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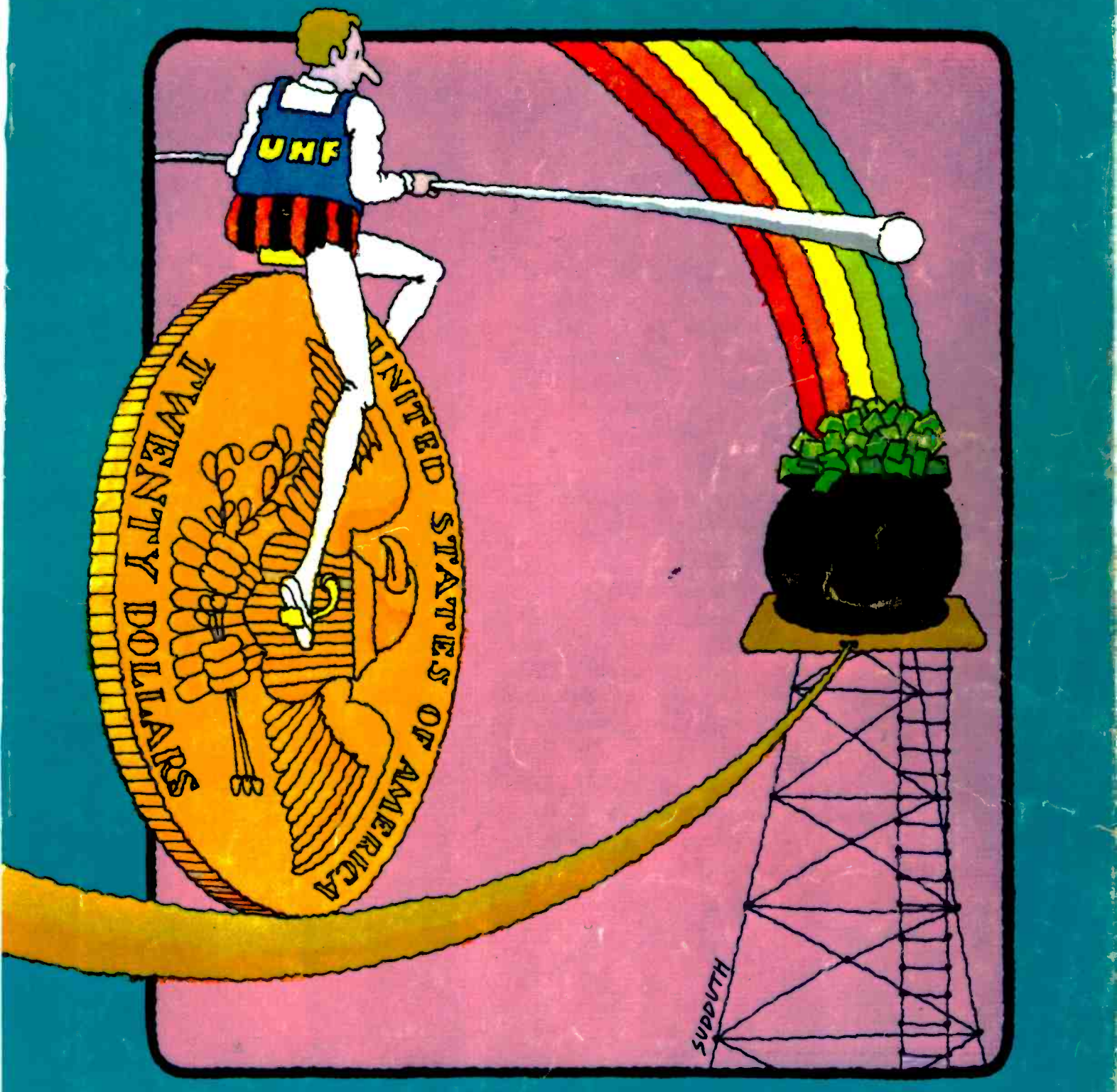
BM/E

BROADCAST MANAGEMENT/ENGINEERING



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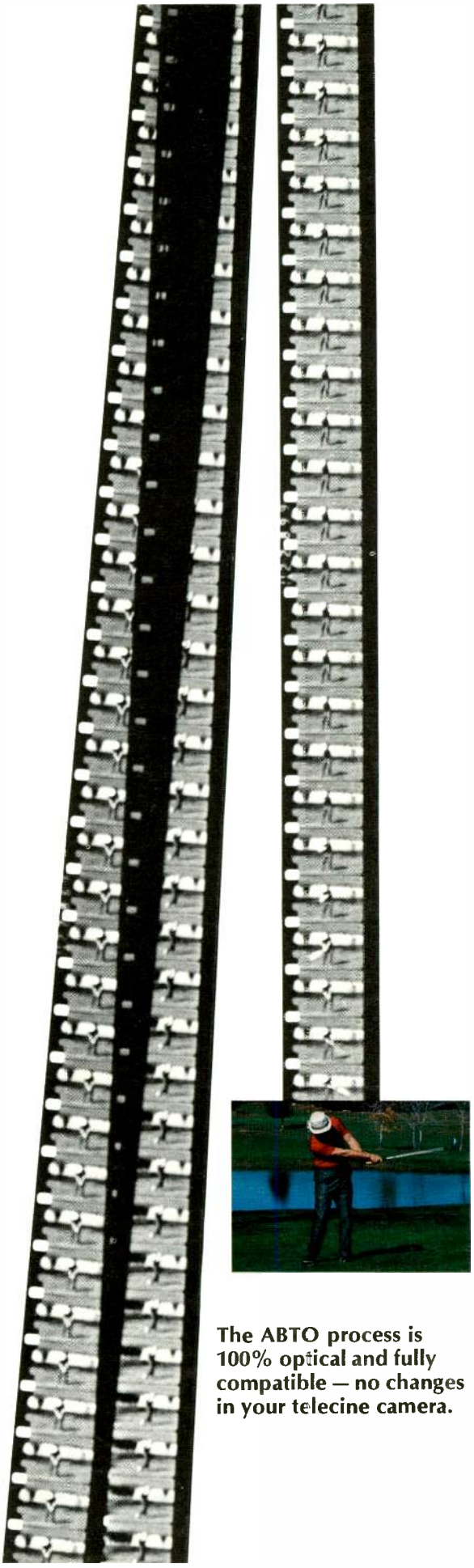

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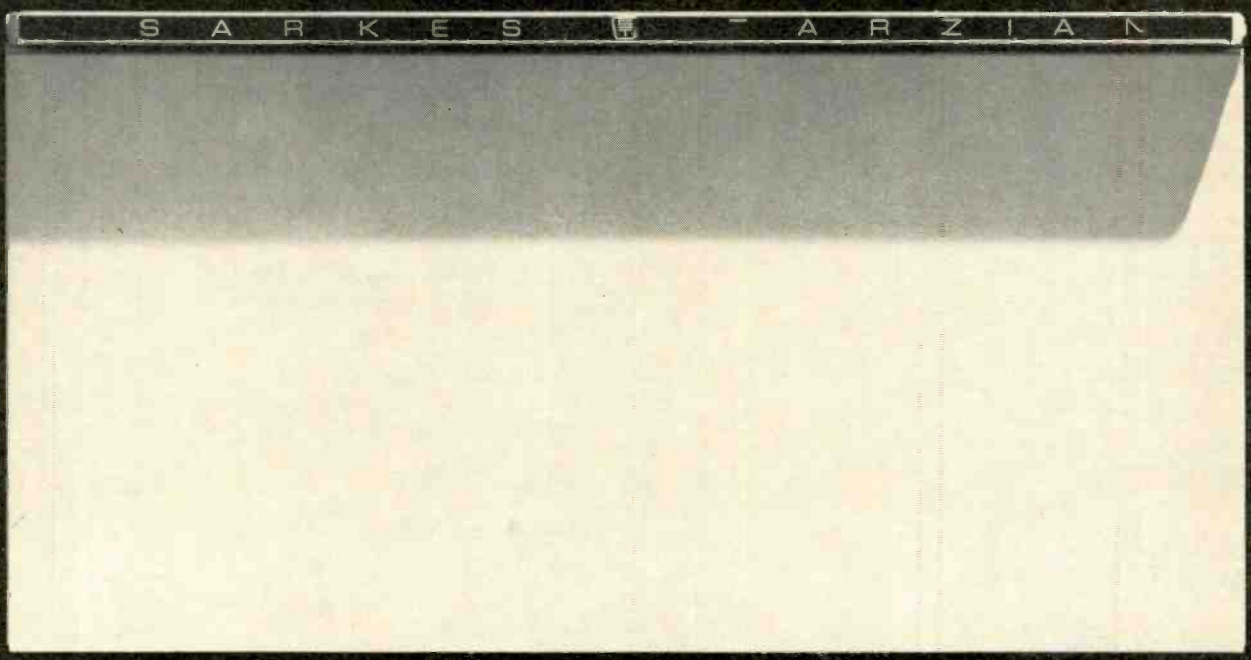

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MARCH 1970/VOLUME 6/NUMBER 3

BM/E

BROADCAST MANAGEMENT/ ENGINEERING

This month's cover: Illustrator Art Sudduth sees the uhf broadcaster as a guy on a tight rope riding his investment toward a pot of greenbacks. Will uhf ever reach the end of the rainbow? The network-affiliated stations have, but the independent U is in a precarious position. He must carefully balance programming, promotion and operating costs against available and potential revenues. For hints on doing this, see pages 29-36.

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BROADCAST INDUSTRY NEWS

Rand Report and critics haggle over CATV future

Broadcasters and cable TV people took the expected sides in commenting on the Rand Corporation's Report on cable TV, written by Leland Johnson under a Ford Foundation grant. Dr. Johnson had been research director for the Communications Task Force established during President Johnson's Administration.

The report suggested that cable TV "be permitted to grow under liberal rules: employing distant signals without restriction; originating both local and non-local programming; selling advertising, at least on local-origination channels; and interconnecting into regional and national cable networks." But, the report maintained, cable should pay copyright fees for distant (and perhaps local) signals.

"Very bullish," said NCTA president Donald V. Taverner.

But William Carlisle, vice president for television of the NAB, said Johnson's report was "a series of speculative conclusions based upon largely unsubstantiated premises." Other broadcasting men attacked the report as vague and misconceived.

One of the major complaints was that Johnson did not realistically face the issue of competition between cable and over-the-air TV.

According to KMTV's Owen Saddler, "The important fact of the erosion of free TV is still being quietly ignored."

While the report does agree that "in principle, cable can pose a substantial threat to over-the-air broadcasting," it claims that there has been "no clear evidence" that broadcaster revenue or profit has been significantly affected by the growth of cable TV. The report also cites as "a basis for optimism" the fact that, even with the growth of broadcast TV, radio revenues have more than doubled since 1949.

As an example of broadcast TV's possible adaption to cable competition, Johnson cites the transistor radio phenomenon and says: "One can reasonably expect that in the future many families will subscribe to cable for their console color receiver, but will have one or more portable sets around the house for over-the-air service."

The report also mentions the early success of cable in Canada, pointing out that it has not yet hurt Canadian broadcasting's profitability.

Finally, Johnson says, what competitive effects cable does have on broadcast TV might well be offset by "complementary" effects. Drawing an analogy with the competition between movie theaters and TV, the report suggests that broadcast TV may actually benefit from cable, as the increased market from cable and a sharing of programming expenses by cable will make more money available for new and better programming.

Copies of the report (100 pages) can be requested from the Rand Corp., 1700 Main Street, Santa Monica, California 90406.

FCC amends, clarifies rules

The FCC has amended rules on measuring power, remotes, and meaning of rebroadcast.

Sec. 73.51 has been amended concerning indirect measurement of operating power at AM stations. The efficiency factor used in computing output power from plate input power may be obtained from several sources. If the transmitter has previously been in regular operation, the efficiency factor is to be computed from the normal values of plate input and rf power output. At a directional station the factor must be adjusted by dividing it by 0.925 (for 5 kW or less) or by 0.95 (for more than 5 kW). If the transmitter hasn't previously been operated at that power, the efficiency factor may be obtained from the manufacturer's test report or letter. If this is impossible, the FCC table of factors should be used.

Furthermore, the value of the efficiency factor for each mode of operation must be logged daily. The product of plate current and plate voltage must be logged half-hourly.

Sec. 73.67 has been amended concerning remote control. Remote-controlled AM stations may now telemeter plate voltage, plate current, and similar readings onto the carrier for readout back at the studio control point. The readings are converted to tones which amplitude modulate the carrier no more than 6%. Frequency of the control tones cannot exceed 30 Hz. Telemetry must be done only when actually taking meter readings, not continuously. (For more details, see last month's *Interpreting FCC Rules and Regulations.*)

The various sections of Part 73 relating to station identification have been modified. The option of quarter-hour ID's for AM and FM stations has been removed. For AM, FM, noncommercial FM, TV, and international broadcast stations, a deferred ID must be made at the earliest opportunity without undue disruption of program continuity. Should another, regular ID be required within five minutes of the deferred one, the regular ID may be ommited.

Sections of the rules applying to rebroadcast of standard radio, fm and noncommercial educational fm broadcast services have been revised to clarify the definition of the term "rebroadcast." The amended sections define it as "reception by radio of the program of a radio station and the simultaneous or subsequent retransmission of such program by a broadcast station."

FCC renewal policy gives the licensee security–but how much?

Your future is in your own hands, the FCC has told broadcasters in its recently issued statement on license renewal. But, according to dissenting Commissioner Nicholas Johnson and others (see *BM/E*, January, 1970, p. 6) this has been true for too long.

Under the Commission's policy, if the applicant's programming service has been "substantially attuned to meeting the needs and

The big jump in short hops

This is the year, as you all know too well, for going over the arithmetic on owning your own microwave relay equipment.

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Continued from page 6

interests of its area, and the operation of the station has not otherwise been characterized by serious deficiencies," then the license will be renewed even if challenged by an applicant who promises better service.

Thus the Commission has balanced two competing public interests: security for the broadcaster serving the public adequately; and competition to spur broadcasters into improving service.

The only difference between this "new policy" and the present policy, according to the statement, is that broadcasters will not be allowed to defend past programming by showing recent upgrading (particularly that done right after a competing application has been filed).

But Commissioner Johnson sees a further difference: "What the public loses by this statement can be summarized in the word 'competition.'" In allowing a broadcaster to retain its license merely by showing "substantial" service of the public interest (rather than showing better service than that offered by the challenger), the FCC has, in Johnson's eyes, gone against the theory of the 1934 Communications Act.

Under that theory, the dissent argues, the public would be served by the best licensees available and each broadcaster would be open to the risk that the competition would offer a better service and thus win away the license.

The FCC's job, Johnson said, was to "choose the best from among the applicants before it, whether the incumbent's record was 'mediocre' or 'excellent.'"

Whether the new statement amounts to a change in policy or not, at least it doesn't close the door on those who agree with Commissioner Johnson that licensees have become too entrenched. The "solid concept of substantial service," which the FCC admits must be developed if the renewal policy is to be effective, is still undetermined.

Therefore, what kind of service meets this standard will probably be the next issue to be decided in the battle over license security. For more information on the new policy, see this issue, page 12.

Satellite question—now it's the FCC's

It took quite a while for the White House to issue its recommendations on the FCC's domestic satellite policy. But when the word came out, it was worth the wait for most entrepreneurs.

The Administration wanted to see a minimal amount of regulation for the satellites—preferred the systems to be developed by private business on a competitive basis.

"Government should not seek to promote uneconomic systems or to dictate ownership arrangements; nor should coordinated planning or operation of such facilities be required except as essential to avoid harmful radio interference," the recommendation from the President said.

Instead, private enterprise should be encouraged to develop commercial satellite systems as it finds them "economically and operationally feasible."

The Administration's policy would allow any financially qualified entity (subject to monopoly and interference questions) to establish its own satellite facilities, to lease them, or to join with others in such programs.

The policy statement urged the FCC not to make arbitrary limitations on the number or kinds of satellite services, but to give all "entrants" into the field an equal opportunity—along certain guidelines.

These guidelines were not tight requirements, however. They covered financial qualifications for users, minimal rate regulation, satellite construction so as to allow as many as practical to be put into use, and other basic regulatory decisions.

As for the adoption of set policies, the White House advised that these be developed slowly, over a three to five year period, and that any policies effected be flexible.

Next will come some action from the Commission which, Chairman Burch stated, has given the satellite matter "the highest priority."

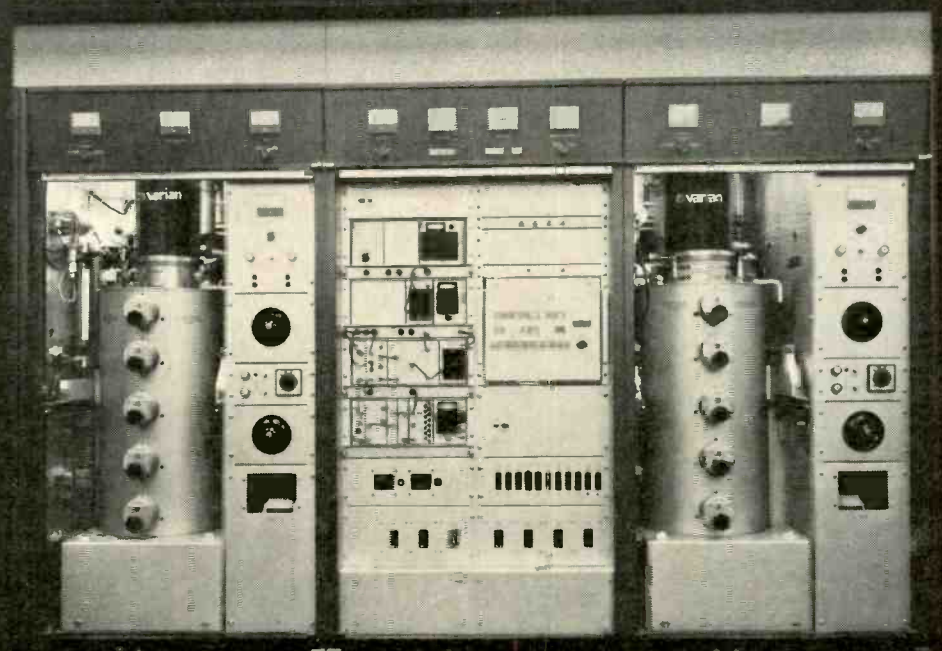
TV violence studies begin

Many suggestions on what broadcasters should do with violence are finding their way into formal reports.

One released by the media study group of the National Violence Commission, mostly concerned with news and programming on TV, criticized broadcasters for poor handling of violence and minority views in news programming.

Continued on page 68

England's ITA took our integral cavity klystrons.



And left them alone.

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That's why our integral cavity tubes were selected to power ITA's twenty-four transmitters directly from solid state drivers. (Since launching its pioneer UHF color telecasting throughout the UK last November ITA's network has grown to twelve stations.)

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FOCUS ON
CATV

FCC proposes CATV rule change

The Commission has proposed permanent adoption of a temporary modification that has "worked very well" since March, 1968—that the FCC process only waiver requests for program exclusivity and carriage and distribution of TV signals of CATV systems with 500 or more subscribers.

The Commission's reasoning is that it's these small systems "which frequently can best make out persuasive hardship cases" and that processing such matters can "engender difficulties out of proportion to their impact on broadcasting."

If this amendment of Section 74.1103 of the rules is passed, requests for special relief could still be filed against systems with fewer than 500 subscribers if special hardship could be shown.

FCC reports CATV actions

The Commission has reported a U.S. Court of Appeals affirmation of one of its CATV authorizations along with various new CATV actions of its own.

In the legal arena, the U.S. Court of Appeals for the Sixth Circuit has affirmed the FCC action of May 7, 1969, which authorized Telerama Inc. to carry the same distant signals on its Euclid, Ohio, CATV systems as it had carried on three of its other Ohio systems before February 16, 1966.

As for its recent actions on CATV cases, the Commission:

- Waived hearing requirements of CATV rules on distant signals to allow Wauchula Cable TV Inc. to carry seven Florida signals.
- Authorized Micro-Relay Inc. (a common carrier) to begin carrying the distant signal of WJRJ-TV, Atlanta, to the four CATV systems of Clearview of Florida Inc., Tallahassee: Nadel Colorvision, Adel, Georgia; Moultrie TV Cable, Moultrie, Georgia; and Clearview of Georgia, Valdosta and Thomasville-Cairo, Georgia.
- Directed Lake City Cablevision, Inc., operator of a CATV system in Lake City, Fla., to provide non-duplication protection for the signals of WJXT (CBS), Jacksonville.
- Denied a petition by Pottsville Trans-Video, operator of 12-channel CATV systems at Pottsville, Minersville, and Schuylkill Haven, Pa., for reconsideration of a show cause order and a former FCC action requiring the CATV system to protect signals of three Pennsylvania TV stations.
- Stayed a show cause order issued to General CATV, Inc., requiring it to show why it shouldn't be ordered to cease and desist from violating the Commission's order in Delaware County Television Cable Co. et al (1968).
- Ordered V & G Cable Service, owner and operator of a CATV system at Wheeling, W. Va., to cease and desist from operating its CATV system in violation of program exclusivity requirements of Section 74.1103 (e) of the rules.
- Directed All Channels Cable TV, Inc., operator of a 12-channel CATV system at Lafayette, Louisiana, to show cause why it shouldn't cease and desist from violating the program exclusivity rule and the hearing requirements of Section 74.1107(a) by carrying the Beaumont, Texas, stations without a rule waiver.
- Denied a petition filed by GT&E Communications Inc. for immediate action and waiver of procedural rules in order to consolidate a Section 214 Certificate application with the Manatee County, Florida, CATV Show Cause proceeding in Docket 18610.

CATV companies announce acquisitions

Several cable television companies have recently announced expansion plans.

With its agreement in principle to combine CATV operations with Harriscope Cable Corporation, Cypress Communications Corporation has moved into the third to fourth largest cable TV spot in the nation. Transactions have so far involved about a $23 million total.

Another recent acquisition is that of Cable Information Systems Inc., which includes the purchase for cash and notes of Oak Ridge CATV's assets. With the acquisition of this Vikoa subsidiary, Cable Information Systems should own and operate 11 CATV systems with about 16,000 subscribers.

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INTERPRETING THE FCC RULES & REGULATIONS

Renewal Competition and Community Needs

The spectre of competition haunts every station operator at license renewal time. The past few years have raised this fear with the WHDH debacle in Boston (where an existing operator's license was awarded to a competing applicant), and with the plethora of recently-filed applications contesting the present licensee's continued operation.

The much-debated "Pastore Bill" (S. 2004) seeks stringent restrictions on competing applications filed against existing licensees. It is cogently argued, however, that this Bill practically eliminates competition in the broadcast services (already tainted with a monopolistic aura). Controversies between Congress and the FCC—as recently demonstrated by the FCC's refusal to give Congress its files in the WIFE case—have stymied, if not foreclosed, favorable action on S. 2004.

Certain members of the public, the Congress, the FCC, Department of Justice and the Administration have all demonstrated support for public competition in renewals and for a restructuring of the broadcast industry. But under the WHDH case, it seemed likely that the competitors would prevail in most cases—even over broadcasters with good and/or exceptional broadcast records. This inherent risk threatened the stability of the entire industry and placed in jeopardy the licenses of good, as well as bad, broadcasters. Thus, even the proponents of competitive renewal hearings apparently agreed that a compromise should be reached. And a new policy—to protect good broadcasters—was formulated.

The Federal Communications Commission has attempted to set forth guidelines for existing broadcast licensees (and potential applicants for presently authorized facilities) by issuing its Policy Statement On Comparative Hearings Involving Regular Renewal Applications. Many have misinterpreted the new policy and have concluded that the days of renewal challenges are over. Clearly, this is NOT the case.

The Statement does, however, indicate changes in the Commission's disposition as to the treatment of applications filed in competition with regular renewal applications.

Background Considerations

The "public interest" has always been uppermost in the Commission's mind when considering broadcast applications. And so, in issuing its policy statement, the Commission has balanced the interests of (1) existing licensees (whose expenditures, especially in television, approach astronomical proportions) and (2) the public need for free competition.

The Commission has reaffirmed the desirability of the limited license term (3 years) and has declared that it will permit review of the broadcaster's "stewardship" at regular intervals to determine whether the public interest is being served. Also, the Commission will give new parties a chance to demonstrate, in public hearings, that they will serve the public better.

In other words, the Commission believes that the "public interest" will be benefited most if both elements—the "statutory or competitive spur" of a potential license challenge and the practical consideration of "predictability and stability" for existing broadcast operations—are sanctioned.

Specific Policy Statements

The Commission's new policy (largely formulated some years ago,[1] but now specifically stated) provides comfort for the existing licensee who has truly operated in the public interest. For the operator who has relied on a diet of entertainment fare and commercials, however, there is little solace.

The Commission has declared:

> If the applicant for renewal of license shows, in a hearing with a competing applicant, that its program service during the preceding license

Continued on page 16

1. See Hearst Radio, Inc., 15 FCC 1149 (1951) and the *Policy Statement on Comparative Broadcast Hearings,* 4 FCC 2d 393 (1965).

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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Get the same highly stable performance from your monitor you expect from your cameras. Get the Ball Brothers TCB-14R. For full specifications, write to Ball Brothers Research Corporation, Boulder, Colorado 80302.

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The IVC-300 opens new approaches to programming and production flexibility. For example you can take a long shot with our new 18:1 zoom lens. Or lower your handicap with a minicable that is one-half the size of ordinary cable and weighs only 16 lbs. per hundred feet. Built-in cable compensation means you can go all the way with cable runs up to 2,000 feet. A new master gain control that multiplies the IVC-300's sensitivity in graduated steps of 3dB delivers excellent pictures at light levels down to 40 foot candles. The IVC-300 comes on as the lightest, most portable studio and remote camera in the business, weighs only 72 lbs. An absolutely unbeatable combination recognized by more and more broadcasters.

A companion film chain camera—the IVC-230—is also proving itself a winner, produces pictures comparable to higher priced cameras at substantially lower cost.

IVC has been making the tour as a company for just four years and for the last two years has served the broadcast industry with color cameras. Proof of our winning ways are the more than 60 multiple and single camera broadcast installations IVC has completed in those two years.

The IVC-900 increases the lead

From the leader in 1-inch color VTR's . . . comes a recorder that talks the language of the broadcaster . . . the IVC-900. The new IVC-900 color videotape recorder meets all applicable FCC and EIA specifications for monochrome and color broadcast. Put it on the air with assurance that color picture quality will be outstanding—comparable to pictures from quad recorders costing three to five times as much to buy and more than five times as much to operate.

