

JANUARY 1972

# BM/E

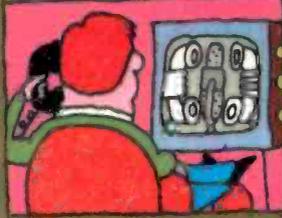
BROADCAST MANAGEMENT/ENGINEERING

IMPORTANT  
IT'S TIME TO RENEW YOUR  
FREE SUBSCRIPTION TO BM/E.  
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**CALL-IN SHOWS  
A Form of Access**

**Inside: CM/E Magazine  
For Cable Operators**

SUDDUTH

# Teledyne announces the introduction of their new Color Telefilm Recorder that transfers color tape to color film with remarkable quality.



Teledyne Camera Systems' CTR-2 Color Telefilm Recorder.

## Extraordinary quality and practical economy from the outset.

Teledyne has developed the first broadcast quality Color Telefilm Recorder. They knew that excellence was mandatory. A piece of equipment that wouldn't deliver sharp, clear, color-balanced 16mm film transfers would not stand up to your criteria. So, the system was perfected and then it was introduced.

## Engineering bottom line.

Primary heart of the system is the camera (DBM-64B) which uses compressed air to pull down and stabilize the film in less time than the television vertical blanking period. Result is full

frame recording without mid-field splice or shutter bar.

## System works for operator not the other way around.

Human engineering, ease of operation, and maintenance maximizes productivity. All components are immediately accessible. Test points on the printed circuit cards used with the built-in waveform monitor allow operation, adjustment, and trouble shooting without a separate oscilloscope. Slanted camera optical path is very convenient for magazine loading.

## It almost had to be Teledyne.

You expect innovation from pioneers. Because the camera came first, from Teledyne, the system's development was only an extension. That camera revolutionized tape to film transfer and is clearly the industry's standard.

## Partial list of nomenclature that makes the point.

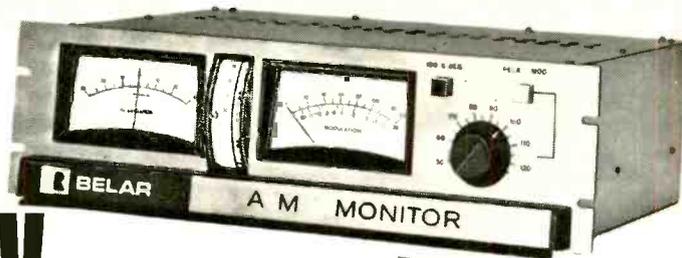
DBM-64B Camera. Conrac RHM-19 Display. Tektronix 528 Waveform Monitor. Modified Tektronix 602 "X-Y" Display. CBS Labs Mark II Image Enhancer. Rank Decoder. Maurer "F" Prime or Auricon "Modulite" Variable Area Recording Galvanometers. Teledyne CK-120 Magnetic Recording System. And so on.

## Giant step for the state of the art.

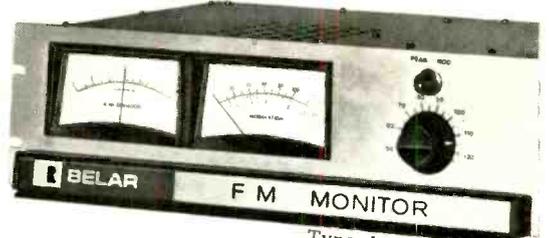
Video tape production and 16mm broadcast and dupe transmission are now a quality reality. To learn more about this capability and making it available to your operation, contact Teledyne Camera Systems at 131 North Fifth Avenue in Arcadia, California 91006. Telephone (213) 359-6691. They'll send you a reel sample.

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 and TV frequency  
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Isn't it time you stopped running around and finally settled for a company that can handle *all* your frequency and modulation monitoring needs? Contact Arno Meyer . . . he'll show you the way.

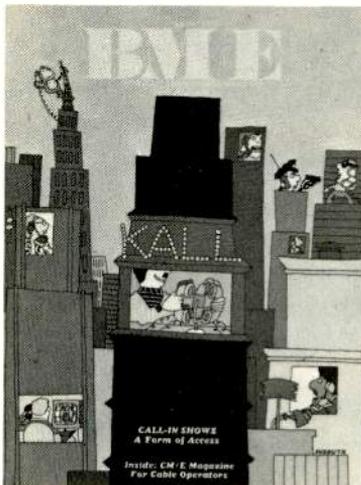


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Circle 101 on Reader Service Card

# BM/E

BROADCAST MANAGEMENT/ENGINEERING



Listener-participation shows can be a form of public access. WMCA, New York City, inspired this month's cover, but we quickly point out the party-line hook-up at WMCA is more sophisticated than shown (see p. 17). Call letters KALL are not available to opportunists. They're assigned to Salt Lake City Broadcasting Company of Salt Lake City (which has a Call Kall show).

**BROADBAND  
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200 Madison Ave.  
New York, N. Y. 10016  
212-685-5320

**Editor:**

**James A. Lipke**

**Technical Editor:**

**Thomas R. Haskett**

**Contributing Editor:**

**Robin Lanier**

**Assistant Editor:**

**A. E. Gehlhaar**

**Art Director**

**Gus Sauter**

**Production Manager:**

**Arline G. Jacobs**

**FCC Counsel:**

**Pittman Lovett Ford  
Hennessey and White**

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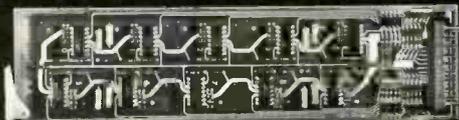
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**CM/E MAGAZINE: For Cable Readers Only/Between pages 40 and 41**

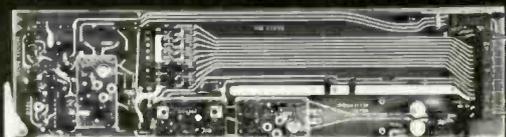
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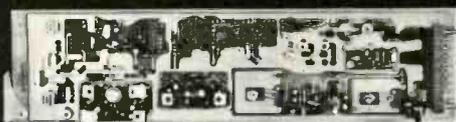
# 3600 SERIES ROUTING SWITCHERS



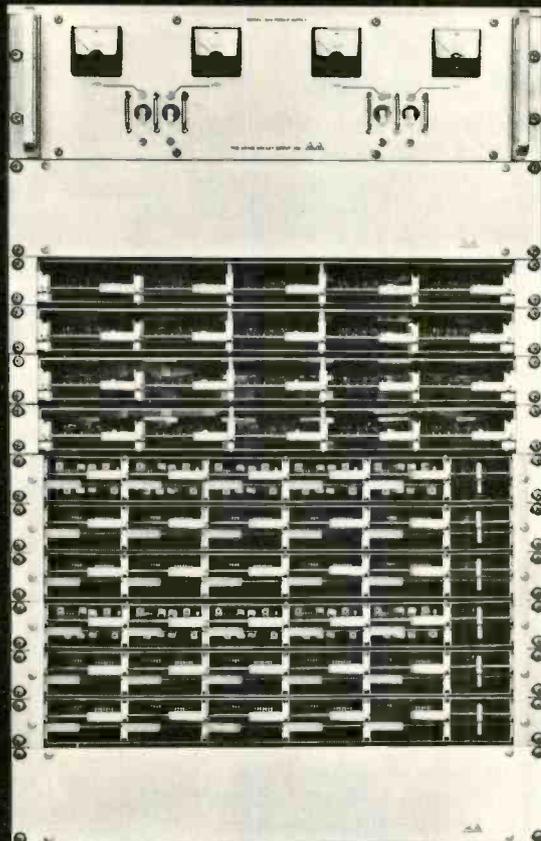
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# BROADCAST INDUSTRY NEWS

## Spate of Cable Studies Released at Year End

A wonderful new world via cable TV is envisioned in three major reports released in December: "On the Cable, The Television of Abundance" (report of the Sloan Commission on Cable Communications); "Urban Cable Systems" (prepared by the Mitre Corp. for the Markle Foundation), and "Interactive Television: Prospects for Two-Way Services on Cable" (prepared by the Rand Corp. for the Markle Foundation). These reports are getting to the public via extensive press and TV (NET) coverage. Public exposure is also being aided by a new booklet, "A Short Course on Cable," being distributed by the Office of Communications of the United Church of Christ.

Interconnected cable TV systems bringing in as many as 40 channels to 40 to 60 percent of all homes by the end of the decade was predicted by the Sloan Commission chaired by Edward Mason of the Graduate School Of Public Administration, Harvard University. Rapid development of cable TV is desirable, the Commission says, to bring in an era of television of abundance, and it urges that copyright and distant signal issues be resolved quickly by



**N. J. Public Broadcasting To Use New Color System.** Frank L. Marx (L), president, ABTO, Inc., demonstrates simple modifications of motion picture camera to ABTO system which uses standard black-and-white film, but projects color. Dr. Lawrence T. Frymire (R), NJPBA executive director, and John T. Wilner, NJPBA engineering director, observe.

Congress and the FCC.

The report urges that cable get wide access to programming. Diverse programming and a healthy program production industry is essential. Royalties should be paid for program rights but exclusivity should be severely limited in time. The Sloan group speaks for the public's benefit, it says, not vested interests. The Commission endorses pay TV including sports coverage. In news coverage, it would like to see all-news channels fed by some newly created news services. The equal time rules for political broadcasts should not apply. Public access channels should be encouraged. For a 20 channel system, the Commission envisions six for network and local stations, two for service users, one for public access and one for experimental education. Of the remaining ten, the cable operator should be obligated to lease eight, but could operate two for himself.

The Sloan Commission would prohibit network ownership of cable, but would encourage broadcasters to seek franchises if their franchise area did not reach more than ten percent of the homes, or if their aggregate media holdings did not reach more than 40 percent of all households.

The Urban Cable System report focuses on creating a model Washington (D.C.) Cable Television Service System, described as an evolutionary one-way system. Cable is seen as able to reduce the cost of new communication services and an analysis of these costs are included.

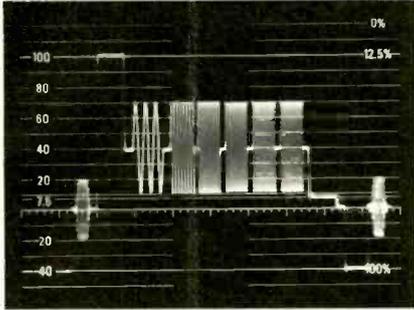
The Interactive Television report, by Walter Baer of Rand, looks at new services and concludes that an extra cost of \$150-\$340 per subscriber is required for two-way services. This could be paid for by additional monthly revenue services of between \$4.50 and \$13 per subscriber. The report sees no single service as an answer, but suspects a mix of responsive services supported by home subscribers, business and government might work. (More on these reports will appear next month.)

## Business Briefs

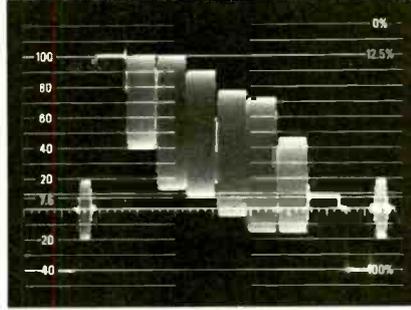
**Broadcasters Promotion Association** gave awards for 1971's best station promotion to WFLD-TV, Chicago, in Category I (top ten markets, networks, reps) and to KCMO-TV, Kansas City, in Category II (all other markets). WFLD-TV won with a brochure, "In Chicago, WFLD-TV is the Hottest One;" KCMO-TV won with a multi-media campaign on the station's local news programs . . . **MSI Television** of Salt Lake City is the national sales agent for the **Laird Telemedia Electronic "Q" Board**, which provides visual and aural cueing information, including a large countdown display, for videotape productions . . . **Low Power Broadcast Co.** of Frazer, Pa., becomes **LPB Inc.**, to reflect expansion of the company's broadcast equipment line into all levels and areas of the industry. The firm also announced a doubling of its plant space . . . **KRTV-3, Great Falls, Montana**, will build a new television production center, including an octagonal studio 60 feet from wall to wall with a 180-degree cyclorama . . . **American Cable** announced sale of its cable systems in Waco, Temple, and McGregor, Texas, to **CableVision Properties**, a Denver-based company . . . The **Canadian Association of Broadcasters** has agreed on a Broadcast Code for Advertising to Children, a voluntary self-control measure aimed at bringing broadcast practice into line with community feeling on the subject . . . **Dental Dynamic Systems**, of Hollywood, bought **Alto Fonic Programming, Inc.**, and changed the name of the firm to **Alto Communications, Inc.** Alto supplies prerecorded programming and music libraries to broadcast stations . . . **Cypress Communications**, Los Angeles, agreed to buy from **Cable Information Services**, New York, cable systems in Crestview and Niceville, Florida, with about 2000 subscribers between them . . . **Fairchild Sound Equipment Corporation** has moved from Long Island City to the home plant of its new

(Continued on page 8)

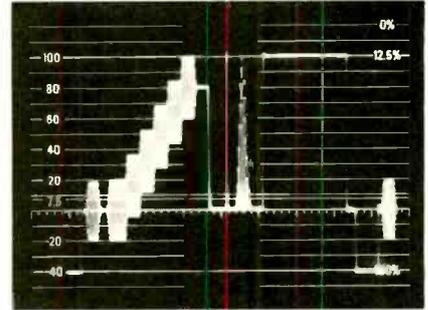
# remoting your transmitter?



LINE 18 FIELD I MULTIBURST  
(REDUCED AMPLITUDE)



LINE 18 FIELD II COLOR BARS



LINE 19 FIELD I, II COMPOSITE  
TEST SIGNAL (WITH SUBCARRIER)

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Going to remote your VHF transmitter soon? You will need test signals, monitoring equipment and technical information, and we are ready to help you with all three — now. TEKTRONIX Television Products are available now to provide the exact test signals required for insertion in the vertical interval (FCC 73.676 [f]). The required "suitable test signals" are generated by the TEKTRONIX 147 NTSC Option 1 and the 140 NTSC Test Signal Generators.

You will be required to delete signals or noise already existing on lines 18 and 19 "prior to the insertion in the vertical interval of locally generated test signals (FCC 73.676 [f5])". The 147 meets the requirements with automatic fail-safe protection and automatic bypass capability.

"Off-the-air facilities must include a demodulator, a visual waveform monitor, a picture monitor . . ." and "where any portion of a station's transmissions are in color, a color monitor and a vectorscope or other instrument . . . will be required . . ." (FCC News #6712). The 650 Color Picture Monitor, the 529 Waveform Monitor and the 520 Vectorscope more than fulfill the video monitoring requirement.

We are not only ready to provide the products, we are ready to provide how-to-do-it information. Ask your TEKTRONIX Field Engineer for Television Products Application Notes describing the signals and monitoring requirements.

<b>R147 Option 1 NTSC Test Signal Generator</b> . . . . .	<b>\$2900</b>
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<b>650 Color Monitor</b> . . . . .	<b>\$2500</b>
<b>R520 Vectorscope</b> . . . . .	<b>\$2850</b>
<b>R529 Waveform Monitor</b> . . . . .	<b>\$1575</b>

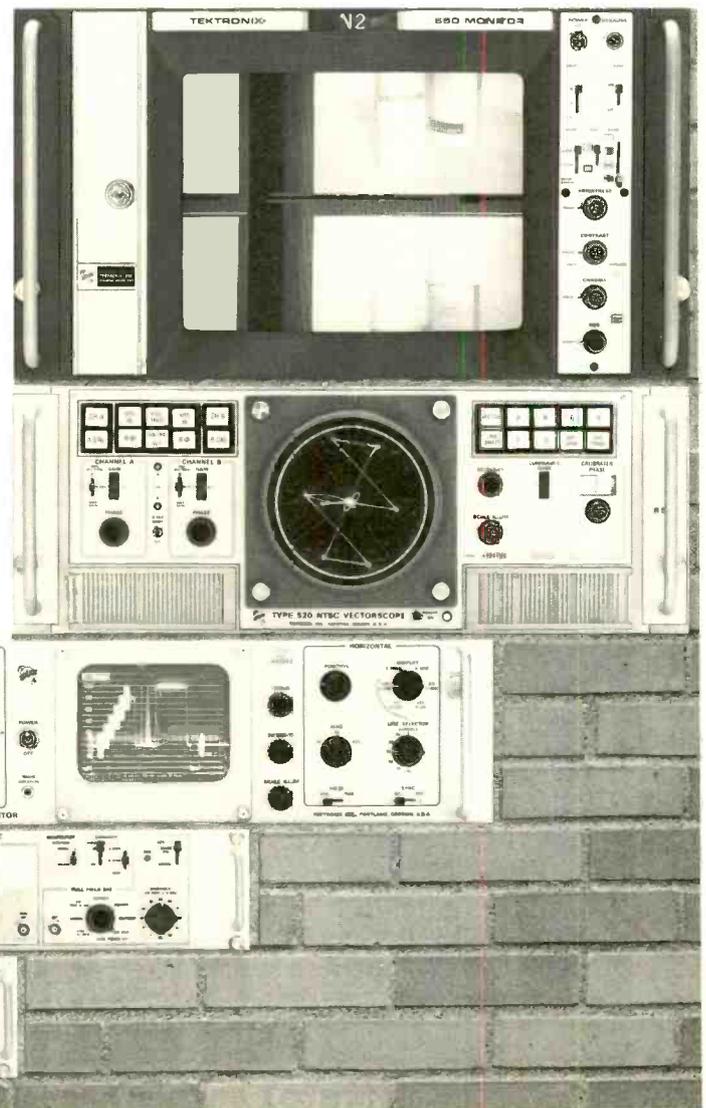
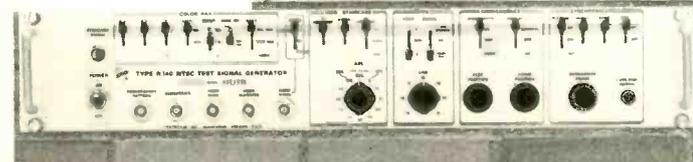
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## NEWS continued

corporate parent, Robins Industries Corp., College Point, N.Y. . . . **Magnavox Video Systems** called response to its new color TV cameras, introduced at the National Association of Educational Broadcasters meeting at Miami Beach in October, "highly gratifying" . . . At the same convention, and at the concurrent National Industrial Television meeting, **International Video Corporation** received orders totaling more than \$1,100,000, according to an announcement by M. A. Moscarello, president . . . The National Broadcasting Company has ordered from **Computer Optics**, Bethel, Conn., more than \$100,000 worth of video display terminals . . . **FRP Productions, Inc.** is the name of the film production services company recently announced by Arthur Florman and Everett Rosenthal; the company, to be located at 460 West 54th Street, New York City, will offer "total production services" covering every aspect of film production for local, domestic, and foreign film makers . . . **Quick-Set, Inc.**, maker of instrument positioning equipment, has moved to a new, larger plant at 3650 Woodhead Drive, Northbrook, Illinois . . . **The Grass Valley Group, Inc.**, announced a contract with WWL-TV, New Orleans, to supply \$460,000 worth of broadcasting equipment and facilities . . . **Dolby Laboratories** signed license agreements with Pioneer Electronic Corp. and Toshiba, in Japan, bringing to nearly 40 the number of hardware manufacturers who will use Dolby B-Systems in their products . . . **Kliegl Brothers**, of 32-32 48th Avenue, Long Island City, New York, is sponsoring a series of regional seminars on television lighting, covering every aspect of professional lighting technique. Seminar leader is Herbert Greeley, for the past nine years light director of the *Tonight Show* . . . **Landy Associates** is the name of a new rep firm formed by James Landy, and headquartered at 12 Buxton Road, Cherry Hill, N.J. Mr. Landy has been active in the broadcast industry since 1946, with executive roles in Central Dynamics Corp., International Video Corp., and Ward-Richmond Hill, among others.

