter. Model V18-90M has $f/1.8$ aperture, polyurethane drive gears, is made of corrosion-protected aluminum in a steel-cage assembly. \$710. VICON INDUSTRIES. 290

"FIVE" MIXER AUDIO CONTROL

console

B-500 series

the B-500 monaural

\$750

the B-502 stereo

\$1050

B-503 dual channel

\$950

for complete information please contact the Director of Sales Dept. B-50



McMartin

MCMARTIN INDUSTRIES INC. 605 NORTH THIRTEENTH STREET OMAHA, NEBRASKA. 68102 TELEPHONE (402) 342-2753.

Circle 148 on Reader Service Card

rapid VTR editing



at low cost

The EDS - 200 uses SMPTE precoded tapes to ensure excellent edit accuracy • Controls two VTRs plus external source • Programmed micro-computer control • No-overshoot high speed search • For quad or helical VTRs • Units may be linked for multi-machine control.



CENTRAL DYNAMICS LTD

CANADA - 147 HYMUS BLVD., MONTREAL 730, QUE.
U.S.A. - 230 LIVINGSTON ST., NORTHVALE, N.J. 07647

Circle 149 on Reader Service Card

PERFECT YOUR CCTV SYSTEM WITH **COSMICAR**[®] LENSES



TV-COSMICAR-EE 16mm F/1.6

The TV-COSMICAR-EE 16mm f/1.6 is a high-speed EE lens specially designed for 2/3" vidicon cameras. It maintains image luminance 100 lx against subject brightness between LV11.3 ~ 17 (350 ~ 18,000 cd/m²), about 1,800 ~ 96,000 lx.

The automatic electric-eye diaphragm close down completely provided that subject brightness exceeds approx. LV20 (144,000 cd/m²), 768,000 lx. In case the camera is switched off and not in operation, the automatic diaphragm closes down, completely shutting off the light for protection of the vidicon camera.

The "Change-over Switch" in front of the lens controls the operation of the diaphragm.

When the switch lever is turned on to "EE", the lens diaphragm operates as fully automatic electric-eye, and is brought on to "OPEN", the diaphragm stays fully opened condition.

Be sure to get the finest image recording results with quality Cosmicar lenses.

Also available are scores of other lenses, ranging from 8.5mm to 1,000mm 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"

Circle 150 on Reader Service Card

**THE
LEADER
IN
CATV
TOWERS**

*"Quality—Service
and Price!"*



Yes, quality, service and price on CATV systems are the reasons for Fort Worth Tower's position as the industry's leading supplier. Experience gained as a pioneer supplier of CATV enables Fort Worth Tower to provide you with a quality product at a price that is reasonable and attractive.

Take advantage of our experience. For assistance in systems planning, engineering and complete systems quotations . . .

CALL OR WRITE TODAY
Fort Worth Tower
COMPANY, INCORPORATED
P.O. Box 8597, Fort Worth, Texas
(817) JE 6-5676
—Associated Companies—
Tommy Moore, Inc.
Big State Engineering, Inc.
Tower Construction Finance, Inc.

Circle 151 on Reader Service Card

**NEW
LIT**

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

"Application Guide for Forced-Air Cooling of RCA Power Tubes" is a technical treatment of requirements and methods, describing analysis of ambient conditions, design of proper cooling systems, etc. RCA. **200**

Equipment for television test and measurement is the subject of a new short-form catalog, TV-2, which includes complete technical description and application notes on each instrument. Rohde and Schwarz. **201**

Full line of trenching equipment is covered in pocket sized brochure; models range from 7-hp handlebar to 65-hp four-wheel drive. Ditch Witch. **202**

Sixteen-page catalog, in color, shows **consoles, desks, and instrument cabinets** for broadcasters in the Econo-Rack line. Amco Engineering. **203**

Professional broadcast items, including phono pickup arms, turntables, pre-amplifiers, loudspeakers, are covered in new catalog. Micro-Trak Corp. **204**

Pocket-sized "Tool and Equipment Catalog" of 148 pages lists more than 2000 items useful to job foremen, linemen, technicians in the CATV, telephone, and power industries. Anixter-Pruzan. **205**

A series of six catalogs presents **electronic components** according to application, as follows: 1) communications components; 2) industrial power components; 3) microwave devices; 4) instrumentation components; 5) comput-

er components; and 6) research and scientific products. Amperex Electronic. **206**

A new 16-page bulletin, STP-473, **"Standard Test Procedures for High Voltage Power Supplies,"** shows loading methods, set-ups for voltage calibration and for static and dynamic output voltage regulation. Spellman High Voltage Electronics Corporation. **207**

Three publications that may aid **TV camera designers and users:** 1) technical bulletin on the 8507 and 8507A vidicons; 2) application note #AN-4906, "Upgrading an Intensifier Vidicon camera to SIT-Tube Operation;" and 3) application note #4907, "General Information and Guide For RCA 3-inch Image Isocons." RCA. **208**

Data sheet describes cassette tape recorder with speech time compression and expansion. "Varispeech." Lexicon, Inc. **209**

