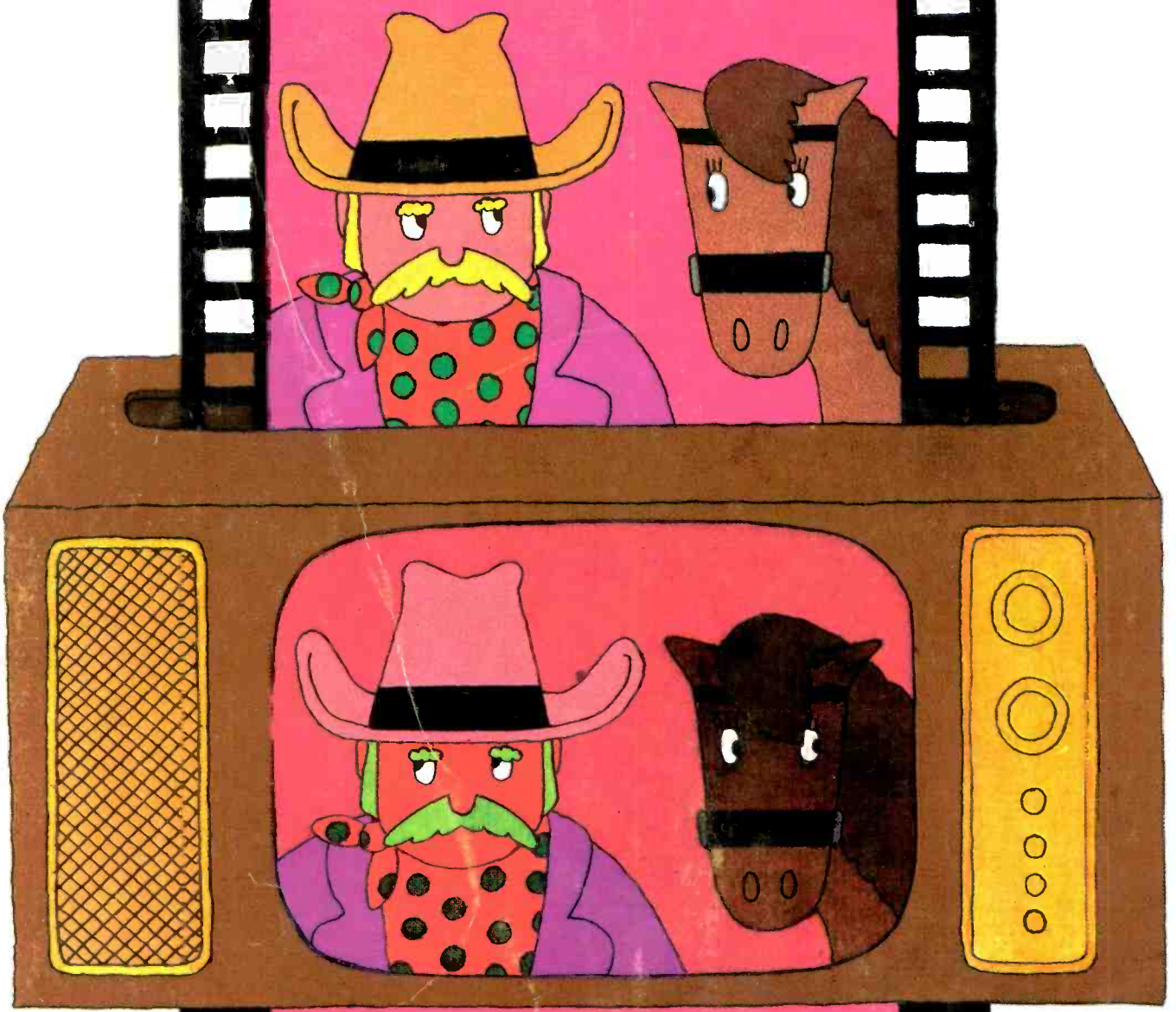
A MACTIER PUBLICATION / JUNE 1968

BM/E

BROADCAST MANAGEMENT/ENGINEERING

FOCUS ON COLOR TV FILM

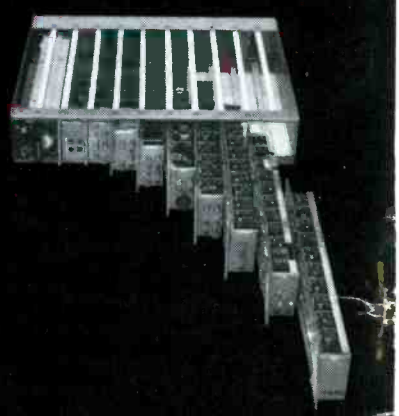


how to ease into a deluxe color sync generator without straining your budget

In three easy steps, you can build your way economically to the same high quality deluxe color sync generator used by the major TV networks. Start out with Riker's basic EIA sync generator—four modules, rack frame and power supply—$2900. When your budget can afford the expansion, add two more modules for deluxe sync lock and you get the advantage of three selectable speeds for locking to an external composite video or sync signal. Cost: $790.

Now you're all set to step up to color. Add three more modules—$1985—and you have eased into Riker's widely used, field-proven Model 520-4CL Color Sync Generator with Deluxe Sync Lock. You now own the best sync generating system in the broadcast industry.

The Riker module at a time approach is the sensible way to build quality equipment into your facilities. Over the long term it's also the most inexpensive way. If you're interested in details on sync generators, write or call Riker—the one company in the TV broadcast industry offering a complete line of all solid-state instrumentation for video analysis, simulation and control.



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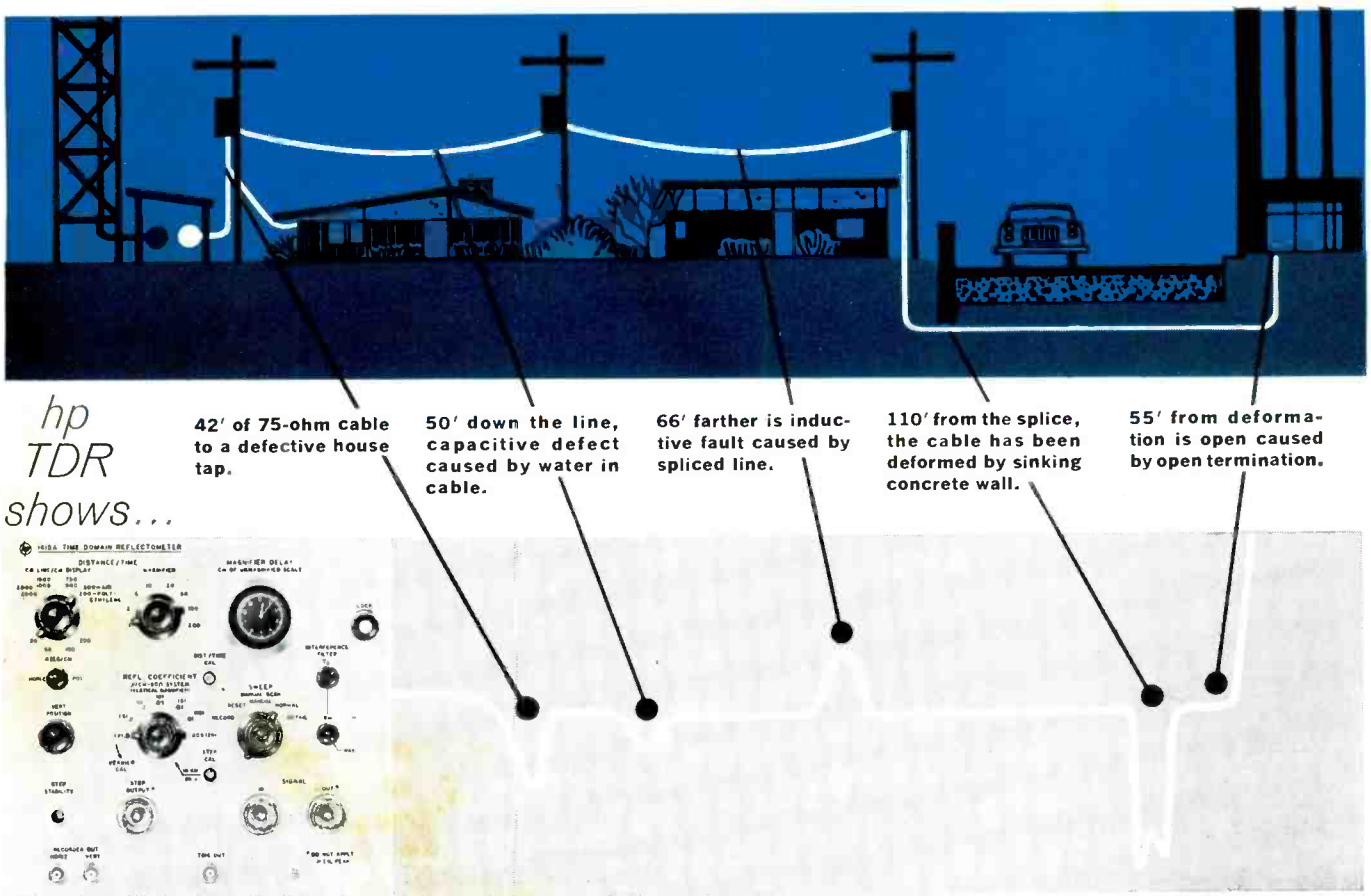

CABLE FAULT GUESSWORK ENDS HERE

Improve Picture Quality, Quickly Identify and Locate Cable Faults with hp TDR

Spend your time on the air . . . not up in the air! With hp's E75-140A CATV Fault Locator Package, you save time and money because you can (1) quickly locate and identify cable faults, (2) detect faults *before* they can cause downtime, (3) get your system back on the air much sooner in the event of a sudden crippling fault, and (4) consistently maintain high picture quality.

Use the hp E75-140A package to get a graphic picture of cable quality—and such faults as shorts, opens, loose connectors, defective tapoffs, splices and mismatched terminations. High sensitivity and resolution of the package detects faults to within 5 percent of the actual distance from the test point.

The E75-140A, factory calibrated for your 75Ω system, makes it easy for you to locate faults in up to 3000 feet of cable, and read the distance in feet. With a flick of the front panel slide switch, you can choose the calibrated scale for either polyfoam or polyethylene cable. The vertical scale is calibrated in percent of reflection for easy use. A slide rule is supplied to convert the proper value for dielectrics other than polyfoam or polyethylene.

Long persistence P7 phosphor CRT eliminates annoying flicker when you view the slow sweep speed in DETAIL mode. Special 75Ω overlays allow you to read impedance levels directly off the CRT face. Use the recorder outputs to make permanent records of your system.

The hp E75-140A CATV Fault Locator Package includes an hp 140A Oscilloscope mainframe with P7 phosphor CRT, hp H08-1415A Fault Locator Plug-in, hp 10458A 75Ω adapter with CRT overlay, and hp Application Note 67 with TDR slide rule.

For complete specifications on the special CATV Fault Locator Package, contact your local hp field engineer. Or, write to Hewlett-Packard, Palo Alto, California 94304. Europe: 54 Route des Acacias. Price: hp E75-140A CATV Fault Locator Package, $1900.

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JUNE 1968/VOLUME 4/NUMBER 6

BM/E

BROADCAST MANAGEMENT/ ENGINEERING

This month's cover: Several features this month are devoted to our theme: Focus on Color TV. The cover zeroes in on "off color" TV films. Gus Sauter and Vince Lewis teamed up to portray that idea. Or did your mind's eye correct for the color shift in the middle panel. If so, skip pages 32-39.

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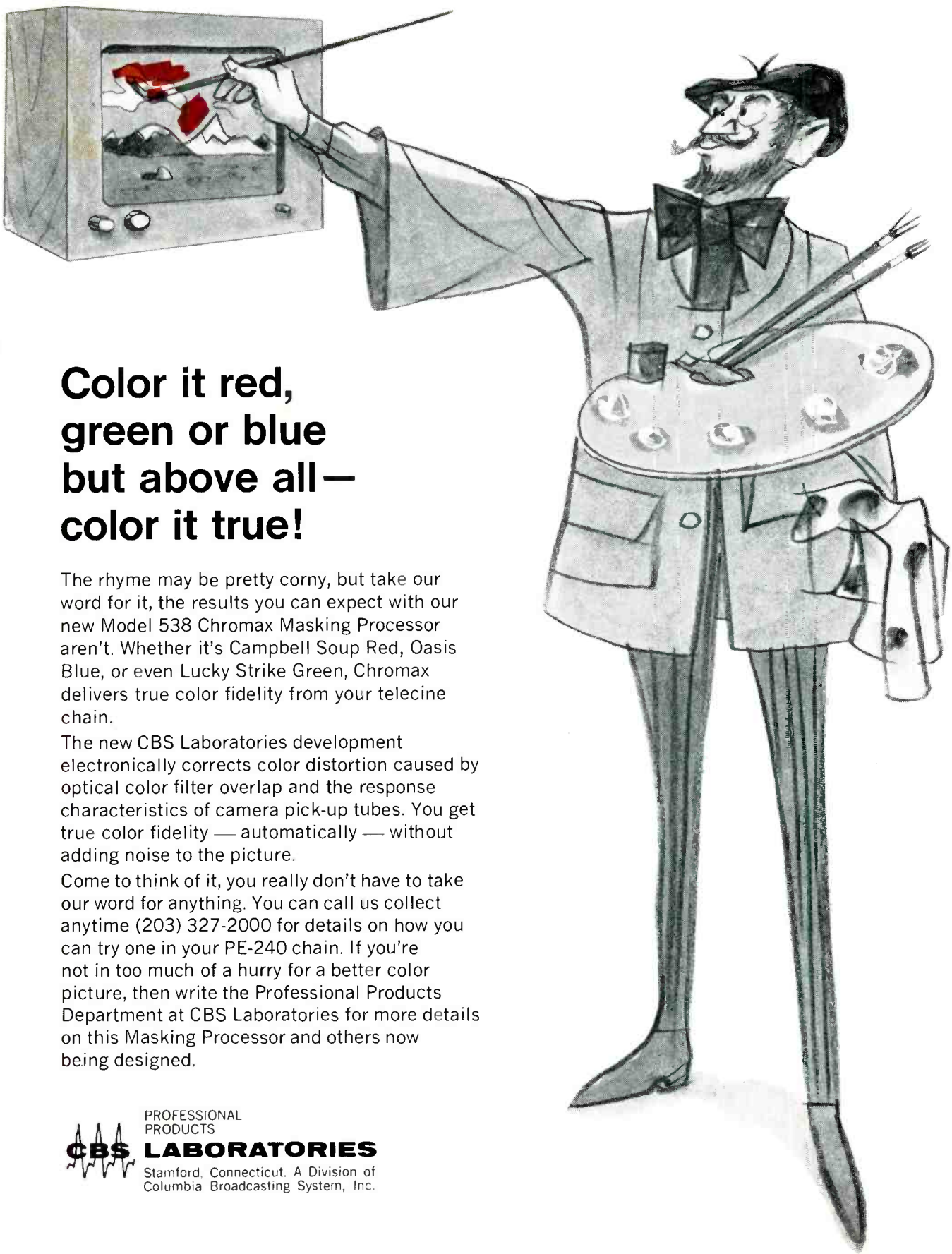

Color it red, green or blue but above all— color it true!

The rhyme may be pretty corny, but take our word for it, the results you can expect with our new Model 538 Chromax Masking Processor aren't. Whether it's Campbell Soup Red, Oasis Blue, or even Lucky Strike Green, Chromax delivers true color fidelity from your telecine chain.

The new CBS Laboratories development electronically corrects color distortion caused by optical color filter overlap and the response characteristics of camera pick-up tubes. You get true color fidelity — automatically — without adding noise to the picture.

Come to think of it, you really don't have to take our word for anything. You can call us collect anytime (203) 327-2000 for details on how you can try one in your PE-240 chain. If you're not in too much of a hurry for a better color picture, then write the Professional Products Department at CBS Laboratories for more details on this Masking Processor and others now being designed.

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BROADCAST INDUSTRY NEWS

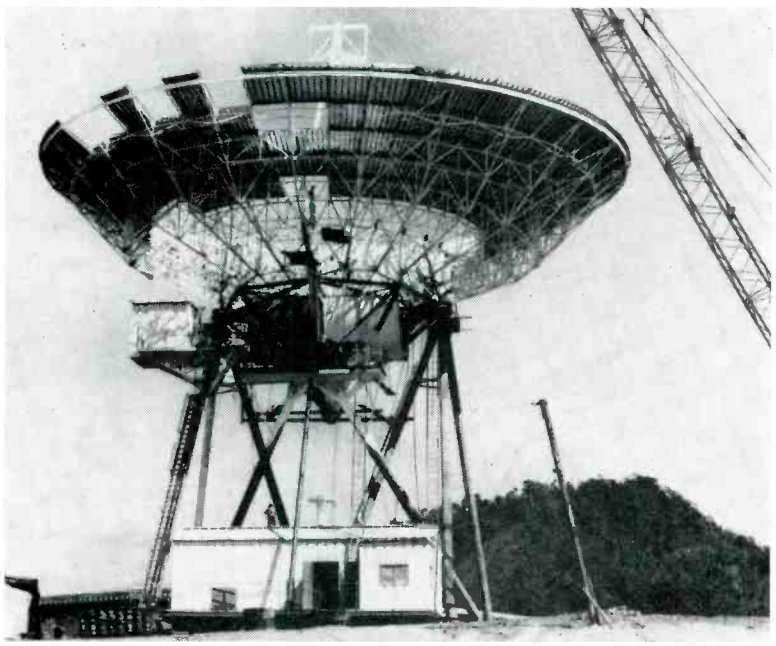
Commo Birds Save Users $20-Million

Speaking recently on "Regulation in the Space Age—Challenge and Opportunity" at a panel session of the second American Institute of Aeronautics and Astronautics, Chairman Rosel H. Hyde of the FCC told Institute members that space technology has inspired revolutionary regulation concepts resulting in savings of $20-million a year to globol communicators.

"It is interesting to note that a whole series of claims and contentions about the interference which the proposed earth stations might cause to the terrestrial facilities of the other carriers were quickly resolved, after the policy of 50-percent ownership by Comsat and 50-percent divided among other carriers was adopted," Chairman Hyde said. "It is also worthy of note that the other carriers, who as customers of Comsat heretofore expressed doubt, if not serious objection, about the 12½-percent return sought by Comsat, are now not only silent on this, but have adopted it as reasonably applicable to their investment in the earth stations."

"In response to requests from the Commission for information as to how their respective applications would further the purpose of the Communications Satellite Act, namely that the benefits of the new technology be reflected in reduced charges to the users, the carriers indicated that they would make substantial reductions, in the order of 25 percent or more, in currently effective rates," Chairman Hyde said. "The Commission took appropriate note of this and provided for the realization of such major savings to the public."

"As a result of the Commission's decision that Comsat should not be licensed to provide service directly to the ultimate user except in unusual circumstances, the terrestrial carriers have introduced massive rate reductions, ranging from 25- to 40-percent, in their previous charges for leased circuit facilities and have also reduced many message telephone charges by some 25 percent. In all, as a result of this decision by the Commission, all users in international communications have realized rate reductions well in excess of $20-million per annum, with further reductions to be forthcoming as new and more efficient satellite and cable facilities are added."



Construction of a multimillion-dollar satellite communications earth satellite station is nearing completion in the Phillipines, it was announced by General Telephone & Electronics Corporation. Shown (above) is the station's dish-shaped antenna, measuring 97 feet in diameter. The station will serve as a ground terminal for voice, television and data communications to and from an Intelsat II satellite in synchronous orbit 22,300 miles over the Pacific Ocean. The station is located at Pinugay, about 25 miles east of Manila.

Comsat Shows First Profits

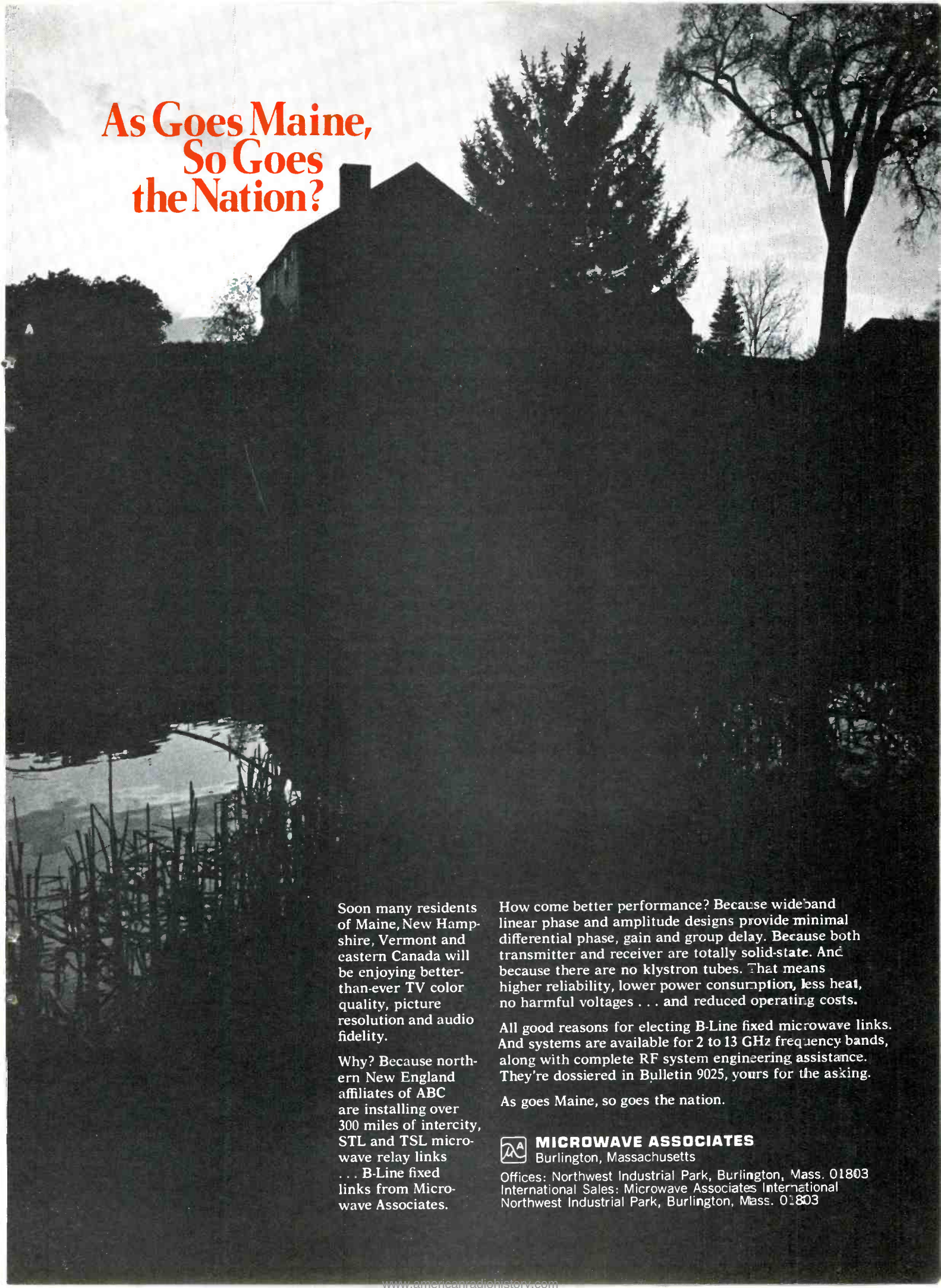
This year may be at long last, the "Year of the Profit" for Comsat, according to a report released by analysts for the brokerage firm of Paine, Webber, Jackson & Curtis. The report states that the Communications Satellite Corp. showed its first profit from satellite operations in the final quarter of 1967 —an estimated three cents per share. Interest income permitted the company to report per-share earnings of 46 cents for the full year.

Still to be resolved, however, Paine Webber cautions: "Comsat's permanent rate structure, its relationship with other international communications companies, its share of future markets with overseas cables and its possible role in domestic communications."

While the price of satellite and cable circuits are still competitive, the report notes, satellite technology is moving ahead at a much faster rate, and by the mid-1970's satellite circuits should be substantially less costly. Rate reductions, in combination with the development of international direct dialing, should accelerate traffic growth, giving Comsat's earnings added stimulus.

Expansive-Minded Cable TVers Celebrate

The mood is bullish for the 17th Annual Convention of the National Cable Television Association, to be



As Goes Maine, So Goes the Nation?

Soon many residents of Maine, New Hampshire, Vermont and eastern Canada will be enjoying better-than-ever TV color quality, picture resolution and audio fidelity.

Why? Because northern New England affiliates of ABC are installing over 300 miles of intercity, STL and TSL microwave relay links . . . B-Line fixed links from Microwave Associates.

How come better performance? Because wideband linear phase and amplitude designs provide minimal differential phase, gain and group delay. Because both transmitter and receiver are totally solid-state. And because there are no klystron tubes. That means higher reliability, lower power consumption, less heat, no harmful voltages . . . and reduced operating costs.

All good reasons for electing B-Line fixed microwave links. And systems are available for 2 to 13 GHz frequency bands, along with complete RF system engineering assistance. They're dossiered in Bulletin 9025, yours for the asking.

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held June 29-July 2 in Boston.

Some 2500 persons are expected to attend the NCTA Convention, which has selected the theme "Exploring the New Dimensions of Cable Television." Convention headquarters is the Sheraton-Boston Hotel. Exhibitors will occupy the adjoining War Memorial Auditorium.

"The theme chosen for the convention is descriptive of the growing users for, and the newly-developing opportunities in, the public service medium of cable television," explained Albert J. Ricci of Keene, N.H., operator of several New England cable systems and chairman of NCTA's Convention Committee. The "Wired City" will be discussed on Tuesday.

The unusually strong growth of CATV during 1967 was underscored by the new edition of "Television Factbook" distributed late last month. Homes served jumped 700,000 in 1967 to a total of 2.8 million, according to the Factbook, and operational systems rose from 1770 to 2013.

The NCTA Convention gets underway at 1 P.M. Saturday, June 29 (two days earlier than reported in advance notices). To show how growing numbers of cable systems are originating programs of a uniquely local nature, a cablecasting demonstration has been programmed for June 30, P.M.

About 10 percent of the over 2000 cable systems now operating in the U.S. originate programs of their own, and this number is expected to double within a year, according to NCTA.

A special NCTA "Project X" exhibit will demonstrate, for the first time, some of the potential uses of cable television in American homes and businesses.

Management sessions will cover legal, promotional and public relations topics. Technical sessions have not yet been formed but papers on 20-channel operation, underground problems and testing considerations are expected.

As we go to press 58 exhibitors have signed up for 165 booth spaces. Jerrold and Vikoa will occupy the most real estate. A new exhibitor this year is International Video Corp., which will feature an NTSC-type color camera for local origination priced at $12,600.

'Electronic Newspaper' Via TV Seen Feasible

The possibility that television stations might go into the "electronic newspaper" business has been termed "quite feasible" by John F. Dille, Jr., president of the Communicana Group of Indiana. Dille spoke at an NAB Convention luncheon meeting of the Association for Professional Broadcasting Education at the Pick Congress Hotel.

Dille went on to say the "electronic newspaper" idea under study by an NAB group is not the same thing as a facsimile newspaper which would involve a printout device in the home. Essentially, there would be a "continuous transmission of what might be called 'frames' rather than 'pages'." These would be stored in memory tubes in a unit installed in conjunction with the home television set.

"A member of the household could turn on the set and punch up the index button," Dille said. "An index frame would appear on the television screen, telling what frame would contain the sports news or the obituaries or the comic strips, etc. You would then punch up the index button for whatever number chosen and that frame would appear on the screen."

Canadian Broadcasters To Join NAFMB

The National Association of FM Broadcasters has formed a Canadian Region to be represented on the Board of Directors, according to Abe Voron, NAFMB president. The new region was formed because of increasing interest among Canadian fm stations.

Canadian members of NAFMB will elect their regional representative in the near future. He will represent the more than 100 fm stations in Canada. It was indicated that NAFMB membership would not be in competition with the Canadian Association of Broadcasters, but as a complimentary association comparable to NAFMB's relationship to NAB in the U.S.

FCC's Johnson: Local Programming 'Essential'

Local programming is "essential to the very continued existence of broadcasting," FCC Commissioner Nicholas Johnson said in a videotaped appearance at the 18th Annual Broadcast Industry Conference at San Francisco State College April 19. The Commissioner appeared on tape after receiving a "Broadcast Preceptor" award from the college Broadcast Communication Arts Department for "signal accomplishments and holding to the highest standards in broadcasting."

Taking his text, "Great Power and Great Responsibility," from a speech by President Johnson to broadcasters, the FCC Commissioner emphasized local program needs. Networks, he said, cannot provide local news, advertising and discussion forums, promote local causes or present programming for special local tastes. "Why do we have over 7000 radio and television stations in this country? To provide local service. That's the theory. Is it fact?"

The Commissioner reminded the conference of alternatives to broadcast service. He mentioned telephone time and weather services, recorded music, home projected film and video records.

"Nor is the local broadcasting station the only way to distribute information and entertainment instantaneously nationwide," Commissioner Johnson added. "Today, a very few superpower radio stations—which exist in virtually every country but ours—could bring network programs to all the people. Scientists tell us the possibility of direct satellite-to-home television is not too far away. Cable television, with microwave interconnection of cable systems, is here already."

TV Projection System

General Electric recently introduced a major new product development for large-screen color television display.

The system, to be priced at $35,000, is based on an entirely new principle of color selection, a single gun Light Valve tube, and is a product of the company's Research and Development Center at Schenectady, N.Y. and in company laboratories in Syracuse, N.Y., and Cleveland, Ohio.

According to James M. McDonald, general manager of the company's Visual Communication Products Department, the Light Valve system will produce commercial quality color television pictures as large as six by eight feet which are designed to meet the broadcasters' need for studio previews, audience participation shows and high brightness monitor usage.

Heart of the system, the Light Valve, is an electron tube containing a high efficiency single gun system which regulates the light color and intensity through electro-optical means. The sealed Light Valve

Continued on page 12

Q. what video distribution amplifier has all these features...

- Lowest cost per output
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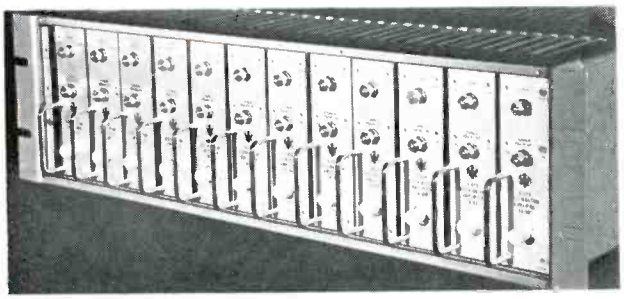

Your best buy—feature for feature, dollar for dollar . . . 72 outputs in 5-1/4" rack space—at less than $45 per output.

The Ward TA-901 Video Distribution Amplifier is a high performance, multi-purpose amplifier for distributing color or monochrome video signals in TV systems. Each TA-901 plug-in module, with built-in power supply, provides six source-terminated outputs. Twelve TA-901 amplifiers can be accommodated in a standard F-800 5-1/4" rack frame. Write or call for complete details.

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FOCUS ON
CATV

Broadcast Ad Club Hears Of Cable Explosion

The Broadcast Advertising Club of Chicago heard a number of speakers, representing many facets of the communications industry, predict that cable TV will play a large role in the coming communications explosion.

CBS Broadcasting Group President John Schneider said, "I think we're going to have it (cable). The skyline of metropolitan areas convinced me of the growing need" for cable TV.

Schneider does not, however, "see cable replacing conventional TV stations in the spectrum."

J. Leonard Reinsch, president of Cox Broadcasting, with wide CATV holdings predicted that broadcasters who fight CATV will not be able to cope with the communications explosion. He feels that communications will become one vast complex where information is developed primarily by electronics, and that distinctions between media will disappear.

He said, "It looks like a bright 10 years ahead—with the greater rewards going to those broadcasters who realize that change is occurring rapidly.

George Akerman, chairman of the *Boston Herald-Traveler* and WHOH-TV, said that "It seems certain that cable TV will play a big role in the distribution of the future newspaper."

He pictures the home-owner, "viewing the morning index on his TV set and then dialing the sections of the paper he wants."

NCTA President Fred Ford called CATV "a restless giant—a giant waiting to see how Congress and the Supreme Court are disposed toward settling our problems concerning copyright payments and FCC jurisdiction."

Predicting that once these issues resolved CATV will expand rapidly, Ford called for the creation of a Cabinet-level Department of Communications.

FCC Commissioner Lee Loevinger warned that if broadcasters insist on increased government regulation, they will get it. "But if they get it, they'll get even stricter regulation of broadcasting, too."

Incidently, Commissioner Loevinger, considered to be sympathetic to CATV, has announced his retirement, effective June 30, 1968. However, indications are that he may reconsider because of his long-time friendship with presidential hopeful Hubert Humphrey.

New FCC Actions Cause Mixed Emotions in CATV

The FCC has been making CATV-ers happy with recent decisions. After deciding that cable TV will not hurt uhf in three hearings ("Focus on CATV," May *BM/E*), the Commission also gave Vumore Video Corp. permission to import Denver stations into Colorado Springs.

Industry sentiment was summed up by Fred Ford who said, "The cable television industry is heartened by the Commission's rejection" of the arguments that the "Colorado Springs Cable TV system would have an adverse effect upon local broadcasters and the development of uhf."

Two other FCC actions, however, worried the CATV industry. For the first time, the Commission has inquired into whether a cablecaster was honoring the equal time and fairness doctrine. While Pioneer Valley Cablevision was exonerated, the inquiry itself is seen

as an ominous move toward FCC jurisdiction over CATV program origination.

The FCC has also suggested that no company be permitted to own more than one kind of station—a-m, fm or TV—in a given market. CATVers fear that this restriction will be expanded to include CATV systems.

Fred Ford called the situation a real threat, saying that it "cannot help but discourage well-qualified individuals who invested their money to develop TV from now investing in cable."

Who Needs A Franchise?

In a decision that may have wide implications, New York Justice Matthew M. Levy held that the phone company can lease CATV facilities to a system operator without a franchise.

He ruled in favor of Comtel, currently serving some 2000 subscribers plus 6000 hotel rooms in New York City.

Three other CATV firms serving the big city all have city franchises.

This is a case where the cable TV industry actually welcomes FCC intervention. Hope is that the Commission will rule that FCC approval will be required for all leaseback CATV systems.

Pole Rights And Underground Construction

Many CATV operators are looking toward underground construction for relief from rising pole attachment rates.

Underground construction, however, is not always practical. Willard A. Hargan, president of the California Community Antenna Association recently told the Nevada Public Service Commission that it costs 100 to 200 percent more to build an underground system.

In an effort to eliminate the bad blood between the telephone and the cable industries, representatives of AT&T and the NCTA met in Washington. AT&T officials said their rates were fair, while the NCTA staff said that the Bell Companies are obliged to explain and justify proposed rate increases. The talks were cordial, but no decisions were reached.

No Copyright Legislation This Year

The riots that followed in the wake of Martin Luther King's assassination, plus a long Easter recess and other pressing matters have apparently killed all chances that a new copyright bill can be enacted this year. Therefore, Register of Copyrights Abraham Kaminstein is pressing for a "skeleton bill."

In a letter to Sen. McClellan (D.-Ark.), Kaminstein wrote: "It is conceded on all sides that the bill as a whole cannot be enacted this year."

He pointed up the need "to provide reasonable protection to CATV operators against excessive liability should the Supreme Court rule against them."

Chances for a skeleton bill appear slim, however.