The IVC-900 records and plays back for 3¼ hours on a standard 12½" NAB reel. It offers IVC's unique Instant Video Confidence, an amazing feature that plays back your recording on a monitor as it is being recorded, always assuring a perfect copy.

Clean, sharp assemble and insert editing, built-in dropout compensator and processing amplifier are part of the package. Head replacement cost and frequency of replacement are reduced as much as 90% with a head life guarantee of at least 1,000 hours. Color or monochrome tapes are interchangeable with *all* other recorders using the IVC format.

Network and major market broadcasters will find the IVC-900 invaluable for delay recording, dubbing, back up and significant savings in storage of program material. The IVC-900 is a first line recorder for smaller and medium sized stations. Stations of all sizes will find the IVC-900 useful for preproduction screening.

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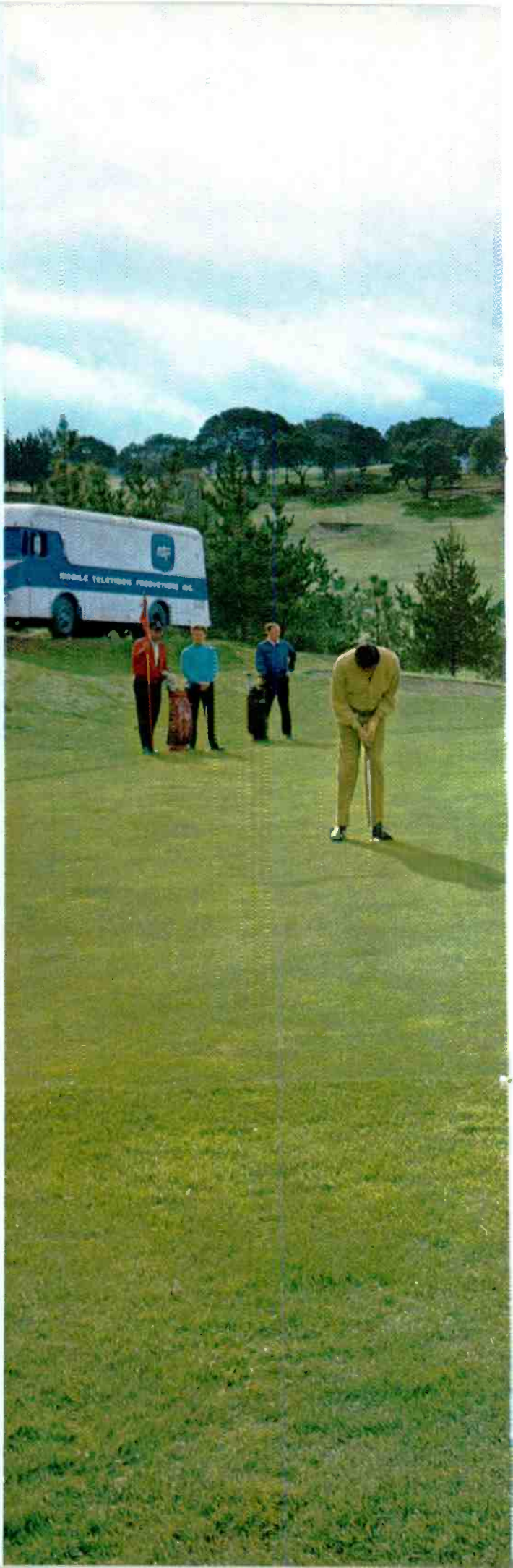
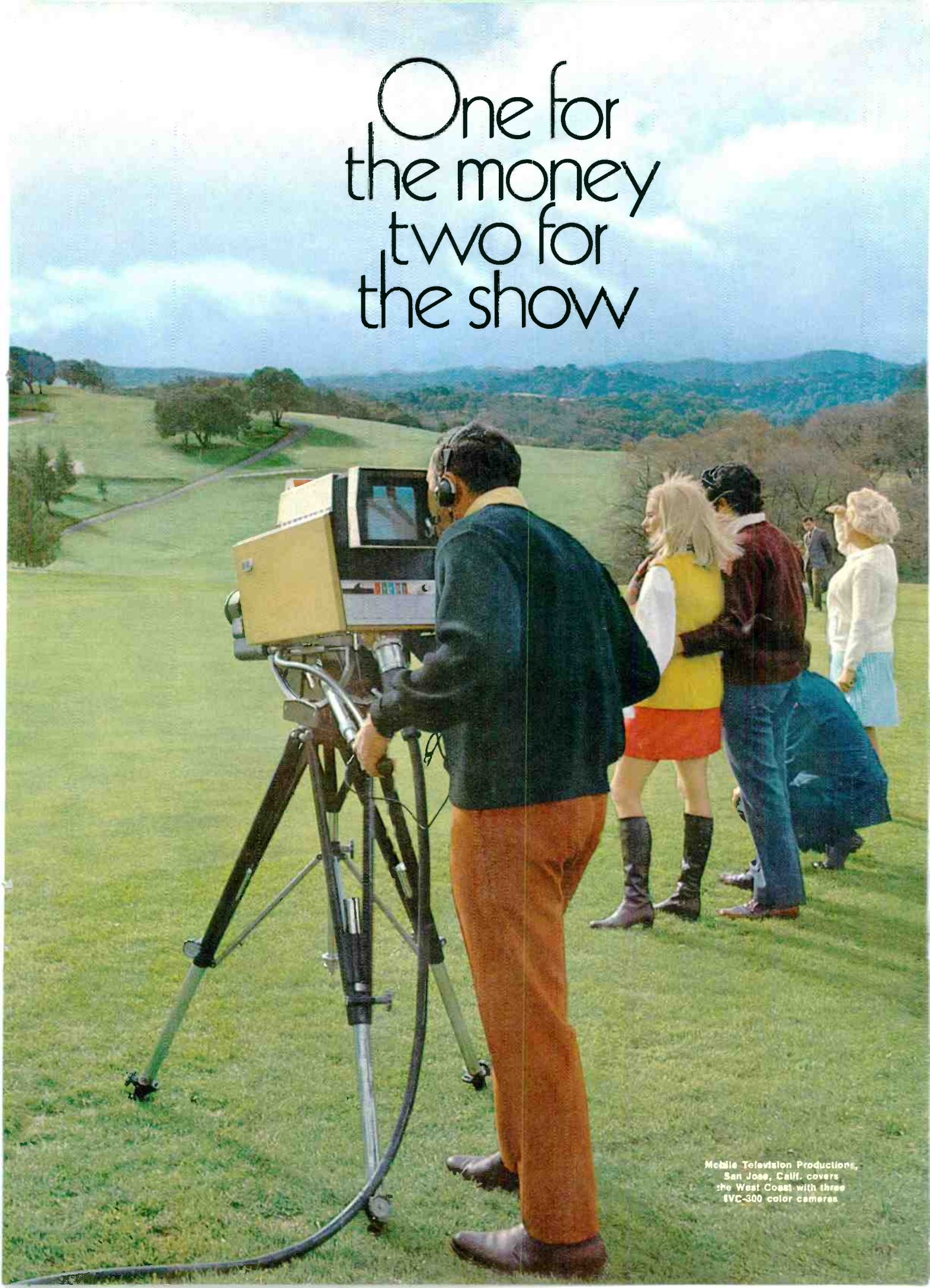


One for the money two for the show



Mobile Television Productions, San Jose, Calif. covers the West Coast with three IVC-300 color cameras.

FCC Rules

Continued from page 12

> term has been substantially attuned to meeting the needs and interests of its area, and that the operaton of the station has not otherwise been characterized by serious deficiencies, he will be preferred over the newcomer and his renewal will be granted.

The statement is worthy of being engraved in stone and affixed to your program manager's wall.

The Commission's declaration appears to mean that an existing licensee, who truly and substantially serves the public needs and interests of the communities in his coverage area, need have no fear that his license will be taken away and given to a competing applicant. But it's open season on those without substantial public interest fare.

The policy for treatment of renewals and competing applications (1) encourages good faith competing applications; (2) forces the broadcast renewal·applicant to run on his past record; (3) increases, for broadcasters with marginal operations, the risk that their licenses will not be renewed; and, happily, (4) provides a sanctuary for all broadcasters that truly ascertain and serve community needs.

Community Needs Surveys—the Primer

As any knowledgeable broadcaster can readily testify, the most onerous portion of the application is that in Section IV, dealing with "Ascertainment of Community Needs." Commission policy regarding adequate response to this section has changed perceptably over the past few years. It now culminates in the "Primer."

The most salient features of the Primer (and those that most directly affect the renewal applicant) relate to a clarification of the phrase "community needs and interests." The Commission states that "needs and interests" are to be considered generally synonymous with "community problems." These are not, repeat not, program needs and interests. "Problems" is the key word. The main thrust of the applicant's response should be directed to this end and the licensee must propose and broadcast programs to serve these "community problems."

The applicant must ascertain and identify the problems of his community. This must be accomplished by consultations with leaders of a representative range of groups and with members of the general public from communities throughout the area served. The Commission now requires that applicants actually determine what constitutes a "representative range of groups." He must determine the kinds of groups involved in the total makeup of the community.

The representative cross-section must be both societal and geographical. It is incumbent upon the applicant to indicate, by cross-sectional survey, statistically reliable sampling, or some other valid method, that the range of groups, leaders and individuals consulted is truly representative of the economic, social, political, cultural, and other elements of the community. Guesswork or esti-

Continued on page 18

Help celebrate the introduction of the Fernseh 3-tube color camera.

Buy one.

The Fernseh KCU 40 is the camera that revolutionized the European television production technique.
It's the first lightweight model for both studio and field use with all the performance you'd expect from a 3-tube camera. High light sensitivity. High signal-to-noise ratio.

True color reproduction with optimum focus.
A few of the more special features include 7mm or 11mm camera cables, and a tiltable viewer.
We'll be in Booth 419 at the NAB Convention in April in Chicago. See you there.
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FCC Rules

Continued from page 16

mates based upon alleged familiarity of the area are inadequate.

Professional research organizations may not be hired to do the major portion of the survey. While a professional service could be used to provide background data, the individuals primarily responsible for consultations with community leaders are the principals or top-level employees or prospective employees of the applicant.

Community leaders are considered to be the prime repository of knowledge of community problems; however, members of the general public must be consulted as secondary sources.

When the surveys are complete, the applicant is expected to list, in exhibit form, all significant community problems, whether or not he proposes to treat these problems through proposed programming. Then, the applicant is expected to determine on a good faith basis which of the problems merit treatment by the station, and how they are to be treated. There must be an exhibit linking programs and problems. The applicant is expected to state the title, time segment, duration, frequency of broadcast, and description of the program and to describe the community problem which it deals with.

Short announcements, editorials and news programs may be proposed as secondary programming to meet community problems, but the perceptive applicant and operator is one who produces and presents actual program fare to meet community problems.

Conclusion

The renewal hearing policy does not eliminate the risks of competing applications. It encourages good faith challenges. Marginal and poor programming may well result in a grant of the competing application. Only the good broadcaster has been insulated from any meaningful threat of losing his license. The "bad" broadcaster has been thrown to the wolves.

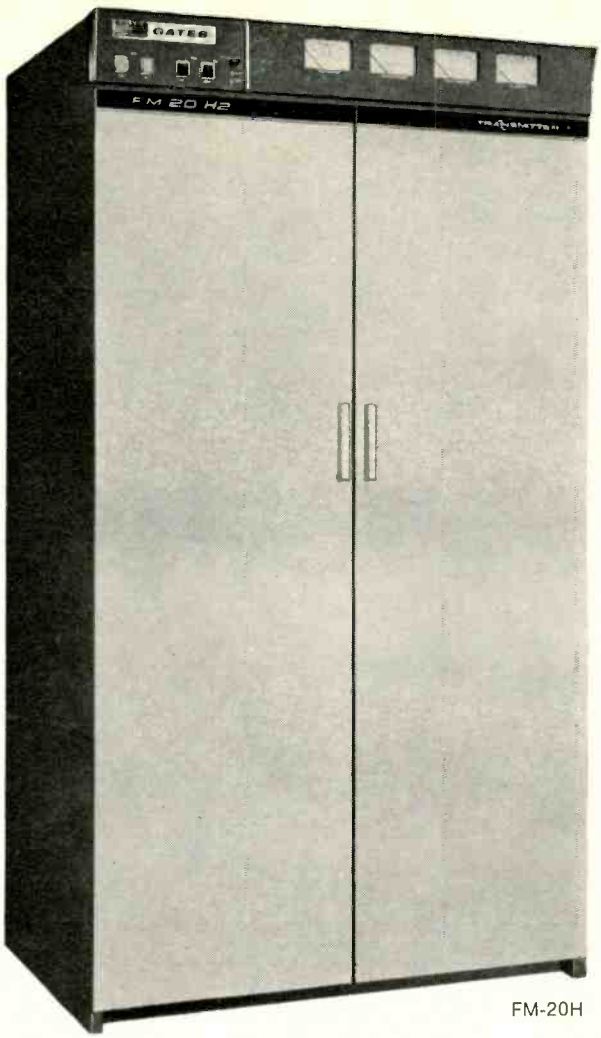
The nuances and semantics of "good" and "bad" programming are yet to be defined by case law. The new Primer on Ascertainment of Needs shows how to become a "good" broadcaster: ascertain needs and respond to them with some substantial programming.

Renewal applicants now have guidelines to follow in protecting their existing operations. The Commission seeks to promote "conscientious and good faith substantial service" to the public—not a "triennial flirtation with such service."

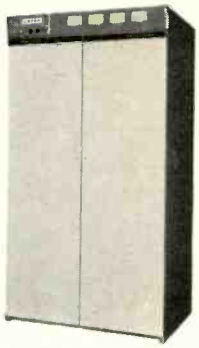
The perceptive broadcaster who plans ahead will protect his investment and continue to operate under Commission aegis. His plan: diligent, continuing surveys of the communities served by the station; programming to meet community problems; and programs responding to community problems.

The new policies will tend to discourage spurious and frivolous competitors. But they may well encourage good faith challenges against mediocre and poor broadcasters! **BM/E**

FM-1H



FM-20H



FM-10H

Look what our customers say about reliable Gates FM Transmitters . . .

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Paul Wolfcale, Radio Station WMZK-FM
Booth Broadcasting Company, Detroit, Michigan

"Our Gates 10H couldn't be easier to operate. Or provide our listeners with richer, more 'life-like' sound."
Larry Gordon, Radio Station KWIL-FM
Albany Radio Corporation, Albany, Oregon

"Our Gates 1H gives us the finest in stereo, mono and multiplex sound. And the TE-1 Exciter is the best we've seen."
Vic Michael, Radio Station WMLP-FM
WMLP, Inc., Milton, Pennsylvania

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The only true parallel system design makes RCA's transmitter safe enough for remote or computer control.

RCA's Maxim-Air VHF transmitter is guaranteed to hold its specifications for thirty days without adjustment.

RCA's Maxim-Air is reliable solid state with only 10 tubes,—just 3 tube types.

RCA's Maxim-Air modulates at high level, with only one tuned linear amplifier—plus signal shaping at the output—to assure signal integrity.

Only RCA's Maxim-Air was designed as a parallel system. It's two transmitter units.

If one goes out, the other takes over and no one notices but you.

That's what it takes to have a transmitter that can live alone.

That and the motorized controls we've built in so it can be tuned remotely, by man or computer.

RCA's TT-30FL 30 kW VHF transmitter. The best color picture today. The best use of people tomorrow.

No problems.

RCA sells solutions.

RCA

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Nostalgia, Expectation to Mark '70 NAB

Industry commemorates first 50 years by looking back and ahead. New technologies to debut give glimpse of future: color TV news from b&w film; videotape printers, more labor-reducing equipment.

NAB Convention Agenda

SATURDAY, APRIL 4
Registration and non-agenda events.

SUNDAY, APRIL 5
Registration, exhibits open, and non-agenda events.

MONDAY, APRIL 6
Morning — Opening General Assembly, for Management and Engineering.
Luncheon — Separate Management and Engineering Luncheons.
Afternoon — Concurrent RAB, TVB, and Engineering Conference sessions, followed by Radio and Television sessions, and Engineering Workshop Sessions.

TUESDAY, APRIL 7
Morning — Early Bird Workshops, Radio Assembly, Engineering Conference technical sessions for radio and television, and non-agenda television meetings.
Luncheon — Separate Management and Engineering Luncheons.
Afternoon — Open. This period unprogrammed, to permit delegates to visit exhibits, hospitality suites, etc.
Evening — Broadcast Pioneers Banquet.

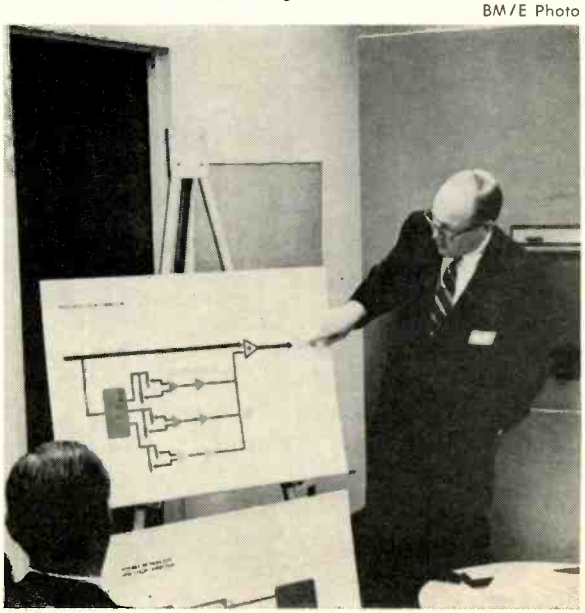
WEDNESDAY, APRIL 8
Morning — Early Bird Workshops, Television Assembly, Engineering Session, and non-agenda radio meetings, followed by a General Assembly.
Luncheon — Joint Management and Engineering Luncheon.

"SEE YOU AT the bash-iversary in Chicago," is the way one broadcaster described the forthcoming 1970 NAB convention, April 5-8, Conrad Hilton, Chicago. NAB conventions are never quiet affairs. This one marks broadcasting's 50th anniversary and is being planned as a four-day birthday party.

The official theme is "Fifty Golden Years and The Best Is Yet to Come." All promotional material at the convention will be tied in with the observance. Most exhibitors are planning to salute the anniversary in one way or another. Broadcast Electronics, Inc., has commissioned the minting of a special commemorative coin honoring the

New Color Corrector is shown by CBS Labs engineer Henry Bovin. Device enables chroma correction of an NTSC-encoded signal.

Explaining Color Converter is Renville H. McMann, Jr., co-inventor with Adrian B. Ettlinger. Both are with CBS.
BM/E Photo



semicentennial. The limited-edition memento will be offered to attendees at a special registration booth.

The Broadcast Pioneers will hold a special banquet on Tuesday with a "heavily nostalgic" program.

What's ahead, though, will dominate. The exhibits will reveal new technologies, new methods and new products, some of which are described here, as proof that the best is yet to come. There are more would-be exhibitors than space and some newer companies are setting up displays in adjoining hotels.

Issues that cloud the future will be aired. News slanting (Vice President Agnew may be there), license renewal, filthy speech and free speech, movie censorship, control of violence, control of ownership, pay-TV, and CATV will be reflected upon by broadcasters and Capitol Hill leaders. Dean Burch, new FCC chairman, will address the convention.

Early morning workshops are something new this year. Workshops, which start on Monday, will be conducted simultaneously but repeated on Tuesday and Wednesday. Subjects to be covered include license renewal, finding and training minority employees, local radio sales, use of computers, audience measurement, broadcast news freedom and public relations. Workshop proposals were made by NAB Convention Committee co-chairmen, James M. Cadwell, WAVE, Louisville, Ky., and Hamilton Shea, Gilmore Broadcasting Group, Harrisonburg, Va.

Workshops are also going to appear as part of the Engineering Conference. Two are slated—one on automatic logging of aired programs and other station operations; the other on remote control operation of television stations.

Rosel H. Hyde, retired chairman of the FCC, will receive the NAB's Distinguished Service Award in recognition of "40 years of unique continuing service in developing broadcasting in the public interest." Also to be honored is the crew of Apollo 11.

You saw the debut at NAB '70

It's customary for major exhibitors to spring a surprise at NAB. Last year the most intriguing product was RCA's cartridge video tape player built to quad standards. This year the new ABTO color TV-from-black-and-white-film-system is likely to draw the largest crowd.

The new process has not been a hush-hush secret, but NAB 1970 will mark the first public showing of the revolutionary system which Frank Marx, formerly v-p of engineering for ABC and new president of ABTO, says will cut broadcasters' operating costs.

Joining Marx to help establish the new system are long-time broadcast pros Charles Riker, who formed Riker Video, and Al Malang, formerly of Riker-Maxson and G.E. The company name,

Ampex DR-10 is a low-cost TV disc recording system, not considered BC quality but useful in CCTV and ITV.

ABTO, incidentally, is a contraction of ABC and Technical Operations, Inc. These two organizations jointly developed the new process and are major stockholders of the new company.

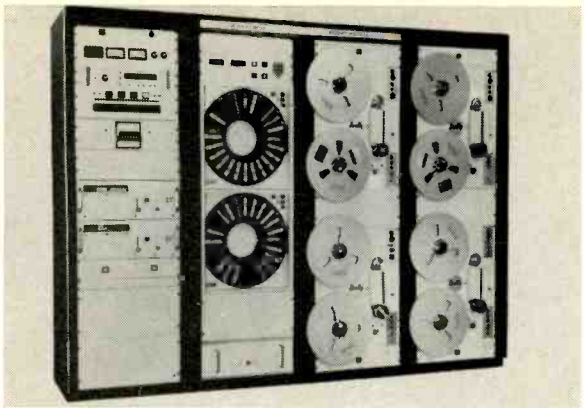
Color from black-and-white film will save news departments money on two counts—b&w film stock (Plus X) costs less, and b&w processing costs less. Further advantages of the new system are less time for processing and easy-to-obtain high uniform quality. ABTO is so confident that money will be saved that it is going to market the process on a share-the-saving formula rather than as an outright sale of equipment.

The recording process works this way: color information is coded on b&w film by shooting the scene through an optical grating inserted between the lens and the film. The grating consists of three sets of lines each rotated from the other by about 60 degrees. Thus red is photographed on one axis, green on another, and blue on a third. The black and white film carries a composite monochrome picture which can be projected as a normal black and white print. However, if a decorder filter is placed in the projector and a point light source used, the red, green, and blue color information can be retrieved separately. The system is completely optical; no electronics are involved.

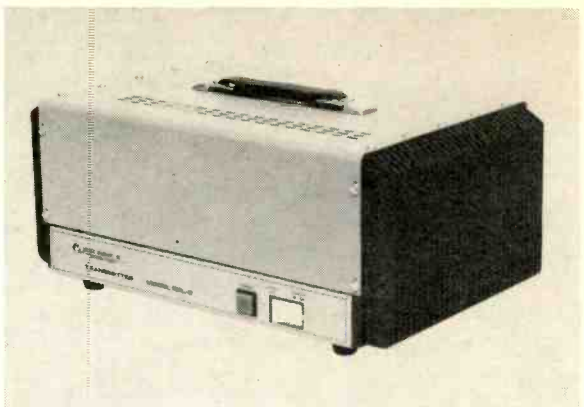
Since the color information is not stored in organic dyes, the color images are not affected by temperature or humidity variation. The color signal does not fade with time.

Marx and Riker see the new process not as replacing existing methods but as supplementing them. The ABTO system can be integrated into existing news operations simply by inserting the dime-sized grating into the 16mm news camera and modifying the telecine chain by adding the decoder filter and a new light source. The modification will permit the projection of color film with no deleterious effects.

The color-from-black-and-white-film-system can be seen both on the exhibit floor and in the lobby of the Essex Inn. Riker hopes to get a snip of the film with the invisible color lines into hands



You can program up to 24 hours with Broadcast Products' AR-1000 automation system, with up to 12 sources.



New vhf remote pickup link from Moseley Associates is RPL-2. Companion audio mixer (not shown) handles three inputs.

of engineers and managers before the convention, along with an invitation to take it to the Essex Inn. Then with a showman's flair, this b&w film cut will be projected in full color. How can they miss?

High-speed quadruplex videotape duplication

Ampex has developed a videotape duplicator which prints copies by the contact method. The tapes—high-coercivity master and conventional slave—are pressed together as they pass through a magnetic transfer field. During the process, the slave receives a mirror image of the patterns on the master. Ampex claims the system can produce up to five copies of an hour-long color quad tape in six minutes.

A sample tape was shown at the Atlanta SMPTE conference in January. Ampex says the slave tape is identical to the original, except for a 3-dB deterioration in S/N ratio. Color and resolution appeared good. A demonstration is scheduled for NAB, but Ampex says production models are about a year away.

Among other products to be displayed by Ampex will be a low-cost television disc recorder for immediate and repeated analysis of recorded monochrome pictures. This isn't billed as a broadcast quality machine and was first shown at NAEB as an instant replay device for CCTV. Called the DR-10, it is priced at $8000 and up and should be of interest to educational broadcasters.

Post mortem color corrector

You can do chroma correction *after* encoding with a brand new device that will be on display at CBS Labs booth. Now you can paint a video tape or network feed at almost any point in the transmission stage.

The prototype of the new Color Corrector has been field-tested by the CBS network and was demonstrated publicly in New York in February. Production models will be on hand at NAB.

Normally an NTSC encoded color signal can't be chroma-altered without being decoded, and reencoded—a hairy process. CBS doesn't decode, instead generating an encoded error signal which is the opposite of the chroma to be corrected. The error signal is added to the encoded signal and the picture color can be varied as desired. Separate paint controls are used for the red, green, and blue channels.

During a demonstration, a CBS engineer will "ride chroma" on several sample video tapes and film clips, including some Super Bowl coverage from a hand-held camera. He will then straighten out hue and saturation variations, taking out a little blue here, putting in a little green there.

The color corrector is a unity-gain device which can be inserted almost anywhere in the video chain. A transmitter operator could use it just ahead of the transmitter, watching the incoming line monitor for uncorrected color, and the air monitor for the results. He'd be compensating for chroma changes in the entire chain from camera to transmitter.

Alternatively, the corrector could be used with a computer-assisted automation system.