"Tech Topics" is a bi-monthly technical publication covering new developments and applications of switches, plugs, connectors, indicators, adapters, jack panels, etc. Switchcraft. **210**

Two brochures cover **cells for lead-acid stationary batteries.** Gould. **211**

A set of 16 application notes describe **how to test and service two-way radio equipment**, using the FM-10 Frequency Meter/Signal Generator. Among the topics are: frequency measurement; deviation measurement; audio distortion; 20 dB quieting sensitivity; and others. Singer. **212**

A 200-page handbook, **"The RF Capacitor Handbook,"** discusses in comprehensive detail basic design considerations and uses of RF capacitors, including high-frequency circuit design, characteristics of different designs, test methods, ways of increasing gain and power, bandwidth, and many others. Available from American Technical Ceramics, 1 Norden Lane, Huntington Station, N.Y. 11746, for \$4.95.



THE SMALL ONE
The Model RPL-3
REMOTE PICK-UP LINK

Transmitter—Only 4 inches high—3 full-time audio channels
—Audio limiter—AC and DC operation

Receiver—Electronic squelch—two-frequency operation
(manually and remotely selectable)

Contact us for further details on the RPL-3

MOSELEY ASSOCIATES, INC.
SANTA BARBARA RESEARCH PARK

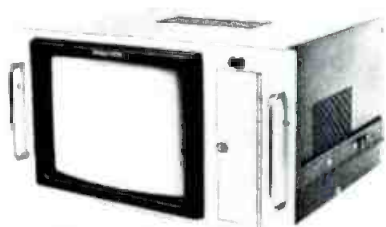
111 CASTILIAN DRIVE
GOLETA, CALIFORNIA 93017
TELEPHONE (805) 968-9621
TELEX 658448

Circle 144 on Reader Service Card

1969 — World Video Introduces the First One-Gun Color Monitor . . .

**1972 — World Video Introduces “The Un-Monitor”
The Revolutionary 17” One-Gun Color Monitor . . .**

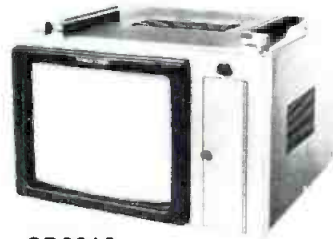
See the latest in professional color video monitors from “The Innovators” at the NAB Convention March 25-28, Booth 508 Shoreham Hotel.



CR6210



CR6700



CB6210



WORLD VIDEO, INC.

P. O. BOX 117, BOYERTOWN, PA., 19512

PHONE 215-367-6055

Circle 152 on Reader Service Card

accurate measurement of the fourth dimension

Standard Electric Time has developed and manufactured units for the precise measurement of elapsed time since 1932. These panel mounted or portable units are available in several models with accuracies to plus or minus one millisecond. They can be connected to electrical or electronic circuits for remote start, stop and reset.

For full details request catalog 261.



PANEL MOUNTED



PORTABLE

Model	Scale Divisions	Timelimit	Accuracy
S-100	1/5 sec.	6000 sec.	±.1 sec.
S-60	1/5 sec.	60 min.	±.1 sec.
SM-60	1/100 min.	60 min.	±.002 min.
S-10	1/10 sec.	1000 sec.	±.02 sec.
S-6	1/1000 min.	10 min.	±.0002 min.
S-1	1/100 sec.	60 sec.	±.01 sec.
MST-100	1/1000 sec.	6 sec.	±.001 sec.
MST-500	1/1000 sec.	30 sec.	±.002 sec.

STANDARD ELECTRIC TIME
DIVISION OF JOHNSON SERVICE COMPANY



89 LOGAN STREET, SPRINGFIELD, MASSACHUSETTS 01101

Circle 153 on Reader Service Card

MAY, 1973—BM/E

SPOTMASTER REBUILDING SERVICE

CLEANING ADJUSTMENT DIAGNOSIS \$45

We will thoroughly clean and adjust your 400 or 500 series SPOTMASTER® record/play unit for \$45.00. Delay model \$5 extra. Playback unit \$35.00. Any malfunctions or defective parts noted during preliminary testing will be corrected only after customer notification and approval. We are a franchised SPOTMASTER® dealer in new equipment, used equipment, and parts.

COMMUNICATION MEDIAS
P.O. BOX 54 / ALLENTOWN, PA. 18105
PHONE (215) 437-0607

Ship all equipment freight prepaid.
New accounts must enclose check with order.

Circle 154 on Reader Service Card

BM/E CLASSIFIED MARKETPLACE

CLASSIFIED ADVERTISING RATES

DISPLAY CLASSIFIED ADVERTISING: \$22.50 per inch 1x; \$22.00 per inch 3x; \$21.00 per inch 6x; \$20.00 per inch 12x. ALL OTHER CLASSIFIED ADVERTISING 25¢ per word; minimum \$3.00. BLIND BOX NUMBER: No 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

HELP WANTED

Engineers

FIELD SERVICE ENGINEERS

The leading manufacturer of videotape recorders and television color cameras is looking for field service engineers for our Eastern and Central Regional Service offices.