Pete Lucchin (second from left), manager of Alpine Cable Television, Inc., Pleasantville, N.J., interviews committee members of the International Electrotechnical Commission who recently visited the Jerrold-operated CATV system.

unit is expected to provide a new level of reliability and service. The Light Valve is a General Electric development which has resulted in a number of patents and patent applications. It uses a fluid layer.

The new system permits either a self-contained rear projection display or a front projection display on any normal screen surface. A similar monochrome unit has the capability of producing pictures twice the area of the color unit with equal brightness.

McDonald stated that the initial product, priced at $35,000, will be a three- by four-foot projection color unit. Present plans call for delivery of limited quantities starting in the second quarter of 1968, with delivery priorities established by orders received in the immediate future.

North Carolina to Get World's Tallest Tower

Tallest manmade structure in the world may soon be TV station WBTV's antenna tower, proposed for a site near Denver, North Carolina. The 2096-foot tower will usurp the tower height record now held by KTHI-TV in Fargo/Grand Forks, North Dakota. KTHI-TV's tower is 2063 feet high; the new tower slated for WBTV will top KTHI-TV by a scant 33 feet, and it's a good bet that another broadcaster will be after this stratosphere title before long.

In addition to the new tower, WBTV plans a new transmitter and building at the tower site. According to Charles H. Crutchfield, Jefferson Standard Broadcasting Company's president, the enlarged signal radius will increase effective covered area by 50 percent—adding nearly a million more people to the station's present audience of approximately 1,863,000. New building and relocation costs are expected to run more than a million dollars. The actual construction will start with final approval by both the FCC and the FAA.

Four Stations Cited For Lottery Broadcasts

Forfeiture of $2000 have been assessed against stations WBRE-TV, Wilkes-Barre, Pa., and WNEP-TV, Scranton, Pa. and forfeitures of $1000 against WMUU, Greenville, S.C. and KLPW, Union, Mo., for broadcast of lottery advertisements or information.

The first three stations appear to have been caught in the teeth of the Commission's Section 1304 by placing the nonbuying collectors of sales promotional coupons at a disadvantage since the number of coupons they could obtain was limited. Purchasers of packages of bread in which the coupons were inserted, on the other hand, were permitted to obtain as many coupons as they wanted by buying more bread.

KLPW's difficulty arose from the broadcast of announcements consisting of reading a newspaper advertisement offering a jackpot beginning at $50 and increasing by $5 for each automobile purchased in a specific period of time. The advertisement indicated that anyone purchasing an automobile was eligible to participate and a drawing to determine the winner would be held at a future specified date.

The Commission said it appeared that the contests or promotions were lotteries since all the elements of a lottery (prize, chance and consideration) were present. The winners were selected by chance through a drawing and consideration was present since the participants were required to purchase an automobile or gasoline.

The weather may be unpredictable. But that doesn't mean your microwave has to be.

With Lenkurt's 76E microwave radio system, you can always forecast reliable video transmission.

That's why major networks have used it for years for studio-to-transmitter links. And that's why you can rely on it to get the best video through to your CATV and ETV customers.

The 76E operates in the 12.2–13.25 GHz frequency range. Its r-f manifold is factory tuned to the frequency you specify—and it never needs retuning. Drift is no problem. And differential phase and gain are better than industry standards—giving you consistently superior color transmission.

So if you'd like predictable transmission for your customers, call or write Lenkurt Electric Co., Inc., San Carlos, California.

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The PC-70 Studio-Field Color Camera. Now used by all three networks on prime-time shows. Plus a growing list of groups, independents, and videotape producers. Why? Because it offers pictures of truest fidelity. Unquestionably, the finest Plumbicon camera in the world. Because it offers lowest maintenance, simplest set-up, widest selection of lens types around today.

The PCP-70 "Little Shaver" Portable. It can do anything the PC-70 can do . . . but it gets around a lot more. It's the *broadcast quality* portable. For news, special events, sports. You'll see them all over the place this year, wherever the networks go, and at pace-setting independents. They're lightweight, easy to set up, can get the closest, most intricate shots in beautiful, faithful Norelco color.

Last year more Norelco Plumbicon cameras were sold than any other kind. If you haven't met America's first family of Plumbicon Color Cameras, now's the time to get acquainted. We have modified and improved it further. For example, the new-generation PC-70 has the revolutionary extended red sensitivity Plumbicon tube (as do other members of the family), separate-mesh Plumbicons for finer overall resolution and improved highlight handling capability, external filter wheel control and new, no-guesswork set-up accessories.

It's remarkable. The entire family is endowed with those important traits that mean so much: All offer extraordinary resolution and color fidelity. They offer camera control unit compatibility from camera to camera. They have interchangeable CCU modules. Stability. Low maintenance. Simplicity and ease of set-up. Economy. Backed up by total Philips Broadcast service. You must meet the family. Call or write, today.

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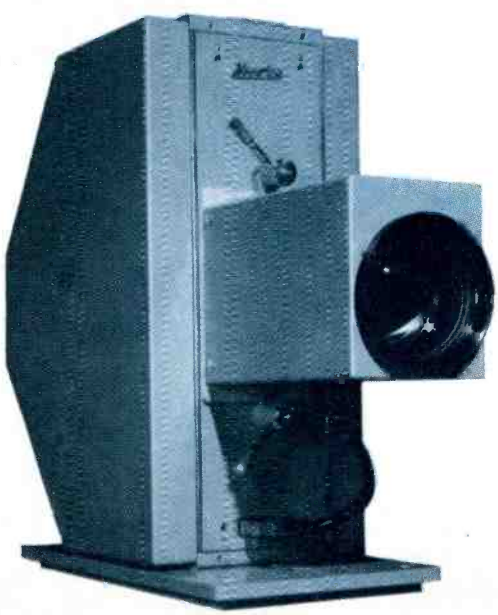
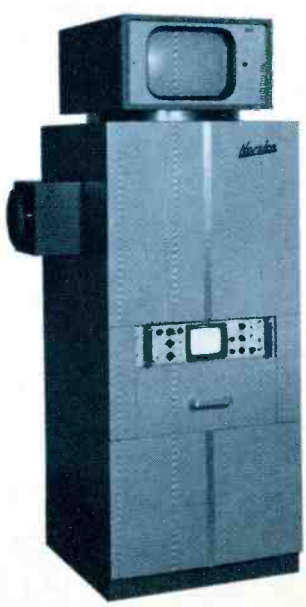
The PCB-701 Remote Pan and Tilt. The swinging Robot. *Works all by itself.* It pans, tilts, focuses by remote control. Ideal for small studios or networks. You can mount it in a studio, a stadium, an operating room . . . a *mountaintop.* It offers economy, low maintenance and the superb color reproduction that has made Norelco the number one name in color cameras.



The PCF-701 Film Camera. The only three-Plumbicon color film camera in the world! This telecine camera is the heart of a complete film system, and its beam split optical assembly is specifically tailored to the colorimetry requirements of color motion picture film. Now you can show movies and filmed commercials with the breathtaking fidelity that distinguishes Norelco three-Plumbicon color.



INTERPRETING THE FCC RULES & REGULATIONS

Television Multiple Ownership Rules Reviewed

THE PURPOSES of the Commission's multiple ownership rules are to promote (1) the maximum competition among broadcasters and (2) the greatest possible diversity of programming sources and viewpoints. The rules appear in §§73.35, 73.240, and 73.636. These sections govern multiple ownership of stations in the standard, fm, and television broadcast services, respectively. Each section is divided into two main parts: (1) the so-called "duopoly" or "overlap" portion which provides limitations on the common ownership or control of broadcast stations in the same broadcast service which serve substantially the same area, and (2) the "concentration of control" portion which proscribes the grant of a license for an a-m, fm, or TV station to any party —if the grant "would result in concentration of control" in the particular broadcast service "in a manner inconsistent with public interest, convenience or necessity."

The concentration of control portion sets forth a number of specific factors that will be considered by the Commission in determining whether a particular grant would result in a concentration of control contrary to the public interest. In this regard, the a-m and fm rules state:

> In determining whether there is such a concentration of control, consideration will be given to the facts of each case with particular reference to such factors as the size, extent and location of areas served, the number of people served, classes of stations involved and the extent of other competitive service to the areas in question.

The TV rule uses the identical language except for the absence of the words "classes of stations involved."

The concentration of control portions go on to state that although the aforementioned factors will be considered in determining whether the grant of a license would result in undue concentration of control; in any event such a concentration will be deemed to exist if the grant would result in more than a specified maximum number of stations in each service. That maximum is seven a-m stations, seven fm stations, and seven TV stations, no more than five of which may be vhf. The *concentration of control of mass media is not precluded by a specific rule but is rather impeded by Commission policy.*

These provisions are designed to further maximum competition among broadcasters and, more significantly, *the greatest possible diversity of programming sources and viewpoints.* The Commission has dedicated itself to the prevention of undue concentration of control of mass media and to the development of the greatest diversity and variety in the presentation of information, opinion, and broadcast material. Its actions in this area have been guided by the Congressional policy against monopoly in the Communications Act, and the concept, as recognized by the courts, that the communications business is and should be one of free competition. (See FCC 64-1171, December 18, 1964.)

The Duopoly Rules

As adopted initially Sections 3.35(a), 3.240(a), and 3.636(a) of the Commission's Rules provided limitations on the common ownership or control or multiple a-m, fm, and TV stations which served substantially the same area. These provisions of the Rules, commonly referred to as the "duopoly" or "overlap" rules, were intended to preserve and augment the opportunities for effective competition in the broadcast industry and to implement the Commission's policy of maximizing diversification of program and service viewpoints. The latter policy has assumed a very special importance in a democratic society. As stated in the following case, it is well established that ". . . the widest possible dissemination of information from diverse and antagonistic sources is essential to the welfare of the public . . ." (*Associated Press v. United States,* 326 U.S. 1,20; *Scripps-Howard Radio, Inc. v. F.C.C.,* 89 U.S. App. D.C. 13, 19, 189 F. 2d 677 cert. den., 342 U.S. 830).

Concentration of Control Problems

The question of diversification of mass communications media has double aspects—diversification in the locality involved, and diversification of the total mass communications ownership without restriction to the community in question. Where one applicant was licensee of a 250-watt a-m station in the city, with the smallest service contours of the four stations located there, it was entitled to a preference over the other applicant, which controlled the only morning and Sunday paper in the city and which, in turn, was closely affiliated with the only other paper in the city. The newspaper applicant argued that operation of a television station will attract a greater portion of a radio station's listeners than of a newspaper's readers, and thus a grant to the newspaper applicant would achieve a greater degree of com-

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This section, providing broad interpretation of FCC rules and policies, does not substitute for competent legal counsel. Legal advice on any given problem is predicated on the particular facts of each case. Therefore, when specific problems arise, you would be well advised to consult your own legal counsel.

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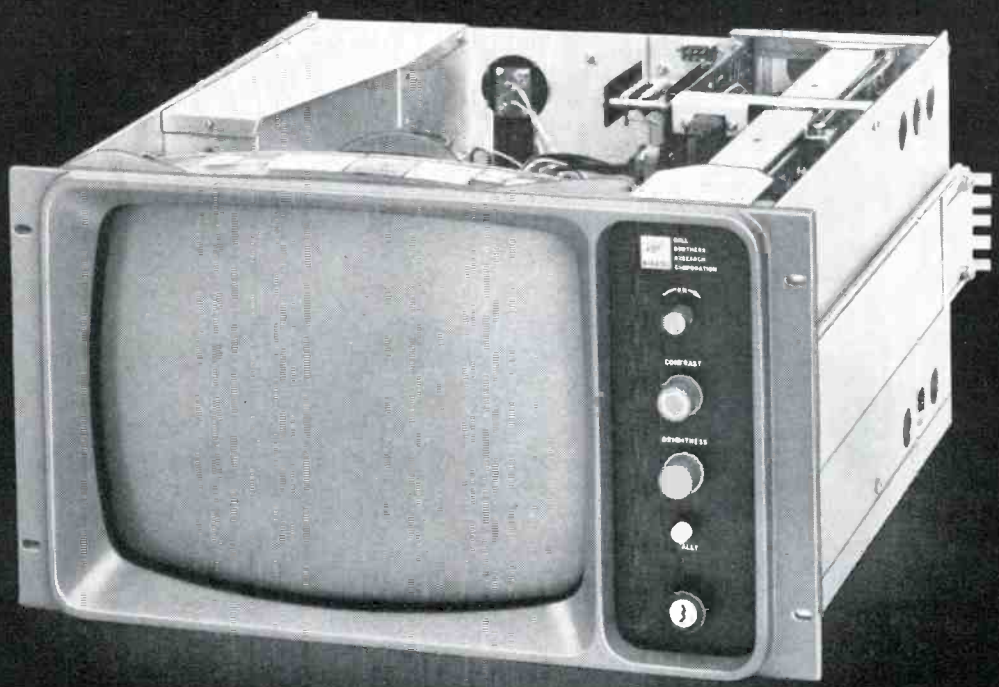

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petition. The Commission did not agree and preferred the radio applicants. *The Commission observed that it seeks to achieve diversification in the control of all media of communications and not merely of broadcast facilities.* See *Radio Fort Wayne, Inc.*, 9 RR 1221 (1945). *This case reflects the FCC's proclivity to prefer moderate "concentration of control" of broadcast facilities to a combination of broadcast and newspaper ownership.*

In a Public Notice issued December 18, 1964 (FCC 64-1171, 29 FR 18399, 3 Pike & Fischer RR 2d 909), the Commission, citing figures, expressed its concern over the marked increase in multiple ownership of television stations in recent years,—*especially of vhf stations in the largest markets* where the number of viewers is greatest and where diversity of interests and viewpoints should be maximized.

Subsequently, on June 21, 1965, after further study of the matter, the Commission released a Notice of Proposed Rule Making and Memorandum Opinion and Order in Docket 16068 (FCC 65-547, 30 FR 8166, 5 Pike & Fischer RR 2d 1609) which proposed adoption of an amendment to the concentration of control portion of the TV multiple ownership rule thereby providing *for ownership of not more than three TV stations or more than two vhf stations in the top fifty television markets.*

At the same time, the Commission terminated the interim policy expressed in the December 18 Public Notice and substituted therefor a new interim policy as follows:

> Absent a compelling affirmative showing to the contrary, we will designate for hearing any application filed after June 21, 1965, for a new television station, assignment of license, or transfer of control, the grant of which would result in the applicant or any party thereto having interests in violation of those set forth in proposed §73.636(a) (2) (ii) in the attached Appendix. *Divestiture will not be required, but commonly owned stations in excess of the number set forth in the proposed rule which are proposed to be assigned or transferred to a single person, group, or entity will be designated for hearing.* However, no hearing will be designated in any of the foregoing situations which involve applications for assignment or transfer of control filed in accordance with §§1.540(b) or 1.541(b) of the Commission's rules, or applications for assignment or transfer of control to heirs or legatees by will or intestacy if the assignment or transfer does not create common interests which would be proscribed by the above-mentioned section — — — — —. (Emphasis supplied.)

The new interim policy was published in a Public Notice released on June 21, 1965 (FCC 65-548, 30 FR 8173, 5 Pike & Fischer RR 2d 271), the same date on which the Notice of Proposed Rule Making and Memorandum Opinion and Order was released in Docket 16068. The latter document, in addition to proposing an amendment of §73.636 of the Rules, disposed of petitions for reconsideration of the December 18 interim policy and requested comments as to the aforementioned "top fifty market" rules.

The notice, after having presented statistics showing that there is an apparent trend toward more vhf stations coming under group ownership in the largest markets and a corresponding decline in the number of single-station owners, stated that the Commission was concerned that under the present limitation of five vhf stations per owner there might be a continuation of the trend. It also expressed concern that the future growth of uhf—

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which has its greatest immediate potential in the largest markets—might follow the vhf pattern. The proposed rule was designed to counter the apparent vhf trend and to prevent the development of a similar trend in uhf. *The Top-Fifty-Market Concept* was proposed for three reasons. These are (a) the substantial degree of ownership concentration reached in these markets; (b) the high proportion of the total population resident in these areas and consequently the very large audiences reached by the individual vhf stations; and (c) the availability of ample economic support for individual, local ownership of both vhf and uhf stations in these markets."

The Notice of Proposed Rule Making (para. 19) asked that parties focus their comments ". . . upon the question of need for the changed rules and the appropriateness of the specific rule proposed. In arguing need, or lack of need, for a new rule, parties may submit programming showings in a manner which seeks to demonstrate that the programming was made possible solely by virtue of a multiple ownership situation which could not arise under the proposed rule. Parties opposing the proposed rule should concentrate primarily upon the question of public benefits which may be ascribed to multiple ownership in excess of the level proposed herein. In short, the issue posed is not as between multiple ownership and single ownership, but as between the present level and a more limited degree of such ownership."

Elsewhere in the Notice (paras. 16-18) comments were requested on six specific questions. The Commission studied all of the comments filed. Only one filed expressed the view that there was an undue concentration of control in television broadcasting. However, the commenting party also stated that the proposed rule would be ineffective *without the further requirement of divestiture! All other parties expressed the view that there was no undue concentration of control and opposed the proposed rule.*

Finally, on February 7, 1968, the Commission issued a Report and Order deciding *that the proposed rule should not be adopted and that the proceeding should be terminated.*

First, the Commission noted that since the institution of the instant rule making proceeding many new uhf stations have been activated in the major markets. This has lowered the previous degree of concentration of station ownership in these markets, and the development of uhf is providing as many separate owners and separate viewpoints as would have occurred with a more restrictive multiple ownership rule in the absence of these stations. Equally important, the Commission observed that, insofar as uhf stations are concerned, an absence of the type of restriction proposed in the rule may well serve to make for a more rapid development of such stations and enhance the chances of development of a fourth commercial TV network. It would significantly contribute to the entry of persons who have the know-how and the financial resources to enter into and carry on uhf television broadcasting during this most crucial period. Indeed, the Commission believed this consideration of possible benefits to television service through entry of the multiple areas, although not as critical as in the uhf area, is also relevant to the public interest

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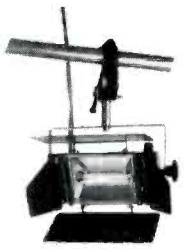

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judgment to be made in this field with respect to vhf operation. Consequently, the Commission decided that *the problem of concentration in the top 50 markets should continue to be dealt with upon the basis of case-by-case consideration within the standards of the present multiple ownership rules*. Of course, while there are the benefits of predictability in the adoption of a specific limit for the 50 largest markets, the Commission decided that the greater flexibility permitted by an ad hoc approach is preferable. Since there is a standard in the rules limiting total ownership and control by any one party, the Commission emphasized that it *will continue carefully to scrutinize every acquisition, whether in the top 50 markets or in other communities, to prevent undue concentration.*

More particularly, in light of the special problems concerning the top 50 markets set forth in the Notice of Proposed Rule Making above, the Commission will *expect a compelling public interest showing by those seeking to acquire more than three stations (or more than two vhf stations) in those markets. The compelling showing should be directed to the critical statutory requirement of demonstrating, with full specifics, how the public interest would be served by a grant of the application*—that is, the benefits in detail that will be relied upon to overcome the detriment with respect to the policy of diversifying the sources of mass media communications to the public. In other words, within the total limits now contained in the rules, the Commission will continue to adhere to the ad hoc approach in order to deal with particular situations in particular communities. A fixed limit would be too restrictive and the Commission's conclusion in this respect was further reinforced by the present critical phase of uhf development and the need to have enough flexibility to take appropriate action.

Conclusion

From the foregoing discussion, broadcasters might assume that the Commission's refusal to adopt its proposed Top Fifty Market rule and return to the case-by-case approach means that the multiple ownership criteria have not been changed. This assumption appears false.

Today, the FCC's case-by-case approach to all transfer and assignment applications is appreciably more intense; any sign of concentration of control will require extensive explanation to pass the rigors of Commission review.

To augment the anxieties of broadcasters the Top Fifty Market Proposal was rejected by a 4-3 vote, and three dissenting opinions were attached to the *Report and Order*. Commissioner Bartley's dissent was cryptic, but Commissioners Johnson and Cox were lengthy and vitriolic. Finally, in a recent address, Commissioner Cox, in discussing the multiple ownership rules usually said, in effect, "The rules don't require divestiture *now* . . ." The obvious, unintended implication was that the rules some day may require divestiture.

In closing, the broadcasters may prudently expect more trouble in all facets of the multiple ownership. They should have their legal counsel maintain close surveillance of all developments and file comments liberally in future rule making proceedings. ●

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RCA

By Jack Roth

Right: WRIZ transmitter 6½ miles off the coast of south Florida.

Below: Speedboat stands ready to ferry transmitter crews to and from mainland. During proof of performance tests it does double duty.

WRIZ's Offshore Transmitter Makes for Lively Logistics

Ever try a proof of performance using aircraft and speedboats? This is typical of the imaginative solutions to challenging problems WRIZ's staff has to come up with to make its offshore transmitter operation technically feasible and economical.

Author Roth is president of Mission East Company, the organization owning WRIZ.

WRIZ, 1550 kHz in Coral Gables, Florida, is one of the more unusual a-m broadcasting stations in the U.S. Its completely self-contained 40-kW effective transmitting radiated power facilities are perched on a platform above the sea water off Florida's shores.

The station is owned by the Mission East Company, an operating subsidiary of Mission Broadcasting Company, which also operates KONO-AM and KITY-FM in San Antonio.

Six and a half miles off the Miami shoreline and a mile off Cape Florida on Key Biscayne, the WRIZ transmitter site is centered above seven and a half acres of salt water leased from the State of Florida—right in the midst of one of the nation's best fishing areas.

The station layout consists of two separate buildings and four transmitting towers built on concrete pilings driven into the bay bottom. Six-hundred-fifty feet of catwalk interconnect the various sections, the catwalks are eight feet above mean tidewater level.

There are two modern transmitters in the main building, the master transmitter the first of its type to have been installed by an American broadcasting station. It is a Gates BC-10H unit manufactured by Gates Radio Company, Quincy, Illinois, a subsidiary of Harris-Intertype Corporation. With the exception of five vacuum tubes in the output stage, this is the most completely transistorized transmitter used in high-powered broadcasting.

A 1-kW Gates Vanguard II transmitter is provided as a standby for the 10-kW BC-10H unit. It, too, is almost entirely solid-state, employing only one vacuum tube.

The unusual location of the station's transmitting facilities was dictated by the limited nature of its assigned frequency. Under an international agreement predating Fidel Castro's takeover, 1550 kHz was allocated as a clear channel to Cuba. Now it is also occupied by Mexican stations.

This makes it necessary for WRIZ to adhere to a strict 318° NNW directional pattern. The offshore location was the only one that would permit saturation coverage over an arc ranging north from the Florida Keys to Fort Lauderdale during the station's sunrise-to-sunset transmitting schedule.

Many engineering and construction problems were solved during the station's erection, both en-

vironmental and physical. The transmitters required protection against the ravages of salt-laden air, and the buildings against Florida hurricanes.

Station design and construction were directed by George W. Ing, Mission East's director of engineering, with the on-site assistance of Ted Bryan, chief engineer of WRIZ

Construction began in April, 1966 after Roth obtained FCC approval to purchase a construction permit authorizing a 10-kW daytimer on 1550 kHz in suburban Coral Gables. Their permit had lain dormant since 1961. The group holding it had been unable to cope with the complex engineering problems that prevailed.

There had been some physical work on the facility, however. Piling and the 2 platforms had been set on the coral shoal where the transmitters are now. This made soundings unnecessary. The erection of platforms, catwalks and, finally, buildings were undertaken without delay by the contractor, Dock & Marine Construction Company, Miami.

All building equipment and materials, including tower components, were transported to the site on barges towed by tugs.

Platforming was constructed of planks laid 1-inch apart. These were covered with plywood and tar paper in alternate layers to provide subfloors 5-inches thick. The tar paper keeps moisture from entering the buildings from below.

There are two buildings on the site. One houses the electronic equipment, the other the three diesel-driven generators supplying all of the station's power needs.

The buildings are built on separate platforms to prevent generator vibration from affecting electronic equipment. Of frame construction, both have flat roofs topped by tar and gravel. They are secured by steel rods (two at each corner) from the roofs to below the floors and platforms. This is for protection during hurricanes. Roof supports, tie rods and other construction are also tied down with hurricane straps.

Outside walls have tar paper coatings covered by asbestos siding for protection against fire, moisture and the elements. Redwood was used for exterior trim. There are six tinted thermopane windows in the transmitter building measuring 1 $\times$ 5 feet, provided on special order.

Windows were sized to expose as little glass as possible to hurricane winds, yet provide the engineers with an outside view. They are fixed in place permanently and are completely sealed against moisture.

The transmitter building's outside walls and ceilings have 3-inch fiberglass insulation to keep out heat, as further protection against moisture, and to facilitate air conditioning.

All catwalks are bolted to the concrete piling. Hurricane straps tie the decking to catwalk supports.

During much of this construction, workmen were in water ranging from waist to shoulder-high depth. They worked from skiffs and floats propelled by poling and small motors. This slowed construction to about one-third of normal.

Main transmitter room contains microwave gear and 10-kW solid-state Gates BC 10H.

Engineer on duty helps himself to the comforts of home in transmitter installation's galley.

Each day's work had to be meticulously planned. Material delivery was especially critical. Lack of a simple nut or bolt could delay work for several hours until one could be brought from shore.

The station's four slender, guyed 160-foot towers, also supplied by Gates Radio Company, were transported in manageable sections to the transmitter site by barge, then erected with a barge-mounted high crane. Their bases are triangular-shaped concrete piles with concrete caps for tower footings. A microwave receiving antenna surmounts one of the transmitting towers.

Interior of the transmitter building is conventional in appearance. The gates BC-10H 10-kW, Gates Vanguard II 1-kW transmitters, and Gates Custom 10-kW Phasor are installed through one wall, with their front panels flush. Through-the-wall installation serves a dual purpose—it gives the room a streamlined appearance and facilitates air conditioning.

Air conditioning is provided by a conventional, unducted 5-ton York packaged unit set into a wall. This air conditioner is operated manually, not by thermostat. It is placed in a closed-in area behind the transmitters and phasor, heat is discharged through the outside wall. Cooling capacity exactly matches heat output from the 10-kW transmitter.

When the problem of protecting the electronic

equipment against extremely high temperatures, humidity and salt air prevalent in the Miami area was first considered, it was feared major air conditioning steps would be necessary. There was no problem.

Studies indicated that the best way for environmental control would be to circulate conditioned air in a room behind the transmitting equipment without drawing any air from the outside. By this method, despite the 10-kW heat output of the transmitter, the air circulating around in the room is maintained at not more than 76° F.

Constant dehumidification is automatic without any special equipment. Condensation is drained below the air conditioning unit. During periods of 100-percent humidity there is a steady flow of water.

A 7500-ft^3/min exhaust fan backs up the air conditioning unit. It will effectively exhaust the heat generated by the transmitter in the event of air conditioning failure.

The building's main room, which houses sleeping and cooling facilities for the engineers, can be cooled sufficiently by a conventional 1-½-ton air conditioner.

Transmitter Ground System

Careful design and construction have proved effective in preventing changes or fluctuations in the tuning of the antenna system by tides or weather conditions.

Total ground system consists of 22 miles of No. 8 hard drawn copper wire and approximately 1000 feet of 4-inch copper strap. The ground system around each tower consists of 240 radials, 120 of which are 45 feet long and the other half 160 feet long.

The 120 short radials and 85 feet of the long radials are elevated 8 feet above mean tide level to prevent tide fluctuations from affecting the tuning of the directional antenna array. The other 75 feet of the long radials are laid on the floor of the ocean.

Concrete blocks are tied to the ends of these radials to keep currents in the water from moving the wires out of position. This necessitated driving concrete piling around each tower to support the ground system above water.

The ground system of each tower is tied together under water by 4-inch copper strap that is held in place on the ocean floor by creosoted stakes driven on each side of the strap. In addition, the complete ground system is tied to the transmitting equipment by a 4-inch copper strap under water and a 2-inch copper strap that is laid on the catwalk.

During construction of the ground system by Dock & Marine personnel, one of the main problems was raising the ground wires to the No. 3-0 hard drawn copper cable that supports them at the piling. Since the wire was under tension, great care had to be exercised to prevent the wire from breaking when it was heated during welding. Working in water that varied from waist deep to shoulder depth, the men had great difficulty in stretching the wires tight enough to prevent swaying in the wind during stormy periods.

On-site power was another basic requirement. Two General Motors Detroit Diesel 60-kW, 240 V, 3-phase generators provide power for the transmitters. They have automatic voltage regulation within 1 percent.

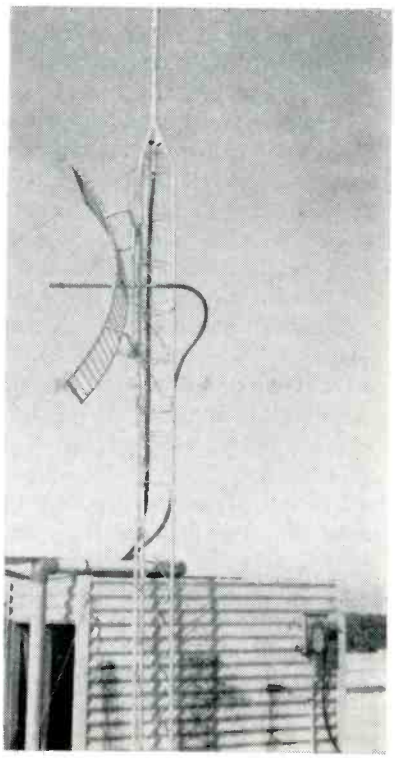
Normally, the 60-kW generators are alternated in use weekly. But, should trouble develop during interim periods, switching from one to the other is accomplished without the duty engineer leaving his regular transmitter house operating station.

Pre-alarm warming signals—lights and horns in the transmitter building—are provided. Should a high water temperature or low oil pressure condition develop, the generator in service will automatically shut itself down, start up its companion unit, and perform the switchover. The pre-alarm system functions essentially as a warning that trouble has developed and changes are about to occur automatically.

Augmenting the two 60-kW units is a 20-kW, 240 V, single-phase diesel generator that supplies power for tower lights and building illumination at night. The 20-kW unit incorporates automatic shutdown and automatic voltage regulation, but must be switched manually.

Diesel engine exhaust noise level is successfully controlled by residential-type mufflers. They reduce the noise to a level comparable to a small air conditioner. Generator maintenance requirements have been minimal, consisting mainly of changing oil and oil filters on a 100-hour schedule.

Fuel for the generators is stored in two 5000-gallon tanks mounted adjacent to the power building. Replenishment is on a six-month schedule. Fuel oil is hauled to the site by barge.



Microwave, 945-MHz antenna receives programming from studios in bank building in Miami, 10 miles away.

Main control room in WRIZ studios in Coral Way National Bank Building.

Monitor Points

During station construction, WRIZ's engineers encountered an interesting problem in establishing monitor points. They were especially hard to locate because there were no reference points on the water.

An unusual method worked successfully. It was based on a geodometer—a device never before applied to a radio broadcasting problem.

A geodometer, which sends out a high-intensity light beam much like a laser, was carried in one of the station's two speedboats. The light beam was bounced off a mirror target at the center of radiation of the towers.

The light beam, traveling back to its point of origin in the speedboat, indicated distance accurately to a quarter of an inch per mile.

There was a similar problem when proof of performance was begun by WRIZ's consulting firm. Using boats and aircraft was the solution.

Although the WRIZ signal originates from a water-based transmitting site, programming comes from modern studios in the new Coral Way National Bank Building in Miami.

This offered a challenge in station planning—how best to get the programming from land to sea. Laying telephone lines underwater to the transmitter site was both physically and economically unfeasible.

A page was taken from TV/fm signal relay techniques and Moseley microwave transmitting and receiving equipment was provided. This adds another unusual dimension to WRIZ's operation. It is one of the few a-m stations in the country using microwave as the principal means of linking its studios and transmitter together.

Microwave operation is on 945 MHz, a less critical frequency than those employed by TV stations. It is considered more dependable. The microwave path is approximately 10 miles long. Signals are beamed from a 75-foot-high antenna atop the studio building to a receiving antenna at the a-m transmitter site standing 165 feet above the water.

Routine voice communication between studios and transmitter site, and also between automobiles and speedboats and the studios and transmitter site is through a 450-MHz Marti remote broadcast system. This provides a broadcast-quality signal and can be substituted for the microwave relay system should it ever fail.

Broadcast control and operating equipment at the studios includes a Gates M-6377 Diplomat console, five Gates M-5890 record turntables, four Gates/ATC-CP II cartridge machines, and three Gates/ATC-CAR II cartridge record units. Gates monitoring equipment prevails at both the studios and the transmitter site.

Living Quarters

Two engineers alternately man the transmitter on 72-hour shifts. Both Lawrence S. Roser and Louis T. Krebs, Jr. are veteran engineers and boating enthusiasts. Roser also admits to a fishing hobby.

They have full, apartment-size living facilities, fully electrified. Fresh water is stored in a 500-gallon steel tank equipped with a pump to maintain even pressure. The tank is filled weekly by the WRIZ boat on its regular trips. Sanitary facilities are those standard for any modern home with a septic tank.

Standard broadcast and short-wave radio plus television are provided for off-duty entertainment and there is excellent nighttime fishing.

Transmitter site construction, started in April, was finished in October, 1966. Proof of performance, studio preparation and final details occupied the time between then and the station's formal opening in January, 1967.

Since going on the air, WRIZ has established a firm place for itself in the highly competitive, 16 a-m station Miami area market. Managed by Richard Wilcox, who had previously held a like position at San Francisco's successful KABL, the station adheres to a rigid "good music" policy based almost wholly on million-seller LP record album material.

Its penetration of the Miami market has been aided substantially by the previously-mentioned 40-kW effective radiated power its Gates BC-10H 10-kW transmitter is delivering throughout its service area. This makes the station a good "buy" for advertisers, as well as a strong source of pleasant programming for listeners.

Despite the seasonal vagaries of the Miami area's weather, to which its transmitter site is especially exposed, no service interruptions have as yet occurred.

Chief Engineer Bryan says this reliability record has prevailed without once having to remove the back panel of the 10-kW transmitter, much less using the 1-kW Vanguard II in anything but a silent, standby role.

Weather conditions have upset the station's operating routine only once. That was recently, when Biscayne Bay was considered too choppy for safe transit of an engineering relief from the mainland to the transmitter site in one of the two 24-foot high-powered speedboats maintained by WRIZ for that purpose.

This, however, affected no one but the engineer awaiting relief. He had to stand an extra watch, but that personal inconvenience was easily adjusted later on. •

The CATV Nonduplication

The first article in this series discussed the Public reaction to the new rules and their impact on CATV operators. This article will cover the effect on TV stations plus the problems of contours and picture quality.

By Lon Cantor

THE FCC HAS RECEIVED many submissions from TV stations operating in CATV areas. The stations complained about the following:

1. Noncompliance by CATV operators.
2. The burden of notification placed on protected channels.
3. The inadequate protection provided by the rules.

The Taft Broadcasting Company, licensee of WNEP-TV in Scranton, Pa. supplied some factual data.

"Scranton-Wilkes-Barre is the most densely CATV saturated television market in the United States. About 165,000 homes (approximately 550,000 persons) located within the Grade B contour of uhf station WNEP-TV . . . subscribe to CATV. This is more than 30 percent of the total number of homes in that area."

" . . . CATV . . . has in large measure transformed that market into a television suburb of Philadelphia and New York City."