### Association News

**NAB**—"Absurd" was the characterization the NAB gave to the FCC proposal that "minimum program percentages" be used as a measure

of broadcast performance in license renewal proceedings. That would raise "the spectre of unlawful Commission interference with programming judgments exclusively delegated to the licensee," said the NAB. Moreover, the NAB comment went on, stations would tend to shoot for minimum compliance, with routine programs in news, public affairs, etc., to the detriment of the public . . . NAB also opposed, again, a plea from AdTel Ltd., market research firm, that a cable television system in Harrisburg, Pa., be allowed to substitute commercials in programs taken off the air, without consent of the originating station. NAB said that the "monumental question" is whether the Commission will permit an outside party to tamper with a television station's signal, possibly undoing the public respect and goodwill the station has worked to build . . . **NCTA**—A colorful NCTA brochure, "Let's Talk About Cable TV," urges readers to find out what cable will mean to their families and industries by inviting an NCTA speaker to address their conventions, seminars, and meetings. NCTA has initially mailed the brochure to chambers of commerce, trade associations, and governors of the 50 states. With the brochure goes a companion booklet with biographical sketches of the NCTA speakers, who are 32 CATV industry leaders and members of the communications bar who have volunteered their services.

**SMPTE**—The 111th SMPTE Conference is scheduled for April 30-May 5, 1972 at the New York Hilton Hotel, with Calvin H. Hotchkiss, Eastman Kodak, New York, as program chairman and Donald R. Collins of Tele-Cine, Inc., Massapequa, New York, as arrangements chairman. The chairman for the SMPTE Exhibit, with 94 booths available, is John J. Burlinson, Jr., National Screen Service, New York. Additional information about the convention and exhibit is available from SMPTE Conference Committee, 9 East 41st St., New York 10017 . . . Meanwhile, SMPTE will also sponsor its Sixth Annual Winter Television Conference, February 4 and 5, at the Sheraton-Dallas Hotel, in Dallas. The main thrust of the meeting will be the production of color commercials on film and videotape. Leonard F. Coleman, Eastman Kodak, Dallas, is program chairman. Additional information can be had from SMPTE

Winter Television Conference, 9 East 41st St., New York 10017.

### FCC Proposes New Cable Identification Rule

Viewers have complained that cable operators use call signs easily confused with TV broadcast call signs. So the FCC has proposed rules that require a cable operator to identify originated programs as the product of the CATV company by name, and by the use of the expression "Cable TV, Channel—, —, (location)." The Commission said it did not propose four-letter call signs for cable because of the general shortage of such signs in the "K" and "W" series. The new rules would put the identification at the beginning and end of each cable-cast program, both aurally and visually.

### Sony, Teletronics Team Up for Cassette Duplication

Formation of a jointly-owned subsidiary, S-T Videocassette Duplicating Corporation, was announced by Sony Corp. of America and Teletronics International. The new joint enterprise, based in New York, will duplicate video cassettes for entertainment, educational, and industrial applications. Format is that of Sony's U-Matic video cassette equipment, with 3/4-inch tape.

### Sony, 3M Cross-License Tape and Equipment Patents

Another joint action significant for the video cassette upswing is the trading by Sony of manufacturing and selling rights on its U-Matic equipment for similar rights to the 3M Company's "High Energy" cobalt-energized magnetic tape. Sony will make and sell the tape in Japan and elsewhere. 3M will make and sell the U-Matic equipment through its Mincom Division, under the Wollensak brand name.

### JVC Video Cassette System Is Compatible with Sony's

JVC Nivico (Victor Company of Japan) swung into the international video cassette battle-royal by introducing on the Japanese market a recording and playing system in the same format as Sony's U-Matic. The equipment is supposed to reach the American market in mid-1972. Also compatible with Sony and JVC is a system from Panasonic, recently demonstrated but not yet in general distribution.

# Why is Norelco the magic word in television?

Probably the single most important factor is the spectacularly successful performance of the most wanted, most used—and of course, most imitated—Norelco 3-Plumbicon\* PC-70 color camera.

But beyond that, discerning TV practitioners have found Norelco systems the direct route to excellence in an exciting variety of applications. In schools and universities, Norelco systems are extending the teacher's reach, with live and taped instruction. Coupled with microscopes on the one hand and telescopes on the other, Norelco cameras are showing us the invisible, and transporting us to the distant.

At the Fernbank Science Center Observatory, a tiny Norelco monochrome camera helped NBC show the Moon's surface to the world during a lunar landing.

In California, a midget Norelco camera provided continuous coverage of a front-page trial for overflow journalists outside the courtroom.

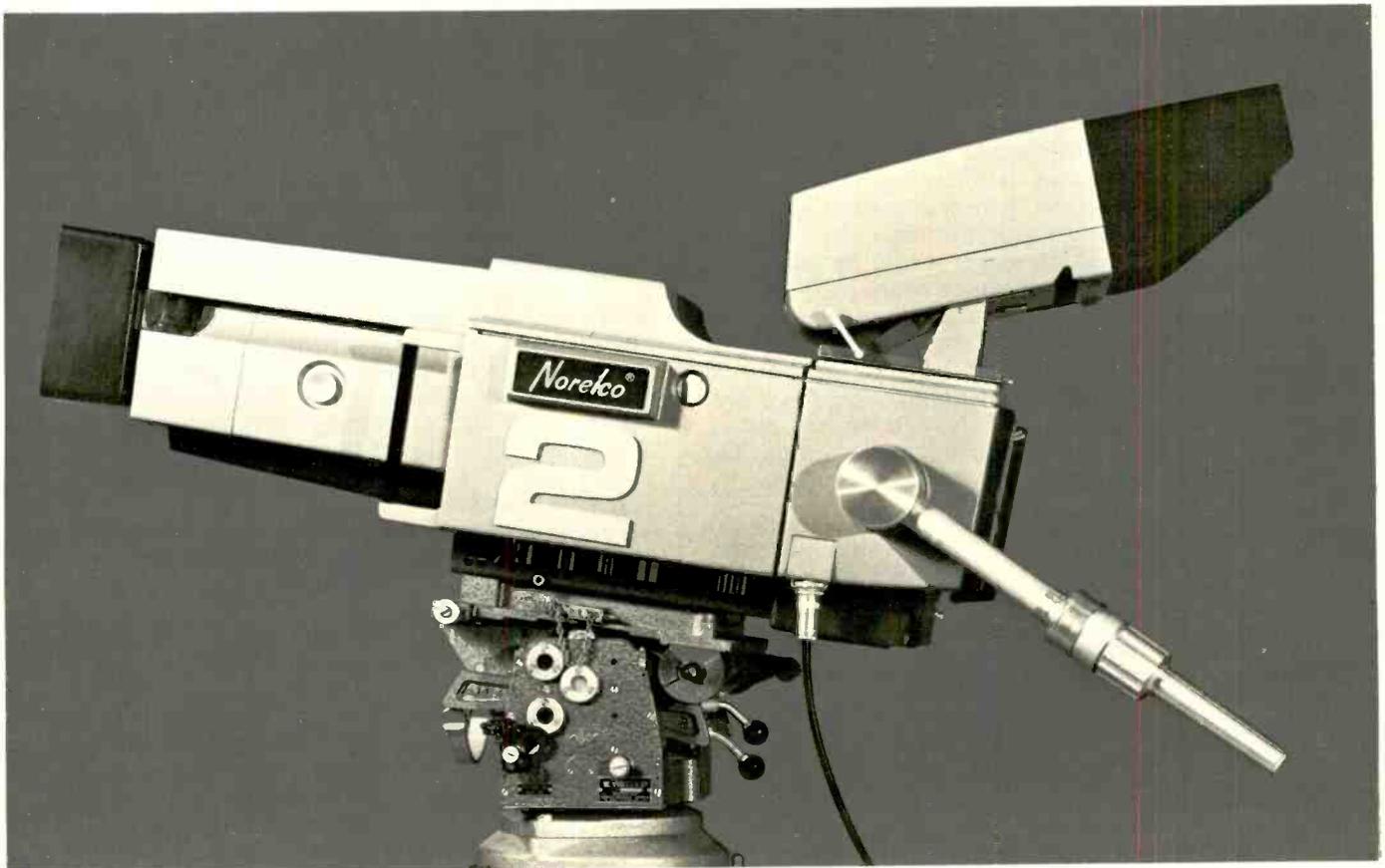
In dimly lit Mission Control, a Norelco color camera was eyes for the Earth's population, peering over the space team's shoulders.

Norelco cameras multiply men's senses by monitoring heavily trafficked highways, bridges and tunnels. They help the night nurse guard precious lives in the nursery and intensive care. They stand sentinel over doorways and corridors, stockrooms, warehouses and parking areas—even in utter darkness. They keep an eye on priceless paintings, and they are the vital link in a great hospital's "tele-diagnosis" system.

The self-same monochrome camera that captures the Moon through a Fernbank telescope is showing a golfer the error of his ways at the club. And the self-same color camera that brings you Walter Cronkite is helping teach tomorrow's doctors and dentists at the University of Texas Medical Branch.

## Reliability—Performance—Professionalism.

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# INTERPRETING THE **FCC** RULES & REGULATIONS

## **Renewal: Part I**

### **Comparative Hearings**

While only a few station operators must actually meet competition at license renewal time, *every* operator faces the possibility of challenge. The Commission has struggled for many years with the problems of relevant criteria and required performance in renewal applications. Currently, it is exploring pertinent standards for *television broadcasters*, who have, increasingly, been challenged at renewal.

The Commission and the courts have played havoc with renewal standards. Once yielding an "insuperable advantage" in comparative hearings to an incumbent broadcaster, the Commission has, over the past few years, steadily elevated its performance requisites. The television broadcaster has been an unwitting witness to these proceedings and, with the ensuing confusion, has been forced to exercise "guesswork" to determine exactly what performance is required of him.

#### **1970 Policy Statement**

In its 1970 "Policy Statement Concerning Comparative Hearings Involving Regular Renewal Applicants,"<sup>1</sup> the Commission stipulated a two-part hearing process which made it difficult for challengers to gain "equal footing" with incumbents. The Statement said, in pertinent part, that a full comparative hearing which considers the merits of *both* incumbent and challenger would be granted if, and only if, the existing licensee could NOT demonstrate a past record of "substantial service without serious deficiencies." In other words, if the licensee demonstrated a "substantial" past performance at this initial hearing, the Commission would not proceed to the second phase of the hearing but, rather, would grant the renewal application forthwith. The Commission elaborated:

The renewal applicant would have a full opportunity to establish that his operation was a "substantial" one, solidly meeting the needs and interests of his area, and not otherwise characterized by serious deficiencies. He could, of course, call upon community leaders to corroborate his position. On the other hand, the competing party would have the same opportunity in the hearing process to demonstrate his allegation that the existing licensee's operation has been a minimal one. And he, too, can call upon community leaders to testify to this effect if this is, indeed, the case. The programming performance of the licensee in all programming categories (including the licensee's response to his ascertainment of community needs and problems) is thus vital to the judgment to be made. Further, although the matter is not a comparative one but rather whether substantial service has been rendered, the efforts of like stations in the community or elsewhere to supply substantial service is also relevant in this critical judgment area. There would, of course, be the necessity of taking into account pertinent standards which are evolved by the Commission in this field.

#### **1971 Court Decision**

Spurred by the U. S. Court of Appeals' decision in *Citizen Communications Center v. FCC*,<sup>2</sup> the

1. 22 FCC 2d 424 (1970).

2. Case No. 24,471, decided June 11, 1971.

Commission has been called to reevaluate its "pertinent standards." In effect, the Court is forcing the Commission to consider "superior" service as an alternative test to "substantial" service in granting renewals. In addition, the Court admonished the Commission for utilizing its two-stage hearing process. Stating that the Commission's policy had a "deadening effect" upon renewal challenges, *the Court reversed this guideline* and maintained that it violated the mandates of 1) Section 309 (a) of the Communications Act, and 2) Section 309 (e) of the Act, as interpreted in *Ashbacker*.<sup>3</sup> The Court declared:

The Act says nothing about a presumption in favor of incumbent licensees at renewal hearings. The Act provides, inter alia, that no license shall be construed to create any rights beyond its terms, conditions and period, that an applicant waives any claim to a frequency because of previous use, that a renewal license may be granted for a term not to exceed three years, and that a license does not vest in the licensee any right in the use of the frequency beyond the license term. The Commission has in effect abolished the comparative hearing mandate by Section 309)(a) and (e) and converted the comparative hearing into a petition to deny proceeding.

The Court acknowledged the "greater burden" the challenger must sustain in order to prevail over his incumbent-opponent in a comparative hearing. Yet, the Court maintained this is a "substantive" burden and forbade the Commission from strewing the challenger's path with "procedural" obstacles. The challenger must be given a chance to meet the incumbent on "equal ground;" *he must be given a full, comparative hearing.*

#### **Performance Required**

For the television broadcaster, what constitutes a "substantial" or "superior" performance? What criteria will the Commission evaluate at renewal? What are "serious deficiencies?" How can a broadcaster assure favorable and expeditious treatment by the Commission at renewal? How does the Commission balance the need for stability in the industry with the need for a competitive spur?

The Commission is currently wrestling with all these problems. At hearing, the incumbent broadcaster is held to a performance test of "substantial" or "superior" service to the needs and interests of his area. The Commission and the Court of Appeals (*Citizen* case) are engaged in a battle of semantics over just what these tests mean. The Commission uses "substantial" in the sense of a solid or strong performance as contrasted with a service only minimally meeting the needs and interests of the area. The Court uses "superior" in the sense of a performance surpassingly good or comparatively better. As confusing as this is to the broadcaster, he need only heed the warning of this semantic battle: *The Court is steadily forcing the Commission to grant licenses at renewal to the group that would provide the "best possible" service.* As the Court put it:

Only records which demonstrate "unusual attention to the public's needs and interests" are to be given favorable consideration, since average performance is expected of all licensees.

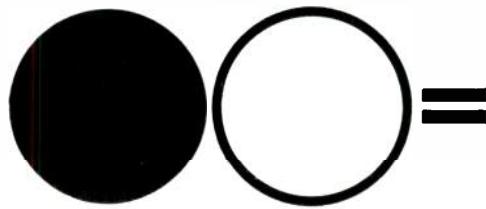
However, in its "Further Notice of Inquiry"<sup>4</sup> issued in August 1971, the Commission asserted ". . . it did not intend to overturn the policy that 'a plus of major significance' should be awarded to a renewal applicant whose past record warrants it."

3. *Ashbacker Radio Corporation v. F.C.C.*, 326 U.S. 327 (1945).

4. FCC 71-826, Docket No. 19154.

Continued on page 12

# THE ABTO EQUATION:



## **Black and white into color. Think what it means to you...**

Abtography. An accomplished miracle. A new color video system. You shoot with standard black and white film. You process quickly, inexpensively, as with any black and white stock. You show in brilliant color.

See it in operation now. Color at half the cost. In less time. With greater operational flexibility. That's what the Abto Equation means to you. A whole new horizon... or should we say rainbow... of possibilities in programming.

The Abto system is amazingly simple, inexpensive to install. The more you use it, the more money you save. And if you wish to use black and white or conventional color film, the Abto system handles them with no problem. Yes, Abtography even works with slides. Shoot in black and white. Show in full color.

The only problem with the Abto Equation is that it's hard to believe. Seeing is still believing. Arrange a demonstration. Come skeptical. Get the facts in black and white. You'll leave thinking color.

Demonstrations will be arranged in the order in which requests are received. We anticipate a deluge.

**abto** INC.

1926 BROADWAY / NEW YORK, N.Y. 10023 / (212) 787-5000

Hence, if the broadcaster renders full performance in the public interest and presents his past record at renewal in an ample, solid fashion, he should warrant such a "plus." "Full performance" means a conscientious service throughout the three-year period and not an upgrading of same during the third year because of the imminence of possible challenge. The Commission forbids such a "triennial flirtation" with the public interest.