Previous field maintenance on videotape recorders and television color cameras experience required. Broadcast television experience desirable.

For immediate consideration, please write outlining your experience to the regional office nearest you: John A. Bollow, Eastern Regional Service Manager, 5 Corporate Drive, White Plains, N. Y. 10604, (914) 694-1234; C. M. Nowell, Central Regional Service Manager, 1920 Waukegan Road, Glenview, Ill. 60025, (312) 729-5160. We are an equal opportunity employer.



TELEPROMPTER CORPORATION VIDEO ENGINEER

Outstanding Opportunity for person with BSEE and 10 years broadcasting and/or ETV experience in technical design, layout, operation and maintenance of studio facilities. This position is on the corporate staff level with responsibility for selection of equipment and setting of operation and maintenance standards for CATV studio installations. Must be willing to travel. Excellent benefits. Salary commensurate with experience.

Send resume to:

Norma J. Kraus
Director of Personnel
TelePrompter Corporation
50 West 44th Street
New York, N.Y. 10035

Midwestern distributor of educational and industrial video needs you have the all around engineering, service, sales and financial know-how to sell and supervise complete studio installation on your own.

We have ample capital available but prefer a man who wants to be a substantial owner and thus a direct participant in future earnings by virtue of an investment in our business of not less than \$25,000.

Thorough knowledge of video engineering, service and installation, bid specifications and procedure, is required. Reply with resume to: Box 11475, Kansas City, Mo. 64112.

CAN YOU DO IT ALL ?

WANTED IMMEDIATELY, Video Tape Engineer. Excellent Salary. Live near the top ski areas of the Rocky Mountain West, America's cleanest air. Contact collect: Scott Tipton, Opr. Dir., KYCU-TV, Cheyenne, Wyo. (307) 634-7755.

SALES POSITION

High level technical sales of quality line of video switching and terminal equipment to TV stations. Great opportunity for ambitious man willing to travel the East Coast. Based N.Y. area.

Contact or write Marketing Mgr.



VITAL INDUSTRIES, INC.

3614 S.W. Archer Road
Gainesville, Florida 32601

★ VIDEO DESIGN ENGINEERS ★
★ If you have experience in color video equipment design and are looking for a more challenging position and greater opportunities, we need you. ★
★ We are a young, nationally known company and we are expanding rapidly. We need an imaginative man willing to assume product development responsibility from inception to manufacturing. ★
★ We are located in beautiful eastern Pennsylvania with excellent hunting and fishing in our backyard, yet close to Philadelphia, New York, and Washington. ★
★ If you are the man we are looking for, please send your resume, including salary history. Confidential replies to: ★
★ Jack Taylor ★
★ WORLD VIDEO, INC. ★
★ Post Office Box #117 ★
★ Boyertown, PA 19512 ★

TELEVISION ENGINEERS

Need 2 First Class engineers for expanding TV operation in Southeast. One should have experience and capability sufficient to assume future assistant chief engineer position. Other man should have at least 1 year experience in TV studio operation. Reply to Box 573-3, c/o BME, Blue Ridge Summit, Pa. 17214.

AN OPENING EXISTS for a mobile technician in the Detroit area. Experience in maintaining and operating VR 3000 and color cameras in the field is a prime requisite. Extensive travel may be necessary. Resumes and inquiries should be made to Editel Productions Inc., 24151 Telegraph Road, Southfield, Michigan 48075 or call (313) 353-1660.

Modern, well-equipped UHF television station in central California has openings for experienced and well qualified transmitter and studio engineers. Studio engineers must be capable of VTR maintenance. Send resume and availability to: Box 573-1, c/o BME, Blue Ridge Summit, Pa. 17214.

Engineering Help Wanted. Chief Engineer needed by Midwest AM-FM combination. Good salary and working conditions. Reply to: Box 573-5, c/o BME, Blue Ridge Summit, Pa. 17214.

HELP WANTED (cont'd)

Television Technician: Experienced in studio color cameras, video tape recorders and film chains. Must have a 1st Class phone license. Send resume to: Robert L. Pincumbe, Instruction Services Ferris State College, Big Rapids, Michigan 49307. An Equal Opportunity Employer.

California major market VHF in one of nation's fastest growing areas needs studio technician. Requirements include First Class radio telephone license; minimum 3 years experience; maintenance and operation ability; Technical school graduate or equivalent technical education. Wage scale \$220 to \$250 per week. An Equal Opportunity Employer. Write Box 573-2, c/o BME, Blue Ridge Summit, Pa. 17214.

Television, Electronic and Maintenance Technicians on broadcast or CCTV equipment either in New York, New Jersey, Pennsylvania, Los Angeles or Connecticut areas. Send resume to: VPC, P.O. Box 268, New Hyde Park, N.Y. 11040.