" . . . CATVs serving 13,500 television homes in that area today do not carry WNEP-TV in violation of the (FCC) Commission's rules. 97 percent of these CATVs are located within the Grade A contour of WNEP-TV . . . "

"As the direct result of noncarriage and duplication of WNEP-TV by Schuylkill and Carbon-County CATVs, those counties have been lost to WNEP-TV's ADI (areas of dominant influence)."

"Scranton-Wilkes-Barre is the 60th largest market in the nation based on ADI. If the CATVs in Schuylkill and Carbon Counties operated in accordance with the Commission's rules, the two counties would be returned to the Scranton-Wilkes-Barre ADI and the market's ADI rank would then be 45th in the nation."

" . . . WNEP-TV and the other Scranton-Wilkes-Barre stations have filed substantially more than 100 pleadings . . . urging the Commission to enforce its carriage and nonduplication requirements."

WNEP-TV supported its submission with three complete tables showing the amount of duplication occurring and including the history of waiver requests.

WBRE-TV, operating in the same market, made the point that during the early years CATV helped them, but now it is hurting them. Because of the importance of CATV in the Scranton-Wilkes-Barre area, WBRE-TV started by doing everything possible to make sure that they were carried by as many systems as possible. "We provided engineering help, equipment, maintenance, promotion help, and anything within reason that could be done to gain access to the CATV audience and to keep that audience."

"During the early years, say from 1958 to 1963, this was a highly satisfactory project and WBRE-TV was on up to 1,000,000 homes in the area covered by the stations predicted Grade B contour and in many cases even beyond the Grade B in areas not otherwise well served."

"In the past few years, however, with the advent of the 12-channel system, CATV operators began to add more and more stations, importing signals by direct pickup at their previous head end sites as well as importation by microwave . . . "

" . . . The CATV systems not only duplicated the local signals, they triplicated them."

" . . . Here are the effects as of June 1967: 42 CATV systems which have 19,134 homes do carry the local signals and do not duplicate them; 55 CATV systems which have 109,573 homes do carry the local signals and duplicate or triplicate them; 8 systems with 18,946 homes do not carry WBRE-TV at all . . . In short, we receive nonduplication protection from only 13 percent of the total CATV homes."

" . . . It can be said here that in many of these

Controversy—Part II

cable towns, because of the terrain, no signal, either U or V serves the majority of the community at housetop level. The signals must be gathered at the highest mountaintop and relayed downward by the CATV system. Hence, the CATV is solely responsible for the chaos which has occurred."

They make the point that more CATV systems are proposed for the area, as well as importation of New York City channels. "This type of operation, if allowed, will have a significant and harmful effect on free TV, uhf-TV and this market."

Channel 8, KNOE-TV in Monroe, Louisiana had a similar complaint. They have asked all 16 of the CATV systems in their area to carry them, preferably on-channel, and to give them nonduplication protection, but none have complied.

They feel that "it is essential that the commission manage to adopt more expeditious procedures" in processing waiver requests. "Under present conditions, CATV systems, by filing a petition for waiver . . . can insure extremely lengthy delays in even the theoretical necessity for compliance . . . The fact that the mere filing of such a petition can insure an extended period of operation without compliance with the Commission's requirements constitutes a great incentive for the filing of such petitions."

WKYT-TV, in Lexington, Kentucky, documented its case pretty well: They state that a year and a half after the Commission adopted its exclusivity rule, they are still not receiving exclusivity from most CATV systems in their area. They give this chronology:

1. Nov. 29, 1966—Winchester CATV system ordered to comply.
2. March 21, 1967—Commission extended its compliance date to July 30, 1967.
3. July 26, 1967—Winchester CATV filed petition for special relief.
4. August 25, 1967—WKYT filed an opposition and a request for issuance of cease and desist order.
5. To date, the FCC has taken no action on this matter.

Their submission includes similar timetables for the other CATV systems in their area.

Even more frustrated is James Fred Paxton, who manages WPSQ-TV in Paducah, Kentucky. He says that he can't even find out whether or not the systems in his area are complying with the rules.

KEYT-TV channel 3 in Santa Barbara, California feels that they have been getting protection but have still been hurt by CATV.

They say, "The CATV systems have reduced KEYT's audience by approximately 20 percent with the nonduplication provision fragmenting the audience. Without the nonduplication, we estimate a further loss of from 20 to 30 percent depending on picture quality on the cable. This is based on CATV coverage of KEYT's area of approximately 35 percent of the sets. Even a 20 percent loss of income to KEYT would be disasterous.

KEYT never had any problems with noncompliance. All CATV systems in their area agreed to provide them with nonduplication protection as soon as they started operations.

They are one of the few respondents who said, "We judge the existing rules to be fair and equitable."

Another California station, KFMB-TV in San Diego, feels that the CATV problem is very complex. George Whitney, vice president and general manager, made a number of good points.

"The significant measure of the impact of the Commission rules," he says, "is not the impact on net weekly circulation, but rather the impact on delivered audiences of local stations which is normally measured by average quarter hour audiences."

According to a survey taken before the new rules went into effect " . . . During the prime time half hour segments surveyed, over 20 percent of the CATV homes watched Los Angeles network stations."

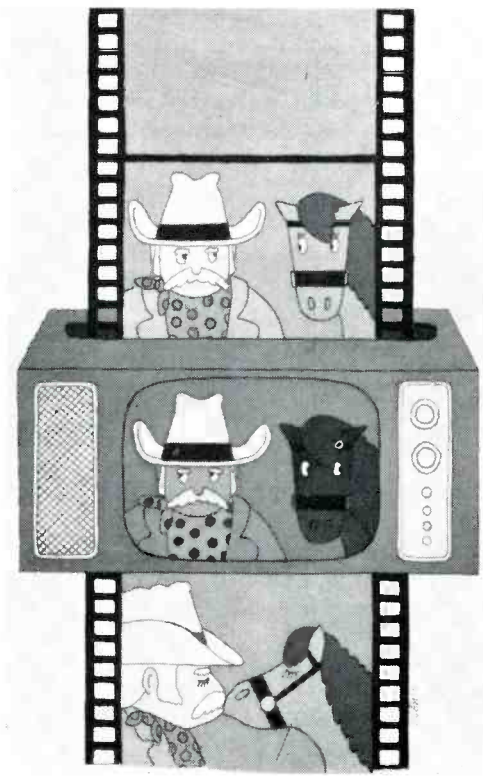
"A number of difficulties have been experienced in connection with the carriage of local stations on CATV systems and their provision of duplication treatment. Among them are:

a. "Degradation of local signal when carried on channel. At many times and in many places local stations' signals are virtually unwatchable when carried on-channel on CATV systems. This presents a difficult dilemma for local stations. If they request on-channel carriage, their signal is significantly lower in quality than others available on the system. On the other hand, if local channels request carriage on a different channel, the viewers will become confused and the substantial good will developed by the local stations over the years through the promotion of its channel number will be largely destroyed among its CATV sub-

Continued on page 50

What To Do About TV's Unbelievably OFF-COLOR Films

Broadcasters and film people abrade each other over who should do what to improve color. Result: little progress in standards. At the 103rd SMPTE Conference last month, members of the Color and TV committees pressed for faster action. Next SMPTE steps are covered in inset page. For the big picture start below.



WHEN IT COMES TO FILM, N-T-S-C color standards might well stand for never-twice-the-same-color. Piggybacked color commercials look like they were all prepared by the National Association for the Advancement of Colored People—with no favorites. Skin tones are randomly red, green and blue, with all hues between and flanking. All at once everybody is concerned. "We're sitting on a time bomb," one network engineer working on telecine declared. "I'd like to tell you what I really think, but it's too hot a potato."

At the SMPTE Detroit meeting on color TV last winter, CBC engineers deplored the poor quality of 16mm motion picture releases and asked for color film standards (*BM/E*, April, p. 59). The Canadians' concern is minimal compared to the apprehension now voiced by National Advertisers footing the $multimillion bill annually for color commercials.

The Association of National Advertisers has turned the problem over to the SMPTE Color Committee for a solution. The first remedial steps taken at the color committees' meeting held in Los Angeles in early May are reported in the box, p. 35.

The overwhelming, overnight concern did not stem from the advertisers or advertising agencies. It's their own lack of quality standards that is responsible for the hue and chrome scandal. The networks are forcing the issue. The networks can produce outstanding 35mm and acceptable 16mm film. They can work closely enough with the film processing labs to get prints of desired density, contrast range and color balance. Timing corrections in going from the original negative to master positive can be made as scenes are put together to produce a pleasing uniform quality product. Theatrical releases under the control of the networks are good.

Advertising agencies, unfortunately, have not shown the same expertise. And the steps to getting

commercial prints are more involved in two important aspects. One, there are more intermediate steps in producing a commercial. Secondly, 200 to 400 release prints may be made. The practice of many agencies (and their clients) is to shop this production order out to the film lab that will give the best price—a nickel a foot or less. There are plenty of labs who will calculate their cost in mils rather than pennies. They simply cut out timers and do no screening of what comes out of the print tanks. As a result, one network official says six out of nine commercials are bad. Prints made by optical reduction rather than contact prints better but more costly. Labs with stringent quality control charge ten cents a foot and over.

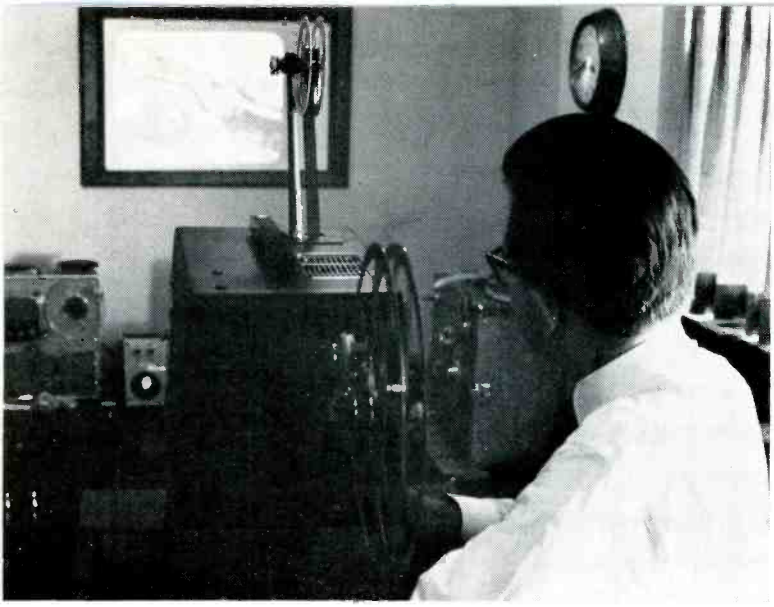
Although the lack of any quality control in making release prints is a big contributor in the bad commercials shown on TV today, the extra steps involved lead to deteriorated quality. In a theatrical 16mm release the steps are: develop the 35mm negative, make a positive print, reduce optically to make a 16mm color dupe negative (timing corrections are made in this step), run off release prints from this color dupe negative.

In commercials, one starts with the 35mm color negative, then an interpositive (color master) is made and then an optically reduced dupe negative as in the case of theatricals. Additional steps of adding titles, special effects, etc. now take place and a second color master and a second color dupe negative is made. These are done in the 16mm format and the picture deteriorates a little bit each step of the way. Then if the 16mm prints are made with no quality control procedures as described earlier, the results are deplorable.

A third factor leading to rainbow telecasting in addition to the extra processing steps and weak print control is subjective evaluation of what is proper color. Whether or not there is, or can be, objective "right" color as measurable by precision instruments will be discussed later. In the absence of such standards, tasty, pleasing color is generally obtainable if expert timers are given their head. In the short lifetime of the color TV commercial era, agencies have not been able to home grow such color balance experts. Screening day is fun-and-games day where the agency man and the client fulfill their esthetic ambition by tincturing the color positive the way they think best. Sometimes such viewing takes place in a fluorescent lighted office, sometimes the directions come over the phone and okays are given without even proofing the effect of the last instructions. It is now abundantly clear no two self-styled agency experts see color eye-to-eye—in fact they may unknowingly be partially color blind. The home viewer takes the beating. As Howard Chinn of CBS remarked in his acceptance speech upon receiving the NAB engineering award, "The fuss over loudness measurement of commercials is childs play compared to the problem of variations in color." Thank heavens the eye can accommodate better to the environment than the ear.

If the Madison Avenue national advertisers are "blowing it" what about the regional and local main street boys? Are they worse? According to a Group W spokesman, yes. Some stations serving regional markets are so distressed over the color quality that they are asked to telecast they invite clients and agencies to preview what the on-air picture will look like. This doesn't improve the situation for the home viewer but the station stands a chance to collect its bill even though the client, too, is distressed when he sees the final result.

Although the inconsistent color commercial is the most scandalous eyesore at the moment 16-mm color movie films are less so only by relative degree. As pointed out by Rodger Ross and Lloyd C. Harrop of CBC, far too much film material is beyond the range of correction by telecine paint pot controls. CBC has adopted standard telecine operating procedures to in effect give a zero position to all knobs. The objective is to have a standard departure point so that after pre-screen-



Improper screening conditions lead to bad results. Proper color balance for optimum home viewing can be achieved only if previewing is done under controlled conditions.

EBU Moving Toward Standards

The European Broadcast Union is looking toward specifications covering color films intended for TV. In December of 1967 a draft recommendation included:

Color balance—Both 16mm and 35mm should have a positive image and be balanced for projection by an illuminant having a black body spectral distribution at 5400 K ±400 K. The neutral gray scales should achieve a metemeric match to true neutral density (visual comparison does not allow them to be distinguished).

Light reflected from viewing screens under open gate condition should approximate the spectral distribution of a black body at 5400 K ±400 B.

Optimum screen brightness, ambient lighting level and other viewing conditions are still under study.

Color Film Densities—Color film density should be 0.35 ±0.05 in those areas of the picture which are to be reproduced as television white. The density corresponding to television black is not being pinned down precisely but something near 2.0 will be satisfactory, the committee says. Higher densities for special effects may inprove color reproduction but detail can not be reproduced at densities higher than 2.0. Measurements are to be made with a densitometer cell conforming to I.S.O. Recommendation R5 (1954), in singly diffused light.

Telecine Equipment—Because of continuing changes in telecine equipment and color film stock a final standard gray-scale characteristic for equipment is not possible. As an interim proposal, EBU recommends that telecine equipment have a gamma between 0.4 and 0.45. This gamma should be maintained over a signal range corresponding to a contrast ratio of 60:1 on the film.

The EBU expects to have a final version of a specification or color film EBU-G-3 completed sometime in 1968. EBU Working Party G is studying the final draft now.

Ed. Note: European's use flying spot scanners rather than vidicon pickups. Hence their equipment considerations, gamma rating, etc. are different and films matched to this equipment would not necessarily be optimum for U.S. equipment.

ing the film material, a systematic approach to paint pot adjustment might be possible. Using this orderly procedure, the Canadians find films for which compensation is impossible. Ross and Harrop pleaded for broadcasters not to accept such film from distributors and processing labs.*

Tolerably good 16mm prints should be possible when the original is a typical 35mm color positive. The eye will see the scene as it was intened. (The eye cannot, however, re-adapt quickly enough at the commercial breaks and this is part of the problem.) Many old movies appear to be too cold or blue and the contrast range is limited. Foreign imports may be far worse since the color positive from the vault is not available and distributors are ordering release prints made from used, scratched prints.

The situation is likely to get worse before it gets better since the demand for fresh films is so intense. Processing labs say they can't do a good job on these but what are they to do—turn the business down? Wide-screen motion picture films, which most films of current vintage are, require conversion to the TV 3 by 4 aspect ratio and this calls for a squeezed dupe negative. An extra step is involved and if quality control isn't exercised, picture deterioration takes place.

Will the Real Culprit Please Stand Up

Thus far in probing the reasons for the deplorable quality of telecine film material, the ad agency, the nondiscriminating film lab and the film distributor have been fingered as culprits. The list does not end here. (It's because so many people are involved that the system is out of control.) Also in the act are the raw stock film manufacturers, the lighting man, the camera man and the producer, the telecine equipment manufacturer and the broadcaster.

- The broadcaster blames almost everybody and in particular the equipment manufacturers, the film processor, the distributor. He suspects the film manufacturers is not capable of producing a standard, consistent product. He scores the telecine equipment manufacturer primarily for failure to hold the dichroics within a reasonable tolerance and frequently sloppy optical alignment. He has to buy a color masker to try to compensate for tube characteristic variations, filter variations and film type variations. If he's an engineer, he can't see why standards on end densities and color balance aren't established so taking characteristics can be specified.
- The telecine equipment manufacturer says

*BM/E talked to one film lab whose product has been rejected by CBC as having "too much green." The lab did another print which was acceptable but later had a New York network screen the rejected film. The network man said it was of acceptable quality and the green could be compensated for. The lab's implication was that a standard telecine operating procedure is more limiting than free knob twisting.

don't pick on us—everybody else is in the act too and not enough in known about what goes wrong. He's mum on what can be done about improving the optics.

- The film processing lab blames his shlock competition (no quality standards), the distributors and agencies for buying so cheap, and lack of common practice on part of producers. Poor exposures on the part of camermen are pinpointed as a problem. Some producers favor a "yellow" print, others something else. The networks' producers should get together, they say. The lab man doesn't see tight standards as a solution. There are too many variables that go into making up a pleasing picture and "standard" values as read by instruments will not assure a pleasing picture. Education of buyers is desirable since "tastes" vary too much.
- The film manufacturer thinks end densities and color balance could be standardized but that all concerned will have to participate actively in supplying samples so that values and tolerances that produce satisfactory pictures can be pinpointed.
- The producer and lighting director say their contribution is an art and that the esthetic quality sought for cannot be programmed by engineers and instruments. A bad botch is blamed on the lab. Some producers are not satisfied with the colors represented on SMPTE color reference series 3.
- The agency and client say to the industry, "You're the experts. You come up with some solutions."

Are Standards Possible?

After listening to the eloquent plea for standards by Ross and Harrop at Detroit and what appeared to be a throwing up of one's hands on the part of some panelists, *BM/E* decided to dig further into the solutions proposed.

Harrop made several specific recommendations which *BM/E* reported in April. They were:

- End densities and transfer characteristics must be specified.
- Taking characteristics must be specified and may have to be shaped by matrixing units for different film stock.
- Dichroics and tolerances must be specified. Once again variations may be correctable with a matrixing unit.
- Viewing conditions should be specified and, if possible, a relationship established between the film projected image and the electronic image.
- Unless an A-B judgment can be made once the screen and electronic images are related, a panel will have to be used to select optimum reproduction.

Ross pointed out that he could not secure film material that would give hue and saturation signals that could be lined up in a Vectorscope. *BM/E* asked Eastman Kodak whether film dyes and processing can be controlled sufficiently so that the hue can be put in a Vectorscope box. Daan Zwick of Eastman Kodak replied:

SMPTE Steps to Better TV Color Film

It's a tradition at SMPTE conventions to show short films of the industries' best effort each morning and afternoon prior to the commencement of technical sessions. On Monday evening May 6, SMPTE showed some of the industry's worst efforts. Reels of TV commercials and clips from network color programs were showed to the discomfort of the color committee. This indictment against the industry, coupled with the realization that Europeans are forging ahead to overcome the difficulties witnessed, got the ball rolling. Between the color committee and the TV committee, these steps were taken:

Color balance: To reduce the variability in colors now appearing in commercials, guidelines to better color balance are to be drafted. Advertisers and their agencies are to be advised to match the SMPTE Color Reference film examples more closely. Unsettled: Should the reference film be simplified for easier use?

Room standards: Following the lead of the EBU, the standard illuminant for TV use should be 5400 K ±400 K. Such standardization will help agencies evaluate their color product that will appear on TV. Unsettled: What should viewing room standards be?

Densities: Daan Zwick is to get cooperation of sources in getting several hundred sample films. Density measurements of these films, added to that obtained from 84 commercials tested so far, will be evaluated and recommended end densities necessary for pleasing films drafted for future consideration.

Test Slide: A subcommittee is to determine the feasibility of a standard slide containing the six basic colors to be available to broadcasters. Samples with dyes and densities that will fit Vectorscope boxes have been produced by Eastman Kodak. How such slides that will not shift in characteristics with time and use might be made and disseminated will be explored by the subcommittee TV 14.12.

Transfer characteristics: TV Committee Chairman Dick Putnam will take under advisement whether SMPTE should strive for a recommended practice (if not a standard) on transfer characteristics for films and equipment.

Other action: A heavy emphasis on educating the industry on how to use SMPTE references and materials will be undertaken. How to use the universal leader will be explained to lab processors, theater projectionists and TV operators. Unsettled: Should leader be all black? An operational gray scale alignment pattern (no. 12) will be finalized by June 19. An operation alignment resolution chart in 35mm and 16mm film 2 × 2 slide and in 8 × 10 opaque form will be available as soon as a company can be lined up to produce the art work. Concurrence was expressed that SMPTE should take the lead in getting others concerned about improving the total color system. How to do this? Undecided.

"These are really two separate questions: Can film dyes be 'put' in Vectorscope boxes? and Can film process and systems be controlled sufficiently for television requirements?" Ross noted that "film dyes, any film dyes in current use, independent of any control or variability problem, cannot generate the proper signal to match the television counterparts of these signals. This is due to the characteristic of photographic dyes which have 'unwanted' absorptions and which achieve high saturation at low brightness, unlike the television colors which achieve high saturation at high brightness.

"This incompatibility can be overcome," as Ross stated, "by use of masking circuits. This is being done in Europe, and is expected to become standard practice in the U.S. (*Ed Note*: CBS Labs has built such equipment and currently has a small production run scheduled.) I believe that the knob twisting for these masking circuits must be done at the factory and then the knobs should be thrown away. This may require some standardization of dye systems, or at least, determination of optimum masking for the most common dye sytems. There is a strong possibility of misuse of these controls by individual broadcasters, if knob twisting is left as an option."

BM/E also asked whether film processors and systems be controlled sufficiently for TV requirements? Zwick answered "Yes," but then commented on the how and who.

Zwick feels the SMPTE can recommend practices and standards but points out that our free enterprise system, which promotes invention and new application of technology, also tends to shun standardization and conformity. The route has to be voluntary self-regulation of standardization. In Zwick's view, the problem reduces itself to the question, "How can the film and television industries be convinced that it is in their own self-interest to adopt standard procedures and recommended practices?"

Zwick has reported to SMPTE meetings that density values for color are possible and has indicated what such values might be. But he did not get follow up support from industry in supplying film examples from which he might finally determine such values and the effect of standardization on them. Zwick got practically no response from that appeal. His conclusion is that

Who Sparks SMPTE?

To understand why TV standards lag one must appreciate that SMPTE was in the motion picture business long before the advent of color TV. It's not hard for broadcasters to nettle the old-timers and some resistance to new pressure is natural. Further, there are so many different professions and industries involved it's hard to apply a systems concept to solutions—even though it's definitely a systems problem.

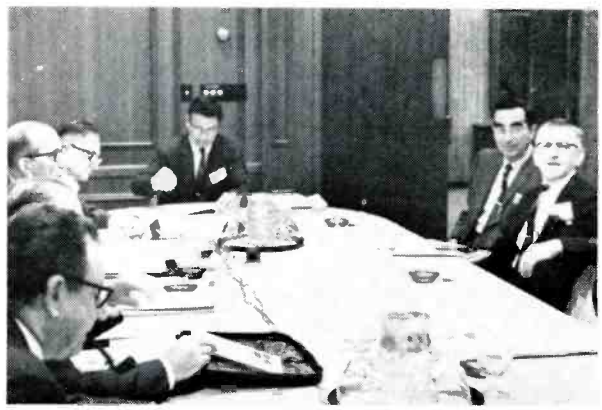
At the last committee go-'round — Color Committee meeting (chaired by Frank Brackett, Technicolor) and TC Committee (chaired by Dick Putnam, GE)—the networks were aggressive.

Most insistent advocate for action on wide front was Joe Flaherty of CBS-network. His assistant Blair Benson and head of TV subcommittee 14.12 was outspoken and agreed to undertake more work. Ed Bertero of NBC as unofficial liaison with Bill Kistler of the Association of National Advertisers led in criticism of filmed commercials.

Pressures of working with advertisers and agencies were well described by John Kowalak of Movielab, Fred Scoby of Deluxe and E. H. Reichard, Consolidated Film.

Volunteering to do whatever is possible to improve the situation were Daan Zwick, and John Waner of Eastman Kodak. Perceptiveness to the problems and perspective in how to deal with them were displayed by Alex Alden of SMPTE staff and long timer William Wintringham of Bell Labs. Wintringham hopes to serve as liaison with other interested committees: American Cinematographers Association, IEEE, EIA, NAB.

Move a-headers were Lloyd Harrop and Rodger Ross. They're establishing standards for Canada.



Standards are discussed: L to R. Bertero, NBC; Kozanowski, RCA; Wintringham, Bell Labs; Alden, SMPTE, Putnam, GE (chairman); Zwick, Eastman Kodak; Harrop, CBC—all members of TV Committee of SMPTE.

Blair Benson, CBS Network, center, reads from subcommittee report. He is flanked on left by Ed Ancona, NBC and T. G. Veal, Eastman Kodak. On right is Joe Flaherty, CBS Network.

"it takes more than a demonstration of technical feasibility to arrive at standards or recommended practices."

He added: "Discussions are occurring but they are not supplemented by enough action to arrive at the needed solutions."

A problem in TV film production is that the industry is not prepared to invest the time and money (such as control and retest) that the motion picture industry did to achieve consistent results. Zwick made this economic point and it was understood by everyone with whom *BM/E* talked. This, Zwick says, results in the variability which is now plaguing the industry. One answer, according to the film expert, is "to develop new control techniques which can be used in the face of current restrictions. This will require new effort on the part of either the laboratories or the film manufacturers, or both."

Zwick agrees with Harrop that standardization of end densities and standardization of viewing conditions could lead to a rational basis for the passing or rejecting of film by networks or stations.

The economic impact of rejection could lead to upgrading practices all the way back to the original photographing, Zwick said.

Specification of transfer characteristics of films (negatives, positives, print stock) and telecine equipment needs the cooperation of film and equipment manufacturers. It will also require, Zwick opined, a lead from manufacturers in establishing set up and measurement procedures.

BM/E contacted both RCA and GE as telecine manufacturers, but both companies declined to make any specific comment on the next step. Dick Putnam of GE, who is also SMPTE Television chairman, wished to defer until after his next committee meeting. Dr. Henry Kozanowski of RCA also did not wish to comment without more committee deliberation.

Dr. Kozanowski did underscore the large economic consideration at stake. *BM/E* invited other telecine film chain suppliers to comment but no replies were received at press time.

Typical of the frustration of station broadcasters trying to produce good telecine pictures is that expressed by Richard Monroe of KYW-TV, Philadelphia, a Group W station. Monroe would like to have a standard telecine equipment lineup procedure but cannot find a test slide that is satisfactory. SMPTE test slides were not considered adequate, and further they would fade after repeated use. What Monroe now seeks is a standard opaque pattern from which fresh slides can be made with predicability and at low cost. If a good slide were available, Monroe could match his cameras. Chief problem in producing a slide is getting a yellow with enough saturation. Eastman Kodak may have a solution for this. See SMPTE steps box.

Monroe finds films containing commercials, particularly those coming from local agencies, to be beyond control. In this case KYW would invite agencies to a TV preview. This didn't improve the aired color but it did mean the station was held blameless and the invoice would be paid despite any client displeasure.

But generally KYW or any other U.S. broadcaster can't preview commercials nor theatrical prints. If you're on the air only ten hours a day, you might have time to do pre-screening but no

Electography Rather than Photography?

With so many film problems, shouldn't videotape be used more and more for theatrical and commercial prints? 3M, who coined the term "Electography," would say so. Going the whole route by electronics gives a superior color product. And there are advantages of speed.

Reeves Sound Studios report a strong trend to videotape although the prime reason is speed rather than the ability to do calibrated color video correction. If better color were insisted upon, videotape would have an edge. Once a composite video master is made, excellent reproduction duplicates for distribution are possible. Proper color balance is assured because the broadcast station will set up on the commercial's color bars before transmission. The operator can accurately match the playback recorder to these color bars. This reference is not available with film.

Electronic editing allows substitution of material frame by frame. Animation can be added directly on tape. Special effects are possible with electography at costs less expensive than that charged by optical labs. Special effects generators, in addition to performing wipes, fades and lap dissolves, can produce subjects in miniature sets, keyed-in titles, montage inserts and trick shots.

It takes less time to produce commercials with videotape since three steps of screening and approval often are eliminated (1. after answer prints are corrected, 2. after reduction negatives are made, and 3. after release prints are eliminated). If a producer takes A and B rolls to the videotape house, he can shorten the time needed for optical work since editing and final product approval can be decided upon at one sitting.

Although the cost of color duplicates of videotape is higher than film—$15.50 compared to about $9.00 for one film reel and its backup (on the basis 18 or more duplicates one minute long), the total cost of the commercial is less. This is true, Reeves says, if the film labs' optical negative is eliminated and videotape masters are made from A & B film rolls instead. If TV cameras are used from the outset, costs are less again.

A recent move on the part of processing labs and of distributors to get film prices lower is to not furnish separate backup reels for each spot—a backup is available but as a spot in some other piggyback sequence. Film people have a price edge on making up piggyback reels since film splicers are paid much less than video technicians.

U.S. broadcaster has that leeway.

None of the major networks is previewing commercials according to Ed Bertero of NBC.

There's no time for this, Bertero says, and besides it's a seller's market. If agencies want network help in coming up with better color they have to pay for it—NBC's screening rooms are available at $100 per session.

The noncommercial stations do not give in to expediency quite so rapidly if the practice of WGBH, Boston, Mass., is typical. The noncommercial station will pre-screen material. Tom Keller, chief engineer of WGBH, reports he will not accept poor color film for on-the-air showing. And although noncommercial stations aren't showing as much color, their overall color look is not determined by widely-varying commercials—they don't have any. If a color film is passable it will be played into the videotape recorder and then improved by painting with VTR controls. In fact, Keller says he tries to avoid direct telecine. Some of NET's films are being transferred to tape prepared by bicycling.

Because WGBH will pre-screen Keller is studying seriously the BBC approach of automatic color correction by computer control. Computers can quickly make a color analysis and feed into a matrixing circuit desirable remedies.

Better Color in Europe?

Although late starters in color TV, the Europeans expect to surpass the U.S. quickly. They start with the conviction that PAL and SECAM are more reliable systems, and since the home receiver doesn't have separate hue and saturation controls in the first place, the station should put out a more perfect signal. To facilitate the exchange of programs, standards throughout European Broadcasting Union are necessary. Thus EBU will standardize end densities, color balance and illuminants. See box. Definite transfer characteristics between film and telecine equipment should be possible. (Germany, for example, now has specified transfer characteristics for black and white film.)

The big move to color in Europe and their high standards may directly and indirectly improve the quality of theatrical film in the U.S. Some big deals on film exchange have been made between U.S. syndicators and European networks. The German TV industry, however, is horrified by the quality variations in film being processed in the U.S. and is pressuring U.S. film labs to do something about it.

Stateside Leadership From Canada

The Canadian Broadcast Corporation as a government controlled operation is not pressed as hard economically as private U.S. stations think they are, hence they fuss over quality more. And they are impressed with the high standards being set in Europe.

The CBC did establish in 1967 a standard Color Television Operating Procedure, Instruction No. 4.2.5-4 as part of their Engineering and Standards Policies.

The intent of the setup procedure is to avoid use of painting techniques except when necessary to correct for errors in film dyes.

The CBC previews a film, preferably on a telecine chain. When a chain is not available direct projection previewing is done and color balance and color brightness compared with SMPTE color test film (series [2 or 3]).

Differences in color balance are corrected with Wratten color filters and/or color trim controls. This information is passed to telecine for use during broadcast. Telecine operators therefore, can add specified filters or adjust color trim controls.

The standard setup procedure includes use of a standard register slide and the use of a standard ABC gray scale test film.

Gray scale tracking is assured on the W channel by fine adjustment of RGB target, blank, and shading controls.

A picture check is made by projecting SMPTE Color Reference film for color balance. No controls other than fine adjustment of master pedestal and gain can be operated on the check. After the setting up procedure, the material to be screened is played and color trim contrast and to achieve desired color balance.

The CBC is now writing a standard for viewing rooms. ●

Howard Chinn on Color

"It pains me considerably when viewing a broadcast to see the wide variations in hue and saturation that often occur between different sources of television program material and, on occasion, even between elements of a given program. Unfortunately, although the broadcaster is by no means wholly responsible for this problem, we are being given full credit for its existence by other elements in the industry . . . I recommend that we get our plants in shape to meet existing standards and that we tighten operations to insure competent operation of the equipment at all times. Beyond that, it is essential that suppliers of film and tape program material be prevailed upon to provide acceptable products. . . . But the sooner every broadcasting station can say that it is living up to existing standards, the sooner other elements of the industry will have to assume their just burden . . ."

Remarks made by the CBS director of General Engineering upon receiving the 1968 NAB Engineering Achievement Award.

Next Session Sept. 21

Through Ross's pushing, the Rochester section of SMPTE is planning a full day's session on variability of 16 mm color film. Place is Dryden Theatre in Rochester. General Chairman is Ray de Moulin, Photographers Technology Div., Bldg 69, Kodak Park, Rochester, N.Y.

Credits: BM/E is indebted to many of the individuals mentioned in report who provided background for this report.

If you like Audiopaks our lubricated Audiotape will really be your cup of tea.

Broadcast engineers all over the country like our Audiopak® cartridges so much, we've been using their comments in our advertising. And, we've been giving each one an inscribed cup as a token of our appreciation.

Now, with our Audiotape Formula 17 Lubricated tape designed especially for continuous loop cartridges, their cup will really runneth over.

Here's why:

It provides excellent high end response and signal-to-noise ratio. The long wear, high temperature binder won't soften or gum up heads.

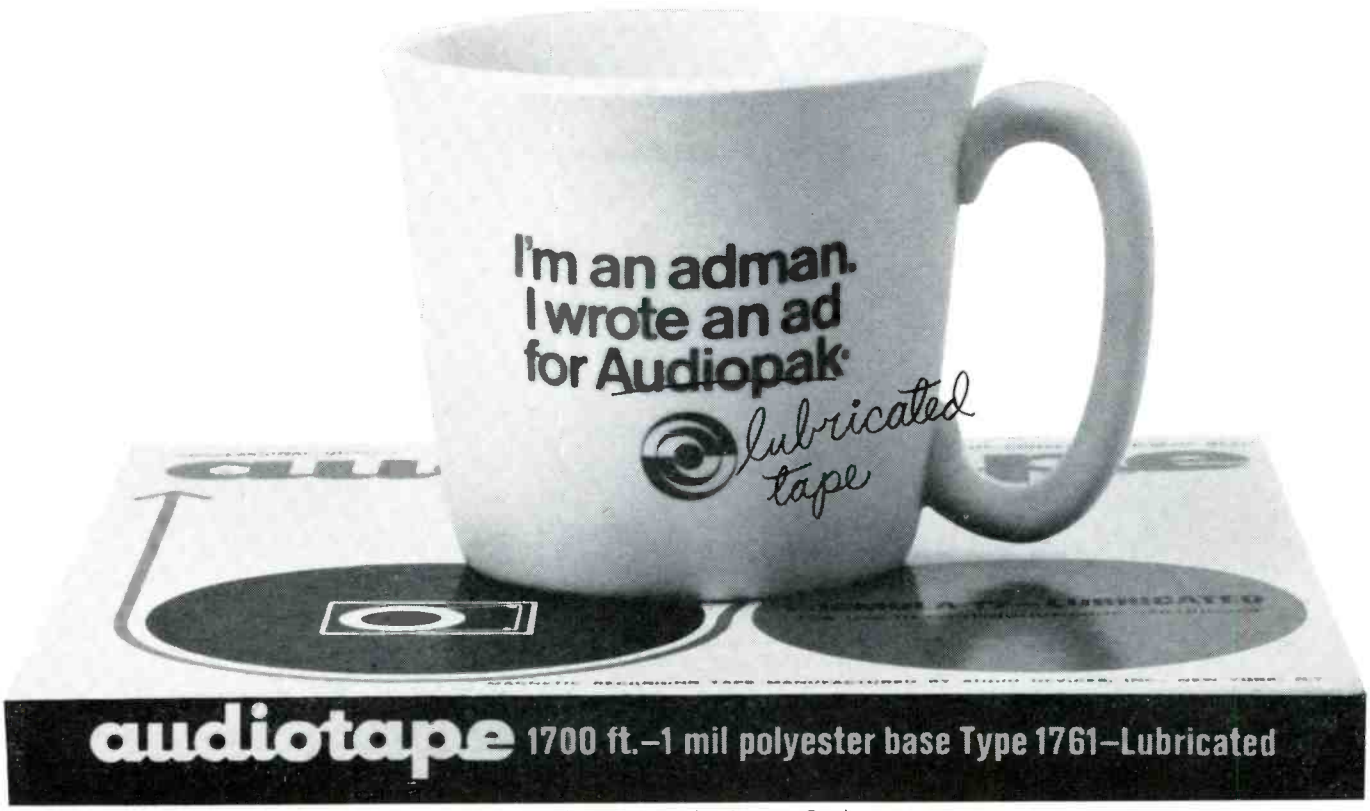
The lubricated coating is permanently bonded to the base. Can't wear off and cause jamming; won't dirty heads and capstans.