Insisting that it is impossible to delineate with mathematical precision what constitutes "substantial" service, the Commission, nevertheless, has proposed such guidelines in two selected areas of television programming: 1) local programming and 2) informed electorate programming (i.e., News and Public Affairs).<sup>5</sup> The proposed figures, as general guidelines constituting "substantial" service, are as follows.

- 1) With respect to local programming, a range of 10-15% of the broadcast effort (including 10-15% in the prime time period, 6-11 p.m., when the largest audience is available to watch).
- 2) The proposed figure for news is 8-10% for the network affiliate, 5% for the independent VHF station (including a figure of 8-10% and 5%, respectively, in the prime time period).
- 3) In the public affairs area, the tentative figure is 3-5%, with, as stated, a 3% figure for the 6-11 p.m. time period.

It should be noted that these figures are general, tentative, and not applicable to "unprofitable" stations and independent UHF's. The burden is on the existing licensee to show the inapplicability of these guidelines. In addition, stations with "lesser revenue figures" are not held to as strict a standard as proposed in these guidelines. Rather, each station would be bracketed according to revenues, ranging from stations (top 50 markets) with revenues 1) over \$5,000,000, 2) between \$5,000,000 and \$1,000,000 and 3) below \$1,000,000. Standard of performance in local and informed electorate programming would be judged according to financial ability to develop same.

The Commission recognizes the existence of an infinite number of variables in proposing these guidelines. It believes that only individual inspection, perhaps in the hearing process, could definitively delineate whether substantial service was being rendered by the broadcaster. Consistently, these guidelines would not be automatically definitive either for or against the renewal applicant. If the applicant did not meet the guidelines, he could argue that his service was "substantial" or "superior," citing, perhaps, "an exceptional qualitative effort." A showing of an "exceptional" dedication of funds, staff, and other resources would likely compensate for a lesser quantitative showing.

In sum, these percentage guidelines will likely be adopted by the Commission on the basis of its notice. For the television broadcaster, they will be more relevant than the current quarrel as to what constitutes "substantial" or "superior" service. Most saliently, they would give a general indication of what is called for, at least *quantitatively*, to meet public interest requirements in two critically important areas.

The Commission further holds that "serious deficiencies" in an incumbent's past performance constitute damaging, if not controlling, evidence against

5. Notice of Inquiry, FCC 71-159, Docket No. 19154.

his renewal case. Commission examples of "serious deficiencies" are: overcommercialization, fraudulent practices as to advertisers, violation of racial discrimination rules, violations of the Fairness Doctrine, rigged quizzes,<sup>6</sup> plus numerous others. However, precise standards being impossible to define in this area, all matters relating to alleged "deficiencies" in the incumbent's operations must be explored in the hearing process.

In its *Citizens* decision, the Court also raised for the Commission's consideration certain additional criteria for evaluating an incumbent's performance. These criteria include: 1) elimination of excessive and loud advertising; 2) delivery of quality programs; 3) the extent to which the incumbent has reinvested the profit from his license to the service of the viewing and listening public; 4) diversification of ownership of mass media; and, 5) independence from government influence in promoting First Amendment objectives.<sup>7</sup> Indeed, the Court suggested that a "plus" in the overall weighing process be accorded the incumbent meeting these criteria.

### Suggestions:

The broadcaster is clearly caught in the middle by the prevailing uncertainty. The performance standard he is required to meet is, at best, ephemeral. Yet he would be wise, both as a matter of conscience and skillful management, to practice, where economically practicable, the following:

1) *Programming*: Operators should develop substantial local, public service programming designed to meet the particular tastes, needs, and interests of the community they are licensed to serve. Increasingly, the Commission is encouraging "localism" in the areas of news and public affairs programming. *A special effort to meet the "percentage guidelines" proposed by the Commission should be made.* Although it has not ruled on the "profits reinvestment" issue, the Commission will give same greater consideration in renewal hearings in the future. Indeed, the operator who shows a substantial investment of profits into service may well nearly insure his license against challenge.

2) *Advertising*: Operators should refrain from putting on an excessive number of commercials in the broadcast day. In addition, loud and vexatious commercials should be eliminated. A balance between sound economics and audience appreciation is advised. In any event, a wise operator will keep thorough records on the amount and nature of advertising in order to justify his advertising practices at renewal.

3) *Diversification of control*: Operators should be aware that the Commission will consider diversification as "a factor to be properly weighed and balanced with other important factors, including the renewal applicant's prior record at a renewal hearing." At this "inquiry" stage, the Commission seems to be saying that multiple mass media ownership will have a demerit effect upon a renewal applicant's case, but it may be offset by showing a superior operating performance or it may be "cured" by divesting during the comparative hearing process.

6. 22 FCC 2d at 426.

7. Slip Opinion at 25, n. 35; at 26 n. 36; at 28.

**Editorial Call:** *BM/E* is interested in describing your efforts in providing "substantial" local news and public servicing programming. Write or call.

# RGB PRIME TIME

## If you want to know how good the new TK-44-B is, get a flashlight.

The new RCA TK-44-B can get full video level at only five footcandles. That's a pretty weak flashlight.



We designed our camera this way for some very good reasons.

One reason is the trend to more, and more profitable, off air production by TV stations.

Advertisers and agencies are looking to the local broadcaster. And that can make a versatile camera a good investment.

Another reason is the trend to more natural lighting situations.

The key to it all is working in low light. Scenes can be made much more natural with a camera that can shoot at monochrome light levels or less without objectionable smear and noise.

It takes you away from that "obviously done in a studio" look that many clients object to.

Also, low light levels are easier to control, easier to air condition around, and cheaper to work with. They save you money.

When you feed us information on trends like this, we try to respond with products that will help you. That makes sense, both for you, and for us.

So, this trend was a major factor in building our new color camera, the TK-44-B. It has the best signal/noise ratio ever.

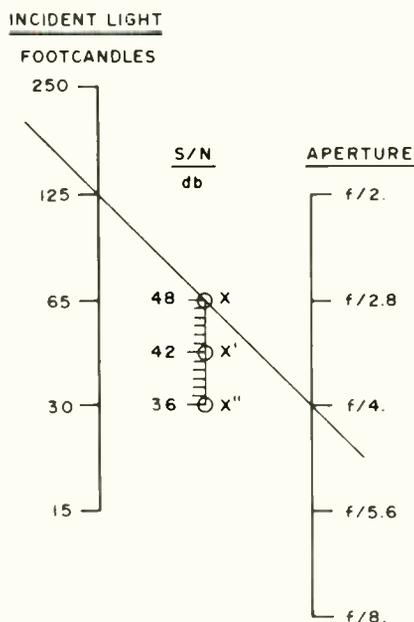
We've built in other features, too. Like Bias Light to minimize lag in low light. And RGB Coring to reduce

high frequency noise so you can get superior pictures at only five footcandles.

Scene Contrast Compression helps, too. It stretches blacks without color shift, so you get detail in shadow like never before.

On top of all that, our customers tell us it's the easiest to set up and most stable camera they've ever worked with.

We're in business to help you get your job done more easily, and with more profits. And that's what our new TK-44-B is designed to do. Even with a flashlight.



Circle 135 on Reader Service Card

## Guide to Chart

Sensitivity and S/N for TK-44-B is specified as follows:

When the camera is viewing a 60% reflectance Munsell under 125 footcandles incident light of 3200K and the iris aperture is  $f/4$ , output from the chain shall be 0.7V white and S/N ratio not less than 48dB, using an applied gamma correction of 0.5, no aperture correction, no RGB coring, chroma off, a typical set of PbO tubes and a bandwidth of 4.2 MHz.

Under normal conditions, just swing the line on the X axis. If video gain is increased so that 65 footcandles gives full level at  $f/4$ , then S/N will drop to 42dB.

It is quite apparent that the TK-44-B can operate satisfactorily at light levels normally associated with monochrome operation.

# "Now that we've got it, there's no going back." That's how they feel about "The Cart."

The first TCR-100 video cartridge systems went to WBAY-TV, Green Bay, Wisc.; WWL-TV, New Orleans, La.; WBRE-TV, Wilkes Barre, Pa.; KSLA-TV, Shreveport, La.; WAFB-TV, Baton Rouge, La.; KSTP-TV, Minneapolis, Minn.; WBAL-TV, Balt., Md.; and WUTV, Buffalo, N.Y.

Here's what some of the station officials say about it.

Chief Engineer Gary Cooper of WUTV, the independent UHF station in Buffalo, N.Y. says, "It has eliminated mass confusion in our production room, cut 'make-goods' tremendously, eliminated black intervals, and given us a beautiful looking product. And we have freed a man for other duties."

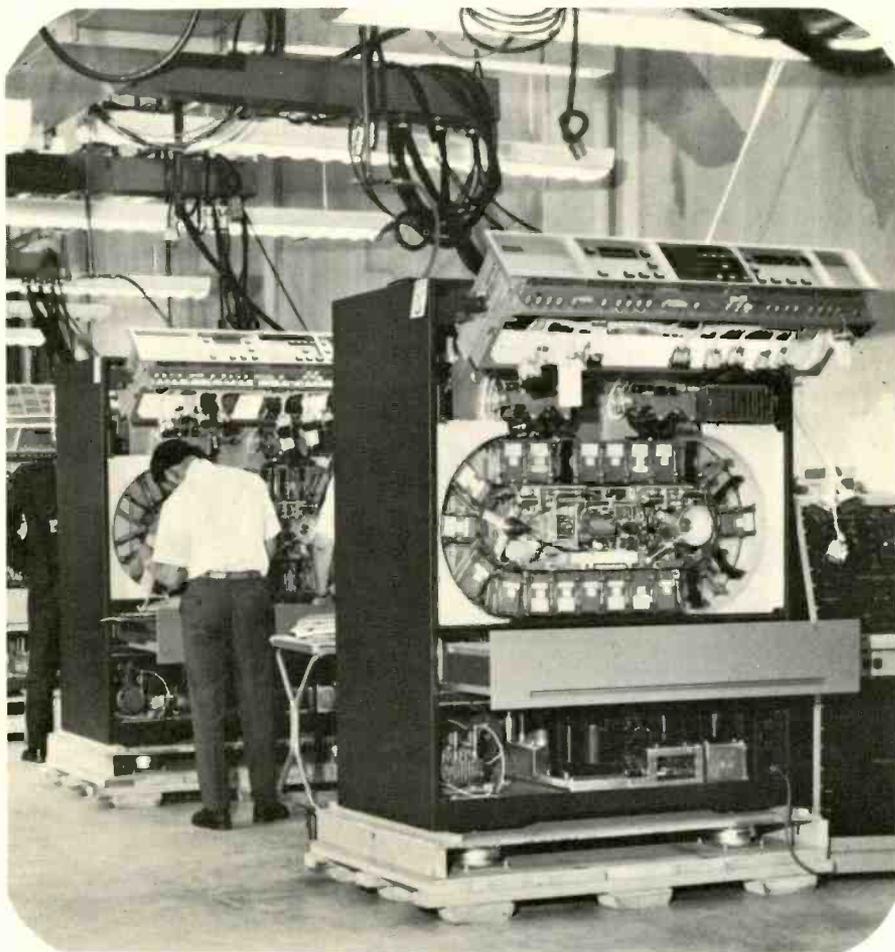
In Louisiana, when 18 candidates entered the Democratic Primary for Governor, the flood of political announcements was enormous. Don Allen, Vice President, Engineering and Operations, of WAFB-TV in Baton Rouge said it would have been impossible to handle the campaign with previous equipment. He also said, "Now that we've had the TCR-100 for a while, we would not want to be without it. There were certain technical problems, in 'the Cart' machine upon installation, but now, after a reasonable shakedown period, it's doing very well."

At KSLA-TV in Shreveport, La., General Manager Winston Linam feels that being able to handle an initial surge of new business has gone a long way toward paying for the TCR-100. With the trend to clustering of short commercials units, he sees "the Cart" as tomorrow's answer. KSLA was able to go from 2 to 4 spots per break, with better quality, fewer errors, and better switching speed. Says Mr. Linam, "Now that we've got it, there's no going back."

RCA's Camden plant is working on a backlog of orders for the cartridge system and the second phase of production has been stepped up to meet customer demand.

Circle 137 on Reader Service Card

## RCA PRIME TIME



Workers on the line at RCA Camden have stepped up the second phase of production, so more stations can use the TCR-100 Video Tape Cartridge Recorder to get good looking, efficient station breaks.

## Earth Resources Satellite gets new RCA Video Recorder.

Video recorders have been delivered by RCA's Government Communications Systems, Camden, N. J., for a new NASA satellite which will test the feasibility of acquiring information on crops, water supplies, mineral sources and other natural resources from outer space.

The recorders, which use a 2-inch video tape, are designed to store information picked up by the satellite when out of range of ground stations. They are expected to have a life in space of 1,000 hours—about three times that possible with systems that

exist today.

The system will store information from return beam vidicon cameras (also built by RCA) through a range of DC to four megacycles as well as 15 megabit/sec digital data from a multi-spectral scanner. Integrated circuits and other advanced technical features will be employed in the recorder to produce high capability in a compact design. Where previous recorders required at least four regulated power supplies, the RCA system will work off a single 24-volt DC source.

Circle 136 on Reader Service Card

# Answers to four big questions about remote control transmitters.



**Q.** Should I go to remote transmitter operation?

**A.** Obviously there is no universal answer to this one. It depends on many factors, among which are:

- ... preference and operating procedure of the individual station
- ... how distant (and accessible) is the transmitter site
- ... age and reliability of the present transmitter
- ... demands on technical personnel.

**Q.** How far should I go in remote control?

**A.** The range of requirements for remote control of transmitters runs the gamut from basic metering and con-

trol to complex systems with capability for diagnostic measurements and identification of component and circuit failures. Since economics usually dictate the extent of the remote control operation, most broadcasters presently prefer a basic system which provides the operating controls and meter readings to meet FCC requirements. Remote operation of television transmitters also requires a complement of remote monitoring equipment, including an off-air visual demodulator and aural modulation monitor, waveform monitor and vectorscope. Vertical interval test signal generating equipment (VITS) must be installed at the transmitter for monitoring its performance at the remote control point. Many stations add automatic logging equipment to relieve operating personnel of some of the routine manual tasks involved in remote operation.

**Q.** Do we need a new transmitter to go to remote control—or can our present transmitter be adapted?

**A.** All RCA current model VHF and klystron UHF transmitters include the capability to be remote controlled. Generally, the age, reliability, maintenance cost and life expectancy of the present transmitter would determine whether it would be advantageous to make a further investment in remote control equipment and necessary modifications.

In planning for remote operation, a new transmitting system should be carefully considered. The new generation of parallel TV transmitters are designed for remote operation. With the parallel system, only once-a-week inspection is required at the transmitter site, with resultant savings in operating costs. Furthermore, since technology has progressed considerably in recent years, today's transmitter specifications are far superior—in terms of reliability and performance. New RCA transmitters, for example, show a 2:1 improvement in virtually every critical performance spec. This, plus the extra margin of safety afforded by parallel operation would make it desirable and economical in most cases to invest in a new parallel transmitting system when considering remote control.

**Q.** What would I save by going to remote control?

**A.** Better utilization of personnel is the obvious saving from remote operation. With a parallel transmitting system, only a once-a-week inspection and calibration visit is required at the transmitter site by FCC rules. New solid state transmitters now available offer greater reliability, reduced operating costs and easier maintenance, resulting in additional economies.

Circle 138 on Reader Service Card

## Unique switcher and chroma key help WBAP-TV, Ft. Worth, win news award.

WBAP-TV Fort Worth/Dallas credits its RCA TS-51 "super switcher" with helping it win a recent news award from the Texas Associated Press Broadcasters Assn. The judges wrote, "The program was extremely well produced with good use of visual material, particularly the chroma key."

The switcher operates with 26 inputs, excluding reentry, black and downstream inputs. And almost all of them are used daily. There are 3

color cameras and 2 black-and-white cameras in the studio, and 4 of the 6 color cameras in WBAP's mobile color unit are also wired to the switcher.

The TS-51 also has 3 chroma keys, 3 TA60/TE60 mix effects amplifiers and effects pattern selectors of 6 mix rows and 2 key rows.

Working with the switchers is RCA's Com Sync, a sync distribution studio system which permits grouping of signal sources, in complete

isolation from all other station operations.

Rupert Bogan, Director of Engineering at WBAP, installed the switcher because, "We needed to increase our switching capabilities. The news comes on 5 times a day, and many times a newscast needs 11 signal sources. On our old switcher, that left only 3 inputs that weren't tied up in a simple news program."

Circle 139 on Reader Service Card

**RCA PRIME TIME**

# New approaches to product planning, service, and information created to fill your needs faster.

Recent changes in our marketing organization should bring you noticeable improvements in three areas: equipment, service, and information.



by Neil R. Vander Dussen  
Division Vice President  
Broadcast Systems  
Communications System Division

**New approach to product planning leading to equipment advances.** Product planning is now set up to keep in closer touch with operating realities at your stations. We want to know your needs better, so we can fulfill them better. It'll be good for both of us.

Currently, we see a need for operating economies and increased versatility without sacrificing quality. So we're stressing cost-effective performance features. Two aspects are getting special attention—simplicity of operation and maintenance, and future compatibility with automation techniques.

Call **TECH-ALERT** for technical service. Now when you need emergency help on technical service, warranty questions, installation scheduling, or general product assistance, call **TECH-ALERT**, 609-963-8000. Ask for extension PC-3434. Specialists are there to give you the answers you need.

For off-hours, a machine will record your message for fast action the following morning, and give you a further number to call if you prefer not to wait.

We want to be there when you need us.

**Getting you the information you need.** As well as supplying you with bound catalogues unique in the industry, we're refining our catalogue sheets to reflect applications benefits more clearly.

Broadcast News will keep bringing you detailed information.

And, with this issue begins a new service, RCA Prime Time, designed to bring you a digest of news every month, that's slanted to your needs. I hope you enjoy it.