EQUIPMENT FOR SALE

SCULLY TAPE RECORDERS: Mono, 2, 4, 8, 12, & 16 track models plus 270 automatic players. Some models in stock now. W.A.L. custom audio control console & console modules. Solid state 120 Watt power Amps. We buy and rebuild Scully lathes. WIFGAND AUDIO LABORATORIES, INC. R.D. 3, Middleburg, Pa. 17842. 717-837-1444.

AMPEX VR660C two inch helical broadcast quality color VTR with electronic editing. Colorcon, alignment tape, manuals, three extra pairs matched heads factory sealed, three hours tape. List price over \$11,100.00. Purchased February 1972, less than 31 hours. \$6,000. Channel One Videotape, Inc., Box 763, Miami, Fla. 33133. (305) 947-2044.

CARTRIDGE TAPE EQUIPMENT—Rebuilt. New paint, heads, flywheel, pressure roller, belts etc. Spotlessly clean and thoroughly tested. 30 day money-back guarantee, 90 day warranty. Also contact us for possible discounts on new equipment and accessories.

AUTODYNE, Box 1004,
Rockville, Maryland 20850
(301/762-7626).

MOTORS FOR SPOTMASTERS

NEW Panst hysteresis synchronous motor HSZ 20,50-4-4701D as used in series 400 and 500 machines. Price \$39.00 each prepaid while they last. 90 day warranty. Terms check with order only, no COD's. Not recommended for Tapecaster series 600 or 700.

TAPECASTER TCM, INC., Box 662
Rockville, Maryland 20851

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., 172 So. Alta Vista Blvd., Los Angeles, Calif. 90036. (213) 934-3566.

WE'VE BEEN ROBBED! Don't let burglars cause you to lose precious air time. Let qualified engineers design and install the ultimate in alarm systems anywhere in the USA. All inquiries will be answered. Write to Box 573-4, c/o BME, Blue Ridge Summit, Pa. 17214.

EQUIPMENT FOR SALE: Collins 1 kw transmitter with stereo generator. Used only 19 months \$4,750 F.O.B. St. Cloud, Minnesota. Collins 4-bay circular antenna 37 CP-4 tuned to 91.1 and Collins horizontal antenna 37AI-4. Best Offer. Write Minnesota Educational Radio, Inc., 400 Sibley St., St. Paul, Minn. 55101. Phone (612) 222-5545.

FIELD STRENGTH METER. 540 KHz to 5MHz. Ten microvolts to 10 volts per meter. New solid state design, long battery life. Stable accurate calibration. Free literature. Solar Electronics, 901 No. Highland Ave., Hollywood, Cal. 90038.

AMERICA'S LARGEST STOCK AND ASSIGNMENT LISTING of new and used broadcast and recording equipment. We trade-sell and buy. THE MAZE CORPORATION, P.O. Box 6636, Birmingham, Ala. 35210.

RCA TFE-10A: 200 MHz transmitting antennas. Broadband, omnidirectional. New, in original packing. Bob Reynolds, (609) 877-0881, 32 Mosshill Lane, Willingboro, N.J. 08046.

GATES 10 CHANNEL EXECUTIVE STEREO CONSOLE in good condition. Approximately 8 years old. \$1250 or best offer. Contact: Barry Blalock, WIXO, 8001 Downman Road, New Orleans, La. 70126 (504) 241-6500.

EQUIPMENT FOR SALE (cont'd)

600 OHM TRANSFORMERS; 600ct: 600ct±1 dB 50 Hz-25 KHz, 20 mw, only 1/2 inch cube, all local engineers are using them! Limited Supply. Only \$14.95 for 10. NES, 1727 Donna Road, West Palm Beach, Fla. 33401. (305) 686-8553.

RCA HEADWHEEL PANEL assembly video recording head MI 40799 5 MIL air bearing low band. Hy Ness Co., 2105 Cruger Ave., Bronx, N.Y. 10462.

The complete and reliable source for new and used broadcast equipment. Request our free listings. Broadcast Equipment and Supply Co., Box 3141, Bristol, Tennessee 37620.

CAPSTAN IDLERS for AMPEX 300, 35 440. Series, self aligning with replaceable ball bearings, \$22.50 net. VIF INTERNATIONAL, Box 1555, Mtn. View, Ca. 94040.

MICA AND VACUUM transmitting capacitors. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 1147 Venice Blvd., Los Angeles, Cal. 90015 (213) 382-6985.

4-650 ft. towers \$6500.00 each. Many more. Ground wire 85¢ per xx. lb. Bill Angle, Box 55, Greenville, N.C. 27834. Tel. 919-752-3040.

One stop for all your professional audio requirements. Bottom line oriented. F.T.C. Brewer, Box 8057, Pensacola, Fla. 32505.

WE BUY TUBES, TRANSISTORS & CAPACITORS. Send your lists of sale items. Specialty Supply Ltd., P.O. Box 22391, Denver, Colo. 80222.

CBS Volumax Model 411—1 year old—\$1,000. Mr. Oberle, WKTZ Jacksonville, Fla. 32211 or call (904) 743-2400.

Ampex AG-440. Full Track, like new. \$1,400. Write: F. Toce, 7399 Lakeshore Road, R.D. #1, Clay, N.Y. 13041.