Very low abrasion properties reduce head wear and premature failure, assures smooth tape motion with negligible wow and flutter.

Audio is the only cartridge manufacturer who also makes tape. (We are the largest supplier in the world.) So, you can be sure our cartridges and our tape match each other perfectly. But regardless of cartridge make, Formula 17 is the best tape you can use.

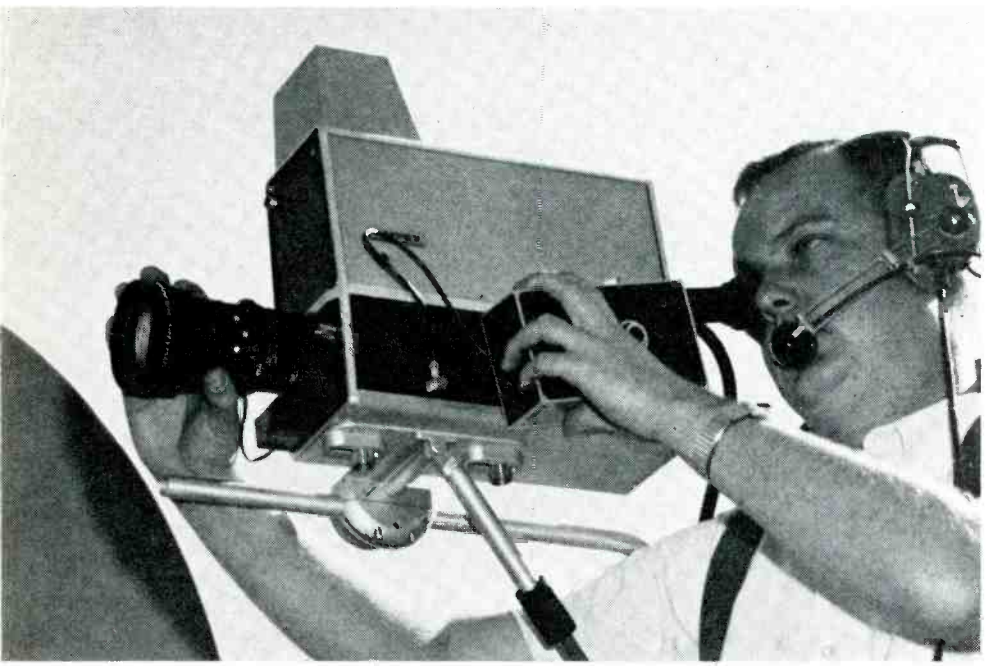
Why not find out about Audiotape Formula 17 for yourself.

Audio Devices, Inc.
A SUBSIDIARY OF CAPITOL INDUSTRIES, INC.
235 E. 42nd St., New York 10017

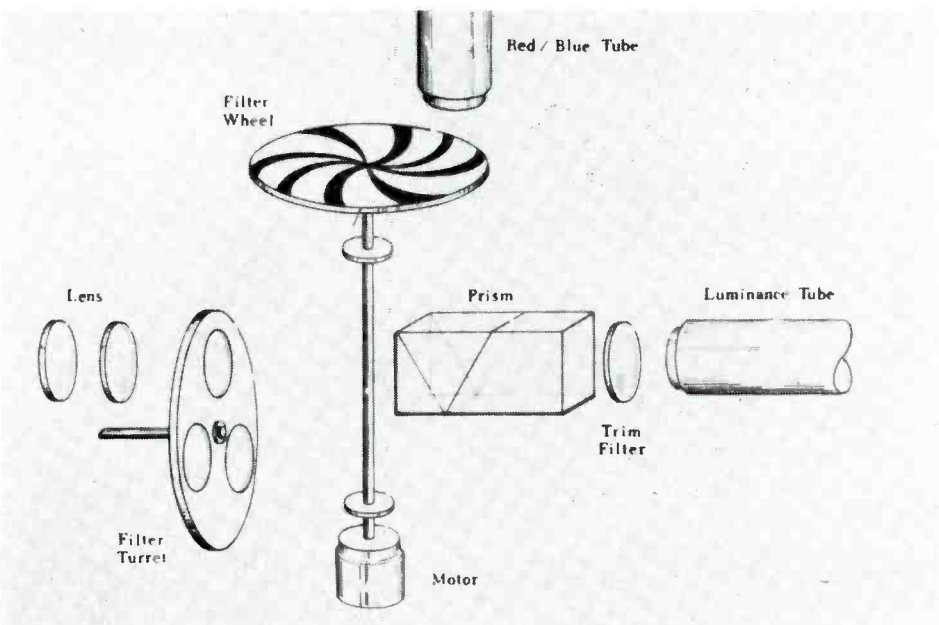


Circle 18 on Reader Service Card

The Ampex Portable: Two-Plumbicon Color Spells Lots of Gadgetry

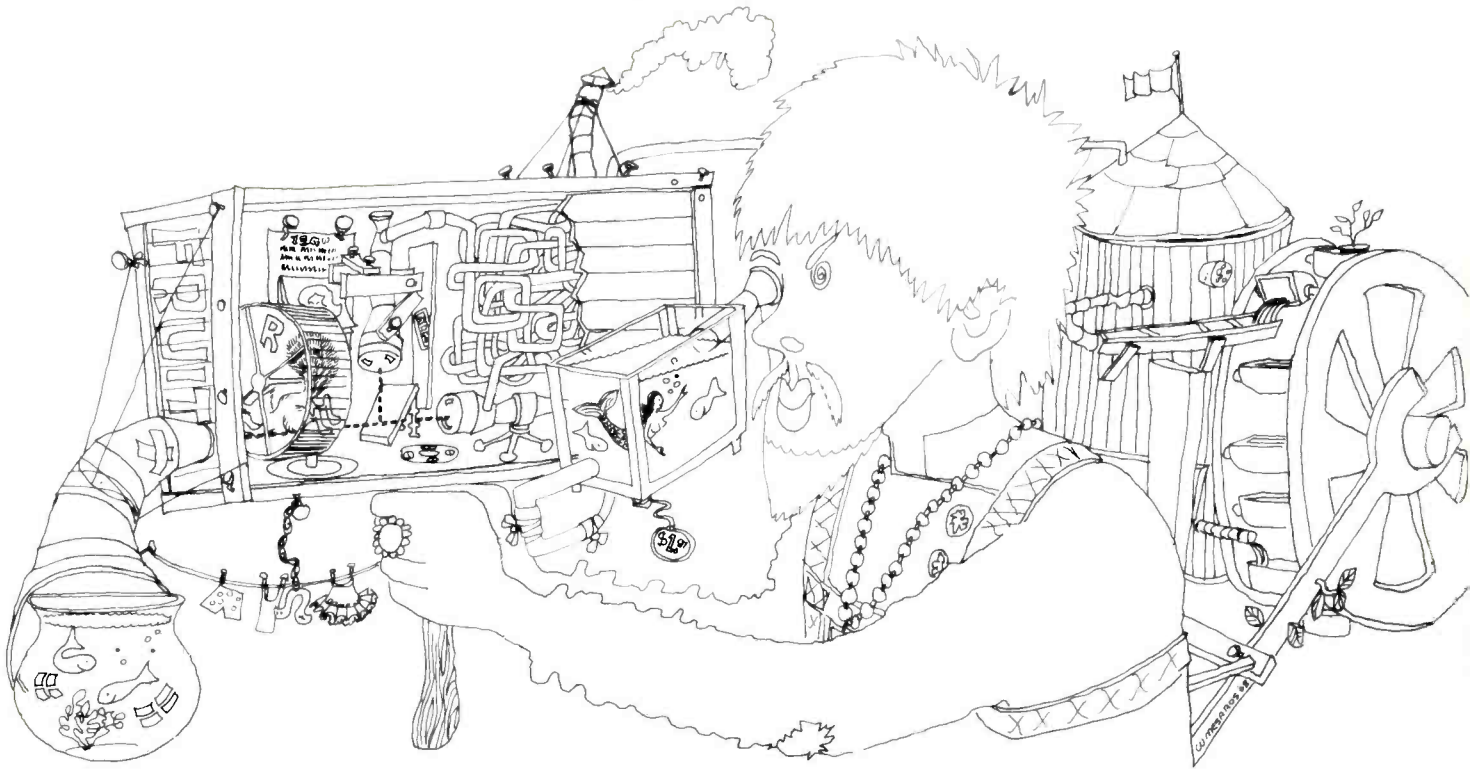


It's sleek and simple on the outside, but under that gray metal cover, Ampex's two-Plumbicon color camera is about as complicated a beastie as has come down the TV pike in quite a while. It ought to keep the service techs out of mischief.



(Above, left) Cameraman easily handles BC-100 camera, sees crisp green picture on one-inch screen in adjustable electronic viewfinder.

(Left) Optical system of the two-Plumbicon camera relies on two-color (red and blue) filter wheel in light path to red/blue Plumbicon tube. Wheel is locked to vertical sync for stability.



IT APPEARED SEEMINGLY FROM NOWHERE—that innocuous, hand-held portable camera at a college football game. People didn't much notice it until they realized that it was putting out a full color program, and this was the wonder of it all because of its small size. But Ampex wasn't saying much about the camera at the time; the ABC cameraman was tight-lipped, and the football-game camera was barely removed from being an engineering prototype.

Then came the Winter Olympics, and the portable color camera was out there on the slopes at Grenoble, taking that miserably cold weather right in the teeth, along with a bunch of shivering and dedicated technicians. A short time after the trials at Grenoble, *BM/E*'s editors learned something startling about the BC-100 camera—it uses only *two* imaging tubes, and its non-NTSC signal is reconverted by base station equipment.

Re-enter the Color Wheel

More details finally came out at the NAB Convention, where Ampex design engineer John Poole delivered a paper on the innermost workings of the BC-100, and its studio-size counterpart BC-200—both two-Plumbicon cameras. The color imaging uses a combination electro-mechanical and electronic matrixing system that's very reminiscent of the Glodmark/CBS color wheel. The color wheel involved separates the red and blue fields going to the straight-line Plumbicon tube. The wheel is locked to the vertical sync, and the resulting signal is Red-Blue in field-sequential form. The other Plumbicon provides the luminance signal, which after processing, also yields the green signal. According to Poole, this arrangement provides all the necessary information for a color picture if the missing red and blue fields can be reinserted.

Reinserting these missing fields involves a delay of 262 lines (½-frame) and the way that this is done seems to add to the system's nightmarish electromechanical complexity. The delay is obtained via the simple (!) expedient of a videodisc recorder. This disc unit delays the chrominance signals for one field, while an electronic field switch provides simultaneous red and blue outputs from the camera's field sequential signals.

The base station equipment needed to convert the camera's "nonstandard" color into NTSC, includes not only the videodisc gear, but a rack of demultiplexing, processing and matrixing circuits; plus matrixing circuits for iris, talkback and cue. The base station also includes a picture and waveform monitor at the operating position, a color sync generator, NTSC encoder and a vertical aperture equalizer.

All this for one portable camera? Yes indeed; after all, the operational feasibility of a two-tube color camera had to be field-tested, and Ampex engineers are busily working on improving the design and trying to eliminate the electromechanical members of the very circuitous color camera chain.

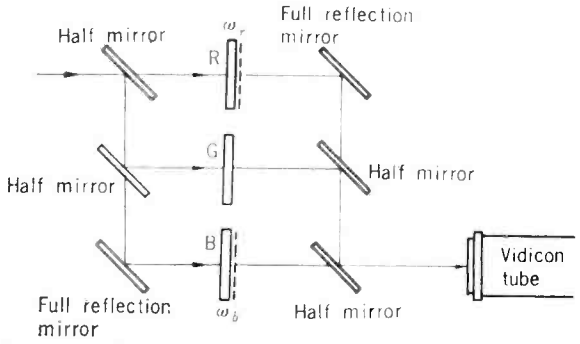
The Basic System

This is Poole's basic description of the system:

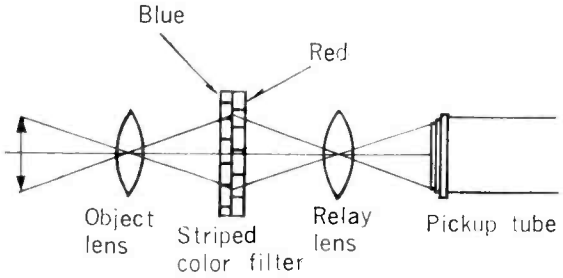
"Two Plumbicons are used in a simple optical system which splits the visible spectrum into luminance for one of the tubes and Red-Blue in field sequence for the other, using a two-color filter wheel revolving locked to vertical sync. This arrangement provides all the necessary information for a color picture if the missing fields of red and blue can be reinserted.

"In the camera to be described, the missing

Next in Line: One Imaging Tube



Oversimplified diagram of optical filtering system in one-vidicon camera.



Actual filtering is done by sandwich of specially prepared thin filter stripes.

Last time we saw a one-pickup tube color camera it had a color wheel spinning in front of it; what's worse, the same kind of wheel had to spin in front of the TV screen. So we're understandably a little curious about this new system from Nippon Columbia, in the light of details on the Ampex portable color camera.

But there's nothing electromechanical in this ingenious camera; it relies instead on a grid of finely manufactured color filter stripes to separate the color primaries for its single vidicon tube.

Of the three primary optical channels, the R and B are the only ones with filtering. The G (or Y) channel provides luminance as well as the green signal. The arrangement of the filter stripes is crucial. Simply overlapping filters would result in black, because of their additive optical characteristics.

By setting up a modified filter response system with overlapping primaries, it's possible to extract properly modulated color information. In overlapping R and G, G and B pass through entirely, while the R component modulates the carrier. The final striping arrangement alternates stripes that pass R + G + B with stripes that pass G + B. The same arrangement is made in overlapping the G and B channels. The final filter sandwich is placed in the camera's single optical path.

The output is nonstandard, and has to be converted to NTSC color. This is done through a matrixing and filtering system that's small enough to be carried in an operator's backpack.

According to Nippon Columbia officials, engineering prototypes of this camera have been undergoing in-use field testing at NHK (Japan's TV network) since December '66. While user and viewer results aren't available, the manufacturer did indicate that full production is expected soon.

fields are replaced by using a 262-line delay in conjunction with field frequency switching. Since the delay line output has red and blue fields in reverse sequence to its input, the field switch outputs can be two fully simultaneous outputs of red and blue respectively. Each color field is thus used twice; once as the original signal and once as a delayed signal, displaced in vertical position by one line.

"The three color signals are then fed into a matrix, in which green is obtained by subtracting appropriate proportions of blue and red from the luminance signal.

"Good color pictures can be made without the 262-line delay, but there is 30-cycle flicker on saturated blues and reds caused by the missing color fields. The main function of the delay line is to remove this flicker. (We sometimes refer to it as the 'Flicker Licker.')"

The camera control unit is carried in the back-pack, which connects with the camera head through a short 30-conductor cable. Vertical deflection, filter wheel motor drive, and iris drive are parts of this unit, which also contains video processors for the two channels, battery voltage regulators, and the multiplexing circuits needed for transmitting the camera outputs over a microwave transmitter or on a single coaxial cable.

The backpack also contains a full EIA sync generator with provision for locking it to the base station color sync generator through a narrow bandwidth command link. There is also demultiplexing for the command line which carries iris and cue lamp control and intercom, under the base station operator's control.

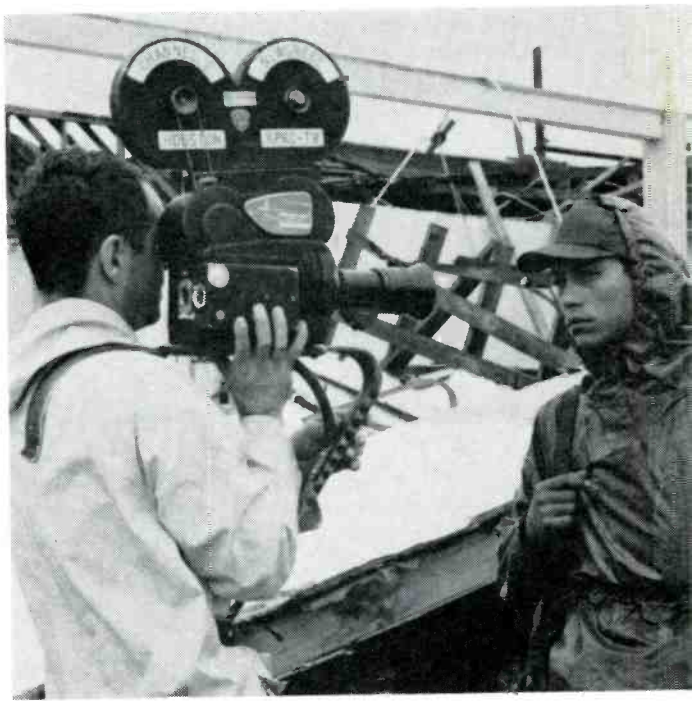
Electronic Viewfinder

The BC-100, and its studio counterpart, both sport a honey of a new miniature viewfinder. The operator can adjust the finder for best eye position, and look at a green-phosphor one-inch crt screen. The tube is a high-resolution type originally designed for Air Force TV reconnaissance. The viewed picture is sharply focused, processed and correctly blanked.

A microwave option with battery pack, ups the backpack weight somewhat, but those long-suffering ABC cameramen don't mind—it's all worth it just to get that scenic ride swinging from the belly of a helicopter over Chamrousse! ●

KPRC Parlays Color Newsfilms into Boosted Revenue

Fast-operating automatic color film processor plus heads-up station promotion have been key factors in making Houston extra color-conscious while KPRC strengthens its position as the area's most imaginative color station.



During disastrous hurricane Beulah, KPRC-TV's newsmen were on the scene shooting color film footage. Here, newsman Jack Long interviews a National Guardsman in Brownsville.

APRIL, 1966 WAS THE START OF A NEW ADVENTURE for Houston's KPRC-TV—the date when their programming went color full-time. Imaginative public relations and merchandising have paid off handsomely as KPRC's color facilities quickly became generally known and available for a variety of promotional and other nonbroadcast functions.

The complement of studio equipment includes five GE color cameras, two RCA color movie chains, two Ampex and three RCA quad video recorders. The Houston-Fearless color film processor was the first one in a Houston broadcast station.

The basic philosophy behind the change was voiced by station President Jack Harris who said, "Television has a responsibility to its advertisers and viewers to help improve the quality of commercials, especially those produced locally." This is one of the main reasons KPRC-TV has plunged into the film production business, and installed their own color film processor using Kodak ME-4 chemicals. The other reason is to improve the overall quality of the station's news programming and special documentary work.

To get the most mileage from its investment, KPRC is merchandising color to its customers—both viewers and advertisers—in a variety of ways, including filming of a 2½-minute station color "commercial" to be circulated among local ad agencies.

Selling the Seller

Promotional activities for viewer introduction to local color used some of the standard methods for getting area coverage, including: newspaper advertising; an on-the-air countdown to "C Day;" promotional announcements on KPRC-TV; use of a station personality show to explain color.

Several local talk shows were devoted to discussing color, and some of the problems involved in producing good color for the viewing audience. One of the "problems" was the purchase of the wrong color shirts for on-the-air staff. For the advertisers and ad agency people, color merchandising went further and was more technical.

A special presentation was made to advertisers and agencies at the studios, including a demonstration of KPRC's color capability. As guests were ushered into the main studio on the appointed day, two news cameramen mingled with the crowd and exposed about 200 feet of Kodak Ektachrome

EF film. While everyone picked up refreshments and talked shop, the film was rushed to the station's film laboratory to be fed into the Houston-Fearless Colorlab Master, daylight loading, color film processor. The processor turned out the film in just over 30 minutes. By the time President Jack Harris was ready to greet the group formally, the color film had been threaded into a 16mm projector, ready for screening.

"Everyone was very much impressed," states Promotion Manager Kirt Harriss. "It was interesting to watch the reactions of those people who had experience with film and commercial processing. We had told most of them that we had the equipment and ability to produce our own color, but telling them and showing them are two different things."

Even though the majority of the guests did not know why the film was being exposed, one guest, from the advertising department of Continental Oil Company, found out what was happening. He was frankly skeptical when told that the film would be ready in something like 30 minutes, and held a stop watch on the processor. His reaction, like most others at the gathering, was one of pleased amazement.

Equipment Displayed and Explained

Added attractions to the day's happenings were the unveiling of the new color studio cameras, a tour of the film lab, and a technical demonstration of the reaction of various colors on television. The demonstration was staged in the station's small studio where a variety of color sets had been set up. Models, many in swim suits, changed costumes several times to illustrate the best and the worst color combinations.

"To date the two most successful merchandising ideas we have used," says Harriss, "have been the studio introduction in September, 1966, and our two and one-half minute promotional film. These two things, as well as all our other efforts in the agency field, have been aimed, not only to increase station business, but to upgrade the quality of material produced and programmed locally." The promotional film is an excellent "idea starter" for local agencies.

Included in the film are scenes showing studio sets, commercial locations, and the wide assortment of scenic possibilities in and around the Houston area. The whole thing is tied together with a narrative-type sound track that admonishes the viewer to do something a little different, and let KPRC help.

The station's film capabilities have also opened the door for more color specials, and made possible 100 percent color news film coverage. One news special was filmed in Vietnam. News Director Ray Miller pointed out the Ektachrome EF film's stability. "Our crew spent 30 days in murderous heat," said Miller, "and the effect on the film, if any, was really not noticeable."

Pocket Camera Makes Every TV Newsman a Photog

A full time color TV station usually can't have a platoon of movie cameramen out covering the local news at all points of the compass—it just isn't economically feasible. But reporters are out where the news happens, and all too often they see news photo possibilities that they have to pass up because of the lack of a cameraman.

As an adjunct to its full-color movie news coverage, Bristol, Virginia's WCYB-TV recently added an intriguing extra feature to its spot news coverage—color slides for its news programs. Since the station is equipped for 16mm color movie processing, 35mm stills were out of the question. So WCYB has equipped each of its non-photographic reporters with a Rollei 16 camera —a camera small enough to slip into the pocket and automatic enough to be "goof-proof" in most picture-taking situations. This way, newsmen carry a still camera with them all the time, capturing spot news photos that would otherwise be impossible.

The film used in the Rollei 16 is the same as used by the station for its 16mm movie cameras —Anscochrome D/64, handloaded into the special Rollei cassettes. For processing, the film is stripped from the cassette and spliced onto the end of movie footage that's going into the processor. Handled this way, the stills can be produced at minimal cost, even including the price of glass slide bindings and mounts.

A single Rollei cassette holds film for 18 exposures—measuring 12 × 17mm. The film is horizontal in format and comes out of the processor as a continuous strip. A given selected frame is cut out of the strip and taped into a standard 12 × 17 opening and bound into a 35mm (2 × 2) glass slide mount. To fill out the "vacant" area of the 35mm mount, the mask contains an appropriate message: "WCYB News, Bristol, Va."

Houston Light and Power Company is sponsoring a series of eight to ten specials during the 1967-68 season—one result of KPRC's new in-house color capability. The subjects, including the Vietnam special, will cover a spectrum of material such as stories on the Houston Police Department, downtown Houston—day and night, and a special on Galveston Island. Each is filmed by a KPRC crew.

At the end of the first year's service, April, 1966 to April, 1967, more than a half-million feet of color film were processed by the station. Some 80 percent of this footage was for news coverage.

A station official indicated that agency people and viewers are becoming more critical of color. With full studio color, a color film processor, and the commercial film department, KPRC can produce reasonably priced, quality material in a reasonable time—just what they've been merchandising since April, 1966. •

New Impact Added by Station's Color Format

By Hugh DeMoss

As the only TV station in town with its own color film processor, WLWC has managed to work itself into a prominent position as the community's foremost color broadcaster.

AS THE ONLY STATION in Columbus, Ohio, with all-color evening news, made possible by in-house color film processing at the station, WLWC-TV has added a dimension to responsible television journalism and simultaneously gained a competitive edge. The station is both taking advantage of and reinforcing the mushrooming trend in color television sales.

Each day, local color films are made for the daytime and evening news, weather, and sports. Half-hour documentaries, as well as special promotions and some local commercials, are also filmed in color and processed at the station.

Fire Engines are Red

The impact of color on the 11 P.M. news has been considerable. The familiar fire engine really is red after all. The autumn leaves are another example. In the same vein, the Sports Department was able to present a recap of the world series of golf in color on the very night of the tournament. Background pictures, in particular, are seen by the late night viewers with a new clarity.

So far the other tv stations in Columbus have been using outside color labs, and do not normally make the late evening news and last-minute events in color.

Competition of this kind also means bringing more news to the public. Since the inception of total color photography and in-station processing, WLWC-TV has been averaging 23,000 feet of 16mm motion picture film each month in its local news, weather, commercials, promotion and public service efforts. Two thousand additional feet are used monthly in production of half-hour documentaries.

Prior to the installation of an internal color processing capability in April, our monthly film usage can be attributed primarily to the addition of another staff reporter at about the same time, and more on location, on-camera reports by newsmen.

Hugh DeMoss is news director for WLWC-TV, Columbus, Ohio.

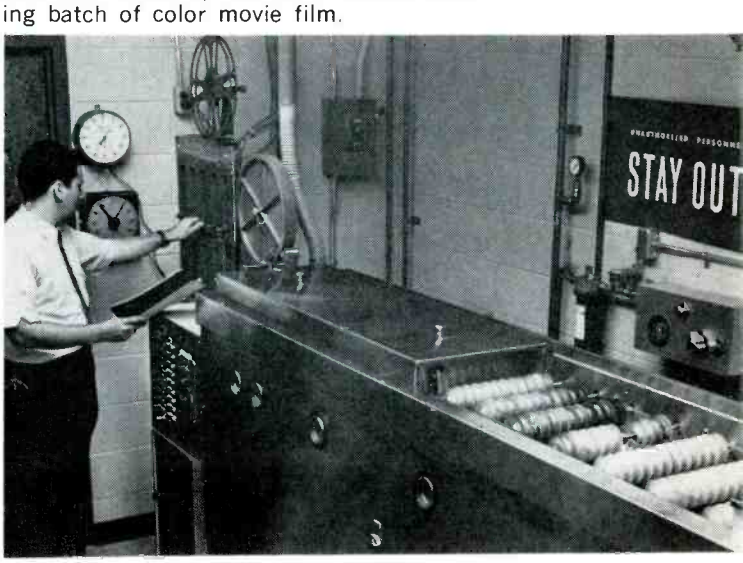
Newsmen Have to Be Versatile

The entire WLWC-TV news staff does its own photography and sound interviewers. Chief Photographer Bob Livingston is the photographic artist of our staff. However, all of our reporters know how to read a light meter, set the *f*-stop, and point the camera. All of the sound films are done on Auricon sound film cameras fitted with a shoulder brace and microphone under the amplifier, an outfit which former Governor DiSalle jokingly referred to as an "Iron Maiden."

The station's Allen Color Film Processor uses Kodak's ME-4 process—involving packaged preweighed chemicals. Processing is so fast and reliable that a local aircraft manufacturer has requested a contract to process their color films of test flights with extra fast service. The station's black-and-white processing equipment was shut down the day following the color installation.

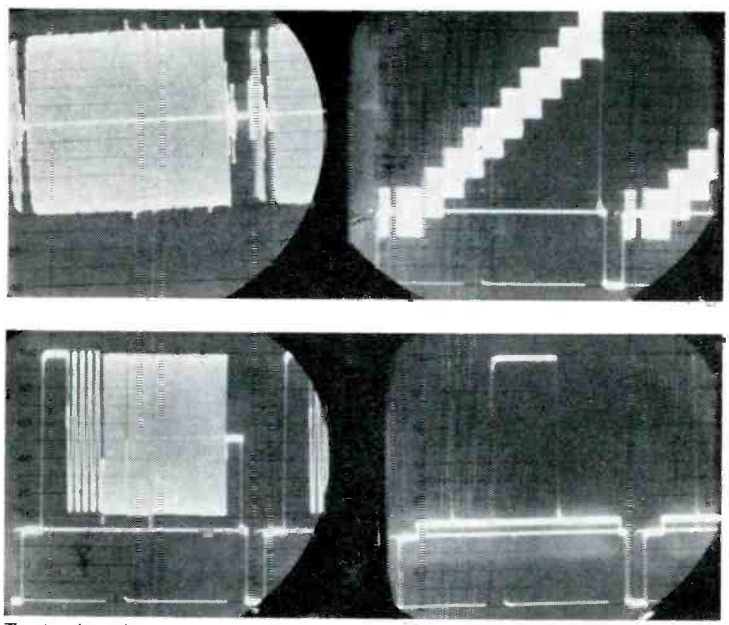
WLWC's new color capability has not affected the way the station looks for and reports news. The change has been dimensional instead, and enables viewers to experience and make judgments with more information. And there's the big plus of being able to do a more effective visual job, improving the station's service to the community. ●

Station's automatic Allen film processor gets final check by technician before starting batch of color movie film.

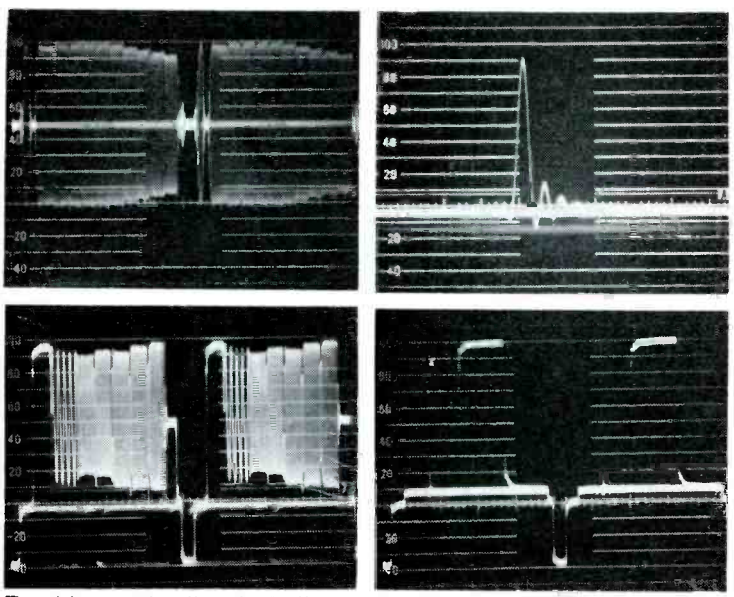


Hidden Test Signals Boost Color Quality

Sixty times a second the networks send out a four-in-one test signal that tells the local affiliate how good his color is.



Test signals sent out during each vertical interval are (top, left) differential gain (top, right) modulated stair-step, (below, left) multiburst and (below, right) sine-squared pulse and sine squared window.



Trouble on the line is indicated by (top, left) degraded multiburst, (top, right) expanded sine-squared pulse showing ringing, (below, left) overpeaked multiburst and (below, right) degraded differential gain.

WARREN PHILLIPS has an unusual job at NBC. When there's trouble on the network's thousands of miles of cable or in an affiliate station's equipment, it's his job to coordinate and direct all efforts for (1) locating the trouble and (2) correcting it in a hurry. Very often an affiliate broadcaster may have trouble without realizing it; or he may know something's wrong, but hasn't the foggiest of what's behind the hue shift he sees on his off-the-air color monitors. Sometimes the culprit is the telephone company's leased lines; sometimes the problem is in the affiliate station's equipment.

Checking up on the actual signal information is getting to be a little easier, with the advent of the vertical interval test signal. This is a set of four test signals sent out by the network during each vertical blanking interval. The home TV viewer may notice these signals as a string of white "diamonds" riding on the crest of the interval blanking bar when the picture rolls vertically.

These test signals have had an interesting genesis. According to Phillips, who is NBC-TV's manager of studio and master control operations, "It had been recognized that we needed some kind of test signal that could be inserted in a normal video transmission path together with the picture. . . . The need for this system was obvious—the only time we were able to test the (network) lines . . . was during downtime . . . (usually) 2 A.M. to 6 A.M."

The vertical interval test signal was arrived at by a joint agreement between AT&T and the three major networks.

As used by NBC, the test signals are inserted into the network in New York. Transmitted over the entire network, any affiliate station or other station using programs from the network feed can check transmission with a line-selector CRO (cathode-ray oscilloscope). By analyzing these four individual signals, it's possible to determine the condition of the complete video circuit at that moment. By using a point-to-point test system, engineers can isolate different sections of the telephone company circuitry. The method is completely identical for the other two networks.

The station's own equipment can also be at fault. When the affiliate looks at this test signal, he can look at it coming directly off the line, with none of his own equipment in the circuit. He can check his own transmitting equipment in a similar point-by-point test. The signal usually comes in from a telephone company clamper, through the station's processing amplifier—which would be one point to test—and then to a distribution system, distribution amplifiers, a switching studio and then out to the transmitter. This signal can be used for step-by-step troubleshooting

if there's a local problem; in fact it's customary practice for a station to use these test pulses right on up through the transmitter.

The display can be observed on any good line-selector oscilloscope—any broadcast monitoring scope that is capable of selecting an individual scan line. Since the test signal occurs at each blanking interval, it is sent out 60 times per second, providing a continually updated signal picture.

Once a week, the network has a half-hour of downtime—from 1 to 1:30 P.M. on Monday for NBC. There are no network shows broadcast at that time, but the network is open and can be used if needed. During that period, the network feeds these same particular test signals—not on a vertical interval basis, but as full-frames—so that the entire signal can actually be seen on the monitor.

Test signals originate at NBC's New York master control, and are displayed on panel scopes.

Lots of Fan Mail

Every week, Phillips receives batches of Polaroid photos from affiliate stations. The Polaroids show waveform pix as they're received off the telephone company line. There's only one reason for sending Phillips these photos—the station's having trouble with its incoming signal from the network. Thumbing through a stack of late-arriving pix, Phillips commented, "Now here's a batch from one of our affiliates; their letter says: 'This week's test doesn't show much improvement. Have you had any success with AT&T in correcting your problem?' " Note the letter says "*your* problem," for this is indeed Phillips' problem on a never-ending basis. It's his job to see that network stations get a clean, usable color signal.