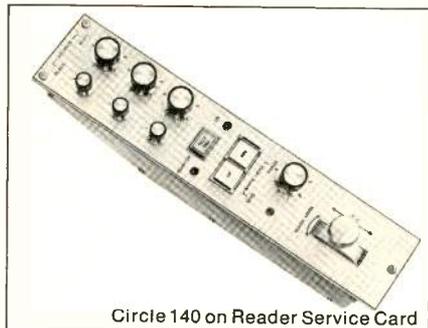
New approaches to product planning, **TECH-ALERT**, new channels of information—these are examples of the ways we try to make your job easier.

After all, that's RCA's business.

Circle 142 on Reader Service Card

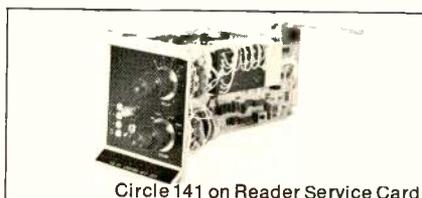
## Products in the news.

**Joystick control** for RCA TK-44-A color spread lets one man operate iris and black-level on as many as six cameras at once. Six joystick units mount in a single console housing containing all controls necessary for operation during production.



Circle 140 on Reader Service Card

**TG-70 Chroma-Key Generator** gives you a color-derived keying signal for use with Special Effects equipment. It accepts red, green and blue signals from a color camera, selects the desired signal and generates a signal which is used to "key out" that color-oriented portion of the picture.

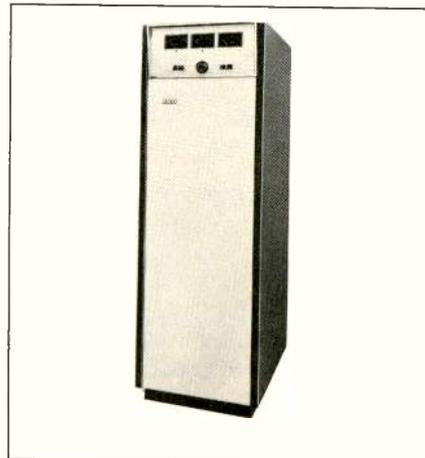


Circle 141 on Reader Service Card

**Compact 1 kW AM Transmitter.** The BTA-1S is a new design 1 kW AM transmitter featuring excellent sound and dependable performance. Partially transistorized, it combines the advantages of tubes and solid state devices to achieve greater reliability and stability with simple circuitry. Exciter and buffer stages are solid state, while the high-level stages employ modern, easy-to-service tetrodes that need no neutralization. Fully broadbanded, the BTA-1S requires only a single tuning control. Heavy-duty modulator components permit the transmitter to handle high modulation levels (115 to 120 percent) reliably, with low distortion.

Slim and trim (26" wide, 30"

deep), the BTA-1S fits almost anywhere. Remote control provisions permit unattended transmitter operation. And, where power reduction at night is required, a Power Cutback option can be added, reducing power to either 500 or 250 Watts at the press of a button.



Circle 143 on Reader Service Card

**RCA PRIME TIME**

# Talk Is Big in New York Radio

Three of the top six stations (ARB) in New York City are all talk. The latest and most modern station to succeed with talk is WMCA—where listeners do most of it. It's engineered that way.

Some pundits say all-talk radio is on its way out. You could prove the opposite in New York City. The youth station, WABC, with rock, holds number one in the latest fall ARB rating, but WCBS and WINS, the all-news stations, are second and fourth respectively. WOR, which is heavily talk, was third (right behind WCBS), and WNEW, heavy on personality and MOR music, was fifth. Holding sixth place, and coming up strong from 16th a year ago (ninth on the preceding ARB), was WMCA, which calls itself Dialog Radio 57. It's a listener-participation talk format for 24-hours a day. WMCA just moved into brand-new studios at 888 Seventh Avenue that have been specifically designed for listeners' participation by Bob Kanner, vice president for engineering.

There are numerous engineering features incorporated in this modern facility such as a floating studio-within-a-room, raised pedestal floors with all wiring and cables underneath, and operating consoles that control dc current only. In this report we'll look primarily at the feature that makes it ideal for a listener-participation format. Integral to the design are back-up systems to assure the utmost reliability—which we will also have to discuss because we can't get away from them.

Two big problems face any engineer who must design for listener participation. The first is not losing the caller who gets on the air and the other is cutting him momentarily, but instantly, if he uses profane, obscene, or libelous language. Kanner has solutions to both these problems. To make life more complicated, he's designed a system that permits one or more listeners to talk directly to one another via on-air conference calls. Further, each guest on a



Frontispiece: View of main news studio control room with 44 channels (22 input gain controls—16 lower bank and six upper bank).



Fig. 1. View of call director, speaker/phone unit, mike, and announcer turret at WMCA.

panel show can talk to a listener. And, since news has to be big at all-talk shows, WMCA has a city news desk that gives the news director access to over 30 inputs. How it's done follows.

### The multi-line call director

Kanner worked closely with the telephone company to figure out a foolproof incoming call system. Heart of the system is a multi-line call director, Fig. 1, which can take and hold eight callers. A program producer screens incoming calls and stacks up all callers that will eventually get on the air.

In case of a telephone line failure, there is a complete second set of call-in lines. If voice contact with the caller is lost, the air personality gives the caller a new private unlisted number to dial which will get them back on the air together again.

Although the producer screens incoming calls (which affords an opportunity to recognize and cut off the habitual publicity seeker), a lot of control must be exercised by the talk host or air personality.

The announcer turret, Fig. 2, provides a good portion of this control. A talkback switch, which cuts in a cue circuit, signals the producer that assistance is needed. If what needs to be done is not obvious, the producer can speak to the talk host

on his earphone, privately. If necessary, the talk host can cut the on-air mike so direct voice communication can take place between himself and the producer. (This communication might be to panel guests in the studio while a listener is talking.) The turret also has a mike short button which can be pressed if the host must cough, clear his throat, etc. (This mike button also shorts the input to the telephone speaker-phone unit.)

The turret also has volume controls for setting the studio monitoring speaker level (channel A or B) and earphone level (channel A or B). There are always two channels in Kanner's circuit back-up system. Cue buttons (A and B) can be pressed if the host or announcer wants to tune in on upcoming cue signals.

The actual telephone lines are handled by the telephone call director and speaker-phone unit. Any one of eight calls can be switched on the air at the moment the host presses a button. The caller hears the host, and vice versa, through the speaker-phone which is a standard telephone unit. The host could take two (or more) calls simultaneously and then press the corresponding conference button on his call director so callers can talk to each other. If several people are in the studio, each can hear and talk via his own speaker-phone. Another important button on the call director is a "kill" button which is depressed before pressing other call buttons to eliminate key click.

It's a daily and regular occurrence at WMCA on *News Call* or *Wrap-up* to get a newsmaker on the phone and then switch listeners with questions to him.

Thus, it's really party-line radio at WMCA, and the only limitation is not more than eight callers at once. About 20 get on for a given show segment. Tally indicators keep track of calls that can't be accepted and they may run several hundred per program—1500 busy signals have been counted. This may sound discouraging to the disappointed caller, but nonetheless the WMCA format must be viewed as a paradigm of honest-to-goodness community access. The quality of the phone line is enhanced by a McCurdy filter-equalizer, Fig. 3. If some point of view on a controversial community issue doesn't get on the air via direct dial-in, there's a great opportunity for spokesmen of this-or-that cause to get invited right into the studio on another day for another go at it. Ken Fairchild, vice president of programming, is proud of the station's service to community groups.

### Censoring callers, or keeping the airways clean and decent

One can't provide direct on-the-air access day after day without worrying about profanity, obscenity, or libelous language. Kanner has solved this with his seven-second program delay system and "panic" button, Figs. 4 and 5.

If a no-no is uttered, the talk host, the producer, or board engineer, has seven seconds in which to press the panic button. This will switch in a tape cartridge message which says, "I'm sorry, we had to cut that off the air." At the end of this time in-

### Newsmakers Accountable to Listeners

When WMCA bills itself as an all-out listener-participation station, it means just that—including the news shows. Listeners can question the newsmakers, which may number six or eight per two-hour news wrap-up. WMCA differs from the all-news stations in that it doesn't continuously repeat the news. It updates headlines every half-hour, but the "news" tends to be on-going community activities as a typical day from *Wrap-up* indicates:

#### Thursday, 11/18/71, on *Wrap-up*:

- 4:10—Jerry Burbank, of the Forest Hills Residents' Association, gives his views against proposed low-income project in Forest Hills. Simeon Golar, New York City Housing Authority chairman, gives his views in favor of Forest Hills low-income housing.
- 4:35—Dr. Monroe Lefkowitz of the New York State Mental Hygiene Dept.—research into effect of TV violence on children.
- 4:55—Tape of Sanitation Union Chief John DeLury, criticizing Deputy Sanitation Commissioner Robert DuVal for allegedly coercing sanitation men to buy tickets to Lindsay political dinner.
- 5:07—Sidney Asch, judge, and author of "The Supreme Court and Its Great Justices."
- 5:22—New York Police Department Deputy Commissioner William P. McCarthy—new efforts to curb police corruption.
- 5:38—Erica Freeman, psychoanalyst, and author of "Insights: Conversations with Theodor Reik."
- 6:23—City Councilman Monroe Cohen (D-Brooklyn)—proposal to limit sales and dispensing of pills to cut illegal usage.
- 6:35—Sarah Lyndon Morrison, witch, and author of "The Modern Witches' Spell Book."

terval—another seven seconds—the program will have been picked up again, sans the offending words.

This is all possible through the incorporation of a pair of endless loop tape transports, in which the playback head is located behind the record head.

Operation can be visualized by looking at the simplified schematic of the air chain, Fig. 6. All program material is recorded on either delay transport, D1 or D2, which are periodically alternated.



Fig. 2. Closeup of announcer turret showing on-off mike switch, top row; attention light (from producer) between monitor speaker volume controls A and B, second row; Talkback switch, Cue A button, Cue B button and cough switch (concealed), third row; Earphone volume controls A and B, bottom row.



Fig. 5. News announcer with hand on panic button. If the young lady presses it, pre-recorded cartridge is cut into air.



Fig. 4. Bob Kanner in front of delay transports. Seven second cart player is at bottom of rack.

(Switching back and forth assures that both transports are always operational.) If or when the panic button is pressed, the Cart Delay Relay is cut in and its message goes on the air. But, simultaneously, this triggering causes the alternate delay transport to begin recording. This transport, which has been switched out, is always running but not recording because of another set of contacts on D1/D2 relay which shorts its input (and output) when it is not on the air. Thus, the offending words are not on this loop.

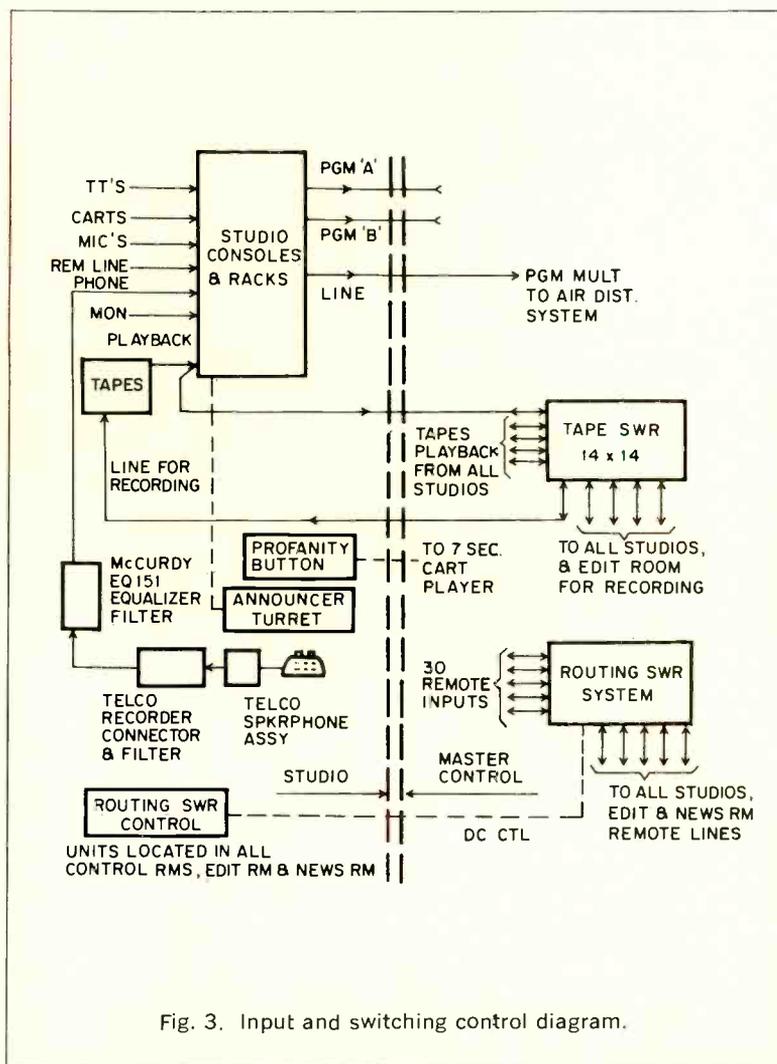


Fig. 3. Input and switching control diagram.



Fig. 7. Apollo-like control center news desk at WMCA.

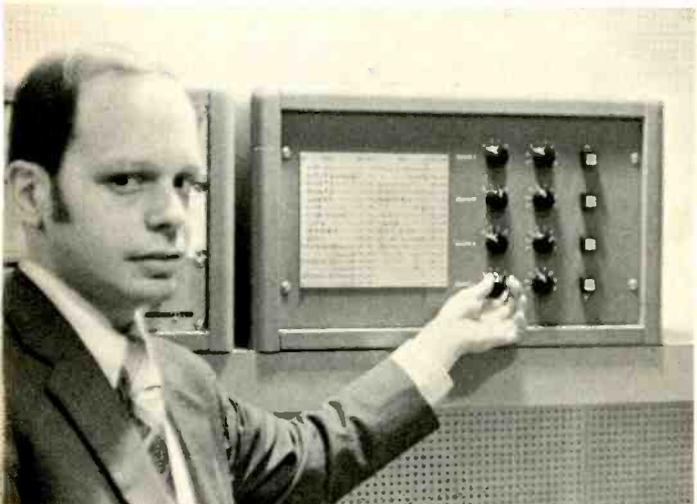


Fig. 8. Kanner points out remote input routing switcher (located in every studio).

Then, at the end of the seven-second "I'm sorry . . ." message, a trip cue pulse on the cartridge tape switches this alternate delay transport onto the air. In the meantime, of course, the host reminds the caller to watch his language. (In practice, the host keeps the panic button pressed until the cursing, or whatever, ceases, so there is no chance of any offending material getting on the air.)

The delay transports are modified Ampex 440's. Take-up reels and motors are replaced with fixed tape guides which form the path for the endless loop. The head assembly has been modified so that from left-to-right, the lineup is playback, erase, record. Scotch Tape 156 (lubricated) is used and the delay transport does not degrade the signal in any way. A special splicing tape from 3M, 621, should be used.

Isolation amplifiers, DA, keep the delay recorder isolated from the line when operating NORM (Fig. 6). Thus the recorder can be disconnected for maintenance without clicks getting on the air.

Boost amplifiers, DB, appear at the output to increase the level of the tape signal.

During switching of machines, momentary shorts keep clicks off the air. Tape loops can be changed without interference with the over-the-air signal.

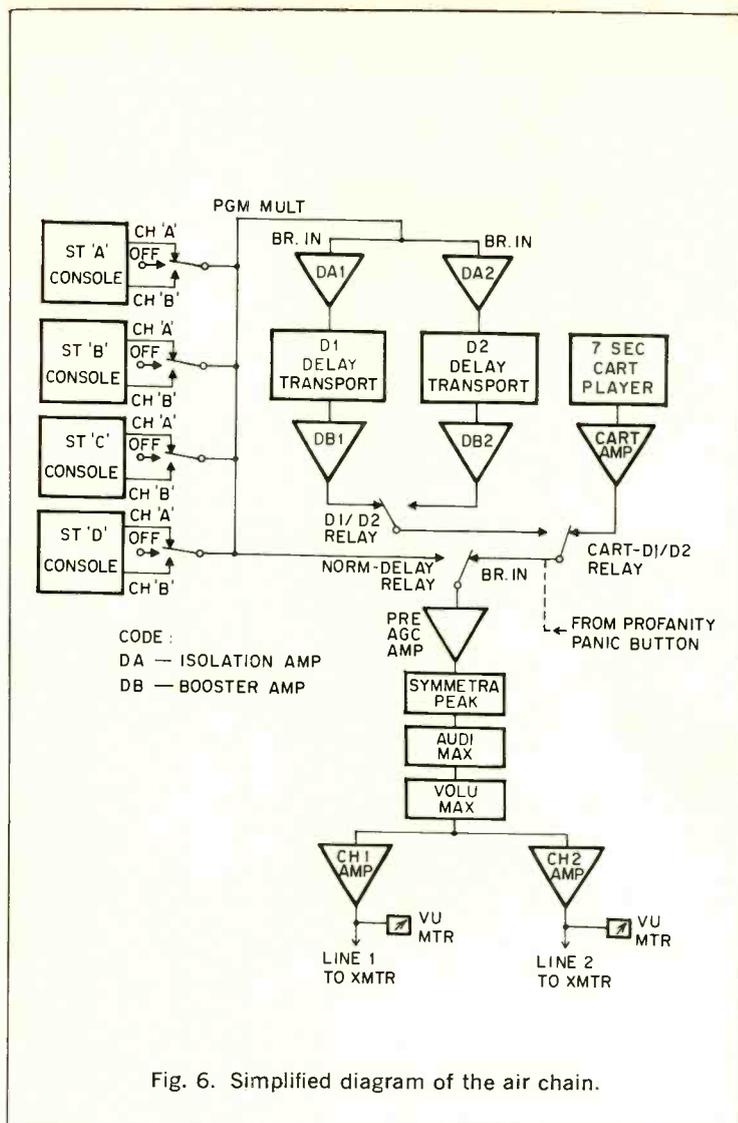


Fig. 6. Simplified diagram of the air chain.