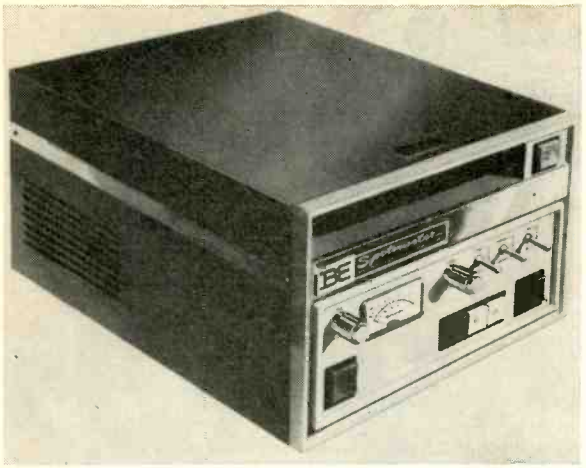
Another useful point for the Color Corrector would be in a video tape production house, between the edited master and the release copies. The device would iron out differences in segments taped from various cameras under differing lighting conditions. Once a tape had been corrected, of course, it would need no further correction.

Price of the new device was given as "something less than $3000." CBS plans to have about 25 units at NAB, just in case anybody wants to take one home and try it out.

And many more

Here's a sampling of other products to be on display at the NAB Convention:

Gates—a brand new line of vhf TV transmitters, announced late in 1969. Covers a range of 1.3—35 kW; uses intermediate frequency modulation, allowing for more precise color correction as modulation is done at a low level stage in the exciter. PA stages are stripline-tuned for greater stability.



Spotmaster Ten-70 line of cartridge tape machines features manual fast forward. From Broadcast Electronics, Inc.

Continental Electronics—not new but high efficiency, screen-modulated AM transmitters—the 317C 50 kW and 315C/316C 5/10 kW units—featuring wide audio frequency response.

CCA Electronics—AM and FM broadcast transmitters. An air cooled, high level 50 kW AM transmitter, self-contained in three independent cabinets and occupying 48 square feet of floor space; a 25 kW FM transmitter, self-contained in two cabinets; and a 1 kW AM transmitter capable of being modulated over 125%; and a three-channel audio control console permitting simultaneous operation and control of AM and stereo programming. Also in the CCA booth will be equipment manufactured by its QRK subsidiary and Rek-O-Kut Division.

Moseley Associates—the new Model 404 aural STL; operates in the 890—960 MHz spectrum for AM-FM-TV intercity service. Solid-state unit uses direct FM, has multiplexing capability for auxiliary program or SCA feeds, remote control, and automatic logging. Also from Moseley:

—A vhf remote pickup link, Model RPL-2, available for 148—170 MHz and 450—470 MHz; minimum output 30 W (160 MHz) and 18 W (450 MHz); power required is 120/240 Vac or 13.5 Vdc.

—A remote pickup amplifier, Model RPA-1, provides audio control facilities for the firm's RPL-2 vhf remote pickup link. Amplifier includes an audio limiter, has one line and two mike inputs.

—An automatic data printer, Model ADP-220, designed to be used with an automatic logging system.

RHG Electronics Laboratory—the new MRS-AP series of fully self-contained solid-state portable microwave relay links, from 0.7—13.25 GHz, 0.25—4.0 W, weather-proofed and rfi protected.

Telemet—the Model 4600 video signal conditioner, designed to correct phase disturbances in the 15—500 kHz band; front panel switch selects from four separate time constants; gain adjustable 0.7—1.4; frequency response ± 0.5 dB—8 MHz; differential gain ≤ 0.1 dB and phase $\leq 0.5°$; noise –60 dB; price $700, delivery in 45 days.

MRS-AP series of microwave links from RHG Electronics Laboratory has output power from 0.25 to 4 watts.

Also at the Telemet booth will be a new broadcast demodulator and equipment for correcting envelope delay.

Marconi Instruments—a fully programmable FM/AM modulation meter, Model 2301. Frequency range 2—1000 MHz; measures deviation in six ranges from ± 1.5—± 500 kHz; F.S. over an FM range of 30—150 kHz; includes demodulated output with less than 0.25% distortion; price $4455.

Broadcast Electronics—the new Spotmaster Ten-70 line of tape cartridge machines, featuring manual fast-forward, built-in mike/line mixer, plug-in deck module; and optional Auto-Cue providing auxiliary tone activation of both fast-forward and sequential start modes.

Broadcast Products—the new AR-1000 automation system, a self-contained, solid-state, modular system permitting individualized programming up to 24 hours in advance, from up to 12 audio sources; features include plug-in circuit elements, independent power supplies, photocell audio switching with full overlap and built-in facilities for network joining.

Vikoa Inc.—an underground-mountable Mini-Stripline directional coupler. Unit is housed in solid zinc-die-cast case, with color-coding on top showing loss in dBs. Tap-to-tap isolation is more than 20 dB with a tap match of 1.22:1 and frequency response to 250 MHz.

Tele-Cine Inc.—zoom lens, Schneider System TV-10, has zoom range 11.2 to 1 at $f/2.1$, is interchangeable with all color TV cameras. Also shown will be Sondor magnetic film recorder, Tele-Tec II automatic VTR programming system, and entire Schneider vidicon lens line.

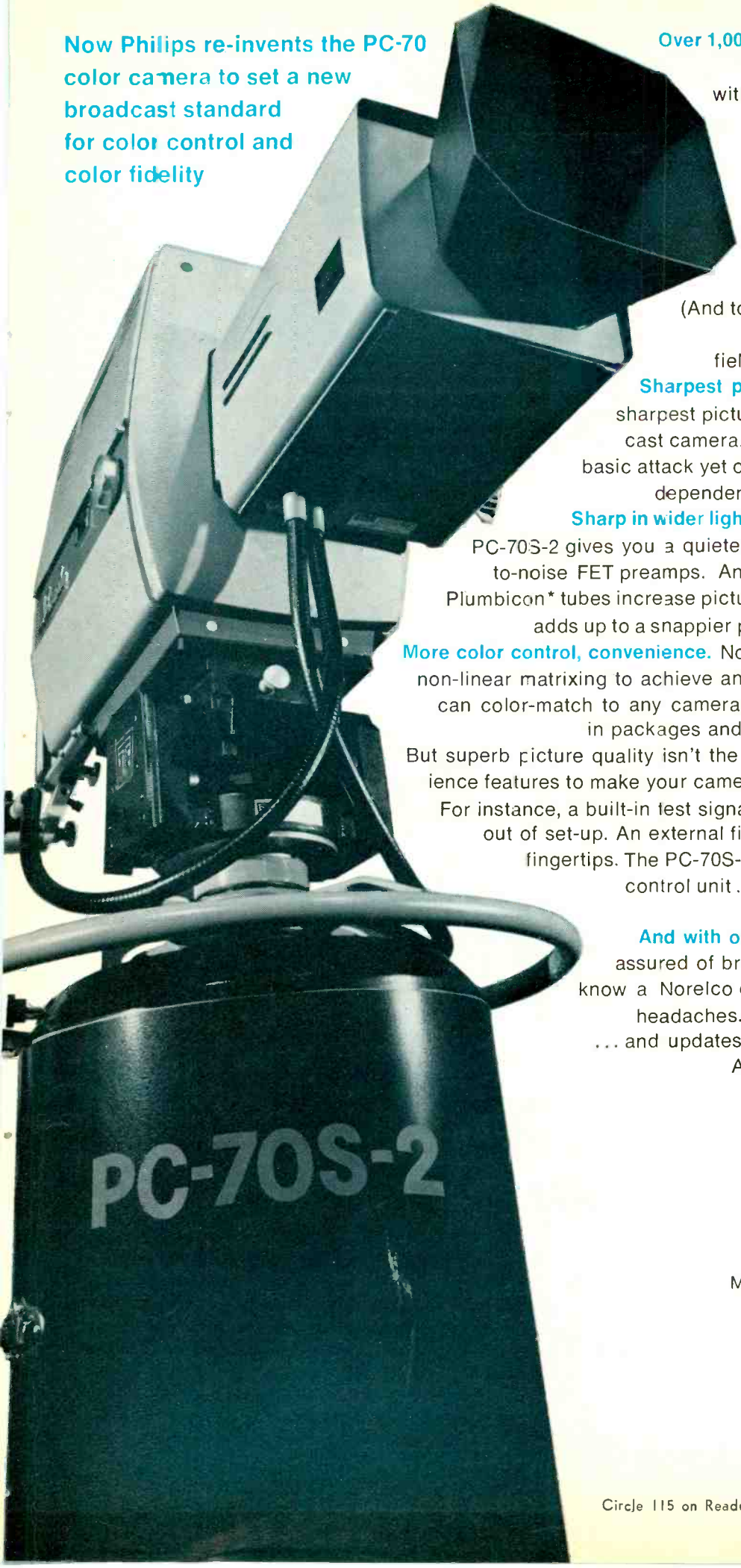
Next month: A comprehensive review of all NAB products. **BM/E**

The Innovators Introduce:

"Son of PC-70"

The Norelco PC-70S-2

Now Philips re-invents the PC-70 color camera to set a new broadcast standard for color control and color fidelity



Over 1,000 Philips 3-Plumbicon* cameras have been delivered throughout the world, with more than 600 serving broadcasters and production companies in the United States. It is the standard other cameras try to match.

That was tough before. Now it's tougher. Because today the Innovators are introducing the PC-70S-2, with an important list of new features. (And to prove you are always state-of-the-art with Norelco, they're available as field update kits for older PC-70 models.)

Sharpest picture yet. Our key innovation is the sharpest picture detail you have seen from a broadcast camera. A new technique introduces the most basic attack yet on picture-degrading "noise" . . . level-dependent comb-filtered contour enhancement.

Sharp in wider light range. In low-light situations, too, the PC-70S-2 gives you a quieter picture. We've added 48-db signal-to-noise FET preamps. And at all light levels, separate-mesh Plumbicon* tubes increase picture resolution and dynamic range. It all adds up to a snappier picture in every area from light to dark.

More color control, convenience. Now the PC-70S-2 is also available with non-linear matrixing to achieve an infinite range of tints and hues. You can color-match to any camera you own. Even those problem colors in packages and costumes snap into true-to-life color.

But superb picture quality isn't the whole story. There are many convenience features to make your cameraman more expert, more productive. For instance, a built-in test signal generator that takes the guesswork out of set-up. An external filter wheel control at the cameraman's fingertips. The PC-70S-2 ranges far and free from the camera control unit . . . up to 3,000 feet with standard cable, or 1,000 feet with mini-cable.

And with over 1,000 cameras delivered, you are assured of broadcaster-proved dependability. You know a Norelco camera will deliver performance, not headaches. You know Norelco delivers service . . . and updates to keep you abreast of innovations. Ask us about details and prices now.

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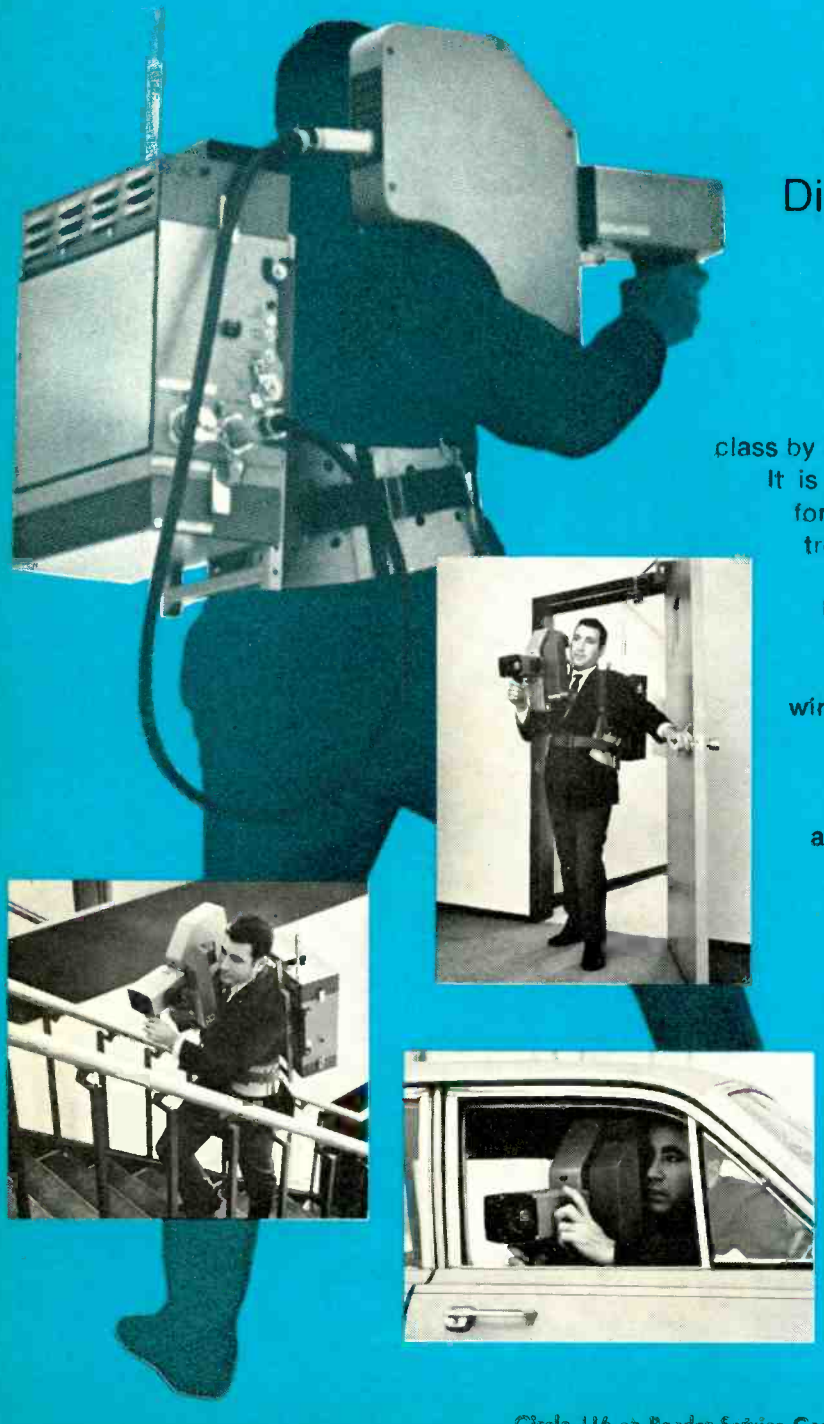
*Reg. T.M. N.V. Philips of Holland

The Portable PCP-90... direct-broadcast color from the backpack



Digitally-controlled Norelco "Minicam" sends a live color-composite signal by microwave or triax

The Norelco PCP-90 "Minicam" is in a class by itself as the most mobile of field cameras. It is the go-anywhere, do-anything portable for broadcast quality color television. Controls can be beamed from as far away as 30 miles. Signal processing is done in the backpack. You can broadcast live, or take along a portable recorder and tape the action for playback. Operating wireless or on small, cost-reducing triax, the PCP-90 with its 1" Plumbicon* tubes brings total flexibility to color telecasting. Minicam is making the scene daily in an unprecedented variety of field, airborne and studio events. It's ready to make your scene now.

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Capital investment by Capital Broadcasting, WDCA-TV Ch. 20, in studio gear is over $1,000,000. Station was amongst first to order video cartridge machine. Plans call for automated master switcher, new antenna, new high power transmitter.

Tight-roping to Success With an Independent Uhf Channel

Mind your P's and M's—programming, promotion, power; and money, management and market.

THE GUYS having the most fun in TV these days are the ones losing the most money. Immense satisfaction comes every time an ARB report shows an increase in share of audience. These days, such increases are coming frequently.

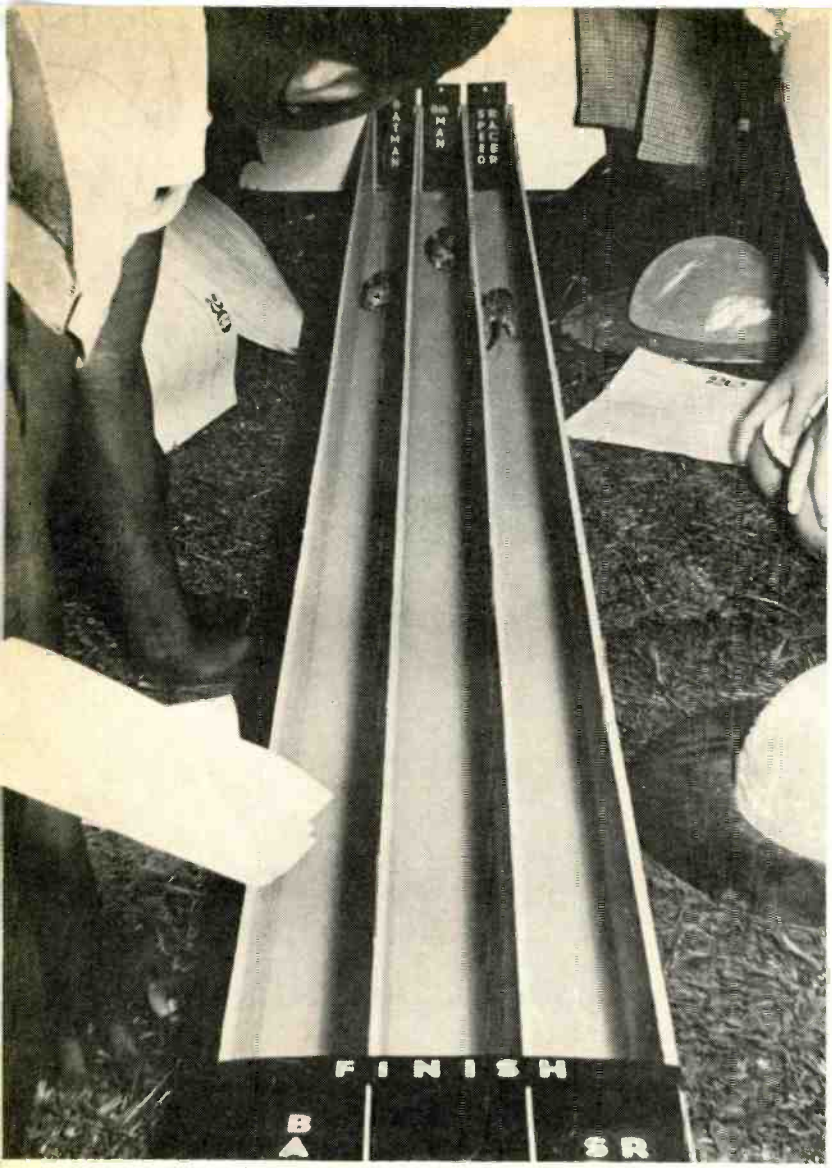
During fringe time these independent U warriors are beating the mighty network V's—at least they have in Philadelphia, Cleveland, Detroit and Sacramento. Whenever a U can wrangle a major sporting event into prime time they may end up No. 1 for the evening. Last winter, when WPHL, Philadelphia, carried a rescheduled NFL Eagles-Colts contest live on a Monday night, they out-pointed *Laugh-In*.

The U with broadcasting rights for a hot basketball team does very well during those hours the courts are active.

And it's not impossible to beat a V during its movie night if the U happens to schedule something sexy against an obscure network offering.

Because of these breakthroughs the independent U in larger markets can now see and smell victory. So while there's still very little profit, there is exhilaration—in the bigger markets, that is. But the picture is not bright everywhere. One sad man is Julian Meyers of Ventura, California. He spent his life savings in six months and went dark in heavy debt in eight. His undoing was his dream and commitment: 65 hours a week of local live programming.

A growing number of stations, however, expect to finish 1970 in the money. Most optimistic about profits next year is U.S. Communications which operates WPHL-TV in Philadelphia, WXIX-TV, Cincinnati, WPGH-TV, Pittsburgh, and plans



Successful U's win with kids. Gerbil races helped improve WDCA-TV's average 3:00-7:30 p.m. 100 percent.

to begin broadcasting in Atlanta and Houston. President Bob McGredy reports some black quarters in 1969.

What it Takes to Win

If you've got the wind for a five year sprint plus a little reserve you can become a winner even in a field of many entries.

Martin Firestone, general counsel for the association of uhf stations, All-Channel Television Society (ACTS) says the ingredients of success for U's are three Ms: Money plus Management plus Market. (See box.) After talking to a number of U managers, *BM/E* feels the three P equation can also spell success. The three Ps, according to Bob McGredy (U.S. Communications), are Programming plus Promotion plus Power. These two formulae are compatible. The money factor of Firestone's formula should be spent on the three Ps.

The Market Comes First

What kind of limits or parameters should be placed on the market? At this reading it looks risky to become an independent U in any market smaller than the 25th. There is no sure cut-off line and each market should be studied individually. The U in Pittsburgh should go because it's in the tenth market and the only independent in town at the moment (not counting the very strong public broadcasting stations WQED and WQEX). The U in Cincinnati looks like a sure thing because it's the 4th station in the 16th market.

It is a certainty that *some* U's can succeed in the top ten markets but it's not clear just how many can, simultaneously. San Francisco is one of the top ten (seventh) markets but it has four U's at present. It's hard to conceive of more than two operating profitably.

San Francisco is an interesting market. First, it is well defined by mountains so there is no significant fringe market. Because of the terrain within the city, a lot of power is needed to lay down a good signal. Although there are 1,372,600 ARB ADI households, San Franciscans look at TV less than other people. This keeps ratings low. On the other hand advertisers are willing to pay a high cost per thousand. No two broadcasters will add these factors up the same way.

Although the 25th market may be too high a cutoff point for assured success, one thing is certain: the only viable small-community U is either a network affiliate or the only action in town with any of the network feeds available to it.

Even then such a U is a community station more in name than in fact. Revenues aren't available to the small town TV broadcaster to do any heavy community services broadcasting. Most stations in small markets have to be content with being more switch throwers than telecasters.

There are exceptions but WMKG, Ch. 54, Muskegon, Michigan, confirms our contention that the small-town independent can't really make it. WMKG began operations on April 3, 1967, with the fond hope of truly serving local programming to its community of 47,200 homes. Channel 54 is the only station in town but Mukegon does get NBC and ABC from Grand Rapids and CBS from Kalamazoo. There is no dilution offered by the local CATV system since the station has successfully fought the importation of Chicago stations.

This small number of homes (221st market) hasn't moved Ch. 54 to hold back in programming. The idea has been to win loyal local viewers. The station has tried and kudos have been heaped on Ch. 54's president Andrew E. Jackson and his crew. *TV Guide* and the trade press have praised the station's efforts at local live programming, but for all the blood, sweat and tears, the station's net weekly circulation as of last November was still too low to meet ARB's minimum reporting standards.

Muskegon is not necessarily a failure—it can meet expenses—but it is not a success story. Twelve months after Ch. 54 began operations it was breaking even with billings at $11,400 per month. Some 83 accounts had been sold time at rates ranging from $12 minimum to $75 for a minute during a sporting event. Free films kept

The Three Ms of Uhf Success

By Martin E. Firestone, All-Channel Television Society.

The uhf industry has grown faster than even its most ardent supporters expected. In 1963 there were only 83 operating commercial and educational uhf television stations in the country. The following year the All-Channel Receiver Law went into effect. Now the number of operating uhf stations has reached 289. Commercial stations number 183. So far more than $170 millions have gone into simply the construction of commercial uhf stations.

In such cities as Philadelphia, Pittsburgh, Cincinnati, Cleveland, Boston, Atlanta, and Charlotte, independent uhf TV stations are now offering programs and program services that weren't available before. Uhf also provides full third network service for the first time in Jacksonville, Birmingham, Dayton and Toledo.

But people say uhf just isn't going to make it. Some other way has to be found to expand TV service to the public. Judging from some of its recent decisions and statements, even the FCC seems to be thinking this way.

It's all because a few uhf stations have gone out of business and a few more are reported dying. And so people think there is an inherent inferiority in the uhf channels.

That's not true and a quick look at the operating history of the stations that failed shows that their channel numbers had nothing to do with it. Even had they been V's those stations could have failed because they did not have what it takes for successful TV: the three Ms—Money, Management and Market.

Bad Beginning

Back in 1964, the All-Channel Receiver Law opened a whole new world of broadcasting opportunity. To some, this meant innovations in their programming; to others, quick and easy money. Uhf got more than its share of speculators, promoters and dreamers. About the only thing this trio of adventurers had in common was not much experience in broadcasting—and less in uhf.

All they felt they had to do was to get their construction permits and get on the air. Financing generally amounted to down payments on equipment, construction and program purchases, plus the initial salary payments. They expected the All-Channel legislation to produce immediate uhf receiver saturation and a rush of earnings.

The considered opinions of men experienced in broadcasting, however, did not support this enthusiasm. During Congressional hearings on the Receiver Law, experts testified that it would take at least seven years after the law was passed before national conversion to all-channel TV receivers would reach 100%. And the U's couldn't hope to approach profitability until the percentage reached 50.

Since the saturation percentage was zero in most markets at the time, it should have been clear to these minimal investors in uhf that they wouldn't be able to hold on long enough.

After the law was passed, the adventurers went into business with insufficient funds, anyway. Their stations soon went deeply into debt, but they merely had those debts transferred into long-term payments—to be paid off as soon as the revenues started flowing.

No Money

At the predicated rate of 13% a year, all-channel receiver conversion took place. The revenues also increased slowly.

The promoters, speculators and dreamers were in trouble. They weren't even meeting operating costs and their enormous debts remained unreduced. Whatever additional sources of financing they could find, they drained during the first few years, just to keep alive. When the all-channel saturation point finally reached the break-even level, the stations couldn't afford to take advantage of it.

No Management

Now these entrepreneurs might have had a chance even with an inadequate amount of the first M, if only they had gotten some quality in the second. Adequate management might have compensated for the lack of money. But, in most cases, sound, professional broadcast management was also missing.

It was the FCC policy to encourage non-broadcasters to apply for uhf stations. Local doctors, lawyers, dentists, retail businessmen, none with any real knowledge of the broadcasting industry, became the principals of these new operations—largely as a result of the FCC policy. Unfortunately, the principals did not choose to invest enough in good operating management.

But as for operating costs themselves, the new broadcasters saw no reason to minimize those in this glamorous and highly technical industry of quick profit. And when the squeeze came, the inexperienced managers didn't know how to cut costs while keeping program service and quality reasonable. So they responded by down-grading their product, only to discover in many cases that they were missing, in addition to everything else, the third and final M.

No Market

Not every community allocated a uhf channel was a viable TV market. The FCC based its allocations on purely technical feasibility. In the early rush to file uhf applications, this fact was overlooked.

Many communities were not separate TV markets, as had been assumed by some new uhf operators. They were part of the markets of larger nearby cities whose TV signals overshadowed the uhf communities. The major networks and program distributors considered these new uhf stations competition; they denied them affiliations and charged them the program rates of the larger market. Only the advertisers honored the small city allocation designated to the uhf stations—by paying small city rates. The combination of high program costs and low advertising rates proved deadly.