PROTECT valuable broadcast property from fire, theft, with a Soni-Tel Alarm System. HBC Sales, Box 189, Haynesville, La. 71038.

Surplus Audio Patch Panels All Standard Configurations. Gulf Telephone & Electronics, Inc. 6235 Beverly Hill, Houston, Texas 77027.

TECHNICAL SERVICES

CUSTOM CARTRIDGE RELOADING and refurbishing. Fidelipac replacement parts and cartridges. Write us today for prices. PROFESSIONAL AUDIO SERVICES, BOX 1953, FT. WORTH, TEX. 76101.

PROGRAM SERVICES

TAPES FOR AUTOMATION

THE CnB STUDIOS
Specializing in Custom Services

3415 BERESFORD AVENUE
BELMONT, CALIFORNIA 94002
415 / 592-6149

"Free" Catalog . . . Everything for the deejay! Comedy, books, airchecks, wild tracks, old radio shows, and more! Write: Command, Box 26348-A, San Francisco 94126.

Deejays! 11,000 classified gag lines. \$10.00. Unconditionally guaranteed. Comedy catalog free. Edmund Orrin, Box 679-M, Mariposa, Cal. 95338.

INSTRUCTIONS

FCC FIRST CLASS RADIOTELEPHONE LICENSE IN SIX WEEKS. Classes in Dallas, Atlanta, Denver, Ft. Worth, Hartford, Houston, Memphis, Nashville, New Orleans, Oklahoma City, and San Antonio. For information contact Filkins Institute, 2727 Inwood Rd., Dallas, Tex. 75235 214/357-4001.

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, 1060D Duncan, Manhattan Beach, Calif. 90266. 213-379-4461.

ATTENTION VETERANS! First class license in five weeks with complete theory and R.C.A.-equipped laboratory training. Approved for veterans Tuition \$333.00. Housing cost \$16.00 per week. American Institute of Radio, 2622 Old Lebanon Road, Nashville, Tenn. 37214. 615-889-0469.

PROFESSIONAL CARDS

COHEN & DIPPELL
CONSULTING ENGINEERS
Formerly GEO. C. DAVIS
527 Munsey Bldg.
(202) 783-0111
Washington, D. C. 20004
Member AFCCE

JANSKY & BAILEY
Telecommunications Consulting
Department
CATV & CCTV
Phone 703/354-3400-ext. 722 or 2400
Shirley Hiway at Edsall Road
Alexandria, Virginia 22314
Atlantic Research Corporation

BROADCAST STUDIO DESIGN
Control Systems, Facilities Planning,
Plant Layout & Manufacturing
DYMA ENGINEERING, INC.
Route 1, Box 51, Taos, New Mexico 87571
Phone: 505/758-2686

RALPH E. EVANS ASSOCIATES
Consulting Radio Engineers
AM - FM - TV - CATV - ITFS
3500 North Sherman Blvd.
MILWAUKEE, WISCONSIN 53216
Phone: 414-442-4210

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

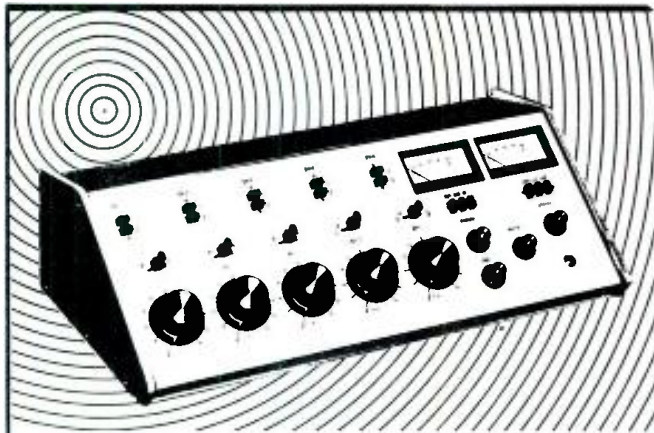
VIR JAMES
CONSULTING RADIO ENGINEERS
Applications and Field Engineering
Computerized Frequency Surveys
345 Colorado Blvd.—80206
(303) 333-5562
DENVER, COLORADO
Member AFCCE

CHU ASSOCIATES, INC.
Telecommunications Division
AM—FM—TV—CATV
Applications—Facilities Planning
Field Surveys and Proofs
Appraisals
800 Fesler St., El Cajon, Ca. 92020
(714) 442-9459
TWX 910 331 1178

USE BM/E's CLASSIFIED MARKETPLACE TO REACH OVER 28,000 BROADCASTERS!

To find a job or fill one, to sell a product or service . . . send your ad (along with a check) to:

BM/E
Classified Advertising Dept.
Blue Ridge Summit, Pa. 17214
717-794-2191



**We spell quality and excellence
another way ... INEXPENSIVE!**

HERE'S A WAY TO KEEP A LARGE PERCENTAGE
OF YOUR MONTHLY BILLING, AND STILL HAVE
A FINE QUALITY AUDIO CONSOLE:

M-52 - 5 CH MONO
DUAL OUTPUT
\$675.00

M-82 - 8 CH MONO
DUAL OUTPUT
\$995.00

S-52 - 5 CH STEREO
\$995.00

S-82 - 8 CH STEREO
\$1,895.00

DEALER INQUIRES INVITED



Audio Interface Systems, Inc.