(Loops are changed every 12 hours, but they could run for three days without signal degradation.)

Kanner has built in additional override switches to interrupt the process just described if any one of the elements malfunction.

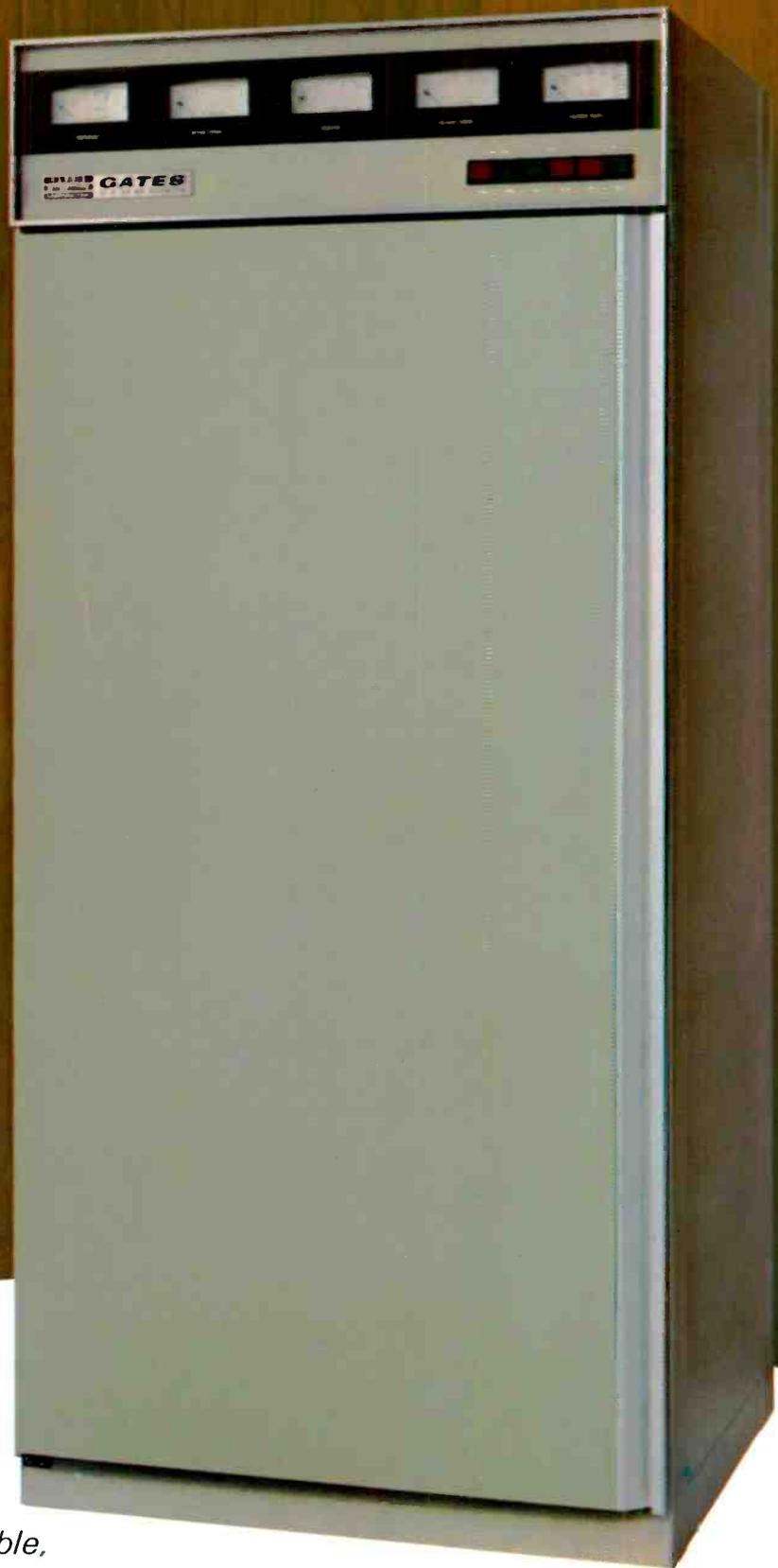
### City news desk

The new WMCA newsroom is built around a specially designed "city desk layout" where the news editor on duty will have access—literally at his fingertips—to police and fire communications, plus 30 monitoring sources, Fig. 7. Without ever having to leave his position, the news editor has eye contact with the personality on the air and a clear view of several teletype machines just beyond in a glass-partitioned room.

The 30 inputs can be obtained at the news desk, and at any of the four studio control rooms and the tape editing room—simply by positioning several selector switches, Fig. 8. No patch panels are used. The routing switching system uses a compact cross-bar switcher imported from Telefunken, Germany.

The news desk looks like something from Houston Space Control Center. In fact, Kanner ap-

(Continued on page 50)



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# WHAT NEWS COSTS AT NBC

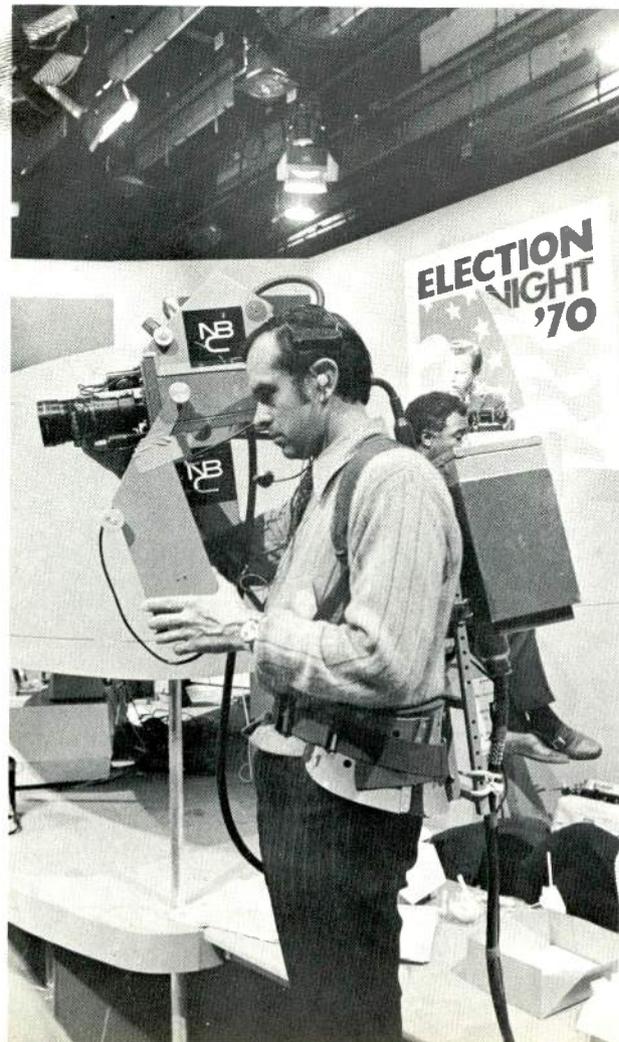
By Alan Pearce

The money it takes to put a satisfactory measure of news and sports programming on the air is one of the essential costs of any broadcasting operation, and in many cases it is only partly retrievable through advertising revenue. This article shows the actual figures for news and sports costs of the National Broadcasting Company for 1970, a fairly typical recent year, and describes the budgeting procedures. The total of \$103 million is, of course, a very long way beyond the necessities of any local station, but most station managers can study the NBC budgeting philosophy and procedures for new perspective on their own news operations.

NEWS AND SPORTS PROGRAMMING is very expensive. It is also an essential part of the broadcasting business. Many in network broadcasting's top management regard news as the cornerstone of everything they do. Sports programming is given to provide a balanced schedule, and also because the network affiliates demand it. NBC—the subject of this article—spends over \$100 million every year on news and sports programming for the Television Network, the Radio Network, and the owned television and radio stations. These news and sports

program costs exclude what NBC calls “overheads”—that is, money spent on top executive salaries, plus the running costs of all the other departments such as sales, corporate planning, research, business affairs, press and promotion, etc. In return for the \$100 million or so investment in news and sports programming, the NBC News Division fills 25 percent of the regular television network programming schedule, between 75 and 80 percent of the radio network's programming, between 21 and 22 percent of local programming by the owned television stations, and 25 percent or more of total programming by the owned radio stations.

Roving TV cameras add to the cost of doing news.



## How the NBC news budget is made

Because the News Division is not operated as a profit center, advertising revenue earned by news and sports programming goes directly to the Television Network, the Owned Television Stations, or the Radio Division, including its six owned AM/FM stations. In return the Television Network, the Owned Stations, and the Radio Division, have to pay all of the News Division's costs. The NBC Television Network pays approximately 75 percent of the total costs of news and sports; the Owned Television Stations Division takes roughly 18 percent; and the Radio Division provides 7 percent of total costs. In fact, the Enterprise Division picks up a small proportion of costs (less than one percent) because it receives income from sales of NBC news and sports material sold abroad. Although the costs of news and sports are shared, control of the capital budget is exercised through the Television Network Division in conjunction with the News Division, and not through the owned stations or the Radio Division. The owned stations and the Radio Division are treated like customers

**Dr. Alan Pearce** is a British economist who completed last year a study of the organization and costs of news and sports programming at NBC. He is now a broadcast economist with the FCC in Washington.



Almost \$1.5 million was spent on Election Day to cover the 1970 midterm elections. See table on page 25.

of the News Division, whereas the relationship between the News Division and the Television Network is much closer because the network pays the bulk of the bills; in return the network gets whatever it can from advertising sales to offset its costs of news and sports.

The sum to be spent on news and sports in any given year is not chosen as an amount of money, to be followed by decisions on what the News Division is going to do with it. The News Division decides what it wants to do and then decides how much money it will cost. If the costs are too high, the News Division negotiates with top management, and the contributing divisions, and a compromise is reached. On the whole, however, the budget is a reflection of past experience.

Part of the budgeting process is like trying to foresee calamity. The president of the News Division is supposed to be a responsible journalist and also a responsible officer of the company. In an emergency, he is allowed to rape the balance sheets of the three operating divisions that contribute to his overall budget, so long as he does it responsibly.

In the fall of any given year, the News Division goes to corporate management and tells them how much will be needed to cover news and sports in the following year. There are certain known costs like labor, equipment, office rent, and the regularly scheduled program budgets. Then comes the unknown element—forecasting the calamities that occur regularly in world news. Officers of the News Division do not look into a crystal ball and try to determine what will happen, but they do thorough research as to what is likely to happen and there are usually a number of known events.

For example, in 1970 the News Division knew that there would be a mid-term election in Novem-

ber, a couple of space shots were expected but only one actually took place in the year, and trouble is always anticipated in the Middle East and South East Asia. Consequently, a budget is built up by trying to assess all the known costs and then several million dollars are thrown in as an unscheduled news contingency. This contingency is based on the amount spent on unscheduled news over a period of years. An average is worked out, something is added for increasing costs, and a figure is put into the budget.

Occasionally this contingency budget is hopelessly underestimated, as for example in 1968 when the assassinations of Dr. Martin Luther King and Senator Robert Kennedy were followed by city riots and the demonstrations at the Democratic Party Convention in Chicago. Generally speaking, however, the contingency is usually in the ball park financially at the end of the year, thanks to many years of experience of covering news events of major importance.

For 1970 NBC decided that the News Division could spend \$103 million on news and sports coverage in that year. This is a percentage breakdown of how the money was spent:

Sports programming .....	42.2
Regularly scheduled news programming .....	37.1
Other news programming .....	7.5*
Departmental costs .....	13.2
	<b>Total 100.0%</b>
*Percentage breakdown of other news:	
Moonshots .....	.8
Political programming .....	2.5
Unscheduled news .....	2.5
Planned specials .....	2.3
	<b>Total 7.5%</b>

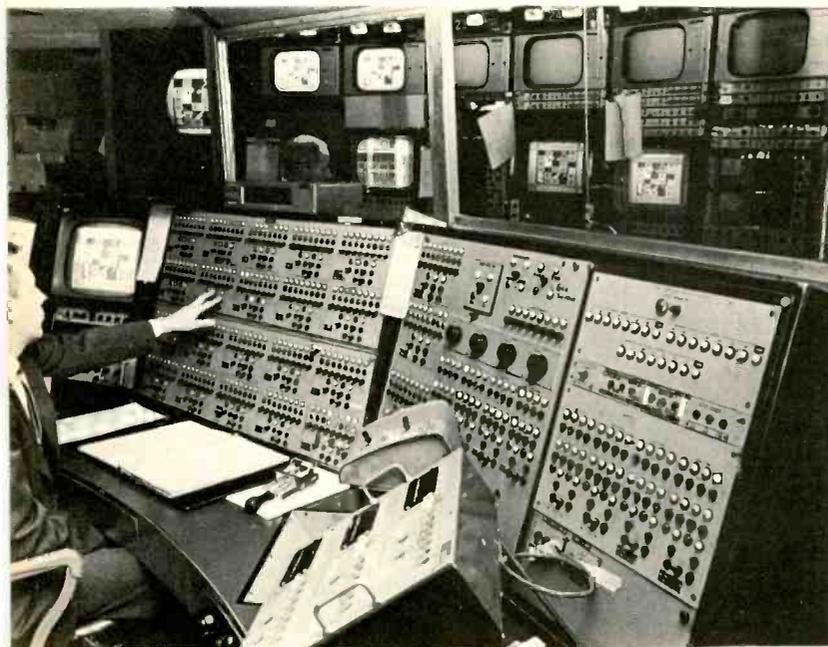
Source: NBC News Divisions Business Affairs.

From the above budget breakdown, it can be seen that there are two elements of cost—departmental and show costs. The show costs wind up against a particular program and many of these costs will be examined in this article. Departmental costs include the administrative overheads that cannot be assigned to a particular program but are assigned to the Division in general, the unliquidated portion of the cost of the overseas bureaus, and any other non-program costs that cannot be put into a particular program budget.

The remainder of this article will be devoted to breaking the costs of news and sports down into particular programs or types of programs. The costs of programming will be examined under the headings of the separate divisions, beginning with



Equipment photos at NBC. Closeup of the TR-70 VTR and the complex master control room.



the Television Network, then going on to the Owned Television Stations, the Radio Division, and finally taking a look at the costs of sports programming.

#### The cost of regularly scheduled news on the NBC Television Network

The most important regularly scheduled news programs aired by the NBC Television Network are:

**The NBC Nightly News.** A seven-day-a-week, year-round, half-hour, early-evening news program. The whole of NBC's News Division has been built around this program, which was formerly known as **The Huntley-Brinkley Report**. The weekly budget in 1970 was \$173,800. Total cost for the full year: \$9,037,600.

**The Today Show.** A five-day-a-week, year-round, early-morning, two-hour, news and general features program. The weekly budget in 1970 was \$99,736. Total cost for the full year: \$5,186,272.

**First Tuesday.** A monthly, two-hour, news magazine. The monthly budget in 1970 was \$264,145. Total cost for the full year (there were only eleven programs because of the mid-term election program which came on the first Tuesday in November): \$2,905,595.

**Meet the Press.** A weekly, half-hour, news interview program, aired on Sunday of each week throughout the year. The weekly budget in 1970 for a show coming from Washington was \$5407; for a show coming from New York it was \$6844. Average weekly show cost was \$6000. Total cost for the full year: \$312,000.

The show budgets are prepared by the News Division's business affairs office in conjunction with the Television Network's business affairs office. In order to keep track of the weekly, monthly, and annual expenditures, a business manager, or unit manager, is assigned to each program; in some cases two business managers are assigned. The main function of the business or unit manager is to act as a cost controller. He attempts to administer the budget as efficiently as possible. He keeps track of all the money that is being spent and constantly projects where the show is going financially. If things begin to get out of hand financially, and the show looks as though it is going to be far over budget, the business manager has to report this to top management. But in normal circumstances the responsibility for keeping within the budget is held by the executive producer or the producer of the particular show.

A second function of the business manager is to take care of the physical elements that are required to put the show together. He organizes and orders equipment, manpower, facilities, outlines schedules, arranges transportation and hotels, etc. So the business or unit managers have both production and business responsibilities.

One of the most important tasks of the business manager is to prepare a weekly actual and estimated cost report summary. This is a statement that compares the actual money spent with the estimate

## Midterm election returns costs.

	Budget	Actual	Under (Over)
	\$	\$	\$
Projection and analysis .....	541,890	478,910	62,000
National Election Service pool .....	385,000	365,000	20,000
Production costs .....	456,125	449,655	6,470
Remotes .....	110,000	128,500	(18,500)
Commercial fees .....	65,000	52,000	13,000
Contingency .....	50,000	—	50,000
		Under	132,970

in the budget. The A&E's, as they are known, form the basis of NBC News Division's and the Network's budgeting procedure. The A&E's help in budget re-evaluation and are an important factor in cost control. These weekly A&E's provide an excellent historical background to costs of programming over the years, and have helped improve the budgeting procedure because they report regularly on what is actually spent on every program produced by NBC.

### Non-regular news programming

As we have seen, there were in 1970 four main elements of programming in this category: moonshots, political programming, unscheduled news, and planned specials.

**1) Moonshots.** There was, of course, only one moonshot in 1970, the Apollo 13, which developed a fault and could not land on the moon. NBC carried special Apollo 13 programming from April 11 to April 21. The total cost was \$831,000. Moonshot budgets have been reduced recently due to greater pool coverage; that is, greater cooperation between the three networks who might pool their resources, and also by presenting less ambitious coverage. The Apollo 11 shot, which landed the first men on the moon in July 1969, had an ambitious programming budget totalling over \$1.5 million.

**2) Political programming.** The News Division budgeted 2.5 percent of its total annual budget of \$103 million for 1970 to political programming because there was a midterm election. Most of the budget money was spent on the election return program broadcasts on November 3 and 4. The summary estimate and actual report is shown in the table above.