Now, there will be more uhf stations going off the air in the coming months. But they will have died from lack of at least of one of the three Ms, not from channel number inferiority.

Children's telethon by WDCA-TV netted $10,000 in nickels, dimes and quarters for Children's Hospital of District of Columbia and gained the station community recognition. Supreme Court Justice William Douglas, above, helped out.

costs down. The monthly payroll was $6000 for six full-time and eight part-time employees. Jackson says the rewards have to be greater for all of the hard work put in. He feels the only way to continue is to sell off a major interest to a large company and to raise capital for expanding into a bigger market. He has applied to the FCC for a permit to set up a 1000 foot tower south of Muskegon. With 1000 feet of antenna and 1 self from the 221st market to the 36th market of megawatt of power, Jackson can catapult him- 780,000 households. With the new power, Ch. 54 would be the only independent in the Muskegon-Grand Rapids-Kalamazoo market.

The Muskegon lesson is that local advertising dollars can't keep a station on the air. You have to attract regional and national accounts and that means you've got to be in a market that counts.

Programming: Appeal to the Counter Mass

Programming the independent U is like programming an independent V, which means you counter program. The clue to counter programming is to run against the networks what did best for them last year. And if the network is running a movie, start yours a half hour earlier. Run news at 10 o'clock instead of 11.

Successful U's like U.S. Communications and Kaiser find that kids, young adults and sports buffs are the surest way into rating books and such demographics are saleable.

Kids. You can capture the kids from three PM on with *Gilligan's Island, Voyage to the Bottom of Sea, Flipper, Batman, Lost in Space, Star Trek* and the like. WUAB, Ch. 43, Cleveland, has ended up with an 18 share during the 5 to 7:30 time slot by running the freshest of previously proven kid stuff. (The material has to be the freshest—WUAB took away WKBF-TV's lead with the kids by showing newer material. Kaiser says it's rebounding with Rocket Robin Hood, first-run Addams Family and others—and by dropping Strange Paradise which bombed.)

The strip. After the kids' show, the aggressive U zeros in on young adults with proven strip programming—*Perry Mason* is still tops. *Man from UNCLE* is in this category as are some comedy shows such as *Dick Van Dyke*. Talk shows like *Merv Griffin* and *Mike Douglas* are viable but those with acerbitic hosts are waning. Rudeness isn't selling this season either to viewers or sponsors.

Movies. Movies are, of course, the chief weapon of U's. A movie against anybody but Dean Martin holds up well. If a U can pick a movie that's unlike the network offering, it helps. Such fine scheduling isn't always possible though. It's not easy to buy top films. A U rarely gets his pick from the distributors unless he has a big

market and can pay the price for first showings. Even then the network gets a chance to bid first since it can pay more. This is important—you can't be good if you're small. The small guy gets only well used products of interest to just a fraction of the habitual viewers.

And sports. The major market U also goes for sports as a sure means of high ratings. The trouble is sports are seasonal and their appeal depends somewhat on the home town's standing. The new Worcester U was happy to outbid a Boston U WSBK, for the Boston Celtic basketball team. WKBD-TV Ch. 50 in Detroit draws well by televising the hot Red Wing hockey team, but in other cities, hockey is a drag. Kaiser was keen on sports a year and a half ago, but is now backing down somewhat, except for hockey in Detroit and baseball in Oakland.

WUAB, Cleveland's biggest U, says it does quite a bit in sports—more than WKBF-TV (Kaiser)—but is reluctant to say it's relying on sports. WUAB has played delayed games of the Ohio State football games with success because the team is one of the nation's best. The station also carries Ohio State basketball live but the increased telco line charges make this effort marginal. The station owns a wrestling club and has a surprisingly good audience. The *Minnesota Fats* show is popular and the station has carried the Stanley Cup playoffs. U.S. Communication's stations are strong on sports and favor professional and college basketball.

KTXL Ch. 40 in Sacramento does well with sports, bringing in hockey, boxing and horse racing.

Public Affairs and News—Slow Payoff

Entertainment and sports work. Public affairs and community programming, however, is risky. Serious community programming isn't going to gain you enough viewers to impress anybody. Not only does community programming not draw, but it costs a lot to produce. It's prestige that's too expensive for most investors.

There are exceptions. Frivolous involvement programs—getting participation in kids shows, giving away prizes every hour and the like—are community programs that do garner viewers, but such activities should perhaps better be called audience promotion rather than community programming.

A local program on the youth drug problem will rate high but a topic of less vital interest will be ignored by the majority. One station that learned to its great disappointment that public affairs programming wouldn't go is WDCA-TV Ch. 20, Washington, D.C. Channel 20 is now on the road to success but its supporters are kids and mothers, not political scientists.

WDCA's audience is promoted by "family television," which offers Captain Twenty's gerbil races in the afternoon and *"Playboy"* after bedtime. The afternoon audience has more than doubled. But even with a decent rating garnered by gerbils, strip programming and movies, revenues weren't enough to finance the necessary modernization, so ownership was sold (to Superior Tube Company) to raise the capital needed.

Many of the most successful U's shy away from heavy local news coverage. A good news operation is very costly. Unless the market is bereft of any decent local news coverage an investment won't show any quick returns. Thus

The Kaiser Philosophy

An outstanding station is a community-involved station. Kaiser wants to own only outstanding stations. This has made locally-produced programming the No. 1 priority for each of the Kaiser outlets in 1970, according to Dick Block, v-p and general manager.

Kaiser's model station is WKBD-TV Detroit. As the oldest (five years), it has shaped a strong local image for itself through creative local programming. This effort includes:

THE TEN O'CLOCK NEWS—a half-hour report five days a week.

LOU GORDON—On Saturday and Sunday nights after 10 p.m. Gordon is called "the conscience of Detroit." He pulls nine and ten ratings and attention from TIME magazine.

THE DETROIT SHOW—a half-hour show 9-9:30 every Sunday featuring Mayor Gribbs. Reveals the good and the bad in Detroit.

NITTY GRITTY—at 9:30 on Sunday. Host is Jim Ingram, an up-from-the-street black man. Topics are social questions from both black and white angles.

BILL KENNEDY SHOWTIME—2-½ hours every afternoon except Saturdays. Kennedy has been a leading Detroit personality for 18 years with the competition. He brought over and keeps his good ratings at WKBD.

CAPTAIN DETROIT—a half-hour children's show Monday through Friday. Captures the kids.

DETROIT RED WING HOCKEY—31 live games in color.

Excluding hockey, locally-produced programming adds up to 24 hours a week.

Kaiser is committed to news even though there is little likelihood of profitability for years. In Boston, Arch MacDonald was taken away from WBZ-TV (Westinghouse) because he was the biggest news name in that market. TEN O'CLOCK NEWS is now on the air in Boston, Philadelphia, Cleveland and Detroit. Kaiser editorializes once it establishes itself as a responsible news source. Editorials are gutsy and relevant.

Each station has an editorial board made up of the general manager, news manager, program manager, and public affairs director. Editorials have produced tangible results.

Gribbs Ingram Gordon Kennedy

Bedlam? No, community involvement at WDCA-TV, Washington, D.C.—gerbil races, free bicycles, a telethon, education specials.

most U's handle news as a five-minute or less wrap-up every hour on the hour. Frequent news reporting, even if it is straight AP or UPI, keeps viewers abreast of the non-TV world.

Again, there are exceptions. Kaiser stations recognize that news is a loser today but Kaiser's Dick Block feels news reporting will pay in the long run (as it eventually did for the networks). Since instant success in news is impossible, Kaiser is investing now for the eventual reward. Others endorse Kaiser's views (which, of course, have been proven sound by Metromedia's independent V's). Channel 27 in Worcester, Mass., the nation's most recent U, backed by The State Mutual Life Assurance Company of America, has a 16-man news department. WSMW-TV whollops out a megawatt from a 2000 foot tower and gets into all six New England states. Its news reporting will serve the many populated communities outside metropolitan Boston.

Promotion and Power Make It Easier

Any station that thinks it knows the secret of success stresses the need for a powerful signal and heavy promotion. The importance of power is discussed in *Up Your ERP,* a separate article in this issue.

KTXL in Sacramento believes in broad coverage—KTXL uses lots of radio, four newspapers, *TV Guide* and billboards. Every station *BM/E* talked to stresses the value of promotion although a few draw the line at newspaper advertising. Promote the electronic medium they say.

Management: Circumspect Vision Needed

If enthusiasm and confidence are the mark of management, the top U's on the move today are well managed. Management at U.S. Communications is probably closest to proving itself with success at its Philadelphia and Cincinnati stations and near success in Pittsburgh. The group owner is aggressive but cautious in its selection of markets. Its next effort will be in Atlanta which is 19th in size. President McGredy's formula is Programming, Promotion and Power.

Kaiser's management has the loftiest goals in terms of dedication to public service, but it is wary of any market below the top ten. It's too early, of course, to tell whether Kaiser's commitment to public service will pay. The company's game plan calls for small-increment ground gaining (impressive news and public affairs) instead of the long pass. Kaiser stations have been beaten so far by other U's in Philadelphia and Cleveland.

It is optimistic about its progress in all markets but its success station is Detroit, WKBS-TV. WKBS-TV is economically successful and is making an impact on the city. (See box on programs.) Detroit is Kaiser's proof that it knows what it's doing.

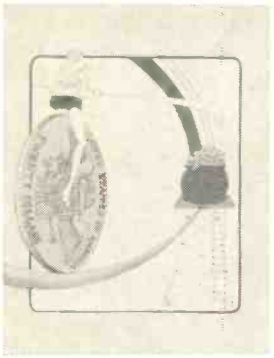
The top U in Cleveland, WUAB, is not in the black but industry observers are sure that John Serrao, vice president and general manager, will make it. Serrao believes in entertainment.

KTXL in Sacramento, owned by a CATV company, Cypress Communications Corp., and operated by Jack Matranga, is very nearly in the black. Matranga believes in entertainment.

It is easy to lose money as an independent U. But the smart manager will have controlled losses which can be directly related to increases in audience. Then he can up his rates. **BM/E**

Up Your ERP! Superpower Uhf TV: How to Compete with the V's

The three most powerful TV stations in the U.S. are U's competing with V's in intermixed markets. If people can't see you, how're you going to sell 'em?



EVER SINCE the first commercial uhf TV came on the air (KPTV, Portland, Oregon, 1952) a major problem has plagued channels 14 through 83: It has always been harder to pick up a U than a V, because signal propagation is more difficult at higher frequencies. This principle is reflected in the FCC maximum powers and antenna heights for the three bands: 100 kW at 500 feet on low vhf; 316 kW at 500 feet on high vhf; and 5000 kW (5 MW) at 2000 feet on uhf.

With all that power permitted on uhf, how come most U's run only 100-1000 kW at 1000 feet or so? For one thing, high-power uhf transmitters were scarce until recently. And of course, they cost more. Also, it's possible to get by with medium power if viewers use outdoor uhf antennas. But many won't, since they get good pictures on vhf rabbit ears.

In an intermixed market, it boils down to this: If a viewer gets a good vhf picture on a monopole or rabbit ears, he wants an equally good uhf picture on that little set-top uhf loop. If the U can't deliver the signal, it can't attract viewers, no matter how good its programming.

Most vhf stations run maximum power. Why not do the same on uhf and have a competitive signal? Three U's have done just that, and the results are pretty good. WPHL-TV Philadelphia, WCCB-TV Charlotte, and KEMO-TV San Francisco have upped their power to the limit (or very close to it). In each case, the U signal equals or betters the competing V signals—both close in and far out. The Grade A uhf contour goes 40-50 miles out, while the Grade B contour runs roughly 70 miles. Both are similar to competing vhf contours. With electronic beam tilt in the antenna, nulls are filled, and more CATV systems can pick up the stronger U signal, adding thousands of new viewers.

U.S. Communications' WPHL-TV Philadelphia (ch. 17) is the superpower pioneer, having gone to 4.3 MW ERP in May 1968. The station has the first RCA TTU-110 transmitter, which puts 110 kW into an RCA TFU-46K traveling-wave antenna at 1080 ft. VP-GM Robert Bryan says the station used the slogan "Tower Power" and conducted an extensive promotion campaign, using billboards, radio, and newspaper when the power boost went into effect.

The Philadelphia TV market (fourth in the U.S.) has six commercial TVs—three V's and three U's—and the network primary affiliates are the V's. But full-color WPHL-TV clears some daytime strips from ABC and NBC, has taken the Sugar Bowl from ABC and a Colts game from CBS. Uhf penetration is 82% in the market, partly because of WPHL-TV.

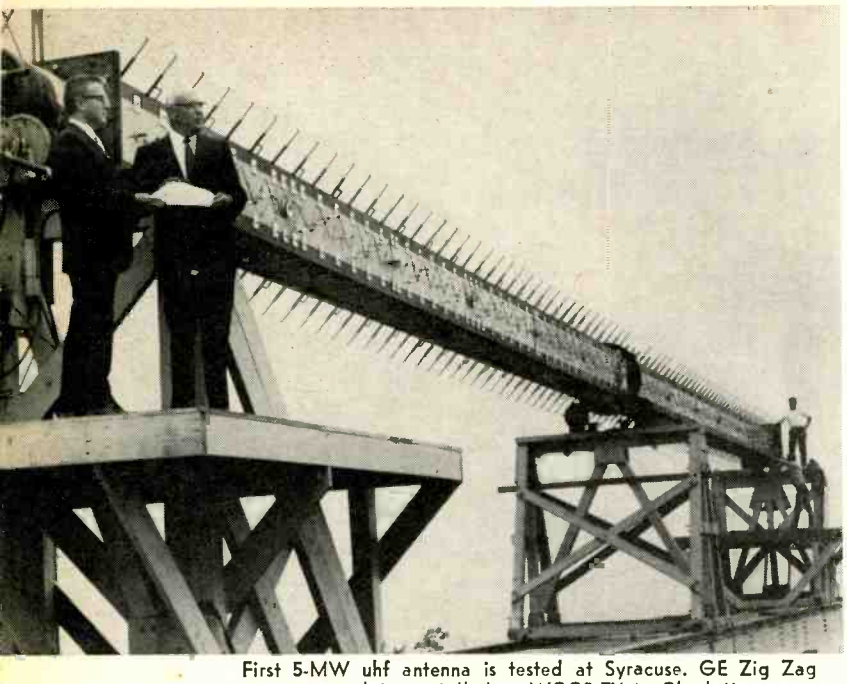
After more than a year and a half of superpower operation, WPHL-TV's ARB net weekly cume is over one million, compared with the 500,000 rating gleaned at medium power, according to Bryan. He also says the station delivers more homes per rating point than the V's. Because of this proof of homes delivered, WPHL-TV has raised its rates several times since 1968, and few advertisers have deserted.

Bryan says the only problem associated with the power boost was the usual run of bugs to be expected with a prototype transmitter. The kly-

Power Isn't Everything

Antenna height above average terrain is at least as important as effective radiated power in determining coverage area. Depending on your market, you may not need top power. In flat terrain, less power with sufficient antenna height and null fill can work nicely.

For instance, WSMW-TV has 1 MW at 2000 feet in Worcester, Mass. (photo at right), and WUAB-TV has 1 MW at 1000 feet in Lorain-Cleveland, Ohio. Both stations put as good a signal into the market as their vhf competitors do.



First 5-MW uhf antenna is tested at Syracuse. GE Zig Zag antenna was later installed at WCCB-TV in Charlotte.

strons kept burning out, but that problem is pretty well under control now.

First Full-Power Station

On Sept. 1, 1969, Mecklenburg TV Broadcasters' WCCB-TV Charlotte (ch. 18) upped power to the 5-MW limit to become the nation's most powerful broadcast station. Parallel GE transmitters drive a GE Zig Zag antenna at 1250 ft.

Station manager Tally Simpson says promotion was essential to making full use of the power boost. In a four-station market—two V's, two U's—WCCB-TV is an ABC affiliate, while the two V's have the other nets. Although viewers wanted to see the ABC programs, WCCB-TV signals weren't as strong as the V's. The signals were fair in Charlotte, but WCCB-TV couldn't compete with the V's in the 14-county metro area containing some 2.3 million potential viewers.

Simpson reports that the station mounted a large promotion drive to publicize the power boost, using co-op newspaper, billboard and radio ads with Channel Master receiving antennas.

New FCC Tuner Rules

Perhaps the last uhf handicap will be largely removed by May 1, 1971. After that date, TV receivers with pictures larger than nine inches measured diagonally will be required to have equal uhf and vhf tuning capability. Smaller-than-nine-inch sets will be required to have such capability after May 1, 1973.

In its rule change the Commission showed no preference for the tuning method used, as long as the same method was used for uhf and vhf.

Besides serving Charlotte, WCCB-TV made 11½ weekly hours available to civic and community officials and groups in 12 metro-area towns. The station selected names at random from area phone books, put one name on the screen nightly for 20 seconds, offering a prize worth $60 if the viewer called within 18 minutes. In four months, only four viewers failed to claim their prize.

WCCB-TV is total color, and even traded in their older PE-250 cameras for new PE-350s when they boosted power, to get the best possible local color.

Although field-strength measurements were made of the superpower installation, Simpson wasn't satisfied with figures. He wanted his out-of-city picture as snow-free as his V competitors. So he took a battery-powered small-screen portable TV, equipped with a vhf monopole and a uhf set-top loop, and drove around the 14-county metro area switching between uhf and vhf. He kept after his engineers until WCCB-TV could be received as well as the V's.

With uhf penetration now at 84% in the Charlotte metro area (and 65% in the ADI), Simpson reports that WCCB-TV broke its own sales record over the previous year. They've raised their rates commensurate with the increase in homes delivered, and have met with little or no sales resistance. In fact, WCCB-TV is now sold out much of the time.

Western Power

Latest entry in the superpower field is U.S. Communications' KEMO-TV San Francisco (ch. 20), which went to 5 MW on Nov. 1, 1969. The 110-kW transmitter is a GE TT-62 A/B, working into an RCA TFU-30JDAS antenna at 1550 ft.

KEMO-TV faces perhaps the most competitive market of the top U's. San Francisco is the sixth TV market, with eight commercial stations—four V's and four U's.

GM Martin Pollins notes that when full-color KEMO-TV boosted power, they used a heavy promotion campaign including billboards, transit posters and radio. They printed a client-oriented brochure describing their new power and coverage area. The results have been gratifying.

Pollins says the station's old coverage pattern was omnidirectional, wasting power over the ocean. The new 5-MW pattern has a null to sea, and the inland contours almost exactly match those of the V's. He reports that many CATV systems now include KEMO-TV on their cable, as they can pick up the station for the first time. And viewers have written in complimenting the station on the better picture.

While KEMO-TV sales have been slow, reflecting the general business trend, sales reception to the power boost and added viewers has been good, Pollins reports. It's still too early to properly judge the effects of KEMO-TV's boost, but if Philadelphia and Charlotte are any guide, the results will probably be beneficial. **BM/E**

WXVW Sports Director Charlie Jenkins reads sports scores into station's Code-a-Phone for listeners' convenience.

Automatic Phone-In Simplifies Listener Participation

By Edward R. Lucas

The automatic telephone answering system can be useful in promoting audience involvement. Here's how two radio stations use their systems.

WHETHER USED for public service or revenue production, the automatic telephone answering device at a broadcast station helps promote greater audience interest, more effective advertising results, and more successful station operation. And the system requires little attention by station personnel. Thus its operating cost is relatively low.

Edward Lucas is a freelance writer in Poulsbo, Wash.

Two radio stations that currently use answering systems effectively are WXVW, Jeffersonville, Ind. (Louisville) and WDAF, Kansas City. Wxvw has a model 200 Code-a-Phone with answering facility only, to provide sports scores to listeners who phone in. WDAF uses a model 770 with answering facility and a two-hour message-recorder system to elicit listener comments, some of which are later broadcast. The stations use their equipment in different ways, but both are pleased with the results.

Telephone Scores

Wxvw does a heavy sports schedule, and eight years ago it installed answering equipment in a system it calls Dial-a-Score. The first machine had an announcement capacity of only one minute, which was often inadequate, especially on weekends when there were many sports activities to report. That machine has since been replaced with a three-minute Code-a-Phone. It's entirely satisfactory for WXVW needs, according to sports director Charles Jenkins. A typical announcement early in the week takes one to one and a half minutes. On weekends, the entire three-minute capacity may be needed.

Announcers read updated scores into the machine seven or eight times during the station's 24-hour operating day. Some West Coast contests don't end before 1 or 2 am Eastern time, and thus aren't carried on evening newscasts. Listeners

Continued on page 66

Blueprint For A Total Telecommunications System

By Claude F. Buster, Jr.

New coordinated switching/distribution facilities needed if we're going to convert blue-sky ideas to blueprint realities.

A TOTAL TELECOMMUNICATIONS service would include, in addition to regular telephone service, two-way video phone, facsimile, television, utility-meter reading, security alarms, and a two-way data link. The data terminal would serve as an input-output device to a computer, Figure 1. Data transmission, for the most part, would be non-narrative information. These services must be offered to the general public if we are all to benefit by the communications revolution.

Let's examine transmission, switching, and distribution facilities needed. We'll find that switching and distribution facilities are the weakest link. High capacity microwave and coaxial cable trunking facilities can handle wide band traffic between principal switching centers. New telephone switching centers are providing custom calling services such as call forwarding, abbreviated dialing and, most recently, wideband switching of video telephone signals.

Telephone companies are now providing a variety of data services over the switched network which are of value to computer users and others. However, many switching centers and distribution facilities are not adequate for handling these newer services. The laser will increase trunking capacity to almost unbelievable proportions and the gap will widen between trunking capability and switching and distribution capability.

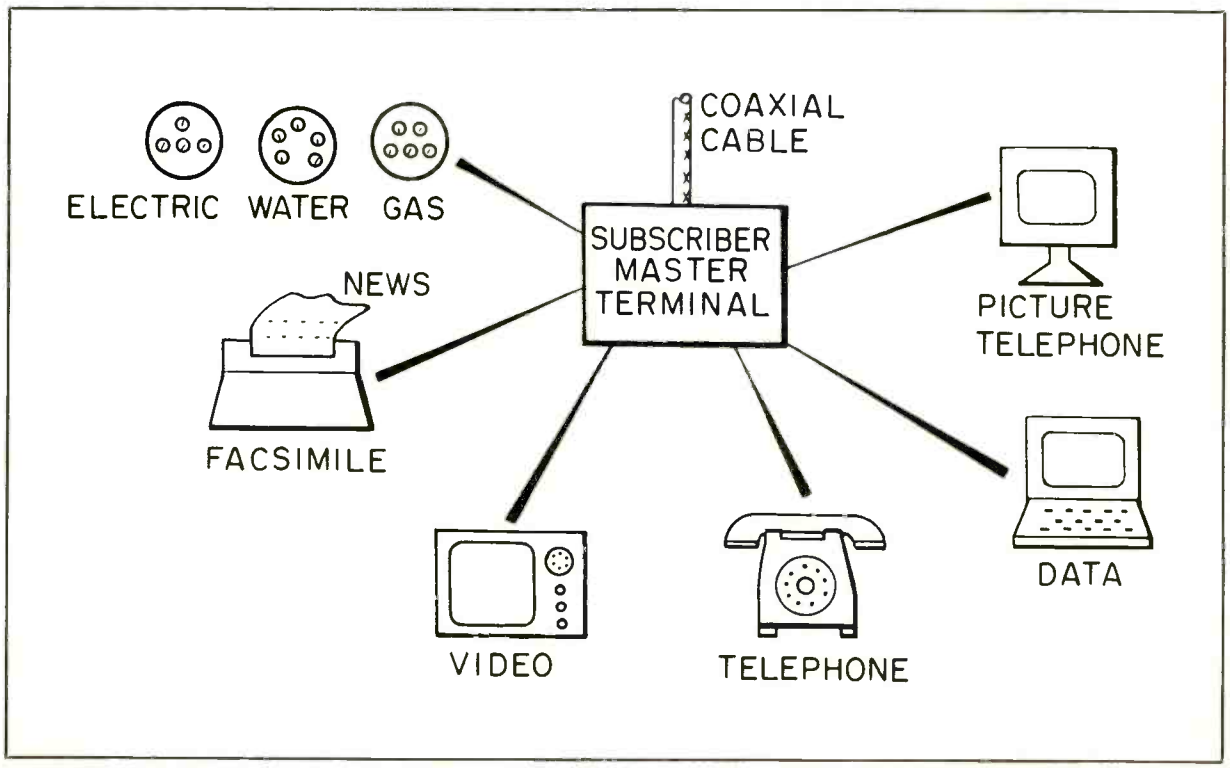
The discussion that follows envisions a distribution system designed around a single wideband coaxial cable. Technical considerations take into account the bandwidth required for the particular type of information; the amount of time allowed for transmission; the distortion that is permissible; and the noise that can be tolerated.

Claude F. Buster, Jr., is an engineer with the Telephone Operations Standards Division, Rural Electrification Administration.

Bandwidth Requirements

The spectrum space required for a signal to pass through a medium is analogous to the physical space required for a vehicle to pass through a mountain. The passband or tunnel can be built to almost any size depending on the availability of space and funds. The passband for speech in telephone service is approximately

Fig. 1. A total telecommunications system would handle not only TV and telephone but a variety of other services.



3000 Hz, Figure 2. This same three kHz passes the commonly used data-phone service. It can pass several channels of slow-speed data. A program channel for standard broadcast AM radio uses five to eight kHz of space depending on the quality of fidelity required. High fidelity FM radio programs require 15 kHz of spectrum space, Figure 3. The video telephone—more specifically the Bell System's "Picturephone"—uses 1000 kHz of bandwidth in each direction of transmission. This service now requires three conventional cable pairs to connect the subscriber to the switching center—one pair for each direction of video transmission and one pair for the audio. The video portion of a television channel requires 4.3 MHz of space. Its audio requirements are similar to FM radio. The television channel as broadcast requires 6 MHz, Figure 4.

Present Telephone Distribution System

Telephone signals distributed to homes are, of course, unmodulated and in analog form. They can be carried over cable pairs that have been equalized for the bandwidth required, but there may be penalties incurred that cause intolerable noise and distortion and the distance capability becomes unfeasibly short for the video signals.

The cable pair approach has worked well in the past but a total telecommunications system requires much more bandwidth than paired cables are capable of providing. Furthermore, the physical layout used to serve subscribers results in considerable waste of copper. The multi-paired cable that leaves the community dial office consists of several hundred pairs. The subscriber farthest from the central office needs only three or maybe one pair. Thus a telescoping cable configuration is used: the number of cable pairs never quite matches the customers on the route, hence the wasted copper. More cable pairs than immediately needed must be installed so that subscribers can be served when and if they move into an area.