Phillips receives about 50 sets of pictures each week—sometimes repeats from the previous week's mail if the problem hasn't been cleared up. First thing he does is fill out a form for each set of pix, acknowledging their receipt, giving his opinion of what's wrong with the receiving circuits, and outlining the action he plans to take. He keeps these photos on file for about six months, so he has a half-year record of each network affiliate's problems and solutions.

The telephone company provides a "network manager" for each major TV network. When Phillips has a specific set of problems to discuss, he'll call his network manager at AT&T, and set up a meeting. They meet at least twice a week to work out transmission problems, and if the problems are minor, they'll be handled purely as routine matters. If there's a bad problem, they'll get on it right away. This kind of constant troubleshooting calls for constant and close liaison between the network and the telephone company.

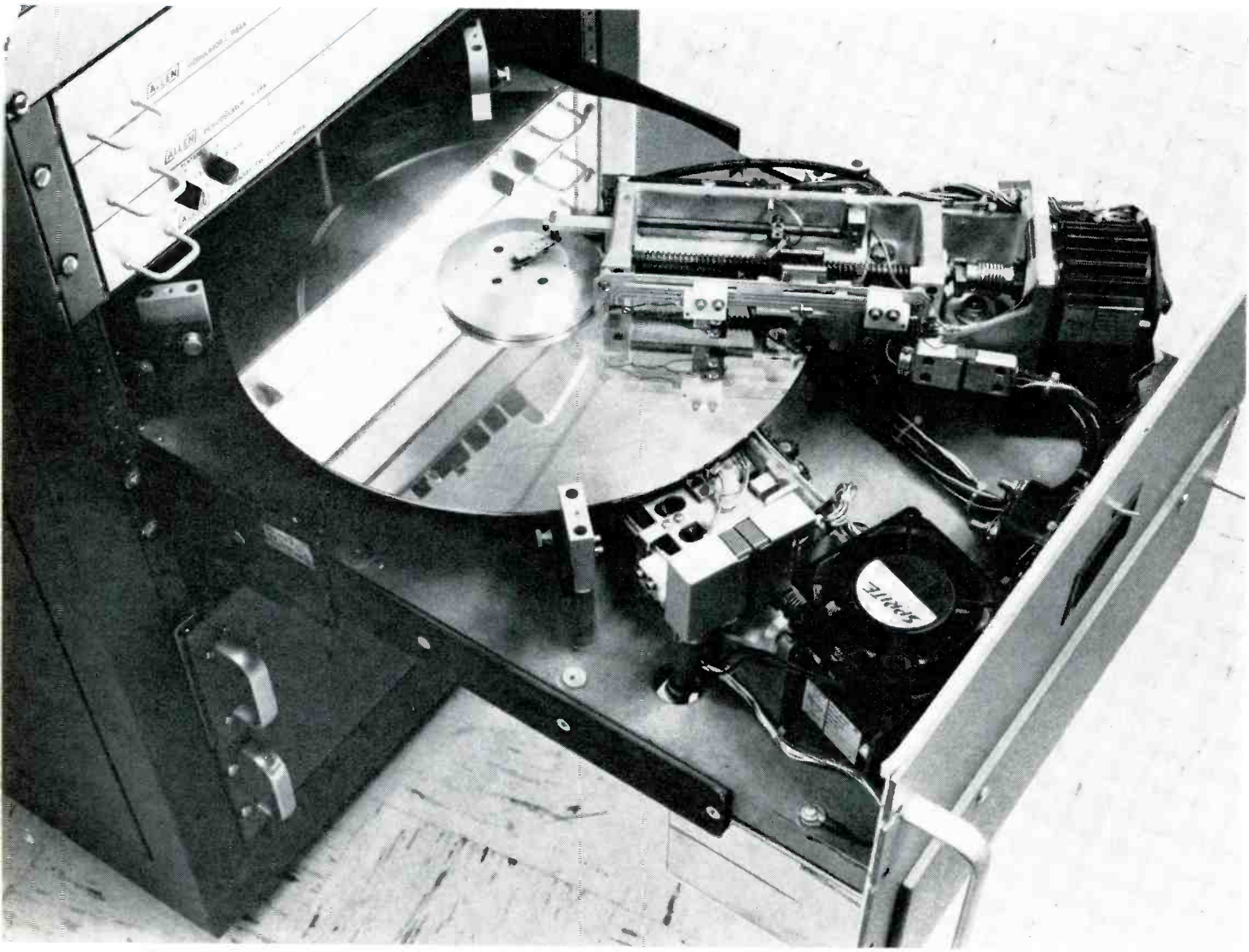
As an example, Phillips indicated that the Spokane, Washington affiliate had telephoned with a problem the day before. "This represents about 5000 miles of video signal by the time it gets from New York to Spokane," Phillips stated. The first step was for the AT&T man to call the local telephone company in Spokane, and they immediately started checking the local loops. These are loops running from the TV station to the AT&T terminal facility which may actually serve several different TV broadcast stations on the same network. Phillips received a phone call a short time later indicating that the telephone people had found trouble on one of the local loops and had replaced it. If the trouble doesn't clear up, Phillips will call his man at AT&T again, and this time the locals in Spokane will start down the line with their oscilloscope, working backwards from the TV station until a good signal is found. This pinpoints the trouble and it can usually be corrected in short order.

Closed-Loop Quick Check

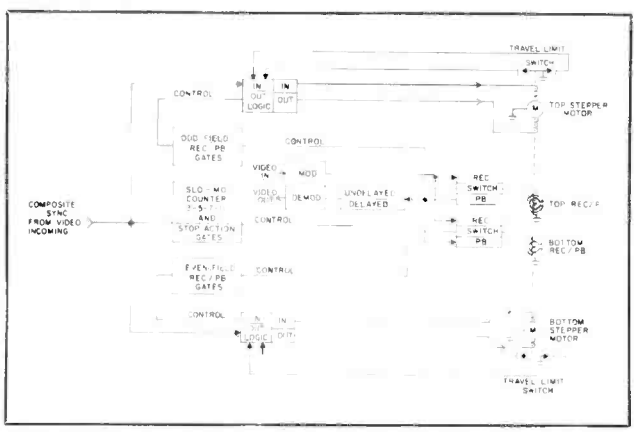
Stepping into NBC's master control room, Phillips pointed out a pair of Tektronix scopes in the equipment rack, both monitoring the vertical interval test signals. "Now by looking at the end of our 3000-mile-long 'round robin' video circuit here," Phillips said as he turned a selector switch, "by punching up this button—this is the same signal we looked at a moment ago—see, here it is leaving and here it is coming back. See the degradation? The loss in level, versus this? This is the window signal and sine-squared pulse leaving; now the rounding off and the little bit of ringing? That's actually about 12 to 15 percent—well within (acceptable) tolerances . . . This is the way we monitor our own round-robin . . . between New York, Chicago, Atlanta, Washington, and (back to) New York."

Yes, we could see the signal degradation he was talking about, but it looked awfully small, and there didn't seem to be much complaining out on the round-robin loop. But degradation there was, and it looked like a good bet that the AT&T network manager would be hearing from Phillips very shortly. ●

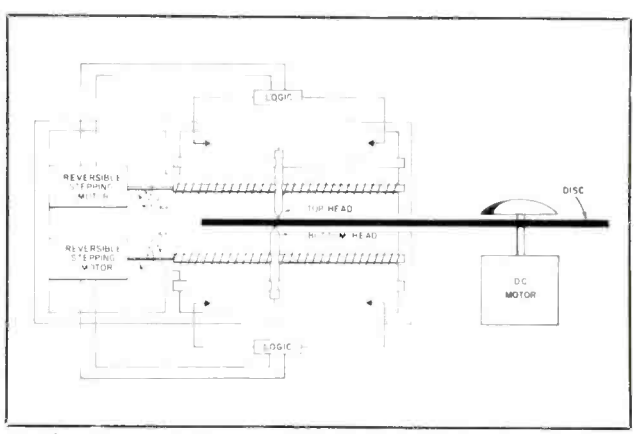
New Video Disc Slows



Top-and-bottom head system records and plays back both sides of the disc simultaneously, and is driven by stepping motors that reverse at the end of their travel.



Simplified signal block diagram of the TV disc recorder shows how logic circuits — controlled by TV field sensing gates — operate the stepping motor drive.



Field number 1 is recorded on the disc's top surface, while field number 2 is recorded directly below it on the disc's underside.

and Stops the Action

By Clarence Boice

The instant playback video disc for slow/stop motion color TV comes of age with this unusual system that anyone can operate.

SINCE THE INTRODUCTION of slow-motion/stop-action video recorders for use in sports events, several different systems have been used for instant replay at normal speed, different rates of slow-motion, stop-action and reverse.

One method tried by the BBC was to modify an existing quadruplex tape machine to provide slow-motion and instant replay. Another approach, used by NHK Laboratories in Tokyo, pairs up a quadruplex and a helical machine.

Backed by several years of experience working with slow-motion/stop-action recording, the MVR Corporation entered into a joint project with Visual Electronics to develop a magnetic disc recorder for slow-motion color television.

Simplicity Was a Design Goal

The basic design of the new disc recorder includes all the desirable functions of the previously tried systems, along with simplicity, straightforward engineering and compactness. In addition to providing stop-action, the machine has slow-motion speeds of one-third, one-fifth, one-seventh, and one-eleventh of normal speed. The system can be transported via commercial carriers, and people totally unfamiliar with the system can set up for operation. The unit has self-contained monitoring, is less than five feet high, and moves easily in and out of any mobile TV van.

The model VM 90 recorder uses one aluminum disc coated with Nickel-Cobalt and a Rhodium-flash top coating. The disc is addressed by two record-playback heads, one on top of the disc and the other on the disc's underside.

Maximum information packing density on the disc is made possible by recording the odd-numbered fields on its top and the even-numbered fields on the bottom. Starting at the inside edge of the disc, field number one is recorded on top and field number two is recorded directly below it on the disc bottom. During the time that field number two is being recorded, the stepper assembly on the top advances the top head two tracks. The head stabilizes in position and is then ready to record field number three. When field number two has been recorded, the signal is turned off through an electronic switch; simultaneously the signal is turned on at the top head for recording field number three. While field number three is recording on the top, the bottom stepper advances the carriage two tracks and the entire process is repeated.

Interleaved Tracks

This pattern continues across the disc, recording every other track, leaving space to interleave information on the return travel. At the end of travel in the first direction, the last two fields are recorded and each head advances back one step, recording the odd field again on the top and the even field on the bottom. The stepper now reverts back to recording every other track, interleaving information across the disc to the opposite end of its travel. After 30 seconds all tracks are filled and new information is recorded over the old information, effectively erasing it. The machine can also make recordings and playback in reverse.

In the slow-motion or stop-action modes, the unit must use one field of information many times over. Reconstructing the signal, the system provides monochrome interlace and chroma dot interlace.

Action Cued Quickly

An unusual system provides the operator with a method of knowing precisely where given points of information are located on the disc. The control panel has a row of 30 tally lamps across the top, and as the stepper assembly moves back and forth across the disc, these lamps light consecutively, showing the operator exactly where the head carriage is located on the disc at any given time.

If an event occurs that the operator feels will be of interest to the program director, he presses the CUE button. This latches one particular lamp ON, showing where the point of interest is located. If additional points of interest occur, the operator presses the CUE button again at each event. As the head carriage continues to travel, the CUE lamps remains lit, showing the operator precisely where these points of interest are.

At the end of the sequence, he presses the FAST SEARCH FORWARD or SEARCH REVERSE button to approach the start of the event or the point of interest, from the closest direction. Using this method, any point on the disc is easily located in approximately three seconds. The appropriate slow-motion playback mode is then selected. The memory system is capable of providing the operator with multiple cue marks at different points of interest. ●

Clarence Boice is VTR development engineer, Visual Electronics Laboratories at Sunnyvale, Calif.

CATV Nonduplication

Continued from page 31

scribers."

b. "Problems have been presented by the CATV companies' insistance on the mandatory 8 day notice provided for in the Commission rules for nonduplication . . . "

c. "When it first began providing nonduplication treatment, one of the local systems carried a slide in place of deleted programs that we felt unnecessarily chastised KFMB-TV . . ."

H&B Communications Corp, one of the nation's largest multiple system operators, agreed with KFMB-TV on the issue of double channel carriage. Their attorneys said:

"The second aspect of audience and advertiser identification appears to be an unstated but implicit commission concern that double channel coverage deprives TV stations of proper ratings credit for the viewing of their signals on CATV systems."

They point out, however, that ARB and Nielsen now take steps to insure that stations do receive credit for CATV viewing even when nonduplication is accomplished by carrying the local station on two channels.

CATV operators were especially unhappy about the problems of leaving a nonduplicated channel blank. The Tehachapi system, for example, pointed out that the average subscriber will "turn every knob he can (on the TV set) when he can't receive the program that is listed when he wants to see it. Almost all the late model TV receivers can be tuned onto adjacent stations and then they miss that station until someone tells them how to tune it back again."

The Huntsville system submission said:

"The deletion rule has hurt the Bryan (KBTX-TV) advertisers . . . Our customers do not consider that we are in the trade area of channel 3 or Bryan. Because of poor roads, the travel time is about the same to the metropolitan area of Houston . . . Bryan being a much smaller city has far less to offer in cultural, entertainment, educational programs, as well as shopping advantages."

Pioneer Valley Cablevision, Inc., operator of a number of systems in Western Massachussetts cited a tremendous influx of viewer complaints. In fact, they were forced to put a person on the phone in each system to explain why the blackouts were necessary. Their opinion is that elimination of the single channel rule would eliminate "all viewer complaints."

At least some TV station owners agree with the CATV operators. R. F. Lee, vice president of Bryant Radio and Television Inc., Lubbock, Texas said:

"Station KCVD-TV has not requested program exclusivity to any CATV company operating outside of Lubbock, Texas . . . The paramount reason . . . is that it is believed that the ill will created in the minds of CATV subscribers would be a greater deterrent toward public acceptance of KCVD-TV than any possible benefits to the station . . . In order not to inconvenience CATV subscribers in Lubbock, Texas, nonsimultaneous program protection has not been requested. It is believed that it should be the policy of television stations, CATV systems and the Commission to serve the viewing audience.

Many CATV operators attacked the economic injury to stations issue directly. For example, Byron H. Hurst of Community Telecable in LaGrange, Georgia quoted TV Factbook figures to show that in 1965, channel 9's net circulation in LaGrange was 25 to 50 percent and now, even without protection, it is over 50 percent.

He said, "To black out a Grade B signal on cable that is available on rooftop antennas is taking something away from the public that is already there."

He pointed out that his company is also in the radio business. "No matter where you go you can receive numerous duplicating network programs on your radio set. Yet radio continues to progress."

The system in Altoona, Pa. also quoted TV Factbook figures. They showed that WFBG-TV went from 212,500 in 1961 to 228,100 in 1967 and WJAC-TV held steady over the same period despite a drastic downward statistical revision by the ARB of TV households in the area served.

"Thus, it can be seen that CATV systems have had no economic impact on these stations."

Because of FCC rules, however, the Altoona system is presently providing these stations with protection.

E.H. Fryman of Multivision, Inc. in Ohio gave these ARB figures:

Station	1965	1966
WRCB-TV	204,300	216,400
WTVC-TV	195,000	201,800

He says that two other stations have withdrawn their requests for exclusivity and that he has not yet provided protection to any station. In spite of this, "The growth in circulation indicates no apparent adverse effect of CATV."

He goes on to say, "Enforcement of the duplication rules will impair the existance of the Dalton CATV system. The system is currently cablecasting local events, and such service is currently being expanded. Since Dalton has no TV allocation, the demise of the CATV system would deprive the community of local TV service."

Many individuals, of course, are in both broadcasting and CATV businesses. The lawyers for Jackson TV Cable Co., Jackson, Michigan said:

"It is the considered opinion of respondent, whose principals, with but one exception, have been engaged in broadcasting for many years, that CATV systems, even operating without the restrictions imposed by the Commission's rules, do not impose" a threat to the TV industry if restricted to off the air signals. They have filed for channel 18, WKHM-TV, and fear no adverse economic impact from CATV.

Two factors particularly annoy CATV system operators. First, they feel that predicted station coverage contours are very unrealistic. Second, they complain that local channel program quality and technical quality often leave much to be desired.

For example, Mark Shadle of Lykens, Pa. said:

"The very foundation on which the carriage and implementation rules are laid is most unrealistic. The contours established by the FCC by which the Grade A and Grade B areas are established, is a figment of the imagination. The particular area in which our cable system operates is only 35 air miles distant from Harrisburg. Nevertheless, because of the intervening terrain, it is impossible to receive the television signals with rooftop antennas. But if you consult the projected contour of the stations, it will indicate that the area lies in a Grade A contour . . . If this particular area were explored realistically and the contour lines drawn accordingly, most of the uhf station's claims for carriage could be ignored."

S.W. Camp of Selingsgrove is among many others who makes the same point. He further suggests "In fairness to all parties concerned . . . if the Commission would permit the TV stations and CATV systems to work together and get actual readings of signals receivable in the communities served by the CATV system, many problems, arguments and filing of petitions could be eliminated."

The Kernsville, California system pointed out that reception was so poor in their area that the FCC had authorized translators for the very channels they are required to protect. They also covered the technical quality issue succinctly, saying, "They (local channels) still do not maintain the technical standards of even the independent stations from Los Angeles . . . Video switching and levelling is accomplished only after several frames of picture rolling and video leveling varying from black to white."

Other systems complained of sync buzz, ghosting and interference on local channels.

The stations, on the other hand, complained about the quality of the CATV system processing and reception equipment, claiming that this was the reason for poor picture quality.

The CATV point of view was pretty well summed up by Irving Kahn of Teleprompter, who said in a letter to *BM/E*:

"Duplication is not a 'divine right' as some broadcasters seem to think. It should apply only if (1) the television station actually provides programming that is responsive to the local public service needs of the cable system's subscribers, and (2) the economic viability of the station would be so jeopardized by the competition of the duplicating signal that the public interest would be adversely affected.

"Where those conditions do exist, CATV can, and does, live with the situation. The unfortunate tendency, however, is for the FCC to think in terms of providing economic protection for stations, whether or not justified by the public interest. Nor is it desirable to make judgments on duplication solely on the technical basis of signal contours without regard to the historic viewing habits of the community and its cultural and marketing traditions.

"For example, it quite often is the custom of a community to shop and attend sports contests, concerts, plays or other activities in a city that geographically is more distant than one that may, by the FCC's yardstick, be 'entitled' to duplication protection. In such cases, noncarriage of the more distant station would result in the rights and interests of the public being capriciously interfered with by a patent of FCC authority."

Most stations feel that the duplication rules are a step in the right direction, but many feel that the burden of notification should be made less cumbersome. They also feel that CATV systems should carry some of the load. One station, WNOK-TV in Columbia, South Carolina, went so far as to suggest that CATVs be forced to carry U's on-channel. But most would be happy if the present rules were only enforced without so much effort on their parts.

WHO-TV in Iowa, for example, said the "principal difficulty encountered in implementation of the carriage and program exclusivity rules . . . is the burdensome detail borne by the station in submitting weekly reports of all programs on which nonduplication is requested. It appears a more efficient and less complicated manner in which to disseminate this advice would be to update a basic schedule as changes occur."

KFMB-TV in San Diego calls for an extension of the period during which programs are protected "since the present same day period is ineffective to provide any practical relief from duplication of non-network programming."

They also want to amend the rules so that a CATV system may request 8 days notification, but should be required to grant nonduplication on less than 8 days notice.

Finally, many systems feel that the FCC should get tough with CATV, forcing operators to comply with the rules without delay.

All in all, the FCC appears to have collected a lot of useful testimony on this controversy. There seems to be general agreement among both CATV operators and TV stations that the rule prohibiting double channel coverage [74.1103 (d) (3)] should be eliminated.

Both sides are complaining about the new rules, but there is little doubt that they have afforded a large measure of protection to TV stations without causing more than a small percentage of CATV operators real problems.

Many CATV subscribers are unhappy, but most stay on their systems. It is possible that if the FCC rules are enforced in all systems over a long period of time, some CATV systems will be forced to shut down, but to date this has not happened anywhere in the country. ●

The moment you begin to radiate 5 million watts of UHF...

Madison Avenue gets the picture

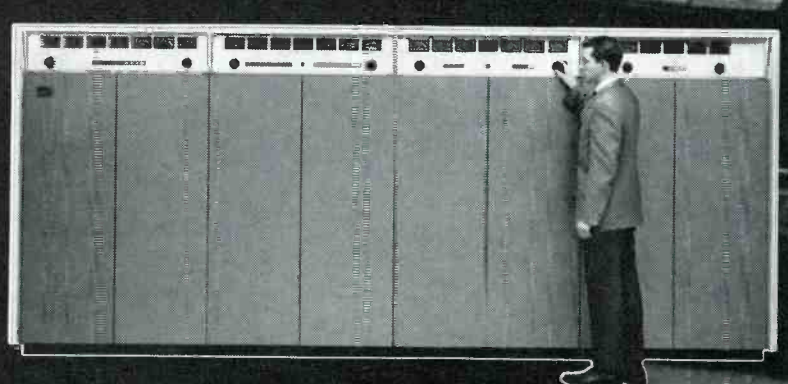
RCA has a new transmitter-antenna combination with the kind of radiated power that reaches Madison Avenue. We call it Omni-Max (maximum UHF in all directions). Put it on-air, and you get five million watts of effective radiated power. On Madison Avenue that means coverage, and coverage means sales.

And there's more than just that. You protect your investment. You cover the outlying towns before somebody else does. Nobody can "outpower" you.

The new UHF transmitter is RCA's TTU-110A. It delivers 110 kilowatts of output power. The new UHF antenna is the Polygon. It is a high gain antenna. It will radiate five megawatts. In short, with this maximum power allowed by the FCC, you have the means to take over the territory. And you hold it!

Call your RCA Field Man. Tell him you'd like to turn on Madison Avenue. He'll show you how five million watts of ERP UHF can reach the people who buy the time. Isn't that the kind of performance you really want? RCA Broadcast and Television Equipment, Building 15-5, Camden, N.J. 08102

RCA



The RCA Omni-Max system is the most powerful UHF antenna-transmitter combination you can buy. The transmitter is RCA's TTU-110A, featuring diplexed amplifiers with efficient vapor-cooled klystrons. Ready for remote control. Combine it with the new Polygon five-sided Zee-Panel antenna which features uniform pattern, excellent circularity for super-gain UHF.


E 41 ST
ONE

BROADCAST EQUIPMENT

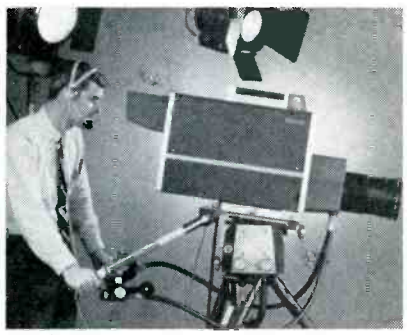
Stereo Studio In An Attache Case

Availability of Model PM-1, a 6-channel portable stereo mixer, has been announced by Gately Electronics, Havertown, Pa. Designed for professional recording and broadcast use, PM-1's most prominent feature is unusual compactness—it weighs only 25 lb, and is housed in an attache case measuring 18 × 12¼ × 5¼ in. Other features include low-noise circuitry, transformer coupled output, illuminated vu meters, plug-in circuitry, stainless steel panel, etc. Specifications include: distortion, less than 0.5 percent at 8 ohms dBm into 600-ohm load (20 Hz to 20 kHz); Output capability, 24 dBm into 600 ohms at less than 1 percent THD (20 Hz to 15 kHz); gain, 37 dBV nominal (high-level input), 80 dBV nominal (40-dB preamp) and 100 dBV nominal (60-dB preamp) with low-level inputs.

Circle 100 on Reader Service Card

Color Camera Uses Lightweight Cable

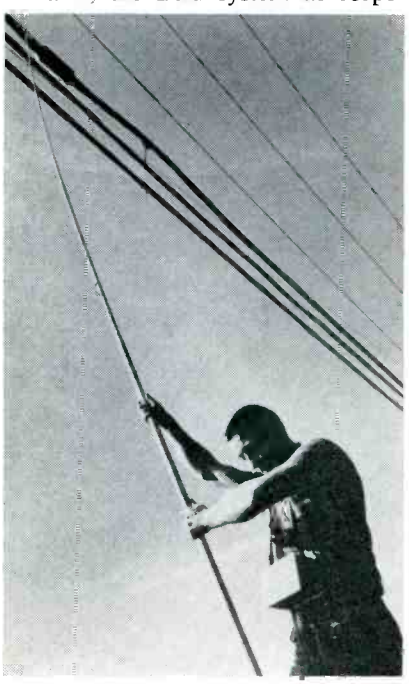
A color broadcast television camera approximately one-third the weight and two-thirds the cost of conventional models has been placed on the market by Ampex Corporation, Redwood City, Calif. The new Model BC-200 weighs less than 50 lb, costs approximately $50,000 and produces quality NTSC video. It uses a lightweight camera cable which weighs 375 lb for 3000 ft, compared with 1.5 tons for the same length of conventional camera cable. Camera's light weight and small cable permit cameraman greater freedom than before possible with a studio color camera.



Circle 101 on Reader Service Card

Cable Fault Locator

The Delcon Division of Hewlett-Packard, San Francisco, Calif., recently announced the development and production of a fault locator with 150-Hz and 990-Hz toning frequencies, capable of locating resistance faults of both aerial and buried communications cable and of all buried power cable. Receiver section of locator picks up and amplifies into audible, 10-dB trouble-shooting tone signals as small as 40 nV. Designated the Delcon Model 4904A Dual Frequency Cable Fault Locator, the field system incorporates all solid-state circuitry and weighs 30 lb including battery power supply. Locator is priced at $880 complete with probes, leads, transmitter/receiver and comprehensive operating instructions.



Circle 103 on Reader Service Card

Low-Cost Monochrome Video Monitor

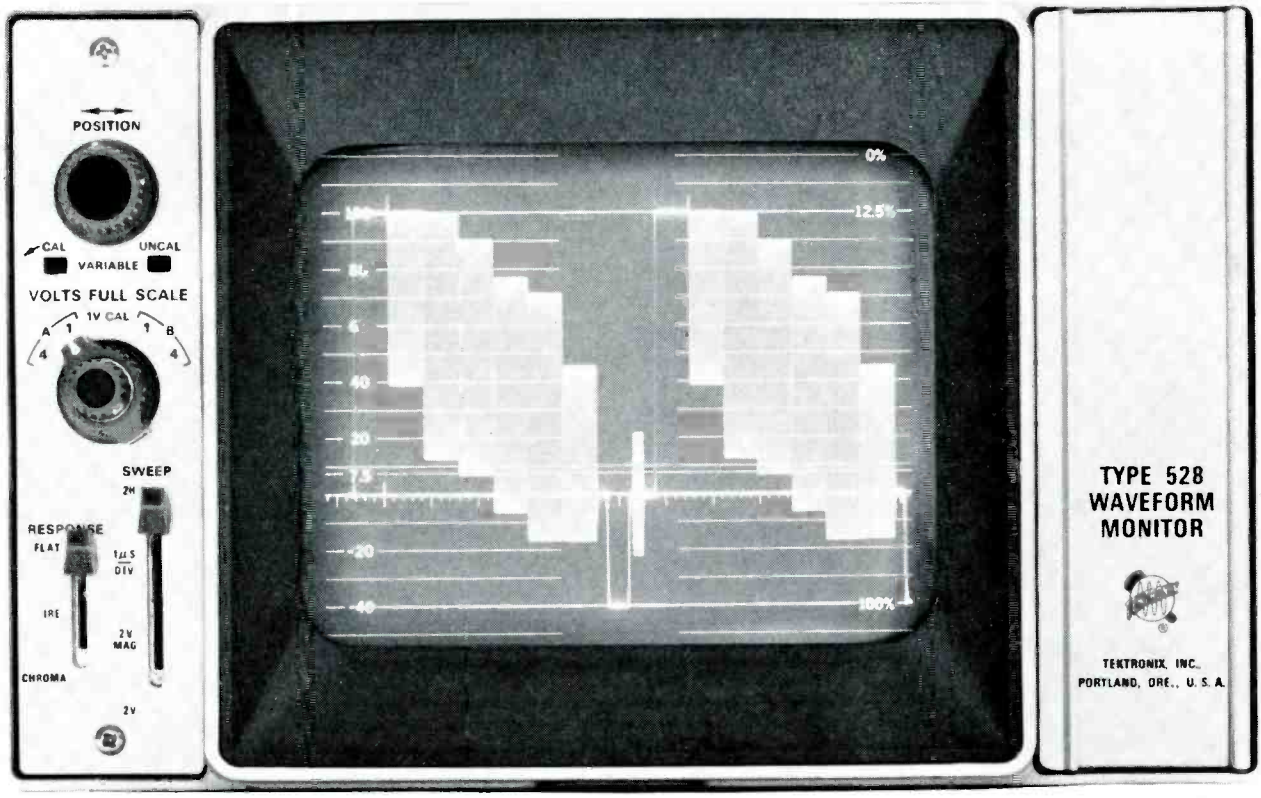
The KNA9 9-in. video monitor designed by Conrac Corporation, Duarte, Calif., for continuous duty has video response flat to 7 MHz (less than 3 dB down to 8 MHz); viewable resolution is better than 600 lines at the center of the screen (400 lines at the corners). A single epoxy-glass circuit board is installed by means of quick-disconnect hardware. Prices begin at $185 in chassis-only configuration. The cabinet version is $225 and a dual-rack-mount configuration is $405.

Circle 107 on Reader Service Card

Edgewise Series Panel Meters

A new, 3½-in. edgewise panel meter series that is designed to take up a minimum of instrument panel space and provides the user with the performance of a conventional 3½-in. meter and stacking capability, is being introduced by the Triplett Electrical Instrument Co., Bluffton, Ohio. The new 320-E Series of easy-to-read edgewise panel meters are manufactured with the firm's Bar-Ring self-shielded construction movement which allows meter stacking, giving maximum instrumentation in a minimum amount of space. Each

NEW television waveform monitor



3/4 Actual Size

- **compact size with large 8 x 10-cm display area**
- **picture monitor output**
- **YRGB and RGB inputs**
- **1-volt and 4-volt full scale deflection factors**

The new Tektronix Type 528 solid-state Waveform Monitor is ideally suited for monitoring waveforms from camera outputs, video system output lines, transmitter video input lines, closed-circuit TV systems and educational TV systems. This compact instrument requires only 5 1/4-inches vertical and 8 1/2-inches horizontal mounting space.

Either of two video inputs, selectable from the front panel, may be viewed on the 8 x 10-cm screen. The video signal being displayed is provided at a rear-panel connector for viewing on a picture monitor.

Calibrated, 1-volt and 4-volt full scale deflection factors provide convenient displays of typical video and sync signal levels. A variable control provides uncalibrated full scale deflection factors from 0.25 volts to 4.0 volts. FLAT, IRE and CHROMA vertical amplifier response positions permit rapid observation and measurement of waveform characteristics. A slow-acting DC Restorer maintains a constant back porch level despite changes in signal amplitude, APL or color burst and may be turned off when not needed.

Sweep modes are: 2 V SWEEP (two field), 2 V MAG SWEEP (expanded vertical blanking), 2 H SWEEP (two line) and 1 μs/div SWEEP (calibrated sweep with accuracy within 3%). Internal or external sync is selectable. Provision is made for YRGB and RGB displays.

This lightweight waveform monitor converts to a portable unit for field service applications by simply adding an optional protective cabinet. An optional Rack Adapter permits side-by-side mounting of 2 Type 528's.

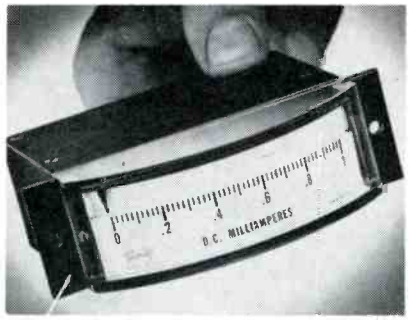
Your Tektronix Field Engineer will be happy to demonstrate this new solid-state waveform monitor on your premises at your convenience. Please call him, or write: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005.

Type 528 Waveform Monitor	$800
Rack Adapter for mounting 2 Type 528's side-by-side (016-0115-00)	$ 85
Cabinet, provides protection for out-of-rack applications (390-0018-00)	$ 30

U.S. Sales Prices FOB Beaverton, Oregon

Tektronix, Inc.

Circle 20 on Reader Service Card

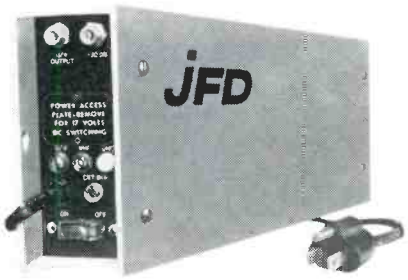


model in the series is equipped with an antiparallax black arrow head type pointer designed specifically to minimize reading error. All models in the series are available with either magnetic or nonmagnetic panel calibration. Weight of Models 320-E, 340-E and 350-E is approximately 17 ounces. Prices range from $27 to $46, depending on range and meter type.

Circle 105 on Reader Service Card

MATV Amplifiers With ICs

A series of three new solid-state MATV amplifiers has been announced by JFD Electronics Co., Brooklyn, N.Y. The three units are a vhf amplifier, a uhf amplifier and an 82-channel amplifier covering all TV and fm stations. All three amplifiers mount on the same cadmium plated 20-gauge steel chassis and fit onto the same solid extruded aluminum case. The new units provide at least 30 dB gain on all channels and an output capability of at least 54 dBV. Built-in power supply is priced at $75.00. Amplifiers range in price from $99.00 to $199.00.



Circle 109 on Reader Service Card

Video Multiplexer Puts 4 Signals on Monitor

Production of Series 2600-400 multiplexer has been announced by Cohu Electronics, Inc., San Diego, Calif. Multiplexer is designed to eliminate the need for a separate waveform monitor for each TV camera in a multicamera installation. Features on the unit include IC four-count generator, IC clamp pulse generator and a staircase generator to synchronize the waveform monitor. Push-button video select switches plus a rotary sequence switch give a waveform monitor display of VIDEO 1, VIDEO 2, VIDEO 3, VIDEO 4, or LINE VIDEO, or SEQUENCED VIDEO in one of three combinations. Price is $795.

Circle 112 on Reader Service Card

Compact Monitor Amplifier

Fairchild Recording Equipment Corporation, Long Island City, N.Y., announces introduction of a new, fully-siliconized, 10-W rms monitor amplifier with total short circuit and overload protection. The Model 610 features compact design, low distortion, flat response and low noise. It has bridging input, transformerless output, and an integrated power supply. The complete amplifier, less line transformer, is on printed circuit card. In this unit, heat sink of the output stage is coupled to chassis of the amplifier, effectively increasing heat radiating surface. Gain control accommodates input levels from –10 dBm (0.25 V bridging) and higher. Minimum level of 0.25 V is required to produce 10 W rms power into an 8-ohm load, or 6½-W into a 16-ohm load. The 610 amplifier measures 3 in. wide × 5¼ in. high and 10 in. deep. Amplifier is priced at $138.