Birmingham, Alabama

ADVERTISERS' INDEX

American Telephone & Telegraph Co.	55
Amperex Electronic Corp.	CM/E-13
Audio Devices, Inc.	Cover 2
Audio Interface Systems, Inc.	74
Audio Services, Inc.	9
Beau Motor Division, UMC Electronics Co.	68
Belar Electronics Laboratory Inc.	51
Berkey Colortran	13
Bosch Corporation, Robert, Fernseh Division	32, 33
Broadband Communications Report	CM/E-29
Broadcast Electronics Inc.	62, 65
CBS Laboratories, A Division of Columbia Broadcasting System Inc.	59, 61
Canon Inc.	39
Canon U.S.A. Inc.	53
Central Dynamics Ltd.	69
Cetec Inc.	66
Charles Machine Works Inc.	CM/E-7
Cinema Products Corp.	16, 17
Cohu Inc., Electronics Division	19
Communication Medias	71
Corley Ltd., D and S	10
Cosmicar Optical Co., Ltd.	69
Datatron Inc.	8
Datavision Inc.	58
Dynair Electronics Inc.	3
Dynasciences Corp.	23
Eastman Kodak Co.	CM/E-18, 19
EMT-Gotham Audio Corp.	64
Electrohome Ltd.	CM/E-31
Electronic Industrial Engineering	CM/E-11, 23
Elpa Marketing Industries Inc.	61
Fidelipac Div. of Telepro Industries Inc.	10, 74
Fort Worth Tower Co., Inc.	70
GTE Sylvania, Lighting Center	24, 25
Garron Electronics Inc.	52
Gates Division, Harris	11
Gotham Audio Corp.	64
Grass Valley Group Inc., The	5
Heller-Oak Finance Corp.	CM/E-27
Hunt Chemical Corp., Phillip A.	21
International Tapetronics Corp.	64
International Video Corp.	Cover 4
Jerrold	CM/E-2
LPB Inc.	56
Listec Television Equipment Corp.	20
McBee Laboratories	59
McMartin Industries Inc.	60, 68
Magnavox CATV Division	CM/E-15
Micro-Trak Corp.	68
Moseley Associates, Inc.	70
3M Co., Mincom Division	12, 13
Neve Inc., Rupert	41
North American Phillips Corp., AKG Division	65
Oak Industries Inc., CATV Division	CM/E-16
Plastic Reel Corp. of America	54
Revox Corp.	45
Richmond Hill Laboratories, Inc.	15
Rohde & Schwarz	43
Schafer Electronics Corp.	60
Scientific-Atlanta, Inc.	CM/E-24, 25
Scully/Metrotech Divisions of Dictaphone	47
Sitco Antennas	CM/E-32
Sony Corporation of America	CM/E-8, 9
Sparta Electronic Corp.	7
Standard Electric Time Div. of Johnson Service Co.	71
Systems Marketing Corp.	63
Systems Wire & Cable	CM/E-21
TAB Books	57
Taber Manufacturing & Engineering Co.	56
Telemet, A Geotel Company	Cover 3
Television Equipment Associates	60
Time & Frequency Technology Inc.	49
Videomax Corp., Sub. of Orrox Corp.	14
Wilkinson Electronics Corp.	22
World Video Inc.	71

SALES OFFICES

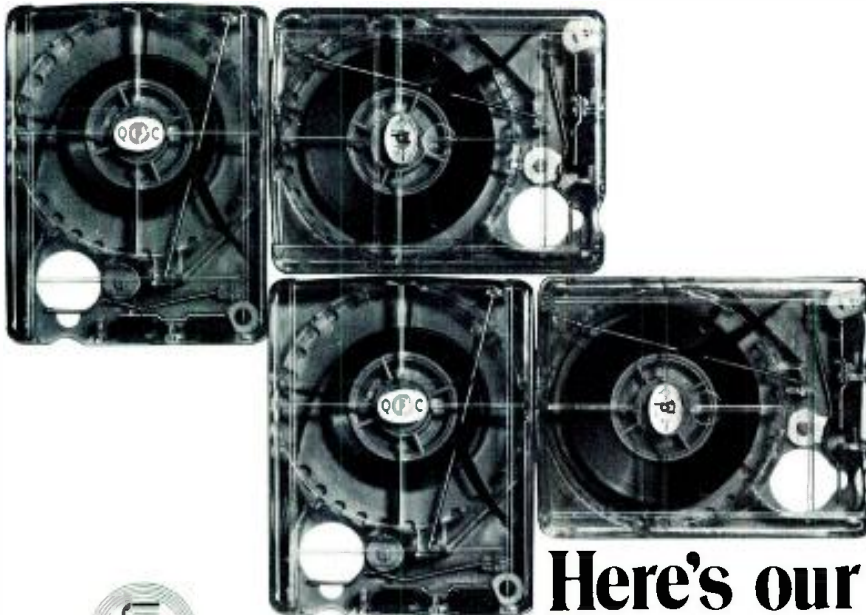
Broadband Information Services, Inc.
274 Madison Avenue
New York, New York 10016