Since the extra pairs will not produce revenue until they are connected to subscribers sometime in the future, their cost must be borne by the present subscribers under the established rate structure. Even if all pairs are used, there is considerable waste associated with this type of facility. When a subscriber is connected at a point along the cable, the remaining length away from the central office is not used. For this reason, a large percentage of multiple pair cable plant is useless. The use of subscriber carrier equipment helps considerably because fewer pairs are required, but still there is waste associated with this type of facility.

Cable TV Distribution System

By contrast the cable television distribution system uses a single coaxial cable to carry signals to subscribers. This is a wideband facility that

Here's a new approach to cable TV. For another one, see "Dial-A-Channel CATV System" in last month's BM/E, which describes an innovation tried in England. The FCC has now forbidden telcos to own CATVs within their phone-service areas and has broken the telco monopoly with the MCI microwave network precedent—so what's to prevent CATV operators from establishing total telecommunications systems like the one described here?

can handle almost any type and quantity of communications services regardless of size. A relatively large diameter coaxial cable transmits the signals to distribution areas. A smaller cable distributes the signals to subscribers, and a still smaller one is used for the "drop" to the customer's premises. There is no waste of copper conductors that are waiting to be used or cannot be used, however, because the full bandwidth capability appears everywhere along the cable.

There are many similarities in the telephone and the cable TV systems. Both systems provide a communications service to persons or firms that subscribe to it; both systems use cable to connect subscribers to a common point; and both systems require similar management and maintenance capabilities. The outstanding difference is that the cable facility used in the cable TV systems is capable of carrying total telecommunications services and the cable facility used in the telephone systems is not.

A coaxial cable system can handle a wide portion of the spectrum. By modulation of a carrier, each individual signal is assigned to a specific location in the spectrum. Cable television generally covers 0 Hz (dc) through 216 MHz, which covers standard broadcast AM radio (0.54-1.6 MHz) through channel 13 (216 MHz) of the vhf television band.

The commercial FM band occupies 20 MHz of space. A large part of the spectrum below channel 2 (54 MHz) is sometimes used for television subchannels. These are TV channels modulated with or translated to lower radio frequency carriers to take advantage of the lower cable attenuation for carrying the signals to a distribution area. However, this portion is not normally used in a distribution system. The 86 MHz of spectrum between the low and high portions of the vhf-TV band have not, as a rule, been used for the transmission of TV channels because of the presence of second order harmonics of channels 2 through 6. However, new cable TV amplifiers are now available that are designed to suppress these harmonics, thereby permitting the transmission of TV channels in this space and also immediately above channel 13.

Because attenuation in coaxial cables increases with increase in frequency, the logical frequency band for telecommunications services would be at the lower end of the spectrum. Fewer repeaters

are required for a given distance, which is a favorable factor in terms of relability and economics. However, it is more practical to carry one-way video services, such as broadcast television and educational television, on the channels to which they are now assigned by the FCC. Two-way telecommunication services are best handled at the lower end of the spectrum.

The two-way telecommunications services and one-way video services can be separated from one another at some specific frequency by means of filters and bypass devices which provide a path for the two-way telecommunications signals around each cable TV amplifier, Figure 6. Because the lower frequency signals experience less attenuation, several cable TV amplifiers can be bypassed before amplification of the two-way telecommunications signals is necessary.

The design frequency of the separation filters can vary to suit the individual situation because each coaxial cable system is independent of the other, Figure 6. This offers the designer the freedom of choosing his own frequency plan without coordination with existing allocations. Field tests in 1963 demonstrated that subscriber carrier telephone equipment can work over a coaxial cable in a telephone system. Additional tests in 1969 with today's modern, low-cost carrier equipment indicates the concept is technically feasible.

There is every reason to believe that a coaxial carrier system is the answer for new real estate developments and subdivisions. If a system is looking for a minimum initial plant investment capable of carrying greater loads at some unpredictable time in the future, a buried cable system is a better bet than multi-pair cable.

Basic Requirements

The following specification describes the basic considerations required for the transmission of two-way carrier-derived voice channels over a single coaxial cable, simultaneously, with the transmission of several one-way TV channels:

(1) The telephone carrier channels shall have frequency response characteristics, speech levels, signaling features and signal-to-noise performance commensurate with existing station carrier equipment.

(2) There shall be no perceptible degradation to the video signals caused by the application of telephone carrier equipment to the coaxial cable.

(3) Subscriber carrier equipment shall be expandable to at least 200 channels on each system and arranged so that subscriber terminals can be connected to the cable at locations all along the route.

(4) The filters and associated equipment for separating the two-way telecommunications signals from the one-way television channels and for bypassing the one-way cable TV amplifiers shall have attenuation and frequency response characteristics that will allow operation of the total complement of telephone carrier channels and other two-way services. This device also shall have provisions for a repeater that will amplify all two-way telecommunications signals in both directions of transmission when required. Coaxial cable should be plowed into the ground. It must be of high quality, both physically and electrically.

The system design engineer should not be as concerned with the physical dimensions and attenuation as he is with the consistency of the electrical properties. He has to depend on each reel of cable to have the electrical properties as specified and he has to depend on its physical properties to maintain consistency of the electrical properties as designed and manufactured. Using coaxial cable manufactured to a good quality control specification gives him some assurance that his system will be dependable during its lifetime. The basic requirements of a coaxial cable are:

(1) It should have low attenuation consistent with economics and physical size. The attenuation should remain close to the theoretical values at all frequencies; that is, the slope should not change appreciably throughout the lifetime of the cable.

(2) It should have a uniform characteristic impedance within dependable limits (high return loss) throughout the frequency range.

(3) The shielding should be effective so as to prevent noise and extraneous signals from entering the cable and to prevent signals from radiating from the cable.

System Design Layout

The actual system design layout can be approached in a number of ways. Since the basic concept is derived from both the telephone and cable TV systems, it seems the best plan might use ideas from both systems.

Cable TV systems usually have the signal source (head-end) located outside the subscriber distribution area. All TV channels are carried by trunk coaxial cable from the head-end to distribution points within the service area. From these points feeder cables distribute the signals to the subscribers. In telephone systems the wire center (central office) is placed as near as possible to the center of the area. Feeder cables emanate from central office to serve respective portions of the exchange area.

A suggested system layout of a model telecommunications system is shown in Figure 7. One-way signals from a remote location are transmitted over a trunk coaxial cable to the community dial office from which distribution feeder coaxial cables extend outward in all directions. By applying approximate filtering at the CDO, each feeder cable can carry its own telephone subscriber carrier system in addition to the one-way video services.

Since each subscriber carrier system has its full complement of channels, the danger of exceeding the system capacity is lessened. If the capacity is exceeded in a feeder, another feeder cable can be installed to serve the same area with

Continued on page 64

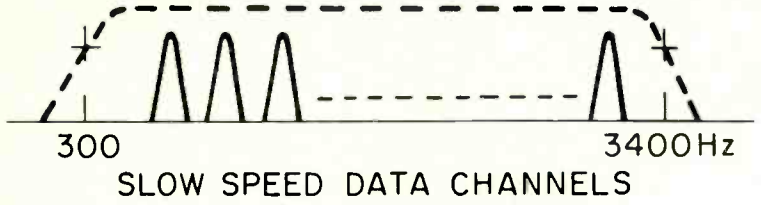


Fig. 2. Slow-speed data channels (facsimile, meter reading, computer data) can be accomodated in the same spectrum space that serves telephone communications.

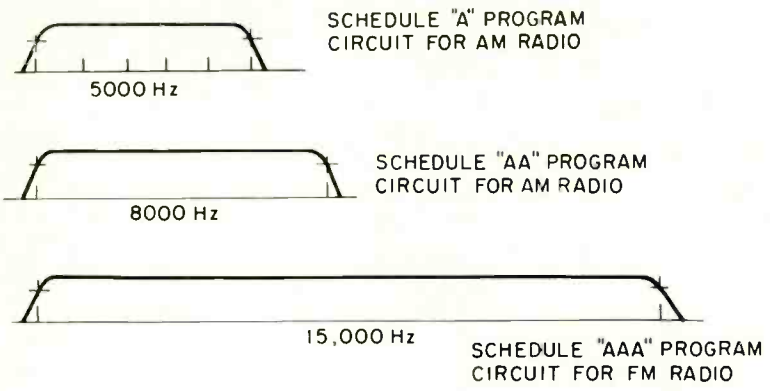
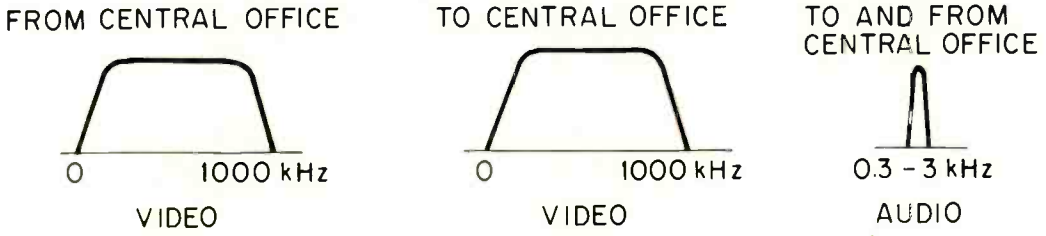


Fig. 3. Broadcast radio program circuits should have different bandpass capabilities depending on the quality of service.



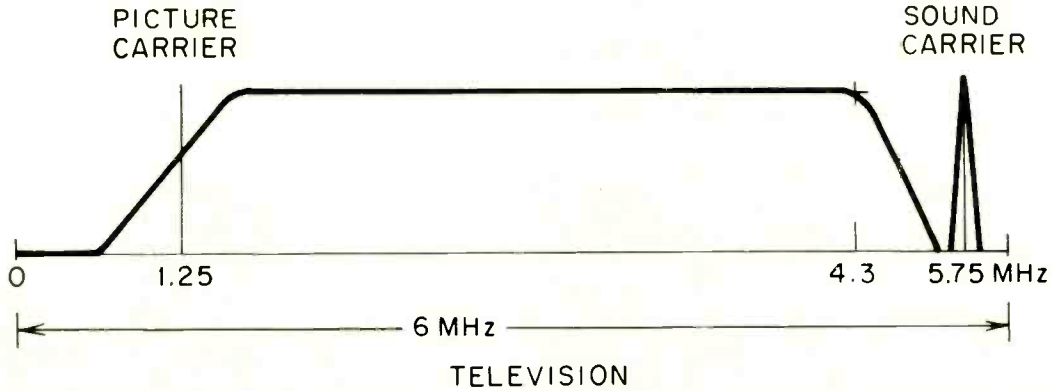


Fig. 4. Regular television requires 6 MHz bandwith. A two-way video telephone service can be accomplished with less.

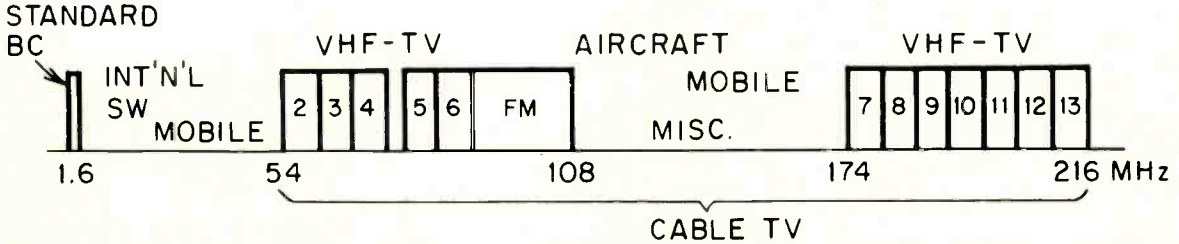


Fig. 5. Frequency allocations by FCC for various services. A coaxial system would have additional services added.

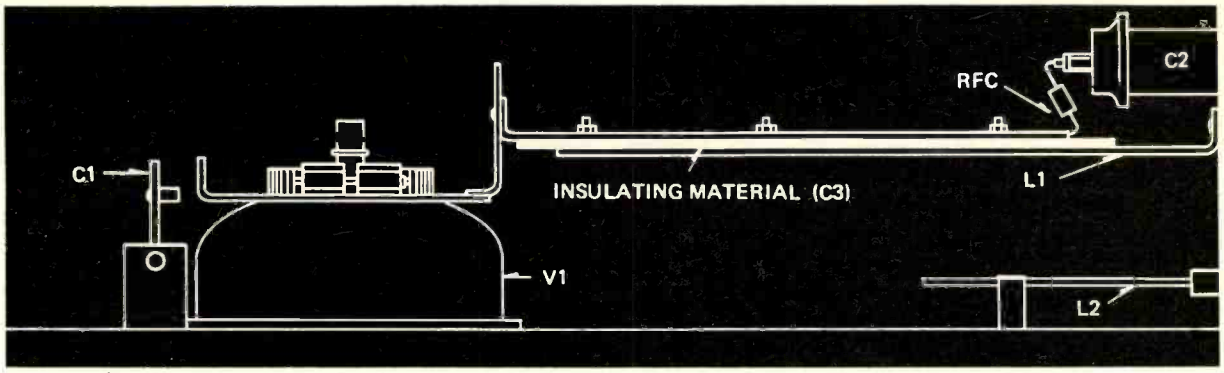


Fig. 1. In this pictorial, you see a 2.5-kW final amplifier (V1) tuned by the stripline (L1-C3). L2 is the output link.

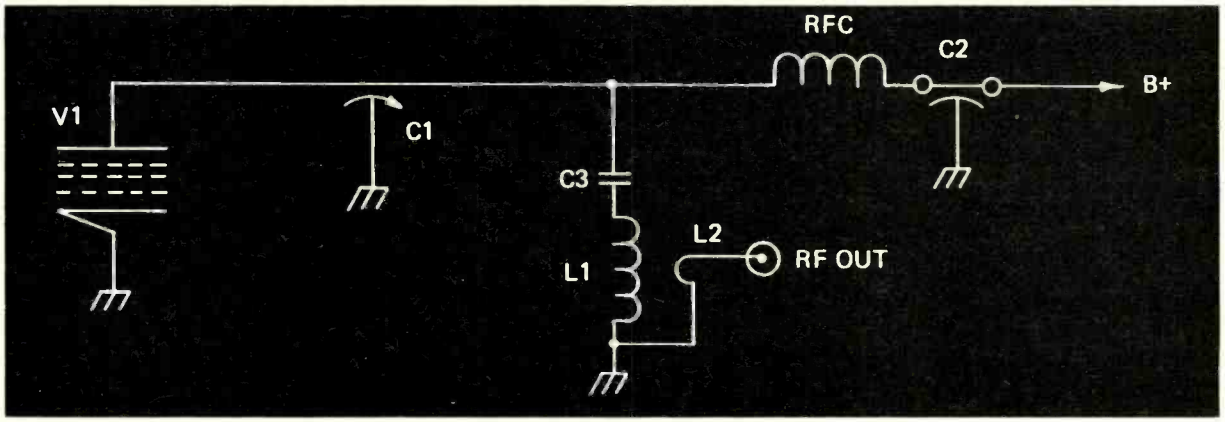


Fig. 2. This is the schematic of the output circuit shown above in Fig. 1. The stage is fine-tuned with C1.

Stripline Tuning

By Paul Gregg

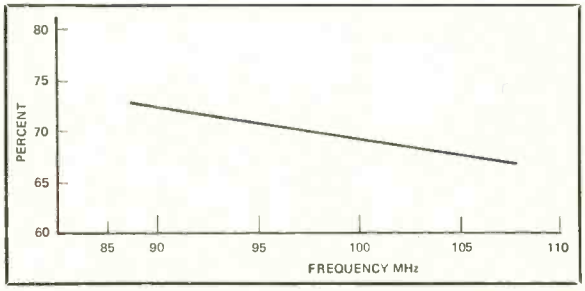


Fig. 3. Curve shows efficiency of stripline-tuned final amplifier in Bauer 602 FM transmitter.

SINCE THE INTRODUCTION of FM broadcasting in the 1940's, coaxial circuits have been used in high-power final-amplifier designs. Generally, this approach has worked well but left much to be desired in mechanical simplicity. The combination of high power, high frequency and modern tubes has not resulted in any really new ideas. Wouldn't it be an improvement if all current-carrying sliding contacts could be eliminated? Ideally, we should have something we could tune and forget, where stability is such that front-panel controls are eliminated. The stripline circuit offers just such properties.

Vhf amateurs have used the stripline for several years and have prepared useful information on the subject.* Commercial use has been limited, except in military applications where wide bandwidth is needed. Then in 1968, two high-power stripline amplifiers were installed at KIOI (FM) San Francisco. One amplifier feeds the vertically-

Paul Gregg is sales manager of Bauer Broadcast Products Division of Granger Associates.

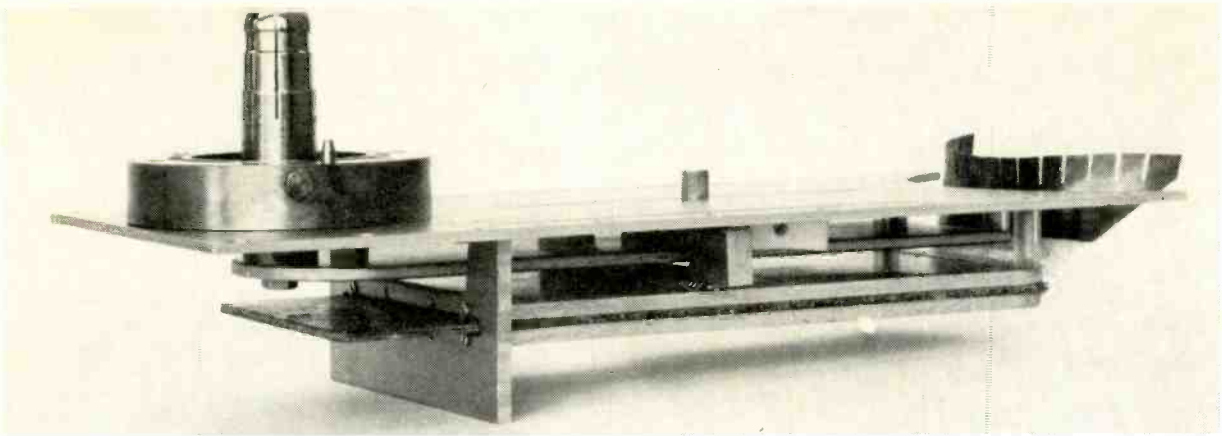


Fig. 4. This plate-circuit stripline is used in a 20-kW FM final amplifier.

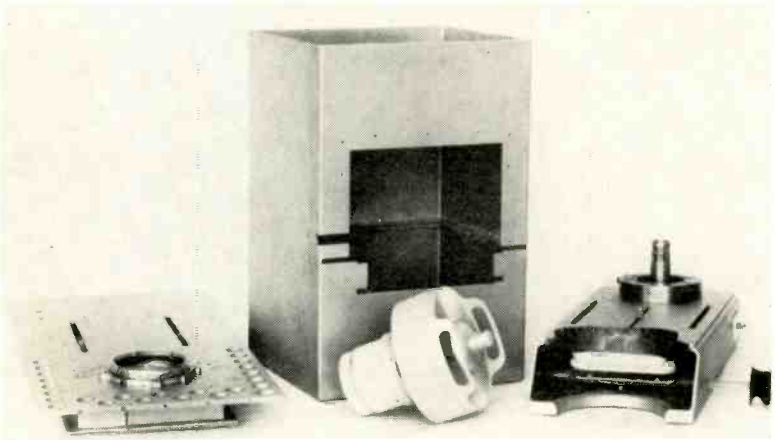


Fig. 5. Components used in 20-kW final of Bauer 620 transmitter include grid line, triode amplifier and housing, and plate line.

for a Stable Final

polarized antenna, the other the horizontal unit. That field test has proven the stability and capability of the stripline circuit. [Ed. note: Gates uses stripline PA tuning in its new TV transmitters.]

Circuit Design

Basically a section of transmission line, a stripline consists of two flat conductors separated by a dielectric. Each conductor is a piece of rigid metal. The line used in the Bauer 602 2.5-kW transmitter is shown in Fig. 1, and its equivalent circuit in Fig. 2. The line is grounded to the cabinet at the end opposite the tube, but when loaded by the tube and air capacitor C1, it can be tuned to resonance in the FM band. Note that the insulating dielectric creates a blocking capacitor (C3) which permits shunt feeding the PA plate and leaves the plate inductor free of high voltage.

The final is rough-tuned to the FM channel in use by moving the entire stripline assembly with respect to the chassis. You fine-tune the circuit with the "flapper"—plate-tuning capacitor C1—which, is to the left of the tube. Note that there is no movable current-carrying contact, thus contributing to overall stability. Overall amplifier efficiency is shown in Fig. 3.

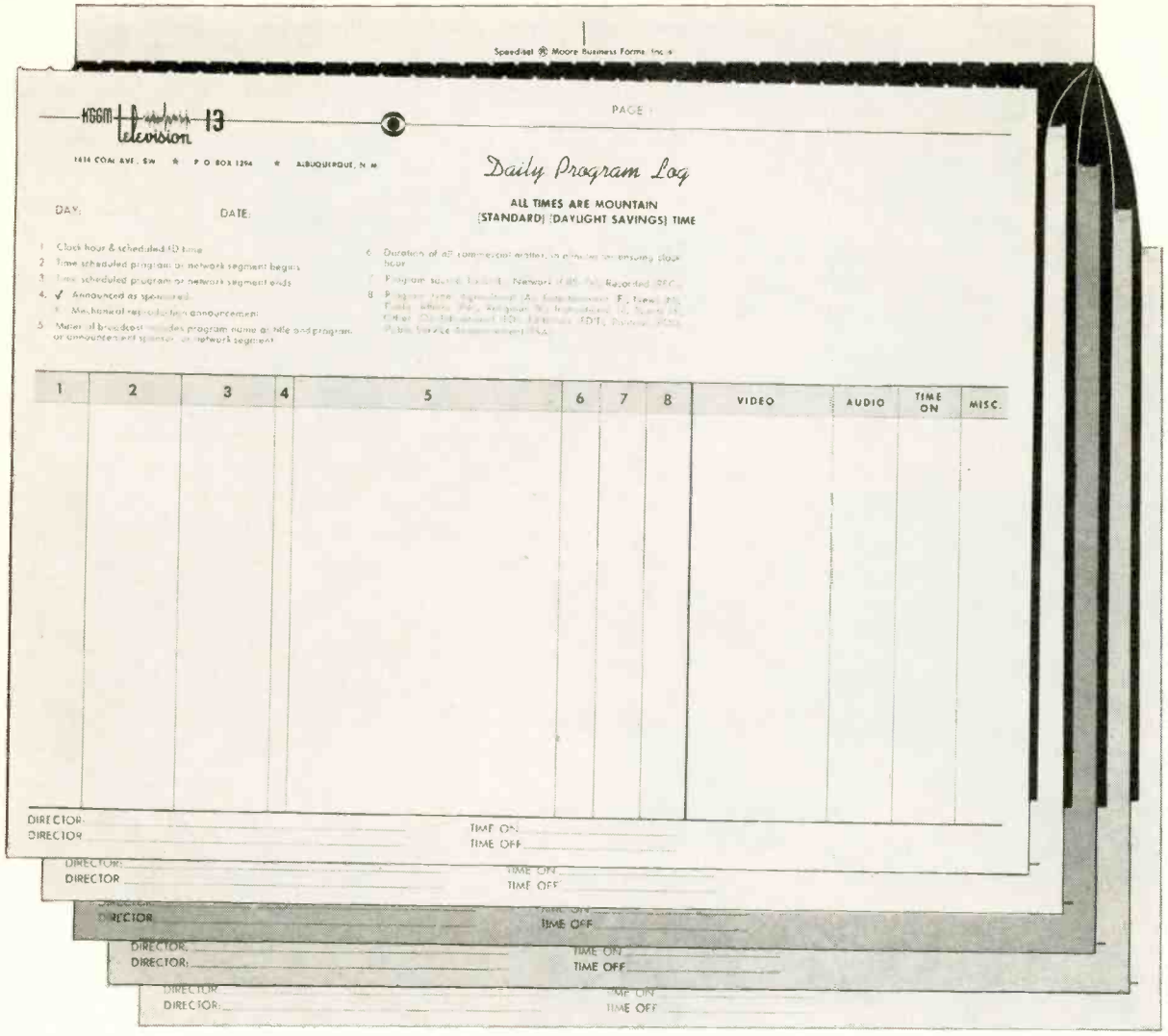
High-Power Stripline

In Figs. 4 and 5, you see the major components used in a 20-kW grounded-grid stripline amplifier. The input circuit is a stripline, which because of its bandwidth, doesn't require fine tuning. Filament current is fed through two low-impedance strips fastened to the top of the input line.

The plate circuit is also a stripline, similar to the one described previously. One difference is that plate voltage is much higher, and sharp edges must be avoided. Also the insulation has to be more efficient; Isomica cured under pressure at 450° F is used. Rough tuning is done with an adjustable short, and a variable air capacitor provides fine tuning. As with the 2.5-kW rig, tuning is a one-time adjustment and the front-panel control is eliminated.

This circuit is used in the Bauer 620 20-kW transmitter. The stripline driver uses a 5CX1500A running about 1000 watts. The final, also a stripline, is a 3CX15,000A7. **BM/E**

**Editors and Engineers Radio Handbook,* 16th Edition, p. 595.



Full Color Program Log

"Our old program log was too cumbersome," KGGM-TV's program director **Robert H. Van Driel** reports.

It was too big to fit anywhere, too hard to type on and too heavy for good carbon copying. So, spurred by the 1966 FCC regulation of program log format, Van Driel went to Moore Business Forms, Inc., for some help. Here's his description of the up-dated log they developed.

KGGM's NEW LOG form, shown here, is based on a Moore five-part Speediset. Columns one through eight are for FCC information. The right-hand third of the form is for optional data. When we need to, we simply cut off the FCC side and send it to the Commission.

Two days before air time we prepare the form as a schedule. Filled in as the programs are broadcast, it becomes our daily program log.

The rows are spaced for an electric typewriter, which saves our typist from adjusting for each line. The horizontal lines are light, so we can read the print between them more easily.

Each of the five sheets is a different color. On top is a white copy for the director, who verifies the scheduled programs as they are broadcast. This one can go to the FCC as part of the composite week, or stay in our files as long as we want it.

Underneath we have a yellow sheet going to projection, a pink for videotape, a goldenrod copy for audio and a green for the announcer. We keep this last sheet for a week, as a guide to the upcoming schedule.

