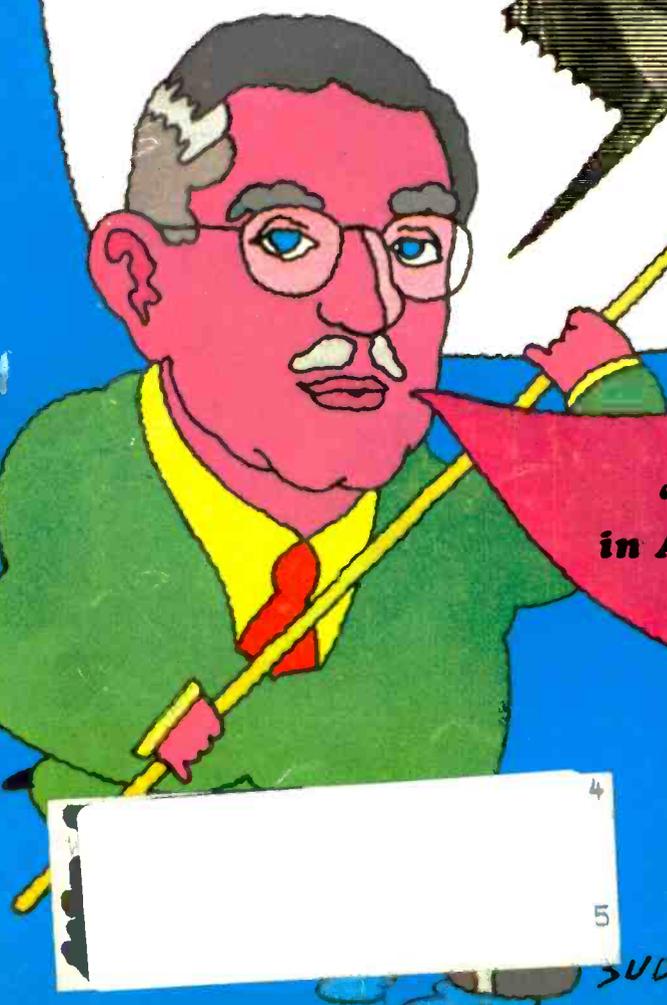


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**NAB Convention Wrapup**

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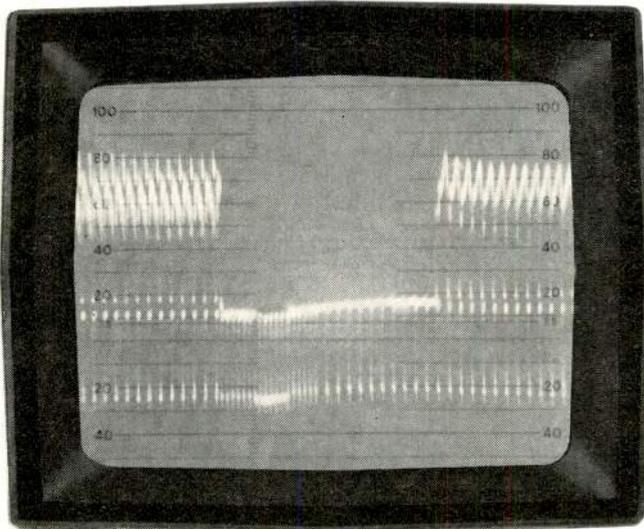
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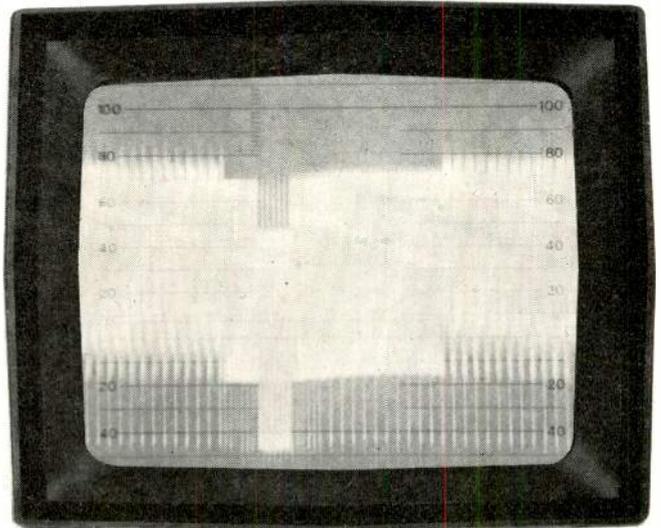
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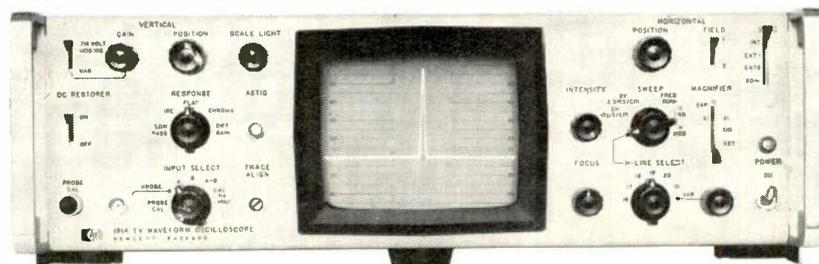
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# BM/E

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This month's cover: There's a certain senator from Rhode Island who has been rather outspoken about the state of affairs on TV these days. While the once-over-lightly with the whitewash as shown in Art Sudduth's cover design may offer only temporary respite, it's a hint of the kind of direct action the Senator would like to take. For his views and other ideas, experiences and products that came out at this year's NAB, turn to pages 29-52. The NAFMB log starts on page 23.

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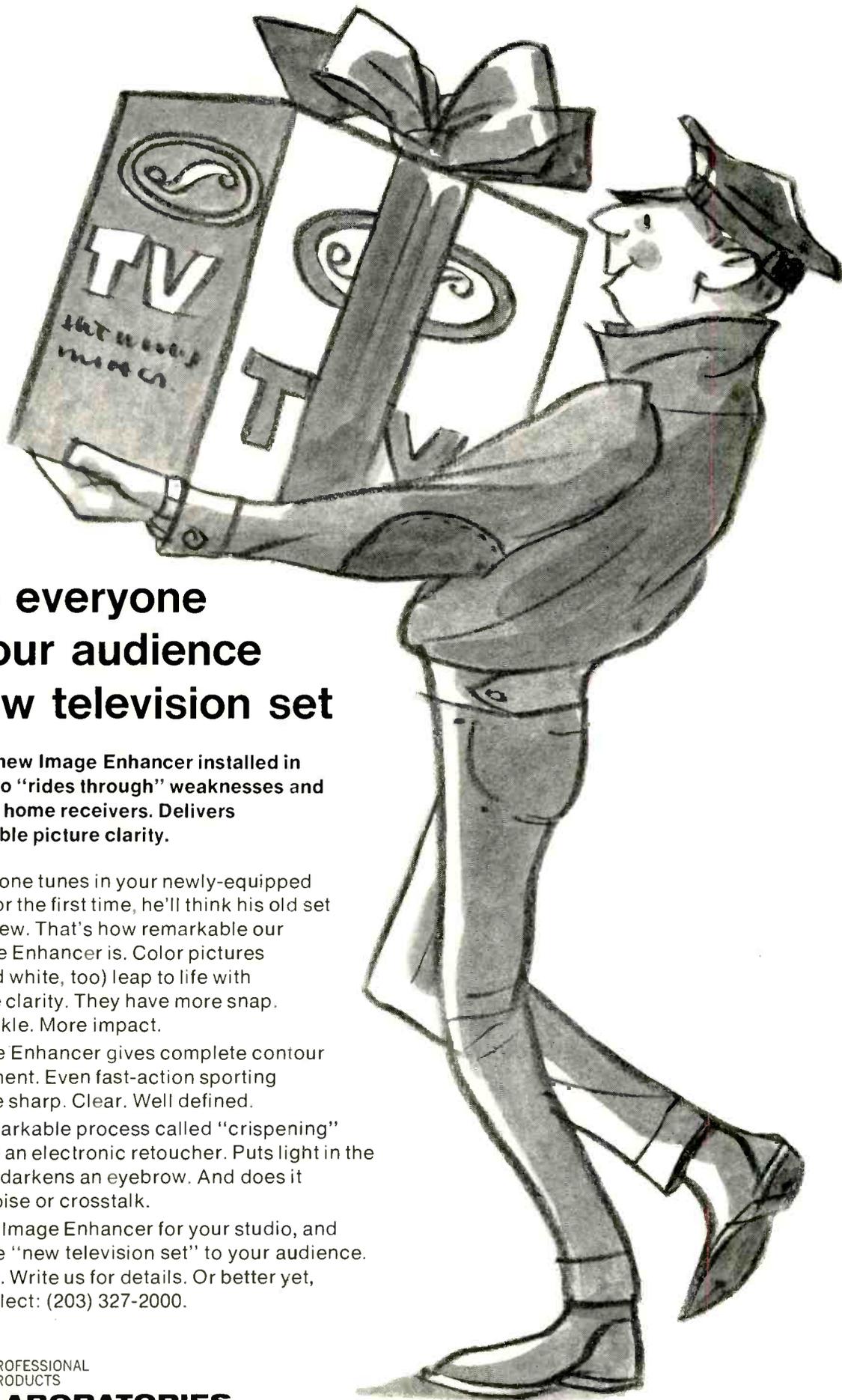


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# BROADCAST INDUSTRY NEWS

## Justice Department backs CATV expansion

The Justice Department has joined the debate over CATV's place in U.S. communications by encouraging CATV as a competitive medium against newspapers and television.

The department called CATV "the most promising means of achieving greater competition and diversity in local mass media communications" in a letter sent to the FCC by Richard W. McLaren, chief of the Department's Anti-Trust Division, on April 9.

Suggested in the letter was that the FCC's earlier regulation of CATV had not been based on the public interest, but on "a concern that CATV constitutes an economic threat to the local television stations, particularly to the marginal uhf stations."

Without specifying details, the

Department urged the commission to relax current restrictions on the cable industry.

Cable companies, according to the Justice Department, should be able to produce programs and sell advertising to pay for independent productions and to develop advertising markets for select audiences. Television stations and newspapers, however, should be barred from controlling cable systems in their own markets. The Department added that independent radio companies need not be barred from buying cable systems, even in their own markets.

Justice department participation in this controversy was foreseen in February and March issues of *BM/E*, pp. 40, 67, respectively.

## Crolyn tape license let

Chromium dioxide (Crolyn) tape

may at long last be nearing production for broadcast use. E. I. du Pont de Nemours & Co., Inc., owner of the Crolyn patents, has concluded a licensing agreement with Memorex.

According to a Memorex spokesman, full-scale production isn't likely before 1970. Chromium dioxide tape has a highly homogeneous coating with exceptional high-frequency and signal-to-noise characteristics. In certain applications, it can double a tape system's effective dynamic range. Special biasing is needed when recording, requiring modification of some recording equipment.

## JTAC Report stresses spectrum engineering

Progress in spectrum management depends on a continued program of "Spectrum Engineering," according to The Joint Technical Advisory Committee (JTAC) Report and its spokesman at the IEEE Convention, on March 25, Richard P. Gifford of General Electric Company's Communication Products Department. Gifford's theme was "Spectrum Management and Nonbroadcast Requirements."

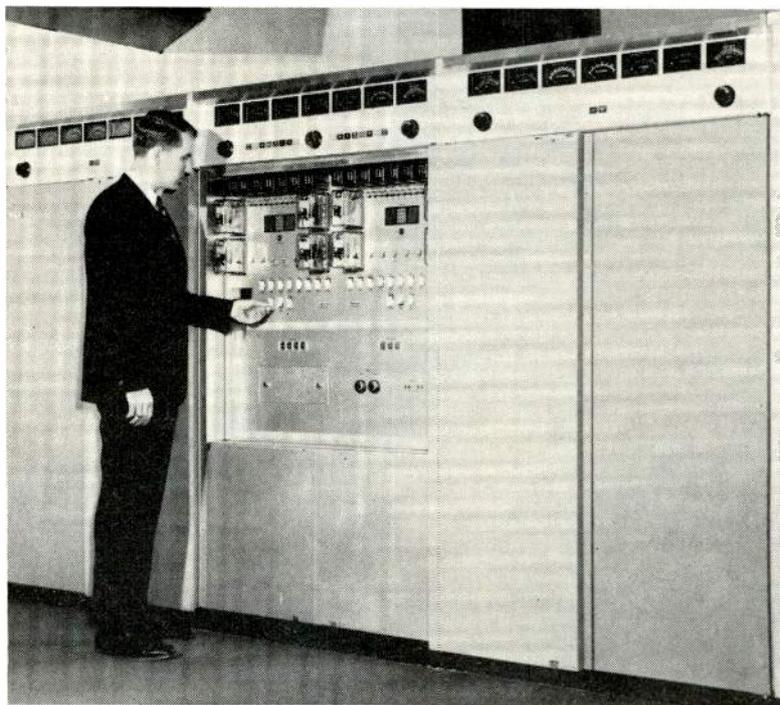
Gifford defined spectrum engineering as the technical component of spectrum management that involves frequent selection, engineering planning and interference reduction.

In performing these functions, the system uses combinations of analysis of spectrum use, building a data base for spectrum use (including a remote console computer system) and measurement of spectrum use.

Documenting strangulation in some services due to lack of sufficient frequencies, the four-year study calls for an end to adding committees and patches to the present system and describes the operation of a spectrum engineering system geared for non-broadcast requirements.

According to Gifford, "the spectrum engineering facility would have the objectivity, competence and man-power to analyze and

## New TV Transmitter Shipped



New family of vhf TV transmitters is represented by this first member—RCA's 30-kilowatt TT-30FL—unveiled at this year's NAB. Advanced design provides a 2:1 improvement in performance specs with complete redundancy of components for automatic transmitter backstop. First order is from Pittsburgh's KDKA-TV, with a total of three such units on order from Westinghouse Broadcasting Co. For more information on this transmitter, circle 301 on the Reader Service Card. For more details on new transmitters, see page 47.

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evaluate technical proposals for reduction of bandwidth requirements without impairment of the quality of the service, whether they applied to broadcast or nonbroadcast service."

## Doctors to learn from TV at home

Sometime this month, about 125 doctors specializing in cardiology in the Washington, D.C. area will plug stethoscopes into their TV sets at 10:00 p.m., Thursday, and hear the heart problem under discussion on WETA-TV's new medical experiment.

Sponsored by Georgetown University School of Medicine, the 28-program series represents a new approach to medical television.

"We are trying to determine whether learning can be achieved over television," says Dr. John F. Stapleton, a co-director of the project.

"In my judgment, medical television has been a disappointment because of poor program content. Our conferences will be fast-moving, will concentrate on the health problems of live patients and will present interesting types of audio-visual teaching aids—X-rays, electrocardiograms, sound tracings and movies," says Dr. Stapleton.

Participating physicians will be provided with 12-in. portable TV sets, equipped with an audiophone jack and a unit to receive a scrambled signal.

A \$225,000 grant from the Division of Regional Medical Programs of the Department of Health, Education and Welfare is making the project possible.

## ETV groups to convert courses to EVR format

Two Southern educational groups—the South Carolina Educational Television Center and the State University System of Florida—plan to convert television courses to EVR cartridge format.

The Georgia announcements were made by Henry J. Cauthen, general manager of South Carolina Educational TV Center, and by Robert E. Wood, director of Instructional Technology for the State University System of Florida, during EVR demonstrations in Atlanta during March.

The CBS EVR Division five-city marketing tour, which began on February 25, ended on March 25 in Boston.

Other facilities which plan to

convert to EVR include: The Great Plains National Instructional Television Library of Lincoln, Nebraska, Bailey Films and Film Associates of Los Angeles and Equitable Life Assurance Society of the U.S.

## WFGA-TV gets award for audience research

WFGA-TV, Jacksonville, Florida, has been chosen one of the winners in "Innovator Awards" competition sponsored by the American Research Bureau.

Judging was based on "creative applications of audience research by a television station."

The station's award was for its "Contact Poll"—a weekly public opinion sampling used as a base and background for news stories, editorials, documentaries. Results of the poll are aired on the news each Friday.

The other two winners—Cox Broadcasting Corp. of Atlanta, Georgia, and KNTV of San Jose, Calif.—were selected for "their outstanding use of research material in sales promotion."

## North American Philips merges with Consolidated Electronic

The February merger of Consolidated Electronics Industries Corp. (Conelco) with North American Philips Company, Inc., has created a company with combined sales at the half billion mark.

According to information released at the stockholders' meeting, Conelco had sales of \$346 million and North American Philips had sales of \$154 million for 1968.

Estimated earnings in 1968 for

### NAB sales seminar

#### to be held at Harvard

The National Association of Broadcasters will hold its third sales management seminar for radio and TV executives at the Harvard Business School from July 13-July 19. Attendance is limited to 70 station and network sales managers and/or others with equivalent responsibilities. \$425 cost includes tuition, teaching material and room and board for the one-week period. Registration forms can be obtained from William L. Walker, NAB's director of broadcast management.

Conelco were about \$10,300,000 (after provision for minority stockholders' interest), while those of North American Philips totaled \$9,200,000.

Under terms of the transaction, Conelco will issue 4,162,500 shares of its common stock in exchange for substantially all of the operating assets of North American Philips.

## Brigham Young holds audio seminar

A five-day technical seminar concerned with "Audio and the Engineer" will be held at Brigham Young University, Provo, Utah, on July 14-18.

Preregistration (prior to July 7) costs \$55.00 per person; registration at the seminar costs \$65.00 per person; two registrations from the same company cost \$95.00, while three registrations from the same company cost \$140.00.

Topics to be covered in the seminar include: legal aspects of recording and of performances, the business of recording, recording studio designing and remodeling auditorium acoustics, the art of sound reinforcement, magnetic tape, multi-channel recording—art or science, synchronous sound recording techniques and the fine art of sound recording.

## Sony drops price on EV-210

Sony Corporation of America has announced that it is lowering the list price of its EV-210 Videorecorder video tape recorder from \$3750 to \$3200.

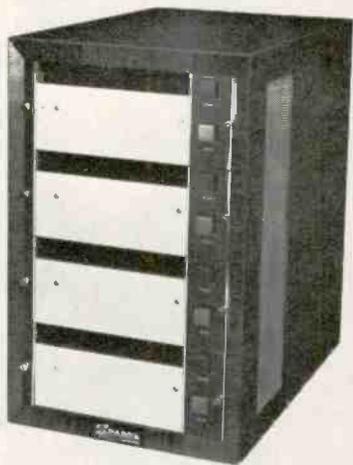
Also, Sony's 15-month extended warranty service, which normally sells for \$300, will be given free with each EV-210.

Quantity production savings, increased 1968 sales, depreciated engineering costs and the field-proved reliability of the EV-210 made the reduced price and free warranty possible, according to a Sony representative.

## FCC receives 1998 complaints in February

The public sent 1998 complaints to the Commission during February, an increase of 197 over January. Comments and inquiries totaled 3174, an increase of 423 over the previous month. Majority of comments favored TV cigarette ad ban.

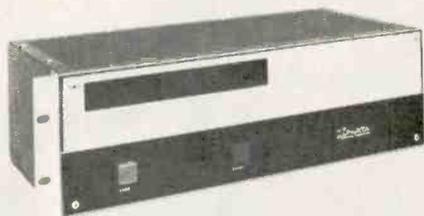
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# INTERPRETING THE FCC RULES & REGULATIONS

## Program Surveys—Recent Cases

In November, 1968, *BM/E's* FCC Rules section concerned itself with "The Broadcaster's Responsibility to Ascertain Community Needs." In light of the Commission's increasing proclivity to "regulate" more stringently in this area, a re-examination of the licensee's responsibilities is needed.

From its beginning, the Commission has been concerned with the licensee's efforts to satisfy "local tastes, needs and desires." This has been part of the Commission's statutory responsibility. However, where does the Commission's responsibility end and where does it begin to transgress on the licensee's right to make independent programming judgments? In other words, do the Commission's "local needs" criteria mark "the beginning of the end"—the eventual government control of programming?

In the *Minshall* case [11 FCC 2d 796 (1968)], the Commission set forth the four elements required by Part I of the "program forms" (Section IV-A and IV-B):

- (a) Full information on the steps taken to ascertain Community needs;
- (b) A record of program suggestions received from listeners;
- (c) Applicant's evaluation of these suggestions;
- (d) Programming to be offered in direct response to the suggestions.

### Section IV (A or B), Part I

In *Andy Valley Broadcasting System, Inc.*, 12 RR 2d 691 (1968), the Commission held, ". . . The new form now makes a program survey mandatory. Applicants, despite long residence in the area, may no longer be considered, ipso facto, familiar with the programming needs and interests of the community." Therefore, a broadcaster—even a long-standing member of the community—will have to show evidence that he has surveyed the community, consulting with public officials, educators and leaders in other areas of community life—*i.e.*, religion, entertainment media, agriculture, business, labor, the professions and eleemosynary organizations, as well as others who represent the interests of the community.

So the question has become, how does a li-

cence apply the four "guides" set forth by the *Minshall* Case? The answer must start with a general outline of their essential elements:

### Consultations with community leaders.

These consultations help determine the needs of the community as seen by the groups represented. A representative range of groups and leaders are needed to give the applicant a better basis for determining the total needs of the community. Interviewees should be identified by name, position and organization. The consultations should elicit constructive information about community needs, not mere approval of existing or pre-planned programming. Whether the survey be by direct mail, telephone, on-the-street interviews and/or any combination of the foregoing with others, the program form application *must* indicate the licensee's method(s). While the *number* of consultations required varies with the size of the market, it is reasonably safe to assume that *the names and addresses of at least 15 interviewees should be stated in the renewal.*

### Suggestions received.

The application should include the *significant suggestions* as to community needs received from community leaders—whether or not the applicant proposes to treat them through its programming service. The applicant must also explain his choice of "significant" needs by *retaining material supporting* the basic evaluation. For example, suggestions that occur in nine out of ten interviews are certainly significant. However, a suggestion that has appeared twice in one hundred interviews is definitely *not* significant.

### Licensee's evaluation.

The applicant is expected to evaluate the relative importance of those suggestions and consider them in formulating the station's over-all program service. The applicant should explain his "modus operandi" or methods used in analyzing the surveys. For example, the applicant may convene round-table discussions between announcers, program directors and management to analyze each survey, keeping a brief memo of the discussions in his program-survey files.

### Programming service proposed to meet the needs as evaluated.

The fourth element set forth in *Minshall*

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

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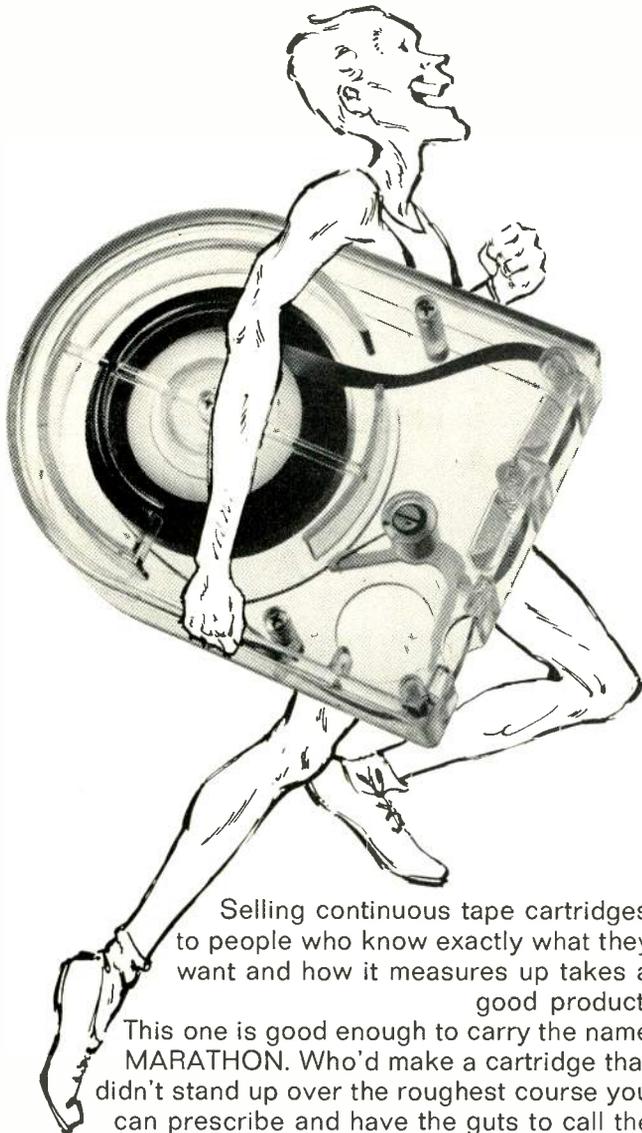
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should be the response to Question 1.C. or 1.D. It calls for the applicant to relate his program service to the needs of the community as evaluated — *what* programming service is proposed to meet *what* needs. In other words, this response is the logical answer to the needs established in the preceding responses.

### Gradual Emergence of Indirect Censorship

The Commission's zeal in determining the adequacy of the licensee's efforts to meet "local" needs may gradually emerge as a form of censorship and/or program dictation.

As to censorship, Section 326 of the Communications Act of 1934, as amended, provides that:

"Nothing in this chapter (Act) shall be understood or construed to give the Commission the power of censorship over the radio communications or signals transmitted by any radio station, and no regulation or condition shall be promulgated or fixed by the Commission which shall interfere with the right of free speech by means of radio communication."

In *Farmers Educational and Cooperative Union of America v. WDAY, Inc.*, 360 U.S. 525 (1959), the Supreme Court stated succinctly:

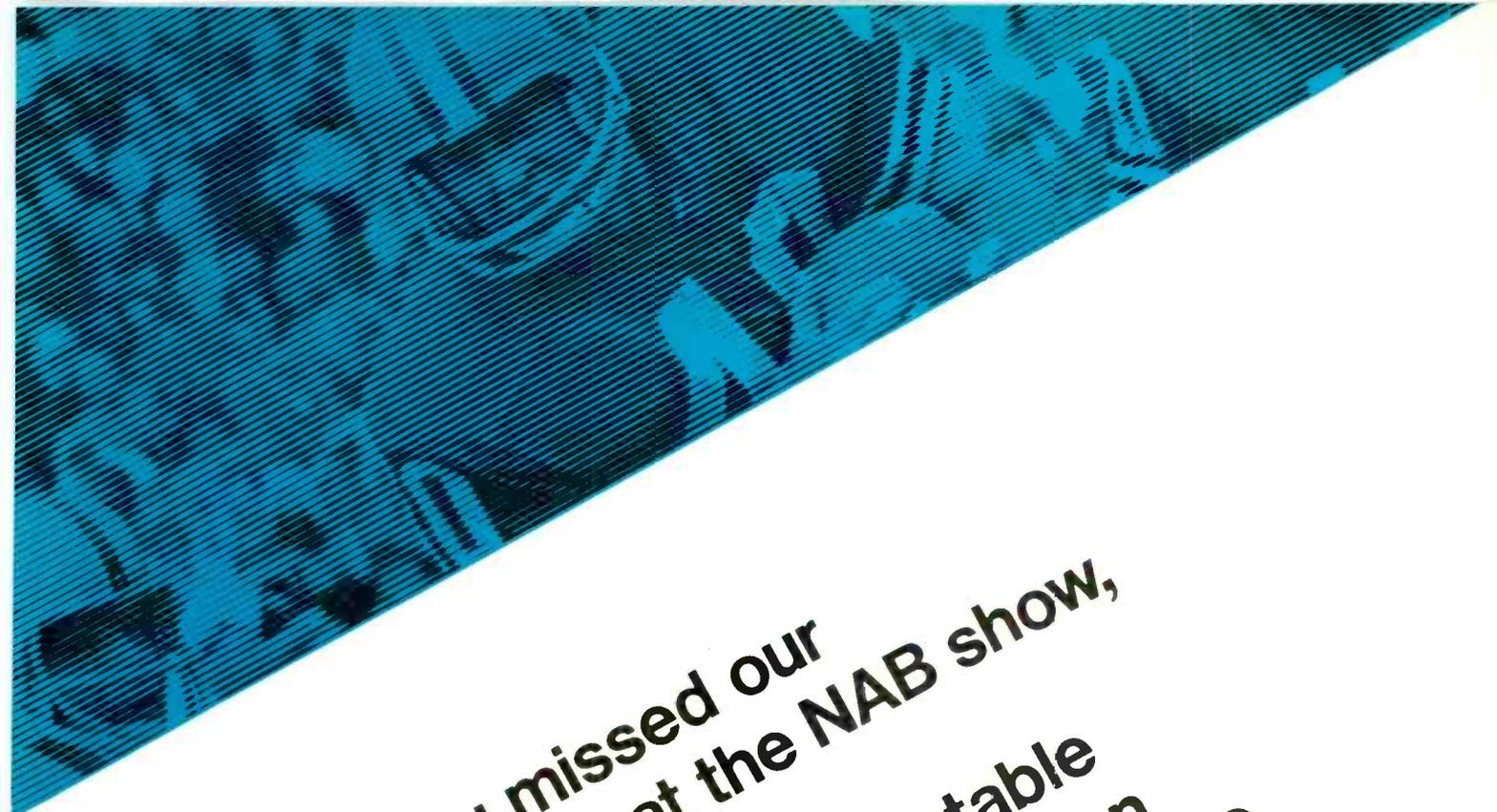
"... expressly applying this country's tradition of free expression to the field of radio broadcasting, Congress has from the first emphatically forbidden the Commission to exercise any power of censorship over radio communication."

And as to program dictation, the Commission's role as a practical (as well as a legal) matter *cannot be one of program supervision or choice*. Supreme Court Justice Douglas commented most adequately about this problem in *Public Utilities Commission v. Pollak*, 343 U.S. 451, 468, as follows:

"The music selected by one bureaucrat may be as offensive to some as it is soothing to others. The news commentator chosen to report on the events of the day may give overtones to the news that please the bureaucrat but which rile the . . . audience. The political philosophy which one radio sponsor exudes may be thought by the official who makes up the programs as the best for the welfare of the people. But the man who listens to it . . . may think it marks the destruction of the Republic . . . Today it is a business enterprise working out a radio program under the auspices of government. Tomorrow it may be a dominant, political or religious group. Once a man is forced to submit to one type of program, he can be forced to submit to another. It may be but a short step from a cultural program to a political program . . . The strength of our system is in the dignity, resourcefulness and the intelligence of our people. Our confidence is in their ability to make the wisest choice. That system cannot flourish if regimentation takes hold."

So it seems that broadcasters have nothing to fear from the Commission when responding to Section IV (A or B), Part I. However, the earlier discussion of programming to be offered in response to needs offers a tempting opportunity for the Commission to substitute its own judgment. Commissioner Lee Loevinger poignantly commented about this very problem.

"The traditional FCC approach has been to demand minimum amounts of programming in various specified categories. Licensees have been required to report the percentage of programming



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falling in such categories as entertainment, religion, agricultural, educational, news, discussion, talks, and miscellaneous. The 1960 program policy statement, *supra*, listed 14 categories, including some of the foregoing and additional ones such as programs for children and editorials.

"This approach is based upon certain implicit assumptions which, simply stated, are these: The public interest in broadcasting is composed of a number of elements, principally those specified in the FCC program reporting forms. Each licensee should serve the public interest. It is the function of the FCC to require each licensee to serve the public interest or else forfeit his license. In order to serve the public interest, each licensee must provide all, or most, of the elements which the FCC specifies as serving the public interest. Therefore, each licensee must provide some programming of each type specified by the FCC (or, in exceptional cases, of most but not all types), or risk losing his license.

"An important point to note in analyzing this approach is that it is based altogether on category classification and has nothing whatever to do with excellence or merit. A program is classified as "talk" whether it is Einstein discoursing on relativity, Niebuhr discussing morality, or the local bartender talking about the proper proportions for a martini. A program is classed as "entertainment" regardless of whether it is based upon pornography, contemporary crime and violence, or classical drama. Hence, it is apparent that a statistical supervision of program categories has about the same relation to a program merit as a requirement for hiring employees on the basis of geographical origin does to a civil service merit system. This approach ultimately rests upon an assumption that category diversity is per se a desirable quality in broadcast programming.

"The hope that excellence, merit or even genuine diversity might be provided by the requirement of a statistical 'balance' or distribution among prescribed categories of programming has been frustrated by experience. For while the FCC has officially insisted on the necessity for such statistical balance virtually since inception, its insistence has neither discouraged or prevented bad programs nor provided or encouraged good programs.

"A final issue with respect to mandatory or rewarding action by the government to require or encourage program quality is that of determining the kind of action to be taken. The only reward or inducement that the government has to offer, however, is the grant of continuance of a license. As a consequence, the practical distinction between mandatory or rewarding action and prohibitory or punitive action is difficult to see. For if the rewarding action consists of the grant or continuance of a license, we are merely saying the same thing in different words. Further, as noted above, *once the FCC takes action either to grant or to deny a license on the basis of specific programming, all those who are subject to its licensing power are, in effect, compelled to comply with the standard stated or implied by that action.* If the standard is based upon the broadcasting of a desirable program other licensees are in effect required to broadcast the same or similar programs." (Emphasis added.)

Of course, there is still no ready answer to the question, "Is the Commission merely exercising its statutory responsibility when it applies its 'criteria,' or is it intruding into the licensee's right of free speech?" It does seem that *the broadcaster must expect greatly increased scrutiny of his programming presentations.* Every licensee must expect the Commission to review thoroughly Section IV-A, Part 1, to determine whether he has completed enough "spadework" in support of the program he proposes as meeting "ascertained" needs, interests, and desires.