EASTERN STATES
274 Madison Avenue
New York, New York 10016
212-685-5320
Charles C. Horner

MIDWESTERN STATES
New York Office

WESTERN STATES
1111 Hearst Building
San Francisco, California 94130
415-362-8547
William J. Healey
16400 Ventura Blvd.
Encino, California 91316
213-981-4721
Art Mandell

JAPAN
Nippon Keisoku Inc.
P.O. Box 410
Central Tokyo, Japan
Tokyo (03) 667-7681
Yoshi Yamamoto



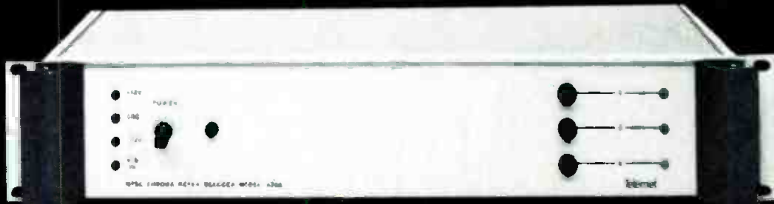
**Here's our
story...**

Want more? Contact your Fidelipac Distributor and learn why
more Fidelipac Automatic Tape Cartridges are in use through-
out the world than all others combined.

FIDELIPAC®

3 Olney Avenue • Cherry Hill, New Jersey 08034 • (609) 424-1234
Fidelipac is a registered trademark of TelePro Industries Incorporated

5 reasons why our NTSC Decoder stole the show at NAB



1. **Keys from any NTSC composite signal** — frees cameras for other operations.
2. **Zero Horizontal Delay** — installation is simple, uncomplicated.
3. **Works with any RGB Chroma Keyer** — whether it's a Telemet model or not.
4. **Chroma Crawl is virtually eliminated** — specially designed comb filter network permits full bandwidth decoding.
5. **Only \$1650** — even with all these advantages, it's priced economically.

We'd like to show and tell you more about our Decoder Model 4706. Write or call Telemet, Amityville, New York 11701, (516) 541-3600.



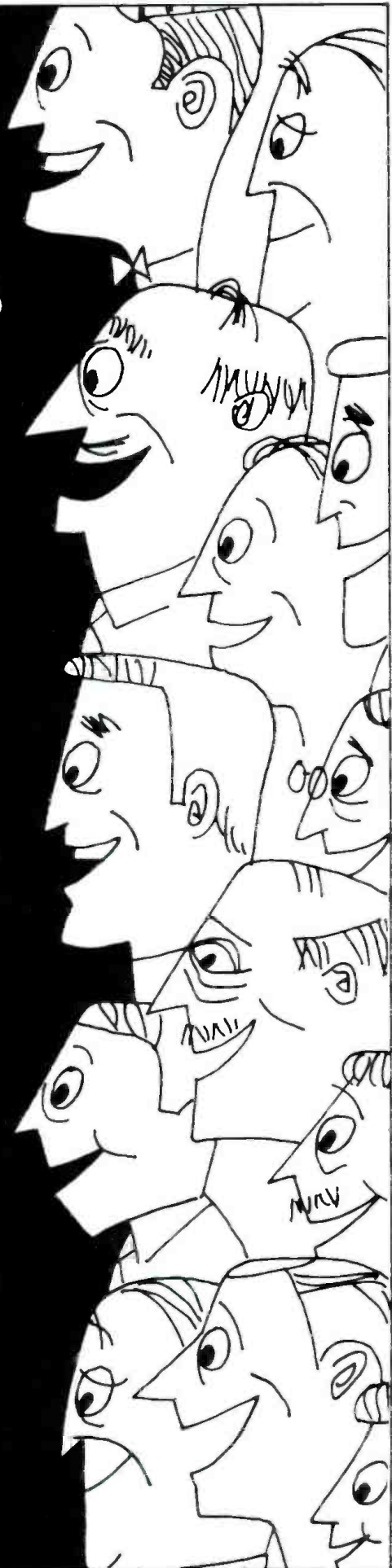
better ideas for broadcasting
Telemet

A GEOTEL COMPANY

Amityville, New York 11701, (516) 541-3600

REGIONAL OFFICES

Chicago, Ill. (312) 627-6026 Houston, Tex. (713) 946-5796 Santa Ana, Calif. (714) 540-6756



Quadruplex-oriented broadcasters agree in growing numbers there's a realistic alternative to the traditional method of recording. It's the IVC-960 One-Inch Color Videotape Recorder with Time Base Corrector. More than 100 are already in use by U.S. and Canadian broadcasters and broadcast teleproduction houses, including the ones shown on this page.