**3) Unscheduled news.** This accounted for only 1.9 percent of the total News Division budget in 1970, but it is the most unpredictable category and it is in the area of unscheduled news that the budget is most likely to be exceeded. Unscheduled news is the most highly priced news, because: a) it is unlikely to attract any advertising, since it goes on the air on an emergency basis; b) it displaces other regularly scheduled programs; c) there is often a considerable advertising loss due to the pre-emption of other programming; d) very often the programs do not lend themselves to advertising, for example, the assassinations of President John F. Kennedy, Dr. Martin Luther King, and Senator Robert Kennedy, or a Presidential Press Conference, or special war coverage in the Middle East or South East Asia.

As examples: On May 10, 1970, the NBC News Division put on an unscheduled program entitled "Our House Divided." It cost \$87,000 to make the program, but the pre-emption costs—the loss of advertising in the programs it replaced—amounted to \$144,000. The News Division is not responsible for pre-emption costs, but they have to be borne by the Television Network. "A Conversation with the President," broadcast on July 1, 1970, cost NBC News only \$12,000 in production costs because it was pool coverage, but the Television Network lost \$57,600 in pre-emptions.

**4) Planned specials.** These represented 2.3 percent of the total news budget for 1970. They vary enormously in cost, ranging from only \$29,000 for a show like "The Loyal Opposition," to \$750,000 for one like "From Here to the 70's," which was 2½ hours long. Sponsorship of planned specials varies. Usually the non-controversial ones like "The Everglades" or "The Great Barrier Reef" earn money, while documentaries on drugs like "Trip to Nowhere" lose heavily. In fact, one NBC documentary, "Migrant: An NBC White Paper," shown on July 16, 1970, cost \$168,190, and led eventually to a great loss in advertising revenue. Coca-Cola, a company that was criticized in the program, eventually withdrew its advertising from NBC and placed it with the other two networks.

### Departmental costs of the television network

Departmental costs represent 13.2 percent of the total News Division budget at NBC and the largest proportion of these costs are picked up by the Television Network. Departmental costs consist of administrative overheads that cannot be assigned to a particular program, the unliquidated portion of the cost of overseas bureaus, and other non-program costs that cannot be put into a particular program budget.

### News programming on owned television stations

The NBC Owned Television Stations Division is responsible for 18 percent of the annual news and sports budget at NBC. In 1970 this amounted to roughly \$19 million, \$14 million for programming and \$5 million for operations and engineering.

WNBC in New York was responsible for 35 percent of the \$19 million budget; KNBC in Los Angeles was responsible for 25 percent; WMAQ in Chicago picked up 20 percent; and WRC in Washington, D. C. and WKYC in Cleveland each had 10 percent of the total Owned Television Stations Division annual news budget.

As an example of a news program budget at the

owned station level, WNBC's "Sixth Hour News," since renamed "News 4 New York," cost a total of \$3,366,000 in 1970.

### News programming in the radio division

NBC Radio Division takes 7 percent of the News Division's annual budget. This news is divided between the Radio Network, which broadcasts between 30 and 40 hours a week and between 75 and 80 percent of that is news and sports programming, and the six owned AM/FM radio stations—WMAQ in Chicago, WKYC in Cleveland, WNBC in New York, WJAS in Pittsburgh, KNBR in San Francisco, and WRC in Washington, D. C. These stations vary the amount of news and public affairs programming used because some of them have a mostly music format while others have much more news and sports and talk-show programming. At a very minimum, however, NBC-owned radio stations have 25 percent of news and sports programming content.

Radio news can, of course, be done much more cheaply than it can on television. Radio does not need all the engineering and film crewing that television requires, nor does it need stagehands, makeup, production personnel, and complicated studio

facilities. Content and production is much simpler on radio, and this is reflected in the radio news programming budgets. The only factor of budgeting that is just as costly is administration; it costs almost as much to administer the radio network and the owned stations as it does to administer the television network.

The Radio Network's news operation cost almost \$5 million in 1970, and nearly \$4 million was spent on covering news for the owned stations. About 60 percent of radio's news costs were attributable directly to programming costs, and 40 percent for supporting costs.

"News on the Hour" is NBC Radio Network's most important news program. The direct operating costs were \$20,000 a week in 1970, making a total for the year of \$1,040,000. If an allocation were made for supporting services, then the budget would be something in the order of \$40,000 a week, making a total for the year of \$2,080,000.

### Sports programming

Sports programming at NBC comes under the authority of the News Division. Sports is probably the highest priced programming on television; it represented 42.2 percent of the News Division's budget of \$103 million in 1970 and provided only one-third of the Division's total network programming contribution.

The biggest slice of the sports programming budget goes to rights costs—these are the fees paid to the football, baseball and basketball leagues, and the money paid to golf, tennis, and other sports tournament organizers, for the privilege of broadcasting their events on a regular basis. Consequently rights cost NBC News Division 34 percent of the \$103 million budget; the other 8.2 percent goes to program costs.

In 1970 NBC paid \$11 million for a limited football season, excluding Super Bowl costs and the all-star game. In 1971, the same season will cost \$12 million in rights. In addition NBC paid \$2.5 million rights costs for the Super Bowl.

NBC's contract with the baseball league is for \$50 million rights payments over a three-year period ending after the 1971 season. This means that NBC pays between \$16.5 and \$17 million a year for baseball rights.

By comparison rights costs for college basketball, golf, tennis, and other sports are minor. A major golf tournament can cost as much as \$250,000 for rights, down to \$50,000 for a minor tournament. NBC paid the NCAA \$1.4 million over two years for college basketball. The rights for Wimbledon Tennis from England in 1970 came to \$60,000.

Although rights costs are very high due to the intense competition between the three networks, program costs for sports events are also quite high due mainly to the type of sophisticated coverage that the viewer demands. An average sports pick-up, that is the cost of sending a mobile unit to cover a ball game, costs \$40,000. The Super Bowl, however, needs a \$125,000 pick-up because it requires more cameras.

BM/E

### Breakdown of some functional and equipment costs

Here are some of the important functional and equipment costs included in the totals for the NBC news and sports operation, as described in the accompanying article:

Labor costs the News Division something like \$22 million a year. AT&T land lines account for another \$10 million. Satellites have become cheaper as more have been launched; in 1970 NBC News spent \$602,553 on satellites, down from \$1,108,750 in 1969. NBC's stock and processing costs for news are currently around \$3 million a year. Videotape for news comes to around \$610,000 a year, but costs are increasing.

Electronic camera costs vary widely; the Norelco cable-connected portable PCP 70 costs in the region of \$90,000, while the more sophisticated PCP 90, which is cableless, costs roughly \$125,000 complete with transmitter. Most of NBC's studio cameras are RCA TK 44's, which cost around \$80,000 complete with pedestal. A mobile unit costs something like \$4 million fully equipped and they are used mostly for news and sports events. VTR machines—Ampex or TR 70 C's—cost between \$120,000 and \$150,000 each. An Ampex slow motion machine used for sports events costs \$100,000. Film cameras range in price and sophistication, and NBC News has many different types. The Bell and Howell 16mm Filmo costs about \$1000 and NBC News has over 130 of them, along with 135 single-system sound cameras, which are generally converted Auricon Cine Voice, selling at \$5600 before conversion. In addition there are 30 Arriflex costing \$7500 for a basic camera before conversion for news purposes, and six Arriflex BL's costing \$12,000 each. Lighting equipment to go with these film cameras ranges in price from \$300 to \$1100, and is assembled by NBC's newsfilm department.



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8813 	12.5	17.5
8915 	17.5	25.0

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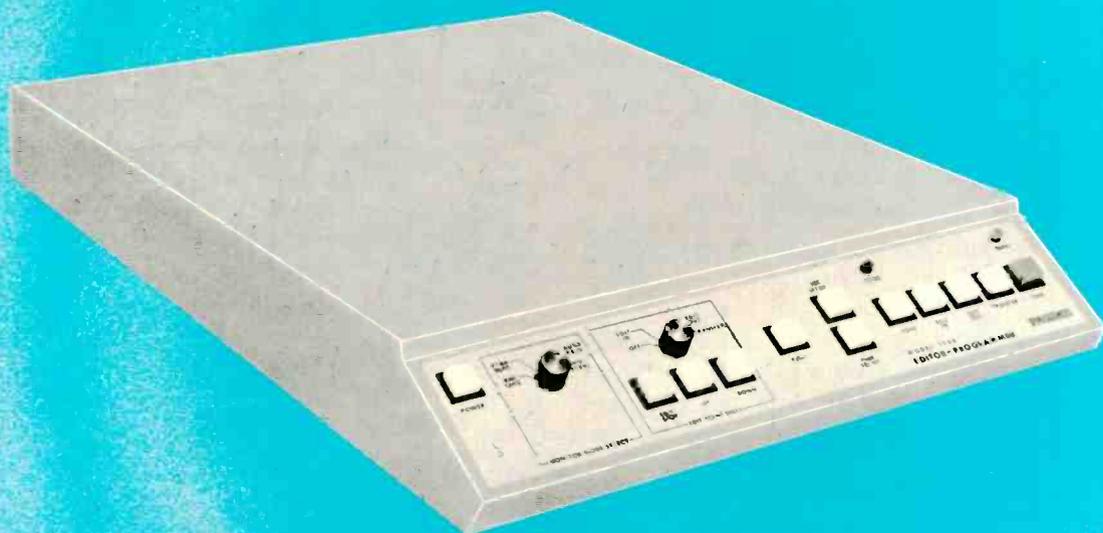
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# Studio On Wheels

How a local AM station built its own mobile studio and gained the capacity for a very wide range of remotes, from news to sports, from panel shows to public meetings, with discs and carts right at hand.

## Objectives and Planning

By C. K. Thompson, general manager, WGNV, Yonkers, N.Y.

BEFORE WE BOUGHT a single piece of equipment for our mobile unit we wanted to be sure that we had considered all possible uses of the unit, and the methods for implementing those uses. Our main objectives were:

- 1) The ability to do a complete remote broadcast, news or special event, with personalities, recordings, commercials, guests;
- 2) Remotes, either from the truck itself or from an in-store location;
- 3) Operation both close to the station and far away;
- 4) Operation without ac power whenever desirable or necessary;
- 5) P.A. from the truck, either in conjunction with a broadcast or for a non-broadcast record hop;
- 6) Operation while in motion;
- 7) Use of the unit as a "press box" at sports events, including replays of game highlights.

We decided early that such a mobile unit would help the station image significantly and create sufficient new billing to justify buying a new truck large enough for the whole job. We settled on the Ford Super Van because it had enough floor space to match a plan that filled our needs.

The plan included a console with two turntables, a mixer, two cart machines, a record bin, and a storage cabinet for mikes, small tools, tape, wire, etc. We wanted shelf space for the transmitter and PA amplifier, space for a cart rack, a seat for guests being interviewed, space for heavy-duty storage batteries, storage for a Yagi antenna and mike and power cables. And, of course, the spare tire.

On the outside, we wanted to use a ring antenna when close to the station, and a Yagi when far away.

In sum, we wanted the unit to be a self-contained studio-control room that could replace the permanent facilities in an emergency. The van did just that when the ceiling in our control room fell in. In another case, we lent the van to a second station in

the area that had a studio fire. The reader can measure the success of the van by this: our instructions to staff in case of fire are to get out first, the book-keeper's records, then the mobile unit, and last, studio equipment!

## How We Built Our Studio on Wheels

By I. Daniel Martin, chief engineer, WGNV

WHEN WE DECIDED to build a new mobile studio, I checked what I had that might be useful:  
One Bogen RTP-1 remote amplifier;  
Two Western Electric 22-A remote amplifiers (not used for years);  
Stromberg-Carlson PA amplifier;  
A few spare mikes;  
No spare turntables;  
No van.

Strike a chord? I decided to start from scratch.

### Selecting equipment

In April '68, when we started the project, Ford had just announced its small van with the engine in front and alongside the driver—the only van then available with this arrangement. We decided the VW bus would be too small. We liked the Ford also for windows on all sides, full-roof header, six-cylinder engine, and inside base.

When I came to the station a year before, there had been practically no catalog information on equipment. By circling reply card numbers in trade magazines, I soon had a pretty complete file of manufacturers' catalogs and could make an intelligent survey for the items we needed.

We chose the Marti M-30B/TPS transmitter and MR-30/150-170 receiver for van-station linkage because of recommendations from other users. We chose 161.67 MHz after surveying area stations.

The control board had to be the center of operations for the truck, which meant a five-channel board, with two channels for microphones, two for turntables, and one for the two cart machines which would be wired in parallel. The Sparta A-15 met these requirements, with pre-amps in the first four

channels and two Sparta TE-2 passive equalizers for pickup inputs.

The rest of the original equipment for the van included the following:

- A used Presto T-18 turntable;
- Rek-O-Kut B-12GH turntable;
- Two tone arms with cartridges;
- Two Shure Unisphere I 565 mikes;
- One Bogen CHS35 35-watt amplifier;
- One Tapecaster 700-P cart machine to go in the studio so the Spotmaster 700-P there could go in the truck.

### Physical layout

Fig. 1 shows the physical layout that evolved from interchange of ideas with the programming department. The turntable cabinet is separate from the control board and can be taken out of the van to go into a remote location when we need that. Alternatively, the control desk alone can be moved out of the van for a special events broadcast.

I had never built cabinets before this assignment, but I waded in. By studying the cabinets in our studio, I came up with a screwing-and-gluing approach that would give the cabinets the strength they needed for frequent lifting, shoving, perhaps even dropping. The extra time I put into this phase of the project has paid off—as this is written, three years later, not a single cabinet has burst a seam.

The control desk has a shelf on the right for the connector and patch box which I wired into the control board. The left side has a record drawer, with

a door that folds out like a drawbridge to support the pulled-out drawer. Below the record drawer I mounted a ten-inch monitor speaker that takes over from the Sparta speaker when plugged in. Heavy-duty drawer pulls were bolted to the underside of each side of the control desk. To hold the control unit firmly to the floor of the van, seat belts are fastened to the floor and run through these drawer pulls.

I had to move the spare tire from the right rear of the truck to make room for the turntable cabinet; the tire is now on the left side, as shown in Fig 1. Doors open to give access to storage under the turntables. When we travel, the pickups are taken out of the arms, the arms tied down, and the turntable plates lifted on plastic foam to keep them from bouncing on the bearings, a prime cause of bearing flats.

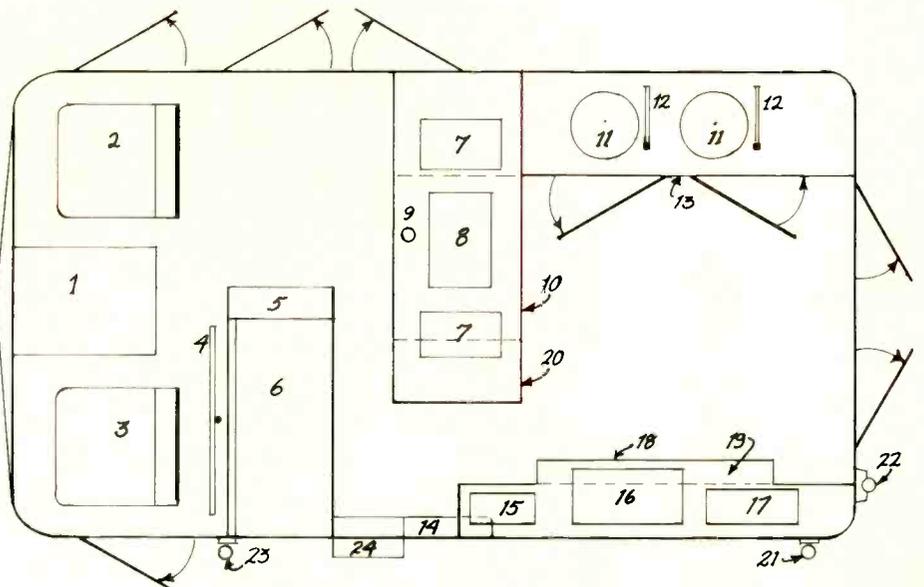
The turntable cabinet, like the control cabinet, is held in the truck by seat belts. This proved to be an excellent way to hold the two cabinets down; we did have a collision in which the truck was damaged, but the equipment came through unhurt, except for one cracked storage battery.

### Wiring and installation of components

I wired the electronic components together in their cabinets before finishing the inside of the truck, so we could use them as soon as possible. Each of the first four channels on the control board has a three-position input switch, two for live input and one for off. That allows us to use four mikes, or two mikes and two turntables, without switching. With switching, we have eight positions and there have been times when we needed all eight for microphones (removing the pickup equalizers from the

Fig. 1. Layout of WGNY mobile van

1. Engine cover
2. Passenger's seat
3. Driver's seat
4. Yagi antenna storage
5. Communications transceiver
6. Guest bench and battery storage
7. Cartridge machines
8. Sparta control board
9. Microphone gooseneck
10. Console
11. Turntables
12. Tone arms
13. Turntable and storage cabinet
14. Spare tire
15. Clock radio
16. Marti transmitter
17. Public address amplifier
18. Cart rack
19. Equipment shelf
20. Record storage and speaker
21. Ring antenna mount
22. Yagi antenna mount
23. Communications antenna mount
24. Air conditioner



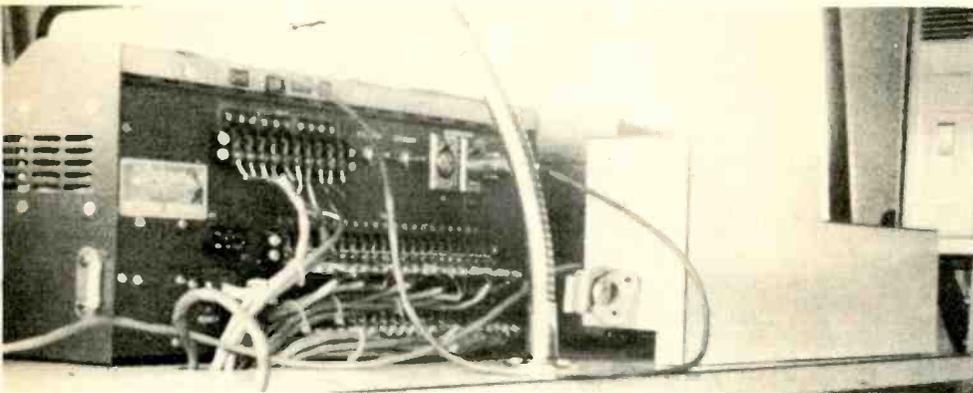


Fig. 2. Rear view of Sparta console with protective cover removed.