All five sheets and the carbons between are bound to one stub. We can pull the perforated sheets off easily and toss the stub holding the carbons into the trash.

We think ours is one of the first program logs to conform completely to the new FCC standards. And one of the handiest. **BM/E**

Turn on the Ampex AG-440B and listen:

Perfect silence.

Switch to record: no pop.

Hit the stop: no pop.

Go from rewind to stop: no tape shrieking.

The Ampex AG-440B is so mechanically quiet some engineers use it in the same room with live microphones. It's so electronically quiet you can forget about switching pops.

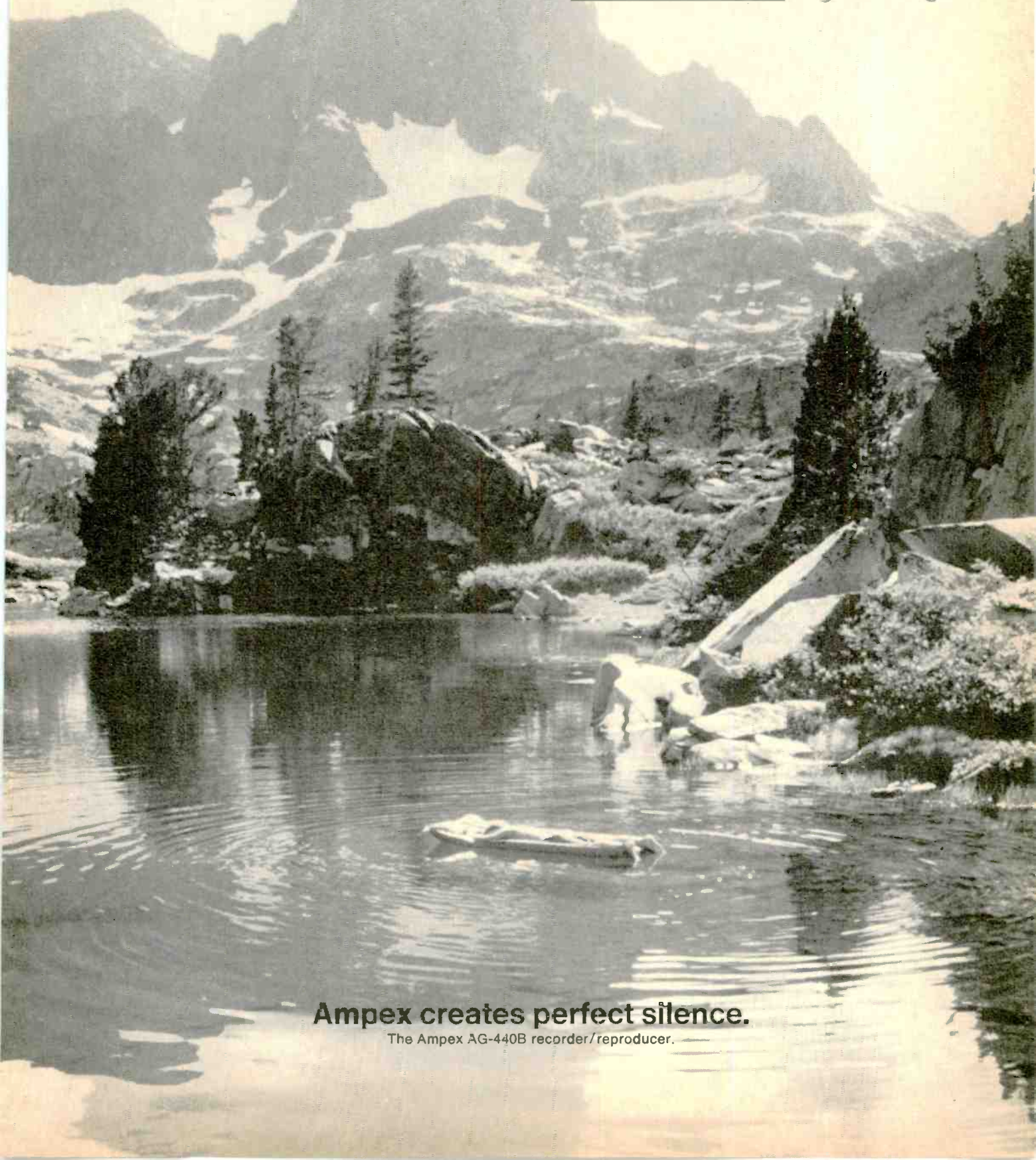
That's why, in its own quiet way, the AG-440B has become the standard of excellence.

Ampex quality is featured throughout: Rigid die-cast frame. Modular design with front-mounted circuit boards. Individual torque motors control tape tension. Easy changeover from quarter-inch to half-inch tape.

The AG-440B is also one of the most versatile recorders you can buy. Console. Portable. Or rack installation. Start with one channel. Build up to four or more. It's the perfect reproducer for the future four channel stereo.

To hear other quiet reasons why the AG-440B can be your best recorder/reproducer buy, and how you can put it to work for you for as little as $50 a month, give us a call. (415) 367-4400. Or write Ampex Corporation, Professional Audio Division, M.S. 7-13, Redwood City, Calif. 94063.

AMPEX



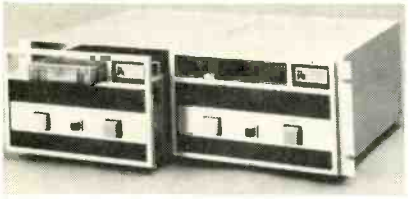
Ampex creates perfect silence.

The Ampex AG-440B recorder/reproducer.

BROADCAST EQUIPMENT

Tape cart units

New line of tape cartridge equipment is available from new company,

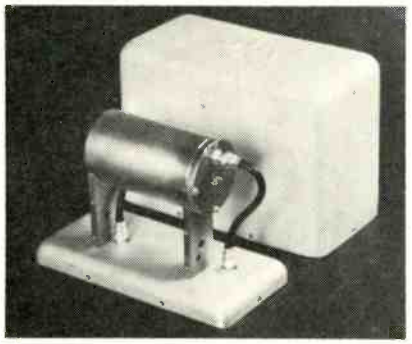


International Tapetronics Corp. All units are said to meet or exceed all NAB cartridge equipment standards; using integrated circuit components, all equipment is designed for rack or desk top mounting. Two pictured Model SP reproducers mounted side by side, for instance, require 5¼ in. of vertical panel space in a 19-in. rack mount.

Circle 275 on Reader Service Card

Band-pass filters

Series 62 CATV band-pass filters offered by Scientific-Atlanta Inc., solve preamplifier cross-modulation



problems, have frequency stability and flat pass-band response and may be cascaded for extra rejection. Available for any vhf TV channel, these weatherproof high-Q tuned cavity filters are designed for tower or pole mounting. Filter performance isn't supposed to be affected by temperature changes over the range of –40 degrees to +150F. $100.

Circle 284 on Reader Service Card

Solid-state tape deck

The Astrocom/Marlux Model 407 solid-state tape deck incorporates three motors—one each for supply and take-up reels and a hysteresis synchronous capstan drive motor; four heads for erase, record, playback and reverse playback; "life tested" push button solenoid-operated controls for immediate activation of tape motion; automatic reverse through conductive strips; dual VU meters, automatic tape lifters and automatic shut-off switch. The two-speed 40-lb tape deck (7½ and 3¾ ips) provides wide range frequency response-30-20,000 Hz at 7.5 ips. Wow and flutter is said to be less than .07 percent at 7½ ips, and less than .11 percent at 3¾ ips; crosstalk

is reported as better than 45 dB. $379.95.

Circle 278 on Reader Service Card

Monitor or sound reinforcement amplifier

Langevin's Model AM100 monitor or sound reinforcement amplifier puts out 100 W rms sine wave power, with a frequency response of 30 Hz to 20,000 kHz ± dB. Distortion is said to be under .5% over a band width of 30 Hz to 20 kHz. Output load: 4-8-16 ohms; 70.7 V isolated distribution line. Inputs and sensitivity: Standard input is unbalanced bridging which requires 1.0 V or full 100W output; optional input TF-400D transformer, $21.00. 20,000 ohms bridging "0" level for full out-

put; 600 ohms matching 15 dBm for full output. All TF400 transformers can be factory or field installed. $356; input transformer, extra $21.

Circle 280 on Reader Service Card

Message repeater

3M message repeater employs a small, durable tape cartridge which requires no threading or tape-handling and will play through any type of sound system. Each cartridge can hold ten messages and a card index to identify cartridge contents. Each

track of the tape cart can record a maximum of 25 seconds for short spot announcements; an extra cart offers ten 55-second segments for longer corporate-type announcements.

Circle 282 on Reader Service Card

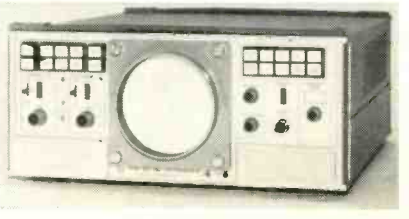
Color TV receiver-monitor

RCA Model JM-897W color TV receiver is designed to serve as a general purpose utility monitor. Suitable for noncritical viewing spots that don't need critical efficiency of high cost monitor sets, the receiver is equipped to accept rf or bridged direct TV video and audio line feed without the costly adaptors required when entertainment-type TV sets are used for monitoring functions. It's housed in vinyl-covered metal cabinet and has a 23-in. diagonal picture tube. A separate 75-ohm video input for direct off-air recording is included, as well as two external speaker outlets for sound reinforcement and provisions for audio tape and phono input. Other features include: automatic fine tuning, automatic chroma control, 25,000-V New Vista chassis. RCA's Super Bright Hi-Lite color kinescope, automatic color purifier and solid state color demodulator.

Circle 276 on Reader Service Card

PAL/NTSC vectorscope

Type 522 PAL vectorscope was designed to measure luminance, hue and saturation of 525 line 60 field PAL color TV signals using a color subcarrier frequency of 3.575611 MHz. A luminance channel separates and displays the luminance (Y) component of the composite color

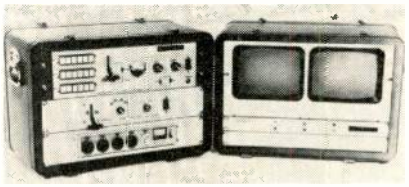


signal. Two 0 degrees to 360 degrees phase shifters provide independent phase control of channels A and B. Video cable lengths can be accurately matched for time delay at the color subcarrier frequency to less than 0.5 degrees phase difference. Differential gain and differential phase measurement capabilities are provided with accuracies within one percent for gain and 0.2 degrees for phase. Tektronix Inc.

Circle 283 on Reader Service Card

Portable CATV studio

Designed to simplify setup for remote CATV productions, the Porta-Studio (Model TPC-100) by Tele-Mation is housed in two portable

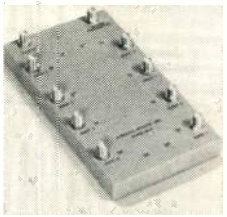


cases. The two cases contain virtually all needed video and audio switching and controls, along with appropriate monitoring facilities. Included are video control center, audio mixer and screen splitter with fader bars. System can take up to six video inputs.

Circle 295 on Reader Service Card

Combining networks

Series 68 combining networks from Scientific-Atlanta provide labor saving means of connecting outputs of CATV signal processors, modulators, fm amplifiers and pilot carrier oscillators to the distribution trunk cable.

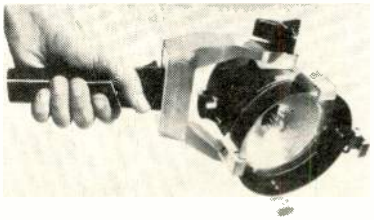


Models are available in six and eight input configurations with 10 and 14 dB coupling. Series 68 combining networks can be cascaded for systems requiring more than eight inputs. Six input network: $100.00; eight input network: $105.00.

Circle 286 on Reader Service Card

Portable quartz light

Berkey-ColorTran has introduced a professional battery operated or 110

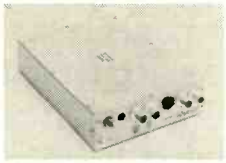


V portable "quartz" light. The Mini-Pro (code number 100-091) incorporates a utility yoke containing an on/off switch and recessed power receptacle for the 110 V detachable nine ft cord. Portable and weighing 30 oz., the unit can be stand-mounted or hand-held with a high impact plastic handle accessory that locks to the yoke. A variety of single-ended, long-life "quartz" lamps is available for both battery operation and 110 V. A complete line of professional accessories includes handle, barndoors, dichroic, daylight filter, scrims and stands. $45.00 with cord. A Mini-Pro Kit is available, for $325.00, including three housings and an assortment of accessories.

Circle 287 on Reader Service Card

Head-end FM converter system

Electronics Development Corporation's new head-end FM converter

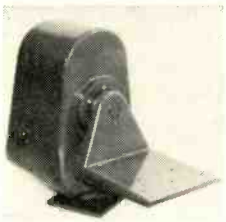


system receives off-air FM stereo signals and down-converts them for simultaneous transmission with video in CATV microwave systems. Companion converter is used at drop points to translate signals back to the 88-108 MHz FM band.

Circle 288 on Reader Service Card

Pan & tilt heads

Good for industrial and educational CCTV applications, these remote controlled pan and tilt heads feature several models. Type 230 head will carry cameras up to 150 lb. The horizontal plane of the pan is 10 degrees to 370 degrees; the vertical plane of the tilt is infinitely variable ±10 degrees to ±185 degrees. Type 210 head weighs 26 lb and will carry cameras weighing up to 30 lb. The horizontal plane of the pan is 10 degrees to 340 degrees and the vertical plane of the tilt is 90 degrees to ±45 degrees infinitely variable.



Type 250 P control box permits setting a camera to survey various predetermined positions without having to search for them. Power Optics Inc.

Circle 289 on Reader Service Card

TV camera crane

Listec Television Equipment Corporation has released the Falcon camera crane Type 526, manufactured by W. Vinten, Ltd., in England. Available with manual or powered jib control, the Falcon provides lightweight capability, although it is said to carry the heaviest known TV camera and operator. The crane is usually steered by one operator through a special steering linkage that permits the unit to turn in its

own length. Lens heights range from 2 ft to 12 ft above ground, depending on the choice of camera platform. Full 360 degrees panning is provided around the pedestal support. Manual jib: $6995; powered jib: $9600.

Circle 290 on Reader Service Card

Mobile production studio

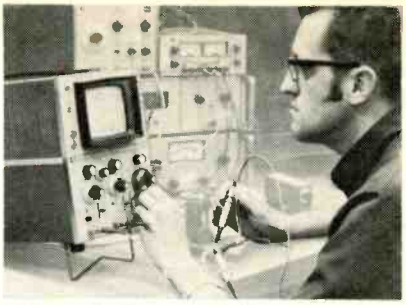
Intended mainly for mobile monochrome use, the Telenetics Mark-II portable production system includes a four-input audio mixer and monitor, intercom amplifier, industrial sync generator, and video switcher/effects generator. Also in the console are three 3-in. monitors, and

rear connector panel feeds full audio and video to the console. Two vidicon cameras with 5:1 zoom lenses are part of the package. Price is under $10,000.

Circle 291 on Reader Service Card

Lab-grade oscilloscopes

Two new Hewlett-Packard oscilloscopes—Models 1215A (single-channel) and 1217A (dual-channel)—have frequency response from dc to 7 MHz. Both have deflection factors ranging from 5 mV/ div to 20 V/div and 21 sweep times ranging from 1 μs/div to 5 sec/div; instruments have triggered or recurrent sweep, single-

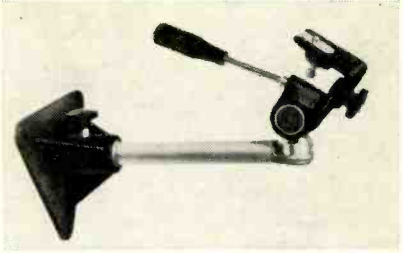


sweep capability and automatic triggering. The dual-channel instrument can be operated in a B-A mode in which each input forms one leg of a differential input. Weighing less than 25 lb, they are made in two configurations: a compact bench cabinet (the A series) 8½ in. wide × 12 in. high × 19 in. deep, and a rack mount version (the B series), which is 5½ in. high for systems use in standard 19 in.-wide instrument racks. Model 1215A/B sells for $950; the dual-channel model sells for $1175.

Circle 279 on Reader Service Card

CCTV camera mount

Welt/Safe-Lock Inc. has introduced a new wall mount engineered to support and aim CCTV cameras. Fully adjustable pan head has three-way controls. All parts are made of aluminum. Casting measures seven in. along each edge; standard tubular arm puts camera about 11 in. from



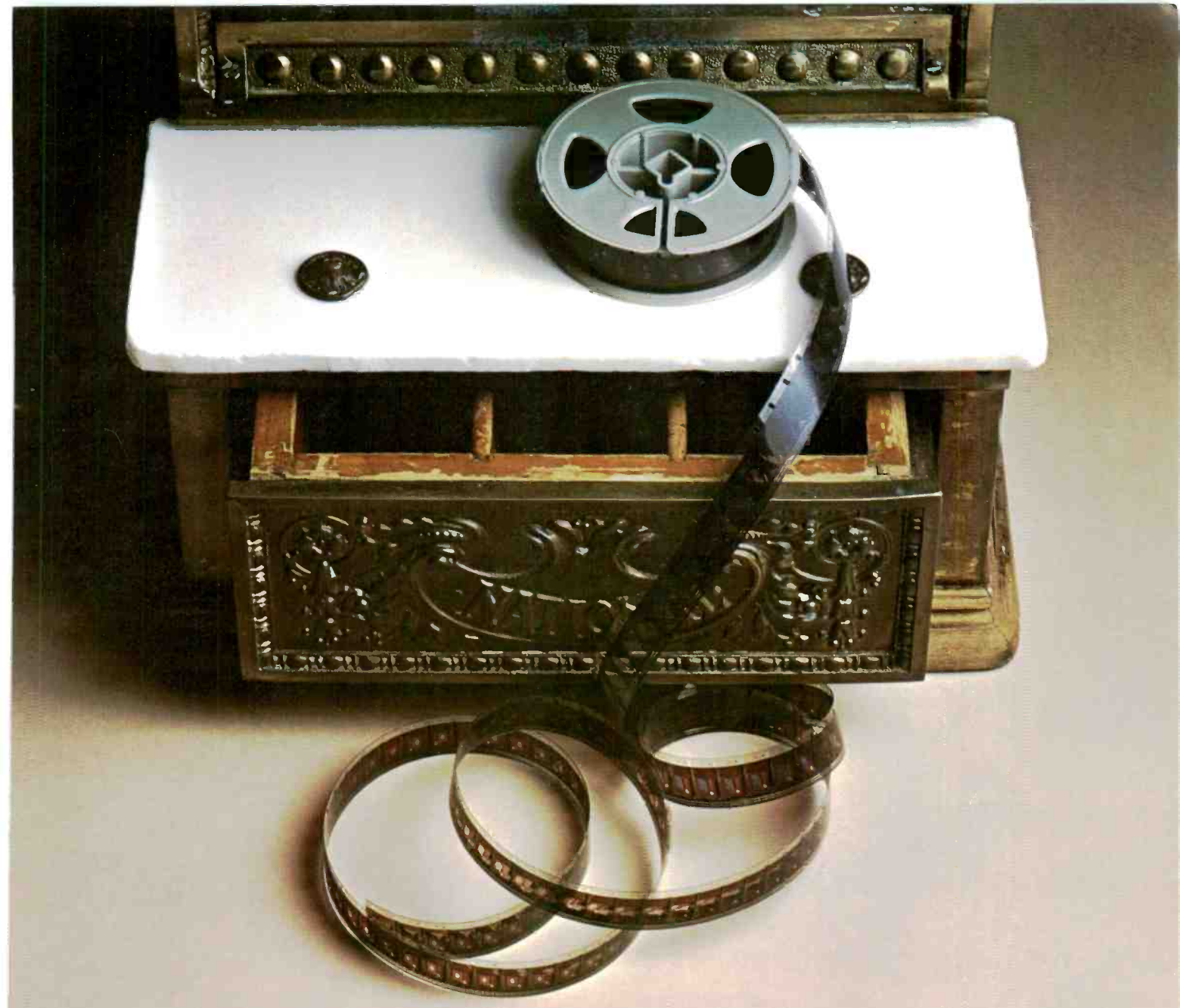
wall. Models are also available for floor, table or ceiling installations. $22.95.

Circle 292 on Reader Service Card

Electronic timer

Video Devices Company has announced its electronic timer with numeric video generator that offers TV broadcasters direct generation without camera, art work or mechanical clocks. Features include: only SYNC drive; adjustable character size; position and slope; remote control up to 2000 ft; bidirectional count; presettable automatic stop; plug-in modular design with integrated micrologic circuits. It can also be supplied with video tape editing equipment to accept data from equipment in the form of 1 2 4 8 parallel BCD code. The resultant TV picture is suitable for superim-

Continued on page 51



KETV has made the switch to color film a commercial success.

"We got our Kodak ME-4 Process about four years ago to give us the color news, sports, and documentary coverage that is so important for a full-color operation," says Greg Pflaum, Production Coordinator for the Omaha station. "This is still the primary function our ME-4 processor has, but we've also had success selling, shooting, and processing color commercials for local advertisers.

"When anyone wants a color commercial around here, we can do it. Pricewise it works out well for the advertiser, since we can shoot the spot right at his place of business. It gives a note of authenticity that a studio-shot spot wouldn't have.

"And, commercial processing keeps the machine busy when it's not processing news and documentary footage. We've even got the Kodak Silver Recovery System at work and it's paying back dividends, too.

"The *Kodak Ektachrome* EF and MS Films have really worked well for us. Packaged ME-4 chemicals are clean and easy to use and most adaptable to the pace of a television operation."

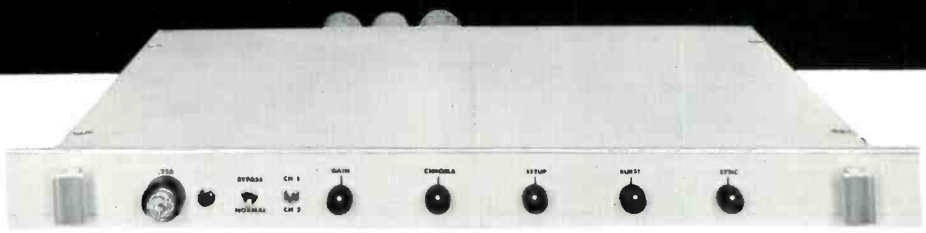
Is your Kodak ME-4 Process bringing in extra money? Check into it and be pleasantly surprised at the commercial possibilities. You say you don't have Kodak ME-4 yet? You better call a Kodak Regional Chief Engineer right away. Ray Wulf in New York, Dick Potter in Chicago, or John Waner in Hollywood can show you how your station can get with the times.

EASTMAN KODAK COMPANY
ATLANTA: 404/351-6510
CHICAGO: 312/654-0200
DALLAS: 214/351-3221
HOLLYWOOD: 213/464-6131
NEW YORK: 212/262-7100
SAN FRANCISCO: 415/776-6055

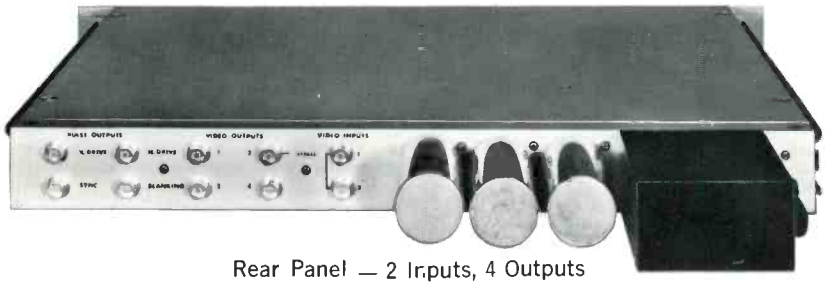
Kodak

The VI-750 Video Tamer

PROCessing AMPlifier



Front Panel Knobs Readily Set at Unity Gain



Rear Panel — 2 Inputs, 4 Outputs

- Digital Sync Generator with extensive use of IC's re-generates all pulses to EIA Standards.
- Phase-locked color burst regenerated with correct breezeway and constant amplitude.
- Dependable AGC action maintains constant peak level without clipping. Uses no LDR's.
- White stretch with differential phase compensation for transmitter use.
- Noise immune clamping removes low frequency disturbances.
- Applications: Input to transmitters, VTR's, microwave, output of switchers, off-air pick-ups, remotes, network and helical scan recorders.
- Thirty-day free trial with no obligation.

Color VI-750 with burst regen and white stretch	**$2,400.00**
VI-750 Monochrome	**1,990.00**
AGC — Additional	**400.00**

GOOD ENGINEERING IS VITAL

VITAL INDUSTRIES, INC.

MAIN OFFICE: 3614 S.W. Archer Road Gainesville, Fla. 32601 904—378-1581

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210 Elder Fields Road Manhasset L.I., N.Y. 11030 516—627-0351

Circle 121 on Reader Service Card

Continued from page 48

position over video tape program feeds for generation of kinescope editing work prints and for quad to helical work print transfers.
Circle 293 on Reader Service Card

By-pass vacuum coaxial relay

Dow-Key Company's new vacuum 50-ohm coaxial by-pass relay #196-104 employs vacuum-enclosed contracts; for maximum reliability, it is intended to allow an rf amplifier to be by-passed and the driving source connected directly to the amplifier's load. The relay is rated at 3 kW at 30 MHz and 1 kW at 400 MHz.

VSWR is 1.1:1 maximum at 400 MHz. Coil operating voltage is 26 Vdc. Relay can also be supplied with type C, N and BNC connectors.
Circle 294 on Reader Service Card

TV field strength meter

JFD Electronics Corporation's Model 1720 solid-state, portable field strength meter is said to be ideal for CATV and MATV field use. Working from four 9-V batteries, it measures both vhf and uhf signals. Frequency ranges: vhf = 54 to 216 MHz; uhf = 470 to 890 MHz. To conserve batteries, the 1720 automatically turns itself off when the cover is closed. $395.
Circle 277 on Reader Service Card

Portable TV waveform monitor

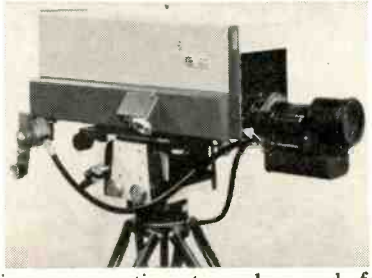
Data Instruments' 1Y4 vertical amplifier module offers gated line selector, picture monitor and wide band amplifier facilities in one portable package. Primarily designed for field service on TV lines and links, the unit will accept video signals on all

broadcast line standards at any amplitude between 5mV and 250V peak white level, without internal adjustment. Dc restoration of back porch or sync-tip level may be applied via a front panel switch, and the input circuit may be ac or dc coupled or internally terminated. When used as a normal vertical amplifier, it has a frequency response of dc-30MHz from 10mV/cm and 5Hz to 5MHz at 1mV/cm.