Every licensee should guard against being coerced (in any fashion) into making programming decisions merely to satisfy the Commission; such decisions by any licensee would truly threaten

# Professional Origination

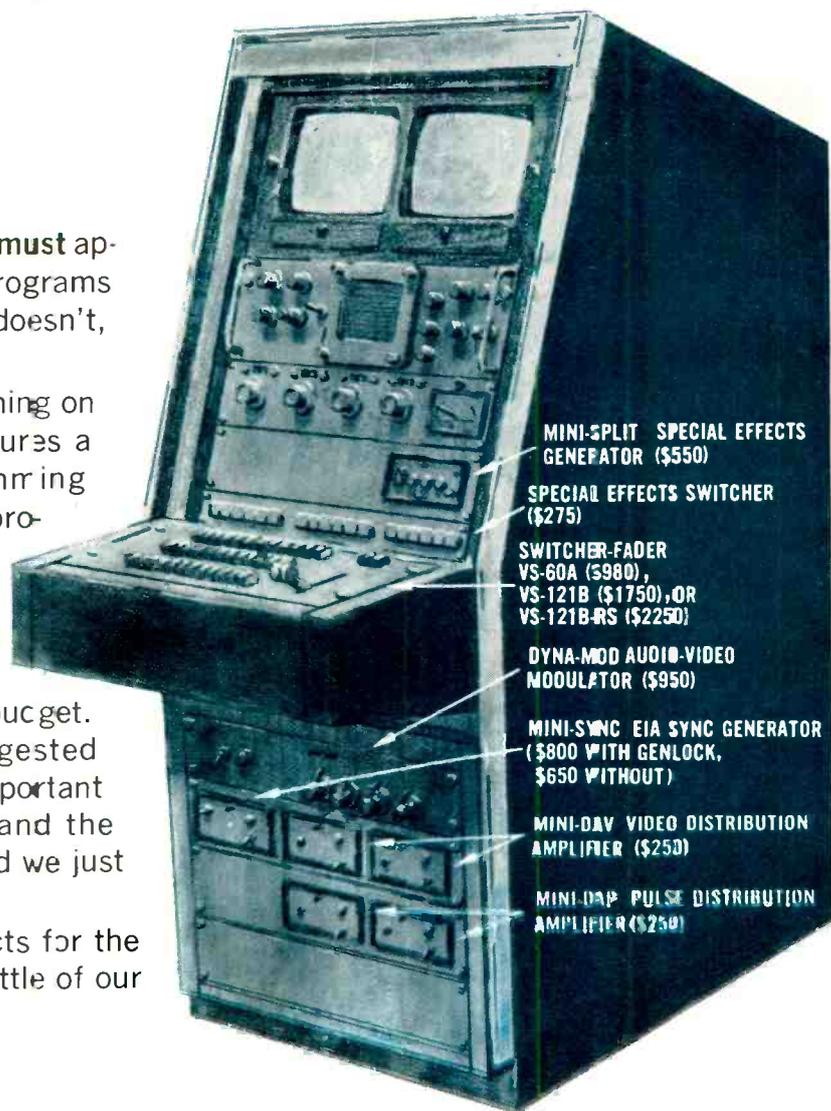
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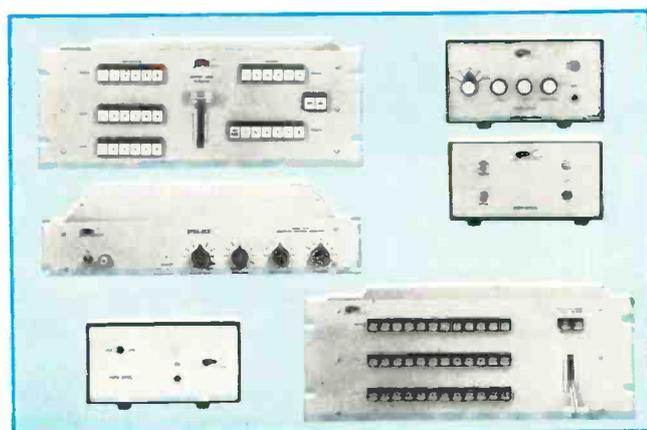
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the foundations of free broadcasting in this country. No matter how erudite, intellectual, or well educated the Commission's staff may be, not one of them is in nearly as good a position as the licensee to make rational, considered and supportable decisions on programming needs in the licensee's community. So far, the Commission's staff has not exceeded its statutory limitations. It has taken great pains to be certain it is not substituting its own “programming judgment.” However, the Commission has assumed a more stringent attitude towards broadcasters disclosing “weak” efforts to determine their community needs. For example, numerous renewals have been deferred—pending receipt of additional information requested by the Commission's staff concerning responses to Section IV (A or B), Part I.

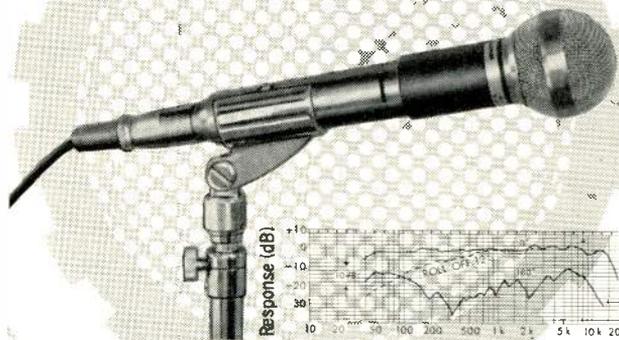
To minimize the Commission's intrusion in this area and to avert inquiry into your practices, you should make more frequent and more detailed surveys of the tastes, needs and desires of your audience. Telephone surveys, street-corner interviews, conferences with civic leaders, post-card surveys, lengthy questionnaires, surveys by your staff of their own social clubs (Elks, Lions, etc.) are a few of the many techniques available. Surveys should be made *every* year and should be *documented*. *Staff meetings*, to analyze results, should be held regularly. And, at the moment, the most important survey is the survey of civic leaders in your service area. In any event, if you have the slightest doubt concerning the responses to the questions therein, consult with your attorney.

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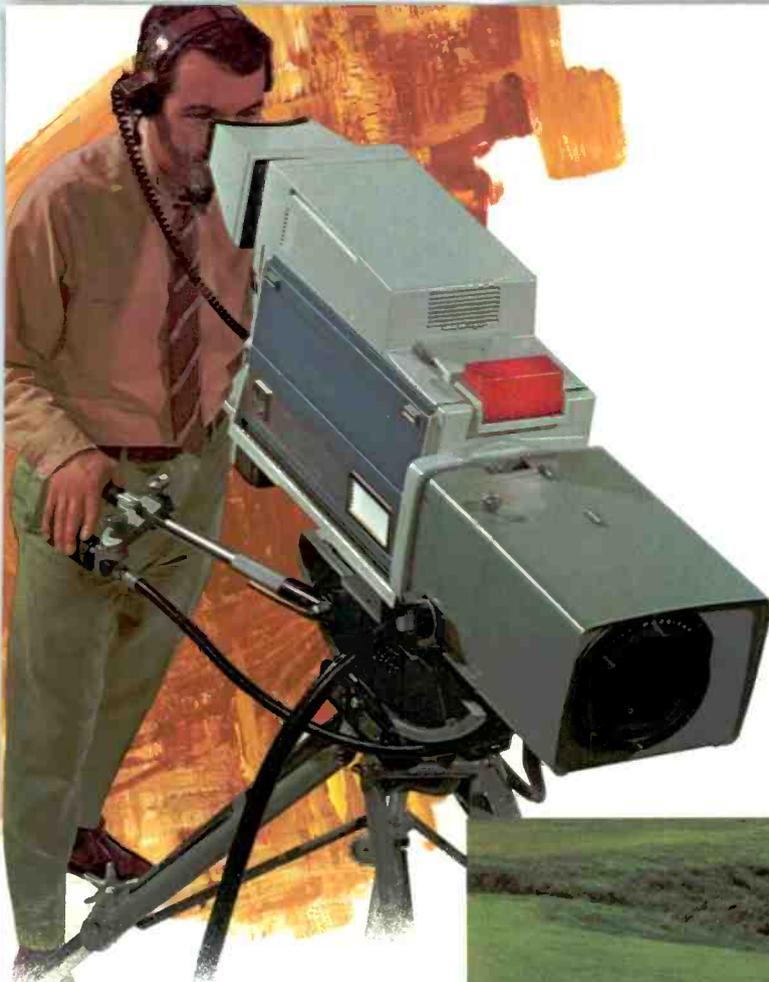
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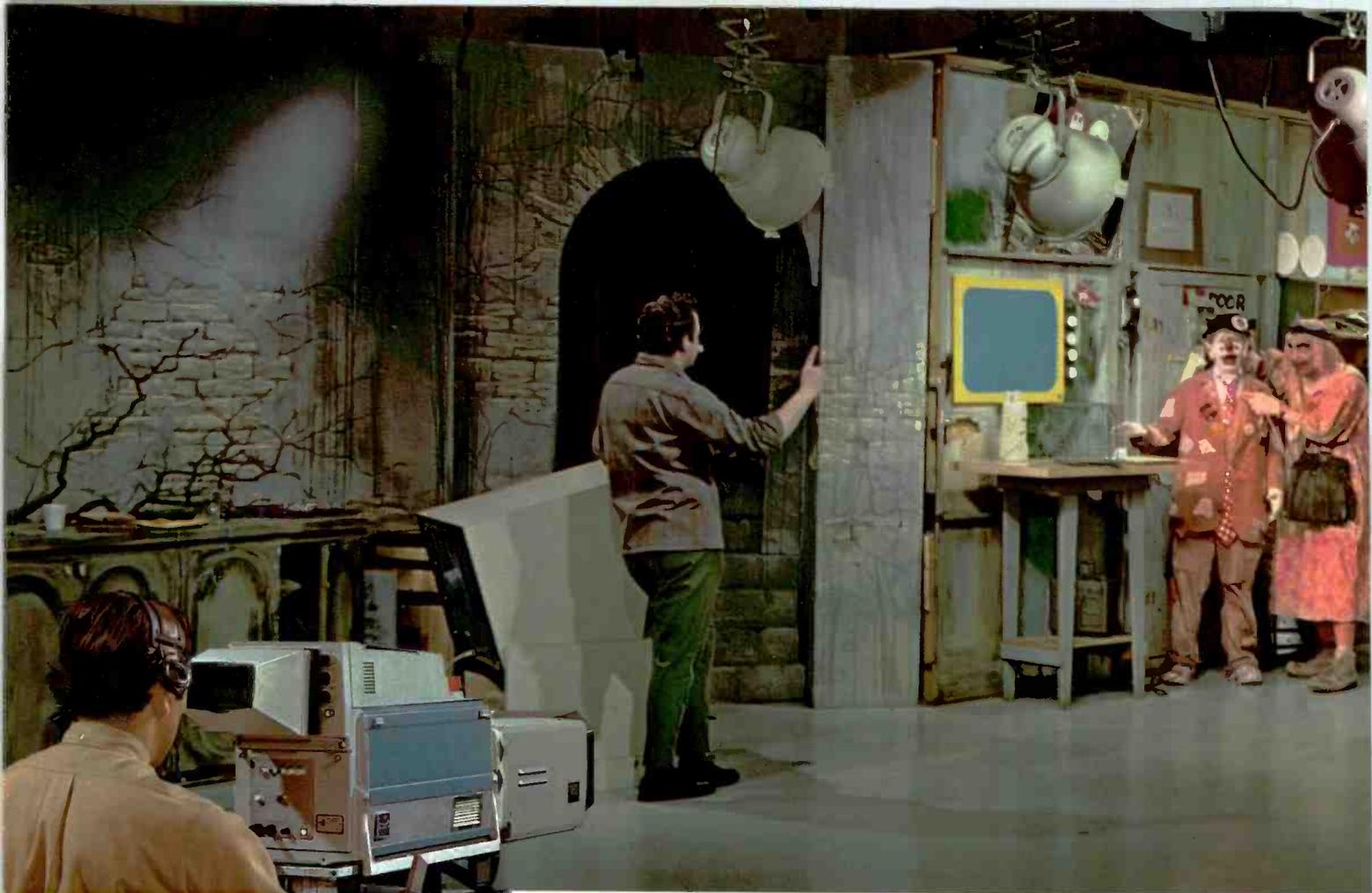
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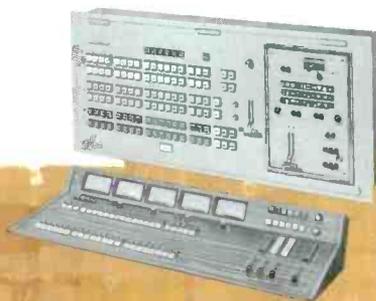
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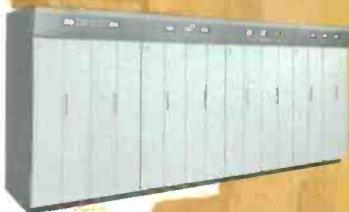
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## Fm-ers Set Optimistic Note

Fm embodies the growth and the future of the broadcasting industry—so went the consensus at the three-day meeting of NAFMB in Washington. Speaking at the Washington Hilton, Allen Kalish, president of Kalish, Spiro, Walpert, Ringold, Inc.—Philadelphia-based ad agency—told the assembled broadcasters what it takes to make out in today's highly competitive sales market.

First on the agenda is a professional sales staff—or if you can't get all pros, get at least one professional and successful salesman and let him train the others. Kalish believes that there's too little professionalism among radio salesmen today, especially among fm-ers, and the road to success lies the way of the pro.

"Love your customer," says Kalish, "even if you walk out of his office with no contract." This "love" filters back to the prospect and before long affects his thinking about you and your station. "Be helpful," Kalish continues, "and give your customer something extra, whether he signs with you or not." He went on to cite instances in which the professional salesman demonstrated his interest and "extra" special services to the prospect. The pro would bring news of the industry to the customer, telling him what others were doing in his field, and how various campaigns were going. The technique is never high-

pressure, but rather a high-key *genuine* interest in the customer's operation and well-being.

Enthusiasm was cited by Kalish as a prime ingredient of success in any fm station. If you feel genuinely enthusiastic, he feels, then this enthusiasm will filter down through all levels in the station and will certainly encompass the salesmen and will influence their attitudes in the field. Enthusiasm not only helps the station, it helps sales.

### Congress Won't Move

Speaking at an NAFMB luncheon, Congressman Samuel Stratton (D-N.Y.), an extremely popular figure who has put in several years working in the broadcast industry, feels there won't be much sweeping legislation affecting the broadcast industry in this Congress. There is a great concern on Capitol Hill, he stated, with the increasing amount of violence and other "objectionable" elements that tend to dominate TV and radio today.

Stratton went on to say that there is also some question today of whether broadcasters are simply offering reports of the news or if they are actually influencing the news. This question has been paramount in Congress lately—especially since the calamitous Democratic National Convention in Chicago last summer. Stratton posed the dilemma facing

the broadcaster today: "Are you offering a solution, or are you part of the problem?"

### Long Live Radio

"Fm is dead; long live radio!" exclaimed ABC Radio Network President Walter Schwartz. His contention was that fm is no longer a baby medium to be coddled and excused for its shortcomings. Fm has arrived and is full-fledged radio, he said.

Schwartz feels that the all-radio concept is here now; fm is no longer distinctively different. "Fm," he said, "has been operating under a self-imposed inferiority complex. The aim now should be to create *radio* stations, not jukeboxes." Schwartz further believes—in the face of a rising FCC tide against easy license renewals—that renewals will depend on how well your station operates in the public interest, the public convenience and the public necessity.

Another shortcoming of fm, according to the ABC executive, is the fm station's failure to promote itself as a desirable medium. This is one of the main distinctions today between fm and radio in general.

### Buy Time on Time

Citing one of several unusual approaches to selling radio ad-

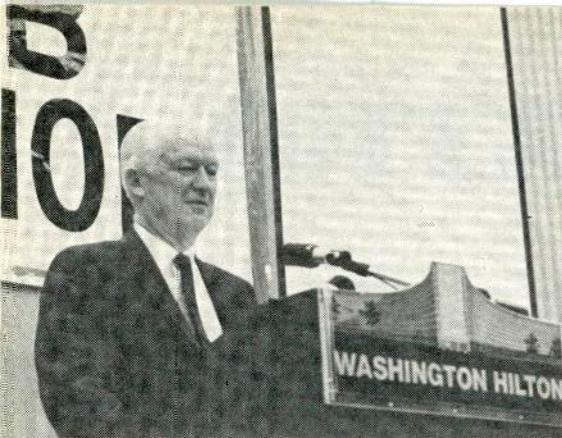
Marion Armstrong, widow of the Major, awarded plaques, and gave money to NAFMB.



Twice always like so in Hilton's Jefferson Room, crowded with intent listeners. Here, Allen Kalish makes telling points on the mechanics and personalities of sales.

BM/E Photos





Rosel Hyde spoke briefly, stuck to MOR format in his remarks.

BM/E Photos



WRR's Durward Tucker described his station's classical music programming.

vertising, George Kravis, president of KRAV, Tulsa, showed an imaginative "Zoo's Who" presentation for prospects—a delightfully illustrated booklet that presents the media facts and figures in a favorable and unforgettable format. In another gimmicky move, his station honors BankAmericards—allowing sponsors to "buy time on time." While only one or two advertisers have actually used the credit card, the "we honor BankAmericards" is one more psychological advantage for the station.

Another aspect of sales-building, "psyching the salesman," was espoused by wivc's (Peoria, Ill.) Pat Nugent. No relation to the Texas broadcasting interests, Nugent has instituted psychological brainstorming sessions with all his salesmen, pumping them

full of enthusiasm and salient facts about fm and about wivc in particular. He prefers to call his salesmen "communications experts," rather than time peddlers. Part of wivc's formula for success is to hire ex-newspaper ad salesmen and to retrain them for the fm radio slot. The station also uses the hard sell in station promos and mailing pieces—all designed to keep the fm-er's image firmly implanted in the prospective customer's mind.

Techniques more related to accounting and actuarial procedures than to the nuts-and-bolts of sales were offered by Dick Stakes of WMAL, Washington, D.C., Bob Galen of Blair Radio, New York, N.Y. and Josh Mayberry of New York's ABC radio network.

### Separating the Sound

"Fm is totally separate from a-m," said Warren Knoerbel, in describing the programming philosophy of WNBC-FM, Binghamton, N.Y. Knoerbel believes that programming excellence is a must for the fm station. His crew uses a clever production tape as a sales tool, played for prospective clients on portable transistor tape recorders.

One of the programming ideas used at WNBC is a nostalgia program—everything from Amos 'n Andy clips to rollicking descriptions of incredibly inept engineers during the early days of radio. These specialty programs make the spec tapes that much more attractive as a sales tool. The station unabashedly merchandises sound and creative features; it sells radio sound, not fm *per se*.

### Jingo Callsign

"We revamped from top to bottom; we even changed our call

## Armstrong awards go international

Both American and Canadian broadcasters were honored with Armstrong awards for excellence in fm programming and news. Stations copping top-prize plaques were: Boston University's WBUR; Washington, D.C.'s WASH; WFBM, Indianapolis; WAMU, American University of Washington; Toronto's CHUM; WHA, University of Wisconsin; Philadelphia's WUHY; and WNCN of New York. Certificates of Merit went to: WUHY, Philadelphia; KPFK, Hollywood, Calif.; WRVR, New York; KPLX, San Jose, Calif.; WGBH, Boston; WLIB, New York; KNX, Hollywood, Calif.; WMAQ, Chicago; WRVR, New York; WQXR, New York.

Stations winning two awards were: WRVR, CHUM and WUHY.

Personal achievement awards were made to Harry Maynard, Larry Lessing, Lynn Christian and David Pollinger.

letters," said KIOI's James Gabbert. The call letters were promptly reworked into "K-101" because the station's frequency just happens to be, "Radio 101." It's a catchy, kinky kind of send-off, and Gabbert's boys have made plenty of capital on this coincidental similarity. The San Francisco station, a loser as KPEN until its December 1, 1968 changeover day, has promoted itself like the dickens. Rocketing up from 12th place, *within one month of its change*, KIOI became the Bay Area's number one night-time station.

But promotion isn't the whole story. Gabbert said that unless a station has a good product to sell, the promotion effort is useless. An important element in this promotion is total listener involvement with the station. Contests are used almost on a continuous basis, with top prizes of \$101 (naturally). One highly successful contest, the "golden graffiti competition," drew an enthusiastic and ingenious response. It's really quite a challenge to the listener to come up with good graffiti that can be read aloud on the air. Another must, said Gabbert, is a streamlined rate card. "Make radio *easy* to buy," he said.

## Marion Armstrong angels while Hyde says nothing

Two distinguished guests at the second-day luncheon, Mrs. Marion Armstrong and Rosel Hyde were rather divers in their effectiveness. Chairman Hyde, in what must be one of the shortest speeches by a bureaucrat on record, said simply that fm should encourage innovation and originality among broad-

casters and he congratulated the award winners present at the luncheon.

Capping her marathon award presentation, Mrs. Armstrong, widow of the late Major, announced an additional award—\$10,000 from her to the NAFMB. She got a standing ovation.

## Bob Bartley loves us

Speaking out on the growth of fm and his particular personal fondness for the medium, FCC Commissioner Robert T. Bartley feels that fm has had to do a tremendous job, and do it alone. Major Armstrong had told Bartley back in the 1930's, "The first thing you have to do in fm is to forget all about a-m." It's only recently that fm has really been able to do this. And all this in spite of the total lack of support from the major networks—fm has had to make it alone and on the local level. Bartley feels that fm-ers have done an excellent job of developing their medium.

"Fm's strength," Bartley said, "lies in the fact that stations are so locally oriented. Fm stations serve the needs of the community, and thereby help the community to improve itself."

## It Takes Heart

The small-market fm-er has some monumental problems of his own. Speaking for the small-town fm-er, Hugh Dickie, president and general manager of WTMB-FM, Tomah, Wisconsin, said, "It takes heart to sell fm; you've got to believe in it." Dickie formats his station in a way that lets his personnel share the joy and charm of the small town with the listeners—even the ones in larger communities. The most salable programs are simulcast on both a-m and fm. Fm provides the station with "extra reach" into those areas where the a-m signal is weak or nonexistent in simulcasts. A-m and fm part company at 2 p.m. each day.

The station stays on top of its ratings by being community-minded and involved. If there's any action, anywhere, the station will be there with its crew. Features regularly include special live shows, grand openings, rural meetings, government ceremonies—anything at all that's happening and is of interest to the community.

Another listener-pulling gimmick is the station's rumor report. Listeners who have heard a good rumor (or a bad one) are invited to phone it in. The station's news staff will then check it out and

report on whether it's true or not. WNBC even sells its *sign-on and sign-off*. It's quite distinctive for a sponsor to be able to say, "The next six hours of silence are brought to you by . . ."

Still another innovation at WNBC is its weekly auction—held from 1 to 3 p.m. on Mondays. The very first week, this auction of the air netted the station a profit of \$700, and by the third week, profits were hitting close to \$1000. One big advantage of the auction, other than its immediate cash value—it allows the station to collect merchandise from deadbeat accounts; such an account may contribute a tractor to wipe off its debts to the station.

## Why Not C & W?

Describing his own experiences with the controversial C & W format (controversial for fm), Jerry Holley of Topeka's WIBW told how his station did a complete turnaround. Formerly an all-classical music station, the change-over to C & W became an economic necessity. One thing Holley strongly believes—the desk man must be an avid C & W fan himself—not an ersatz C & W man who "knows such-and-such singers personally." The listener can tell the difference, and for the C & W format to go, the man at the mike has to know what he's talking about; it can't be faked. Rotating with the prime time slots are local sports events with live coverage. The station also cross-plugs with county fairs and other local events. Among the sporting events are local "games of the week" in small communities within the contour that have no radio stations of their own. This way, the residents buy fm sets and effectively increase the station's overall reach in the market area.

## Longhair Longhorns

A highly successful fm station in Dallas, WRR-FM carries a 100-

percent classical program. Its success, as described by Managing Director Durward Tucker, is based in large part on this 100-percent formula. "You won't get devoted classical music listeners," he said, "by diluting the product with fake or imitation stuff or the so-called semi-classical music." He believes that the devoted listener will turn to his station because he wants good, solid, classical music and nothing else. "One thing, though," Tucker continued, "classical programming will *not* make your station number one in the market."

Tucker recognizes that the classical music audience is a minority group, but not necessarily at all times. The 7 p.m. to 12 midnight stint is a prime time slot for WRR, running number three in Greater Dallas, behind two a-m stations. Later on in the evening, WRR hits the number two post position. Tucker feels that classical music doesn't lend itself readily to automation, but that all fm operators should study automation possibilities very carefully.

## Other Areas, Other Formats

Success in fm seems to demand a total and accurate knowledge of the community served and its needs. Having a "good" sound isn't enough. WDAD-FM in Dayton went the soul music route when it discovered that there wasn't a single rhythm & blues station in its market area. Some argued that the local negro community had no fm sets, but as WDAO's Joe Whalen pointed out, "They had no reason to own fm sets. We gave them a reason."

WDAO has an integrated staff and has rapidly risen to top ratings for the Dayton market. The station is highly involved with the community and is heavily promotion-minded. The station is now number two in Dayton and uses different call letters to emphasize the difference between its a-m and fm operations. **BM/E**

Kalish almost made it to the door before being buttonholed.

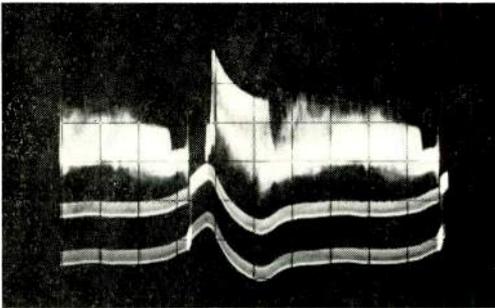
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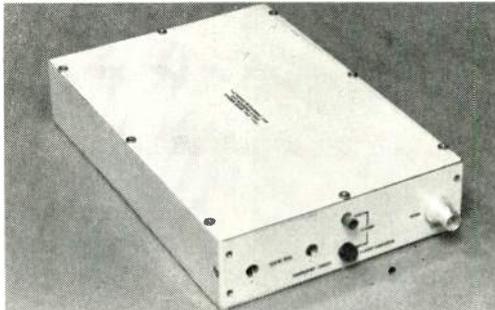
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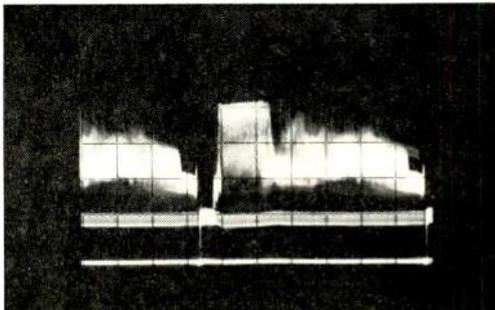
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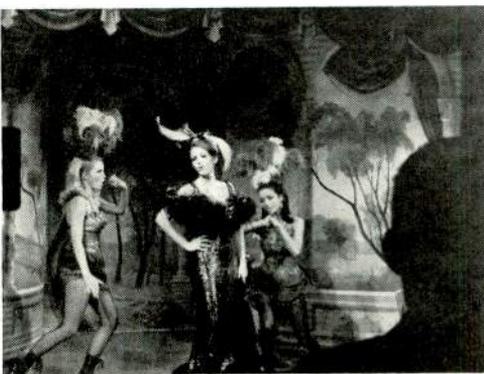


# NAB WAB CONVENTION RECAP CONVENTION RECAP

## Superfluity of Criticism, Equipment and Ideas



Despite the lack of a central arena for the NAB—broadcasters attending the 47th annual Convention got it socked to them—criticism mostly, interspersed with some faint praise—all salted liberally with excitement and enthusiasm for the industry's future—by invited critics, eager manufacturers, promotion-minded program purveyors—even by their peers. The Convention was spread all over the map, meeting in the Sheraton-Park, the Shoreham, across Rock Creek Park in the Windsor Park, and further down Connecticut Avenue in the new Washington Hilton. Local taxicabs did a land-office business

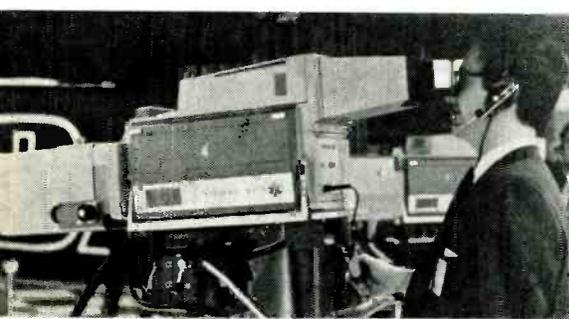
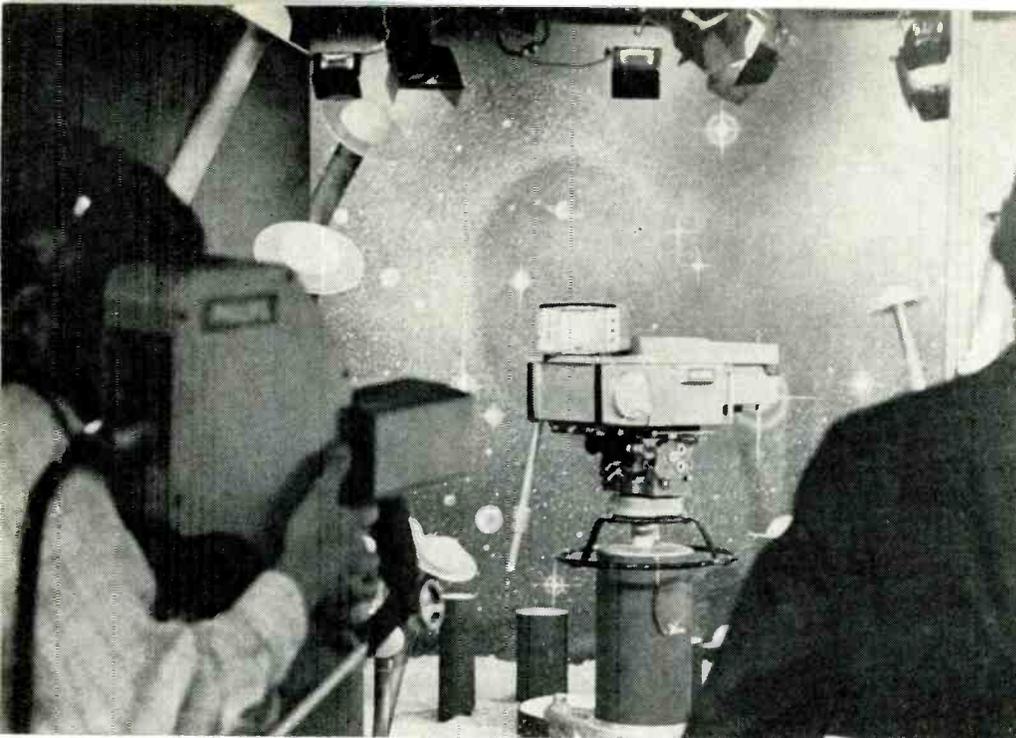


Bottomless French maids (top) starred for Visual, belles chimed for Ampex (above) and unexpected visitor (right) introduces himself to Wasilewski.

BM/E Photos



For more information on the products described on the following pages, circle the Reader Service Numbers shown in bold face in the special section on most pages.



BM/E Photos  
Philips stars (top) PC-100 (in center stage) and PCP-90 at left garnered top billing and sales. Visual's new camera (above) was booth highlight.

shuttling conventioners among the hotels, and one exhibitor, IVC, provided free bus service between the Washington Hilton and the Shoreham.

John Earl Fetzer, honored peer who received the NAB distinguished service award, leveled self-criticism when he said, "The codes need dispassionate and affirmative application without temporizing . . . there has been a persistent advocacy to lower standards."

Top-billed critic, Senator John Pastore, and outspoken former FCC Commissioner Lee Loevinger, provided some cheer to broadcasters by pledging support to prevent renewal time from becoming roulette, but Pastore emphatically admonished broadcasters to clean up their screens by refusing to run excessive sex and violence. Pastore's remedy: self-impose a strong NAB code of ethics.

**More and better broadcast gear.** The message delivered by the broadcast equipment suppliers was cheered by most, but viewed with

alarm by those treasurer-controller types present. Muttered one jogging between the Sheraton-Park and Shoreham, "Everything we bought last year seems obsolete this year."

Sophisticated engineers recognized that last year's products weren't obsolete, but they were quick to admit that buying decisions will become rougher. Not only are there more brand new products to choose from, but there are more sources for established product lines. Comparison shopping is no breeze.

Among the brand new products were these: A helical scan portable professional broadcast quality VTR; a video tape cartridge carousel for automatic commercial playing; a random search down-to-one-frame VTR electronic editor; a servo-controlled tape cartridge player; a tape cartridge player integrated with an audio console; a 24-hour disc logger; a TV demodulator; random access slide projectors (two); a video tape cleaner; a sound sync system for filming; a telephone line enhancement system. There were, of course, many upgraded products. (See exhibitors.)

Additional sources—some new, some old—for existing products were prevalent; broadcast color cameras from Visual and IVC; a stop action video disc recorder from Data Memory; lighting controls from Skirpan; a new character generator from TeleMation; automatic data logger from Humphrey; and automation services from many. Two new names in automation were Television and Computer

Corp. and Broadcast Computer Services.

There was no formal TFE exhibition as in previous years, but program distributors managed to entice many broadcasters to the Washington Hilton to sample their wares. The Washington Hilton was the site of the NAFMB meeting and the annex studio of IVC (which felt cramped in its limited Shoreham exhibit space.

## Digest of Issues at NAB

The NAB convention was a multi-programmed affair and that meant you couldn't take it all in. Were it all on closed circuit TV one would still need to watch 3 or 4 sets simultaneously which is a feat beyond that even of McLuhan children.

The print media, however, does afford the opportunity of a digest not by sessions but by ideas. Here is such a run down:

**The First Amendment.** Just about everybody was for it: NAB president Wasilewski and broadcaster John Fetzer were standard bearers with an able assist via telegram from NBC president Julian Goodman. FCC Chairman Hyde opined that freedom was secure and urged that broadcaster's not to "play it safe" by going noncontroversial. It was the *most important* issue facing broadcasters these gentlemen declared. Conventioneers later adopted a resolution that attacked any curbs on news or programming freedom.

**Station Renewal.** The FCC should not hold station renewal approval like Damocles sword over heads of broadcasters, said Senator Pastore. The FCC shouldn't play renewal roulette, said former FCC commissioner Lee Loevinger. Congress must write a law to prevent this. Loevinger said. However, Whitnev Young, executive director of the National Urban League concerned over recognition of the black man as part of our society, pondered over the impact if networks would drop their affiliation with racist stations.

**Programming Standards.** Broadcasters must be individually responsible for their own stations and collectively responsible through NAB codes. Power rests with individual stations said Wasilewski. Senator Pastore said the same thing and declared the code (self-adopted) is a step away from government censorship not a step toward it. CBS

## FCC Industry Engineering Panel Ritual Declared Inadequate

There was a host of questions directed to the FCC panelists and as the allocated time drew to a close one annoyed engineer in the audience urged that the time for each session be lengthened in the future.

Much time during the session was spent explaining why this or that hasn't been done. Such statements were repetitions of previous years' sessions; and hence the impatience with ritual that has little substance.

Not wholly answered were questions of why no proof of performance documentation for TV as in a-m and fm, and why not a spec on allowable noise from tape cartridges. What to do when the telco takes away 15 KHz line service and what about records that have 10 to 20 dB compression got responses from the panel but no real solutions. Neither was there an answer to progress toward authorizing more remote control of transmitters.