Circle 108 on Reader Service Card

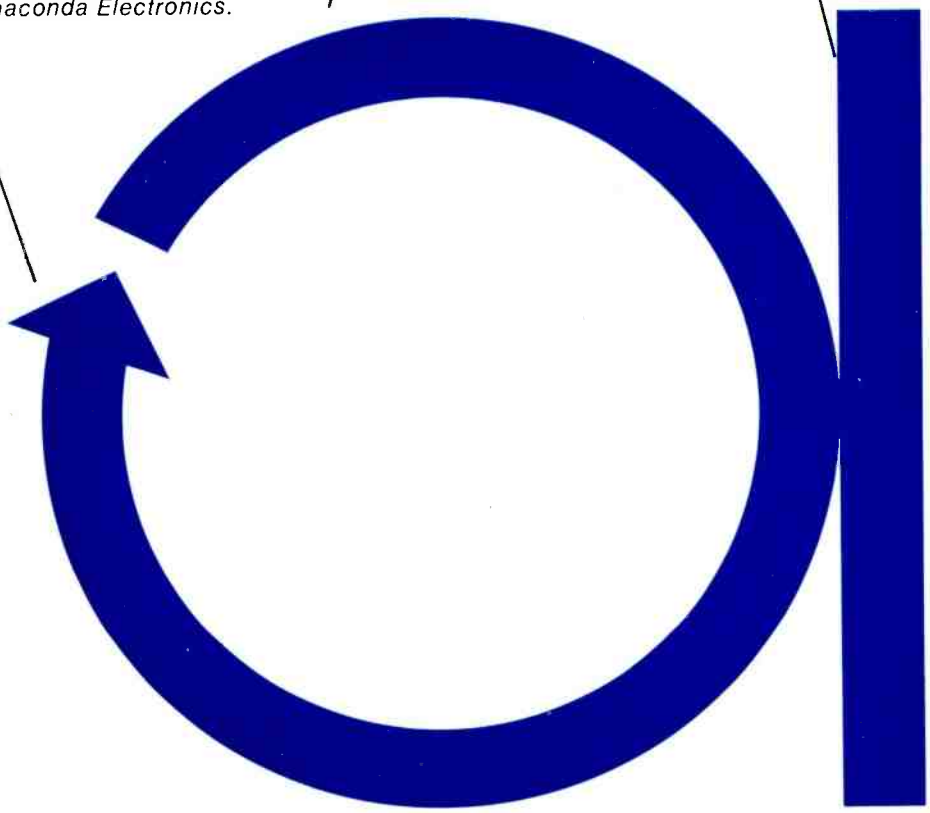
Low-Cost Mic Series

RCA/Electronic Components, Harrison, N.J., has announced a new line of low-cost microphones for use in professional broadcast, recording,

This is the new logo for Anaconda Electronics.

This straight line represents simplicity in product design. And it's one way of saying that we're pretty straightforward folks to do business with.

This feedback loop represents the total communications goals of Anaconda Electronics.



(Look again. It's a futuristic lower case "a.")

This logo is an announcement: Anaconda has assumed 100% interest in what used to be Anaconda Astrodata Co.

We're now Anaconda Electronics Company.

Our business is electronic communications. CATV and Carrier, for example. It's a natural extension of Anaconda's years of leadership in cable transmission.

And the grand old name does have advantages—size, stability, and years of experience. Besides, it's easy to remember.

ANACONDA electronics

Anaconda Electronics Company, Subsidiary Anaconda Wire and Cable Company, 1430 South Anaheim Boulevard, Anaheim, California 92803

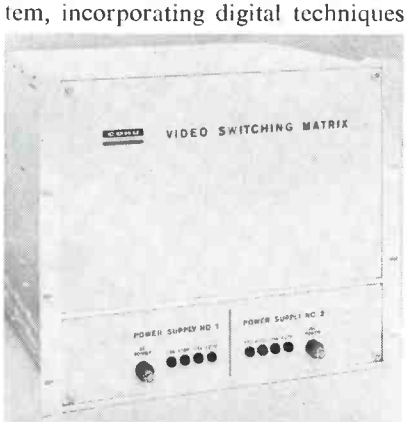
Circle 24 on Reader Service Card

and stage performances, as well as in-home recording and communications applications. The Starmaker line, consisting of six new cardioid and omnidirectional mics has optional user prices ranging from $8.00 to $50.00. The Starmaker 96 (top of the line) is intended for on-stage use, for recording sessions, or in a variety of broadcast applications. Mic has frequency response from 50 to 15,000 Hz and features a 3-position roll-off switch to reduce rumble and unwanted background noise. A special 5-pin connector permits switching the output impedance from 200 ohms (–78 dBV level) to 15,000 ohms (–60 dBV level) merely by reversing connector. The line is available from authorized RCA Microphone Distributors.

Circle 104 on Reader Service Card

Precision Solid-State Video Switcher

Introduction of a production, solid-state video switcher that produces vertical interval switching of high quality video signals has been made by Cohu Electronics, Inc., San Diego, Calif. Switcher accepts composite or noncomposite, monochrome or color, synchronous or nonsynchronous video in any combination. Automatic circuitry prevents accidental mixing or nonsynchronous sources. Among the major features is a double re-entry vertical interval switching system, incorporating digital techniques



and integrated circuits. Other features include overvoltage protection, standard cut on mix, effects and preset/program buses, automatic inhibit of nonsynchronous dissolve, fade to black with automatic cut, automatic sync insertion and no midfade color drop when fading to monochrome. Circuit redundancy prevents single-unit failures from disabling switcher. Adjustable, pre-programmed delay sections provide interchangeable output amplifiers.

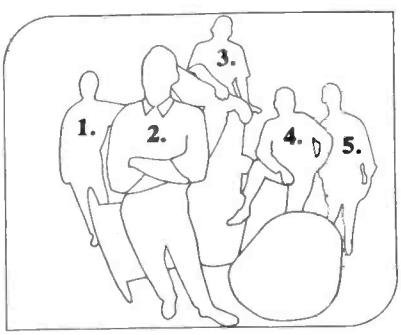
Circle 106 on Reader Service Card

MEET "THE COAXIALS"

Our new cable group that's making things happen nation-wide.

Heading up our five new nation-wide regional Times Sales Service Centers, these men and the facilities they manage now provide cable service hundreds of miles and many hours closer to you than before. They're ready, willing and able to help you with prompt consultation and quick shipments on any type of coaxial cable you need.

Now you can get in touch with any of "The Coaxials" most convenient to you. Why not give him a call today?



1. Heinz Matuschka, Western, Redwood City, California
Office: (415) 365-5161 · Home: (415) 427-1913
2. Mike Ganley, South West, Dallas, Texas
Office: (214) 742-5630
3. Bill McNair, South East, Atlanta, Georgia
Office: (404) 872-3228 · Home: (404) 288-2623
4. Don Atchison, Mid West, Kansas City, Missouri
Office: (816) 842-3885 · Home: (816) 741-6813
5. Bud Desmond, North East, Wallingford, Connecticut
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TIMES WIRE & CABLE
DIVISION OF THE INTERNATIONAL SILVER CO.
Wallingford, Conn.

SEE "THE COAXIALS" IN PERSON AT THE NCTA SHOW

Circle 27 on Reader Service Card

Wide Angle Lens

The Zolomatics Cyclops lens has been designed by Zolomatics Corporation of Hollywood, Calif., to fill the need for a wide angle fixed focus lens for industrial and educational

purposes. The lens has a viewing angle of 110° in the diagonal and 100° in the horizontal, with a focal length of 6mm and a relative aperture of f1.4, lens can be used for numerous applications. Price is $395.

Circle 110 on Reader Service Card

Monitor Amplifier

Model 1035 solid-state monitor amplifier, made by Comrex Corp., West Concord, Mass., is a rack mounted monitor, designed for input levels normally found on jack fields

and telephone lines. Input impedances are 150, 600 and 20 k ohms, balanced; input level, −20 dBm to +30 dBm. Amplifier output is 5 W. Model 1035 is priced at $135.

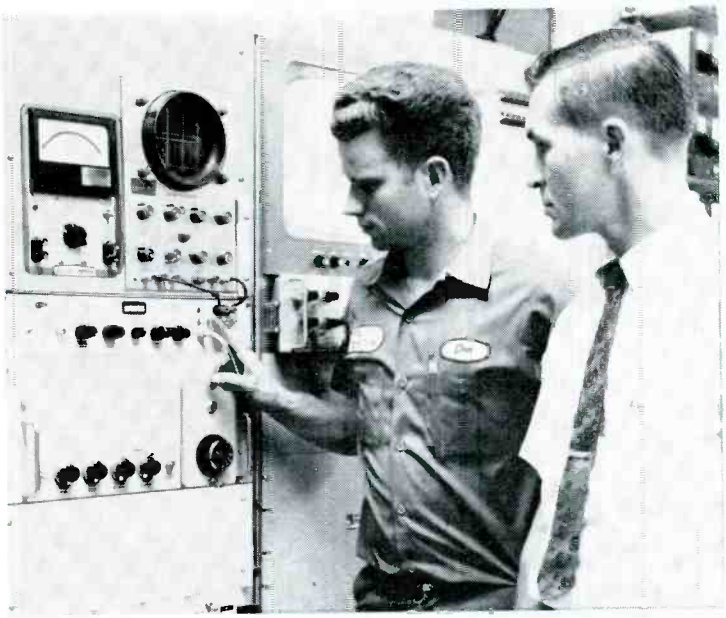
Circle 111 on Reader Service Card

Low-Cost Portable Cassette Recorder

Model 1100 portable cassette recorder, available from Allied Radio Corporation, Chicago, Ill., operates from 5 low-priced C batteries or from an ac outlet by means of a snap-on ac adapter. Unit records up to 2 hr of monophonic sound on two tracks of tape. Cassettes, sold in mailing boxes, are available for 60-, 90- and 120-minute recording. Features

"EVERY CABLE TV SYSTEM USING MODULATORS NEEDS A SIDEBAND ANALYZER,"

says Don Cantrell of TOTAL TV, Santa Rosa, California



Don Cantrell, Chief Technician, demonstrates operation of TS-100B Sideband Analyzer to Jim Monroe, Mgr. of TOTAL TV.

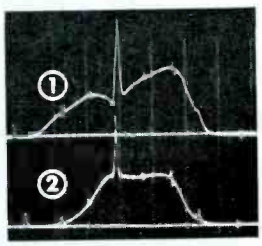
TOTAL TV of Santa Rosa, California has been using a DYNAIR TS-100B Sideband Analyzer for over a year. Here's the way they feel about it . . .

"The DYNAIR sideband analyzer allows us to check modulator operation at any time—precisely and in just a matter of minutes. It also greatly shortens the time required for modulator alignment."

Yes, cable TV operators everywhere have discovered what broadcasters have known for years . . . *the only practical way to check transmitter operation is with a sideband-response analyzer.*

The DYNAIR TS-100B Sideband Analyzer is designed especially for the needs of the CATV operator. It is completely solid state and has a self-contained regulated power supply. It is extremely compact. And it is priced at only $1250 . . . a small price to pay for the savings in time and the increased system performance that are immediately realized. (And an *especially* small price when compared with the $8500-odd worth of standard precision test equipment you would have to assemble to do a roughly equivalent—but many times slower—job!)

These units are available for immediate delivery. Give us a call and place your order today. (If you're still not convinced, ask the man who has one . . . or see it in operation at the NCTA convention, booths 69, 71 and 73 along with the RX4000A Demodulator and the TX4A Modulator.)



Actual Sideband Analyzer waveforms indicating (1) poor modulator response and (2) Proper response.

The Dynair TS-100B generates a video sweep signal which is applied to the video input of the modulator under test. The RF output of the modulator is then directed back through the TS-100B, where the RF spectrum is analyzed and then applied to an oscilloscope for display. The display is a precise representation of the sideband response curve, showing both the visual and aural carriers. Markers for frequency measurement are provided at 0.2, 0.5, 1.5, 3.6 and 4.5 mHz to allow exact frequency determination.

DYNAIR
ELECTRONICS, INC.
SAN DIEGO, CALIFORNIA

6360 FEDERAL BOULEVARD, SAN DIEGO
CALIFORNIA 92114 (714) 582-9211

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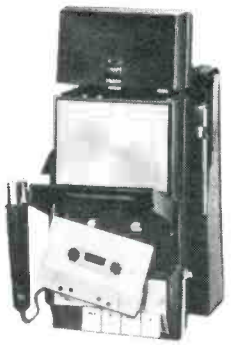
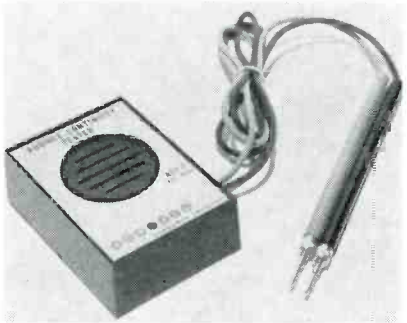


include keyboard-type pushbutton operation, fast forward and rewind, level/battery meter and extension speaker jack. Lightweight and compact, Model 1100 measures 12 × 6 × 4 in. Price is $59.95 with ac adapter, remote control start/stop dynamic mic, cassette, earphone and carrying case.

Circle 114 on Reader Service Card

Audible Continuity Tester

CalComp audible continuity tester, made by CalComp Consumer Products, Anaheim, Calif., tests electronic circuits without danger so solid-state components, and supplements ohmeters requiring visual check. Continu-



ity is indicated by a clear tone, and pitch changes with resistance (0 to 50 ohms); open circuit 2.5 V at probes; short circuit 6 mA at the probes; power, 9 V dc battery; 30-in. probe leads; 2¾ × 1 3/16 × 3¾ in. Tester weighs 8½ oz.

Circle 116 on Reader Service Card

Cable Stripping Tool

The G&W Electric Specialty Co., of Blue Island, Ill., has introduced a new cable stripping tool which enables splicers to remove the plastic protective jacket from nonlead telephone lines without damaging underlying shielding or insulation. New stripping tool can be used to remove neoprene, polyethylene or PVC jackets. Tool has rotary head which al-

NOW! FOR 12 OR MORE CHANNELS get the new COLORVUE INTERMEDIATE BRIDGING AMPLIFIER!

Whether you're planning a new CATV system . . . expanding your present system . . . or replacing amplifiers that no longer deliver high-grade signals . . . specify AEL's new 50 to 270MHz bandwidth Amplifier for Intermediate Bridging or Line Terminating operation.* Featuring hybrid micro-circuitry for maximum reliability and stability, the CVT-1RB provides high output capability, high operating gain and a ±0.5db response flatness.

What's more, it's a completely modular Amplifier, with one basic housing and individual plug-in modules, including off-trunk splitters that permit distribution to 1, 2, 3 or 4 feeder lines. Maintenance is quick and easy, since the modules are replaced in seconds, in the field, without taking down the Amplifier or turning off the power. And there's a lot more! Send in the coupon below or call us at 215/822-2929.

INTERNAL TEST POINTS Easily accessible . . . only two bolts required to open housing.

VARIABLE GAIN CONTROL 0 to 18db range with variable control and thin-film plug-in attenuator.

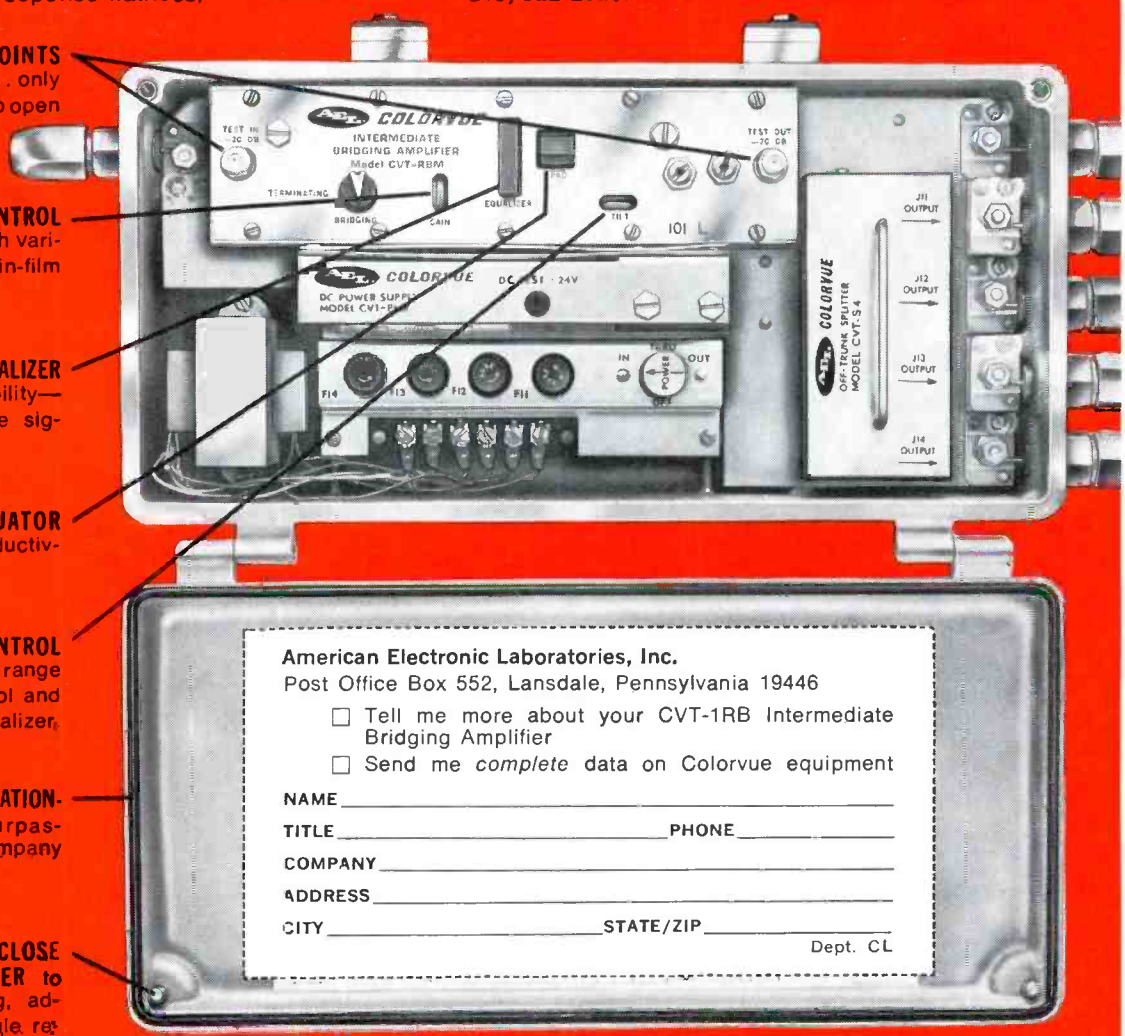
HYBRID PLUG-IN EQUALIZER maintains high stability—reliable, high-grade signals.

THIN-FILM ATTENUATOR provides high conductivity—color fidelity.

VARIABLE TILT CONTROL 0 to 24db (of cable) range with variable control and hybrid plug-in equalizer.

WEATHER AND RADIATION-PROOF HOUSING surpasses rigid utility company standards.

TWO BOLTS OPEN/CLOSE THE HOUSING COVER to speed field testing, adjustment and module replacement.



American Electronic Laboratories, Inc.
Post Office Box 552, Lansdale, Pennsylvania 19446

☐ Tell me more about your CVT-1RB Intermediate Bridging Amplifier
☐ Send me *complete* data on Colorvue equipment

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*Coming soon . . . the trunk line amplifier for 270MHz

CATV DIVISION
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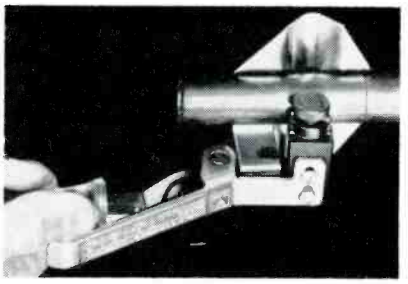


lows proper selection of cutting blade. Circular and axial cuts are made to precise depth, permitting sheathing to be peeled off without harming insulated conductors. Cable strippers are available for cables with jacket OD from 5/16 to ¾ in., or for cables from ¾ to 1⅛ in. OD.
Circle 115 on Reader Service Card

Low-Cost Quartz Lamp

Packaged Lighting Services, Yonkers, N.Y., recently introduced the Quartz Daylighter, utilizing a 5000 K quartz-halogen dichroic sealed beam, medium beam lamp. The lamp is rated for 650 W, 120 V and operates on ac or dc with unrestricted burning positions. At a 15-ft distance, over 600 ft candles illuminate a 12- × 8-ft area, with no hot spots. Quartz Daylighter QDL-5 is priced at $25.50 without lamp. QD-5 is priced at $16.50.

Circle 113 on Reader Service Card

FM Stereo Receiver

Allied Radio Corporation of Chicago, Ill. announces the release of a new Knight-Kit 50-W solid-state stereo fm receiver, Model KG-980. Using transformless driver and output circuits, hum and noise are held to within –65 dB Aux; –60 dB Phono. Frequency response is within 1 dB from 18 to 30,000 Hz. Tuner has a four-stage front end, including

Careful, your income tomorrow may be limited by the cable you install today.

Buy Superior Continental's E-X-T-E-N-D-E-D *Spectrum Coaxials and take the lid off!*

Because these coaxials cover the continuous range to 300 MHz and beyond with no discontinuities, you get more transmission space than with standard cables.

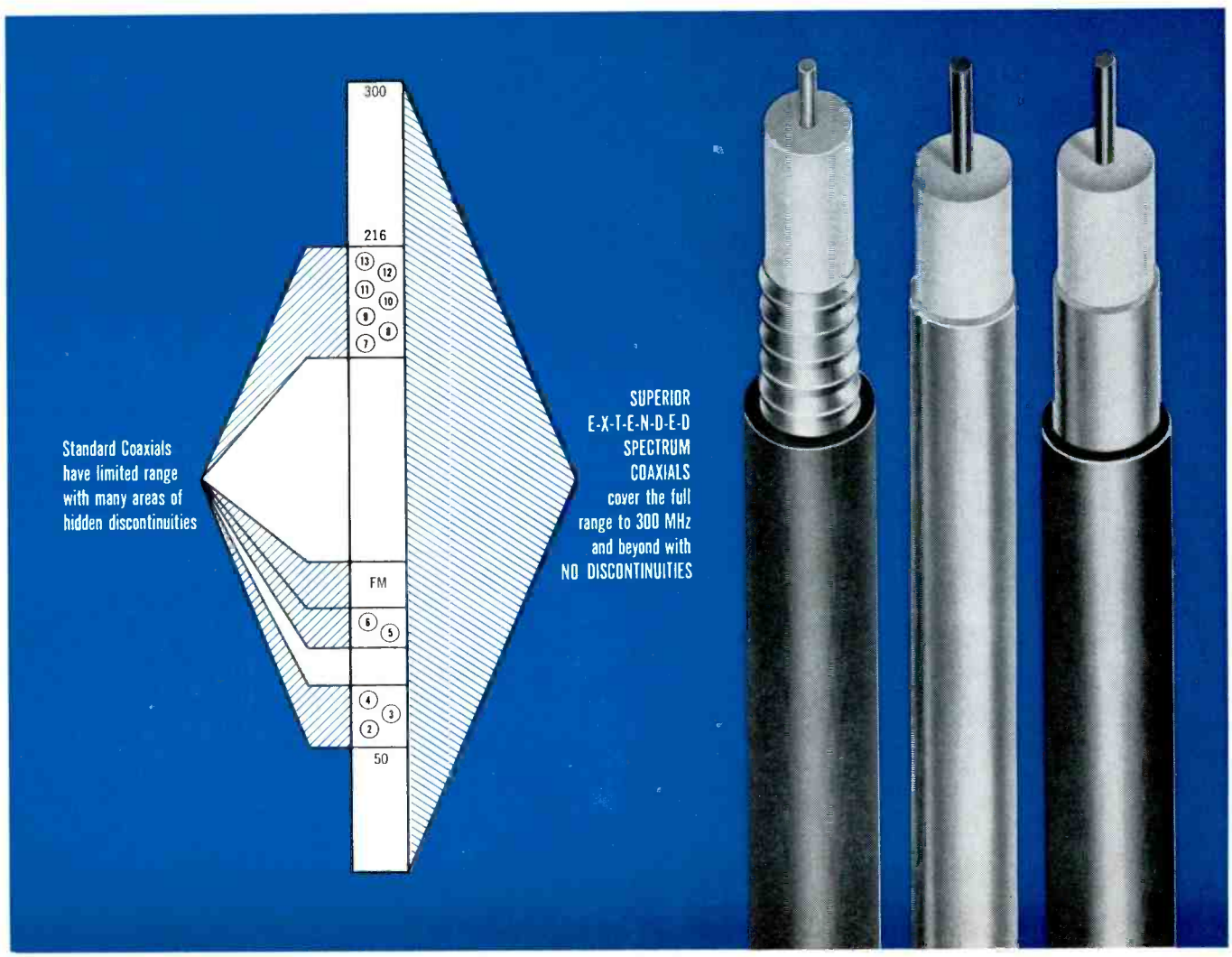
The additional 84 MHz segment from 216 to 300 MHz, together with full frequency utilization from 216 MHz down, opens up many opportunities for new services when you want to add them.

- **CATV, new channels**
- **ETV and ITV programming**
- **CCTV for business and industry**
- **Data transmission**
- **Remote control telemetering**
- **Alert and alarm systems**
- **Traffic and highway control systems**

Install Superior Continental's Extended Spectrum Coaxials, Coppergard® or Alumagard® aerial or direct burial types. This way, your system won't outgrow the capability of your cable. Means more revenue because you can provide more services, now and later.

Superior Sales and Service Division
P. O. Box 2327 Hickory, North Carolina 28601
Phone 704/328-2171

SUPERIOR CONTINENTAL CORPORATION



Circle 35 on Reader Service Card

two rf stages. Tuner specifications include usable ihf sensitivity of 3 mV, frequency response from 30 to 15,000 Hz ±1 dB, harmonic distortion of less than 1 percent, and hum and noise −50 dB. Amplifier has power output of 25 W per channel and channel separation of 50 dB. KG-980 receiver kit is priced at $149.95. A walnut cabinet case is available for $19.95.

Circle 118 on Reader Service Card

Fixed Station Antenna

Andrew Corp., of Chicago, Ill., has recently designed a new low cost lightweight, easy to install, omnidirectional antenna for the 25- to 76-GHz communications bands. Type 903, Unipole antenna consists of a folded radiating element and four helical ground rods encased in fiberglas. A unity gain antenna, it exhibits a maximum vswr of 1.5. For coastal areas, a hurricane model is also available.

Circle 119 on Reader Service Card

Fm 2-Way Radio Runs 100 W

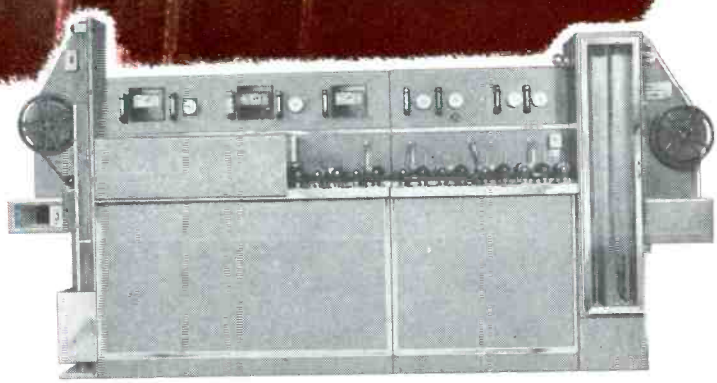
A 100-W fm 2-way radio has been introduced by Pye Communications, Inc., Mountain Lakes, N.J. The 2-way radio, which operates in the vhf band from 25 to 174 MHz, normally is mounted in the trunk and remotely controlled from a compact control unit, measuring 6¾ × 3⅝ × 1⅞ in., and fits beneath dashboards. Units are available for single or multi-frequency operation, up to 6 chan-

nels. The fully transistorized receiver, which drains less than 300 mA from battery, features a high signal-to-noise ratio and an audio output of 2 W with less than 10 percent distortion at 1000 Hz. The entire unit is dustproof and splashproof, and is provided with an electronic squelch.

Circle 117 on Reader Service Card

You can do it easily...with a TREISE COLOR PROCESSOR!

Now that big things are happening in network color, the logical next step for your station is to film your local news in color. You'll gain added interest from your community . . . enhance your value to advertisers . . . and brighten your profit picture. Treise makes it possible by offering you a fully automatic, professional quality processor that will have your local news "on the air" in color within minutes after the exposed film is loaded in the processor. This compact, self-contained unit can be operated in a 17′ x 9′ area, requires only simple plumbing and electric plug-in, and is so foolproof, anyone can run it!



Check these features: Warms up in only 20 minutes (instead of the usual 2 to 3 hours) • stays on temperature automatically • only processor in its price range that meets or exceeds all Kodak color requirements • even provides 50% additional first-developer time to permit full utilization of new EF Ektachrome film • operates up to 40 fpm (the ideal speed for most TV station needs). Want more data?

Write for free catalogs on Model MTV-30 (illus) and Model MT-20 (up to 70 fpm), plus our full line of color and B&W processors and accessories.

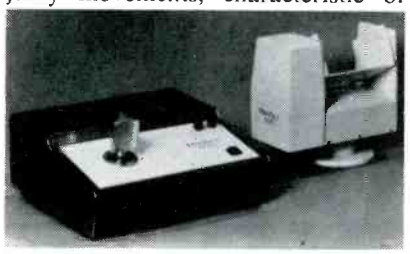
TREISE ENGINEERING, INC.

1941 First Street • San Fernando, California • Phone (213) 365-3124

Circle 37 on Reader Service Card

Camera Servo Control Has 'Joy Stick'

A new finger controlled "Joy Stick" servo controlled Model 520 Pan and Tilt CCTV system, made by Albion, Inc., Nyack, N.Y.., provides stepless rotational speeds up to 120°/s and down to less than 1°/s without the jerky movements, characteristic of



conventionally motorized systems. A remotely-located camera can be panned and/or tilted at a speed and direction corresponding to pressure on the control "Joy Stick." Model 520 Pan and Tilt system remote control unit operates to a distance of 1000 ft from control. When used in conjunction with the pre-set position selector, the pre-set "shot" may be transferred to the control stick without any movement of the mechanism.

Circle 120 on Reader Service Card

Pointer-Slide Previewer

Designed for use in demonstrations, lectures, briefings and instruction sessions by Ednalite, Peekskill, N.Y., the "Cordless Pointer-Previewer" is a device that acts as an electric pointer or as a slide previewer-editor. Device permits speaker or

demonstrator to point out details of a screening from any part of the room by means of a point of light. Simultaneously, he can preview, even pre-edit, his next slides in darkness. Pointer uses D flashlight cells. Price is $9.95.

Circle 121 on Reader Service Card

FOR WCAU-TV NEWS, BLACK-AND-WHITE WASN'T ENOUGH.

NOW THEY "SHOW IT LIKE IT IS"- IN FULL COLOR.

"Color film has given our news coverage a sense of immediacy and added a vibrant new dimension to our day-to-day reporting of local events," says Philadelphia's WCAU-TV. "Now we can shoot art exhibits, fashion and flower shows, and other community activities which lose much of their meaning in black-and-white.

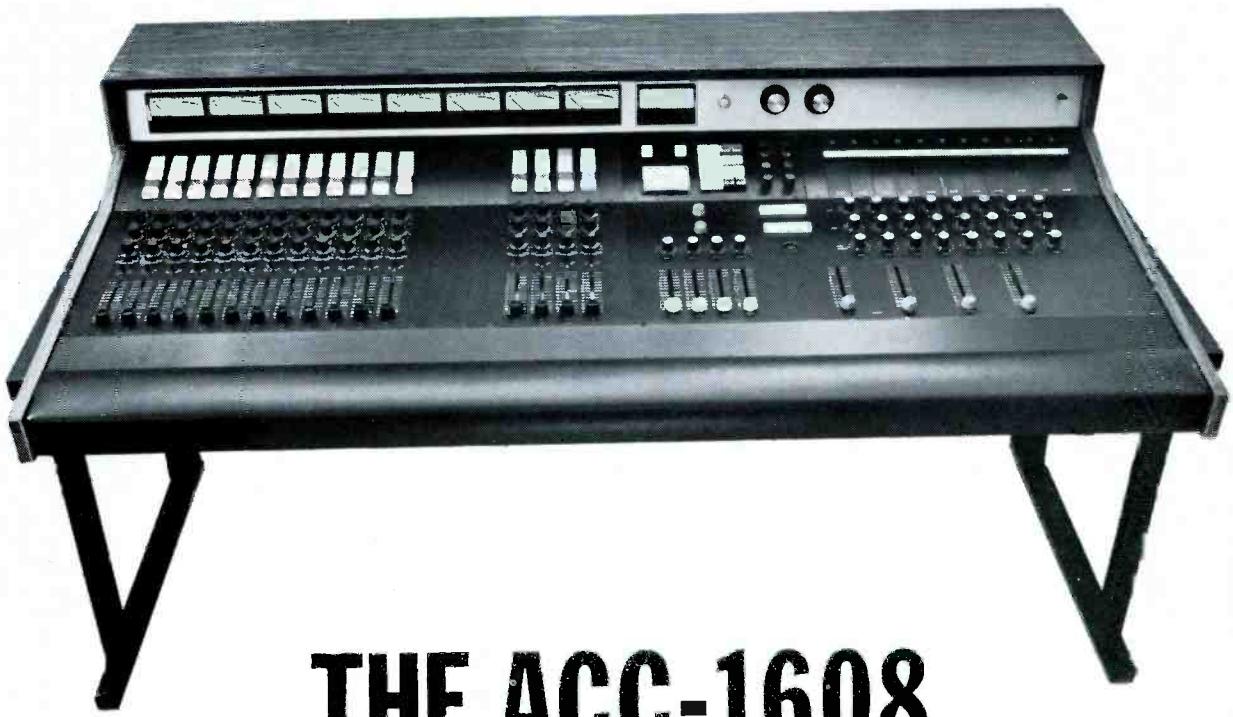
"Our documentaries and special reports depend on color film," the station continues. "When we filmed the elevation of an Archbishop to Cardinal, color brought into focus the symbolism of the placing of the red hat on his head. And with our study of the art of a noted Pennsylvania artist, use of color was a necessity. Color film brought to life slum housing conditions in Philadelphia of which most Philadelphians were oblivious. It gives us the impact we need."

Use of the Kodak ME-4 process, Kodak prepackaged chemistry, and Kodak color film provides "flexibility and necessary immediacy." It enables WCAU-TV to get documentaries, news stories, and late-breaking film stories on the air in color. Kodak gave WCAU the help they needed to switch to color film and processing. Additional technical help is always available. Sooner or later all television news will be in color. Don't be later, call Kodak now.

Kodak

EASTMAN KODAK COMPANY

ATLANTA: 5315 Peachtree Industrial Blvd., Chamblee, 30005, 404—GL 7-5211; CHICAGO: 1901 West 22nd St., Oak Brook, 60523, 312—654-0200; DALLAS: 6300 Cedar Springs Rd., 75235, 214—FL 1-3221; HOLLYWOOD: 6706 Santa Monica Blvd., 90038, 213—464-6131; NEW YORK: 200 Park Ave., 10017, 212—MU 7-7080; SAN FRANCISCO: 3250 Van Ness Ave., 94119, 415—776-6055



THE ACC-1608 "ON THE RIGHT TRACK"

DO AWAY WITH "TEMPORARY, HALF-FUNCTIONAL" SYSTEMS... THIS 8-TRACK AUDIO CONTROL CONSOLE DOES THE WHOLE JOB!