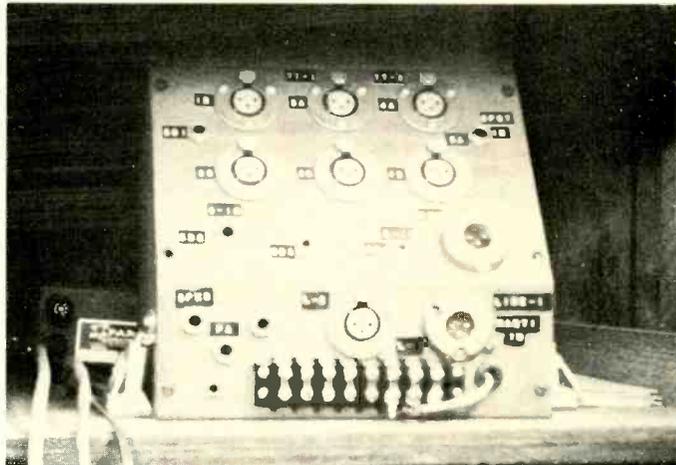


Fig. 4. Handy connector box. Inputs on sloped panel; outputs on lower portion.

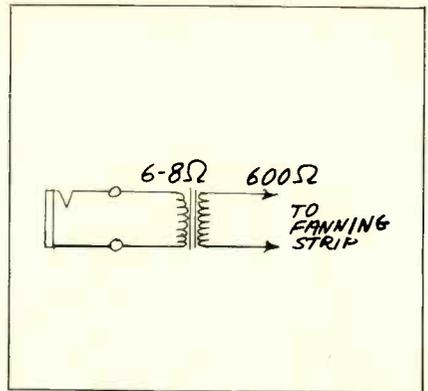


Fig. 3. Stancor A-7948 wired with voice coil as input to take feed from cassette's external speaker connection.

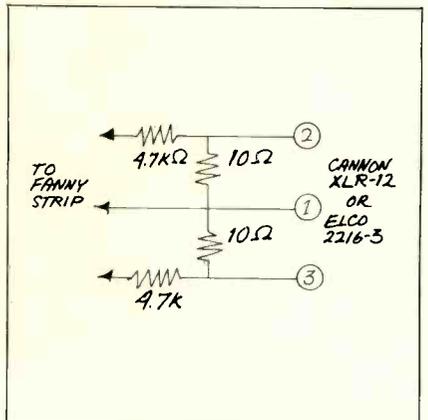


Fig. 5. Bridging pad for three different inputs. See text.

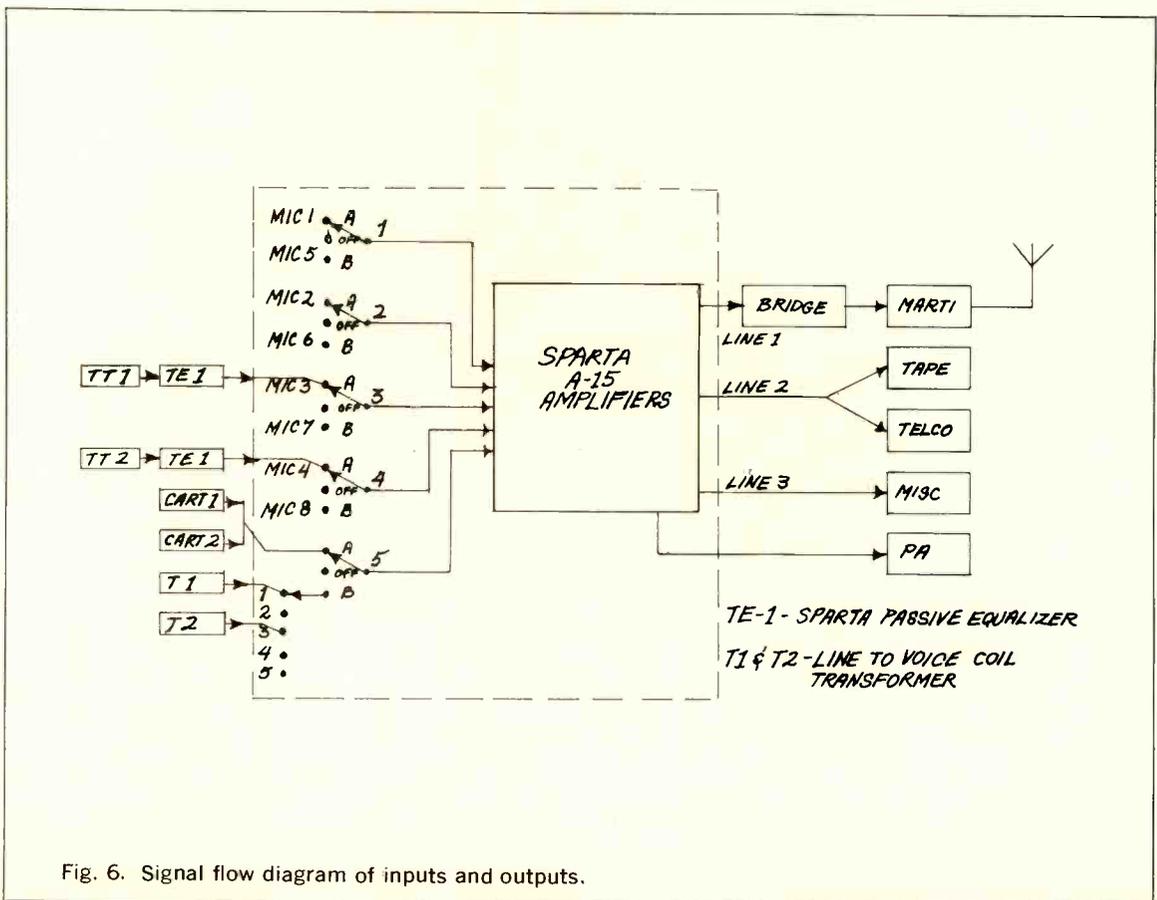


Fig. 6. Signal flow diagram of inputs and outputs.

two turntable channels). Panel discussions, important local public meetings, self remotes, are some examples.

I rewired the Channel 1, position B (a Cannon mike connector), to Channel 2, position A, and then wired the speaker muting circuit into these channels. These positions are used when broadcasting from inside the truck. Fanning strips were used to wire the connector box to the A-15. I liked these better than Jones plugs because they took less space, and not much more time for connect or disconnect.

Channel 5 on the control board, the high-level channel, has a five-position switch on the B position. I put in a variety of connectors on all the Channel 5 positions: phone jacks, mini-phone jacks, phono jacks. Two of the inputs go through a Stancor A-7948 voice-coil to line transformers, wired with the voice-coil side to the jack so we could feed from the external speaker connections of most any cassette or other tape recorder, getting a high level signal into the board.

All the input connectors are on the slanted side of the connector box and all the outputs on the front vertical side.

The output of the control box can be switched any of three ways. In order to connect it to the Marti with normal mike cable, I put in a bridging pad (Fig. 5) to line 1 with a male Cannon connector (per the Marti manual).

Output 2 goes to a female Cannon connector, with barrier strip connectors in parallel so I can feed a tape recorder or telephone line, when too far away from the station for air linkage.

Line 3 from the console goes to phone jacks so we can feed a variety of other equipment. Fig. 6 is a simplified diagram of the wiring in the cabinets.

### More woodwork

Before we could put the cabinets in the truck, we had to cover the ribbed floor. We used pressed wood panels with carpeting over them, except for the last 18 inches—I ran out of carpet. But that turned out to be a good idea—the uncarpeted area was good for repairing faulty equipment.

To avoid carrying out the station's cart rack whenever we had a remote, I built a duplicate cart rack for 168 cartridges. This rack is normally kept in the production room. Whenever we make a cartridge for a commercial or announcement, we make a simultaneous dub which goes into the "remote" rack. That has proved to be far from a wasteful procedure, more than paying for itself in recovery of commercials misplaced or malfunctioning in the main control room. When we schedule a remote we can see if we have all the carts: the duplicates should all be in the remote rack. We do vary from exact duplication when a sponsor requires many different cuts: we put only two or three cuts on the dub cart. In addition to the regular carts, we also have one with assorted PSA's, one with assorted station promos, one with a 1000-Hz test tone for setting levels in the van, and another announcing that WGNV will broadcast from that spot in a



Fig. 7. Completed interior of mobile unit.



Fig. 8. Exterior view of van with various antenna mounts. Mount for yagi is on rear.

few moments. We put the last on the PA just before air time on remote.

I built a shelf into the left near the rear to hold the Marti, the PA amplifier, and the digital clock radio. The clock has a switch so it can be stopped and set on station time. We can also feed the air program to the PA system during news periods.

The cart rack goes under this shelf, with a cover held to shelf and floor by toggle bolts to keep carts from sliding out when the truck moves. The removable panel has a sign painted on it, "On the Air," and changeable nameplates for the announcer's and engineer's names. We put the board on an easel, or in a store window, at a remote.

The top of the battery storage compartment (Fig. 1) is upholstered to form a seat, done by a local auto upholsterer at nominal cost. This is our in-truck "interviewee seat."

I tried a low-BTU air-conditioner in one of the windows, but this was one of the few mistakes we

(Continued on page 52)

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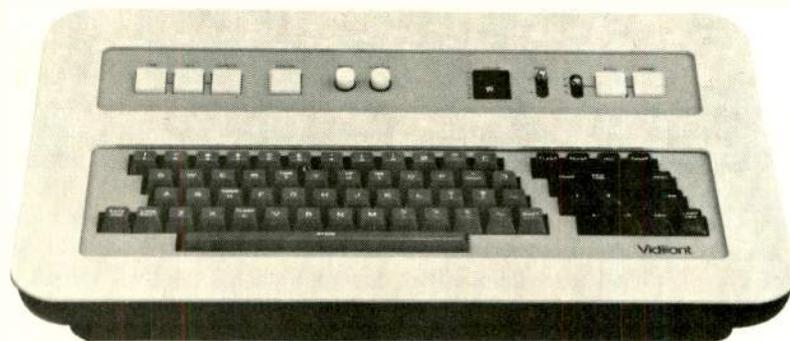
For further information including a 12-page booklet of specifications, please contact: John Dale, Vice President and General Manager, 711 Fifth Avenue, New York, New York 10022, (212) PL 1-4400. Or Robert Jones, Western Sales Representative, 1438 North Gower Street, Hollywood, Calif. 90028, (213) 462-3111.

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Versatile Five-Spot

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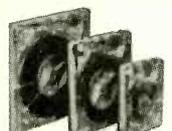
- Tape cartridge winder
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## AUDIO FILE:

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"Compatibility" is a word, and an idea, that is getting almost rubbed out of shape by over-use. But, the series of problems that "compatibility" stands for are very real: some of them will be important in determining the main directions that audio is taking. The broadcast station man responsible for audio needs a grasp of compatibility problems and solutions—some for day-to-day practice in getting out a good signal, some for estimating the importance of skirmishes and alarms during this period of intra-industry audio warfare.

Here are some brief comments on three compatibility problems.

**Phase error in stereo tapes.** A discussion of this problem and description of one approach to solution appeared in *BM/E*, April 1971. To recap, azimuth error produced by misadjustment or tape skew in any stereo tape system (more prevalent in cartridges than in open-reel equipment) by shifting the phase relation of the two channels, can seriously degrade the *mono* signal put out by the station, because that output is produced by summing the two channels. A phase shift of 170 degrees, for example, will heavily depress the 5 to 8 kHz output in *mono*. Stereo listening will be effected in more subtle and usually unnoticeable, or at least acceptable, ways. Since most FM listening is still in *mono*, this is a serious matter for any FM station using stereo tapes.

One alleviation of the problem described in the April 1971 *BM/E* article, is the development of stereo cartridges with precisely-adjustable tape guidance (CBS-Marathon), allowing the operator to reduce or eliminate phase error from tape skew. The Aristocart from IGM attacks the same problem with a modified fixed tape guidance system. Other tape manufacturers have told us they will be announcing "solutions" shortly, but we are still waiting.

Implicit in all approaches, however, is the necessity for the audio engineer to monitor in advance, *in mono*, all his stereo program material. If a summed signal sounds good

in monitoring, it will sound good on the air. Listening can be supplemented, but not replaced, by a simple phase-relation test, familiar to every audio engineer, feeding one channel to vertical and one to horizontal on a scope.

Careful azimuth adjustment is, of course, a necessity in any case, setting the peak while watching a *summed signal* (recommended by Eric Small, chief engineer of WOR-FM, who is also responsible for some of the other valuable suggestions on this problem). For this purpose, a convenient and precise azimuth adjustment system like that on the Gates cart machine is highly desirable.

A useful supplementary gambit is a phase reversal switch on one channel; a 180-degree switch brings the problem under control in some cases. Along that line, the engineer may also want to put in a switchable all-pass 90-degree phase shift network, which may be the prescription. Another approach sometimes used by Small is duplication in real time, since high-speed duplication seems to aggravate the problem.

**Pickups for matrixed discs.** Four-channel discs produced by one or another matrix system are going to be a larger and larger fact of life for every stereo FM station. Columbia is releasing many records with its "SQ" system, Vanguard is following suit, and other record companies are, or soon will be, using that or other systems. The FM station that wants to get into four-channel broadcasting will necessarily, in the future, need matrixed discs to fill out its four-channel programming.

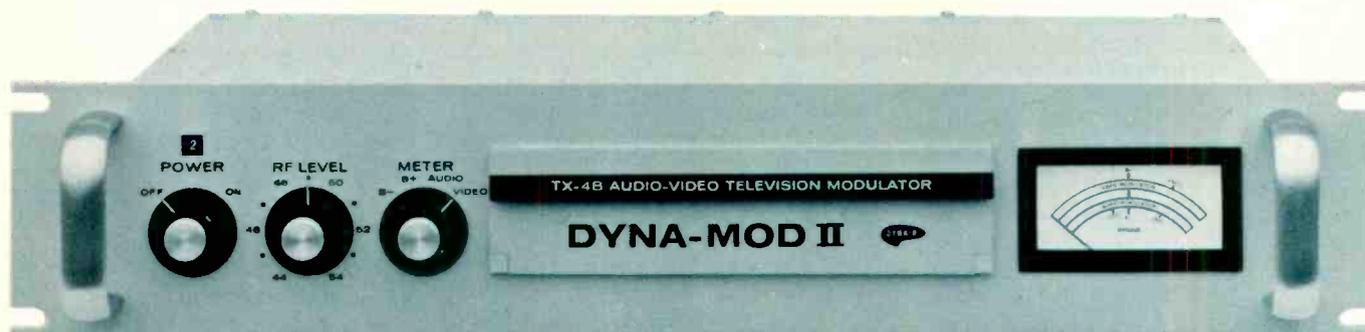
Some pickup promotion has implied that a stereo pickup needs special characteristics to play matrixed discs, and confusion is evident in questions being received by pickup manufacturers: Which of your pickups works on matrixed discs? When are you getting out a model for this?

But the whole virtue of matrixing stands on the fact that it uses exactly the same equipment as standard two-channel stereo between the encoder, at the sending end, and the decoder, at the playback end. A standard two-channel stereo pickup plays matrixed discs exactly as well as it plays two-channel discs. John J. Bubbers, vice president for engineering of Pickering and Company,

(Continued on page 48)

# DYNA-MOD II

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It's not easy to improve on a product like the DYNA-MOD, which has long been the standard of the industry . . . many manufacturers have tried and failed. But **DYNA-MOD II** is a step forward; it reflects improvement over its predecessor in styling, operator convenience and performance.

The basic **DYNA-MOD II** accepts separate audio and video inputs with which it generates a broadcast quality VHF television signal on any standard channel; other frequencies are available on special order. The new modulator is also available for use with inputs of video only, separate video and 4.5-MHz aural, or combined video and 4.5-MHz aural.

The **DYNA-MOD II** contains a sideband response filter and output amplifier which assure quality performance in adjacent-channel color systems without the addition of external filters. Maximum RF output is 500,000 microvolts with a second output providing a 10-DB reduction. A switch-selectable attenuator allows attenuation of either output in 1 DB increments over a 10 DB range. A third RF output, which is 30 DB below the line

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## New Product Development At NAEB

Last month major issues at the 1971 NAEB Convention were reported. This report comes from the exhibit floor.



Behind the gathering is Dynasciences' new VTR editor.

The NAEB exhibit area produced several firsts. Panasonic showed a  $\frac{3}{4}$ -inch format videocassette compatible with Sony's previously-announced  $\frac{3}{4}$ -inch unit. The company hedged its bet by continuing to show a  $\frac{1}{2}$ -inch videocassette version demonstrated last year at NAEB. (At the same time the company vigorously reaffirmed its intent to be strong in  $\frac{1}{2}$ -inch reel-to-reel equipment.) "Panasonic," said Alvin Barshop, "will supply those things the customer wants." The home video market is too vague to call, he said.

Adding momentum to the  $\frac{3}{4}$ -inch videocassette forces, was the joint 3M/Sony announcement on cross licensing made at Miami. The agreement will permit Sony to manufacture and sell the new 3M High Energy tape and 3M to manufacture and sell new Sony  $\frac{3}{4}$ -inch U-matic videocassette equipment.