Circle 296 on Reader Service Card

Low-light color camera

Using Westinghouse SEC vidicons for extra sensitivity, Model 270 camera from Commercial Electronics produces full color picture at 10 footcandles at *f*8. Lens can be stopped down to *f*16 with normal black-and-white studio lighting. Camera is especially suitable for sta-



tions converting to color and for educational programming. Optimum highlight illumination at faceplate is about 0.01 fc which produces signal current of 0.3 microamp with S/N ratio better than 40 dB. Camera head weighs 95 pounds and is priced at $28,500 less lens.

Circle 298 on Reader Service Card

Mobile videotape consoles

Family of mobile videotape consoles for closed-circuit television is available from Mark IV Systems. Basic console is formed by two cast fiber-

glass sections enclosing the recorder, audio and video monitors and optional equipment. The lower wheeled base section provides storage for videotape and operating supplies. The console system is permanently connected to the recorder with its own 12-in. video monitor and speaker. Any low cost TV camera may be used with the system. The console fits Ampex VR-5000, VR-

6000 and VR-7000 series without modifications to the standard equipment; additional units will be available for Sony, IVC and other recorders. No external cables are required, as the pedestal camera mount plugs into the top of the console, automatically connecting power and video to the system. (Any one-in. Ampex machine excepting the VR-7800 mounts directly to the console frame once it is removed from the factory carrying case.) The console weighs 60 lb.

Circle 299 on Reader Service Card

Video switcher system

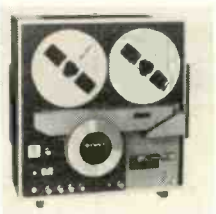
Model VS600 solid-state video switcher system from Ampex Corporation uses digital central logic to reduce interconnecting wires and to increase reliability and performance. A building-block design in the matrix and logic enables use of any combination of signal inputs and outputs. An automatic transition dissolve system also provides operator with pushbutton control of the mode as well as the speed of program and

scene transitions. Including the remote control panel and matrix rack frames, the VS600 costs about $30,000.

Circle 300 on Reader Service Card

VTR

Sony Corporation of America's EV-300 EVR features two-channel audio and slow motion and stop action in the playback mode. Audio can be dubbed on channel 2 without disturbing previously recorded video. Automatic shutoff occurs when the tape



reaches the end of the reel, and an electronic tracking control feature permits adjustments that assure the optimum picture in the playback mode. Optional remote control unit is available. Using one-inch tape,

the EV-300 conforms to standard EIA TV signal requirements and will record and play back in monochrome any composite TV signal with 60 fields per second, including random interlace signals. Sony guarantees 100% tape interchangeability between all EV series videocorders and video heads are guaranteed for a full year. $2450.

Circle 301 on Reader Service Card

Gear-driven tripods

Davis & Sanford has announced a new line of gear-driven tripods, Models AG and BG. Intended for educational and other CCTV installations, they are made of aluminum

and are ideal for heavy CCTV viewfinder cameras. They are portable and can be folded without removing the wheels. Other features include: Gear-driven elevator column (1-⅞ in. diameter) slides up and down on nylon sleeves, hence no metal-to-metal contact; self-locking gear mechanism keeps the center post in position regardless of the weight on the head of the tripod; and weight: 15 lb.

Circle 302 on Reader Service Card

Clearing Up Transmitter Static

The January 1970 issue of *BM/E* carried three articles on modern broadcast transmitters and listed basic specifications for over 200 models. Not all are FCC type-accepted, as we stated, and some exist only on paper. Our aim was to offer you, the reader, an overview of what's available today. We felt that when a manufacturer advertises a "paper" transmitter, he implicitly agrees to build it and get type acceptance; therefore the paper transmitter is available. However, such a projected transmitter may well contain bugs, and perhaps a prospective buyer should ask the manufacturer: How many models have you built? What stations are using them?

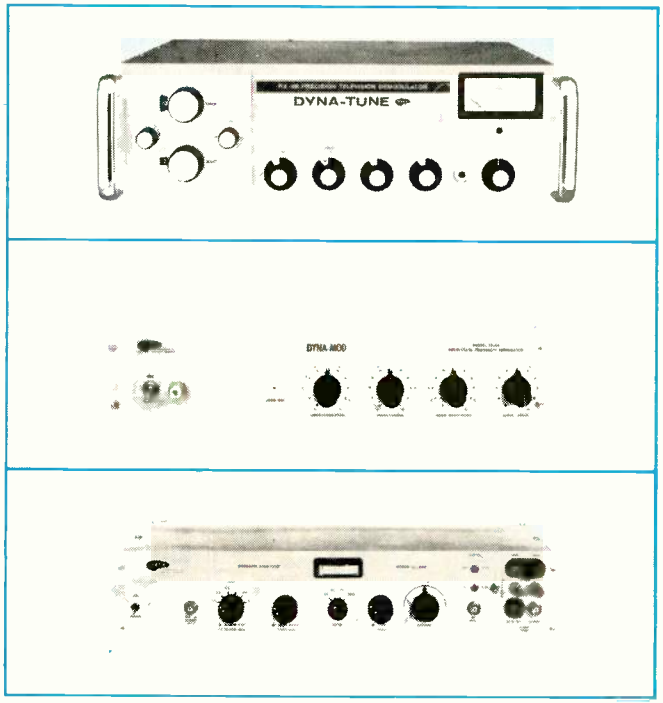
from professional-quality local origination
. . . all the way to testing, switching and distribution

DYNAIR OFFERS MORE THAN 200 DIFFERENT PRODUCTS FOR THE TELEVISION INDUSTRY

DYNAIR concentrates its major effort in one technical area: Equipment for the television industry. More than a decade of pioneering design experience has produced a comprehensive line of equipment that—year after year—sets the pace in video signal distribution, switching, modulation and RF demodulation.

FOR THE HEAD END

DYNAIR's field-proven, solid-state equipment solves CATV head-end problems and assures broadcast-quality pictures. Here are three tried-and-proven units which belong at the head end of every CATV system. . . .



RX-4B DYNA-TUNE for high-fidelity off-air color. Uses completely new filtering and signal-restoration concepts to provide superior adjacent-channel color performance in either microwave-fed or demod-mod systems. Actually improves the color signal in many critical areas over that produced by the broadcast RF transmission system.

$1275

TX-4A DYNA-MOD for broadcast quality transmission. Supplies signals approximating FCC specifications. Provides interference-free pictures in a full 12-channel system . . . with crisp, clean color. Available for operation on any standard VHF channel.

$950

TS-100B SIDEBAND ANALYZER for broadcast-precision testing. Quickly checks overall alignment of video amplifiers, modulated stage and RF amplifiers of modulators—in normal operation. Provides the same test techniques used by broadcasters and eliminates tedious point-to-point checking. Tunes to all channels for system flexibility.

$1750

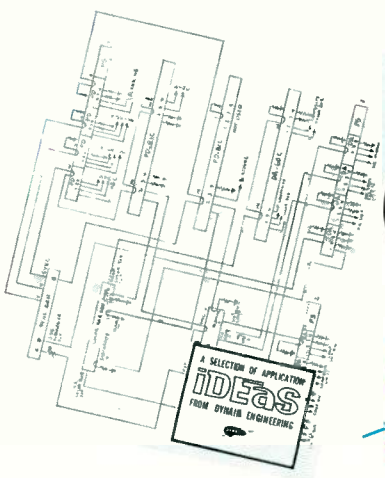
FOR LOCAL ORIGINATION

DYNAIR's complete line of low-cost programming accessories are designed specifically to provide professional results without fancy cabinetry or expensive "frills." You can assemble a system for your particular needs between camera and monitor from dozens of available DYNAIR units, including . . .

- Video Switcher-Faders
- Special-Effects Generators and Switchers
- Sync Generators
- Video Distribution Equipment
- Pulse Distribution Equipment

DYNAIR's new "IDEAS" booklet will prove very helpful in designing your local-origination system. Make sure you add it to your library.

A FREE COPY IS AVAILABLE TO YOU. SEND FOR IT TODAY.



See our new line of low-cost Vertical Interval Switches at NAB—Booth 210

DYNAIR SAN DIEGO

6360 Federal Blvd., San Diego, Calif. 92114, Phone (714) 582-9211

Circle 132 on Reader Service Card

NAMES IN THE NEWS

William N. Davidson has been named director of management services for the WFBM stations according to Eldon Campbell, vice president and general manager.

Jerome Lansner has been appointed assistant director of the Code Authority of NAB.

Sonderling Broadcasting Corporation has elected **Jerrold Levine** to the positions of treasurer and controller.

Robert E. Weissman has been elected president and director of Spencer-Kennedy Laboratories.


R. E. Weissman


F. Ward

Frank Ward, recipient of the manager of the year award for four consecutive years—1964-1967—has been elected president and chief operating officer of Speidel Broadcasters, Inc.

Ronald F. Abate, chief product engineer, System Wire Cable Inc., Phoenix, has been appointed to the NCTA Engineering Subcommittee.

Ed F. Shadburne is the new executive vice president of WHAS Inc.

Frederick Breitenfeld, Jr., executive director, Maryland Center for Public Broadcasting, Baltimore, and **O. Leonard Press,** executive director, Kentucky Authority for Educational Television, Lexington, have been elected to four-year terms on the board of directors of the Education Television Stations division of the NAEB.

Ray Cox has been named vice president of marketing services for Combined Communications Corporation.

Donald F. Smith has been named national sales manager for Ampex professional audio products, and **Stan Foss** has been named product manager, cameras for the corporation's video products division.

Get it all together

And TeleMation's got it all—from the industry's best selling camera to the most complete and sophisticated television production systems. And everything in between.

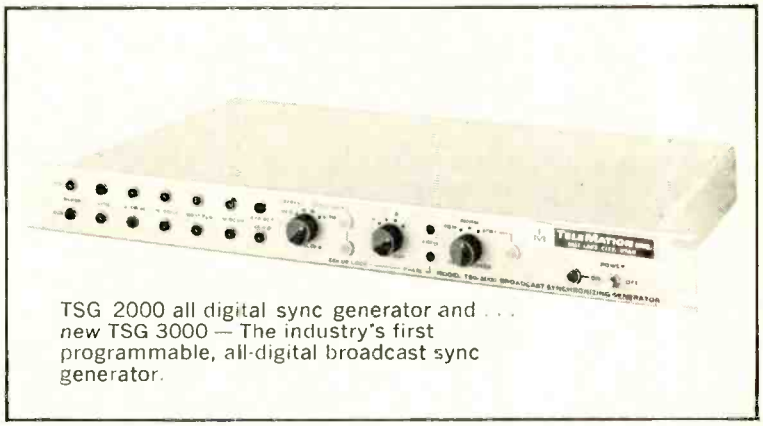
For instance, video production and distribution switchers, optical multiplexing systems, 14 models of synchronizing generators, and a complete line of video test equipment.

Only TeleMation gives you one source for complete systems capability. We've put together advanced concepts, IC/MSI/LSI technology, precision manufacturing, product availability and a distribution organization to give you the finest engineering, design and service in the business.

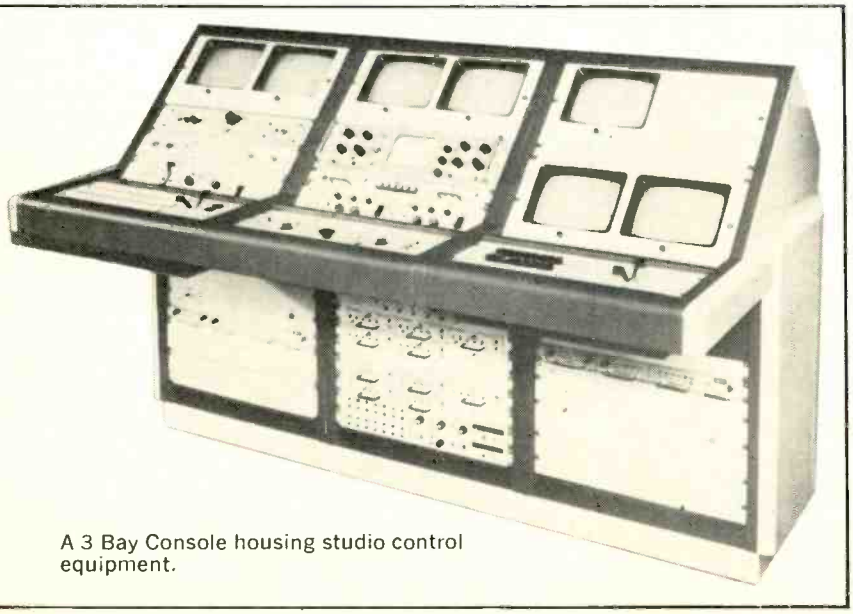
These are just a few reasons for our remarkable growth and ever increasing list of satisfied customers.

Talk to TeleMation.

Our best selling TMC 2100 Series Camera.



TSG 2000 all digital sync generator and . . . *new* TSG 3000 — The industry's first programmable, all-digital broadcast sync generator.



A 3 Bay Console housing studio control equipment.

TELEMATION, INC.
The Total System Supplier
2275 South West Temple
Salt Lake City, Utah 84115
(801) 486-7564

TALK TO US AT NAB BOOTH 416 NORTH HALL
Circle 134 on Reader Service Card

Conrac Steps Up The Pace

With The Solid-State Color Standard

Well aware of industry demands for improved reliability, we brought out the high quality RHA series of stabilized monitors for rigid studio requirements. All solid-state. Controlled phosphor . . . for the first time, assured color match between all monitors in a series. Today, only a few months after introduction, the RHA models are the color standard of the broadcast industry.

A Color-Matching Display Monitor

At the same time, Conrac introduced a companion series of KHA utility displays for less stringent audience and client room use. Also solid state, broadcast quality, but at lower cost. And, the same controlled color-matching phosphor. For the first time, assured color matching between monitors of different model series became possible.

And a Color-Match Modernization Program

The Conrac CYA17 and CYB17 models, by far the most widely used color monitors in the field, will still out perform anything except the new RHA. But the kinescopes don't match the new ones. You could junk the monitors and buy our new models. Maybe you should. But that might not necessarily serve you best. Conrac has a practical answer. Modernization. Now you can return your CYA17 or CYB17 to Conrac for a complete overhaul. No only do you get a new 90-degree kinescope but it uses the same controlled color-matched phosphor as our RHA and KHA models. For only $800 total, you also get extensive mechanical and electronic modifications and a full one year warranty. Ask for a return authorization today.

Stick Around. After 21 Years, Were Running Harder Than Ever

CONRAC CORPORATION

600 N. Rimsdale Avenue, Covina, California 91722 • (213) 966-3511

Circle 135 on Reader Service Card

Harry Trenner, president of KCKC-(AM), San Bernardino, Calif., has resigned from the NAB board of directors and has withdrawn his station from the organization following his letter to NAB President Wasilewski that supported a separate trade association for radio stations.

NCTA general counsel since March 1967, **Bruce E. Lovett** has resigned to become vice president for corporate development of American Television and Communications Corporation, Denver, Colorado. He'll be based in its new Washington, D.C. branch office. His successor is **Gary L. Christensen,** an assistant general counsel since 1967.

Hillard P. Tavrow has been elected vice president, manufacturing, of Memorex Corporation.

Andrew F. Inglis has been named division vice president, RCA Commercial Electronic Systems.

Dr. Robert L. Hilliard, chief of FCC's educational broadcasting branch, has been reelected to a fourth term as chairman of the Federal Interagency Media Committee.

K. Blair Benson, staff consultant, advanced technology, CBS-TV Network, New York, has been elected vice president for television affairs of the Society of Motion Picture and Television Engineers.

Communications Transistor Corporation of San Carlos, Calif., has announced the appointment of **Richard Orth** and **Robert E. Herdman** to the board of directors.

Commissioner H. Rex Lee has been named chairman of the Commission's educational communications committee, which will be responsible for coordinating educational communications activities and for development work.

Lee Polk, director of public affairs and news for WNDT, New York, has been named director of children's programming for NET.

Howard Stalnaker, vice president and general manager of Meredith Corporation stations WOW-AM-FM-TV, Omaha, has been elected chairman of the Nebraska Educational Television Commission.

Western Michigan University's Television Services has announced the appointment of a new producer-director—**Richard Atwell**—"to meet the growing demands of the medium on the campus."

FCC ACTIONS

A request by Forum Communications Inc.—applicant in the competitive proceeding with WPIX Inc. for the license of channel 11, New York City, (see August, 1969, *BM/E*, p. 11)—for various WPIX documents concerning means of ascertaining community needs and interests, corporate relationships and past programming, has been granted by Hearing Examiner James F. Tierney.

A request by Twin City Area Educational Television Corporation, St. Paul, Minn., licensee of ETV stations KTCA-TV and KTCI-TV, St. Paul, for authorization to use a remote control signal to activate and deactivate video tape recorders located at various schools during nighttime nonbroadcast hours to record educational programs for future use has been granted.

Universal Communications of Pittsburgh Inc.'s application for renewal of WARO, Canonsburg, Pa., license has been granted for a short term only. In its letter, the Commission admonished the licensee for using an inaccurate contour map in its sales promotion.

Application of WSER Inc. for license renewal of WSER(AM), Elkton, Maryland, has been granted.

Petition by Home Service Broadcasting Corporation for reconsideration of an FCC order setting aside grant without hearing in July, 1967, of the Corporation's application to construct a new standard broadcast facility on 1060 kHz with 1000 W daytime only, at Natick, Mass., has been denied.

A request for WFMT Inc., formerly WGN Continental FM Company, to amend its application for assignment of the WFMT(FM), Chicago, license to WGN Continental FM Company by donating all stock of the proposed corporation to the Chicago Educational Television Association has been granted. Also accepted for filing was the amendment to WFMT Inc.'s transfer application, which was tendered for filing simultaneously with its petition.

Attention TV Stations:

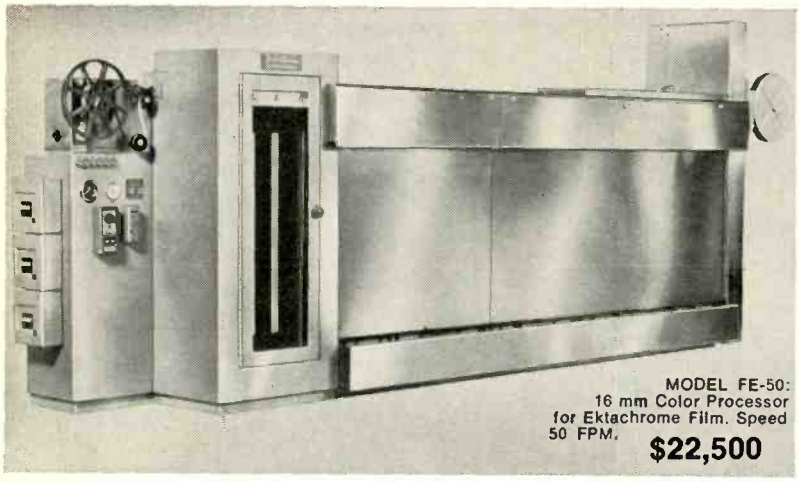
We've got news for you!

FILMLINE'S professional color film processors now available for TV NEWS

The FILMLINE Models FE-30 and FE-50 are exciting new color film processors designed specifically for use in television station news departments. The design is backed by Filmline's reputation as the world's leading manufacturer of professional film processors for the commercial motion picture laboratory industry.

Now for the first time the television industry can enjoy the benefits of professional caliber equipment incorporating exclusive FILMLINE features that have paced the state-of-the-art in commercial laboratories, at a cost lower than processors offering less.

After you check these exclusive Filmline features you'll want to install a Filmline processor in your news department ***NOW!***



MODEL FE-50: 16 mm Color Processor for Ektachrome Film. Speed 50 FPM. **$22,500**

MODEL FE-30: 16mm Color Processor for Ektachrome film. Speed 30 FPM. **$16,400**

- **"FILMLINE OVERDRIVE FILM TRANSPORT SYSTEM"** This marvel of engineering completely eliminates film breakage, pulled perforations, scratches and operator error. The film can be deliberately stalled in the machine without film breakage or significant change of film footage in solutions. The heart of any film processor is the drive system. No other film drive system such as sprocket drive, bottom drive or simple clutch drives with floating lower assemblies can give you the performance capability of the unique Filmline Overdrive Film Transport System.
- **"TORQUE MOTOR TAKE-UP"** gives you constant film take-up and does not impose any stress or strain on the film itself. Completely independent of the film transport system. This FILMLINE feature is usually found in professional commercial processors but is incorporated on the FE-30 and FE-50 models as standard equipment. Don't settle for less!
- **"TEMP-GUARD"** positive temperature control system. Completely transistorized circuitry insures temperature control to well within processing tolerances. Temp-Guard controls temperatures accurately and without the problems of other systems of lesser sophistication.
- **"TURBO-FLOW"** impingement dryer. Shortens dry-to-dry time, improves film results, and carefully controls humidity content of your valuable (and sometimes rare) originals. Immediate projection capability is assured because the film dries flat without the usual curl associated with other film processors.
- **"ZERO DOWN TIME"** The reputation of any film processor is only as good as its reliability. The combination of the exclusive and special added Filmline features guarantees trouble-free operation with absolute minimum down-time and without continual operator adjustments. Recapture your original investment in 2 years on maintenance savings alone. Filmline's "Push the button and walk-away processing" allows inexperienced operators to turn out highest quality film.
- **"MATERIALS, CONSTRUCTION AND DESIGN"** All Filmline machines are constructed entirely of metal and tanks are type 316 stainless steel, heliarc welded to government specifications. The finest components available are used and rigid quality control standards are maintained.

Compare Filmline features to other processors costing more money. Feature-by-feature, a careful evaluation will convince you that Filmline offers you more for your investment.

Additional Features included in price of machine (Not as extras).

Magazine load, daylight operation ■ Feed-in time delay elevator (completely accessible) ■ Take-up time delay elevator (completely accessible) ■ Red brass bleach tank, shafts, etc. Prehardener solution filter ■ Precision Filmline Venturi air squeegee prior to drybox entry ■ Air vent on prehardener ■ Solid state variable speed D.C. drive main motor ■ Bottom drains and valves on all tanks ■ Extended development time up to two additional camera stops at 50 FPM ■ Pump recirculation of all eight solutions thru spray bars ■ Temperature is sensed in the recirculation line ■ All solutions temperature controlled, no chilled water required ■ Built-in air compressor ■ Captive bottom assemblies assure you constant footage in each solution ■ Change over from standard developing to extended developing can be accomplished in a matter of seconds ■ Impingement dryer allows shorter put through time.

Partial listing of Filmline Color Installations: — NBC- New York, NBC- Washington, NBC- Cleveland, NBC- Chicago, CBS & ABC Networks, Eastman Kodak, Rochester.

Laboratories: De Luxe Labs, General Film Labs (Hollywood), Pathe-Labs, Precision Labs, Mecca Labs, Color Service Co., Capital Film Labs, Byron Film Labs, MGM, Movie Lab, Lab-TV, Technical Film Labs, Telecolor Film Labs, Guffanti Film Labs, A-One Labs, All-service Labs, NASA Cape Kennedy, Ford Motion Picture Labs.

TV Stations: WAPI-TV, KTVI-TV, WXYZ-TV, WTPA-TV, WBTV-TV, WEAT-TV, WMAL-TV, WSYR-TV, WDSU-TV, WVUE-TV, WJXT-TV, WTOP-TV, WAVY-TV, KTAR-TV, WTVR-TV, WFBC-TV, WMAR-TV, WCKT-TV, WAVE-TV, WCPO-TV, WAPA-TV, WCIV-TV, WJIM-TV, WWL-TV, KYW-TV, KETV-TV, WNBQ-TV, KSLA-TV, WSAZ-TV, WHP-TV, WHCT-TV, WTWO-TV.

All prices F.O.B. MILFORD, CONN.

Dept. BMM-70

Filmline CORPORATION
MILFORD, CONNECTICUT

"When you buy quality Filmline Costs Less"

Circle 138 on Reader Service Card

NEW LIT

For copies of these literature offerings, circle numbers for appropriate items on Reader Service Card.

New Astrocom/Marlux solid state tape recorder, Model 407, described in tech bulletin. The first in a series of tape recorders, meeting or exceeding NAB specs, model features three motors, four heads, reverse play, solenoid-operated controls, modular plug-in electronics, all-silicon transistor circuitry, sound on sound and sound with sound recording, echo recording, one-fourth track stereo or mono system, frequency response of 30—20,000 Hz at 7.5 ips and 40—16,000 Hz at 3.75 ips, wow and flutter less than .07% at 7.5 ips and .11% at 3.75 ips. **202**

Concise catalog listing full line of wire and cable, tubing and sleeving, and microwave dielectric products from Brand-Rex Division of American Enka Corporation, catalog 769. **203**

"A Study of Land Mobile Spectrum Utilization" is the title of a four-volume study commissioned by the FCC to the Stanford Research Institute. It is available from the U.S. Department of Commerce, National Bureau of Standards, Clearing House for formation Springfield, Va. 22151. Federal Scientific and Technical In-Each volume—Part A Interim, Part B Interim, Part A Final and Part B Final—costs $3.00.

New listing of radio equipment acceptable for licensing has been issued by the FCC. About 184 pages; $27.60 plus 80¢ for mailing, plus local tax. Copies may be purchased from Cooper-Trent, 1130 19th St., N.W., Washington, D.C. 20036.

FM subcarrier multiplexing equipment for wideband data systems is described in Data Communications brochure from Electronics Development Corporation. **200**

Wire and cable catalog 1970 is available from Tele-Wire Supply Co. **201**

"The FCC in Fiscal 1969, A Summary of Activities" features a review of key Commission actions along with a chronological listing of major events and a statistical table of stations in various services. Available from FCC Office of Information, 1919 M St., N.W., Washington, D.C. 20554.