Up till now you 8-track people have had to make do with baling wire and chewing gum imitations of professional audio control console equipment. *No longer.* Electrodyne has specifically designed the ACC-1608 for your use. The same Electrodyne engineering and quality has been used in the ACC-1608 along with that *little bit more* that continually creeps into our products. For starters we designed the ACC-1608 to completely handle your 8-track recording. There are 16 microphone or line inputs, expandable to 20.

Complete 6 position equalization with echo send and cue on each channel is provided along with independent outputs for 8 channel, 2 channel and monaural. There are 2 stereo pan pots, illuminated pushbutton switches and complete monitor switching and level controls. Wrapping things up are the optional features. You name it, and you can have it! Sure, for a price you say ..Try us on price, you'll find *baling wire and chewing gum* are much higher. Let the ACC-1608 get you *on the right track,* all eight of them.

Write or phone for complete literature on the ACC-1608 as well as the complete Electrodyne console and audio components line. Quotations on 12, 16 and 24 track consoles available on request.

ELECTRODYNE CORPORATION
7315 Greenbush Avenue ■ North Hollywood ■ Calif. 91605
Phone: (213) 875-1900 ■ Cable Address: "ELECTRODYNE"

Circle 39 on Readers Service Card

NAMES
IN THE NEWS

Richard Estell, manager of radio stations WKAR-AM and WKAR-FM, Michigan State University, has been elected to the National Educational Radio (NER) board of directors for a three-year term.

Television members of the National Association of Broadcasters recently elected six station executives to the Association's Television Board of Directors to two-year terms. They are: **Joseph E. Baudino,** Westinghouse Broadcasting Co., Washington, D.C.; **Richard C. Block,** Kaiser Broadcasting Corp., San Francisco, Calif.; **Donald P. Campbell,** WMAR-TV, Baltimore, Md.; **Arch L. Madsen,** KSL-TV, Salt Lake City, Utah; **A. Louis Read,** WDSU-TV, New Orleans, La.; **Willard E. Walbridge,** KTRK-TV, Houston, Tex.

Arthur Hungerford of Pennsylvania State University recently was elected to the presidency of the Association for Professional Broadcasting Education. **Mrs. Marianna B. Campbell** of Avco Broadcasting Corp. was elected vice president of the Association, and **Henry H. Fletcher** of KSEI was reelected secretary-treasurer.

The election of **Robert Doubleday** as chairman of the ABC Television Network's Affiliates Board of Governors was announced recently by Burtom LaDow, outgoing chairman.

The Society of Broadcast Engineers has announced the following slate of new officers: **Al Chismark,** president; **Lewis Wetzel,** executive vice president and **Otis Freeman,** member of the board of directors.

Dr. Peter C. Goldmark

Seymour T. Tyler

Dr. Peter C. Goldmark has been named a recipient of the George Washington Award for contributions to scientific research and human knowledge. The George Washington Award, given annually by the American Hungarian Studies Foundation, was presented recently at formal ceremonies in New York City.

Seymour T. Tyler has been named southwest regional manager for Chester Electronic Laboratories, Inc., Chester, Conn., according to a recent announcement by William E. Amos,

Circle 40 on Reader Service Card

national sales manager.

Visual Electronics Corp. has announced the appointment of **Sidney V. Stadig** to the new post of manager-headquarters sales.

Richard R. Peterson

Alfred Garshick

Richard R. Peterson has been appointed marketing manager for videotape systems, announced recently by J. H. Trux, vice president and general manager of Bell & Howell's Tape Division.

Alfred Garshick has been named chief engineer of Boston Insulated Wire and Cable Co. The announcement was made recently by J. C. Burley, president of BIW.

Reeves Sound Studios announces the promotion of **Sandy Tirado** to the post of manager of Field Operations.

Thomas J. Dunsheath

Oral Evans

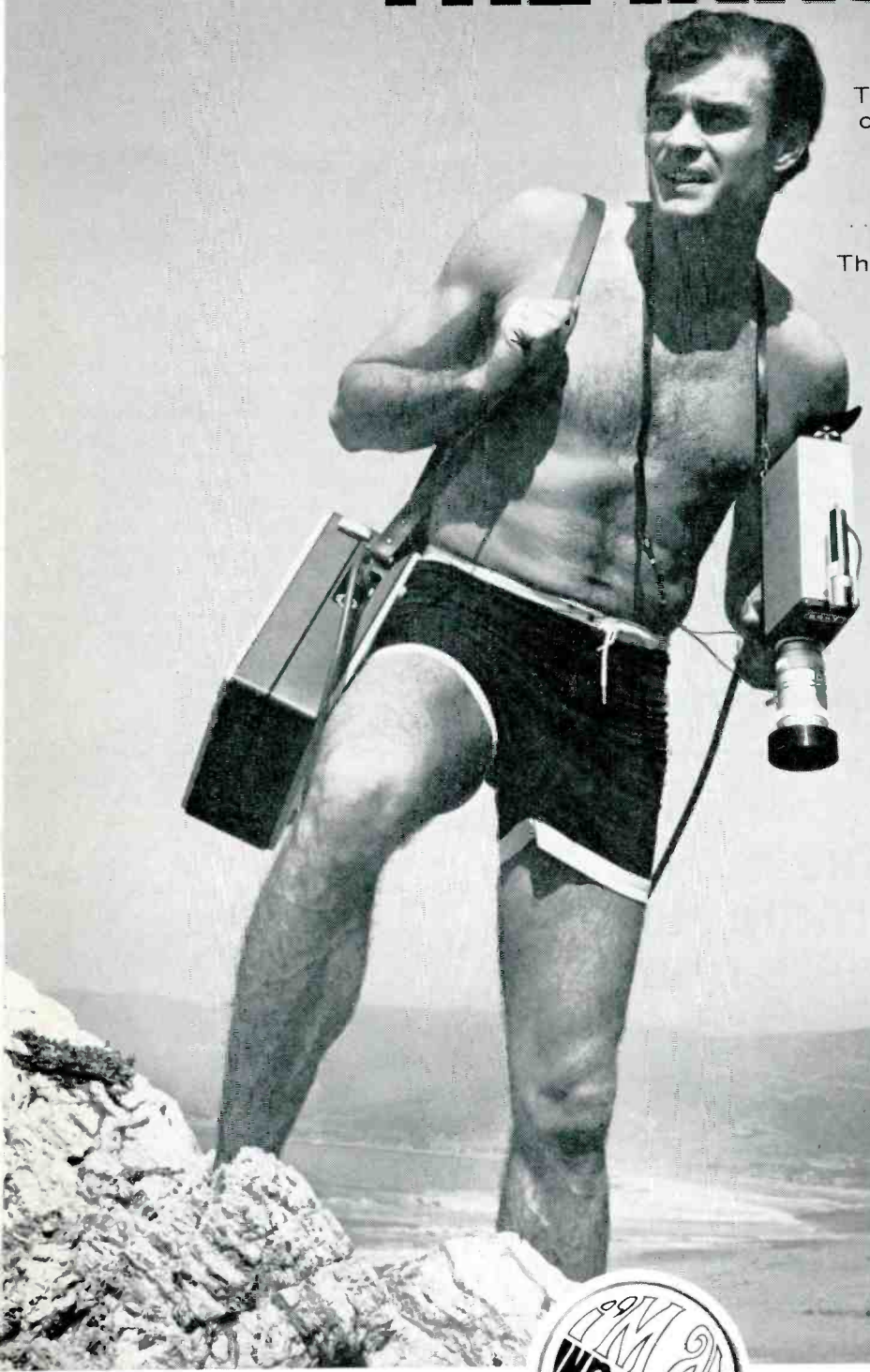
Harold Blakeslee

George Foster

Thomas J. Dunsheath has been named vice president, engineering, for Ampex Corporation's Consumer and Educational Products Division. Rein Narma, Ampex vice president and division general manager, made the announcement. Nathaniel M. Marshall, division vice president, marketing, has announced the appointments of **Oral Evans, Harold Blakeslee** and **George Foster** to top posts on the newly-formed industrial and educational products staff.

Robert N. Vendeland has been named general manager of Conrac Division of Conrac Corporation, it was recently announced by William J. Morland, vice president and communications group manager.

JOIN THE INNOVATORS



This man is a member of the world's newest club . . . THE INNOVATORS. And only Sony, with its wealth of engineering talent and research capabilities, could form this club and develop its membership symbol . . . the all-new, battery-operated VideoRover.

This innovation puts sight and sound on video tape instantly, simply. The VideoRover features a built-in, one-inch TV screen that shows you exactly what you're recording through the zoom lens. And best of all, it weighs only 16 pounds (11 for the recorder, 5 for the camera), so it goes where you go, when you want to go!

Whatever your application . . . sales, training, surveillance or education . . . this newest addition to Sony's famous Videocorder® line is trigger-ready to fulfill your needs.

Want to find out how you can join THE INNOVATORS? Just fill out and mail the coupon, or circle the correct number on the inquiry card elsewhere in this magazine.

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A SIMPLIFIED LEASING PROGRAM IS AVAILABLE ON ALL SONY VIDEOCORDERS.

Yes. I want to join THE INNOVATORS. Send me information on how to join and literature on Sony's new VideoRover.

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VTR DIVISION
47-47 Van Dam St., Long Island City, New York 11101

BM/E

Circle 43 on Reader Service Card

Lee Loevinger, Defense Commission of the FCC, recently appointed WERE General Manager **Harry Dennis** as chairman of the Ohio State Industry Advisory Committee.

Roger D. Allan has been appointed assistant to the director of public relations of the Electronic Industries Association.

WKBD Detroit announces the following series of appointments: **Joseph P. Nagy** as producer-director, **William S. Murray** as traffic manager and **Robert C. Hunter** as producer director.

President Vincent T. Wasilewski of the NAB recently announced the appointment of seven radio broadcasters to serve on NAB's Small Market Radio Committee. **Raymond A. Plank**, owner of WKLA, Ludington, Mich., was reappointed for the final year of his three-year term and redesignated as chairman of the committee. Also reappointed to complete the last year of their three-year terms were **John F. Hurlburt,** president and general manager of WDUN, Gainesville, Ga., and **Robert E. Thomas,** vice president and general manager of WJAG, Norfolk, Neb. Newly-appointed to two-year terms were **Frank B. Estes,** president and general manager of WKXL, Concord, N.H.; **Julius E. Talton,** president of WHBB, Selma, Ala., and **William A. Merrick,** president and general manager of KBMN, Bozeman, Ariz.

The appointment of **Allen A. Preisinger** as sales engineer in Lenkurt Electric Co., Inc.'s Chicago office was announced recently by Donald R. Herdine, central industrial sales manager.

Jack R. Bentley

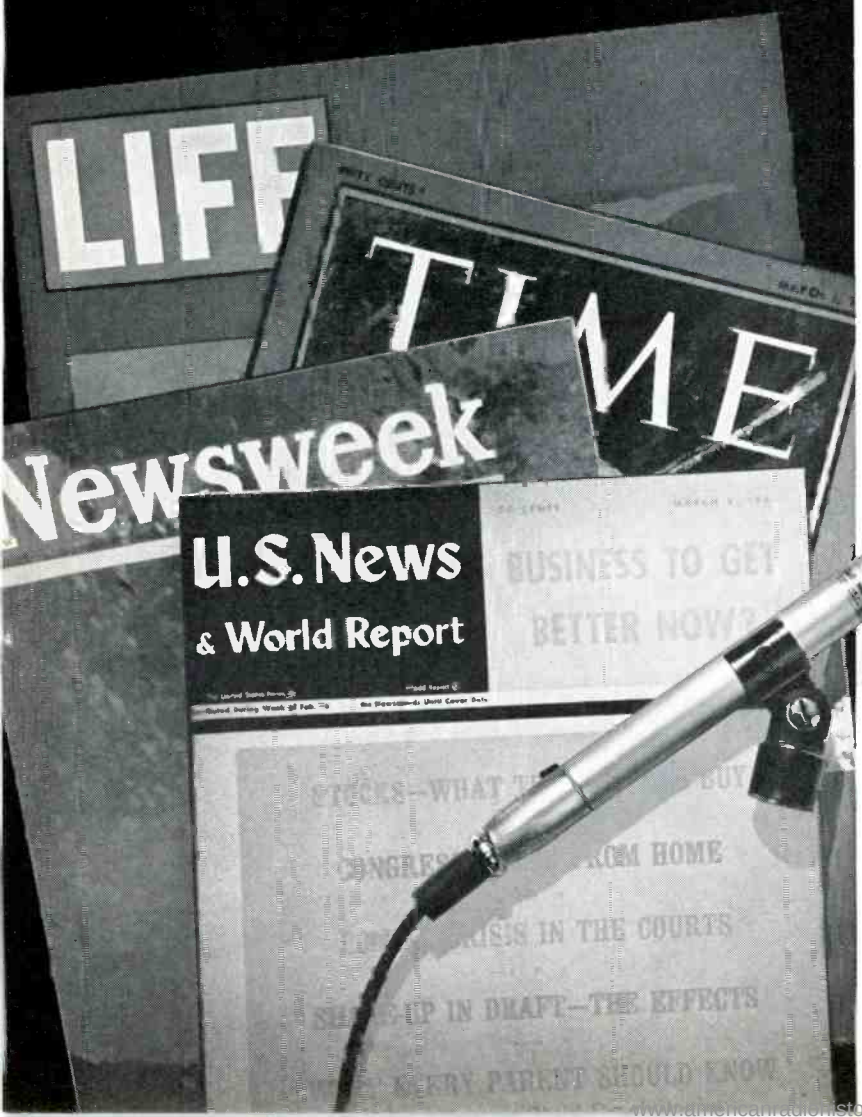
Frank D. Ratigan

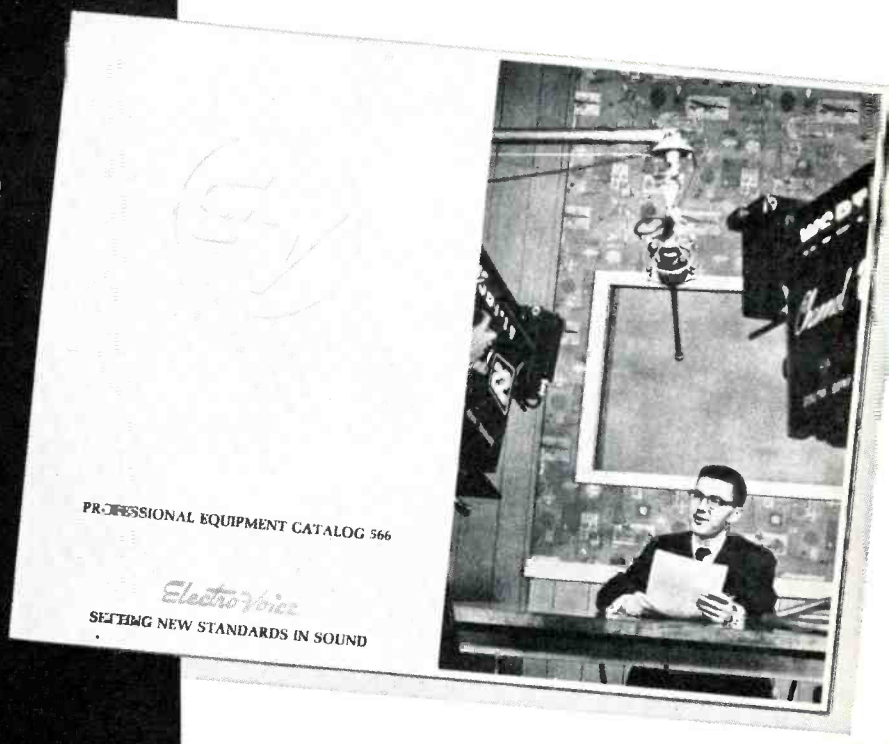
Appointment of three new vice presidents of LTV Ling Altec, Inc., subsidiary of Ling-Temco-Vought, Inc., was announced recently by Lee D. Webster, president and chief executive officer. **Paul E. Ave** will be vice president, secretary and general counsel and **James N. Whitson, Jr.,** will be vice president-finance and treasurer. Appointment of **Jack R. Bentley** as a new vice president of LTV Ling Altec also was announced by Lee D. Webster.

Frank D. Ratigan has been named manager of the Washington, D.C., office of Philips Broadcast Equipment Corp., Paramus, N.J. The announcement was made by Anthony R. Pignoni, director of marketing.

Our current catalog shows the entire Electro-Voice professional microphone line.

Strangely enough, so do Life, Time Newsweek, and U.S. News & World Report! Year after year after year!





For the 7th consecutive year we've counted microphones—by brand—in the four major newsweekly magazines. And, once again, Electro-Voice dominates the picture at major world news events.

We studied every editorial photo, in every issue, for a year. There were more Electro-Voice microphones seen than all other U.S. brands *combined!* E-V microphones were pictured 4.82 times more often than the next most popular brand.

We think this survey tells an important story about Electro-Voice quality and dependability. A story that is continued in TV, radio, movie, and recording studios throughout the world.

If you don't yet have a copy of our current catalog, fill out the coupon today. It will bring full details on the entire line. And to see E-V microphones in action . . . just keep reading.

Electro-Voice®

A SUBSIDIARY OF GULTON INDUSTRIES, INC.

• high fidelity speakers and systems • tuners, amplifiers, receivers • public address loudspeakers • microphones • phonograph needles and cartridges • organs • space and defense electronics

ELECTRO-VOICE, INC., Dept. 681EM,
614 Cecil Street, Buchanan, Michigan 49107

Please send me the current Electro-Voice professional products catalog.

Name_____

Firm_____

Address_____

City_____ State_____ Zip_____

Circle 47 on Reader Service Card

BROADCASTERS SPEAK

Sirs:

I enjoyed your article entitled "The Wasteland of Stereo Fm" by Carl E. Roliff, in the March 1968 issue of *BM/E*.

However, I note with interest Figure 6 on page 43 which seems to be incomplete. This figure is correct for a composite audio signal utilizing both the stereo subchannel and SCA, however, it does not reflect one sideband of the rf signal as indicated in the article. The rf energy of a composite stereo signal and SCA would cover the same spectrum as that of a monaural signal, the exception being that the frequency of sweep would be more rapid for the composite. In other words, energy content of the modulated rf would still be within the ±75 kHz range for 100-percent modulation of the composite signal. It is the amplitude of the composite audio signal that causes frequency deviation on the modulating carrier. The frequency components of the composite audio determine rate of sweep of the rf.

Richard A. Ingraham
General Manager, Chief Engineer
KLGS-FM, Los Gatos, Calif.

We've queried author Roliff on this: "You are correct that Fig. 6 shows only one sideband of the composite signal. In fact, the caption under Figure 6 refers to it as the "Upper Sideband." The text immediately to the left of Figure 6 states that "positive and negative main carrier deviations should be equal.

"The Figure 8 caption is confusion and no one has caught it yet. With no modulation there will be merely a dot in the center of the scope. The straight lines are produced by left only and right signals.

"This is the simplest method of checking total system performance. Hook up that scope and tell me if you get straight lines, and while you are at it check any other stereo stations that will cooperate. I am sure you'll find many slanted lines."

Another reader wrote questioning Roliff's statement that modulation levels are 45-percent main carrier; 45-percent stereo channel since the main channel and stereo subchannel have a modulation capability of 90 percent each. This reader said that when both right and left signals are present and equal in phase and amplitude the main channel will be modulated a maximum of 90 percent.

Author Roliff replies that the whole point is to transmit stereo. If the left and right signals are equal in amplitude and phase, then that is a mono signal and the transmitter should have a capability of modulating 133 percent or ±100 kHz deviation. However, FCC rules limit the mono signal to ±75 kHz deviation equal to 100-percent modulation.

The statement of 45-percent main channel, 45-percent stereo subchannel and 10-percent pilot does add up to 100 percent and makes an understandable explanation to station managers and the less technically inclined, although a simplification.

This same reader doubted the fact that stereo is not as loud as mono. Roliff explains why there is a definite increase in modulation levels with stereo broadcasting compared to mono. Mono ±75 kHz equals 100 percent or total deviation. For stereo, the main channel cannot deviate into the stereo channel and still be broadcasting stereo. No two signals can occupy the same space or spectrum without adding together to cause crosstalk and distortion in this case.

Since part of the 75-kHz deviation is used for the stereo subchannel, the mono listener is receiving reduced modulation and therefore reduced levels of approximately 6 dB.

If, with stereo microphones feeding both channels (mono), you then drop to either left or right there is a 6-dB drop in levels—that is why pan pots have the 6-dB drop built in when in the center or the mono position.

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gives CATV "news power"

...at home, at work, on the go, wherever people are within reach or range of the television screen, Alphamatic News reaches their special interests—through CATV. Alphamatic News is the unique news-carrying system designed especially for CATV origination.

It brings subscribers an additional value—instantaneous, 24-hour news. You can originate every important announcement of news as it's happening—around the world or around the corner. United Press International news flashes as they come off the wire. New York and American Stock Exchange quotations on a fifteen-minute delayed basis. Your own locally originated messages—all are available to you for your subscribers.

And, as additional selling strength, Alphamatic News keyboard input gives you the potential of paid sponsorship—local advertising with no additional costs to you.

Put this uniquely flexible CATV selling tool, the "news power" of a custom Alphamatic News System, to work for you. Write for details and a complete Alphamatic News selling kit that helps you sell more CATV subscribers.

ALPHAMATIC NEWS LOOKS LIKE THIS ON CATV SUBSCRIBERS' SCREENS -BRINGING NEWS AS IT HAPPENS FROM UPI TO THE NEW YORK STOCK EXCHANGE TO YOUR OWN LOCALLY ORIGINATED MESSAGES.

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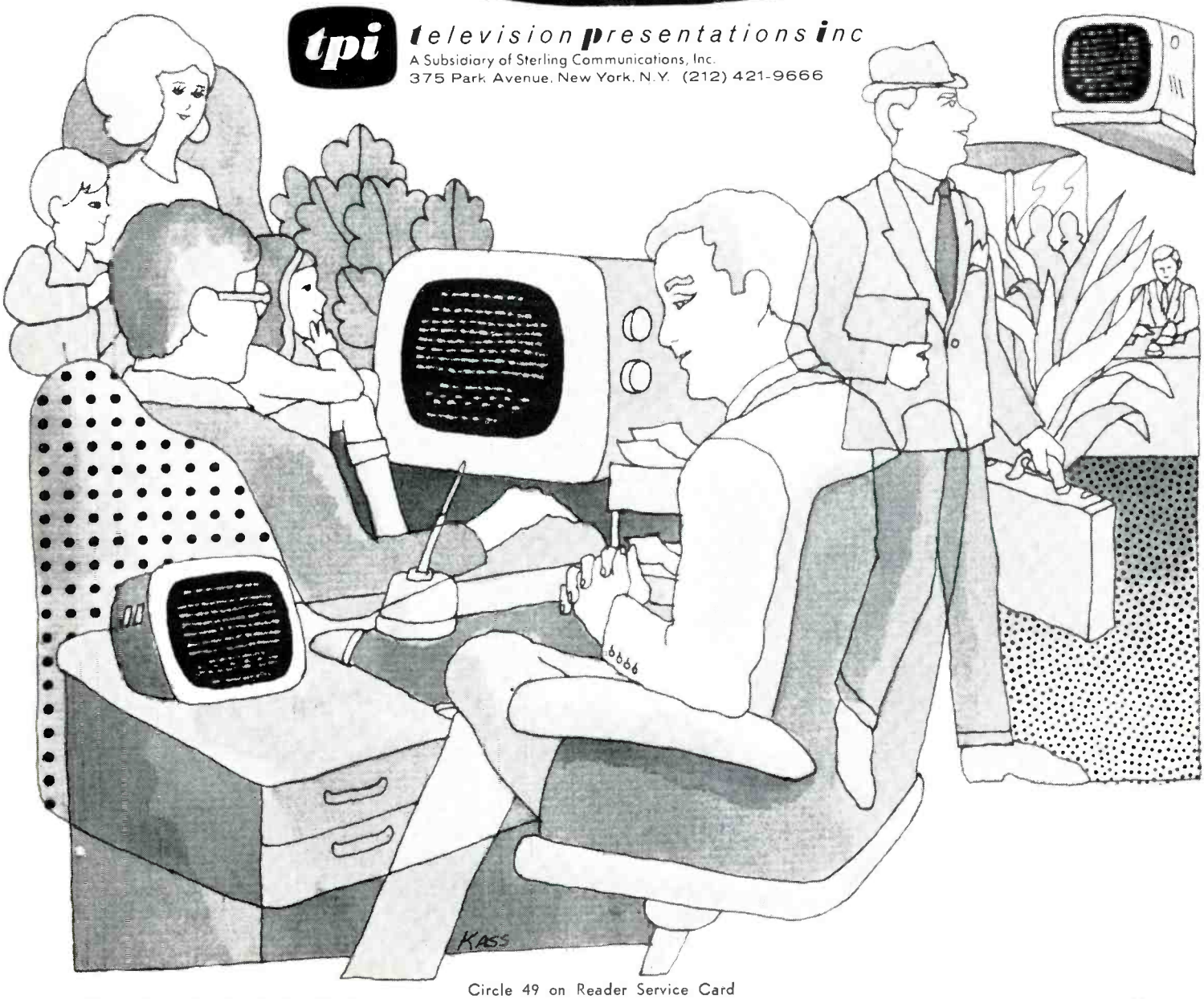


Circle 49 on Reader Service Card

← Circle 48 on Reader Service Card

Sirs:
I've been an avid reader of your magazine since its inception. Especially interesting are the articles concerning FCC rules and regulations. If I recall correctly one of your early issues contained an article on program logs. I would greatly appreciate it if you could send me a copy.

Green Bay, Wis.
Dave McKay
WBAY Radio

May/67 BM/E *on the way, D.M.*

Sirs:
I am a student in the last year of a business school in Paris. I am preparing a thesis on videotape recorders.

I need information on the historical background of VTRs and on their application in publicity and marketing.

Dominique Indjoudjian
Paris, France

June/67 and March/68 BM/E's *on the way, D.I.*

Sirs:
We, as architects, are planning a relocation of radio station WJAX here in Jacksonville.

We have been handed your November '66 issue on radio station planning and modernization which is very helpful. We are wondering if you have other issues of your magazine, perhaps more recent, with other articles which would show layouts or otherwise might be helpful, and if so what would we do to avail ourselves of same. Tear sheets serve our purpose. Awaiting an early reply.

John R. Gravely
Architect
Gravely & Gravely, Architects
Jacksonville, Fla.

Nov./67 BM/E *on the way, J.G.*

Sirs:
Your February/68 issue carried an item on X-radiation from television sets. The article referred erroneously to excessive readings on 12 brands of color receivers in tests at Consumers Union. The number was two, not 12.

Robert L. Smith
Assistant Director
Consumers Union
Mount Vernon, N.Y.

Thanks for the correction, R.S.

Sirs:
Some months ago in your great magazine you ran an article on modifying a "C.B." type two-way radio for use in the 26 MHz Remote Pickup band. Please send me a reprint of the article if at all possible.

Thank you very much, and keep up the good work. ***BM/E*** fills a much needed gap between management and engineering. Usually, both know nothing about the other . . . but through publications such as yours both can learn about the other.

Michael McKee
Chief Engineer
KWCO Radio
Chickasha, Okla.

We mentioned in September/67 "Broadcasters Speak" that an article fitting your description had been run in May/65 BM/E, *M.M. A copy's on the way.*

Sirs:
Congratulations on your two-part article, "Guide to CATV Cable Selection." Such a dissertation on one of the basic components of CATV has long been overdue. Your presentation should be of considerable help to the industry in trying to understand some of the problems, etc., confronting the little ole cable makers like ourselves.

S. A. Mills, Vice President
Production & Engineering
Ameco Cable, Inc.
Phoenix, Ariz.

LITERATURE of INTEREST

For additional data, circle number shown on Reader Service Card.

Disc memories for video display of digital data is the topic of 8-page booklet from Data Disc. **150**

Cabinet air conditioners with 4 cooling capacities from 4000 to 12,000 BTUs are presented in bulletin from Kooltronics. **151**

Circuit tester with capacity to test any type circuit, cable harness, or backplane wiring at the rate of 100,000 tests/s is described in technical bulletin HS1 from Micro Metrics. **152**

"Cooling systems for Electronic Cabinets" is the title of 21-page catalog from Zero Manufacturing. Catalog contains 4 pages of helpful engineering data for blower selection. **153**

"**Rf Measurement** And Test Instrumentation" is a 7-page catalog from Jerrold Electronics Corp. Booklet has illustrations and specifications of sweep generators, amplifiers, measurement comparators, marker generators, attenuators, etc. **154**

"**Barndoors** . . . Functions, Applications and Limitations" is the title of an article in issue No. 3 of *Color-Tran News*. Also included in 8-page newsletter are general application stories and highlights of the third annual Illuminating Engineering Society/Theatre, Television Symposium and a state-of-the-art report on "Film Lighting." **155**

Lettering by transfer catalog (31 pages) contains descriptions of line of over 2000 dry alphabet transfer sheets from Datak Corp. **156**

A-m/fm/TV broadcast audio equipment made by McCurdy Radio Industries is presented in four-page folder. **157**

Electronic measurement apparatus with wide variety of applications is presented in 44-page booklet from Norelco. **158**

Air filter panels for suppression of rf and electromagnetic interference received and/or generated by electronic equipment are described in EMC series data sheets from Technical Wire Products. **159**

"What's New on Smoking in Print" is the title of a pamphlet available for 5 cents each, or $3.00/100 copies, from Department of HEW. **160**

TV market estimates of the number of TV households with color sets, multisets and uhf-equipped sets as of November/67 are tabulated on the basis of area of dominant influence for all states in the union (excluding Alaska) in "Television, U.S.A." from American Research Bureau. **161**

Weather radar data on available models, specifications, installations and symbology recognition are available from Kaar Electronics. **162**

Special purpose tube manufacturing facilities are described in colorful 22-page booklet entitled "Special Purpose" from ITT Electron Tube Division. **163**

Audio automation systems (Series 600) are illustrated and described in detail in 6-page brochure from IGM. **164**

Select-A-Lesson 16-page brochure from RCA illustrates and describes two types of dial access systems designed for instructor use and independent student learning. **165**

"**FM,** A Look at Frequency Modulation Radio" is a 10-page NAB booklet on fm radio. Single copies available free. Bulk orders, 5¢ per copy. **166**

Telescopic Aerial Tower Model TH-28 is described by Baker Manufacturing in an informative booklet in color and illustrated. **167**

Acoustical doors, full-flush, glazed and louvered with sound transmission class ratings from 35 to 62 dB, described in Catalog 170/OV from Overly Manufacturing Co. **168**

Servo controlled pan and tilt system (Model 520) by Albion described in 4-page, 2-color data sheet. **169**

"**Elements of Color** in Professional Motion Pictures," reprinted by the Society of Motion Picture & Television Engineers (SMPTE), containing 104-pages and 27 color illustrations is available with 8-page insert, "Motion Picture Prints from Color Originals," provided by Eastman Kodak for $7.00. Discounts for SMPTE members. **170**

RCA's **TeleRoamer,** a self-contained television production center from RCA, is featured in an 8-page brochure from RCA that shows three new instructor-controlled television systems. **171**

"News from Rohde & Schwarz," (Edition 28) includes a survey of the range of test equipment especially made for monochrome and color television and a discussion of vhf radio and TV antennas with specific antenna characteristics, radiation patterns, power gain and polarization. **172**

Frequency selective voltmeter (Model 2006), designed to measure directly voltages in a-m, fm and TV frequency ranges is described in 8-page illustrated booklet from B&K Instruments. **173**

Intercommunications system (Model Altecom 300), serving 10 to 99 stations, for in-office use, is described in Data Sheet AL-2149 from Altec Lansing. **174**

Cardioid mic and specifications for guitar and theater speakers are presented in Brochure AL-1370 from Altec Lansing. **175**

Photographic writing speed vs displayed signal amplitude of oscilloscopes is topic of discussion of bulletin from Tektronix. **176**

Cable manufacturing processes and list of cable types are presented in booklet entitled "The Truth" from Brand Rex Div. **177**

"Man and His Sound—Expo 67," "Multi-Screens and Expo 67," "The Labyrinth Pavilion at Expo 67" and "A Cruciform System for Expo 67" are papers contained in the March/68 issue of the *Journal of the Society of Motion Picture and Television Engineers.* Journal is available from SMPTE for $2.00. **178**

Magnetic boards for presentation of sales, production, financial, or other data is topic of 28-page catalog from Methods Research Corp. **180**

Oscilloscopes & Associated instruments is topic of 336-page illustrated and indexed catalog from Tektronix. **181**

Data sheets listing features and specifications of AG-600 portable audio recorder, AA-620 speaker/amplifier and AM-10 mixer are available from Ampex. **182**

Catalog and handbook (84 pages) from Hewlett-Packard combines discussion of dc power supplies and descriptions, specifications and illustrations of available products. **183**

Automatic programming system made by MaCarTa is described in brochure now available. **184**

Audio products general catalog from Ampex provides application notes and product information on recorders and tape. **185**

Case histories illustrating use of audio equipment in educational, industrial training and automation applications are available from Ampex. **186**

Audio tape—Series 600—performance characteristics are presented in brochure from Ampex. **187**

Aural STLs and solid-state radio remote control systems are described in 8-page Bulletin 222 from Moseley Associates. **188**

"The Case For Attenuators" in vol 5, no. 1 of "Watt's New From Bird" discusses attenuator applications. **189**

"STEP" system for TV switching automation is presented in 4-page bulletin from Chrono-Log Corp. **191**

Knobs—including tactile-shape, pointer, crank, slip-clutch and spinner types—are presented in brochure from Russell Industries. **195**

ACCESSIBILITY

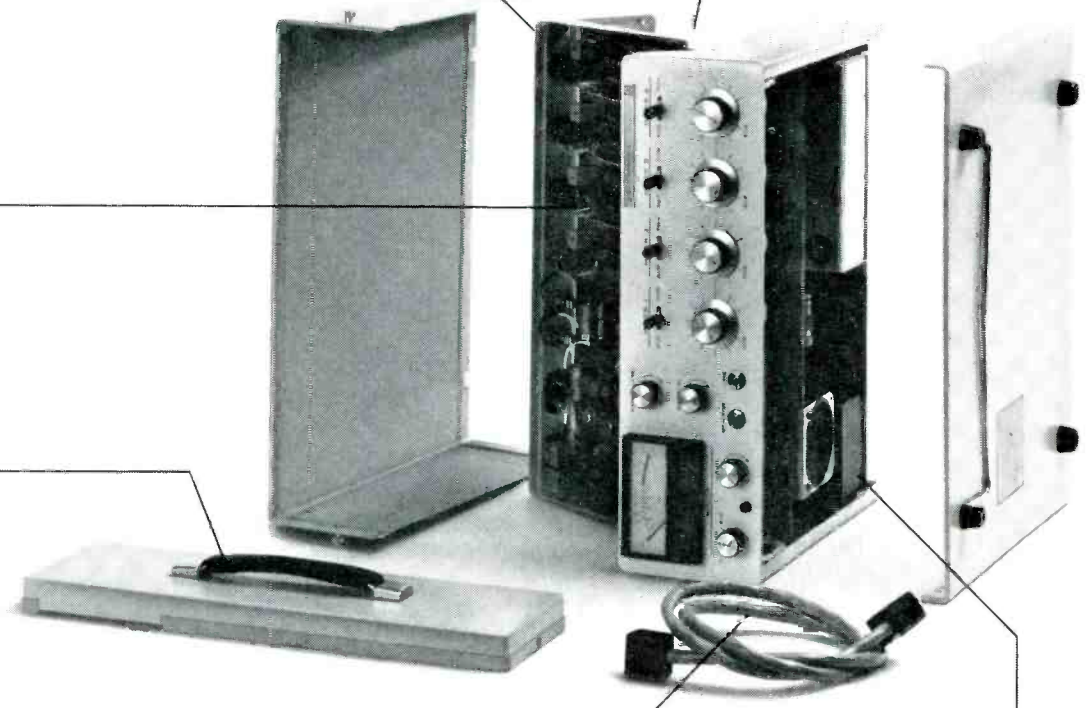
Top and bottom covers removed individually to expose all components. Circuit board hinged for easy access to reverse side and cables.