Some points were cleared up: Aural power output meters of TV transmitters must be established at 80%, 100% and 110% points every six months (rule 73.689). At sign-on and sign-off only call letters and location are necessary. Regarding the a-m freeze, new rules won't be ready for a couple of months. It's too early to say when the freeze will be lifted.

Although industry sentiment was that most rules are too restrictive, the FCC is somewhat skeptical about loosening regulations. Harold Kassens mentioned that of 239 fm stations recently inspected 85 citations were made for improper power operations and 105 for improper logging.

Through a gigantic effort on the part of the NAB Engineering Committee several approaches to a flashing light meter for measuring aural over-modulation were demonstrated. The FCC asked for comments so that a substitute for the VU meter can be adopted (FCC Docket 18063). Although the official deadline has passed comments are welcome.

President Frank Stanton rejecting the idea of a NAB Code censor issued a statement "Responsibility for judging programs cannot be centralized." He backed the concept of individual licensees deciding what was responsible action.

**Ownership.** If the fairness doctrine is not maintained, there will have to be more emphasis on diversity of ownership said FCC commissioner Cox. Reversal of the current cross ownership practice would invite chaos said Wasilewski. There is now more information of all kinds available for more tastes than any individual can absorb, he added. But a cornerstone of the American philosophy is competition and more diversity. If diversity is economically viable, it is to be encouraged said former FCC commissioners Lee Loevinger and Paul Porter.

Douglas Anello, NAB counsel said 5000 weak voices could not be as good as 500 strong ones. He and Sol Taishaff, publisher of *Broadcasting* argued that any divestiture of ownership be left to the Justice Department.

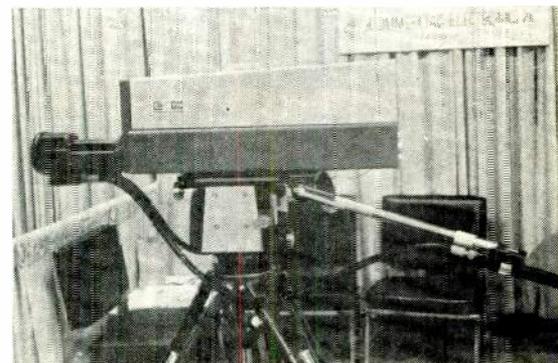
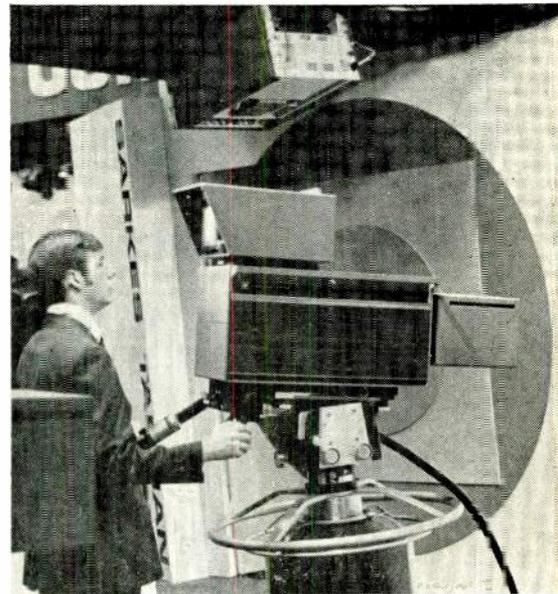
**Fairness Doctrine.** Private operation combined with public service is the heart of the American system—otherwise channels would be rented or auctioned off, said FCC chairman Hyde. If a license can be used solely for presentation of a licensee's viewpoints, ownership will have to be limited. Editorialized, but don't deny the right to reply, said Hyde.

**Education.** We are placing special emphasis on children's programming . . . we cannot leave educational values that can be achieved with pre-school children to chance said Frank Pace Jr., Chairman of the Board, CPB. The Electronic media's vast potential is largely untapped said FCC commissioner H. Rex Lee, Administrators, politicians and educators in the country and abroad are afraid to allow the new world of telecommunication to alter their traditional methods, he said.

**Race.** "I am proud of our programming which promotes racial harmony and understanding," said Wasilewski, "but we must do more to get more minority group people working in broadcasting."

Whitney Young Jr. said broadcasters have to develop a greater sensitivity to the problems of the ghetto and the urban causes. Mark Roseman, youth and college director of NAACP said both educators and broadcasters were failures. He

*Continued on page 38*



BM/E Photos

(Top) IVC-300 set new low price for studio Plumbicon camera. Sarkes Tarzian unit in use (center) and 10-ft candle camera from Commercial Electronics (bottom).

### Reader Service Card Numbers

- 302—Norelco color cameras
- 303—Ampex cameras
- 304—RCA cameras
- 305—IVC cameras
- 306—EMI cameras
- 307—Visual cameras
- 308—Sarkes Tarzian cameras
- 310—Commercial Electronics cameras
- 311—General Electric cameras

## Two-, Three-, or Four-Tube Camera?

The theoretical arguments, pro and con, of three-tube versus four-tube color cameras are not really important, says Max Berry of ABC. More important is detailed mechanical and electrical design, cost, and the camera manufacturer's service reputation.

Four-tube cameras do not cost more to operate because useful tube life is longer. There's a definite place for the two-tube color camera, Berry concluded.

Casting theory aside, Berry evaluated the three camera types in terms in ten factors: Picture sharpness; sensitivity; signal to noise; shading; colorimetry; chroma key operation; setup time; prominence of tube defects; motion break-up, and operating cost.

All cameras, two-, three-, and four-tube versions, need to be touched up during shows because operators see color edges. The PC-70 is used satisfactorily by ABC without contours out of green, said Berry.

Indoors, at 300 foot candles average, three- and four-tube cameras perform the same and both can work down to 50-foot candles if camera movement is at a minimum. Outdoors, both clip highlights or compress lowlights. The two-tube degrades at less than 100 foot candle by both increased noise and colorimetry shifts, but 50 foot candle operation is possible with a lens setting of F2.6 and a T stop of T3 plus.

The two-tube camera has a lower S/N because the luminance signal is further matrixed with relatively noisy R/B signals whose S/N has been further decreased by field delay to generate G signals. Currently, the S/N is down 6dB; 3dB is expected in the future by redirecting light in the luminance channel.

Shading, or balance, of settings are more difficult to make than variable gain or gamma defect corrections. To shade the two-tube camera, the R and B shadings from the same tube must be the same, which is difficult unless selected tubes are used (which are available for a \$10 surcharge).

There's really little colorimetry difference among the three cameras according to Berry. The four-tube will generate a somewhat more saturated color picture, but

not everyone agrees that that is more pleasing. Some color contamination between R and B caused by Plumbicon lag is possible in the two-tube camera, but this can be adjusted out and careful tube selection helps.

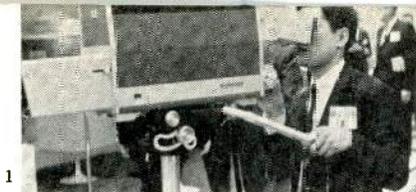
The three-tube camera gives the best S/N in the chroma channels for chroma keying, but four-tube camera operation is acceptable. ABC has not tried to use the two-tube camera in chroma key.

Berry feels the set-up time is about equal for all three camera types and is more a function of operator's or broadcasters' practice and union policy than camera peculiarity. (Sometimes no adjustment is necessary.) The two-tube camera registers faster, but other adjustments offsets this feature.

Motion break-up (smear) is about the same for all cameras. The two-tube camera performs better than might be expected because the simultaneous luminance channel masks any color break-up.

Tube life is the obvious major factor in operating cost and ABC's experience shows that four-tube cameras do not cost more to operate than three- or two-tube cameras. As much as two-to-one longer tube life is possible with four-tube cameras because luminance drops off and noise becomes objectionable faster in three-tube cameras (loss of S/N in chroma channels unnoticeable in four-tube cameras shows up as decreased luminance in three-tube cameras). Saving tip: put objectionable tubes for three-tube cameras into four-tube cameras and get many hundreds of extra hours of operation.

Spots show up more in three-tube cameras and that also is a reason for longer tube life in four-tube cameras. Two-tube cameras haven't been used long enough to draw firm conclusions, but Berry suspects tube life will be shorter than that of three-tube cameras because of lag problems. Lag that appears on three- and four-tube cameras is present in two-tube cameras as well, but there is also contamination of R and B signals derived from the sequential tube. Increasing lag is a definite sign of age in all Plumbicon tubes, so Berry sees the likelihood of more frequent replacement of tubes in two-tube cameras.



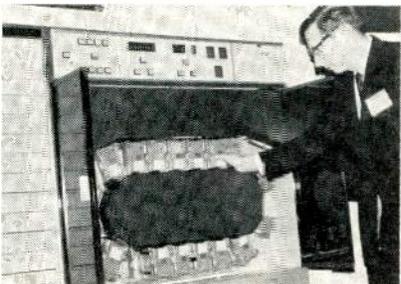
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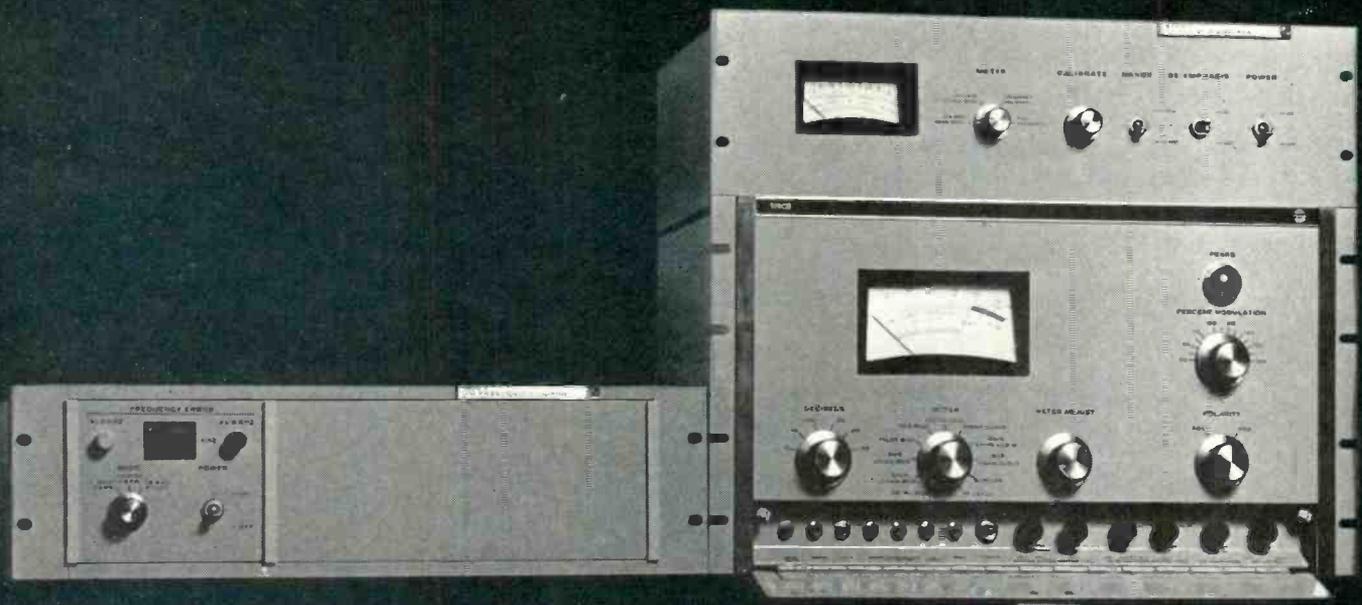


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1. Single I.O. mono camera by Shibaden  
2. Data Memory's control unit.  
3. Portable VTR by Westel.

4. RCA's video tape cartridge carousel.  
5. Electronic editing system by Ampex.  
6. Recortec's tape conditioner.

# NEW MONITOR PACKAGE



Collins' new Monitor Package consists of only three units: 900F-1 SCA Modulation/Frequency Monitor, 900C-3 FM Stereo Modulation Monitor, and 54N-1 Frequency Monitor. These three type approved units ensure conformance with FCC regulations.

**900F-1 SCA Modulation Frequency Monitor** The 900F-1, an all-solid-state unit, monitors and displays modulation and carrier frequency error on the 67-kHz SCA. Components are mounted on a single circuit board. No tuning or adjustment (which could affect accuracy) is required.

**900C-3 FM Stereo Modulation Monitor** The completely solid-state 900C-3 operates in the 88- to 108-MHz range, monitoring stereo or monaural operation. Plug-in circuit cards facilitate fault isolation. The unit requires minimum maintenance.

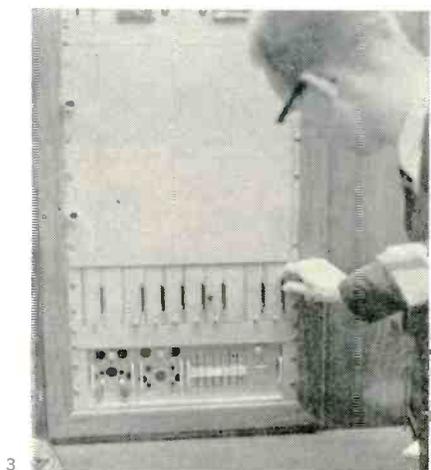
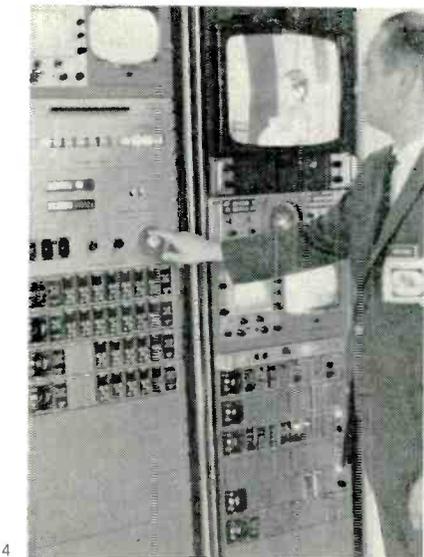
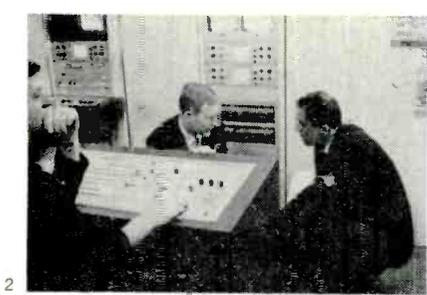
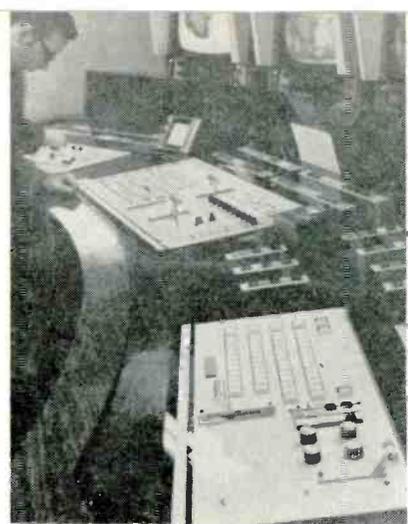
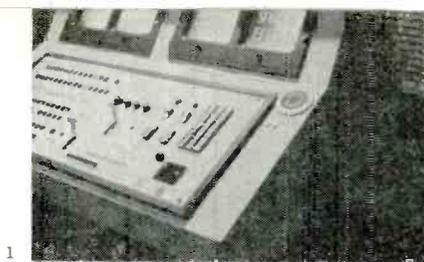
**54N-1 Frequency Monitor** The 54N-1 offers all-solid-state design, error detection for 0 through  $\pm 2$  kHz, fault display, and components mounted on high quality etched, glass epoxy boards. Convenient test points allow ease of maintenance.

For additional information contact Collins Radio Company, Broadcast Marketing, Dallas, Texas 75207. Phone: (214) 235-9511.



COMMUNICATION / COMPUTATION / CONTROL

Circle 117 on Reader Service Card

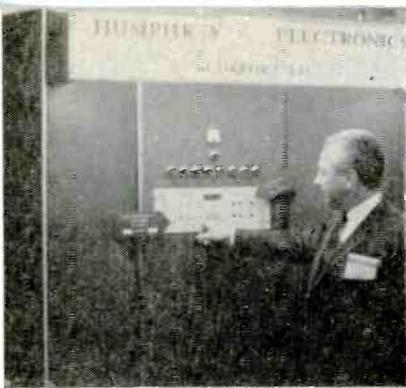


1. Console in Richmond Hill display.  
 2. Ampex's new video switcher.  
 3. Video console by Dynair.  
 4. Riker's dial-a-switcher.

- Reader Service Card Numbers**  
 312—Ward video switcher  
 313—Cohu video proc. amp.  
 314—G.E. video switcher  
 315—Alma video switcher  
 316—Central Dynamics switchers  
 317—Richmond Hill switcher  
 318—Ampex switcher  
 319—Dynair switchers  
 320—Riker switcher  
 321—Vital switcher  
 322—Grass valley switcher  
 323—Telemet video proc. equipment  
 324—Anderson Labs zero delay

1. Video automated switcher by Ward.  
 2. Proc. equipment in Cohu booth.  
 3. Video switcher by G.E.  
 4. Alma's video switcher.  
 5. Central Dynamics new switcher.

1. Vital's snazzy custom console.  
 2. Grass Valley and joystick jockey.  
 3. Telemet's new proc. gear.  
 4. Andersen Labs' zero studio delay.



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1. Remote control gear by Humphrey
2. Applied Electro Mechanics' keying amp.
3. Amplifier modules by Dynascience.
4. Schafer sold new computer control.
5. Disc automation by Seeburg.



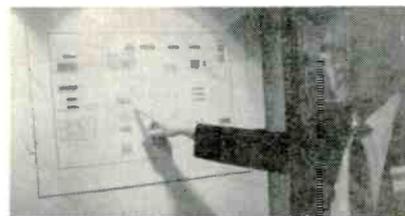
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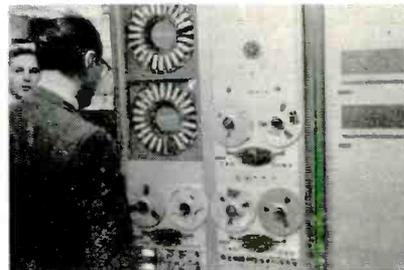


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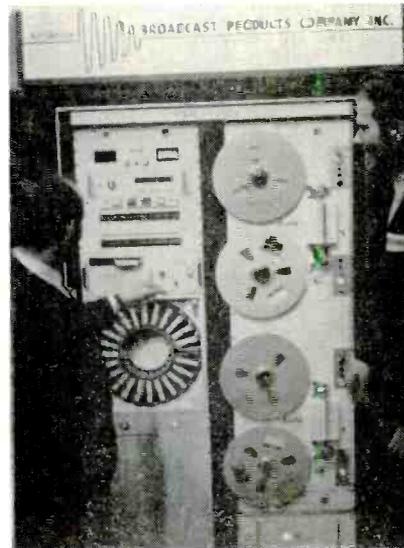
1. Gates showed new cart autolog.
2. Computer scheduling started at Harwald.
3. Broadcast Computer Services had EDP.
4. Television & Computer Corp. sold package deal.



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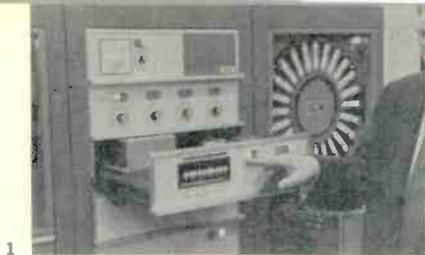


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1. Chrono-Log updated pinboard system.
2. Tape-A-Thon added sophistication.
3. New automation from Broadcast Products.

**Reader Service Card Numbers**

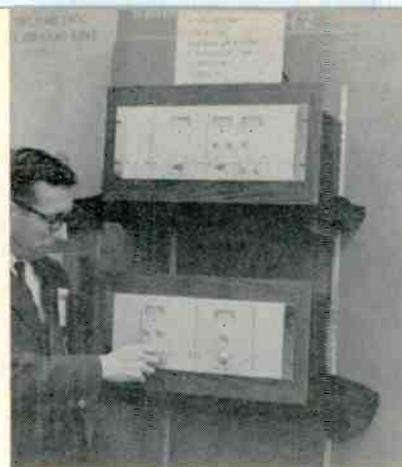
- 325—Humphrey remote gear
- 326—Keying amp by Applied Electro Mechanics
- 327—Dynascience amp modules
- 328—Schafer automation computer
- 329—Seeburg disc automation
- 330—Gates auto cart tape log
- 331—Harwald computer package
- 332—Broadcast Computer Services
- 333—TV & Computer Corp. Services
- 334—Chrono-Log Automation
- 335—Tape-A-Thon audio automation
- 336—Broadcast Products audio automation



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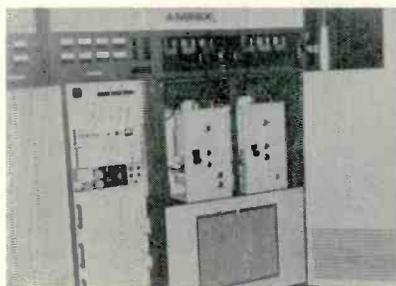
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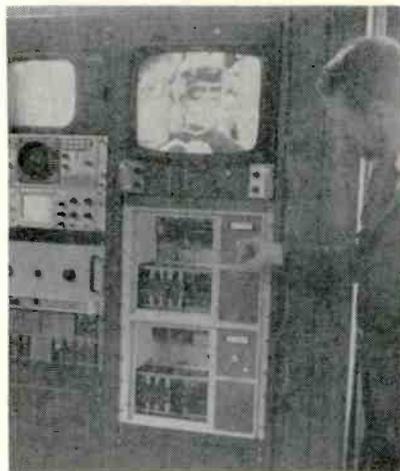
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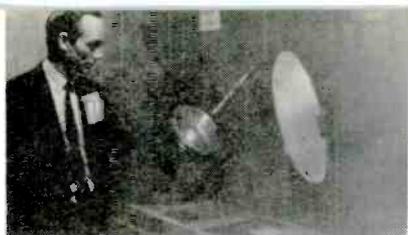
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1. IGM's sequence selector.
2. MaCarTa's improved punched chip system.
3. G.E.'s central computer control.
4. Fm transmitter by Collins.
5. RHG microwave STL.

1. New link by Microwave Associates.
2. Jampro's fm antenna lineup.
3. Vhf transmitter from Ampex.
4. RCA's 30-kw vhf transmitter.

1. Microwave STL by Marti.
2. EMCEE's translators get vote of approval.
3. New TV transmitter from AEL.

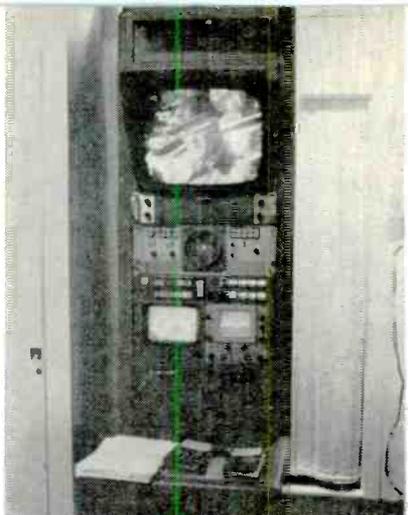
- Reader Service Numbers
- 337—IGM sequence selector
  - 338—MaCarTa expanded chip selector
  - 339—G.E. computer control
  - 340—Collins fm transmitter
  - 341—RHG's microwave STL
  - 342—Microwave Associates' STL
  - 343—Jampro fm antennas
  - 344—Ampex TV transmitter
  - 345—RCA TV transmitter
  - 346—Marti STL
  - 347—EMCEE translators
  - 348—AEL TV transmitter



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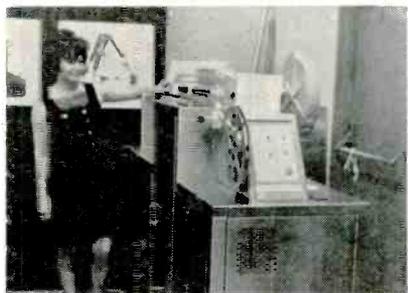
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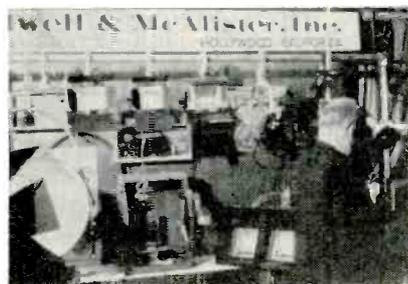
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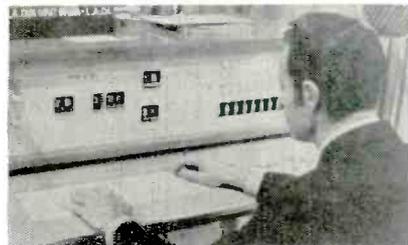
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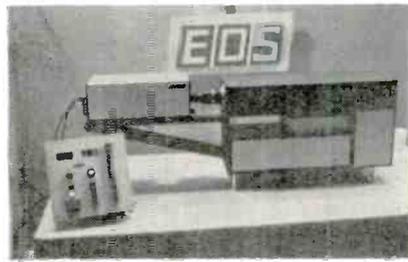
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1. Kliegl had two new lamps.
2. ColorTran's tear-proof filter gel.
3. Portable lighting by Mole-Richardson.
4. Bardwell & McAlister had hanging barndoors.
5. Preview light board by Century Lighting.
6. Listec's random-access slide projector.

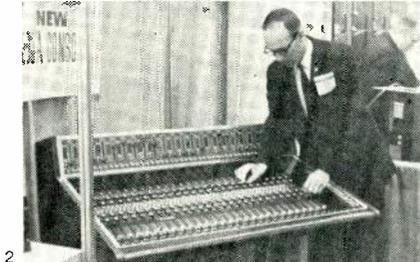
1. Bright background projector by TelePro.
2. Sondor film system on display.
3. Bargain processor from Houston Fearless.
4. Arriflex's new exposure control.
5. General Camera souped up Bolex.

1. Kodak showed film to advantage.
2. McCurdy had more audio consoles.
3. Gotham's audio console from Sweden.
4. New mono console by CCA.

- Reader Service Numbers**
- 349—Kliegl lighting
  - 350—ColorTran gel & lighting
  - 351—Mole-Richardson lighting
  - 352—Bardwell & McAlister lighting
  - 353—Century lighting control
  - 354—Listec slide projector
  - 355—TelePro slide projector
  - 356—Sondor film system
  - 357—Houston Fearless processor
  - 358—Arriflex cameras and equipment
  - 359—General Camera cine accessories
  - 360—Kodak film
  - 361—McCurdy audio consoles
  - 362—Gotham audio consoles
  - 363—CCA audio consoles



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cited the lack of non-white representatives in the audience as evidence that the establishment has not yet met the crisis. "Why shouldn't the community take over the establishment?" he asked. James Graham of the National Students Association charged the mass media is little more than an active force for the status quo and the acceptable.

The "nowness" of the electronics media lends credibility said Dr. Lee Drefus, president of Wisconsin State University. Educators must destroy the non-critical mind and teach taste and inquisitiveness, he said.

### Color Cameras: Show-Stealers

There was no question about it—color cameras are not only better than ever, the field is getting fiercely competitive. New entries in the field ranged from an economy three-plumbicon job from IVC to the expensive portables from Philips. Somewhere in between in the price scale were a space-age digitally controlled studio job from Philips, a Jap/American unit from Visual, a streamlined two-Plumbicon camera from Ampex and two new EMI studio units imported by IVC. Prices ranged from \$29,500 to a high of \$139,000 for those color cameras.

In the Philips booth, two digitally controlled cameras were on display. The first, no great surprise, was the Norelco version of the CBS Labs Minicam. Dubbed the PCP-90, the portable color camera is pricer from \$97,000 in the wired version, up to \$139,000 in the rf version.

The show stopper was another digitally controlled camera—this one a studio model. Called the PC-100, this Norelco camera is sleek and streamlined, uses three one-inch Plumbicons and modular system design. The detachable viewfinder can be rotated or tilted on the camera for maximum flexibility. The unit uses lightweight triaxial cable and compensates automatically for cable length up to one mile. Standout performer from a sales point of view, the sleek, streamlined Norelco PC-100—which wasn't even operating on the

convention floor—had buyers lined up with cash in hand. Asking a two-percent deposit on the \$85,000 camera, Philips sold 91 units at NAB—with deliveries not expected to start before February of next year.

Philips also racked up impressive sales figures on its other cameras. The PCP-90 digitally controlled portable ("Minicam"), tagged at \$97,000 to \$139,000 (depending on options) had 32 buyers. And the old standby PC-70 was still doing well with 31 units sold at NAB. All told, Philips wrote up more than \$13.5 million in camera sales at the convention.

At the low end of the price scale, International Video's three-Plumbicon IVC-300, tagged at an incredible \$29,500, stole a lot of the thunder from the firm's line of imported EMI cameras. Based on the simple, cost-cutting design that made the inexpensive three-vidicon cameras possible, the new studio unit has few frills. The camera, dubbed "the Maverick," sports a nine-inch viewfinder with extendable hood for outdoor use, a Varatol XX 10:1 zoom lens with local or remote servo-driven iris, modular plug-in circuit boards and a filter wheel. Video signal is corrected for cable lengths up to 3,000 feet.

At the other end of its price line, IVC's EMI cameras—the four-Plumbicon 2001-B and three-Plumbicon 20001-C are priced at \$76,000 and \$72,000 respectively. The three-Plumbicon camera is an adaptation of the extensively tested four-tube unit. Both are the same physical size and shape; the difference becomes apparent only when you raise the hood for a peek.

The anxiously awaited unveiling of Visual's new color camera, the VP3, finally happened, and the waiters in the gallery weren't disappointed. The camera worked to good advantage on Visual's color stage, showing the anatomical features of leggy French maids to excellent advantage. Color fidelity looked quite good and detail was crisp and clean.

The VP3 started life as the Shihaden entry at last year's NAB. It has since gone through numerous modification cycles and is now partly built in Japan and partly rebuilt and completed in New York.

1. RCA custom audio gets a try.
2. Altec recording console—no kitchen sink.
3. Custom consolette from Bauer.
4. Vega rf package driven by mini mike.
5. New mike from Shure.

- Reader Service Numbers
- 364—RCA audio console
  - 365—Altec recording console
  - 366—Bauer custom console
  - 367—Vega rf mikes
  - 368—Shure card/oid mike



## KAKE-TV is having local color news and eating it, too.

"When we installed our Kodak ME-4 Process, we not only added the terrific impact of local color news, but we increased our profit by doing commercial color processing locally," says Paul Threlfall, Vice President and News Manager for the Wichita station.

"Now we do color processing for schools, local film producers, advertising agencies, and several local industries. For instance, we process a lot of footage for three out of the four aircraft manufacturers in this area. Before we had our Kodak ME-4 Process, these companies had to fly their film out of state. We've helped to bring their processing costs down to earth, and we're flying on the business.

"The ME-4 Process has been perfect for us. Like when we couldn't hire a photochemist. The packaged chemistry from Kodak made it so easy that we didn't need one. We're even making some money from the chemicals by using the *Kodak Silver Recovery System*."

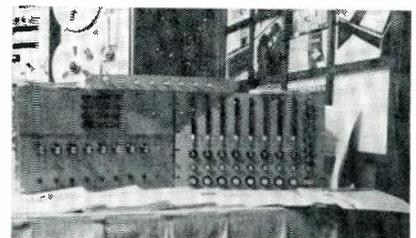
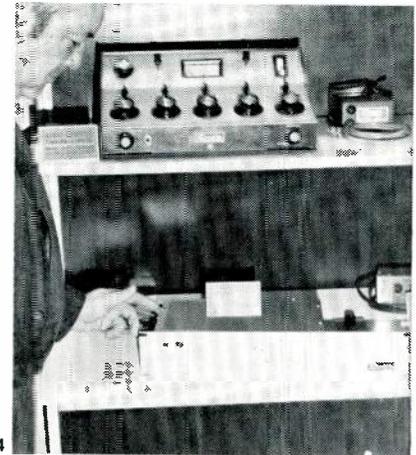
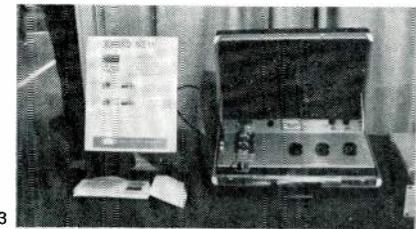


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Under the hood, the three Plumbicons are mounted parallel with printed-circuit yokes. The control equipment is packaged in small separate units for maximum control-room flexibility. The camera head avoirdupois is a scanty 90 pounds and is priced at \$68,000. First customer was Atlanta's WATL.

Another newcomer on the convention floor, Commercial Electronics' model 270, using three Westinghouse SEC vidicons, can work with light levels as low as 10 footcandles. Typical lens opening at 40 footcandles is f8, and the lightweight wonder is tagged at an attractive \$28,800. Sensitometric data on the SEC vidicon in this configuration shows a broadened response in the blue region with not-quite-so-steep a dropoff in red as with vidicons and Plumbicons. "Why cook your talent?" is this company's sales motto.

Sarkes Tarzian's "Polychrome III" was focused admirably on some prettily unattired models who pranced onto and off the stage in an unending show of the camera's color capability and ease of handling. The camera uses three parallel Plumbicon tubes and a sealed optical system.

RCA and G.E. both showed the same studio cameras using "lead-oxide mesh" pickup tubes that were unveiled at last year's NAB. Backing up the production model TK-44A in the RCA camp was the incredible single-vidicon camera first shown at NAB last November. The low-cost unit has been considerably improved in the intervening months, and should be a boon to closed-circuit and cable operators when available next fall.

Noteworthy in the G.E. camera lineup was the use of the company's own lead-oxide mesh tubes (domestic Plumbicons) for the first time at NAB. The camera picture quality delivered was crisp and clean and virtually trouble-free.

## Video Tape Equipments Cartridge machine debu

RCA's experimental automatic system for recording and playing back video tape cartridges—a

video tape carousel—probably got the top attention of VTR users, but there were several show stoppers about.

Westel Co., which first created a false stir at NAB in 1965, was back with a professional quality high band color portable recorder and a companion studio recorder. Westel says its in the market to stay this time (they have been selling to the Military). The portable recorder weighs only 37 pounds and will record 26 minutes on an eight inch diameter reel (tape width is one inch). The studio unit, which fits in a 19 inch rack, will play back at full broadcast standards.

High resolution ferrite heads provide a S/N ratio of 5 - 6 dB, better than other recorders, the company claims. Price of the studio recorder playback unit is \$60,000, price for the portable recorder is \$19,500.