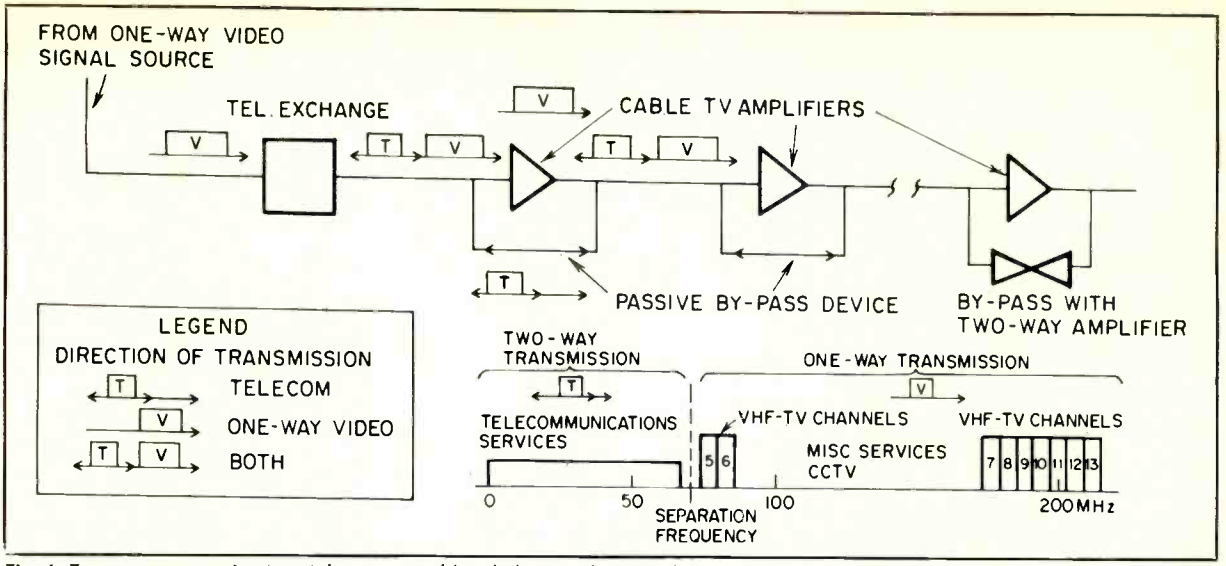


Fig. 6. Two-way transmission in total system would include some by-pass devices (for low frequencies) and some two-way amplifiers.

Continued from page 40

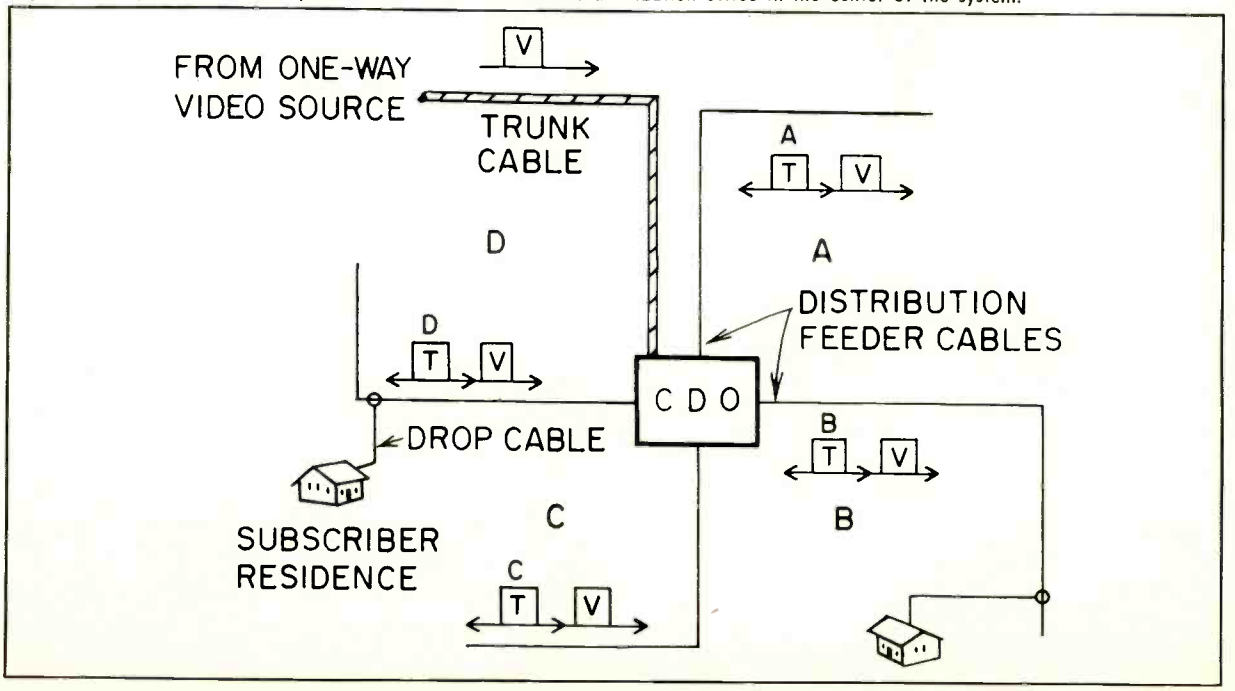
its full complement of channels. This plan requires fewer channels per carrier system which means that more spectrum space may be used per channel, thus reducing carrier equipment cost.

Two-way video such as Picturephone service, can be added to this system within the spectrum space generally used for telecommunications service, Figure 6. Suitable coaxial switchers similar to those used in TV studios would have to be added at the CDO. Amplification of this video signal along the cable could be accomplished with two-way bypass amplifiers, Figure 6. Although Bell Laboratories has demonstrated the practical feasibility of all of these elements, they continue to use pairs of cables (a six-wire loop handles audio and video). Bell places "equalizer" amplifiers within cable pairs to compensate for attenuation. It is interesting to note that one of the newer CATV amplifier manufacturers offers two-way amplification. It is possible, therefore, that standard CATV amplifiers of the future would accommodate two-way video. [Ed. Note: prototypes of such two-way amplifiers may be revealed at the 1970 NCTA Convention.]

Why Not Now?

The need and demand for a total telecommunications service is here. A new generation of subscriber carrier equipment has been in operation for over four years. Improved cable TV amplifiers are available. Much knowledge about coaxial cable TV systems has been gained during the past decade. The ingredients are at our disposal. Assuming the FCC will heed the need, all we require is a willingness on the part of industry to take the final step in establishing a total telecommunication system. **BM/E**

Fig. 7. The layout for a total system would locate the central distribution office in the center of the system.



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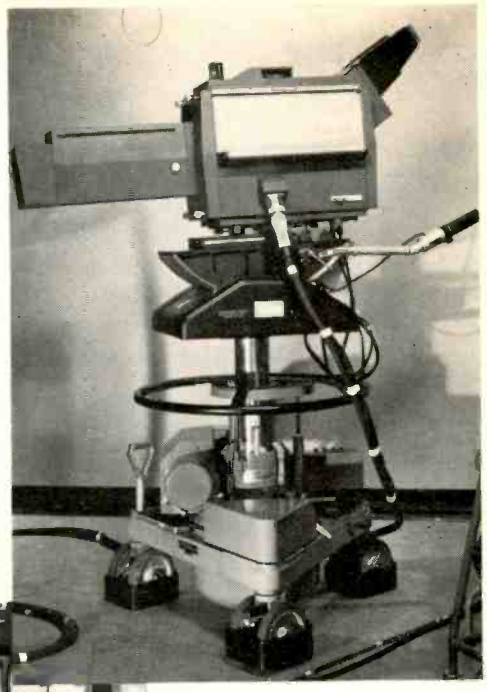

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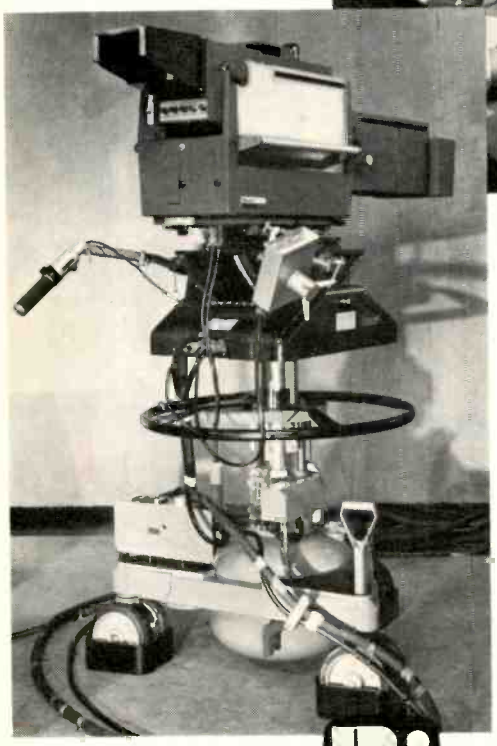

A completely automated color news studio will be presented in our booth at the N.A.B. Convention Exhibit in Chicago, in April. We will demonstrate how, with this equipment, a variety of programs may be presented with our remotely controlled camera systems from master control.

Zoom, focus, pan, tilt, iris and pedestal height may be controlled from a remote location with a "shot fader" unit to provide smooth transitions from one shot to the next.

New engineering techniques now permit the "storage" of camera controls and video effects, all of which leads up to computer control. Random Access Memory Systems, we call them.

We invite inquiries on this remote control equipment and urge you to write for technical articles and material describing it, together with the names of stations now equipped with it.

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Western Inquiries contact: Television Products, Inc. (213) 678-2388

004

Circle 145 on Reader Service Card

Continued from page 37
know they can get the scores by telephoning Dial-a-Score.

Because of the time available and listener interest, Dial-a-Score carries advertising. A typical announcement begins with a six-second sponsor ID, contains a 15-second middle commercial, and ends with a final sponsor mention. Dial-a-Score is usually 80% sold out. Jenkins feels that when people are listening to scores they're intent on what's being said, and advertising makes a strong impact on them. Sponsors buy position on Dial-a-Score by the month.

The service is promoted on the air by WXVW, and tied in with its extensive sports coverage: 100 high-school football games every fall; a 1966 award for outstanding sports news coverage in Indiana. The present service has been such a success that WXVW plans a second Code-a-Phone for weather bulletins.

Listener Opinions

Audience participation is the objective of WDAF's answering system in Kansas City. The station uses two model 770 Code-a-Phones, which not only make announcements but record up to two hours (each) of caller comments. If one machine is busy, the second takes the next call. Thus WDAF can record a maximum of four hours' messages from callers without reloading.

Typical of WDAF's listener-participation format is *Sound Off*. Callers are invited to voice their opinion on any subject of general interest, and announcers suggest topics from time to time.

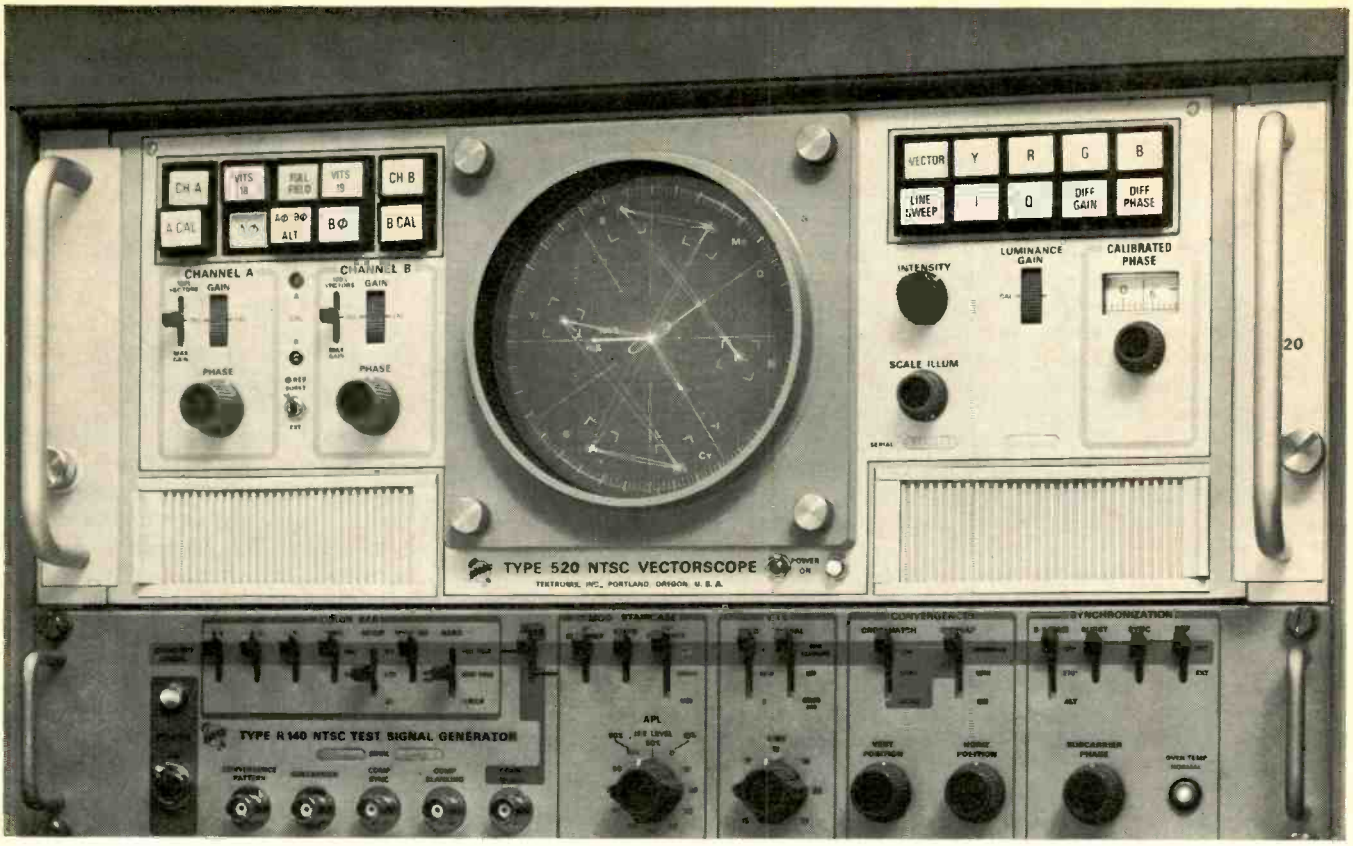
When someone calls the *Sound Off* number, he hears a taped announcement which identifies the station and program. The announcement also urges the caller to make his opinion brief and well thought out, to be considered for broadcast.

WDAF receives up to 150 calls per day; the best are transferred to tape cartridges and broadcast at the rate of about one per hour, from 9 am to 7 pm. Callers aren't required to identify themselves.

WDAF's Code-a-Phones are also used in contests. An example is predicting the score in the Sunday football game of the Kansas City Chiefs. On the following Monday, some of the phoned-in predictions are aired, with the closest estimate receiving a prize.

Just before last Thanksgiving, WDAF ran a contest called *Spot Your Gobble*. Listeners were invited to call in and imitate a turkey gobble, which was recorded. Later, the imitations were broadcast and listeners were asked to spot their own voices. Each winner got a 10-lb turkey.

These two stations' experiences are only two examples of the many audience- and revenue-producing uses which automatic telephone answering systems can provide to broadcast stations. **BM/E**



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The Tektronix Type 520 NTSC Vectorscope provides new operator convenience, advanced measurement capability and silicon solid-state reliability. Push-button operating controls permit rapid selection of displays for quick analysis of color signal characteristics. A luminance channel separates the luminance (Y) component of composite color signals for display at a line rate. Combining the Y component with the chrominance demodulator outputs provides displays of the Red (R), Green (G), and Blue (B) values, revealing luminance to chrominance amplitude and delay errors if present. Line Rate displays of chrominance demodulated along the I or Q axis are provided for checking encoder performance.

Phase and amplitude accuracy of the vector presentation is verified by internally generated test signals. Errors in color encoding, video tape recording or transmission processes are readily apparent and are easily measured. Separate 0° to 360° phase shifters provide independent phase control of channel A and B displays. Excellent resolution for measuring small phase-angles is provided by a 30° precision calibrated phase shifter where 1 inch of dial movement represents approximately 1° of phase shift. Differential gain and differential phase measurements are made with accuracies within 1% for gain and 0.2° for phase. A unique graticule switching arrangement provides automatic selection of an IRE graticule or an illuminated parallax-free vector graticule. The selection occurs at the same time the operating mode is established.

The Type 520 Vectorscope provides the ability to check equipment performance during regular programming times through the utilization of Vertical Interval Test Signals. A digital line selector permits positive selection of Vertical Interval Test Signals from lines 7 through 21 of either field 1 or field 2.

For a demonstration contact your nearby Tektronix field engineer or write: Tektronix, Inc., P. O. Box 500, Beaverton, Oregon 97005.

Type 520 NTSC Vectorscope $2150
Rackmount Type R520 NTSC Vectorscope $2175
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Tektronix, Inc.

committed to progress in waveform measurement

Circle 143 on Reader Service Card

Continued from page 8

"The news media can play a significant role in lessening the potential for violence by functioning as a faithful conduit for intergroup communication, providing a true marketplace of ideas, providing full access to the day's intelligence, and reducing the incentive to confrontation that sometimes erupts in violence," the study group report stated, admitting: "That is a subtle and uncertain mission."

Concluding that the media had failed in this mission, the group asked that the FCC exercise its powers in "upgrading the performance of broadcast media without becoming involved in news content."

The Commission itself rejected the study group's criticism of media news performance, saying that "in-depth analysis of underlying social conditions is now a regular and welcome part of the best of our print and broadcast media."

One solution recommended by the group was the formation of a national center to study press and broadcast journalism.

The center, not mentioned in the final report of the Commission to the President, would be independent of government and the media.

It would oversee the news media and make recommendations (although without the authority to enforce them) on the improvement of news programming; interrelationships between the news media and advertisers, politicians and policy makers; and the coverage of "significant dissident groups."

Something that the Commission recommended instead, however, is already being set up. It's another study—this time an inquiry into TV's effect on children.

It will be conducted by the Surgeon General's Committee on TV and Social Behavior. According to Vice Chairman Dr. Eli Rubinstein, a final report will be issued in a year, covering such topics as the programs children watch, their reactions, their parents' reactions, the setting in which children view TV, and how they behave when watching.

NAEB releases public TV survey

The Educational Television Stations division of the NAEB has released the third survey of Financial and Operating Reports of Public Television Stations, July 1967-June 1968.

The report shows that annual expenditures by public TV stations totaled over $67 million in 1968, up from $62 million in 1967. Median per-station expenditure for 1968 was $404,173—up from $401,525 in 1967. This brings total funds expended by ETV stations since 1953 to over $393 million.

The survey indicates that 27 new stations came on the air during that time period and there was a growth in satellite stations from 22 to 38.

ETS Associate Director H. Holt Roddleberger said: "Although $10.5 million in federal funds had been authorized to continue the educational broadcasting facilities program, no funds were actually appropriated by the Congress during the 1968 fiscal year . . . the effect of the hiatus in federal matching facilities grant monies is clearly evident—expenditures for capital equipment dropped from $21.5 million in fiscal 1967 to less than $14 million in 1968, a reduction of 35.3 percent."

To obtain a copy of the report send 50¢ to the office of Educational Television Stations, 1346 Connecticut Ave., N.W., Washington, D.C. 20036.

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THIS AND MORE IN APRIL BM/E
THE MAGAZINE OF
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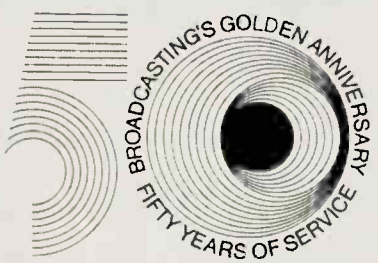

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Mississippi ETV Authority seeks experienced maintenance engineers for VR 2000 videotape, UHF transmitter and color studio. First class license required. Ground floor opportunity. Major expansion planned for July. Send complete resume to:
Director of Engineering, MAET, P.O. Drawer 2470, Jackson, Miss. 39205.

CONTEMPORARY RADIO STATION in growing medium Alabama Market wants chief engineer. The man we are looking for must be competent. He will be working in one of the most modern broadcasting stations in the South. He will be in charge of maintenance. His workshop will be equipped with everything he needs. Announcing ability helpful, but not necessary. The man we are looking for takes pride in his work and thrives on the satisfaction of a job well done. His reward will be good wages and fringe benefits. He will grow with the company. Send resume and photo to Box 370-1 BM/E, Blue Ridge Summit, Pa. 17214.

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The engineers we seek will include their talents in Video, Audio and Computer related circuitry designing products for the Television Broadcasting Equipment market. Send resume to the personnel manager. Vital Industries, Inc., 3614 S.W. Archer Road, Gainesville, Florida 32601.

JOB SPECIFICATION OF TELEVISION TECHNICIAN FOR THE ALPENA PUBLIC SCHOOLS. **Description:** The successful applicant for this position will be placed in charge of the technical operations and maintenance of the Instructional Television Fixed Service System in Alpena County. **Duties:** The television technician shall be responsible for: 1. Operation and maintenance of a 2500 mHz transmitter. 2. Operation and maintenance of television film, tape, and control equipment. 3. School television equipment installation and maintenance, including distribution, receiving equipment. 4. Assisting administrators in planning for future production studios, expansion of ITFS system to multiple channels, electronic learning systems and other duties as assigned by the superintendent or his disignee. 5. Maintenance of audio-visual equipment in cooperation with the director of audio-visual instruction. 6. Maintenance of school intercom systems including CB equipment. 7. Assist in the development of specifications for communications and television facilities within new construction. 8. Qualifications: The applicant shall meet the following educational and experience requirements: 1. Shall be a graduate of an approved technical school program of at least two years duration (or equivalent) with emphasis on communications and preferably television. 2. Shall possess a current First-Class or Second-Class Radiotelephone Operator's License (FCC) 3. Shall have had at least twelve months experience in the operation and maintenance of television equipment (cameras, recorders, etc.). 4. Shall be fully aware of and conversant with the FCC rules and Regulations governing 2500 mHz systems. **Selection:** Preference shall be given to applicants with experience in educational or commercial television broadcast/closed-circuit operations. Applicants should submit professional references as to their abilities and qualifications to: Mr. William Beach, Director of Professional Personnel, 508 Taylor Street, Alpena, Michigan 49707.

Wanted: MAINTENANCE TECHNICIAN — First phone should have V H F Transmitter or studio maintenance experience. Good opportunity for advancement. Contact Chief Engineer, KGVO-TV; Box 1503; Missoula, Mont. (405-543-8313).

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Disc Jockey, good voice, tight board, Career Academy Graduate. 3rd endorsed, foremat versatility. Will relocate anywhere. Specify format. Steve Mansteller, 1217 Harrison, Santa Clara, Cal.

Broadcast grad seeks position as Photographer (still & 16 MM), News, Documentary, or Gen. TV Prod. Some experience. Married, 24, will relocate. Michael Honey, 5416 So. Elmwood St., Littleton, Colo. 80120. 303-798-7157.

Wanted transmitter watch, AM or TV. Several years experience. Prefer N. California or Southern states. Consider other locale. James Taylor, 1106 W. Burbank Blvd, Burbank, Calif.

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Dumont television station equipment including Cameras, Monitors, Transmitters, Oscilloscopes, and voltage Calibrators, must be pre 1950, 20BP4, 15AP4, 121P4CRTS. Dumont receivers Models RA-101-RA 106. Schwartzman, 73 Bridge St. Corning, N.Y.

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AMPEX, VR-7500, VR-6000 1" helical, plus 266324 Cameras, Dynair VS60A Switcher fader, Cohu EIA Sync. Gen. 2472 Model, Make an offer. V-Tip, Inc., 2415 Charles St., Rockford, Ill. Call 815-397-0110.

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FROM THE EDITOR

Serving the Public: U's plus Cable

To what degree, and how, should uhf stations (and for that matter small-market vhf) be protected so that free TV service will not be threatened? Should a public willing to pay for extra signals be denied that right?

Hard questions if you're an FCC Commissioner trying to do the right thing. You know you favor an outlet for local expression in every community, more program diversity, and adequate free TV. But how do you regulate to optimize results?

If we were sitting on the Commission we'd have to admit small-market U is never going to make it without a network. Therefore, cable has to be encouraged to expand and to originate in every community possible.

But we must control importation of distant signals. If a market is not capable of generating more than $1.5 million annually, there's not much profit especially if three stations are trying to cut it (usually less than 10% before taxes). The same holds true for two-station markets grossing less than $.5 million each. The formula proposed in the Senate copyright bill which calls for three network-plus two independent- plus one ETV-station in every market can't help but cut the currently thin profits of small-market stations (and therefore, local service) further—3+1+1 sounds safer if we want to be assured of three free TV channels.

We ought to encourage the broadcasters affected to get into the cable themselves—we ought to go so far as to encourage an independent U broadcaster to operate a cable system in the same community.

Preventing unfair competition becomes even a tougher problem when we consider the medium-sized markets. It takes at least $1 million a year to operate a station that is putting on some reasonable counter-programming plus some locally-produced public affairs telecasting. This means uhf, as a fourth station, can be viable only in markets billing in excess of $5 million. We're now talking the top 50.

The copyright proposal of three independent and one ETV station in addition to three networks (3+3+1) will cramp U's. The chance of one U making it in markets 25 to 50 are slim unless they might supplement their income by trying Pay-TV. We'd better reduce the competition for the time being to 3+2+1.

If there are only 25 markets for independent U's, the prospect of generating funds that might yield more program diversity looks bleak. If there were 60 independent U's (20 in the top 10 and 40 more), $30 million is available for programming.

Programming will be helped by CATV copyright royalties which will produce $4-6 million in 1971 (using the Senate bill S-543 formula). A ten-fold increase in CATV subscribers will produce $40 million or so. This is not much more than U's alone might generate. Royalties should be higher.

Do we discriminate against the poor and rural areas by permitting cable as a substitute for U's? Undoubtedly we take away some option over viewing times because there will be fewer reruns (the staple of most U's) on the air simultaneously. Not every sporting event will be on free TV. But we can't imagine any urban area without three commercial and one educational signal.

Rather than increase royalties we might tax cable subscribers, say, $1 per month. Then we could not only support free translators for every rural area, but could build resources for the Corporation for Public Broadcasting as well. Then ethnic and specialized stations could get some grants. How's that for promising approaches?

James A. Lippke, Editor

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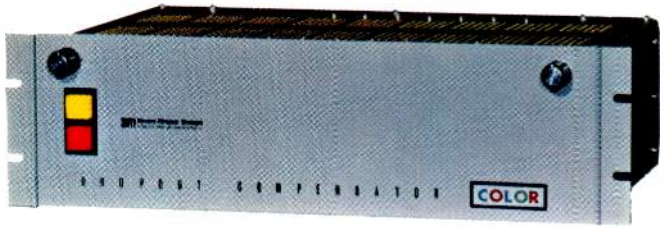

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