FLEXIBILITY

- 4 switch-selectable inputs: hi-level/mike/equal phone cannon XL connector/barrier strip input.
- External studio and local speaker.
- P. A. output (public address).
- Muting relay contacts on barrier strip.

ELECTRONICS

- Etched-epoxy circuit board.
- Plug-in silicon transistors.
- 4 preamplifiers (each normal on equal RIAA phono).
- 1 program amplifier.
- 1 monitor amplifier.
- Speaker muting relays for local and studio speakers.
- May be strapped to operate from any mixer.
- Two-speaker muting.



PORTABILITY

Weight: 28 pounds.
Height: 5".
Width: 14".
Length: 17".

PARALLEL OPERATION

Optional plug-in cable allows parallel operation of two 212J-1's. Arrangement provides 8 input channels (hi-level/mike/phono), two metered program output channels, and two switchable input monitor channels.

OPTIONAL POWER SOURCE

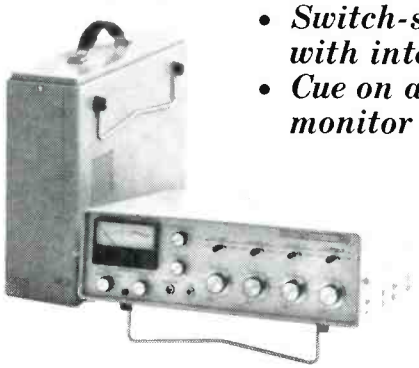
Self-contained power supply that operates the unit on AC also serves as charger for optional internal nickel-cadmium 12-volt battery. Unit switches automatically to battery in the event of an AC power loss. Unit also operates on external 12-volt battery.

a studio production console and remote pickup amplifier in one unit

That's the combination you get in Collins' new 212J-1 Console. Produce spots, conduct remote pickups, or operate the control room in emergency situations.

Completely solid-state, the 212J-1 offers:

- ***Four input channels, each with selectable switches for hi-level, microphone, or phone (RIAA equalization).***
- ***One program output channel.***
- ***Switch-selectable monitor amplifier with internal speaker.***
- ***Cue on all mixers overriding into monitor channel.***
- ***Local and studio speaker muting.***
- ***Public address system feed with level control.***



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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.

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We are expanding our distributor territories, and offer to those who qualify franchises for background music, with phone lines, FM Multiplex, or on-premise systems.

Complete details forwarded on request: Address:

Joseph F. Hards, Vice Pres.
SEEBURG MUSIC LIBRARY, INC.
1500 North Dayton Street
Chicago, Illinois 60622

PERSONALS

PROFESSOR JOE LANGSTON (California State College at Long Beach) 653 Winslow Ave., Long Beach, Calif. 90814, wishes address of Al Venning; wants to contact him for research on UAW TV show Venning directed at CKLW-TV, Windsor, Canada, in the 50's.

HELP WANTED

ASS'T DEVELOPMENT ENGINEER

Will perform specific professional engineering tasks in the fields of television, sound and other communications media. The field of work encompasses electronic systems design and writing of specifications. Should have min. six yrs. exper., with T.V. distribution systems and studio type facilities. Send resume to:

University of California
Employment Office
A-328 Administration Bldg.
405 Hilgard Avenue
Los Angeles, Calif. 90024

Chief engineer for new UHF station in major midwest market. Your chance to build station from ground up. Must be experienced all phases of installation and technical operation, including VTR, color, and personnel supervision. You know what we want. If you have it, send complete summary, references, photo, salary to Box 668-1, c/o BM/E, Blue Ridge Summit, Pa. 17214.

IMMEDIATE OPENINGS—Qualify for any of the following positions: Technicians for RCA closed Circuit Television equipment—Camera men—Maintenance men—Video Tape Men—Video Engineers, RCA Rep. 143-08 94th Ave., Jamaica, New York, or (212) 297-4344.

Wanted—audio maintenance technician to handle installation, repair, maintenance and some operation of quality audio equipment. Strong maintenance background mandatory. Send resume to James Gundlach, State University College, Oneonta, New York 13620, or call 607-431-3316

HELP WANTED (Cont'd.)

BROADCAST PERSONNEL
NEW ETV STATION

Ground-floor key position openings now available for West Virginia's first public/educational TV station—WWVU-TV, Morgantown. New physical plant including million dollar color facility. High band color video tape (4) and color film (2). Transmitter is 30 kw. Applications being accepted for Studio Supervisor, Project Supervisor, Video Tape/Film, Master Control Switcher and Transmitters Operations personnel. Contact: Mr. Jack Podeszwa, Personnel Office, West Virginia University, Morgantown, West Virginia 26506. Telephone: Area code 304-293-3179.

First Class men, all levels, for maintenance only. No mike work. If you have experience we will pay for it. If you need experience we will train you. Pleasant operation. East Coast. Box 668-7, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Morning man for MOR midwest 5 kw—good on production—some TV also—right salary for right man. Send picture, resume and references to Box 668-2, c/o BM/E, Blue Ridge Summit, Pa. 17214.

TRANSMITTER SUPERVISOR—to install and maintain new remote RCA TTU 30. Apply to Wallace Provost, Chief Engineer, WREP-TV, 1168 Commonwealth Ave., Boston, Mass. 02134.

Openings—1st phone engineers experienced in maintenance, audio, videotape. Send resume, Chief Engineer, WGBH-TV, 125 Western Avenue, Boston.

Combo man wanted. Accent on announcing, but some basic technical knowledge desirable. Atlantic coast area. Box 668-8, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Opening for 1st Class studio engineer. Color experience desirable, but will consider aggressive learner. Call or write Arthur Bone. WJRT-TV, P.O. Box 12, Flint, Michigan. 313/239-6611.

POSITIONS WANTED

Have rate card will fly. Seeking management position where these qualifications will be utilized: broadcast "idea" salesman, creative programming. Bachelor Science degree, radio/TV, developing active advertisers, commercial pilot license, instrument and multi-engine rating. Resume is in Box 668-9, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Radio-tv announcer looking for first position. Broadcasting school graduate. 3 yrs college, military completed. 3rd endorsed. Will relocate. Dependable, anxious to get started. Paul Siragusa, 79 Chatsworth Ave., Kenmore, N.Y. Phone: 716/873-2930.

Creative TV Producer/Director, 36, with heavy experience videotaping productions, remotes, music scoring, desires position with production center or station, or as production manager. Box 668-11, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Beginning announcer-dj. Broadcast school grad., 3rd endorsed. C&W, MOR, play by play for baseball, basketball. Prefer midwest, Arizona or Nevada. Available now. Robert Erschen, 313 Bryant St., Dubuque, Iowa, 319/582-0870.

Creative University of Michigan graduate engineer with 23 years experience. Will assure uniform high quality, FCC compliance, reduced maintenance. $1000/month minimum. Box 668-3, c/o BM/E, Blue Ridge Summit, Pa. 17214.

TV Development Engineer. Broadcast, CCTV, CATV and Film Systems: Cameras, Projectors, Color Transmitters and Receivers, Video Test Equipment. 25 years Tube and Solid State experience. SMPTE. Wm. P. Kruse, 324 Tyrone, El Cajon, Calif. 92020.

Hardworking Chief Engineer available. Construction, maintenance, proofs. AM and FM stereo. No junk or dishonest stations need reply. Family man. Will consider maintenance engineering. Box 668-4, c/o BM/E, Blue Ridge Summit, Pa. 17214.

POSITIONS WANTED (Cont'd.)

Negro announcer—dependable—experienced. Reliable—can work any type station. Third endorsed. Box 668-12, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Negro broadcast school graduate. 3rd endorsed, draft exempt. Anywhere. Needs a start—NOW! Box 668-13, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Kovacs-type TV personality/writer. Brilliant. Funny. Reasonable. Box 668-10, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Soul jock—3rd endorsed, tight board. Draft exempted. College training, relocate. Box 668-15, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Authoritative newscaster DJ, announcer third class ticket, non-floater, family man. Jazz or popular music. Box 668-14, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Disc jockey—experienced; tight board, dependable, newscaster, authoritative, salesman, aggressive, versatile, creative, third endorsed. Box 668-5, c/o BM/E, Blue Ridge Summit, Pa. 17214.

DJ—announcer. N.Y. Career Academy grad. 3rd end. Draft exempt. Looking for first start. Willing to work hard. Charles Urnie, 76 Brookdale Lane, Waterbury, Conn. 06705.

Soul R&B, top 40 dj—Needs start—authoritative news—excellent commercials—third endorsed. Clarence Collins, Box 5627, Chicago, Ill. 60680.

Radio school grad. 24. knowledge of sales and sports. Anywhere east of Mississippi. Box 668-6, c/o BM/E, Blue Ridge Summit, Pa. 17214.

EQUIPMENT FOR SALE

ANTENNA FOR SALE

1 RCA TFU-24BLS Antenna (Ch. 27) with ½ degree electrical beam tilt. Good condition (VSWR 1.1 to 1 or less).
28 sections RCA MI 19089 UHF Trans. line. 3⅛ inch—20 ft. sections.

Contact: R. J. Wickham,
Dir. of Eng. WKOW-TV
Madison, Wisconsin 53701

Remote control metering—Gates M-4616 RCM 12-includes transmitter/receiver, power supplies and conrol panels. $350. G.E. FM circular antenna—2-Bay, 88-108 MHz-power handling capacity 12.5 kw-gain 1.70. $150.00. Write or call—Sierra Electronics & Engineering Corp., P.O. Box 1526, Reno, Nevada—Telephone 786-2600.

Scully tape recorders, finance and trade. Two Spotmasters Playback, and one record/playback, all three, $38.25 monthly. New equipment. QRK or Russco deluxe turntables, $10.80 monthly. Write for list. New cartridges shipped freight prepaid. Audiovox, Box 7067-55, Miami, Florida 33155.

2 450D Ampex type tape playbacks, low impedance heads, automatic reversing, 600 ohm output, schematics, spare belts, cases. Gates M6160 SCA 67kc subcarrier generator. High Tor Background Music, 847 S. Circle Drive, Colorado Springs, Colo. 303/634-4118.

SACRIFICE: RCA Color TV camera, controls & power supplies—$5,300.00. Like new COHU solid state color sync Generator, color standard, genlock—$1,650.00 Ampex/Motorola big screen color monitor—$450.00 FOB Tampa, Florida (813) 232-7033 after 6 P.M. No collect calls.

Ampex PR-10-2 stereo recorder, good condition. "Make an offer." A superior type EM voltage regulator. Input: 195-255V. Output 230 V. 3-phase, maximum current 38 amps. Maximum KVA 15. "Make an offer". WFIN, Findlay, Ohio 419/422-4545.

RCA TTU-1B transmitter with spare parts, $15,500.00. Color corrected and presently tuned to channel 33. Good condition, also available one RCA channel 33 filterplexer. Contact David Boyer, WICO-TV, 17 E. University Ave., Champaign, Illinois 61820.

Largest supply of G.E. & Motorola radio and mobile telephone equip. in the U.S. (30-50), (150-174), (450-470), Base, repeater, and dial equip. Dealers invited. Western Mobile Telephone Company, 200 South Anaheim Blvd., Anaheim, Calif. (714) 774-0520.

← Circle 51 on Reader Service Card

EQUIPMENT FOR SALE (cont'd)

FRANCHISED DEALER for the following: Klipsch, Tannoy, Altec, Rectilinear, Teac, Uher, Ar, Wharfedale, Dynaco, Sherwood, Kenwood, Garrard, Benjamin, Tou-Jay, Audio Originals, Superior Sound, 621 S. Main St., N. Syracuse, N.Y. 13212.

Mr. Chief Engineer avoid break-downs don't buy used tubes. Buy brand new RCA, GENERAL ELECTRIC, WESTINGHOUSE and EIMAC tubes. Send us your requirements. UNITED RADIO CO., 56 Ferry St., Newark, N.J. 07105.

Browning model BR-3A-67 and BT-3A-67 Background Music SCA receivers—67kc. Some require service. As is $35.00 each—House of Sound, 714-2nd Avenue, South Minneapolis, Minn. 55402.

For Sale: country records. About 800—45's, 140 LPs. 95% country old, new and in between. Best offer. Mrs. Harris, 1524 Vista Avenue, Boise, Idaho.

Complete kit audio proof forms $3.50 postpaid. Specify AM/FM. Box 2605, Corpus Christi, Texas 78403.

"Broadcast equipment!" Complete stations packages—bought sold. "SOS", 270 Northcrest, Chattanooga, Tennessee.

Whatever your equipment needs . . . check first with Broadcast Equipment and Supply Co., Box 3141, Bristol, Tennessee 37620.

Towers, broadcast, microwave, CATV, TV, new and used, phone 224-9922 Tower Maintenance, Inc., 2408 Old St. Rd., Tallahassee, Fla.

6 element circular vertical and horizontal antenna. Price $2,400.00. Box 668-16, c/o BM/E. Blue Ridge Summit, Pa. 17214.

Protect your records. Send for our free Lp supply lists. Record Supplies, Hillburn, N.Y. 10931.

GOVERNMENT Surplus Electronic catalog — 25¢. Meshna, Nahant, Mass. 01908.

EQUIPMENT WANTED

Wanted: guyed or self-supporting tower 610 ft. Capable of supporting 12 bay hi-band pedestal mount antenna and 6 bay FM antenna and related equipment. Minimum 40 pound wind load. Contact William A. Ekberg or Ivar Nelson, KFYR-TV, Bismarck, North Dakota. Telephone 701/223-0900.

WANTED: all equipment for the construction of small black and white television studio. Seeking donations but will consider purchase. Supt. of Schools, Dr. James P. Harrison, Nether Providence Township, Wallingford, Pennsylvania 19086, 215 LO 6-9000.

Wanted: 4 RCA or Marconi b&w used camera chains in perfect condition. Channel 3, Box 1875. Monterrey, Mex.

330 foot guyed tower on the ground. Radio Columbus, Inc. Box 707. Columbus, Mississippi 39701. Telephone: 601/328-5040.

MISCELLANEOUS FOR SALE

SALE ON ELECTRONICS BOOKS! 5 for $3.98! Guaranteed retail value of $16.50! Grab Bag of 5 electronics books on testing, test equipment, TV, radio, hi-fi, stereo, etc. Clearance of books which sell for as high as $4.50 each. Send check or money order to: Grab Bag, Dept. BO7, Box 304, Emmitsburg, Md. 21787.

Drop ins—tape of 100 produced funny commercials, one liners, etc. . . . only $10.00. Hilarious! Audition on request. Funnies, 5118 Danny Boy Circle, Orlando, Florida.

Japanese Electronics. New products monthly! $1.00. Money-back guarantee. DEE 10639 BM Riverside, North Hollywood. Calif. 91602.

SIGNS, NAMEPLATES, LABELS, Decals, Badges, Trophies, Plaques. Seton Corp., Dept. BM/E, New Haven, Conn. 06505.

Professional Electronics Projects — $1 up. Catalog 25¢. PARKS, Box 15265, Seattle, Wash. 98115.

TECHNICAL SERVICES

VIDEO TAPE RECORDER AUDIO HEAD ASSEMBLY SERVICE

Precision relapping of all heads and supporting posts, includes cleaning and testing. AMPEX VTR audio assembly . . . $75.00 complete. Brand new shelf stock replacement heads of our manufacture available when relapping not advisable. LIPPS, Inc., 1630 Euclid St., Santa Monica, Calif. 90404 (213) EX 3-0449.

BROADCAST EQUIPMENT REBUILDERS . . . for the best in tape cartridge rewinding and reconditioning. Send for cartridge price list. Let us sell your used equipment for you swiftly and profitably. Route 8. Box 718, Fayetteville, N.C. 28304. Telephone 425-7332.

TECHNICAL SERVICES (cont'd.)

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PRECISION FREQUENCY MEASURING SERVICE
SPECIALISTS FOR AM-FM-TV
445 Concord Ave. Phone 876-2810
Cambridge, Mass. 02138

Best Buys for Local Merchants

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Audible Advertising, Inc.
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Call or Write for Samples!!!

16mm CATV SOUND PROJECTORS (synchronized for TV) $650.00
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Background Music Service
For
FM Multiplex-Wire Line-CATV Systems
Magne-Tronics, Inc.
21 East 40th Street, New York, N.Y. 10016

Something slipping? Try Vita Drive rubber drive cleaner on your tape playback equipment. Recommended by many stations. $1.25 1 oz. bottle. Postage prepaid. NO COD's. Friend's Manufacturers, 135 N. 4th Street, Philadelphia, Pa. 19106.

"DEEJAY MANUAL" is a folio of Gags, Ideas, Breaks, Gimmix, Fun for the working deejay. Special $3.00 with this ad. Write for free "Broadcast Comedy" catalog. Show-Biz Comedy Service (Dept. E) 1735 E 26 St., Brooklyn, New York 11229.

Deejays! Monthly gag service exclusive for jocks. "Hollywood Gag Digest" 711 No. Cherokee, Hollywood, Calif. 90038.

DEEJAYS! 6000 classified gag lines for radio, $5.00! COMEDY CATALOG FREE! E. Orrin, Boyer Road, Mariposa, Calif. 95338.

GIVE YOUR STATION A NEW BRIGHTER SOUND—Write The Sound Doctor, Box 3694, Birmingham, Ala.

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R.E.I.'s famous (5) week course for the First Class Radio Telephone License is the shortest, most effective course in the nation. Over 98% of R.E.I. graduates pass F.C.C. exams for 1st class license. Total tuition $350.00. Job placement free. Write for brochure Radio Engineering Incorporated Schools, 1336 Main Street, Sarasota, Florida—or 3123 Gillham Road, Kansas City, Missouri—or 809 Caroline Street, Fredericksburg, Virginia.

FCC License in six weeks from the nation's largest license school. Compare reputations and success rates before you invest. Professional announcing training on the nation's only fully school-operated commercial station used solely for training. School locations in Dallas, Atlanta, Chicago, New Orleans and Minneapolis. Write Elkins Institute, 2603 Inwood Road, Dallas, Texas 75235.

First phone in six to twelve weeks through tape recorded lessons at home. Sixteen years FCC license teaching experience. Proven results. Bob Johnson Broadcast License Training, 1060D Duncan, Manhattan Beach, Calif. 90266.

FCC License preparation by correspondence. Also, associate degree in electronics by three semesters in correspondence and two semesters in resident classes. Free details on either course. Write: Grantham Desk 7-B, 1505 N. Western Avenue, Hollywood, Calif. 90027.

GUARANTEED FIRST PHONE, 4-6 weeks. Broadcast Engineering Academy, 3700 Lemay Ferry, St. Louis 63125. 314/892-1155.

USE BM/E's CLASSIFIED MARKETPLACE TO REACH OVER 21,000 BROADCASTERS!

Please run the ad attached in BM/E's CLASSIFIED MARKETPLACE in your next:

☐ 12 issues ☐ 6 issues
☐ 3 issues ☐ 1 issue

in a space of ..... inches .....
words under the Classification of:

.....

.....

☐ Check enclosed ☐ Please invoice

Name .....

Station or Co. .....

Address .....

City ..... State .....

BM/E, Classified Advertising Department, Monterey Ave., Blue Ridge Summit, Pa. 17214. 717/794-2191.

Circle 52 on Reader Service Card ➔

Somebody had to make a coaxial cable like this.

A coax CATV engineers could really bend. And rebend. Form drip loops, expansion loops and spirals. All without mandrels or straighteners. All without kinking, cracking or rupturing the sheath.

Somebody had to make a coax so flexible and easy to install, it's practically foolproof.

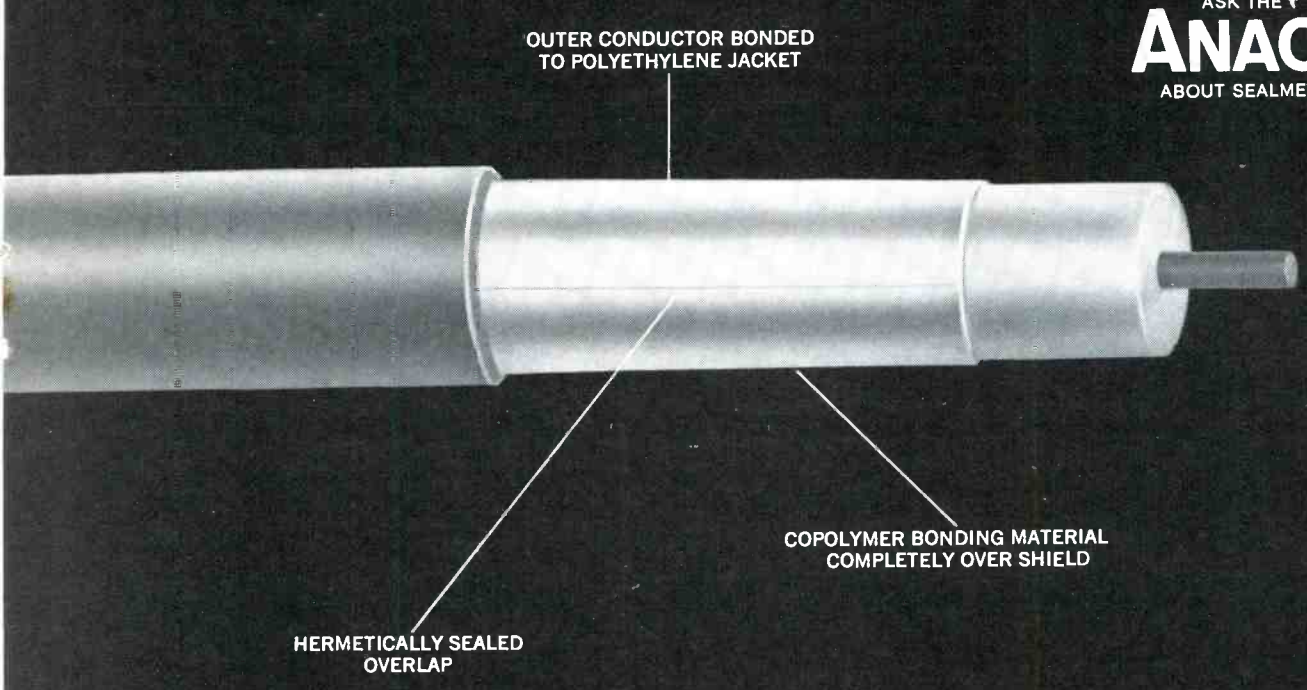
But a coaxial cable that was also moistureproof. Absolutely. And Anaconda did it, with a special sealing and bonding design called "Sealmetic®." This special Anaconda construction hermetically seals the cable sheath at the shield overlap. It also bonds the entire outer conductor to the polyethylene jacket to form a unitized sheath. A sheath so strong the cable core is completely protected from moisture and humidity.

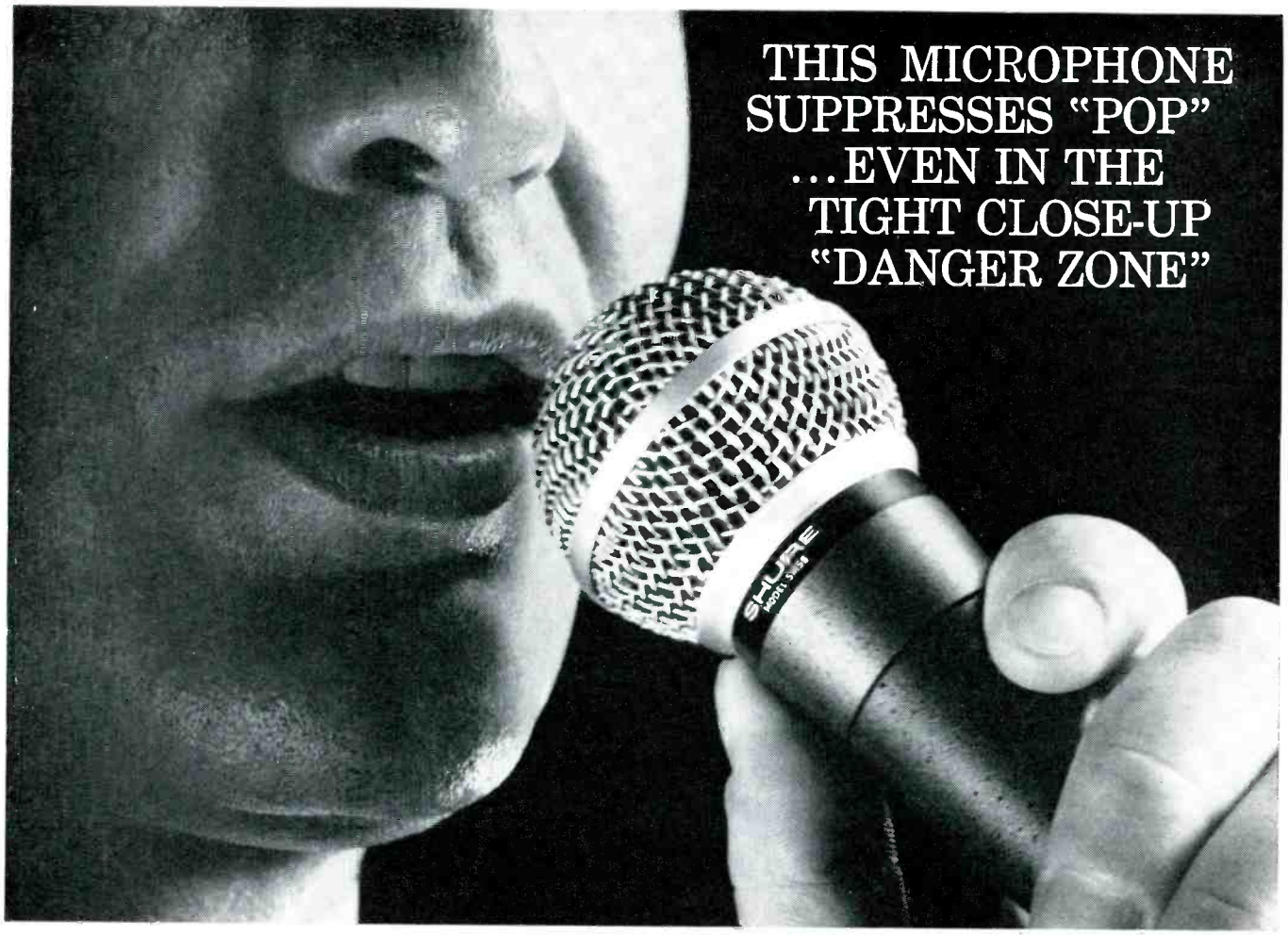
A sheath so strong it guarantees permanent electrical excellence: signal integrity, low attenuation. And a structural return loss of 26 dB or better.

Somebody had to make a coaxial cable like this: exceptionally flexible, electrically excellent. Anaconda did: Sealmetic Coaxial Cable.

Anaconda Wire & Cable Co., 605 Third Ave., N.Y., N.Y. 10016.

ASK THE MAN FROM
ANACONDA®
ABOUT SEALMETIC COAXIAL CABLE





The Shure SM58 *self-windscreened* unidirectional microphone is ideal for broadcast uses such as remote news, sports, interview and vocal recordings because it eliminates or minimizes the irritating "pop" caused by explosive breath sounds. With the SM58 you will have the peace-of-mind assurance that you're delivering the quality audio that goes with pop-free pickup. It's great for studio announcing, too—or wherever the announcer or vocalist has the audio-degrading habit of "mouthing" the microphone. Of course, the same filters that eliminate pop also do away with the necessity for an add-on windscreen in outdoor uses.

On the other hand, the unusually effective unidirectional cardioid pickup pattern (uniform at *all* frequencies, in *all* planes) means that it is a real problem-solver where background noise is high or where the microphone must be operated at some distance from the performer. Incidentally, but very important, the SM58 tends to control the low frequency "boominess" that is usually accented by close-up microphones.

All in all, close up or at a distance, the Shure SM58 solves the kind of ever-present perplexing problems the audio engineer may have felt were necessary evils. The SM58 might well be the finest all-purpose hand-held microphone in manufacture today. And, all things considered, it is moderate in cost.

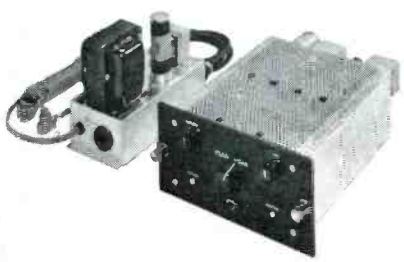
Other features: the complete pop-proof filter assembly is instantly replaceable in the field, without tools. Filters can be easily cleaned, too. Stand or hand operation. Detachable cable. Rubber-mounted cartridge minimizes handling noise. Special TV-tested non-glare finish.

For additional information, write directly to Mr. Robert Carr, Manager of Professional Products Division, Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois 60204.

SHURE SM58

SELF-WINDSCREENED UNIDIRECTIONAL DYNAMIC MICROPHONE

SHURE STATION-TESTED AUDIO CIRCUITRY EQUIPMENT



Shure stereo equalizer and preamplifiers are praised as MAJOR contributions to upgrading station quality by broadcasters.

SE-1 Stereo Transcription Preamplifier
Provides precise RIAA equalization from magnetic phono reproducers at line levels. Separate high and low frequency response trimmers. Lowest distortion, noise level, susceptibility to stray RF fields.

M66 Broadcast Stereo Equalizer
Passive equalizer compensates recorded frequency to three playback characteristics: RIAA, flat, roll-off. Provides precise equalization from magnetic pickup at microphone input level.

Circle 53 on Reader Service Card

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Central Tokyo, Japan
Yoshi Yamamoto

FROM THE EDITOR

Postscript to What to Do About Off-Color Films

One of the disturbing aspects of our digging into the case of the shifting hue (page 32) is the unconcern of broadcasters over bad quality.

The prevailing attitude seems to be: "What am I to do? I haven't got time to screen films, and if I did reject one, we're stuck—the general manager bought a package."

When it comes to 16mm commercials, the broadcaster cares even less. If the advertiser pays for such lousy quality, let him play it—it's his money.

We submit that this lack of concern on the part of broadcasters is one reason why color TV sets aren't selling more widely. Too many potential viewers liken color TV to some "psychedelic" circus. When the novelty wears off, you're dead. Broadcasters are responsible for the perfect customer resistance rationale—"Why should I pay $500 to see green people?"

It is true that the broadcaster alone can't reform a system that is out of control. But he does have a responsibility to do his part.

Howard Chinn has said, "We must get our plants in shape to meet existing standards . . . we must tighten our operations . . . we must prevail upon suppliers to provide acceptable products . . . if we find constantly recurring deficiencies we better do something about it." Dan Zwick points to the need for much cooperation and says we should not drop the issue with the question, "Who is going to bell the cat?" We think the broadcaster should bell the cat, or at the very least, blow the whistle.

James A. Lippke

BM/E's August issue will spotlight station planning and modernization. If you're doing or have done any major new construction or overhaul work in your station, we'd like to get some details from you. Include any descriptive material you have along with floor plans and photos if possible. The most interesting (and most unusual) plans will receive feature treatment. We're very short of time for this issue, so please mail that material to us right away.

We're also looking for short (one- and two-paragraph) ideas on how you ingeniously solved some sticky technical or business problems. Pix will help here, too.

To Black and back.

International Nuclear's brand new TBG2 Black Burst Generator allows you to go to black and back with perfection.
The TBG2 has two outputs available for added versatility, and each have burst phase and burst amplitude adjustments so the two feeds can be matched under any condition.
The TBG2 has the industry's only continuously rotatable phase control, and it's accurate to within one degree. All the controls are on the front panel, and can be locked.
The TBG2 Black Burst Generator is small, compact and lightweight. So is the price, $475.00.

Write or wire or phone collect:
Ray Weiland, President
INTERNATIONAL NUCLEAR CORPORATION
608 Norris Avenue
Nashville, Tennessee
(615) 254-3365
"Transistorizing the Television Industry"

INTERNATIONAL
NUCLEAR CORP.

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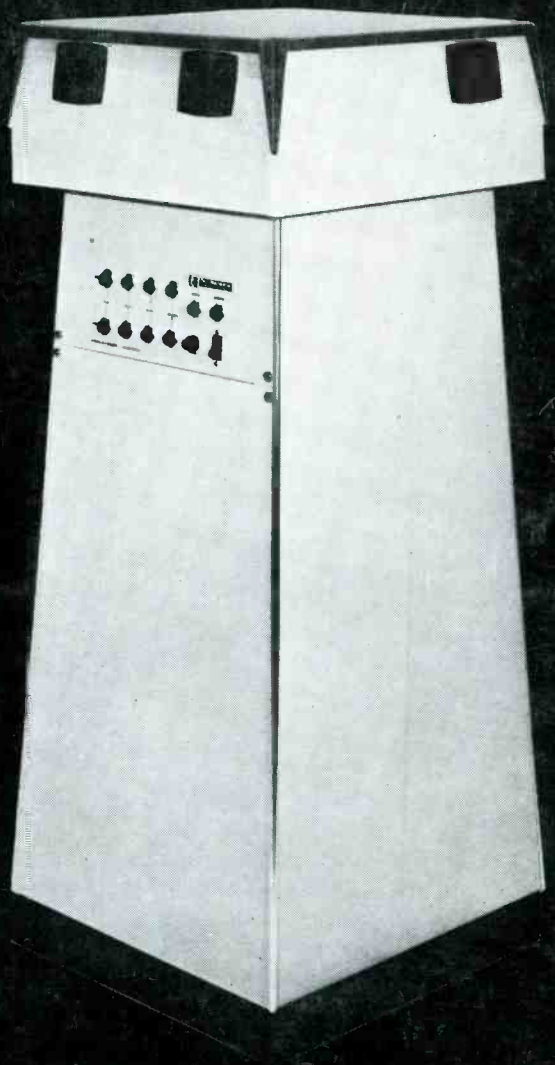

Optical Multiplexer

TMM-211

For trouble-free operation in color telecine service

FEATURES:

- Four Projector Inputs
- Two Camera Outputs
- All Optics Factory Aligned — No Field Adjustments Necessary
- 3" x 4" Optical Format
- Flat Spectral Response Insures Perfect Color Operation
- All Optics Mounted on Single Rugged Casting
- Compatible with All Color Film Chains
- Mirrors Operate in Verticle Plane — Minimizes Dust Problems
- Time-Tested Mirror Mechanism — Smooth Operation without Use of Clutches
- Powerful Motors — Lifetime Lubricated Enclosed Gear Trains

DESCRIPTION

The TMM-211 Optical Multiplexer is designed to provide many years of trouble-free operation in television broadcast service. Four movable mirrors are used to permit optical switching of any of four film and/or slide projectors into either of two cameras.

A precision-machined aluminum optical base plate is used to mount the drive motors and mirrors. The casting is an extremely rigid mounting base and is strain-relieved to provide long-term stability. The entire optical assembly "floats" on a three-point mounting to insure that external stress will not impair optical alignment.

Write for complete details — request Form TPB 170

TELEMATION, INC.
2275 So. West Temple, Salt Lake City, Utah 84115
Telephone (801) 486-7564

See our exhibit at the NCTA Convention, Booths 147-151 / Sheraton Boston Hotel / Boston, Mass. / June 29 - July 2.

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