A new name at NAB and future supplier of stop-action, slow-motion magnetic disc recorders for color broadcasts is Data Memory, Inc. DMI showed the VDR-222 Video-disc Series billed as an advanced product line utilizing the basic engineering concepts developed by MVR Corp. (MVR is now absorbed into DMI). The VDR-222-J based on a predecessor and field tested for a year by an unnamed sports network provides 25 seconds of stop-action, slow or reverse motion playback. Priced at \$69,500 the unit is considerably under the comparable Ampex unit. The remote control unit has 25 cue positions individually selectable and 15 playback modes. A CCTV version is available for \$39,500.

Visual Electronics wasn't displaying its stop action disc recorder announced last year, but that was only because there wasn't enough display room a spokesman said. Visual was showing a new US-40 compact high-band quadraplex recorder which it billed as the smallest broadcast high-band color recorder available. It's designed for on-location recording sessions. The US-40 supplements the VA-50 which was developed (and sold from the floor). Visual sold five units to a church group for video taping and multiple dubbing purposes.

1. Background music amplifier by Johnson.
2. AKG's mikes in Philips booth.
3. Telephone line enhancer from Kahn.
4. Sparta monitor amplifier.
5. Suburban Sound's mixer and switcher modules.
6. Dynamic presence equalizer from CBS Labs.

- Reader Service Numbers  
 369—Johnson amplifier  
 370—AKG microphones  
 371—Kahn phone line enhancer  
 372—Sparta amplifier  
 373—Suburban mixer/switcher modules  
 374—CBS presence equalizer

# So What's New ?



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1



2



3



4



5

A new attention getter at Ampex was its random access tape controller the RA 4000. The new system is designed for spot or program playback on the air and for editing an assemblage of video tapes. The system records a unique address to identify each television frame. The recorder automatically searches for a desired address, stops, cues itself ahead of its address and waits for "normal roll command."

A digital time code generator records on the cue track, consecutive hours, minutes, seconds and frame numbering. A reversal button permits complete editing of a program or commercial without actual recording. The logic circuits and memory then permits the edited tape to be made up. The frame address code is carried on successive tape copies.

The RA 4000 works with VR-2000 units equipped with Mark III electronic tape editor. The unit starts at \$17,000; the digital time code generator is priced at \$3450. Both are scheduled for fall delivery.

A standout performer both as an innovation and as a potential time and money saver was RCA's video cartridge system. Easily scoring a "world's first," RCA unveiled a cartridge system that handles and plays video tape automatically—including automatic handling, changing, threading, cueing roll and stop. The tape cartridge holds up to three minutes of playing time—making it ideal for commercials and spot announcements. It can even handle color news clips! The machine holds 18 cartridges and will play them in sequence or select them by code. The unit has two decks—one for on-air and one for cueing, so it's always ready to go. According to RCA spokesmen, the \$110,000 unit can replace as many as five or six VTRs—releasing them for other chores.

New to the NAB Convention was the IVC line of helical recorders. Although these machines have been around for a while, this year marked the first time that they were shown on the exhibit floor with the manufacturer's own nameplate. Included in the IVC lineup was the new, low-cost model 600 and the 1VC-825—a modified 800 with broadcast preview capabilities.

1. Dynamic reverb system from Fairchild.
2. Marathon's pro tape cartridges.
3. Hi output video tape from Memorex.
4. New line from Audio Devices.
5. Tapecaster's new hysteresis-synchronous motors.

## Technical Topics

This report does not include a condensation of engineering papers since they are currently included in "Highlights" published by NAB and will shortly be available in full text from TAB Books (see ad index). Topics include:

- future of satellite communication
- two-, three- or four-tube color cameras (see box this issue for summary)
- use of computers in broadcasting
- operating experience with directional antennas, auto level correctors, etc.
- New equipment: a TV demodulator (Rohde & Schwarz) stereo STL (Moseley), telephone line enhancer (Kahn), video switcher (GE), VHF transmitter (RCA), TV signal generator (Tektronix), automatic network chrominance and luminance corrector (CDL), color cameras (Philips and Ampex). See exhibit wrap-up for more details on these equipments.

Other helical entries were two models from Shibaden. The SVC-727U is a relatively conventional rack-mounting recorder that will record and play back standard NTSC signals with up to 90-minutes playing time on a 10-inch reel of one-inch wide tape. Horizontal resolution of the system is 360 lines.

Shibaden's other entry is the battery-powered SV-707U system—a combination recorder hanging from a shoulder strap and a mono camera. Camera and recorder combined weigh 21 pounds, and will record 20 minutes on a five-inch reel of half-inch tape.

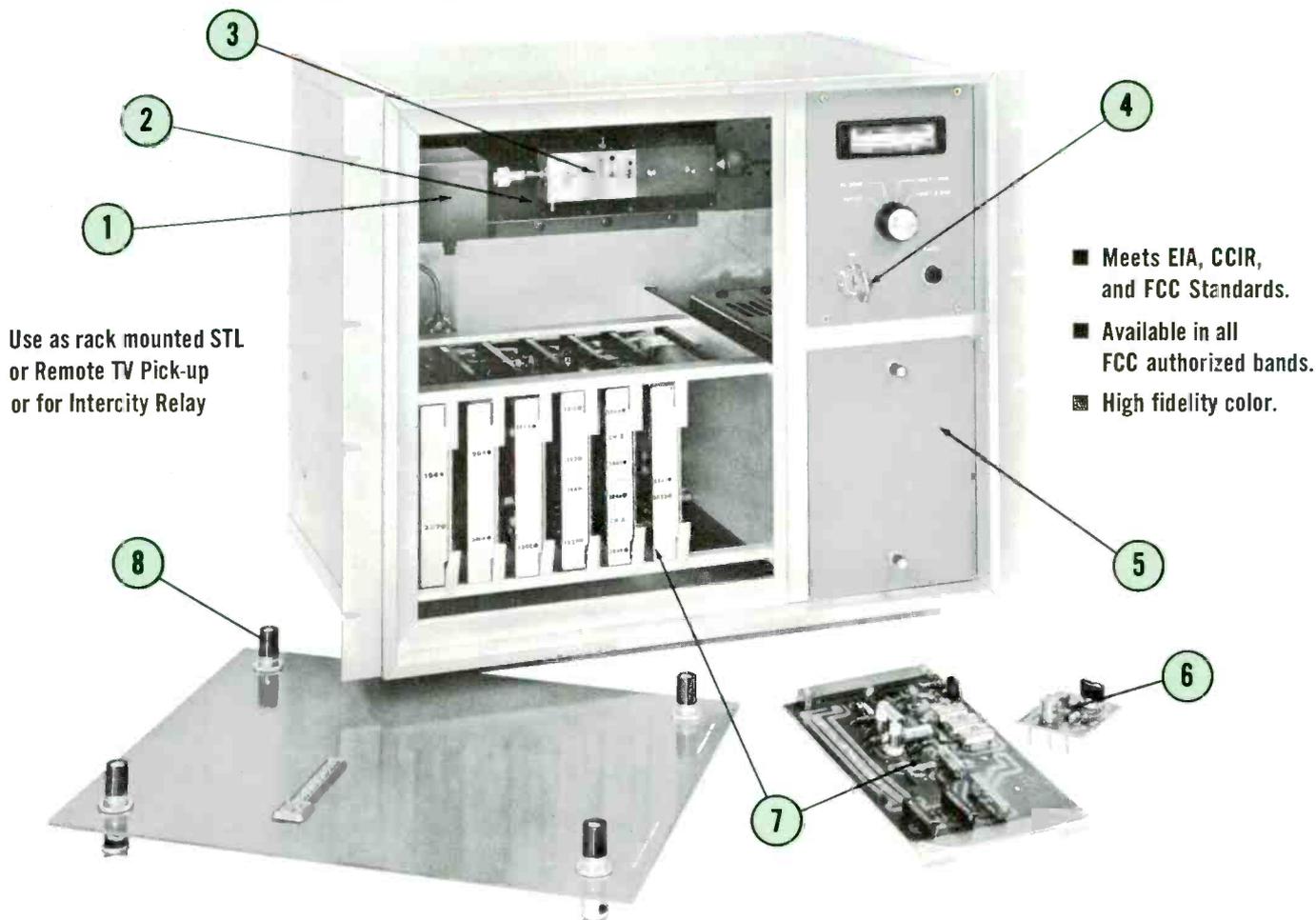
A tape handler and conditioner (VTC) was shown by Recortec, Inc. The versatile machine handles two-inch tape on reels up to 14 inches diameter and cleans both sides of the videotape. It can also be used as a tape rewinder, and with options as an eraser, measuring device, tape polisher and consolidator.

The capstanless transport handles the tape in a vacuum, maintaining constant tape tension.

### Reader Service Numbers

- 375—Fairchild reverb
- 376—Marathon tape carts
- 377—Memorex hi-output videotape
- 378—Audio Devices tape
- 379—3M type 400 video tape
- 380—Tapecaster new motor

# All Solid State Television Microwave Relay Links for High Quality Color and Monochrome TV Systems



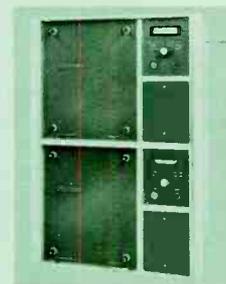
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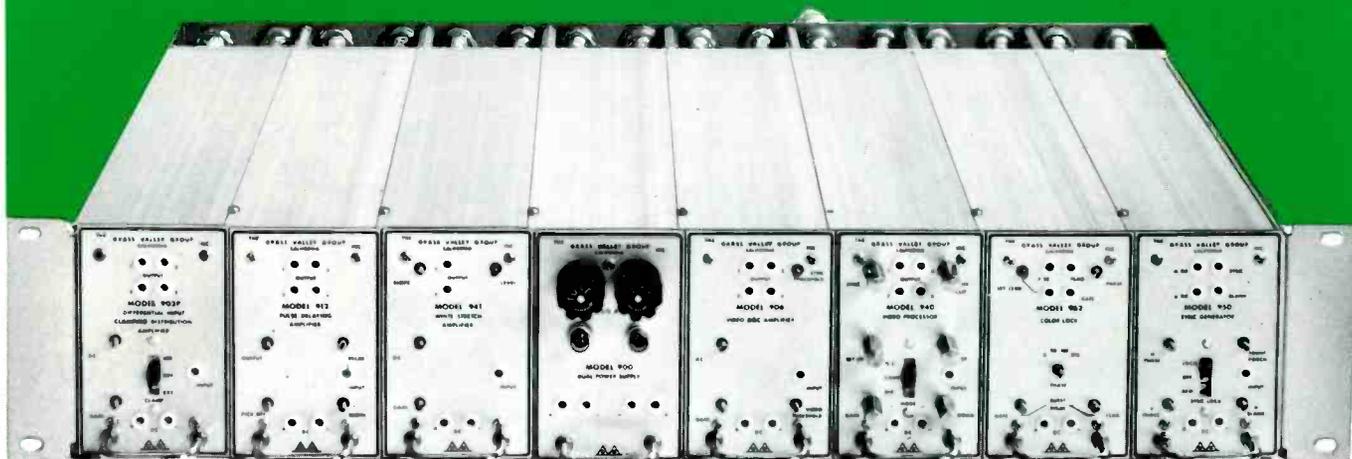
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## Processors: Video legerdemain

Button pushers and joy-stick jockeys had a heyday at NAB. Alphabetically the switching circuit started at Alma Engineering and ended at Ward Electronic Industries. Alma, as a relative newcomer (this was its second NAB), captured attention by featuring low price along with high quality. Pricewise Alma solid-state switchers were generally  $\frac{1}{3}$  or more less than comparable units. The 6511, bottom of the line, sells for \$2450. Central Dynamics Ltd. was also promoting price leadership particularly in the case of its new 800 series production switcher. This 15-input unit complete with special effects, mixing and re-entry started at \$14,900. Cohu's focal point of attention was also a production switcher. Dynair showed switching accessories. General Electric proudly displayed its 40-input TS 300A production switcher. Cross-points on this switcher are set up on a binary coded decimal basis which reduces wiring approximately 10-1 under the conventional one-wire-per-crosspoint approach. (A full paper on the switches was given by Fred Eames.)

Grass Valley revealed its growth by showing a vast array of switches. Richmond Hill stopped traffic with a five-year warranty certificate. Riker Video's booth was, of course, a natural stop for every switcher customer. Telemet displayed its SS-140 that "could fade to the color of your choice . . . with no change in differential phase or gain" and boasted that it was part of an integrated package that included a chroma keyer, effects generator, black burst generator, and black burst colorizer. TeleMation showed switches ideal for CCTV. Vital displayed its VIX-108 production switcher that "thinks for you" and let you play Cecil B. de Mille. Ward, as mentioned, featured its preset switcher, the TS 215 but also showed others. Visual showed a line of switchers in addition to its programmed switches.

Most switcher manufacturers also showed video amplifiers and several showed processing ampli-

fiers to clean up the dirtiest of signals. Newest in this category was a agc processing amplifier by Central Dynamics (and described during the technical sessions by Kenneth Davies). The CD VA 2004 doesn't rely on an arbitrary assumption of the correct video and chrominance level, but relies on a reference signal transmitted during the vertical blanking waveform. A video sampling pulse is generated in the pulse processor on certain lines. This gates the vertical interval white signal to the auto control module. In the auto control module the white reference is compared with the voltage established by the luminance auto gain control. Any error voltage is fed back to the remote gain control to control the video gain. A similar circuit controls the chrominance signal.

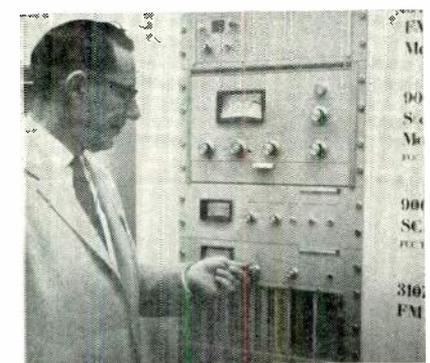
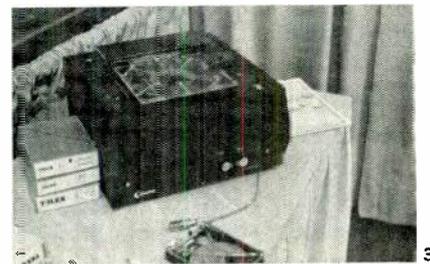
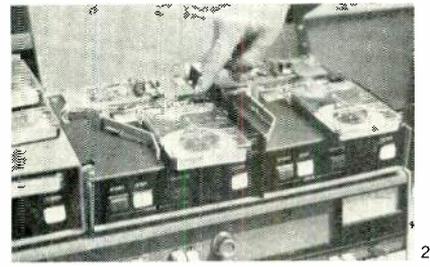
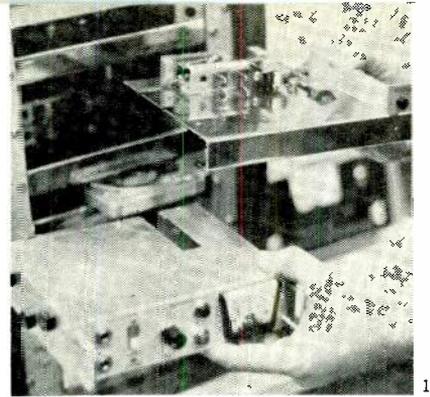
A company new to most broadcasters in the distribution amplifier area is Applied Electro Mechanics in Alexandria, Va. AEM has been building modular distribution amplifiers (video and pulse) colored-black burst generators and keying amplifiers for Washington, D.C. TV stations. It's now ready to sell the nation. The video keyer for \$895 permits double entry switching, headline or titling by video insert, keying color, etc.

In addition to the companies already mentioned, other video suppliers were Anderson Labs Inc., which showed Chrominance delay equalizers. Ball Brothers with agc distortion amplifiers and CBS Inc., which showed joy stick and gain control devices. Dynasciences, Blue Bell, Pa., showed a processing amplifier in the D. B. Milliken booth.

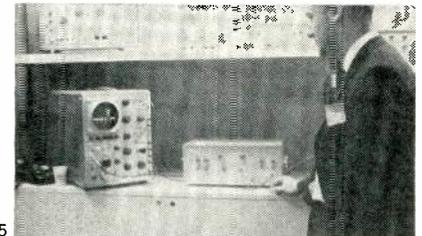
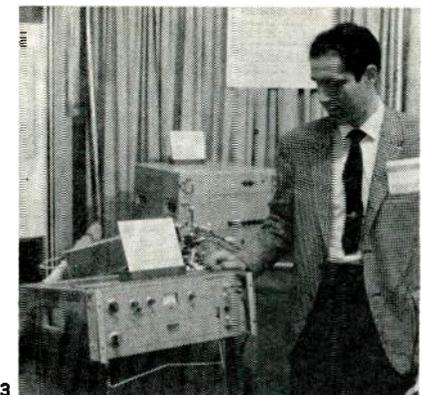
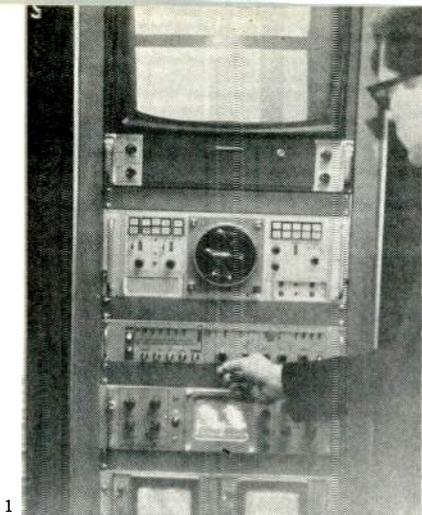
Crammed into a palm-size modular plug-in unit, an integrated-circuit video distribution amplifier module from Shibaden was a standout performer. This mighty handful—smaller than a pack of king-size cigarettes—is available as a plug-in module or with solder leads.

Dynair, noted for its "Mini-Mod" series of processing units, introduced the "Mini-Split" special effects generator. Also prominently displayed by Dynair was its VS-121B-RS remote-controlled switcher-fader with preview buss.

1. Interchangeable tape deck/amplifier in stack by Broadcast Electronics.
2. Lid off Visual's auto-cueing cart machine.
3. Viking cart player for both sizes.
4. McMartin McMonitors for fm stations.
5. SCA monitors by Collins.
6. Remote status alarm system by Rust.



**Reader Service Numbers**  
 381—Broadcast Electronics tape gear  
 382—Visual auto-cue cart machine  
 383—Viking cart player  
 384—McMartin McMonitors  
 385—Collins SCA monitors  
 386—Rust remote alarm



1. TV instrument lineup by Tektronix.
2. Test gear from B & K.
3. Rohde & Schwarz TV demodulator.
4. Field-strength meters from Phase Monitors.
5. Instrument setup by Marconi.

This system is not part of the mini series, but is a full-blown (although compact in size) video switcher with split-lever control.

CBS Labs announced production startup on its new video and audio enhancement systems. The video image enhancer—tagged at \$3,500—may soon become standard hardware in most TV stations. The audio unit, called a “Dynamic Presence Equalizer,” enhances audio signals as they are transmitted. It’s priced at \$1000.

New for Riker Video was its RVS-6000 switching system. This is called an economical system that can be used for routing or other applications where vertical interval switching isn’t needed. The system works from externally sustained contact closures to a common ground.

The switching module has eight inputs and provides one output at 75 ohms. It also has provisions for adding sync on either the local or remote mode. Front-panel controls give a gain range of  $\pm 3$  dB for the unit’s output.

Visual showed a new automated control system that features “hands-off” operation, when desired. The V7000—which will accept IBM cards or magnetic memory inputs, can drive the TV automation system. First unit is being delivered to WTVM-TV, Columbus, Ohio.

Brand-new switcher from Grass Valley, the 1400-20 is designed for use in TV master control centers—either as a programmer-operated unit or as a manual video and audio switching system. In the “programmer” control mode, the switcher’s video portion can do fades, takes and inserts between 13 picture sources. The audio section provides fades and take from 19 audio sources as well as over and under control.

In “manual” mode, the Grass Valley unit provides selectable audio-follow-video switching on both “Program” and “Preset” buses. Manual dissolve control as well as complete programmer override is available at any time without additional switching.

A new vertical interval switcher, the model SS-140, was shown by Telemet division of Geotel, Inc. The unit is a solid-state, modular device, designed to provide flexible switching operation. The trigger circuitry uses high-speed computer circuits, and a delay line logic card is also included. A custom control panel is provided for each switching system.

## Automation pervades the exhibit area

Automated radio programming and automated video switching gear have drawn spotlights at prior NAB conventions. This year the subject took on added significance. There were two exhibitors, both new companies, whose main purpose was to sell computer and automation know-how: Television and Computer Corp. and Broadcast Computer Services (a division of Wolverine Broadcast Corp.). Further, GE prepared a huge illuminated panel to show how it could draw on its computer division to help the broadcaster achieve total automation.

Automation was the central theme of several exhibitors: Broadcast Products Co., IGM, MaCarta, Schafer, Seeburg Music Library and Tape-Athon in the radio programming area; Central Dynamics Ltd., Chrono Log Corp. and Ward in the video switching area. Key automation equipment was featured also by Ampex, Gates, RCA, Sarkes-Tarzian, and Visual Electronics. Automatic logging was the central theme for Humphrey (new company) and Rust.

Television and Computer Corp. of Somerset, N.J., headed by Paul Audet (formerly of Ward), was promoting software service more than hardware. TCC wants to design a broadcaster’s whole system from time availability to billing, using hardware from several sources. The company was promoting one key piece of equipment—a \$29,000 data-controlled TV broadcast programmer switching system which will be available in August.

Broadcast Computer Services, which acquired its know-how by running a computerized traffic-accounting system for several Wolverine stations, was ready to tell others how to do it—for a fee. The forms and system are geared to using Control Data’s new Cybernet computer network.

This was the first year for Broadcast Products Co. to display automated radio programming equipment. Gates, IGM, and Schafer showed systems capable of tying in with other station automation. Seeburg drew attention as the only system capable of playing discs.

In the automated video switch-

- Reader Service Numbers**  
 387—Tektronix instruments  
 388—B & K test equipment  
 389—Rohde & Schwarz demodulator  
 390—Phase Monitors’ field-strength meter  
 391—Marconi instruments

ing area Visual showed a new solid-state system that substitutes a crt display device for the older Nixie readout to show upcoming events. Sarkes Tarzian showed the APT-2000 which also uses a crt display device. Sarkes-Tarzian was teaching prospective customers how to program the device on the exhibit floor—that's how simple it was to operate. Ampex, which recently required the AMP, Inc. pre-programmed switcher, was another source foretelling a future of computer-controlled operations.

Role of the computer in solving engineering problems was discussed by Serge Bergan, a consulting engineer, during the technical sessions. Computers, according to Bergan, lead to better analysis and in-depth studies of technical and economic problems associated with broadcasting *per se* and spectrum use in the broader sense.

An upgraded version of its solid-state STEP system, Chrono-Log's crt step system replaces the pin-board memory and display panel. Instead, a keyboard is used to enter the break sequence into the STEP system on an event-by-event basis. Up to 14 events can be stored and displayed on the crt screen, and changes in all events (except those on the air) can be made from the keyboard at any time. The crt STEP system features expandability from the basic manual keyboard input to complete computer control.

Calling themselves the first manufacturer to apply successfully computer techniques to TV operation, Sarkes Tarzian proudly showed off the APT-2000 system. The new APT is a digital computer that handles all TV station master control requirements. The APT-2000 has generally smaller input and event-handling capabilities than its predecessor (APT-1000), but has basically the same operating features and convenience.

A new alphanumeric logging concept was introduced by Gates, for keeping an accurate and up-to-date program log in both a-m and fm operations. The system keeps the program log current while the material is being broadcast.

To set up the system, a Teletype datacard is prepared for each card or for each cut on the card. The card contains program, commer-

cial or PSA title, length and any other pertinent information. The cards are then read by a Teletype card reader which feeds the data to a card record amplifier—dubbing the encoded information on parallel (unused) tracks on the tape. As the tape is played, this code is read separately and operates the automatic log printer.

The Gates cards can also be coded for edge-sorting, and there are various other varieties and configurations that add to the system's flexibility and overall usefulness.

Another automation firm to computerize is Schafer. The firm showed two control computers at NAB. The smaller of the two, the PCC-8000, will handle most a-m and fm radio station needs. In its simplest form, it can operate a small background music service. Its expandable memory can handle programming for large broadcast automation systems on a 48-hour basis (or more), handling every event, including emergency situations. The system is designed for totally unattended operation. The larger model, the PCS-1000, can run the most complex radio station for a week or more. This unit uses a high-speed disc memory to tie all events to real-time operation.

A new unit added to IGM's line is the optional music sequencer. This unit offers optional sequential control over the company's music modules with up to nine-channel capacity. Two models available are the 10-step sequencer—which permits modules to be intermixed with up to 10 steps (in any order) before the program repeats. The second model offers a 20-step option of sequencing music modules.

The chip's the thing with MaCarTa—as it was last year. The tiny deck of perforated chips, used to program MaCarTa's audio automation gear, form the heart of the system's control. New in the line this time around is a large reel/reel deck, also controlled by the mighty chips.

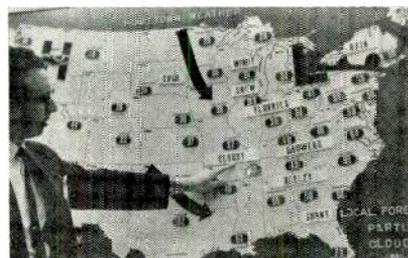
A combined automatic transmitter printout logger and digital readout remote control system—the ALD-1R—was shown by Rust. The system is capable of printing readings of 10 parameters plus time of day and a calibrate-check reading. It can also do 48 remote-control actions. Set up on a Teletype machine, each set of readings is printed across 8½-inch wide paper in 12 columns.

## Transmitters

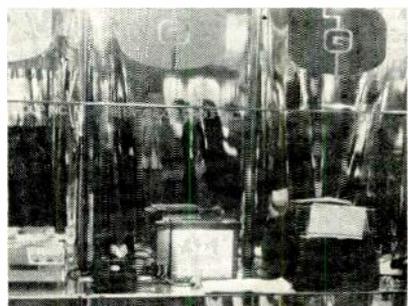
Last year the TV transmitter



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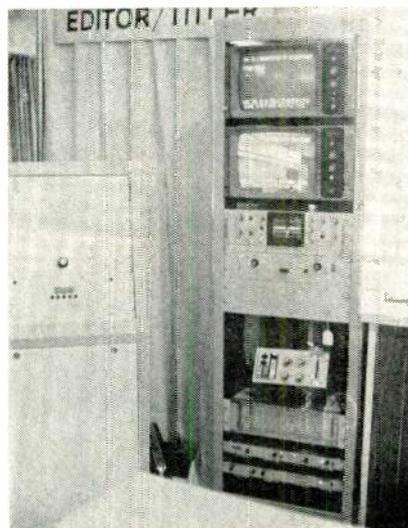
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4



5

1. SCA monitors from Belar.
2. Magnetic weather map by Standard Electronics.
3. Swancor Group's visual displays.
4. TV character generator by TeleMation.
5. Scantlin's TV editor/titler system.

- Reader Service Numbers**  
 392—Belar monitors  
 393—Standard Electronics weather map  
 394—Swancor visual display  
 395—TeleMation character generator  
 396—Scantlin character generator



emphasis was on uhf; this year it shifted to vhf. Both RCA and Ampex, (Townsend) showed new generation vhf transmitters newly designed from the ground up. Philips showed a new vhf import. GE showed its more-solid-state TF series but because the final stages were the same as earlier versions, only RA and Ampex could boast totally new designs. GE did feature a differential phase and gain linearity compensator unit that would compensate for the nonlinear transfer characteristic occurring on the modulation and power amplifier circuits.

RCA's 30 kW TT30FL is in full production and the first unit is being installed this month at KDKA-TV Pittsburgh, Pa. The new transmitter is a joint design effort of RCA and Westinghouse Group W broadcast engineers. RCA claims spectacular state-of-the-art advances both in literature distributed at the convention and in a paper delivered by Howard E. Small. A two-to-one improvement for such specs as differential phase, differential gain and frequency stability are claimed (diff. phase  $\pm 3^\circ$ , diff. gain 0.7 dB). The new performance specs are guaranteed to hold over a 30-day period without adjustment. Only ten tubes of three different types are used cutting the tube complement by 182 compared to old vhf transmitters.

The RCA transmitter is essentially two 15-kW sections each capable of sustaining a signal. A redundant exciter will also switch in automatically should the operating exciter fail.

A new Cermolox triode tube is used in the final output. All tubes used are ruggedized and life in excess of 15,000 hours is expected. An efficient cooling system has reduced the blower to a 1½ hp motor which produces a low velocity—and, therefore, low noise—output.

The new Ampex vhf transmitter is tagged the TA 8000. It uses solid-state i-f circuits up to the 75-watt level (RCA goes to 20 watts). The modulator is also solid-state. Amplifiers use Amperex PG35 tetrode tubes. Basic amplifiers are used at 1.5 kW, 6 kW at 18 kW.

BM/E Photos

1. Crawl titler by Q-TV.
2. Improved color monitor by Ball Bros.
3. New Conrac color monitor.
4. Albion lens gets loving caress.
5. Schneider zoom lens in TeleCine booth.
6. Angenieux zoom lens system.
7. Super color lens by Canon on Philips camera.

Ampex claims modestly, performance equaling or exceeding FCC and CCIR specifications. Whereas RCA used a servo-controlled crystal oven for frequency control, Ampex uses General Technology Corp.'s rubidium standard accurate to 5 cycles in 1000 years. Both RCA and Ampex transmitters are designed for fully remote operation should the FCC approve remote control for vhf transmitters.

Philips continued to demonstrate that it is a full-line supplier by showing a new vhf transmitter. The 17.5-kilowatt (which can be paralleled) is made by Philips Teleindustri (AB) of Stockholm. The unit is all solid-state except for its power amplifier tubes. Differential gain spec is 1 dB, differential phase is  $\pm 3$  degrees.

Color transmission capability, in both high and low bands, is called superior to any other transmitter currently available. Transmitter air-cooling is done with a single blower.

New from Collins was a 20-kW fm transmitter, the model 831-1. Using a direct fm all solid-state exciter, options include stereo mpX and SCA generators. The transmitter has overload protection circuits and is provided with an automatic power output control. Standard equipment includes two 4CX250B drivers and a 4CX15,000A tube in the power amplifier, directional wattmeter, low-pass filter, solid state power supply and control and monitoring circuits.

Also on display in the Collins booth, the MW-408D microwave relay system is a high-performance 1-watt STL. Designed to operate in the 6.875-7.125-GHz band, system is entirely solid-state except for the transmitter klystron. Off-the-air monitoring of transmitters is available as an option.

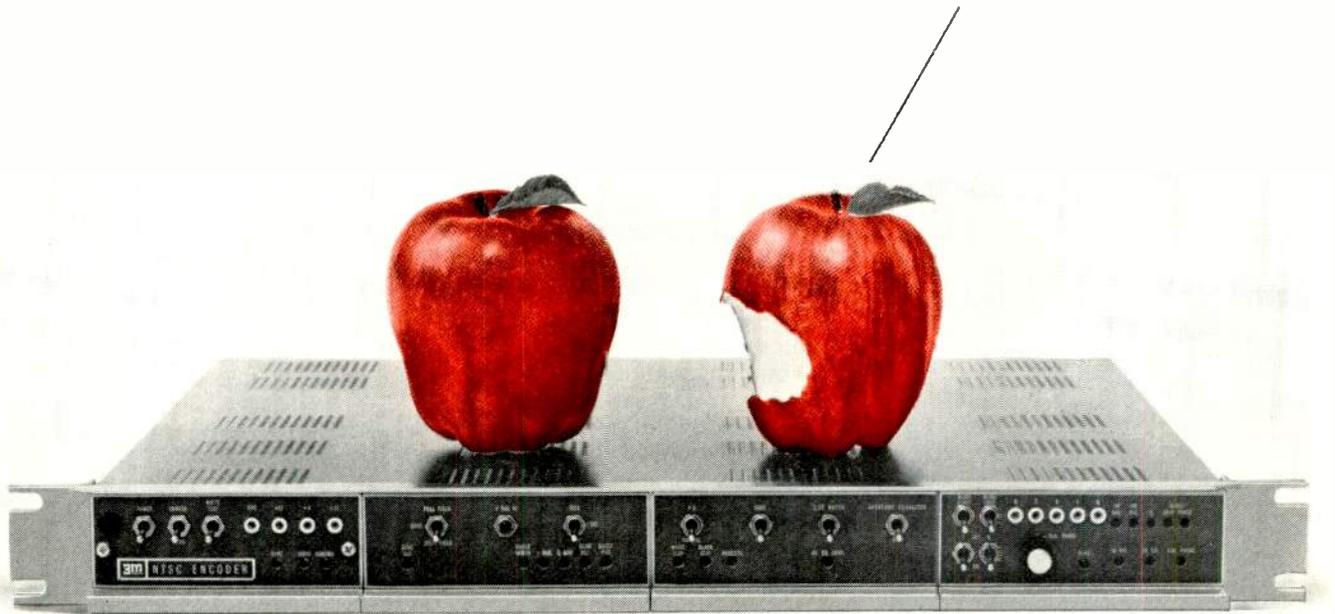
An all solid-state fm microwave link exhibited by Raytheon has an added option this year—the SSA-75 program audio channel. This newly redesigned equipment allows up to four high-fidelity audio channels to be transmitted simultaneously with video by frequency-multiplexing the audio subcarriers in the 5.97-to-8.47-MHz band. The new system has a self-contained power supply, large VU

*continued on page 84*

**Reader Service Numbers**

- 397—Q-TV titler
- 398—Ball monitor
- 399—Conrac monitor
- 400—Albion lenses
- 401—Schneider lenses
- 402—Angenieux lenses
- 403—Canon lenses

IT ALWAYS SEEMS THAT 3M PROVIDES  
A COUPLE OF FEATURES  
THAT OTHER PRODUCTS DON'T



TAKE THIS 3M COLOR VIDEO ENCODER, FOR EXAMPLE...

The 3M Brand Color Encoder has two unique features not obtainable elsewhere. The color bar generator is one. It is **completely** digital, not partially digital. Simplifies setting up procedures, and maintains accuracy between encoders. Affords precision without adjustments. With digital you **know** it is accurate.

Another unique fact is that the 3M Color Encoder considers smaller, lower cost cameras as well as the big expensive ones. A method of input clamping is used on video signals that eliminates low frequency hum and noise and other unwanted effects on the matrix. If you have access to an SMPTE color test film (hand test over colored bolts of cloth) you can determine whether your camera needs clamping. If it does, you're in clover with this 3M Encoder.