The IVC-960 is playing a major role in their operations—either as a front line recorder or as a backup to quad. In fact, broadcasters who place one IVC-960 in service frequently follow up by adding more. One has eight!

Broadcasters like the IVC-960 because the picture it delivers to the home receiver represents no quality compromise. It allows them to dub to quad and offers 3½ hours playing time.

Users, including several group owners, like the low initial investment — far less than quad. They've found that head replacement costs are reduced by a factor of five. Tape costs are one-third of quad in normal use.

Get the whole one-inch story by calling your IVC regional manager listed below or write the Marketing Director at the Sunnyvale address for a copy of our broadcast application magazine and product brochure.

REGIONAL OFFICES

5 Corporate Park Drive
White Plains, N.Y. 10604
(914) 694-1234

Bob Henson

35 Executive Park Dr., N. E.
Atlanta, Ga. 30329
(404) 633-1462

Aric Landrum

1920 Waukegan Rd.
Glenview, Ill. 60025
(312) 729-5160

Coyle Dillon

30 Baywood Rd.
Rexdale, Ontario, Canada
(416) 749-7539

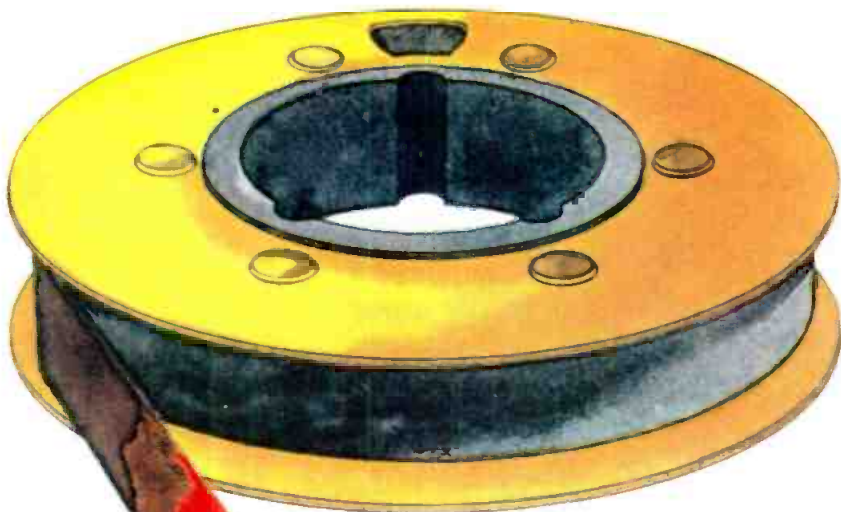
Emil Adamyk

675 Almanor Ave.
Sunnyvale, CA 94086
(408) 738-3900

Dick Reilly



TWO YEARS AGO IT WAS A QUAD WORLD. NOW LOOK.



TAMPA • WALB-TV ALBANY • WCCB-TV CHARLOTTE • VIDEO TAPE ASSOCIATES, FT. LAUDERDALE • WAGB-TV GREENWOOD • WFME-TV ORLANDO • WFTV-TV ORLANDO • WGTU-TV ATHENS
 GAINESVILLE • KTVE-TV EL DORADO • KGBT-TV HARTINGEN • VIDEO FILM INTERSYSTEMS • KVIQ-TV EUREKA • FRESH MEADOWS • KOTI KLAMATH FALLS • WOAY-TV OAK HILL • KNOP-TV NORTH SAN JOSE
 WJCT-TV JACKSONVILLE • WBNB-TV CHARLOTTE AMALIE • RADIO AND TELEVISION SERVICE • KMOI-TV HONOLULU • CITY-TV TORONTO • CKNC-TV SUDBURY • WKRC-TV CINCINNATI • VIDEO EAST NEW YORK • CKPR-TV THUNDER BAY • CHLT-TV SHERBROOKE
 KEET EUREKA • WXEX-TV PEPEBURG • ARMED FORCES • WMPB BALTIMORE • WFTV-TV ORLANDO • WFTV-TV ORLANDO • WFTV-TV ORLANDO • WFTV-TV ORLANDO • WFTV-TV ORLANDO
 CONSOLIDATED FILM INDUSTRIES, HOLLYWOOD • KPCR-TV TORONTO • KPCR-TV TORONTO • KPCR-TV TORONTO • KPCR-TV TORONTO • KPCR-TV TORONTO
 KIMO-TV ANCHORAGE • KIKU-TV HONOLULU • CITY-TV TORONTO • CKNC-TV SUDBURY • WKRC-TV CINCINNATI • VIDEO EAST NEW YORK • CKPR-TV THUNDER BAY • CHLT-TV SHERBROOKE
 WANE-TV FT. WAYNE • WHIZ-TV ZANESVILLE • WVIZ-TV CLEVELAND • WFTV-TV ORLANDO • WFTV-TV ORLANDO • WFTV-TV ORLANDO • WFTV-TV ORLANDO • WFTV-TV ORLANDO

Circle 158 on Reader Service Card