The 3M Color Encoder is compatible with all 3-tube and 4-tube cameras, meets all applicable FCC and EIA specs. There's also a 2F notch filter in the horizontal aperture equalizer to prevent noise beyond camera frequency response.

Luminance enhancement at the flick of a switch assures a sharp picture even if registration is not perfect. With a 4-tube camera, enhancement is from the luminance tube. The green channel is used for enhancement in 3-tube cameras. Switching is on the front panel, as are **all** operation and setup controls, including notch filter.

Overall, you'll find that the 3M Brand Color Encoder is equal or superior to anything on the market yet costs somewhat less. Could we send a brochure?

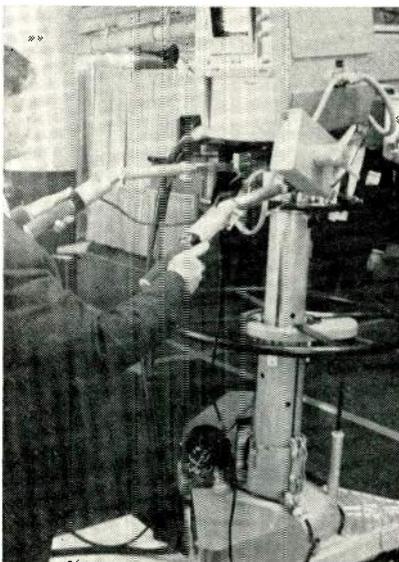
Mincom Division **3M**  
COMPANY

300 SOUTH LEWIS ROAD • CAMARILLO, CALIFORNIA 93010

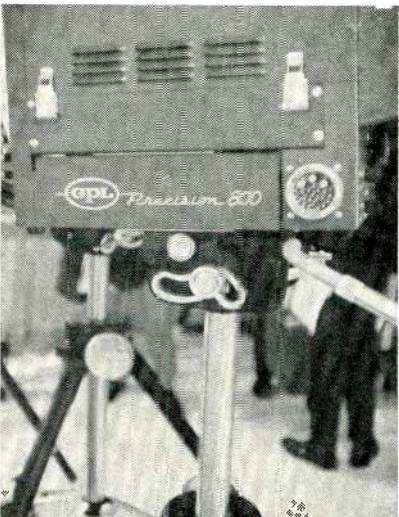
Circle 121 on Reader Service Card



1



2



3



4

1. Colorguard meter demonstrated by Zoomar.
2. TVP camera pedestal from Power Optics.
3. Quick-Set's pan head.
4. Camera cradle by Davis & Sanford.

## Film and Projection Equipment

Refinements probably best describe the progress in projection equipment since last year's NAB, but some innovation was in evidence.

New was an imported random access slide projector from England. Called the EDS 60-Twin Teleslide, the unit swiftly changes slides from two 30-slide magazines. The slide selection can be programmed ahead of time. It takes 0.5 seconds for a sequential change and 3 seconds for maximum random change. EDS stands for Engineering Design and Supplies, Ltd., which is located in Bourne End, Bucks, England. In USA sales outlet is Listec Television Equipment Corp., Plainview, N.Y.

The optical multiplexer is in the form of an optical switch which moves a sliding mirror in 50 milliseconds. Price is approximately \$6000. A random access slide projector was also displayed by Sarkes-Tarzian. We weren't able to pick up specifics at the time this report was written.

RCA announced a modification kit for the popular TK-27 film camera consisting of field effect transistors for the preamplifier. Two low-cost color TV film chains were also demonstrated by RCA. The PFS-710 uses the one tube color camera announced at the NAEB convention and a complete television chain sells for \$9,850. The PK-610 uses a 3 vidicon color camera and produce NTSC color. It sells for \$19,500.

Spindler and Sauppé showed a dynamic dissolve system that worked between paired projectors and also background projectors. Telepro demonstrated a 6000 lumens background projector.

Kalart showed background projectors, theatre projectors and a new 35 mm slide-camera chain.

General Electric drew very favorable comment over its large screen video display system which showed greater stability than in previous years.

Some half dozen stations have placed orders for the system. Chief application is to blow up a TV picture for studio audience viewing. Front Projection Corp. showed how the GE display system could

be used to provide a moving background for a television broadcast.

In film processing equipment, Houston Fearless introduced its "Mini-Color," a compact, low-cost color film processor tagged at under \$10,000. Sarkes Tarzian showed its polychrome film chain, using its model 77 camera.

Arriflex introduced a precision exposure control system ("Apec") for its movie cameras, using a CDS cell to make light readings through the camera lens.

## Audio Gear: Bigger and Better

Audio equipment is getting better and more sophisticated. There were quite a few customized consoles—as well as off-the-shelf items that any station can have delivered in a matter of weeks. Multi-channel multi-purpose consoles had an enormous upsurge, with custom consoles built up from interchangeable modules making lots of headway.

One such console approach was taken by McCurdy with its "Module" building-block concept. Using this equipment, it's possible to build up a console with as many as 30 channels—using integrated circuits throughout. Modules include a universal input control, equalizer, submaster selector, input selector, and variations within each module by changing plug-in circuit cards.

A line of new audio consoles from CCA Electronics featured a 10-channel stereo broadcast unit at the top of the line. This unit uses Altec stereo faders and plug-in modules, switchable mike channels, center channel audition or control, 18 high-level inputs, six low-level inputs built-in cue and monitor amplifiers and complete accessibility to the insides via a tilt-down front.

Noted for its line of audio consoles, the new item from Sparta was a stereo monitor amplifier. The model MAS-50 uses the latest solid-state technology to drive wide-range linear-excursion speakers for studio monitoring.

A Swedish console—made by Studio-produktion A.B.—was displayed by Gotham Audio. The AL 243 console is a basic enclosure for modular assembly of up to 16 strip modules. More units can be added or extended if needed.

Background music equipment  
*Continued on page 86*

Reader Service Numbers  
404—Zoomar meter  
405—Power Optics pedestal  
406—Quick-Set pan head  
407—Davis & Sanford cradle

## Lighting in the Spotlight

There were no radically new developments in lighting—rather lighting equipment manufacturers had subtle improvements and ideas that added up to better stage illumination for color TV.

New from ColorTran was a tear-proof filter gel called "Gelatron." Available in a number of colors and in large sheets that can be cut to size, the gel withstood all efforts to part it except with the aid of scissors.

Shown for the first time by Kliegl were a 10-inch fresnel quartz spotlight rated at 2000 watts and a focusing quartz scoop with a 1000-watt lamp. The focusing feature doesn't change the beam size and is done manually—it's not remote-controllable. The focusing feature permits the studio lighting man to change the light concentration quickly and easily.

Century Lighting showed its "Memo-Q Infinity," a lighting control system with rehearsable memory. The unit offers hundreds of preset "scenes" instead of the few normally included in conventional preset dimmer systems. A single master pushbutton instantly records either a single circuit or all the values of a complete lighting setup.

Sylvania added to its line of tungsten-halogen lamps with the introduction of the 10,000-watt model DTZ. The lamp has color temperatures of 3200 to 3350K. The lamp is 15 inches long and is directly interchangeable with G96 standard types rated at 10,000 watts.

## Tape in New Dimensions

Tape and tape equipment become more sophisticated in recent months. New at the Convention was 3M's type 400 two-inch videotape with specially treated base to prevent cinching and other mechanical problems normally associated with video tape use. These characteristics, says 3M, will greatly improve the tape's wear and life characteristics.

Audio Devices introduced a new video tape as well as several improved audio tapes.

In audio equipment, Viking displayed three new cartridge handlers—the manual model 35, the semi-automatic model 36 and the

automatic model 38. Tapecaster has introduced a new super-torque hysteresis synchronous motor to its tape equipment line. The new motor is available in retrofit kits for updating previous model machines.

Marathon exhibited its commercial continuous tape cartridges featuring differential pulleys. This pulley provides constant tape tension, permits fast-forward winding (up to six times operating speed) and eliminates pressure pads for most tape loads over 2½ minutes.

Tape cartridge players (four of them) built into the top of the audio console was the feature attraction in the SIS Electronics booth. The T-40 "Action" console also has illuminated start and stop buttons, earphone amplifier with tone controls, monitoring amplifiers, microphone indicator lights and fail-safe power supplies.

An added attraction of Spotmaster's Ten-Spot and Five-Spot pushbutton multiple cartridge players is the interchangeable plug-in module concept. Plug-in tape decks and recording amplifiers are fully interchangeable in any of the unit's slots. The equipment, model 610B (10-spot) and 605B (5-spot) was featured in the Broadcast Electronics booth.

Featured in the Visual booth's audio area, the "Rapid-Q" cartridge tape unit is an automatic cueing tape machine available in single or double-headed models. The servo-controlled motor drive will fast forward the tape to pre-selected cue points, readying the cart for playing.

## Test and Instrumentation Equipment

A system of NTSC instrumentation was displayed by Tektronix, including the 140 and R140 test signal generator, type 528 waveform monitor and a series of instruments for the European PAL system.

McMartin prominently displayed its new TBM-3500A fm modulation monitor, TBM-3000A fm frequency monitor and the TBM-2200 stereo modulation monitor—all alongside its several other instruments making a complete moni-

**Reader Service Numbers**  
 408—Andrew coax  
 409—Brand Rex cable  
 410—Boston Insulated Wire camera cable  
 411—Trompeter patchboard  
 412—AEC/Veritas disc logger  
 413—Nortronics heads



1



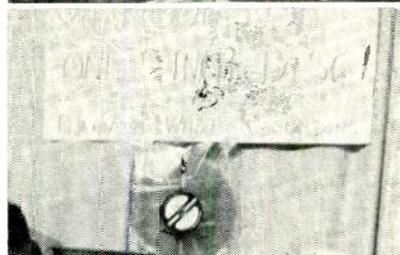
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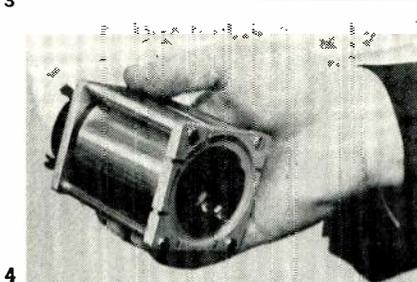
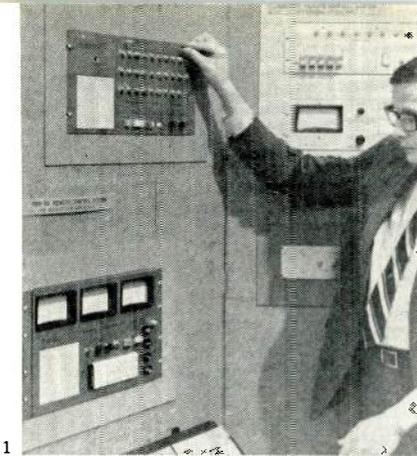


4



6

1. Eight-inch coax from Andrew.
2. Brand Rex's cable lineup.
3. Miniature camera cable from Boston Insulated Wire Co.
4. Patchboard by Trompeter Electronics.
5. Disc documentation/log by AEC/Veritas.
6. Pro replacement heads displayed by Nortronics.



1. Remote control system by Moseley.
2. Wilkinson lightning and surge protector.
3. Video van by IVC.
4. Camera yoke made by Cleveland Electronics.

toring instrumentation package for the fm broadcaster.

Collins also showed a line of monitoring gear, including the 54Z-1 a-m frequency monitor, 900C-3 fm modulation monitor (mono or stereo), 54N-1 fm frequency monitor, 900F-1 fm monitor and 900C-3 stereo modulation monitor.

A tolerance alarm unit, model TAU-1, was shown by Moseley. This unit is designed for use with digital automatic transmitter loggers. Moseley also showed its model AMR-1 a-m modulation monitor.

Rust Corp. had a remote status alarm system on display featuring 10 positions, FSK operation, con-

tinuous monitoring and fail-safe circuitry.

A line of instruments from Shibaden included the model 316S color bar dot generator, the 848 DG-DP analyzer, the TG-5 TV test signal generator.

## Monitors and Visuals

New from Conrac was a transistorized 19-inch color video monitor, model RHA19. Priced at \$2700, the unit is compact and can be mounted in standard 19-inch racks. It also has built-in degausser, an underscan switch for inspecting picture edges, centering controls and a bonded safety shield.

A new option was offered by Ball Brothers for its TCB-14R color monitor. The option, factory-installed, is pulse cross and/or two switchable video inputs.

A title inserter, displayed by Riker, provides an easy and inexpensive way to insert titles and credits over any program. It features a choice of white letters with black borders, or black letters with white border. Only production equipment needed is an ordinary black card or roller with white letters. System takes several steps out of the usual procedures for camera titling.

Q-TV showed a series of titlers with crawl—both horizontal and vertical. The company also exhibited its specially modified IBM typewriters that prepare title strips quickly and economically.

## Camera Optics

Lens manufacturers, although greatly outnumbered by the camera manufacturers at the Convention, opted for prominence with the sophistication of their products.

A series of zoom lenses from Canon included the P17X30B1 with a 30-500 mm zoom range, P6X22B1 with range of 22.5-128 mm, B10X60F (range 60-600 mm), B7X45F (range 45-300 mm) and the P10X20B1 with a zoom range of 20-200 mm. This last lens is called the most compact lens made for Plumbicon cameras.

Varotal XIV-R lens system designed for the Philips PC-70, was featured in the Albion (Rank Taylor Hobson) booth. Albion also displayed a line of other basic TV camera lenses.

Other new lens systems included a 100:1 zoom by Angenieux—zoom range, 18-1800mm and a

new Schneider TV-7 Variogon (11:1 zoom) in the Tele-Cine booth.

What holds the camera? A head, tripod or pedestal, and there were the prime sources of camera mounting and support hardware in strong presence at the Convention.

Davis & Sanford showed a cradle head and tripod assembly with adjustable pan handle and quick alignment capability. Quick-Set's Hercules cam-link pan head was that company's standout item this year.

A new high-low P-10 camera pedestal was featured by Power Optics. Listec showed its Vinten camera dolly with special chassis and steering linkage.

In the wire and cable department, easily the most unusual single item was Andrew's eight-inch diameter coaxial cable. This flexible/semi-rigid cable uses Andrew's air dielectric Heliex principle for very low attenuation or very high-power applications that usually require rigid transmission line.

A new miniature camera cable, type TV-81N, was introduced by Boston Insulated Wire & Cable Co. The new cable was designed for applications requiring a lightweight cable. It's compatible with standard TV-81N cable, but the miniature cable's insertion loss is about 2½ to 3 times that of TV-81N. Standard fittings are available.

A visual aid for speakers, the Q P Executive Prompting System, was shown by Quality Presentations. The system features a transparent angled mirror that lets the speaker look through the mirror into the audience, even while he's reading his lines.

The Harwald Company featured a media utilization system—the book-o-tron 575. This is a computer-based system that can handle many aspects of broadcast station operation and management.

An unusual meteorological visual display system was offered by Standard Electronics. Heart of this display is a huge, metal map of the United States and a kit of magnetic symbols, alphabetical and numerical characters, and special weather symbols—which will allow the TV rainmaker to put a display weather map together in short order.

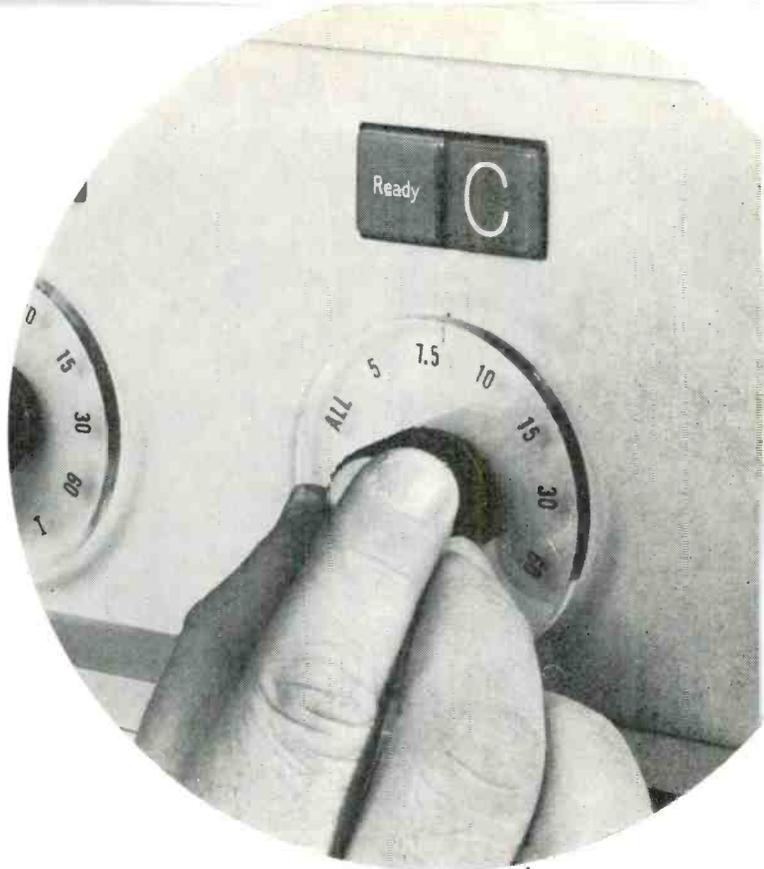
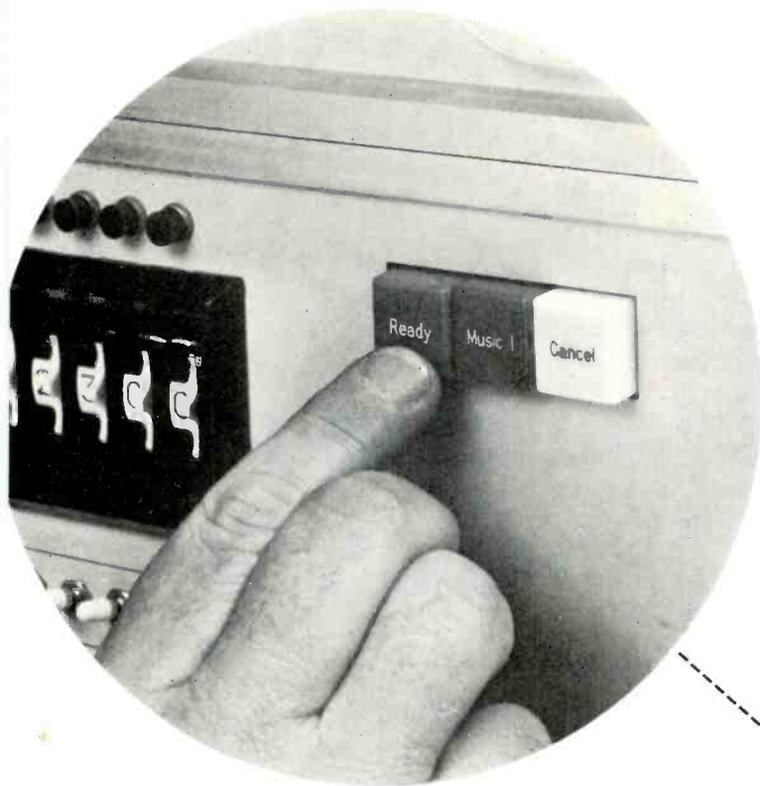
**Reader Service Numbers**  
 414—Moseley remote system  
 415—Wilkinson protector  
 416—IVC TV van  
 417—Cleveland Electronics yoke



The  
General Electric  
guide to explaining  
your unfair advantages  
over competition



# Part 3: cameras

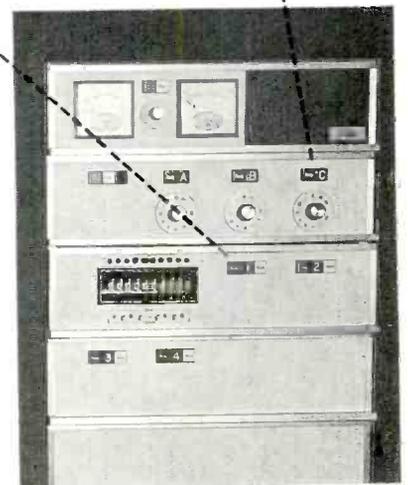


## The MOST FLEXIBLE automation system – now more flexible still!

IGM Series 500 control systems have always had the distinction, exclusive with IGM, of separate controls for voice inputs and music inputs. No other system makes it so easy to program your commercials and "talk" events. You simply set IGM's voice channel modules, as shown at upper right, to the desired frequency and features are scheduled automatically on a real time basis. Format may vary from hour to hour. Changes of spot load are simple to make without changes to the music format.

Now, new music modules, standard in all 500 systems, provide the same flexibility and ease of control of music channels. A new music module, with a portion of the new music sequencer, is shown at upper left. Start with one, two, three or four music inputs. Add more later, if you wish. You may order music modules individually, or with a 10- or 20-step sequencer where sequential control over music is required.

For immediate information on equipment or music services, contact International Good Music, P.O. Box 943, Bellingham, Wash. 98225. Telephone (206) 733-4567.



With the new music modules and optional sequencer, as shown above, an IGM Series 500 system gives you almost unlimited ability to control any music format.

"Tomorrow's engineering today"





Changing pinboards in WXTV's master control takes only a few seconds, and can be done while an automated event is in progress.

# Budget Automation Pays off Fast

**This pinboard TV automation system may not have a fancy computer control but it does the job smoothly and error-free. It has one big extra feature—it can pay for itself within three months.**

LOW-COST AUTOMATION is possible even in slender-budgeted TV stations with a pinboard system that lets the technical director's fingers do the walking. One of the latest broadcasters to install this pinboard control is Paterson, New Jersey's Spanish-language u, WXTV.

Operating on channel 41, the station was established with the objective of reaching an audience of nearly 2,000,000 Spanish-speaking people in and around New York City. Advertisers, quick to recognize the enormous buying power of this market, purchased almost \$1,000,000 of air time well in advance of WXTV's August 4th on-air date.

To eliminate any possibility of station break switching errors—which inevitably result in dissatisfied sponsors and costly make-goods—top management of Spanish International Network, WXTV's parent organization, decided to automate TV equipment, switching completely.

Based on the recommendations of XETV, an affiliate station in Tijuana, Mexico, it decided to install Chrono-log's STEP (Sequential Television Equipment Programmer) system. STEP had originally been installed at XETV to help management avoid hiring three additional operators when it became necessary to record simultaneously on video tape as well as transmit regular program material. The STEP system has been in use 17 hours a day for more than two years at XETV where it automatically controls film projectors and video



A stack of programmed pinboards sits ready for the switcher. Boards will control three VTRs, film projector, slides and audio gear.

tape units, video and audio switching, slide projectors and multiplexers.

STEP's use has helped eliminate switching errors during station breaks while providing smooth operation during a major portion of WXTV's on-air time. Its use has freed three operators to run the video tape recording sessions and to perform routine maintenance. Based on the savings in labor costs of three men and the elimination of costly make-goods, payoff time on the system was estimated to be *three months*.

The Chron-log solid-state system installed at WXTV is made up of an output relay chassis, a solid-state logic chassis, a control panel and a readout display. To simplify installation, a complete machine control interface is included in the system which couples STEP's output relay circuits to the control circuitry of WXTV's three VTR's, film chain, slide projector and audio equipment.

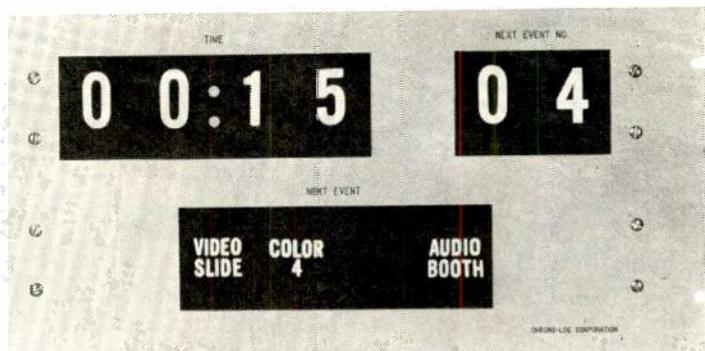
### Easy Programming

Programming STEP is a simple matter and does not require any specialized training. Using the program log (received with the program material once weekly from Mexico) as a worksheet, the operator selects each event and its duration by inserting metal pins into appropriate holes in a pinboard. He is guided by a paper template which spells out each event in familiar terminology. The template also indicates time in minutes and seconds. The operator can schedule up to 16 events on a single board, and pin each event so it will run anywhere from one second to 59 minutes.

The operator prepares as many pinboards as are required to cover all the events shown on the program log. He then previews the presentations by placing STEP in "preview" mode and plugging the boards—one at a time—into his control console. In this mode, STEP runs through the entire sequence of events without actuating any external circuitry. During the operation, STEP displays—on the readout panel—what the next event will be, and the time remaining until that event occurs. During the preview, the operator can also make any corrections in the presentation simply by changing pins in the pinboard.

Once an event has started, it will continue to run for its programmed period, even if the operator unplugs the pinboard from the console. Hence, the operator pins the last event on each board to give him sufficient time—about 10 seconds—to change pinboards.

Before WXTV goes on the air, the operator inserts his first board into the console, places STEP in "automatic" mode and hits the "take" button at the correct time. STEP then automatically switches station equipment with split-second precision. The operator just has to change pinboards as required. If necessary, the operator can change a sequence or override any function and take manual control over the switching operation by placing STEP in "manual mode. At the end of the switching sequence, STEP automatically returns the video and audio to manual control.



Display panel in front of operator indicates next event and time remaining before it will occur.

TIME	min.					sec.					SOURCE		VIDEO		AUDIO	
	0	1	2	3	4	0	1	2	3	4	1	2	1	2	1	2
1	.	.	.	.	.	.	.	.	.	.	1	2	1	2	1	2
2	.	.	.	.	.	.	.	.	.	.	3	4	3	4	3	4
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16	.	.	.	.	.	.	.	.	.	.						

Paper template of this type expedites and simplifies pinboard programming. Pins are inserted through paper.

During the peak period, the system automatically controls film projectors and VTR's video and audio switchers, slide projectors, multiplexers and other mechanical devices. The programming system selects automatic fades, wipes, supers or lap transitions. At the end of such a sequence, STEP returns the video and audio to network or other program sources.

As the programmer runs through the sequence, its optical display shows (in words) what the next event will be and how much time remains before the next event starts. The sequencing pinboard can handle up to 16 events—typically two or three station breaks. The system's three modes are automatic, manual and preview. In the preview mode, the operator can check out the entire break before actually running the sequence and can make changes or corrections by changing pins in the board.

The system will automate the operation of any relay or solid-state video and audio switching system—as long as the original system can work from momentary contact closures. A complete machine control interface is provided to control such mechanical functions as rolling and stopping VTRs, projectors and slide equipment. Isolated contact closures are provided for these functions so the appropriate voltages and contact actions are available.

Ever since it went on-stream at WXTV, STEP has consistently performed the switching operations with a smoothness unmatched by even the most experienced operator. Switching errors and loss of revenue due to make-goods are virtually non-existent. Pleased with its performance, management has expanded the use of STEP to control switching during most on-air time. **BM/E**

# The switch- hitters

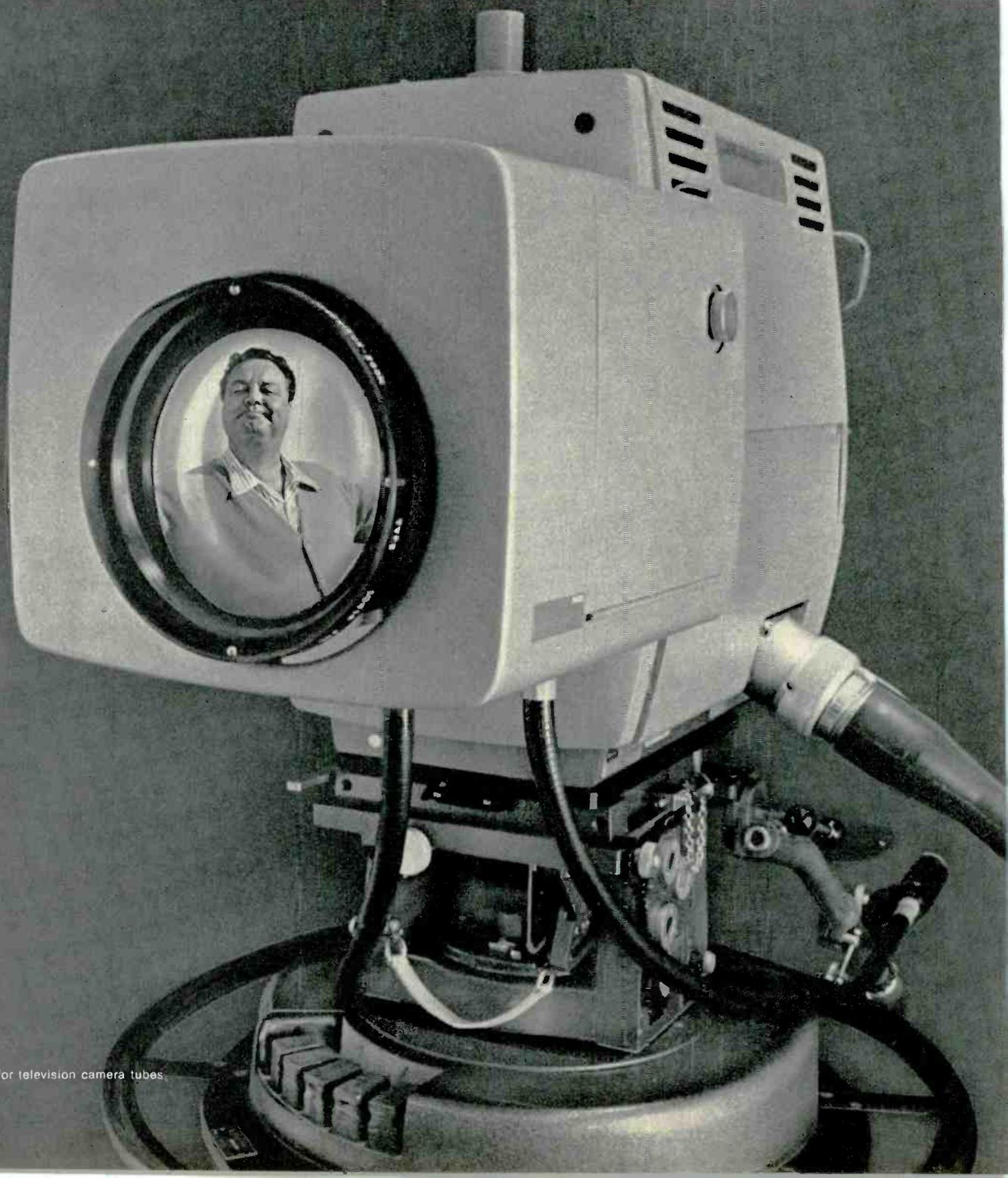
**THE PHILIPS PC-70** ... the prime time king of color cameras ... serves on more live and taped studio color shows, by far, than any other camera.

And it's a fantastic switch-hitter. If the PC-70 is a winner in studio work, in the field it's no contest. For major outdoor news and sports events, the PC-70 consistently takes the most valuable player award.

Why? Its unsurpassed color picture, faithful and sharp. There are over 700 Philips 3-Plumbicon® cameras in use worldwide. A videoman's dream. The cameraman's camera. Management's assurance of the best, most reliable, and most economical performance.

When a better camera is built, Philips will build it.\*  
In the meantime, the PC-70 is the ticket.

\*The Philips PC-100, announced at NAB '69, will be available early in 1970.



**THE PHILIPS PCP-90** digitally controlled "Minicam" takes the field alongside the PC-70 as the most mobile and versatile of portables. Operating wireless or on small, cost-reducing triax, the 3-Plumbicon Minicam brings total flexibility to broadcast-quality telecasting.

The PCP-90 is designed basically as a field camera. Controls may be beamed from as far away as 30 miles. Signal processing is done in the backpack. The Minicam produces a real-time color-composite signal for direct broadcast. Or it can go into the field with a portable recorder to tape interviews or other action—totally unencumbered.

And here again, you have a star switch-hitter. Three new one-inch Philips Plumbicon tubes perform to broadcast standards, bringing the Minicam right into the studio.

Training camps for Minicam prototypes included crowded conventions, major sports, the inauguration and other events. Now it's ready to sign with you.

**PHILIPS**

**PHILIPS BROADCAST  
EQUIPMENT CORP.**

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Larry Muston (in 10-gallon hat) runs one-man band during Tahoe Cable's C & W hour.

# Cable Origination the Busy Way

**One man runs the store at Tahoe TV Cable as general studio technician, desk man, deejay and TV personality. He's on camera while he runs his own daily hour of C & W music; he tapes local sporting events for delayed replay and interviews local political figures and visiting celebrities. It all adds up to a very busy operating day for Larry Muston.**

EVER SEE A ONE-MAN band? Some disc jockeys have that appearance but it's forgivable—the listener can't see the frenzied activity at the audio console. A one-man CATV operation is something else again; the operator obviously can't be on-camera while he's talking to the cable audience. Or can he? Fade and cut to a tiny studio in South Lake Tahoe, California. The man in shirt sleeves, tie and cream-colored Western hat leans forward to adjust the TeleMation video control center once or twice with his right hand until the nine-inch Sony monitor screen clears. "I think we'll give 'em a couple extra minutes tonight, since we'll have the time," he says to himself in a Texas drawl.

He puts a long-playing record on each of two Garrard turntables and flicks a switch on the TeleMation six-channel audio mixer at his left, which stops the 24-hour music from going out on the television weather channel. He flicks another switch on the video control center, which takes the "time and temperature" off and puts him on the air.

Now he's being transmitted to 80 percent of all South Lake Tahoe homes, 95 percent of the 5000 motel rooms and into 800 hotel rooms. South Lake Tahoe is a community of nearly 20,000 on the southern shore of Lake Tahoe, North America's largest Alpine lake. Lake Tahoe, lying on the California-Nevada border in the central Sierra Nevada mountain range, has become a recreation-gambling-ski complex which attracts millions of visitors annually.

"Well, howdy neighbors, and welcome to Country and Western time here on Channel 10,



Muston (left) interviews South Lake Tahoe City Manager John Williams.

coming to you each weekday between 5 and 6 o'clock over the facilities of Tahoe TV Cable." With that, Larry Muston, Lake Tahoe's only television personality, begins three minutes early another afternoon in his third year of local origination broadcasting.

Every weekday Muston spends three hours in a 30 x 20 foot "television studio" operating without any help two TeleMation vidicon cameras, a General Electric vidicon, six microphones, one 24-hour tape deck, one Graflex 16mm movie projector, one movie screen, two Garrard turntables, two Sony television monitors, a video mixer and audio mixer, and, if he has any video tape to replay, an Ampex one-inch helical video tape recorder.

#### Day Begins at 3

His normal broadcasting day begins at 3 p.m., when he takes the time and temperature off the air and begins a series of travelogues and sports films for his audience. Between 4 and 5 p.m. he interviews local news personalities and visiting celebrities. Every Wednesday he spends a half hour with South Lake Tahoe City Manager John Williams. Visiting celebrities may include Los Angeles Mayor Sam Yorty, California head of the American Independent Party Robert Walters, Sammy Davis, Jr. and "Laugh-In" favorites Rowan and Martin. His line of interviewees from the casinos, Sahara-Tahoe, Harrah's Tahoe and Harvey's Resort Hotel could make Joey Bishop and Johnny Carson envious.

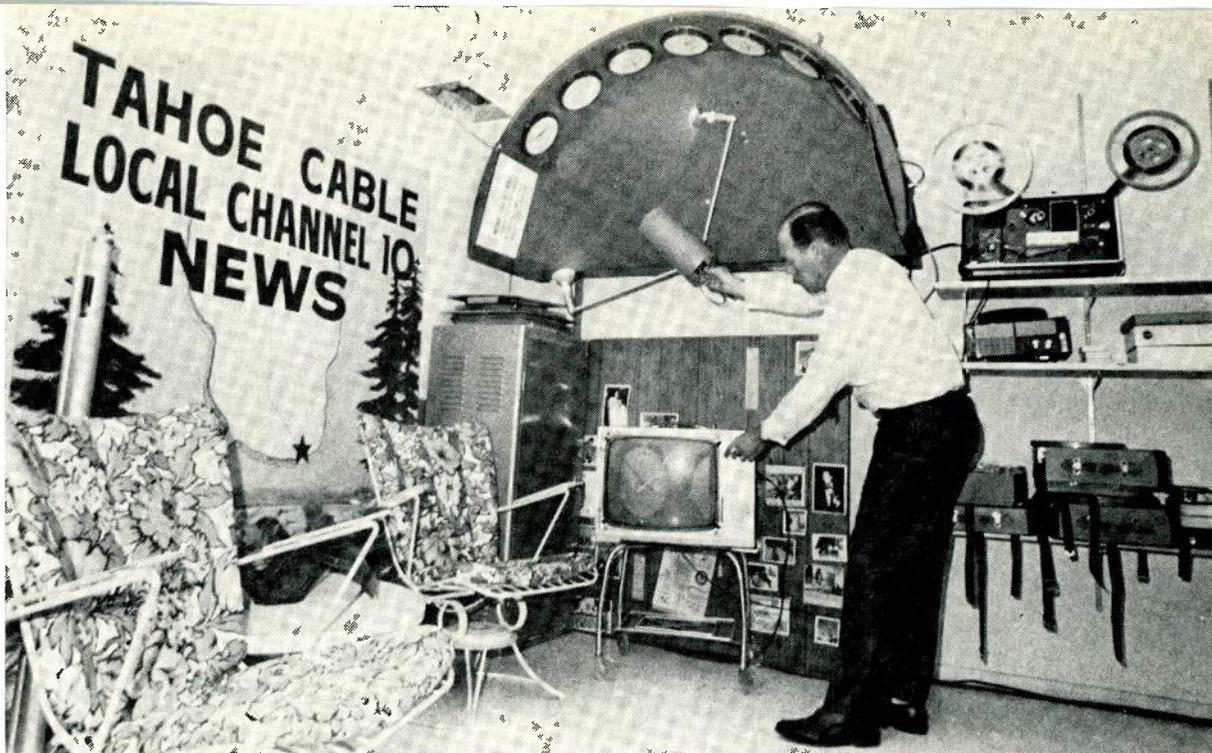
Muston's last hour is the one he enjoys most—sitting in front of the camera spinning country and western records. Within 30 seconds after he's on the air, the phone begins ringing and keeps ringing for the first half hour while he takes requests. "Country 'n' Western," he answers. His Southern accent has stuck despite having lived most of his life in California. One of his fans requests, "I Want You More Than I Can Say." Muston teases, "You do, by golly," reaches behind him into a rack of 5000 records and puts his finger on the right record immediately.

By 6 p.m. he's finished with requests. He puts away the records, returns the weather scanner to Channel 10, flips on the 24-hour tape deck, turns off the lights and leaves. If it's the first or third Tuesday of the month, he'll return to pick up one of the vidicon cameras and install it in the city council chambers where he broadcasts each meeting live. If there's a high school basketball game or bowling tournament, he'll come back for the Ampex video tape recorder and shoot the event for future broadcasting.

#### Two Channels Next

"We hope to do at least 12 hours of programming in the future, and by the end of 1969, we'll be using two channels," says Don Wygal, manager of Tahoe TV Cable, one of 40 systems in the Denver-based Community Television cable company. The company operates in 25 states, from Nebraska to California.

Tahoe TV Cable provides service for South



Chief engineer Muston sets up weather channel.

Lake Tahoe, which, at 6200 feet, is in a natural mountain basin surrounded by 10,000 foot peaks. The cable permits residents to get all four channels from California's capitol, Sacramento, which is 100 miles away, as well as stations from Reno (76 miles), and San Francisco (200 miles away). Without the cable, only one Sacramento station and one Reno station could be received.

Wygol began his career in 1950 in a scaled-down version of his Tahoe operation. He formed a cable system for a community of about 20 farm families living in a basin just east of San Francisco. A year later, he entered the Air Force and taught a course in electronics and helped write technical manuals for Air Force use. In 1960, he purchased a small cable system at South Lake Tahoe which was then designed to stimulate business in a television leasing operation. Within four years, Tahoe TV Cable was ready to begin local origination broadcasting.

"It's strictly a service for our cable customers," Wygol explains. Eventually he hopes to air all high school sports events, ski meets, adult recreational events, to continue interviewing and to introduce syndicated television shows. "Our local origination will be for local people," he says, "and at the same time, the thousands of tourists we get every weekend, primarily from the San Francisco area, will be able to watch their favorite programs while at Lake Tahoe."

#### Local Events

Televizing local events is an effort encouraged by South Lake Tahoe's leading citizens. "Channel 10 provides the community with something even metropolitan residents don't get from their TV stations—an inside view of local government.

"Through CATV, a small community can be better informed than a city," City Manager John Williams contends. Mayor Don Clarke agrees, publicly congratulating Tahoe TV Cable for bringing local government into the homes; congratulations were sent out via Channel 10.

The main effort of Tahoe TV Cable, like most other systems, is to provide an extension of regular television services. In the future, Wygol hopes to provide broadcasting facilities to the local school system and police monitoring for local businessmen.

#### Head-End Antenna

Tahoe TV Cable gets its signals off the air from a commercial antenna on Freel Peak (the highest spot in the Lake Tahoe basin), which are converted to microwave and relayed to the central building, where they're once again translated and sent out via cable. All the while, Channel 10 is broadcasting time, temperature, humidity, barometric pressure, wind velocity and wind direction.

"It amounts to an instant weather forecast for travelers," Muston points out, "which is especially valuable during the winter when a snow storm can close the summit highways in a matter of hours."

"I get calls from people in the motels who turn on Channel 10 to check the weather and see me," Muston relates. "They ask me what I'm doing; they say they're never seen anything like it." That seems to be true. The nearest thing to South Lake Tahoe's Channel 10 broadcasting in Northern Nevada and Northern California is educational television from San Francisco and Sacramento. Even at that, if what he is doing is not remarkable, the fact that he's doing it all by himself certainly must be.

BM/E



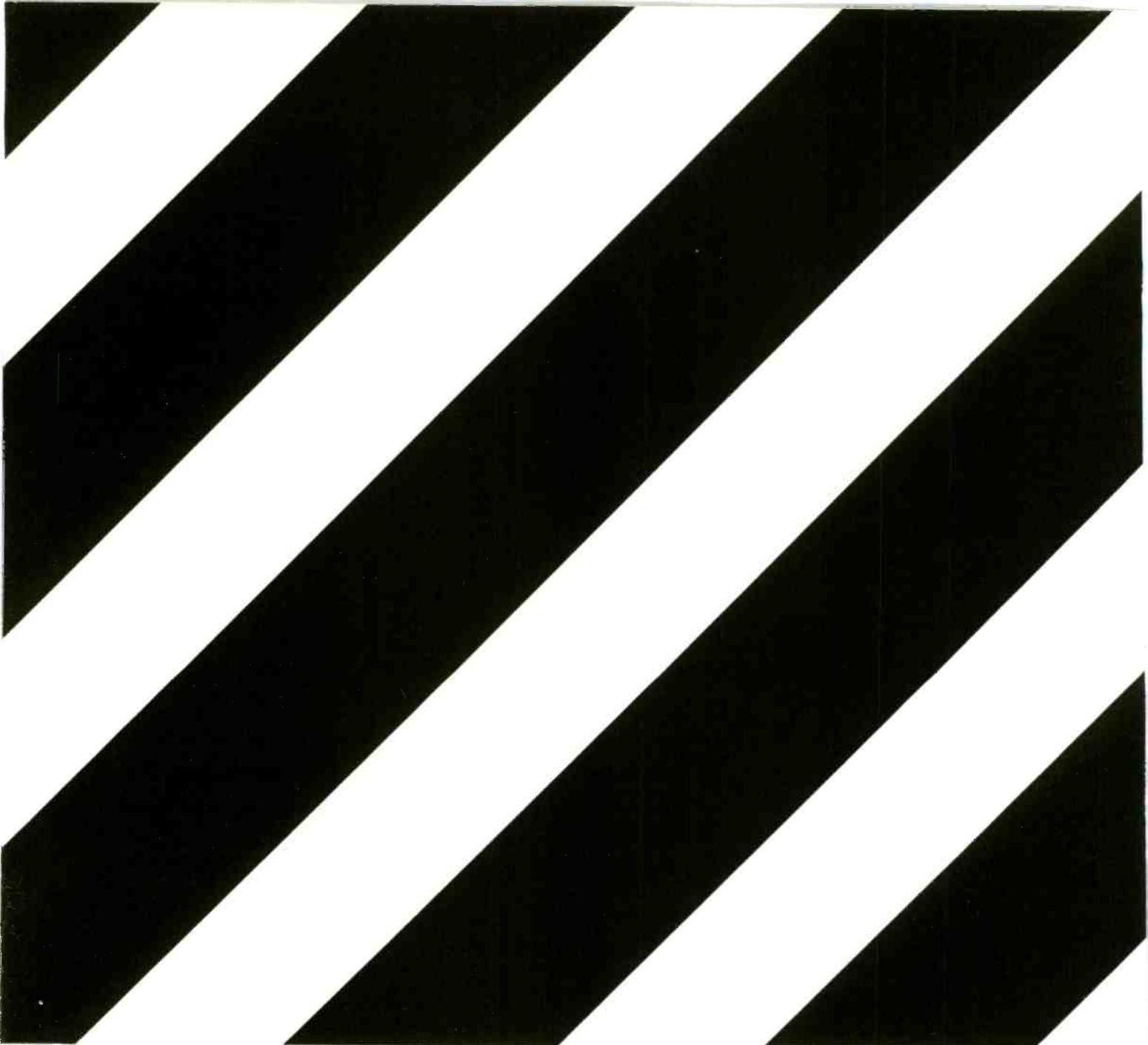
At ROHN, we have our heads in the clouds ...and our feet planted firmly on the ground. Just like our towers. Just let us know what your broadcast tower requirements are. If we don't have something already designed, we'll feed the vital statistics into a computer to get the kind of tower needed to fit your station's requirements. Certainly we can always supply a stress analysis on all our commercial towers. And delivery to the site. And erection service. And if there's ever anything further we can do, just let us know and we'll be glad to oblige. After all, that's why we're here.

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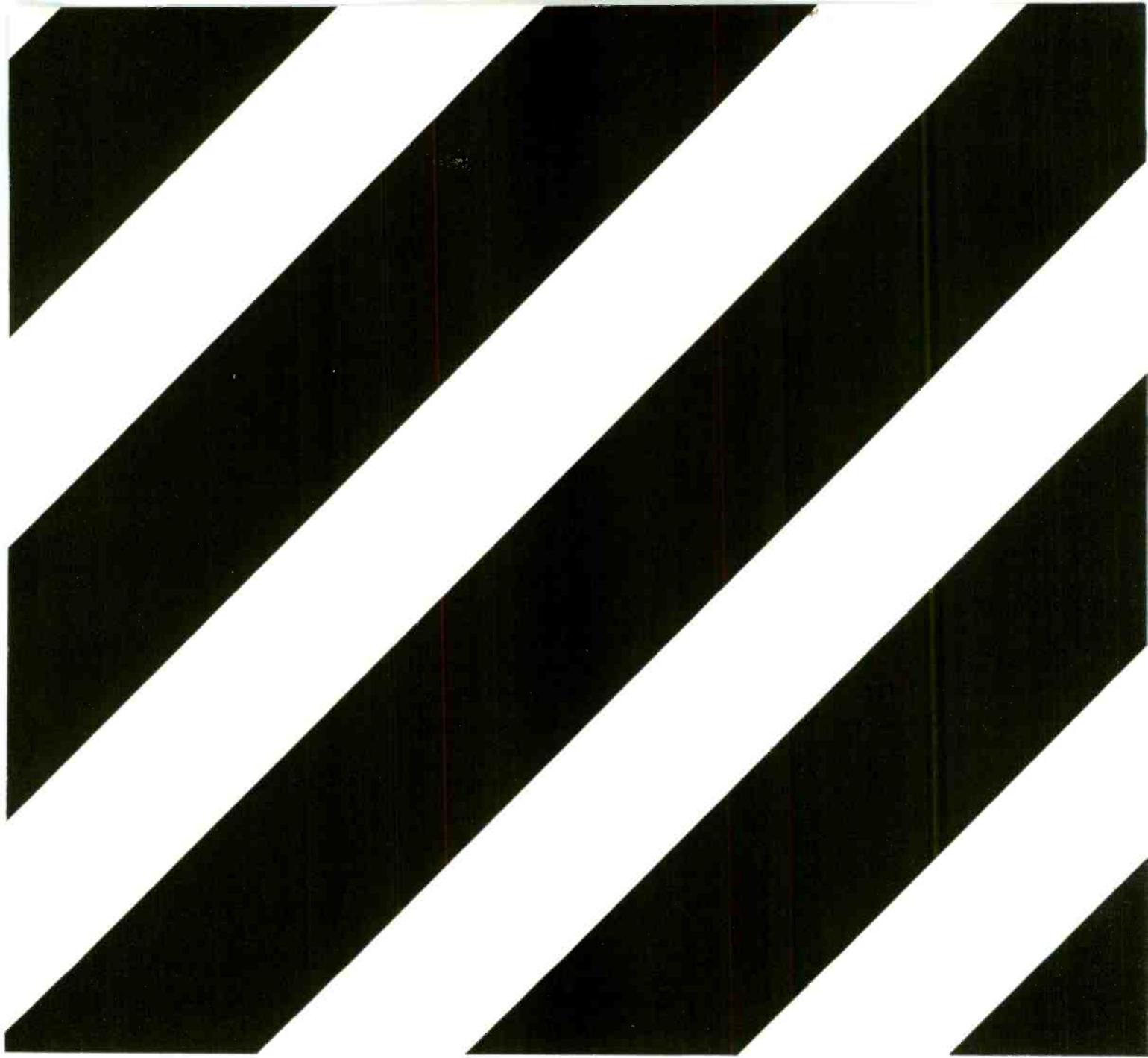
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# NO. 400

## **Guards against cinching**

"Scotch" Brand No. 400 now solves your video tape handling and shipping problems. A new, matte-finish back treatment virtually eliminates cinching, windowing and creasing. Capstan slippage is a thing of the past.



# New "Scotch" Brand Color Video Tape guards itself against damage.

## Guards against scratching.

The exclusive treatment on "Scotch" Brand No. 400 resists scratching, eliminates polyester redeposits on the oxide surface. Prevents the increase of dropouts and effectively extends tape life.

## Guards against dust damage.

This highly conductive treatment reduces static attraction of contaminants that can damage tape and VTR heads. New No. 400 gives you built-in protection, plus performance — the finest value in color video tape.

**3M**  
COMPANY

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO.

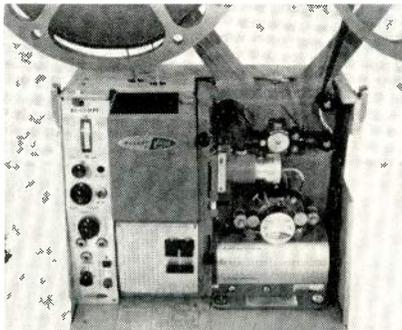


Circle 126 on Reader Service Card

# BROADCAST EQUIPMENT

## Magnetic projector

Model 82-25 MPR optical/magnetic 16mm motion picture projector offers magnetic recording and playback capability in a single unit. Featured are full-power 25-W RMS solid state amplifier, mixing capa-

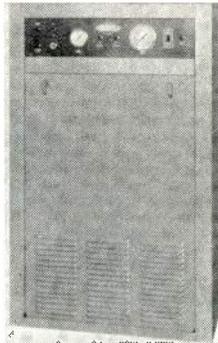


bilities for recording quality sound on film, safety film trips which prevent film damage and color coded threading. The Kalart Co.

*Circle 275 on Reader Service Card*

## Air dryer

Model CAD-1200 oil-less, automatic air dryer provides 12,000 SCFD (14,000 SCFD under emergency conditions) of clean, ultra-dry air for coaxial transmission lines, wave guides, microwave antennae and sage



cables. Unit measures 31 W × 22 D × 50 H in. and weighs 320 lb. Using high-desiccant system of dehydration to guarantee less than two percent rh at 70 degrees F., unit delivers pressures adjustable from 0 to 15 PSIG. The McIntire Co.

*Circle 276 on Reader Service Card*

## Convertible recorder/ reproducer

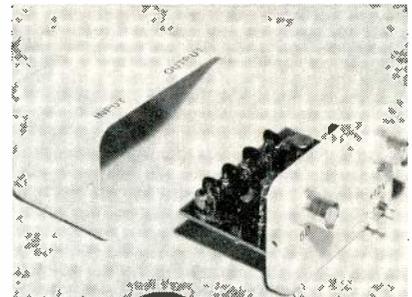
Convertible model of recorder/reproducer can accommodate itself either to 1-in. 8-track or 2-in. 16-track configurations. Two convertible models are available: Model 401 2-in. 16-track console with NAB electronics, for which a 1-in. 8-track head stack assembly is available for converting it to a 1-in.

8-track recorder/reproducer; and Model 401 1-in. 8-track recorder/reproducer which may be converted to 2-in. 16-track with NAB electronics. 3M Company.

*Circle 281 on Reader Service Card*

## Video amplifier

Model C401-A high-gain, broadband video amplifier features 1.0 volt peak-to-peak output capability and 30 db gain over a 200 MHz bandwidth. The device measures 2.75 × 1.75 × 2.12 in., weighs 3.5 oz. and is available with either a



50-ohm or 100-ohm output impedance. Completely solid state, the amplifier operates from a 12-volt DC power source. Conduction Corp.

*Circle 277 on Reader Service Card*

## Tripod

Medium weight VGM-200 tripod is designed for cameras like the Arri 16, BL, 35, Mitchell, Eclair and other medium-weight cameras using long lenses. The VGM-200 has thicker, wider ferrules of polished stainless steel, single-knob leg lock with heavier thread. For less leg twist and more solidity, die-cast tripod shoes are an inch wider at the base with stainless steel shoe points. Legs are straight grained Mountain Ash, mahogany stained and oil treated. VGM-200, Cat. #2252F, with standard Pro Jr.-type fitting, \$135; VGM-200, Cat. #2550, with Ball Head, \$180. Birns & Sawyer, Inc.

*Circle 286 on Reader Service Card*

## Lighting control system

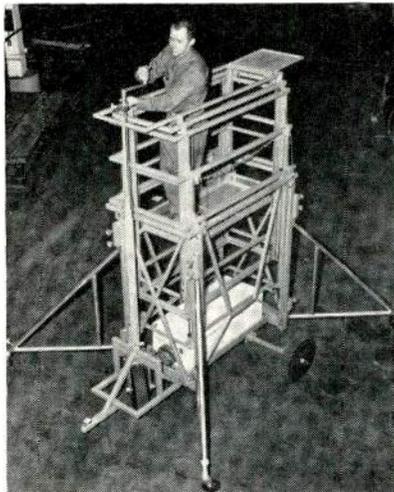
Memo-Q, solid state fully automatic lighting control system, offers hun-

## Mobile scaffold tower

The "Rolls-Rise" Tower is a battery-operated mobile device which enables a man to elevate himself to a working height of 30 ft. The workman can propel the machine manually with one hand while steering with the other without leaving the platform. The system has built-in charger operating from 110-V AC, recharging in less than eight hours. Payload is 500 lb. Accessory items include trailer hitch for work that demands the tower be moved from one job to another over streets or outside buildings, tail and turn indicator lights, rear wheel fenders and a non-conductor fiberglass platform bucket for electrical use. All five models available can be converted from battery to 110-V or 220-V operation. When fully collapsed, the largest tower is 34-in.

wide, 74½-in. long and 78½-in. high. Legs can be adjusted for uneven floors. Mobile-Scaff, Inc.

*Circle 289 on Reader Service Card*





product report  
television instruments

# Total Measurement Capability for NTSC Systems



■ With the introduction of the NEW TYPE 140 NTSC Test Signal Generator, Tektronix now provides measurement capability from signal source to waveform display. ■ Each instrument in the Tektronix television family is designed to satisfy a specific portion of your video measurement requirement — with performance to spare! ■ All of these units provide long-term stability and reliable performance through use of solid-state circuitry and state-of-the-art engineering techniques. ■ Mechanical configurations include rack-mount, cabinet and portable units.

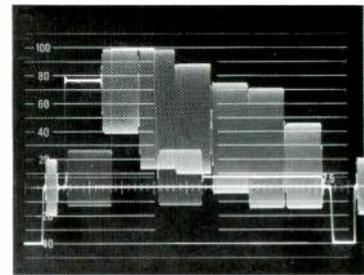
*please turn page for additional information*

# MAKING THE MEASUREMENT

A complete family of television test instruments from Tektronix.

**THE TYPE 140 NTSC TEST SIGNAL GENERATOR** is a compact, solid-state source of high-quality television test signals for 525-line, 60-cycle field NTSC color TV systems. Combined in one compact unit are: ■ **NTSC ENCODED COLOR BARS** with 75% and 100% amplitude, full-field or split-field bars at 10%, 7 1/2% or 0% setup level. ■ **MODULATED STAIRCASE** providing variable APL, 10% to 90% and fixed APL, 50%. The test signal contains 5 steps plus blanking level with subcarrier phase locked to burst. A new signal capability provides a means to check luminance signal distortion caused by rectification of the subcarrier signal. ■ **CONVERGENCE CROSSHATCH** provided for picture monitor linearity evaluation in accord with IRE specification 54 IRE 23.S1 and color picture monitor convergence adjustment. ■ **VERTICAL INTERVAL TEST SIGNALS**, staircase or color bars can be applied to lines 15 through 21 of either or both fields. ■ **EIA COLOR STANDARD AND SYNC GENERATOR** include a temperature controlled color standard with excellent frequency stability. Digital integrated circuits are extensively used to achieve stability, accuracy, and reliability. Outputs are provided of subcarrier frequency, composite sync and blanking, vertical and horizontal drive, burst, composite video and the convergence pattern signal.

140 NTSC Test Signal Generator ..... \$1600  
R140 NTSC Test Signal Generator (includes rackmounting hardware) .... \$1600

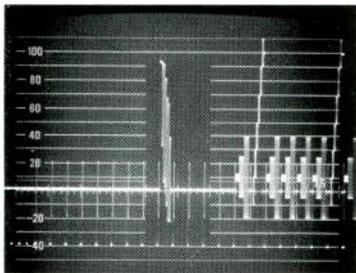


Type 528 Waveform Monitor Display of split-field color bars per EIA Spec. RS189. Signal source — Type 140 NTSC Test Signal Generator.

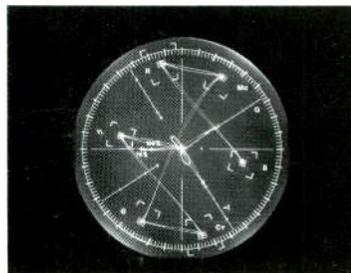
**THE TYPE 528 SOLID-STATE WAVEFORM MONITOR** is ideally suited for monitoring waveforms from camera outputs, system output lines, transmitter input lines, closed-circuit and educational TV systems. ■ This **COMPACT INSTRUMENT** requires only 5 1/4-inches x 8 1/2-inches mounting space. ■ Either of **TWO VIDEO INPUTS** may be viewed on the 8 x 10-cm screen. The signal being displayed is provided at the rear-panel connector for viewing on a picture monitor. ■ Calibrated 1 V and 4 V full-scale deflection factors provide convenient displays of typical video and sync signal levels. A variable control provides uncalibrated full-scale deflection factors from 0.25 V to 4.0 V. **FLAT, IRE, CHROMA, and DIFF GAIN** vertical amplifier response positions permit rapid measurement of waveform characteristics. ■ A **SLOW-ACTING DC RESTORER** maintains a constant back porch level despite changes in signal amplitude, APL, or color burst, and may be turned off when not needed. ■ Sweep modes are: 2-V SWEEP (two field), 2-V MAG-SWEEP (expanded two field), 2-H SWEEP (two line), and 1- $\mu$ s/div SWEEP (calibrated sweep with accuracy within 3%). Internal or external sync is selectable. ■ Provision is made for YRGB and RGB displays. ■ This lightweight waveform monitor converts to a portable unit for field service by adding an optional protective cabinet. An optional Rack Adapter permits side-by-side mounting of two Type 528's.

Type 528 Waveform Monitor .... \$825

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



Color bars inserted during vertical interval. The full field signal is a modulated staircase, variable APL, 90° modulated subcarrier inserted.



Type 520 Vector Display of VITS color bars conforms to EIA Spec. RS189. Signal Source — Type 140 NTSC Test Signal Generator.

**THE TYPE 529 AND RM529 WAVEFORM MONITORS** are general-purpose video monitors with VITS measurement capability. ■ Vertical response characteristics are **HIGH-PASS, LOW-PASS, IEEE and FLAT (8 MHz)**. Vertical sensitivity range is 0.12 V to 1.5 V for full-scale deflection. Full-scale calibration at 0.714 V or 1.00 V is provided. ■ A **VIDEO-OUTPUT AMPLIFIER** supplies video and a brightening pulse to a picture monitor, intensifying the same line(s) displayed on the instrument when using the **LINE SELECTOR**. ■ **DC RESTORATION** maintains the back porch at a constant level and may be turned off for viewing other than video signals. The circuit can easily be modified for sync-tip restoration. ■ **HORIZONTAL SELECTION** provides 2-field or 2-line displays, plus calibrated sweep rates of 0.125 H/cm or 0.25 H/cm. Either calibrated rate may be delayed for line selection. **SWEEP MAGNIFICATION** extends the sweep rate by X5 or X25. **POSITIVE FIELD SELECTION** in the **LINE SELECTOR** mode permits detailed study of any desired line(s), and a front-panel switch selects line 16 through 21 for viewing VIT signals.

Type 529 Waveform Monitor .... \$1115  
Type RM529 Waveform Monitor . \$1165

**THE ALL SOLID-STATE TEKTRONIX TYPE 520 VECTORSCOPE** is designed to measure luminance, hue and saturation of the NTSC composite color television signal. ■ **PUSHBUTTON SWITCHES** permit rapid selection of displays for quick analysis of VIDEO signal characteristics. ■ **DUAL INPUTS** provide time-shared displays for comparison of input-output signal phase and gain distortion. ■ A **CHROMINANCE CHANNEL** demodulates the chrominance signal for use in **VECTOR, LINE SWEEP, R, G, B, I, Q, Differential Gain (dA) and Differential Phase (d $\phi$ )** displays. ■ A **LUMINANCE CHANNEL** separates and displays the luminance (Y) component of the composite color signal. The Y component is combined with the output of the chrominance demodulators for R, G, and B displays at a line rate. ■ A **DIGITAL LINE SELECTOR** permits positive selection of Vertical Interval Test Signals from lines 7 through 22 of either field.

Type 520 NTSC Vectorscope ... \$1875  
Rackmount Type R520 ..... \$1900

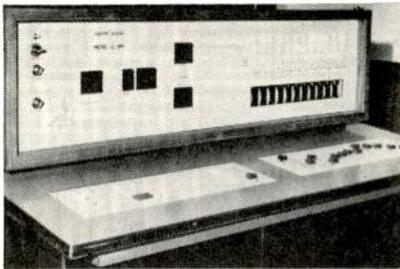


## Tektronix, Inc.

committed to progress in waveform measurement

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dreds of presets. Unlimited number of dimmers may be controlled in a single system and one master button can instantly record all values of a complete light set-up. Different



set-ups can be recalled at will in any order and any scene can be merged directly into another selected scene. Century Lighting Inc.

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## Paging receiver



Model PR-150/2 fm selective-calling, solid state paging-receiver operates in recently FCC-assigned 150 MHz band as well as in 30-50 MHz band. Weighing 7 oz., the receiver measures 2½ W × 5 H × ¾ D in. The crystal-controlled double super-heterodyne receiver offers either beep-only or beep-plus-voice and is available for operation with rechargeable batteries or dry cells. Price is under \$200 and delivery is about 120 days. Minilec Devices, Inc.

Circle 279 on Reader Service Card

## Spotlight

Series 3486, 8 in., 1000-W Fresnelite spotlight for use with Tungsten Halogen (Quartz) lamp is optically engineered for accent, key and



backlighting in television studios. Focal slide is externally operated by means of rapid screw-feed for easy

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## BUILDING BLOCKS TO SOUND SYSTEMS



## The PRO 12 Tape Recorder: industrial reliability, studio performance

The PRO 12 deserves your special consideration. It is the finest new portable professional tape recorder on the market  Solid state  Portable/Compact  Twin-track mono; dual half track; stereo models  Special version for four-track mono and stereo  Semi-servo speed control  Mixer/Preamp with three inputs for each channel  Built-in facilities for mixing two inputs  Test switch for lineup  Multi-play and Sound on Sound recording  Switchable monitoring of recording signal dur-

ing recording—Before and After tape  Built-in monitor amplifier with loudspeaker  Stereo headphone monitoring  Cue and dubbing facilities  Tape-lifters  End-of-tape and tapebreak switch  Pause button  Remote control facilities  For full data, contact the innovators.

**PHILIPS**

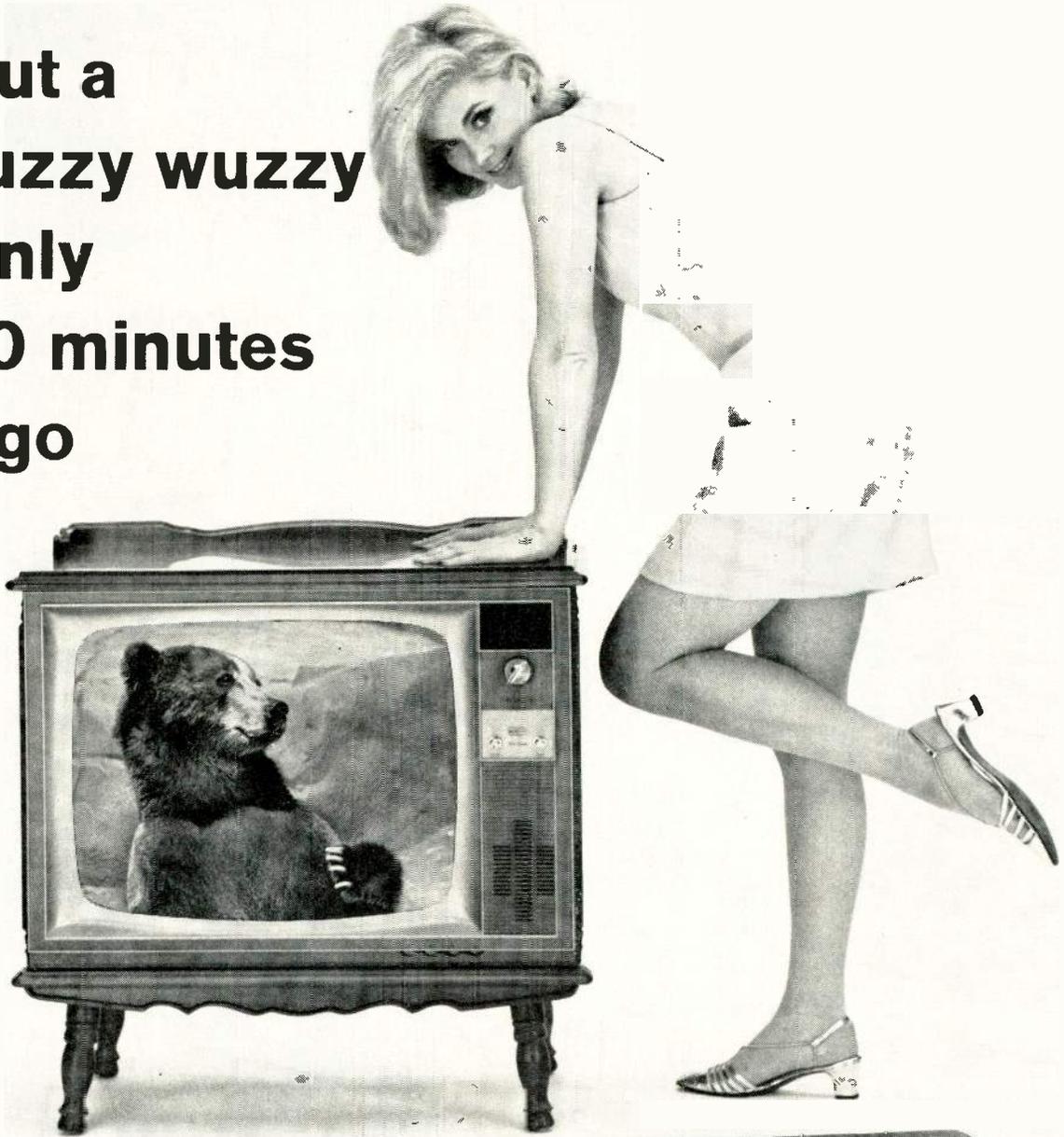
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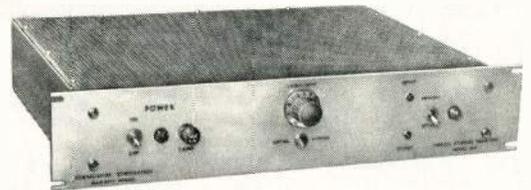
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# SHARP!

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fuzzy wuzzy  
only  
10 minutes  
ago



In a matter of minutes you can end forever fuzziness and colors that bleed. That's how quickly Dynasciences' Vertical Aperture Equalizer (VAE) can be installed to bring everything you transmit into clear sharp focus. Surprisingly low in price, the VAE enables your viewers to see the sparkle of the eyes, highlights of the hair and delicate contours of the performer's mouth. VAE makes you the bright spot on your viewers' dials. The happy effect on your ratings is one advantage you can't bear to miss.



**VERTICAL APERTURE EQUALIZER**  
(Model 468) — Corrects for loss of fine detail caused by charge bleeding in the image tube and the finite size of scanning spot.

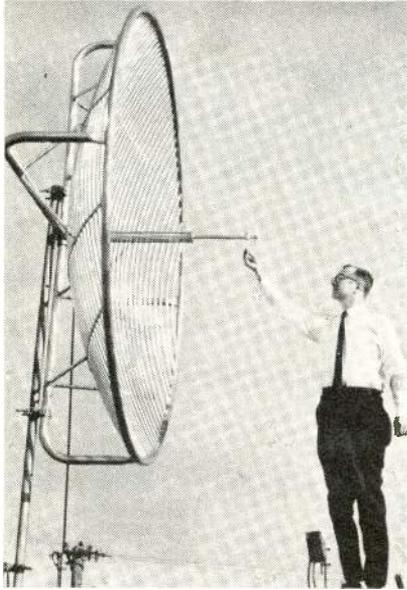
Write or call collect (215) 643-0250 for all the facts on Dynasciences' VAE, today.

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Township Line Road, Blue Bell, Pa. 19422 Phone: (215) 643-0250 Cable: DYNACO.

focusing from flood to spot position. Constructed of corrugated steel with flow-through ventilation and front access door. Century Lighting, Inc. Circle 280 on Reader Service Card

## Microwave grid parabola

Model P-2096F 8-ft diameter microwave multi-element grid parabola antenna is designed for point-to-point relay operation at any specified frequency between 400



MHz and 2.5 GHz. Low equivalent cross-sectional area permits addition of circuits to existing towers without modification or structural change. Standard termination is a 1/8-in. EIA swivel flange and type N termination is available. A heated version is available with factory-installed de-icing cables at the back of each grid element for installation in areas where icing is a problem. Mark Products Co.

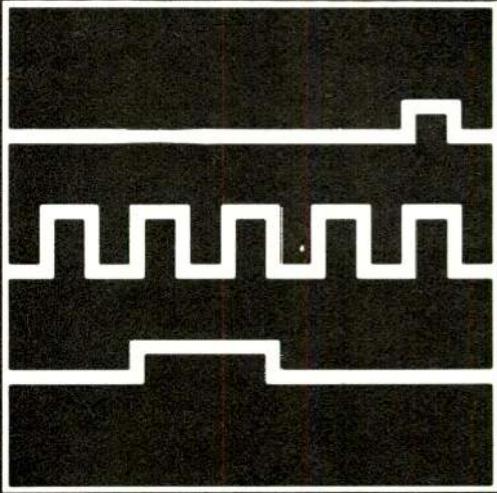
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## Video tape recorder

Model EV-310 Videocorder video tape recorder uses one-in. video tape and records any composite TV signal with a 60-field frequency, in-



May, 1969—BM/E



## DIGILOGIC

Discover how digital computer techniques have revolutionized television broadcast equipment.

From:



**SARKES TARZIAN SYSTEMS**  
Bloomington, Indiana

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## BUILDING BLOCKS TO PROFESSIONAL TV SYSTEMS



## Multi-Purpose TV Camera System for Entertainment, Education, Science, Industry

A new camera system with many exclusive features not found in comparably priced equipment  Plug-in professional design for universal applications in the broadcast, educational, industrial, scientific, medical and commercial fields. An excellent low-cost preset announcer camera for TV studios, animating systems and more  Choice of Plumbicon® or Vidicon camera tubes (Vidicon version excellent in film islands)  Control Unit handles either, permitting choice of best

sensor for each portion of a multi-camera TV system  Solid-state circuitry, from the Plumbicon tube innovators, achieves optimum performance with this superior pick-up tube  Higher scan rate and resolution available for special applications  For data, contact the innovators.

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A NORTH AMERICAN PHILIPS COMPANY  
® Trademark for television camera tubes.

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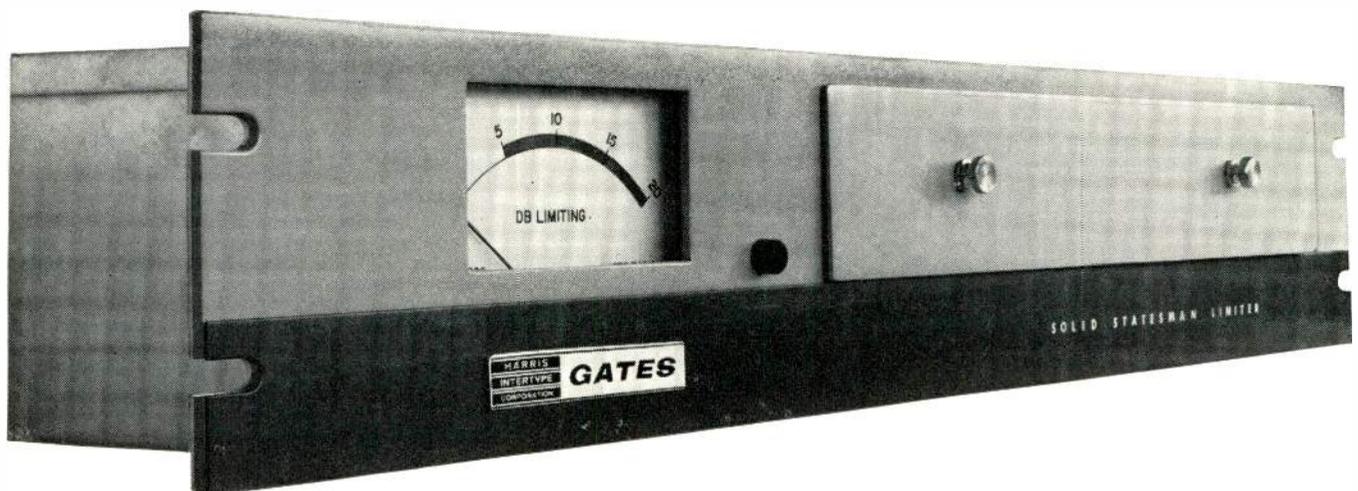
# UP WITH AVERAGE MODULATION. INCREASE SIGNAL EFFICIENCY.

That's what Gates Solid Statesman Limiting Amplifier will do for your station. It brings broadcast signals up to maximum efficiency by controlling audio levels instantaneously, automatically.

The Gates Limiter attacks modulation problems — in just 3 to 5 microseconds (without audible clipping) and a 30:1 compression ratio allows 99.5% modulation.

Asymmetrical limiting is provided for AM stations, permitting positive peak modulation levels of 110% or 120% with negative peaks limited to 100%, thus producing a louder sounding signal.

Want to hear more? Write or call for full information. Gates Radio Company, a Division of Harris-Intertype Corporation, Quincy, Illinois 62301. Telephone (217) 222-8200.

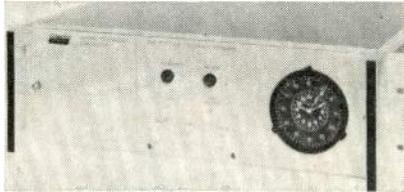


Circle 133 on Reader Service Card

cluding random-interlace signals. The portable recorder records through a rotary, two-head scan system. Time is 60 minutes on a 2460-ft reel of tape. Tapes are interchangeable between all EV-310, EV-210 and EV-200 Series Video-corders. Sony Corp. of America.  
*Circle 283 on Reader Service Card*

### Frequency standard

Model 304D rubidium gas cell frequency standard combines superior long term stability and short term stability. Instrument incorporates design concepts and technologies de-



veloped for spacecraft environments. Integral time scale selector is featured, as well as an optional internal standby battery and charger. Output at one pulse-per-second and a 24 hour time-of-day readout are also available as options. \$7300. Tracor, Inc.

*Circle 284 on Reader Service Card*

### Lens for low light

"Cat's-Eye" lens is first in series of special items for CCTV and motion picture fields. Because of its wide aperture (f/0.95), the lens has ad-



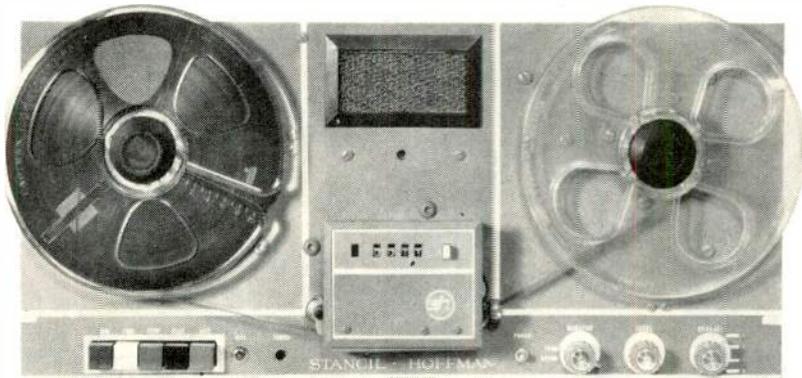
vantages for applications involving use of television under low-light conditions. Lens will fit any standard vidicon camera or 16mm motion picture camera. \$125. Lomax, Inc.  
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### Remote control system

Model PBR-30 solid state 30-channel remote control system for a-m, fm and TV applications handles up to 60 individual control functions. Two versions of this system are available: PBR-30W for telephone line interconnection and the PBR-30R for radio (STL) interconnection. Standard radio version includes control subcarrier gen-

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## STANCIL-HOFFMAN R-70 24 HR. 4 TRACK RECORDER



Here's a full 24 hour, 4 track logger that's so compact and versatile you can take it anywhere to handle any assignment with 100% dependability or rack mount it in the studio. A remarkable new series of silicon transistor plug-in amplifiers makes the R-70 the most versatile ever—AGC, recall, full remote or automatic control, stereo, fail-safe, synchronous time injection, etc. 4 channels round the clock, complete on just one 7" reel of 1/4" tape.

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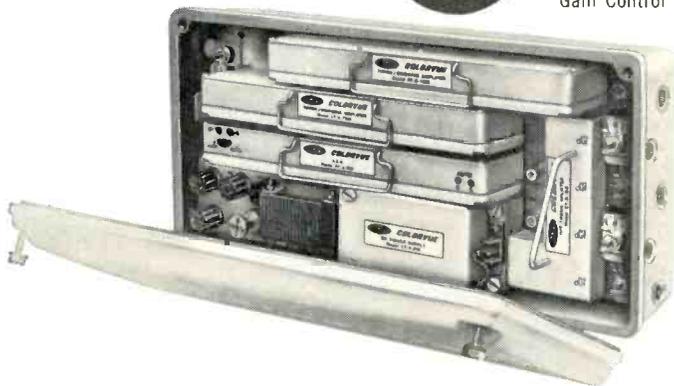
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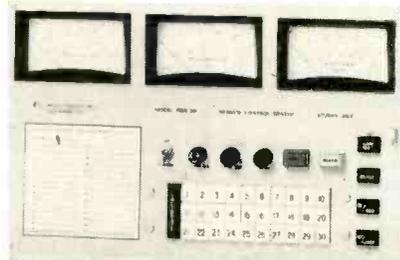


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**AMERICAN ELECTRONIC LABORATORIES, INC.**  
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C-101

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erator and detector for use with the firm's aural STL's. Five-input alarm system is integral part. Moseley Associates, Inc.

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## Cardioid mike



Model 2850 miniature, dynamic cardioid microphone weighs less than 3 oz. and may be used in the hand, on a stand, or as a lavalier. Unit is six-in. long, has a head diameter of 1-13/16-in., has a housing molded of tough Cyclocac and has a 70-12,000 Hz frequency response range. At high impedance, the output level is -60 dB; at 150 ohm impedance output is -62 dB. Microphone is supplied with a 12-ft cable. \$40.00. The Turner Co.

Circle 288 on Reader Service Card

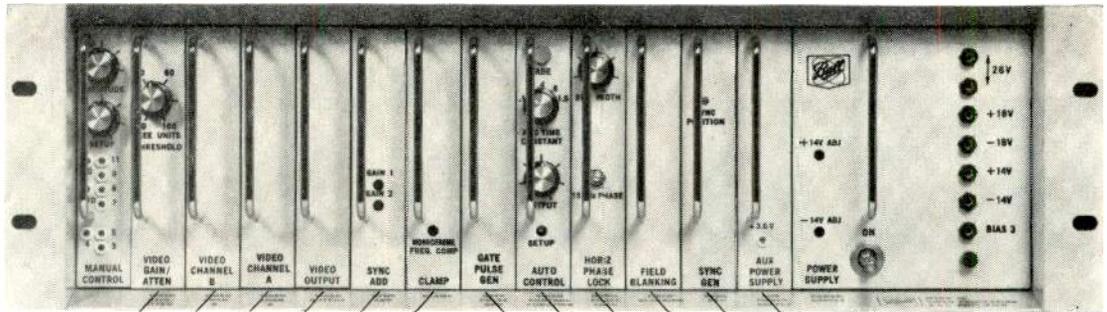
## Television modulator

Model BVM solid state modulator receives video and audio and converts it for distribution through an rf system. Providing transmission in both monochrome and color, the BVM can be employed in commercial broadcast, educational/instructional television, cable, translator, or closed circuit systems. Designed for mounting in standard 19-in. racks, the BVM includes an audio modulation meter as well as a built-in chopper and built-in test tone. Carrier frequency tolerance has been set at  $\pm .002$  percent with  $\pm .0005$  percent available on special order. Emcee Broadcast Products.

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## TV stabilizer system

Television frequency stabilizer system permits TV stations to main-



VIDEO GAIN/ATTEN  
 VIDEO CHAN B  
 VIDEO CHAN A  
 VIDEO OUTPUT  
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AUX POWER SUPPLY  
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 you can  
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 system on automatic  
 gain control for 30 days-  
**FREE!**



The Mark 10-B Video Processing and AGC Amplifier corrects or minimizes "a baker's dozen" of common video disorders — color or black and white program signals—all in one reliable, easy-to-operate, all-solid-state package.

The Mark 10-B automatically corrects input video level variations of  $\pm 6$  dB. It also automatically adjusts to maintain constant set-up for input set-up variations of up to  $\pm 25$  IEEE units.

It suppresses up to 3 V p-p 60 Hz hum by 40 dB. It minimizes undershoots and overshoots without affecting chroma. It removes front and back porch noise. It corrects distorted timing information in the horizontal blanking interval.

The Mark 10-B continues to generate composite sync when input video signal is lost.

It replaces lost or distorted vertical sync and equalizing pulses. It reshapes distorted color burst to EIA standards. It permits independent chroma amplitude adjustment of  $\pm 3$  dB. It allows adjustment of  $\pm 12$  degrees of burst phase adjustment. And, that's saying a lot!

**We know that manufacturers' claims are often misleading. We also know that evaluations must be made in *your* system, by you, to be effective. So, we would like to loan you a Mark 10-B Amplifier for 30 days — FREE! Then you can check the amplifier's utility value and technical performance against your special problems.**

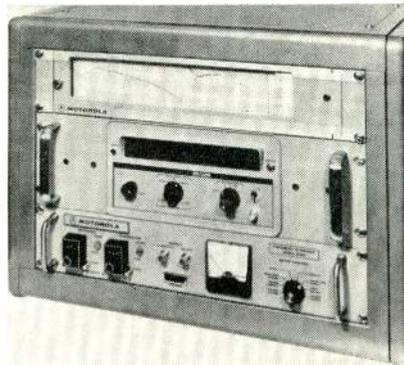
**For FREE use of a Mark 10-B Amplifier for 30 days, send your request—on your company letterhead—to Ball Brothers Research Corporation, Boulder, Colorado 80302.**

**Ball Brothers Research Corporation, Boulder, Colorado 80302**

BB9/5

Circle 137 on Reader Service Card

tain and measure accurate prescribed frequencies—within one cycle—and precise video carrier off-



set frequencies minimizing co-channel interference. System consists of high precision oscillator, strip chart recording receiver which continuously monitors U.S. standard station WWVB in Boulder, Colorado, and an electronic counter showing station's output at any given time. Transmitter stability is as much as 10,000 times FCC requirement of  $\pm 1000\text{Hz}$ . Drift rate on channel two station is less than 0.2Hz per week at carrier frequency. Motorola Communications and Electronics, Inc.

Circle 291 on Reader Service Card

## Lens for CCTV

Model 914 9mm lens, designed to improve closed circuit TV techniques, provides wide angle coverage of more than 82 degrees. Lens



fits standard C mounts and is said to fit almost all CCTV cameras. Cost is under \$200. GBC Closed Circuit TV Corp.

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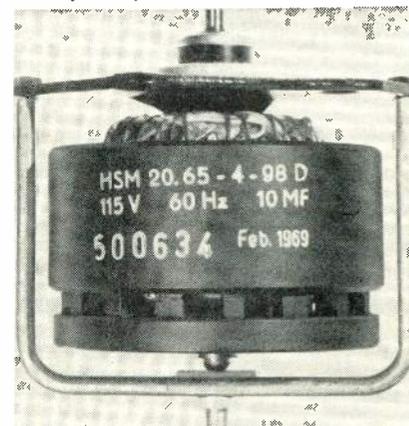
## Vhf receiver

Type 555 vhf receiver, designed for specialized surveillance and monitoring applications, provides reception of a-m, fm and cw signals in the 90- to 180-MHz frequency range. Since the fm signals normally encountered in this frequency band are of low deviation, a high slope fm detector is provided. Bandwidths of 10 KHz and 20 KHz are provided by mechanical filters. Signal monitor's dispersion is adjustable from 0- to 300-KHz and its resolution is 2.5 KHz. Watkins-Johnson.

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## High-torque motor

High-torque motor is to be standard equipment in all Series 700 units. Heavy duty motor is said to have



3- $\frac{3}{4}$  times the torque of the older one. It is also available for direct replacement in all Series 600 and 700 units. Tapecaster TCM.

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# A STAR IS BORN

## FILMLINE'S MODEL FE-50

### A Processor for Ektachrome Film

Processes 16mm Color Emulsions at 50 FPM.



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FROM  
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Milford, Conn.

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ually white machine is in operation, without breaking film or causing lower film assemblies to rise. Provisions for extended development to increase ASA indexes to 250 and higher are incorporated. Machine threadup allows use of standard ASA indexes or accelerated indexes because of Filmline's Film transport system features.

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Now available: Filmline FE-30 Ektachrome Processor. Speed — 30 FPM. Complete with Replenishment System . . . \$15,750. F.O.B. Milford, Conn.

For more details write: Dept. BMMa-69



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# NAMES

IN THE NEWS



G. E. Jacob

R. A. Powell

**Gerald W. Jacob**, former engineering manager of systems management division, Sperry Rand Corp., has been named vice president of engineering, Ccmfax Communications Corp.

Radio Engineering Laboratories' President Frank A. Gunther has announced the appointment of **Richard A. Powell** as director of marketing.

**George L. Abithoul**, a vice president of Audio Magnetics Corp., has been elected president of Audio International, newly-formed division of the Southern California magnetic recording tape manufacturer.

**Bruce L. Birchard**, who established Sony Corporation of America's video tape recorder division in the U.S., has resigned as vice president, VTR division, and will join Computer Image Corp. as executive vice president.

**Murray Fiebert** has been named corporate manager of the electronics group of Instrument Systems Corp., according to Bernard R. Garrett, executive vice president.

**Lloyd F. Taylor**, president of one of the Corporation's principle subsidiaries, has been elected president of Standard Kollsman Industries, Inc.

Thomas & Betts Corporation President Robert McK. Thomas has announced the election of **Horace C. Moses, Jr.**, to the post of senior commercial vice president.

**John S. Baumann** has been appointed broadcast equipment manager of Electronic Engineering Co. of California.

**Fred E. Walker** has been named president of the broadcasting and CATV division of Reeves Broadcasting Corp.

**James D. Secrest** received the EIA Medal of Honor for 1969 at the Association's government-industry dinner in Washington, D.C.

**W. Noel Eldred** and **Ralph E. Lee** have been elected to Hewlett-Packard Company's board of directors. **Donald E. LeBrun** has been named director of design engineering for Bell & Howell's video and audio.

**Donald Sussman**, former production manager for NET's public affair programming, has been named assistant director for operations.

**Robert McK. Thomas, Jr.** has been elected board chairman and **J. David Parkinson** has been elected president of Westline Products Company.

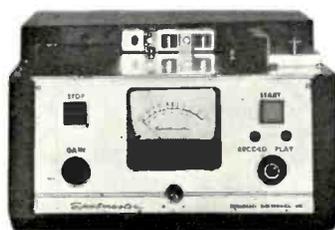
**James C. Hirsch**, vice president for development and public affairs of the Television Bureau of Advertis-

*continued on page 86*

The Spotlight Is on

*Spotmaster*

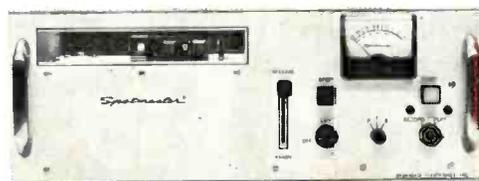
Superior Tape Cartridge Recording and Playback Equipment



Model 500 C



Model 400 A



Model 500 CR

**COMPACT 500 C SERIES**—Completely solid state, handsome 500 C equipment features functional styling and ease of operation, modular design, choice of 1, 2, or 3 automatic electronic cueing tones, automatic record pre-set, separate record and play heads, A-B monitoring, biased cue recording, triple zener controlled power supply, transformer output . . . adding up to pushbutton broadcasting at its finest. Specs and performance equal or exceed NAB standards. Record-play and playback-only models are available.

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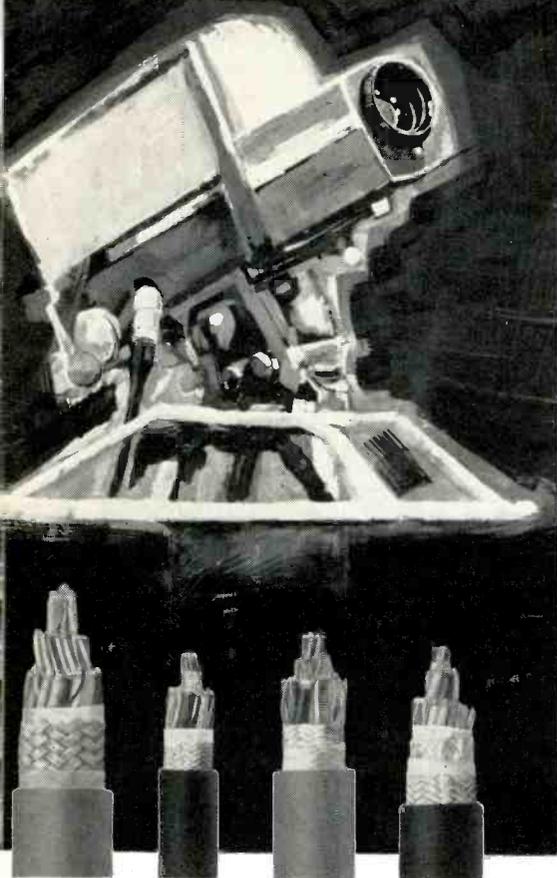
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**NAB Transmitters**

*Continued from page 48*

meters, filters to isolate the sub-carrier and video, and front-panel input level controls.

Continental showed its highly successful 317C—a 50-kW a-m transmitter already well proven in the field. Granger's Bauer model 602 is an all-new fm transmitter with a solid-state direct fm exciter, pushbutton stereo control, fail-safe system for extra reliability, full metering and full remote capability.

EMCEE (Electronics, Missiles and Communications, Inc.) introduced a new translator—the model HTUC-100. The system is designed for superior color performance, and has separate video and audio channels. It also features separate AGC on video and audio carriers, individual output power controls, separate metering for video and audio, built-in diplexer and compensation for selective fading.

Visual featured the next generation uhf TV transmitter—a high-powered 55-kilowatt, dubbed the model VTU-55A. The unit is called more reliable, compact and economical to operate. Features include self-contained signal processing and color correction, sideband filtering, diplexing, circuit breakers and power distribution, built-in dummy load and rf patch panel.

A new a-m STL was presented by Marti Electronics. The complete package includes transmitter, receiver, antennas with radomes, transmission line and connectors. The system features include all-solid-state construction with integrated circuits, FETs and silicon transistors. The system has sub-channels available for remote control and talk circuit, and has self-metered circuits for easy adjustment and maintenance.

Broadcast antennas and tower structures were featured by Dresser Crane with its multiple candelabra tower, Ft. Worth Tower Co. now also providing tropo scatter structures, Rohn Systems and its super-tall towers.

Radiators were shown by Collins—its circularly-polarized fm antenna elements, Jampro—with a line of variously polarized fm antennas, and Alford with its type 4730 delta dipole for vhf TV service. Emphasis this year seemed to be more on height than on improved sophistication.

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## NAMES

*Continued from page 83*

ing, has resigned to establish his own consulting service in fields of communications, marketing and public affairs.

**Richard L. Geismar** has been elected president and a director of Reeves Broadcasting Corp.

**Robert C. Berman** has been appointed director of industrial engineering for Raytheon Co.

## NAB Audio

*Continued from page 50*

was shown by Johnson Electronics. The "Johnson-Aire" audio amplifier model 13MA1 is especially designed for background music systems. It features a two-channel mixer/power amplifier, ungrounded 25-volt and 70-volt outputs, external program gain control, external microphone control and a choice of plug-in accessories. Amplifier power output is 13 watts rms with less than 3% total harmonic distortion.

A new Bauer custom console,

shown by Granger Associates, will accept up to 12 channels, including 12 preamps, one booster amplifier, one program amp and power supply. The unit is available as either a stereo or mono unit. Special features include automatic muting and cueing positions and slider pots.

A new broadcast audio console, the 212V-1, was shown by Collins. This unit provides complete, simultaneous control of broadcasting and auditioning from any combination of eight out of 28 possible inputs. It can be used in a-m, fm and TV broadcasting. The console has six identical preamps, plus two other preamps. Inputs are through 11-position input switches allowing selection among 22 remote lines or other program sources.

Solid-state mixing desk (MD-range) was exhibited by Philips. Using slider pots and plenty of pushbutton selectors, the MD series is built up from standardized basic units.

Also new on the floor was Altec Lansing's 9300A recording console. The unit has 24 inputs and 24 outputs for 24-channel recording. It uses a solid-state volume limiting system instead of the conventional VU meters. Also new on

the floor was a custom multi-channel console by RCA.

Shure Brothers introduced the SM53—a brand new cardioid dynamic microphone. Frequency responses is 70 to 16,000 Hertz, and response pickup pattern is uniform with frequency. The slim case styling of the mike will likely make it popular for hand-held use. Weight without cable is eight ounces. Price is \$150.

Another new microphone entry is a wireless rf job by Vega. Called the Professional 55, the unit is designed to provide 55-dB improvement over existing low-frequency systems. Transmitter operates between 150-200 MHz and is crystal-controlled. It meets FCC Part 74 and 91 specs, and uses frequency modulation. It will accept a variety of microphones or instrument pickups.

Special-purpose units were introduced by CBS Labs and Fairchild. CBS introduced its model 450 dynamic presence equalizer, designed to enhance that nebulous quality sometimes called "presence." Fairchild exhibited a brand-new model 659 reverb unit, with many improvements over previous models.

## the growing line of Melcor Equalizers



Melcor Electronics manufactures an extensive line of Audio Products for the Professional user. Standard Active Lossless Audio Equalizers currently available feature continuous equalization control; stepped equalization; shelf or gaussian frequency response; independent multiple frequency ranges; balanced and or unbalanced input and output connections; high and low level input and output signal capability; bridging or terminated inputs. All units have ultra low noise and negligible distortion. New units featuring sharp bandpass filtering are in development.

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| <b>GE-20</b> Graphic Equalizer — Rack Mount (not shown) |   |

Write for descriptive literature on our lossless Equalizers

## MELCOR ELECTRONICS CORPORATION

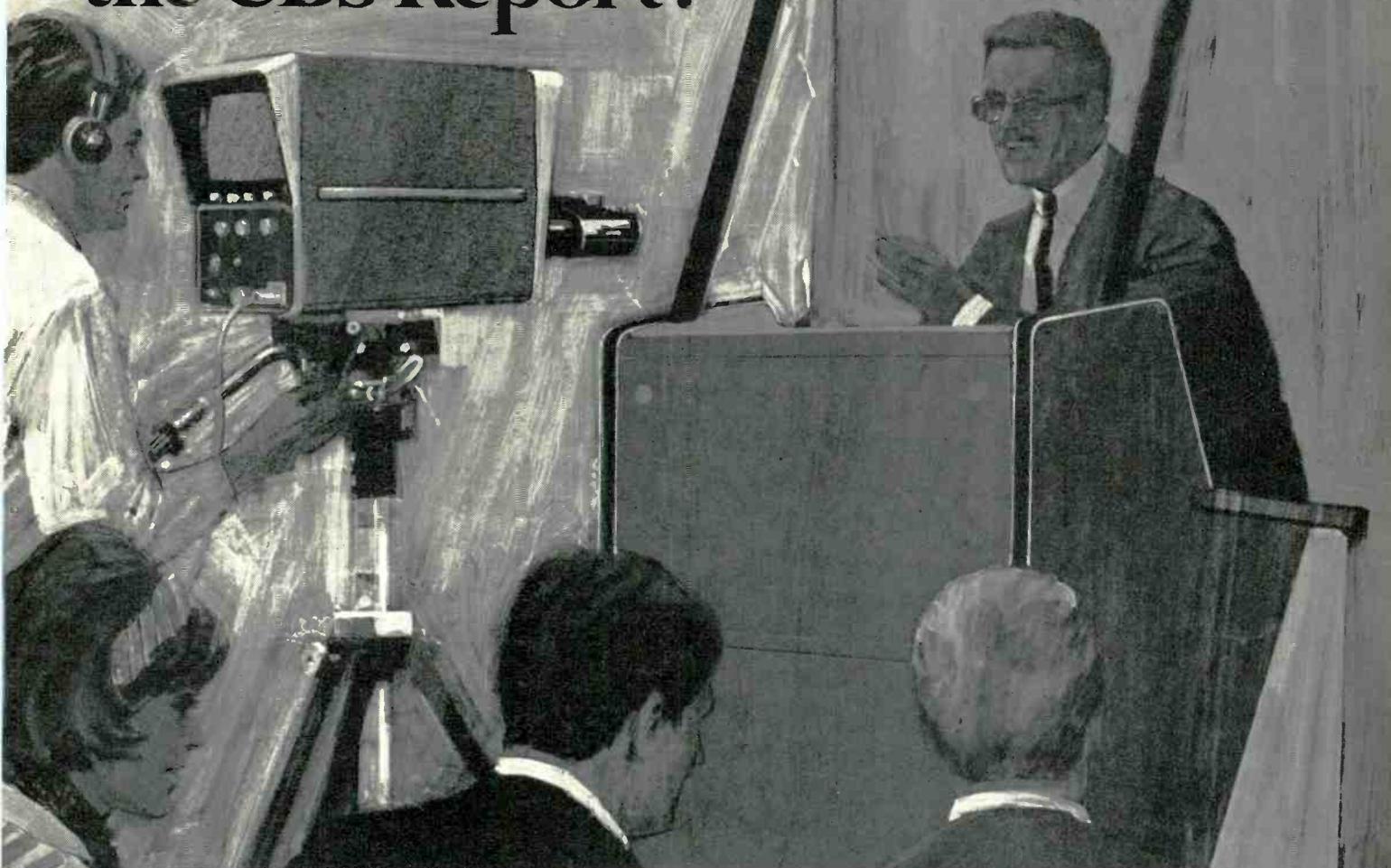
AMPLIFIERS FOR INDUSTRY

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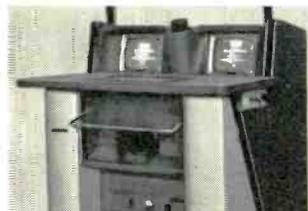
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# How do you make a one man show look like the CBS Report?

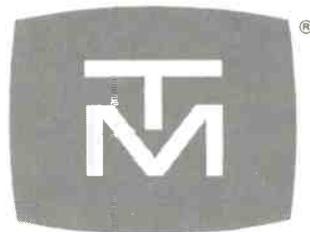


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## Ask Alphamatic News™

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# FCC ACTIONS

**License renewal** of WCCO-TV, Minneapolis, Minn., has been withheld pending examination of charges of "undue concentration" in control of mass media, use of affiliated newspapers and ownership of teams to obtain broadcast rights to pro sports and "reciprocal advantages" in newspaper-station combination.

**Withholding of license renewal** for KRON-TV, San Francisco, Calif., has been announced. Issues to be developed in hearings include: undue concentration of media control, monopolistic practices in newspaper field and station "managing" or "slanting" news.

**Assignment** of the WTRF-FM-TV, Wheeling, W. Va., licenses by WTRF-TV Inc. to Forward Teleproductions Inc. has been approved subject to condition that if For-

ward's acquisition is inconsistent with the resolution of rule making in Docket 18110, it will surrender or dispose of one of the licenses. Sale price for two Wheel-stations is \$7,250,000.

**Notification** has been given to Stephen Van Sadler, licensee of a-m station KVLB, Cleveland Texas, of apparent liability for forfeiture of \$2000 for failure to comply with terms of its license and for 31 rule violations. KVLB's station authorization requires that field intensity at each of monitoring points be measured at least once every seven days.

**Renewal of licenses** request of Pacifica Foundation for its non-commercial fm stations KPFA and KPFB, Berkeley, and KPFK, Los Angeles, Calif., have been granted. Renewal period will expire Dec. 1, 1971.

**The McLendon Corp.**, licensee of a-m station WNUS at Chicago, Ill., has been notified of its apparent liability for forfeiture of \$5000 for violations of terms of the station's

license and Section 73.87 of the Rules. The station operated with its daytime directional pattern beginning at 4:00 a.m. instead of the average hours of local sunrise as specified in its license.

**Applications** of the National Broadcasting Co., for renewal of licenses of its owned-and-operated stations KNBR-AM and KNBR-FM, San Francisco, Calif., have been granted.

**The license** of radio station WKIT-FM, Wilmington, Ohio, has been revoked because of failure to provide broadcast service and because of the aeronautical hazard caused by the station tower. WKIT had been silent without authority since Nov. 27, 1968, in violation of Section 73.261 of the Rules.

**Application** by Columbia Broadcasting System, Inc., licensee of WBBM, Chicago, for review of a Review Board Decision granting application by Circle L, Inc., for a new a-m station in Reno, Nevada, has been denied. The Circle L grant is for a Class II-A station on

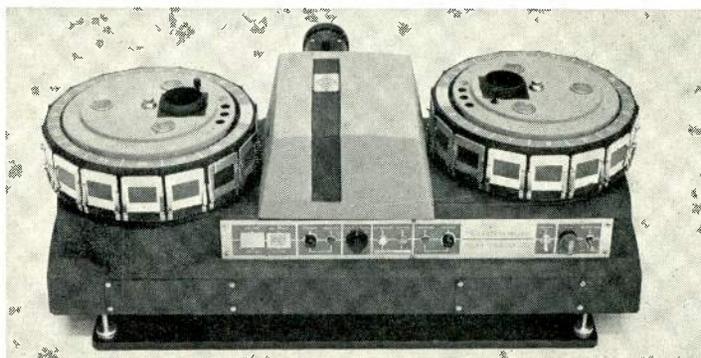
## 2x2 slide projectors for the television film chain

by SELECTROSLIDE

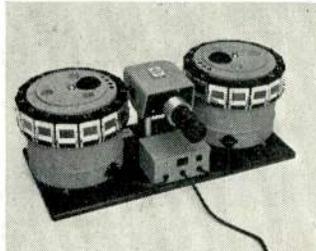
Spindler & Sauppe offers the broadest line of slide projectors for the television industry . . . seven models in all. There's one to fit your requirements exactly: color or monochrome; uniplex or multiplex; forward or reverse actuation; sequential or random access operation; 16-slide to 96-slide capacity. All built to the highest professional standards. Write for complete information.



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**MODEL SLX-TV:** 96 slide, random access. **SLS-TV:** 48 slide, random access. **SLD-TV:** 96 slide, sequential. **SL-TV:** 48 slide, sequential. **SLR-TV:** 48 slide, sequential forward/reverse. All for monochrome or color chains.

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\*Here's why:

The lubricated coating is permanently bonded to the base. Can't wear off and cause jamming; won't dirty heads and capstans. It provides excellent high end response and signal-to-noise ratio. The long wear, high temperature binder won't soften or gum up heads.

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

Circle 146 on Reader Service Card

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

Why not find out about Audiotape Formula 17 for yourself.

**audiopak<sup>®</sup>**

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

780 KHz, the clear frequency on which WBBM operates.

**Assignment** of the license of KRTV, channel 3, Great Falls, Montana, from Snyder & Associates to Garryowen Cascade TV, Inc., has been approved. By the grant, Joseph S. Sample, 99.982 percent owner, is acquiring his third TV station of the eight stations operating in Montana. Selling price for the station is \$1,070,000 cash.

**An opinion** has been prepared denying application for consent to assignment of the license of standard broadcast station WCAM, Camden, N.J., from the City of Camden to The McLendon Corp. An Initial Decision released in January had proposed grant of the application.

**TV station KPIX**, San Francisco, has afforded "reasonable opportunity" for presenting opposing views to a disputed broadcast by California Governor Reagan, according to a letter sent by FCC Chief of Complaints and Compliance Division William B. Ray to the Boalt Hall Student Association of the Boalt Hall School of Law, Univer-

sity of California at Berkeley.

**An application** by Voice of The New South, Inc. for a construction permit to operate station WNSL, Laurel, Miss., nighttime, has been denied in an initial decision.

**Petition** of Norwood J. Patterson, Hillsborough, Calif., asking the Commission either to hold in abeyance or to dismiss the license renewal applications of Storer Broadcasting Co. for stations KGBS-AM-FM, in Los Angeles, has been dismissed. The FCC said Patterson alleged that Storer had agreed to sell him the stations for \$2,300,000 in a contract of May 29, 1968; that Storer now purports to rescind the contract; and that he will file suit in California seeking to compel Storer to honor it.

**Failure to file** financial reports has incurred \$250 fines on a-m stations WJPW, Rockford, Mich., and WNOP, Newport, Kentucky.

**Suspended for six months** is the radio-telephone first class operator's license of Robert Allen Veatch, San Bernardino, California, for transmission on October 27, 1968,

of an "obscene stag" film from KPLM-TV, Palm Springs, Calif., to CATV systems in the Coachella Valley.

**Dismissal of the renewal** application of standard broadcast station KARA, Albuquerque, New Mexico, and deletion of its call letters, has been affirmed. Dismissal action was prompted by facts that the station had been silent for six months and that principal stockholder, John Gallagher, did not intend to resume operation.

**New York City television stations** WNBC-TV and WNEW-TV have been called on to provide "greater effort" in their presentation of anti-smoking spots during maximum viewing periods.

**Forfeiture of \$1000** against Stereophonic Alaska, Inc., licensee of station KAMU-FM, Anchorage, Alaska, has been ordered. Notice of apparent liability was issued Sept. 17, 1968, for violation of Section 73.217 of the Rules in that licensee operated KAMU-FM without program test authority from July 5 to Sept. 19, 1967 and from Nov. 2 to January 23, 1968.

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## Tapecaster Obsoletes Competition

with new **SUPER-TORQUE** hysteresis synchronous motor

New **SUPER-TORQUE** motor represents a significant breakthrough in professional tape cartridge machine design and promises far better performance with years of trouble-free operation.

- Twice the weight
- 375% higher torque
- Rated continuous duty
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- May be oiled without disassembly



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"Don't buy a cartridge machine with built-in obsolescence"



Circle 147 on Reader Service Card

# NEW LIT

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

**Discussion of pitfalls** in accurate measurement of peak envelope power of video, a-m and other envelope modifying modulations is subject of note from Bird. **200**

**Voltage stabilizers** and reference tubes leaflet (201) and "1969 Equivalents Index," (202) reference booklet listing nearly 2000 electron tubes for which equivalents are made by English Electric Valve, are available.

**Silicon-controlled rectifier** regulated dc power supplies are the subject of a bulletin from Sola. **203**

**Thousands of individual** connectors, sockets, coaxial cable, switches and twin lead are described in catalog from Amphenol. **204**

**Reference table** in wall chart form is available from Precision Equipment. Included are difficult-to-find conversions. **205**

**Accessories for videotape recording** and closed circuit TV systems are described in brochure from Concord Communications Systems. **206**

**SRM line of miniature rf connectors** is delineated in Sealectro Corp.'s four-page catalog. **207**

**"J" series printed circuit connectors** are featured in catalog sheet from Viking Industries. **208**

**Specifications and application material** on double-balanced mixers, hybrids, power dividers, single-balanced mixers are included in six-page catalog from Relcom. **209**

**Ordinate Holding Switch**, matrix switching device, manufactured by Telefunken and marketed by Cunningham, is described in four-page bulletin. **210**

**EV-310 Videocorder** video tape recorder and the CLP-1B Video Color Pack are delineated in data sheets from Sony Corp. **211**

**CATV equipment** and components, 1400 Series, is described in catalog from Essex Electronic Systems. **212**

**Audio connectors**, standard microphone connectors, adapters, rf connectors, y connectors, ac receptacles, are discussed in catalog C-502b from Switchcraft, Inc. **213**

## AN AD ABOUT THE OTHER AD ON THIS PAGE.

This is the most expensive turntable you can buy.



Also the cheapest.

At \$1350, the EMT-930st Turntable costs considerably more than any other turntable. But, for your money, you get a precision-made turntable that really slashes maintenance costs because it's virtually trouble-free. ("Still in excellent condition despite ten years of hard use," says one pleased radio station.) Typically, you get ± 0.035% rms flutter; low, low rumble; and you can cue to any beat or syllable with a wow-free start from the world's only remote-controlled turntable. A lot of broadcasters must think now, there are more than 10,000 in use throughout the world. We know of only one greater value: our brochure. It's free. Send for it today.

Be honest with yourself! Of all the audio equipment your station operates, which is the most troublesome? Which requires the most preventive and breakdown maintenance? Which piece of equipment have you purchased every time from a different manufacturer without ever finding one that truly satisfies you?

I bet it's your *turntable!* So, you can hardly be blamed if you read the ad across the way with polite disbelief.

Our advertising agency may indeed prepare pleasant looking ads. But you know that no other motor operated device in your set-up, excepting possibly your cartridge machine, gets so much continuous use (or abuse). Consequently, you're forced to re-buy turntables too often because they fall apart.

That's why I want to tell you—in my own words, without benefit of agency!—that you can really save yourself a great deal of money simply by placing yourself in the position of one of our clients, who writes: "We have six EMT-930 turntables that have been in constant use since 1960. We think they are the greatest we have ever used, but they are *beginning* to need a few parts."

**EIGHT YEARS WITHOUT REPLACEMENT PARTS!**

Impossible? We'll be happy to send you their name and a list of many others with similar experiences. We believe a turntable must be a turntable *system*. That means a complete unit from the platter through the arm and cartridge, remote controls, solid state line level output amplifier, dropping lever, cue lamp, cue amplifier etc., all assembled by one manufacturer with undivided responsibility.

You'd certainly never build your own tape recorder... buy the three motors from one place, the head assembly from another, and the amplifiers from a third. You should do no differently with your turntable.

The EMT-930st fully integrated turntable system has meant the last turntable investment for a large number of stations and networks. Virtually every New York FM stereo station uses them, as do NBC, CBS, WTIC, WDAK, and many, many others.

It may appear expensive at first sight; it's the most economical in the long run. Call Mr. Passin (New York) at 212-265-4111 or Mr. Allen (Hollywood) at 213-874-4444 collect. They'll give you the confidence to act.

Stephen F. Temmer, President  
Gotham Audio Corporation

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



## Also the cheapest.

It's a simple matter of economics. And quality.

At \$1350, the EMT-930st Turntable costs considerably more than any other turntable. But, for your money, you get a precision-made turntable that really slashes maintenance costs because it's virtually trouble-free. ("Still in excellent condition despite ten years of hard use," says one pleased radio station.)

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

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

The EMT-930st is a smart investment. Right

**GOTHAM**  
AUDIO CORPORATION  
2 West 46th Street, New York, N.Y. 10036 (212) CO 5-4111  
1710 N. LaBrea Ave., Hollywood, Ca 90046 (213) 874-4444

\*Name of this and other station users on request.

Circle 148 on Reader Service Card

Circle 149 on Reader Service Card

# CROSS-TALK

Dear BM/E:

I enjoyed reading the special section on FM/SCA in your February issue. I think though, that one of the greatest potential uses of SCA subchannels—which you did not men-

tion—is their use in transmitting controlled, slow-scan television.

We in the Michigan Department of Education have developed a proposal for such a system, which we feel can be of great value to fellow educators. This system is based on a scan rate of one picture every 10 seconds—which would require a frequency bandwidth of 2.7 kilohertz—well within the bandwidth confines of an SCA subchannel.

Charles Ruffing  
Chief, Instructional  
Technological Services  
Michigan Dept. of Education  
Lansing, Michigan

Dear BM/E:

In the article, "SCA Spells More \$\$ for Fm," you listed one of our competitors as the "holdout" from modularized SCA generators. Moseley Associates, Inc., has been manufacturing rack-mounted SCA generators for almost nine years. In this time period, we have sold over 300 SCA generators. We have also been using our SCA generator for telemetry return.

It was a little disheartening to read the part of this article which inferred that only our competitor had this type of SCA generator and this type of capability.

John E. Leonard, Jr.  
Marketing Manager  
Moseley Associates, Inc.  
Goleta, Calif.

Dear BM/E:

I found your special issue devoted to the uses of SCA to be most interesting. In that same issue, you had a small article on the full-time daily broadcast service for the blind that we have initiated. You apparently neglected to mention that this service is carried on the SCA subchannels of KSJR-FM and KSJN-FM.

This is particularly important when you consider that although the potential audience in Minnesota is well over 5000 persons, it doesn't justify use of the full facilities of an a-m or fm station. SCA can serve this specialized audience very well and economically.

The material that's broadcast has broadcast copyright clearance only for the blind. SCA thus offers the only transmission system capable of making this necessary "closed-circuit" broadcast.

William Kling  
Director of Broadcasting  
KSIR, KCCM, KSIN  
St. John's University  
Collegetown, Minn.

Dear BM/E:

Referring to your February 1969 issue, page 24, and the text in the

box "SCA and Radio Paging," I believe there are several errors.

The text reads: "The SCA subcarrier may be a-m, fm or single sideband, preferably with reduced carrier." According to FCC rule 73.319(a), "Frequency modulation of SCA subcarriers shall be used." So far as I know, no other type of modulation is permitted in SCA service.

The text continues: "When broadcasting mono over the main channel, the SCA carrier may operate at frequencies between 2 and 75 kHz." I believe this should be 20 and 75 kHz—FCC rule 73.319(b).

Another part of the text: "When transmitting stereo, the SCA subcarriers must operate below 53 kHz." Again according to FCC rule 73.319(b), the SCA subcarriers must operate between 53 and 75 kHz.

Thomas R. Haskett  
Electronics Writer  
and Consultant  
New York, N.Y.

Dear BM/E:

Hats off to BM/E for your fine articles on fm broadcasting. I was especially impressed with the article by Harry Maynard (Fm: Free Music, Faithful Market). It is about time that fm radio is presented to the public as it really is . . . a creative, versatile medium. I hope to be seeing more fine articles on fm broadcasting, and successful FM stations in BM/E in the near future. Thanks, and keep up the good work.

Normand T. Deragon  
WPRO-FM  
Providence, R.I.

Dear BM/E:

I was very surprised to see that in your special NAB edition, you made a beautiful "faux pas" by putting Angenieux lenses under the heading, "Canon-U.S.A., Inc."

I'd like to take this opportunity to tell you that Canon is probably the world's largest manufacturer of zoom lenses, and has over one thousand broadcast and TV lenses in use in Japan alone, and well over ten thousand vidicon zoom lenses in use in Japan and in the U.S.

Canon introduced two new lenses at NAB: the P17X30 plumbicon zoom lens and the new P17X30 lens—both for color TV cameras.

I am sure that all of the broadcasters who attended the show were extremely impressed with the Canon lenses, and your goof may have even sent us a few customers.

Dick Turchen  
Video Components, Inc.  
New York, N.Y.

**THE  
LEADER  
IN  
CATV  
TOWERS**



**"Quality—Service  
and Price!"**

Yes, quality, service and price on CATV systems are the reasons for Fort Worth Tower's position as the industry's leading supplier. Experience gained as a pioneer supplier of CATV enables Fort Worth Tower to provide you with a quality product at a price that is reasonable and attractive.

Take advantage of our experience. For assistance in systems planning, engineering and complete systems quotations . . .

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— Associated Companies —  
Tommy Moore, Inc.  
Big State Engineering, Inc.  
Tower Construction Finance, Inc.

Circle 150 on Reader Service Card

# Rear mounted boom. Rear mounted operator.

## How can you see it any other way?

Don't blindfold your operator! Let him see where the trenching action is. Safely seated at the rear, he can watch the digging boom and pay constant attention to the trenching job. How else can he see his work? How else can he know when to shift speeds of the digging chain *faster* or *slower* to match the changing soil conditions? How else can he know when to "slow" his travel speed to match digging conditions? Rear mounted boom . . . rear mounted operator. You shouldn't have one without the other. Ditch Witch gives you both. Let us prove it to you with a demonstration.



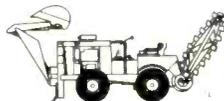
**C & M Series**  
Compact, highly maneuverable, fully self-propelled design available with 7, 9, or 12½ h.p. engine. Capacity up to 10 fpm. C Series trenches to 2' deep, 6" wide . . . M Series up to 5' deep and 12" wide.



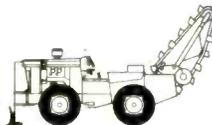
**H12**  
The first two-wheel, steerable-drive, riding-type trencher. Choice of 12½ or 18 h.p. engine for trenching up to 5' deep and 12" wide. Has capacity up to 12 fpm. Features power steering, hydraulically controlled boom, and variable crowd control.



**J20**  
An 18 h.p. trencher featuring 4-wheel drive, floating front axle, power steering and 3-mechanical digging chain speeds, plus reverse, and independent hydraulic travel speed control. Has capacity to 16 fpm, digging range to 5' deep and 12" wide.



**V30**  
A 30 h.p. machine with full hydraulic control of all systems, 4-wheel drive, floating front axle. Independent hydraulic travel-speed control and 4 mechanical digging chain speeds, plus reverse. Capacity to 20 fpm, to 6' deep, 12" wide.

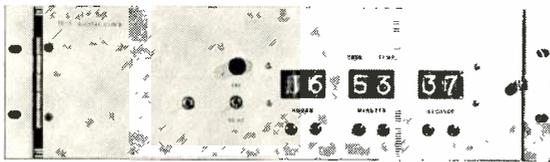


**R60**  
A 60 h.p. trencher with full hydraulic control of all systems, steering-wheel control, 4-wheel drive, floating front axle, independent travel speed control, 4 digging chain speeds plus reverse. Capacity to 36 fpm, to 7' depths, 24" widths.



**Backhoe & Plow**  
For 30 and 60 h.p. machines. Backhoe: 9' reach, 10,600 lb. pry-out pressure, 180° swing, digs to 7' depths. V30 Plow lays material up to 1¼" in diameter to 24" depth; R60 lays up to 1½" diameter to 30" depth.

# NOW....the digital master clock you asked for.



#### MASTER CLOCK DTI-701

Accuracy of 50 PPM. Readout of day, hour, minute, second. Internal or external sync. Fail-safe power supply. External reset. 1 second pip outputs at 4 audio frequencies.

#### ACCESSORY INSTRUMENTS SYNCHRONIZED TO DTI-701

##### RACK-MOUNTED SLAVE DTI-702

Cabinet and bracket available for wall mounting.

##### EXECUTIVE DESK MODEL DTI-703

Walnut cabinet. Attractive blue read-outs.

##### STUDIO MODEL DTI-704

Large read-outs for camera pick-up.

#### ELECTRONIC STOP-WATCH DTI-705

Reads out in hours, minutes, seconds, tenth's of second. Pause control. Zero Reset. Walnut cabinet or custom panel for installation into studio production control panel. Audio pips cue output.

#### RACK-MOUNTED SLAVE WITH STOP-WATCH DTI-706

Combines features of DTI-702 and DTI-705. Remote control stop-watch.

#### ELAPSED TIME CLOCK DTI-707

Presets to any time up to 9 hours in minutes, seconds. Internal or external preset input. Manual or external start. Pulse output in 1 second intervals, 10 seconds to zero, with synchronized audio pips.

For more details write or call:



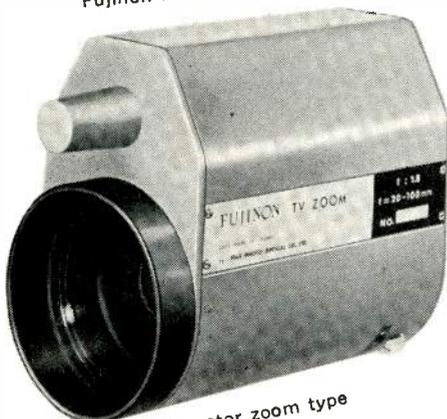
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MANUFACTURING

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Fujinon F 1.8/20-100 push rod type



Fujinon F 1.8/20-100 motor zoom type



Fujinon F 1.8/20-100 standard type

## FUJINON

the sharpest eye  
for CCTV or  
CATV cameras

Vidicon cameras go sharp via Fujinon lenses. With focus and zoom extremely smooth and noiseless. Image remaining constantly in focus throughout the

zooming range. And compact and streamlined design to simplify, while enhancing, the operation of every CCTV or CATV camera. To be sure yours are... specify Fujinon.

### FUJI PHOTO OPTICAL CO., LTD.

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Circle 153 on Reader Service Card

# FAIRCHILD

## FAIRCHILD'S PRECISION MAKES 57 OF THE WORLD'S FINEST PROFESSIONAL AUDIO COMPONENTS

... Fairchild's complete Series of Attenuators: 10 models with new packaging plus Slide Wire Fader / The Integra I Series: an automatic Attenuator, 3 Preamplifiers, 3 Compressors, 3 Program Equalizers, 4 Dynalizers, De-Esser / 692 Remote Card Series: over 12 inputs with extensive switching capacity / Integrated Control Module Series: Input-Output-Monitor Modules / 7 Audio Control Devices including the well known Conax, Limiter and Reverbertron Systems / 2 Gain Shifter Intercom Systems / 7 Power Supply Models / over 24 Accessories. Contact your Fairchild Distributor or write **FAIRCHILD RECORDING CORPORATION** DEPT BM5, 10-40 45TH AVE., L.I.C. N.Y. 11101.

Circle 157 on Reader Service Card

# BM/E CLASSIFIED MARKETPLACE

## CLASSIFIED ADVERTISING RATES

DISPLAY CLASSIFIED ADVERTISING: \$22.50 per inch 1x; \$22.00 per inch 3x; \$21.00 per inch 6x; \$20.00 per inch 12x. ALL OTHER CLASSIFIED ADVERTISING 25¢ per word; minimum \$3.00. BLIND BOX NUMBER: No extra charge. Replies sent to address below will be forwarded to you. PAYABLE IN ADVANCE; send check with order. CLOSING DATE: 5th of 2nd month preceding issue date.

BM/E, Monterey and Pinola Avenues, Blue Ridge Summit, Pa. 17214 Phone 717/794-2191

## BUSINESS OPPORTUNITIES

### FRANCHISE DISTRIBUTORSHIPS FOR SEEBURG BACKGROUND MUSIC

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

Complete details forwarded on request.  
Address:

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

Cable Television System for sale. Located close to Kentucky-Tennessee border. Good location. Good returns for the investment. For information write Box 569-2 c/o BM/E, Blue Ridge Summit, Pa. 17214.

## HELP WANTED

### VIDEO TAPE ENGINEERS

Expansion in the video tape machine field has created new opportunities for engineers to test equipment at our plant and supervise installations at customers' facilities. You should have previous experience on video tape equipment, either with a manufacturer or a broadcast station.

If you are a self-starter and have the experience required, this is an opportunity to grow with a dynamic, expanding national company in the broadcast field. Attractive salary will be commensurate with background and experience. Send your resume to Mr. Frank Haney, General Manager.

VISUAL ELECTRONICS LABORATORIES  
725 San Aleso Avenue  
Sunnyvale, California 94086

Engineer to aid chief engineer in maintenance and operation of full-color production studio nearing completion and existing monochrome studios. New studio will feature Ampex high-band video-tape and General Electric color cameras. Color experience desirable. Salary commensurate with experience. Position open July 1. Send full resume to: Mr. Charles Anderson, Operations Manager, Western Kentucky University, Educational Television Dept., Bowling Green, Kentucky 42101.

Technical man with first phone capable of working with Chief Engineer and in production. Send full resume to: Dr. Fred Haas, Coordinator of ETV, Western Kentucky University, Bowling Green, Kentucky 42101.

## HELP WANTED (cont'd)

HELP WANTED: Television engineer to be in charge of all engineering matters in CCTV state-of-the-art university operation. Directs activities of engineers and technicians within engineering and technical services operation. Contact State University College, Oneonta, New York. Phone 607/431-3314.

HELP WANTED: Television maintenance technician for CCTV state-of-the-art university operation. Requires strong background in all phases of TV maintenance, experience with 1-inch Ampex slant video type machine helpful. Contact State University College, Oneonta, New York 13820. Phone: 607/431-3314.

Available July, 1969. Openings for TV Engineers and TV Technicians. Duties include installing and operating color and black and white TV systems. Salary commensurate with experience. Send resume to Ronald Lask, Chief Broadcasting Engineer, University of Illinois, Medical Center, P.O. Box 6998, Chicago, Ill. 60680.

Announcer for 5KW full-time Pennsylvania adult music station with heavy accent on news and sports. No. 1 in medium market. Modern operation with top sound. Some ability to write local news. Good salary and fringe benefits. 215-696-3690.

Studio supervisor—must have first phone license and be experienced in the operation and maintenance of live color cameras, color video tape machines, and color film equipment. Contact John Schuta, Chief Engineer, WTVW-TV, Evansville, Indiana—phone 812-422-1121.

Position open for #2 man in full color small market operation. Expanding organization, all new RCA equipment. Excellent opportunity for a family man. Fine schools, great hunting, fishing, and outdoor recreation. Send full resume to Box 569-1, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Several CATV Management-technical positions in mid-west. New systems, spring construction. Good pay with group operation. Apply by letter only. Bob Zellmer, Regional Manager, Marshall Cable Inc., Marshall, Minnesota 56258.

Assistant Chief Engineer position available in a combined AM-FM-TV facility located in medium sized Minnesota market. Contact Box 569-3, c/o BM/E, Blue Ridge Summit, Pa. 17214.

WTOC-AM-FM-TV needs technicians with first class F.C.C. license. Reply by letter to Chief Engineer, WTOC, P.O. Box 8086, Savannah, Ga. 31402.

Summer relief positions for technicians available now for full color Chicago ETV station. Contact Chief Engineer, WTTW, 5400, N. St. Louis Ave., Chicago, Illinois 60625, Tel.: 312/583-5000.

Aggressive, proven, local sales manager for number one station. Write all details to Harvey Hudson, WLEE Radio, Richmond, Virginia.

First class engineer for transmitter watch. Loren Guild, Chief Engineer, WTTT, Tiffin, Ohio 44883.

## POSITIONS WANTED

Stop—do not read if not interested: Need a good PD? 6 years broadcasting major market experience news/air/programming/sales/copy—rich network voice—AM&FM. 26 with family. Not interested in a temporary job. R. S., P.O. Box 3253, Beaumont, Texas 77704.

Black personality disc-jockey . . . program variety show and jazz. Best radio ratings in the country. Dependable, married. Resume, tape upon request, Box 569-4, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Manager/Comm. manager, best references, small, medium markets. Full responsibility. 36 years old/civic leader. Experienced all phases. Box 569-5, c/o BM/E, Blue Ridge Summit, Pa. 17214.

D.J.—Salesman, Must do both. Good track record selling, Negro market. Air time guarantees, better billing. Always willing to learn. Box 569-6, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Negro announcer—dependable—experienced. Reliable—can work any type station. Third endorsed. Box 569-7, c/o BM/E, Blue Ridge Summit, Pa. 17214.

## POSITIONS WANTED (cont'd)

Disc jockey newscaster. Dependable, versatile. tight board, creative, third endorsed, re-locate. Resume, tape upon request. Box 569-8, c/o BM/E, Blue Ridge Summit, Pa. 17214.

## EQUIPMENT WANTED

New junior college Educational FM Station seeking studio and transmitting equipment. Tape recorders, console, microphones, turntables, antenna, etc. Donations are tax deductible. Write: Barton County Community Junior College, Great Bend, Kansas 67530.

We need good used Nems-Clarke model 120E series field intensity meter. KKEY Radio, P.O. Box 3361, Portland, Oregon 97208.

## EQUIPMENT FOR SALE

### SONY PV 120U VTR'S 1/2 PRICE

Two VTR's with less than 250 hours are available from schools which lost funding. Excellent time base stability of these 2" VTR's avoids jitters in subscriber's TV sets. \$8950 reduced to \$4475 each. 90 day warranty. "Two inch quality at one inch price."

ALEXANDER ELECTRONICS,  
INC.

4747 Wyandotte St.  
Kansas City, Mo. 64112

## TV EQUIPMENT FOR SALE

1—RCA TP-16 Film Projector, color modified;  
1—RCA TR-20 Film Camera; 1—RCA TG-1 Sync Generator; 1—RCA WA-3 Grating Generator;  
2—RCA TA-5 Stabilizing Amplifiers; 1—RCA TA-1 Distribution Amplifier; 1—RCA MI-26853 Orbiting Generator, 1—RCA GA-7010 Video AGC Amplifier; 2—RCA 580 Power Supplies;  
2—RCA WJ-33 Power Supplies; 2—RCA TG-10 Field Sync Generators; 2—RCA TS-30 Field Video Switchers;

Phone or write KTVW Inc. ADDRESS: KTVW Inc., 5544 North 35th, Tacoma, Washington 98407, PHONE: (206) 752-3544.

Excellent for collectors—golden oldies features or reprogramming AM station or for new operation. FOR SALE: five thousand 78 rpm records . . . everything from Mills Brothers to Eddy Arnold . . . all playable condition . . . western, popular, religious. ALSO, for sale: 6000 33 1/2 rpm LP ALBUMS . . . now and several years back . . . all types; also 8000 45 rpm records . . . junk eliminated. Sell all or part . . . western pop, rock, folk, religious, gospel etc. Contact Dave Button, KSPV, 317 West Quay, Artesia, N.M. 88210.

USED EQUIPMENT FOR SALE—Ampex 601 Recorders, Port. or Rack, overhauled, \$350.00; Magrecorders, usable condition, PT-63 Port. or Rack, \$195.00; Ampex 622 Amp/Speaker, New-Portable, \$175.00; Ampex PR 10-2, Two-track, Stereo-Portable, \$595.00; Uher 24 Special Four-track, three-speed, \$250.00; McMartin TB3500 Mod. Mon., \$500.00; McMartin TBM-3000 Frequency Mon., \$500.00. Mastertone Co., 8101 University, Des Moines, Iowa 50311 (505) 274-2551.

**EQUIPMENT FOR SALE (cont'd.)**

**FOR SALE**

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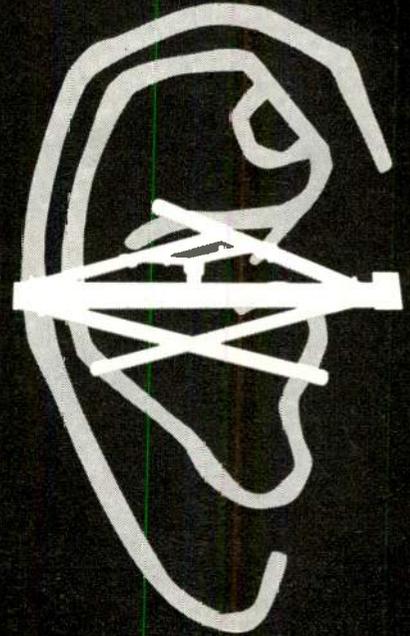
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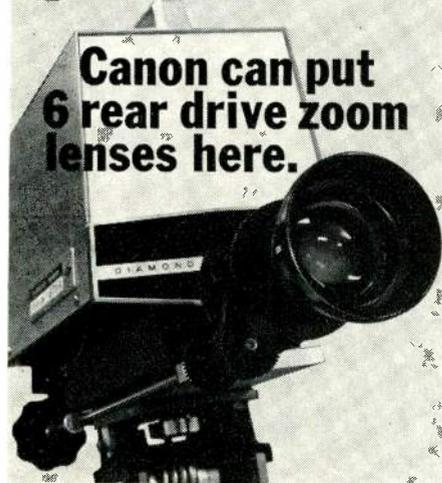
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## FROM THE **EDITOR**

### What To Do About Obsolete Engineering Rules

If you've been to one, you've been to them all; they don't change from year to year. We're speaking of the FCC/Industry Panel held annually at the close of the NAB Convention's Engineering Assembly.

The script goes something like this:

**Industry:** When are we going to get rid of some of those obsolete rules? When will more remote transmitter operation be authorized?

**FCC:** We haven't got time to overhaul all of the rules and keep up with daily chores. We're willing to do changes. The principle is to write a good engineering practice or standard so that broadcasters achieve a desirable end result. Tell us how specific rules or proposed rules affect you.

Last year hope was stirred that an industry committee could get things moving. (See *BM/E*, May 1968, p. 54.) This year the "how" was avoided.

Wallace Johnson and Harold Kassens, chief spokesmen for FCC engineering office, are nice, affable, reasonable-sounding and dedicated guys. It's hard to get mad at them, but it does appear they are bottlenecks.

They have become bottlenecks because they don't want to make mistakes. Trouble is they'd rather live with a rule written for 1934 equipment designs, knowing that it is obsolete, than write one in 1969 for 1969 equipment that might have a flaw in it discoverable in 1971. This concern over making a mistake has shackled technological progress.

Such problems face other agencies, including the Department of Defense. Robert McNamara, then Secretary of Defense, recognized the mess that can result from piecemeal spec changes. An answer was to look at the whole problem of management of specification changes. It seems to us FCC engineering rule-making needs some overall review by experts that can lead to a system that will permit overhaul.

Wallace Johnson is worried that both he and Kassens will be up for retirement before they can effect the needed changes (a concern stated both in 1968 and 1969). We have the same worry. We urge that the FCC spend a few dollars now for a plan on how to manage change. It's needed.

James A. Lippke

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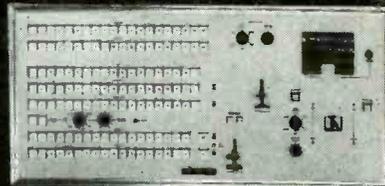
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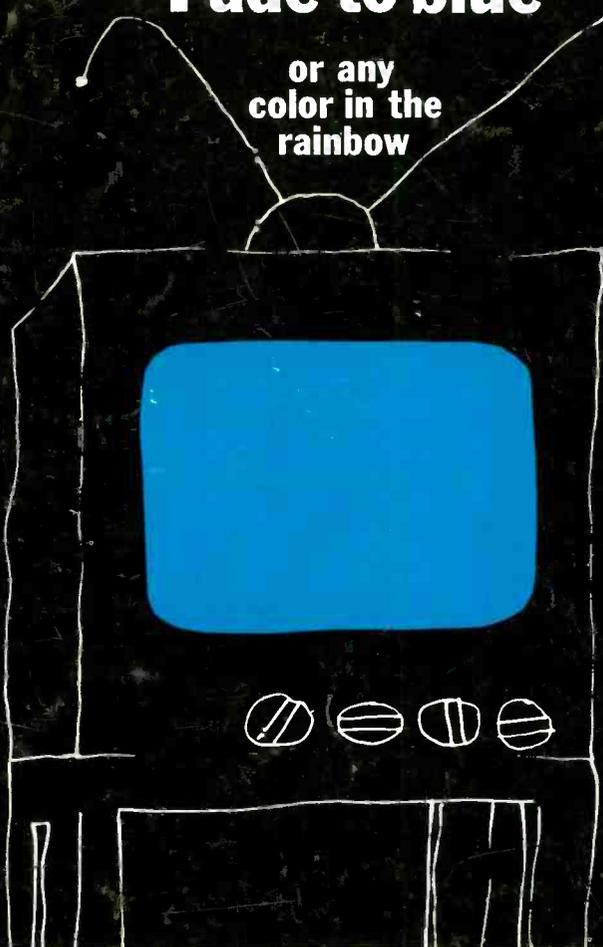
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