Sony's equipment was demonstrated at NAEB and will be in the U.S. market in early 1972. 3M's version will be manufactured and sold through its Mincom Division under the Wollensak name. The company had on display  $\frac{3}{4}$ -inch videocassettes (not players).

Ampex's cartridge loading Insta-video recorder/camera was on display at the Ampex booth.

Panasonic also showed high-speed videotape printing systems. Sony exhibited a tape duplicator which dubs one-for-one, although several slaves could be made from one master at the same time.

Although the progress toward a standard video mechanical format was welcomed, there was a brand new exhibitor present, Telegen (4015 Fabian Way, Palo Alto, Calif.), that bore witness to the fact that a standard, even if adopted, does not solve all. Telegen had the temerity to present to the USA the SECAM/60 as a realistic substitute for any NTSC equipment. The Telegen people (Joe Roizen, president) found that the accuracy of color rendition in NTSC is simply not adequate for some program material. The SECAM encoding approach (sequential and memory) offers genuine stable color fidelity. Furthermore the system uses black-and-white recording and playback equipment. The Telegen booth showed a variety of monitors all showing the same color—color that cannot be misadjusted as the only controls are brightness and contrast. Monitors can be modified to shoot both NTSC and SECAM, Telegen said, and a Sony TV set made for the French market handles both signals.

To go SECAM/60, the user needs a special encoder and a compatible monitor (which can be a USA set modified). More details will be published in *BM/E* in the near future.

A new moderate-cost editor-programmer drew crowds to Dynasciences' booth. The unit provides control and memory to accurately program a "start insert" and "end insert" edit point on the *record* tape. Start transfer edit points can be stored on the *playback* tape. Both *record* and *playback* tapes can be previewed and the operator can visually see the end-product edit before the *record* tape is altered.

The edit point can be independently advanced or retarded any desired number of frames to enable a smooth transition. The Editor-Programmer (Model 1000) can handle either helical scan or quad records. It's priced under \$4000.

Dynasciences also showed image enhancers and video processing

amplifiers priced for the CCTV budget. Image enhancers were available in a variety of models including model 852 which provides enhancement taking contouring from green.

A new manufacturer at NAEB was Danscoll Ltd., from Montreal. This company showed a line of production switchers which can be customized.

TeleMation showed several new items including a super 8 mm projector feeding into a telecine and a pilot model of a new digital NTSC color encoder which promises to upgrade the performance of yesterday's color cameras.

By using digital circuitry, setup is fast and accurate and operation is stable. Major features of the new encoder (which will be available next January) include a luminance black stretch for gamma correction (this brings out detail in a picture with poor scene illumination), and a noise stripper circuit (which eliminates high frequency noise prior to encoding), improving S/N up to 10dB). A color bar generator is included, and various options are available.

New cameras were plentiful. Magnavox captured a lot of attention because of its huge display of simple-to-operate inexpensive color cameras (series 200 and 300). Commercial Electronics Inc. displayed a new two-tube camera priced at \$17,900. Using one-inch lead-oxide tubes, the CEI 280 was billed as a broadcast quality camera with a high signal-to-noise ratio (better than 50 dB) and high resolution (600 lines).

In roughly the same price range (\$15-16,000) was the IVC-150 color camera which used one silicon diode tube to improve red sensitivity. IVC's motif was definitely saturated red.

Ampex unveiled a top-of-the-line CCTV camera, the CC-500, which uses three separate mesh vidicon pick-up tubes. It was priced at \$12,000 with a 10x1 zoom lens. Color cameras were also on display by GBC, Panasonic, Shibaden and Sony.

Cohu drew a lot of attention by virtue of the outstandingly sharp and contrasting pictures emanating from its new model 1500 telecine

Continued on page 48

# Presenting the first broadcast camera to see reds as they really are—while dramatically reducing studio and remote lighting requirements



The IVC-500 Color Camera is casting teleproductions in a new light. The secret is the new one-inch silicon diode tube in the camera's red channel. It's the tube most other cameras wish they had but don't (because they are designed for the older 30 millimeter tubes). For the first time all the elusive shades of red can be captured. And we've kept Plumbicon\* tubes where they perform best—in the green and blue channels. The super-sensitive silicon diode tube lets the IVC-500 operate in 100 foot candle settings rather than the normal 200, producing beautiful pictures. Light and air conditioning bills drop while performers' comfort increases in the cooler environment. Strong on remotes, the IVC-500's outdoor or arena colorimetry looks like studio quality even at 10 foot candles. It's compact and highly portable. In comparative demos against more expensive broadcast cameras, chief engineers invariably identify the IVC-500 as having superior colorimetry. A true broadcast camera at a price you can afford. Write or call to arrange for a demonstration.

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It's happening in broadcast markets from the West Coast to New York. From Canada to Mexico. For the first time broadcasters have a realistic alternative to high-cost quadruplex color recording. It's the versatile IVC-900 Series Broadcast Color Videotape Recorder with Time Base Corrector. A natural for network delay, sports programming (3½ hour recording time), locally produced origination or commercials, including both remote vans and studio production work (playback synchronously through switcher/fader, special effects generator)—even dub to quad if required. Initial investment far less than for quad machines. Head replacement costs are reduced by a factor of five. Tape costs are one-third of quad in normal use. It all adds up!

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**Maintenance accessories** for open reel, cartridge, and cassette tape recorders and reproducers include professional items for cleaning, degaussing, erasing, splicing, head alignment. QM Series also has several dual-purpose products: they clean and demagnetize, or clean head and capstan. NORTRONICS. **275**

**Four-Mixer monophonic audio console** has keys for selection of any of 13 inputs. Studioette 80, successor to the widely used Studioette, accommodates four microphones, three turntables, two open-reel and one cartridge machine, network, remote, and three utility inputs for special station needs. Outputs are one program, two muted speakers, one non-muted speaker, one cue bus for accessory amplifier/speaker. GATES. **276**

**Dual-channel audio console** has eight mixing inputs, with push-button selection of three external sources to each mixer. Model B-803 normally assigns three mixers to low level mike inputs; four to medium-level unbalanced inputs, such as turntables and tape players; and the eighth to medium-level balanced inputs, such as network lines or remote lines. MCMARTIN. **277**

**Character generator for TV** is portable, entirely self-contained. Model D-2400 allows simultaneous presentation of two displays, one on-the-air

## MODEL D-2400

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- \* 4-PAGE STORAGE
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and the second being prepared, changed, previewed on the preview output. Characters are 32 scan-lines high; one-row horizontal crawl is available; up to 32 one-row titles can be stored for sequential display. Connectable to teletype or computer for instant display for election results, for example. \$4500. DATAVISION. **278**

**Low-light-level portable VTR** is battery-powered, has built-in electret condenser microphone, zoom lens, and electronic viewfinder showing picture as it will appear on TV screen. "Total Darkness Porta Pack" can produce clear pictures with one-thousandth of a foot-candle of face-plate illumination.



It is highly sensitive to infra-red, good for very dark conditions. Recording and playback time are 30 minutes on 7.5 ips, 1/2-in. tape, with better than 300 lines horizontal resolution. GBC CCTV CORP. **279**

**Miniature ceramic reed filters** have a constant bandwidth independent of frequency, and can set adjacent signals at intervals of 15 Hz and 30 Hz. Matsushita reed filters are small and lightweight, have high stability, resistance to vibration and shock, sharp selectivity. MATSUSHITA. **280**

**Solid-state microwave radio** is for common-carrier applications in the 10.7 to 11.7 GHz band. MA-12G has maximum output of 1.5 watt, is type accepted by the FCC for 1200 message channels FDM, or 288 PCM channels using VICOM PCMT carrier multiplex. Frequency stability is .005%, crystal referenced; receiver noise figure 11 dB (7 dB with optional TDA); video S/N is 70 dB. Options include: hot standby, space diversity (dual polarization for PCM), continuity pilot, service channel, fault alarm, up to 4 subcarriers for 15-kHz audio. MICROWAVE ASSOCIATES. **281**

**Random selector for carousel system** is complete within itself, uses IC logic circuits, no relays. Basic 50, designed for APT-3 Broadcast Automation System, allows a skip of any carousel

position. \$645; double, 100-selector unit, \$995. AITKEN COMMUNICATIONS. **282**

**Single-channel VHF amplifiers and band-pass filters** are designed for MATV systems. Series 7400 amplifiers include 12 models, one for each channel, with 51 dB gain, AGC, back-matched input and output monitors. Series 7300 filters are high-Q band-pass with 5-section helical coil resonator filters. CHANNEL MASTER. **283**

**Studio monitor stereo amplifier** typically supplies 100 watts continuous power per channel into 8 ohms, 180 watts per channel into 4 ohms. Model D-150 is rated at less than 0.05% IM at 75 watts per channel, less than 0.05% THD. Noise is 110 dB below 75 watts output. Phase response is  $\pm 15$  degrees, 20-20,000 Hz. \$399 without panel, \$429 rack mount. CROWN INTERNATIONAL. **284**

**Automation programmer** gives full random access to up to 36 carousels or other multiple cart units, plus up to 90 separate audio sources. Model AR-2000 permits pre-programming of, and access to, 1000 or more program events via an easy-to-use 10-digit keyboard. Greater memory can be added. One panel display shows event



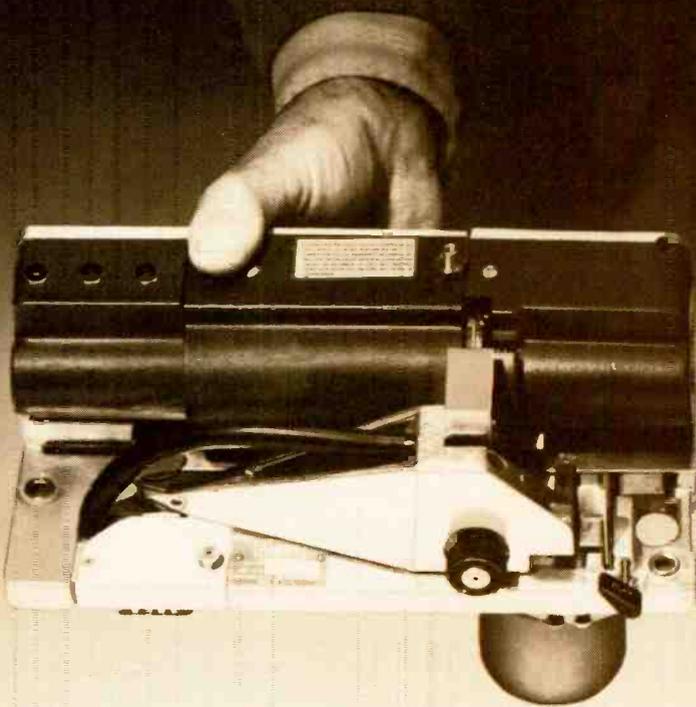
in progress, another shows any event in the memory. Punched-tape programming, covering several days, is an option. BROADCAST PRODUCTS. **285**

**Electrostatic stereo headphones** claim virtually flat response over entire audio spectrum. Model PEP-77C has choice of polarization self-energized or from 117/VAC power supply. Power supply is in control console supplied with phones which accommodates two sets of phones and has phones-speaker selector switch. \$99.00. SUPEREX. **286**

**Stereo mixer kit** can be constructed into a six-input stereo mixer, with any input switchable between microphone or line sources. Prokit SM-6, in addition, can be switched to supply

Continued on page 43

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## Ampex-rebuilt VTR quad head. Good as new.

Choose Videomax, and you get a refurbishing job so good that your head will actually perform *better than it did when you bought it*. We install a new drum with features the original one didn't have. We rebuild and test to tolerances of millionths of an inch. We treat your head like a patient, keeping detailed, 64-parameter records that include even a video-taped "headprint." We label your head to certify that the operation was a success—that all parameters have been met or exceeded. And our doctors are broadcast engineers—men with practical, first-hand experience in the design, manufacture and use of professional VTR equipment.

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RIAA-equalized phono inputs on inputs 5 and 6. Two or more of the mixers can be stacked to go beyond six inputs. Kit, \$299; wired, \$499. GATELY. **287**

**Electronic digital clock** is ½-in. thick, completely self contained, can be mounted on the outside of a panel. Model DC1400 is all solid state, uses large LED's for standard readout, has BCD outputs for compatibility with computers and other instruments. It has complete selection of time ranges: 11:59:59, 11:59.99, 11.999, 23:59:59, 23:59.99, 23.999, etc. Under \$250. NATIONWIDE ELECTRONIC SYSTEMS. **288**

**Another form of electronic digital clock** generates the characters as video signals for display on TV monitors. Video Digital Clock system can feed any number of remote monitors, with a single 75-ohm coaxial cable to "daisy chain" the monitors to the central clock. Characters are 1½-in. high on 9-in. monitor screen, larger on



larger screens. Available are various time ranges, 60-Hz line frequency time base or internal oscillators, parallel or serial BCD data outputs. \$1910 and up. CHRONO-LOG CORP. **289**

**Digital multimeter** has 25 ranges including ac and dc voltage ranges from 100 millivolts to 1000 volts, current from 100 microamps to 1 ampere and resistance from 1000 ohms to 10 megohms. Model 8120A over-ranges on all ranges by 20%. All range selections are by push button. \$795. FLUKE MFG. Co. **290**

**Encoder and decoder** for synthesized four-channel sound use "matrix" systems. **Quadrasizer I** (encoder) puts third channel equally and in phase on left and right, fourth channel equally and out of phase. **Quadrasizer II** (decoder) recovers ambient sound from any two-channel source, sends it to rear speakers. Encoder, \$59.95; decoder, \$19.95. SOUND SYSTEMS INTERNATIONAL. **291**

**Mounting head for TV and movie cameras** is balanced under load with little or no drag at any angle through the 45-degree up or down tilt. "Tangent" head has constant equilibrium and stability at all angles, responds to fingertip pressure. It can be used in

tracking, laser, and microwave work also. Load capacities from 25 to 200-plus pounds. HF PHOTO SYSTEMS. **292**

**Color video monitor** is produced by modifying Sony's solid state Trinitron color TV receiver. VACC Color TV Monitor has BNC looping input connectors, complete power line isolation. \$495 in cabinet; \$525 for rack mounting. VIDEO AIDS CORP. OF COLORADO. **293**

**Tape recorder series** supplies varied tape formats with plug-in head assemblies. E200 also has plug-in cards to give preset bias and equalization for



each speed. Capstan units are interchangeable, with two-speed motors covering 3-¾ and 7-½, 15 and 30 ips. Noise, unweighted, is 62 dB below peak level on full track at 15 ips, 60 dB below peak on stereo. Wow and flutter over a bandwidth of 200 Hz total 0.06% at 30 and 15 ips. LEEVERS - RICH EQUIPMENT LTD. (LONDON). **294**

**UHF broadband Yagi antenna** covers frequency range 450 to 470 MHz, or 406 to 420 MHz. Model CA7-460 has 10 dB gain, over dipole, VSWR of less than 1.35, front-to-back ratio of 15 dB. \$85. SCALA. **295**

**Radiation-cooled transmitting tetrode** has low-temperature filament to extend life. Model 4-400C has maximum plate dissipation of 400 watts, is intended for use as amplifier, oscillator, or modulator. It is directly interchangeable with the earlier 4-400A. EIMAC DIVISION OF VARIAN. **296**

**Trunkline amplifier** for CATV has both forward and reverse capability. Model XR-2 is an "all-push-pull" design, covering 54 to 300 MHz forward with two pilot tones; reverse circuits cover 5 to 30 MHz with one pilot tone. KAISER CATV. **297**

**Bulletin alarm** for news tickers counts bell signals, alerts personnel of incoming important information with an illuminated display panel. Unit ignores unimportant testing and office signaling. \$195. BROADCAST AUTOMATION ASSOCIATES. **299**

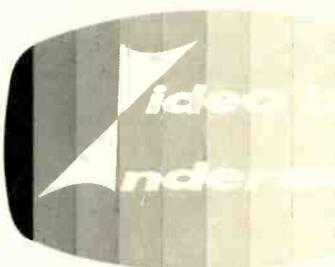
continued on page 44

# BORDERLINE

Puts a dark border around  
your keyed-in lettering or artwork



Compare the top screen with TMI Borderline to the one below

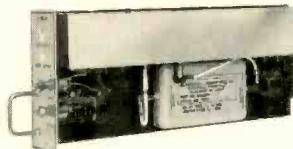


Borderline makes lettering, logos and artwork stand out against the lightest background. Increase contrast and readability. Makes TV viewing more enjoyable. Thousands of uses in sports, news reporting, commercials and special events. Add dramatic impact to lettering even on the lightest background.



## VIDEO DELAY LINES

Wide band fixed delay lines replace bulky cables and passive equalizers. Any increment of delay from a few to hundreds of feet is available. Continuously variable delay lines allow you to easily handle problem areas of changing source delay. A single unit replaces cable, equalizer and amplifier—up to 275 feet of cable delay.



## VIDEO DELAY MODULES

Broad experience in producing delay lines ranging from a few nanoseconds to large ultrasonic quartz delay lines used in video field storage systems have resulted in this advanced I-H module.

Applications include zero delay amplifiers, comb filters, vertical aperture correctors, drop-out compensators, video insert edging, video disc systems.

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**Title keyer/edgers** generate titles and insert them into program video. Model 906 puts in title, also generates and edge on all transitions with a horizontal video component. Model 906-7 has color in addition. Models 906B and 906-7B function the same, respectively, but put edges all around title. All are downstream devices. 906, \$1275; 906-7, \$1490; 906B, 3035; 906-7B, \$3250. OMNIX. **298**

**One-kilowatt AM transmitter** has a solid-state oscillator, and control features readily adapted to remote control. Model BC-1H is completely self-contained in a single six-foot high cabinet. A built-in dummy load is rated for a full 100% modulation; improved antenna to dummy load switching eliminates the need for any tools. Overload protection recycles the transmitter up to three times, then shuts it down if the overload is still there. Power reduction to 500 watts or 250 watts is a screwdriver adjustment. The transmitter is FCC type-accepted. GATES **300**

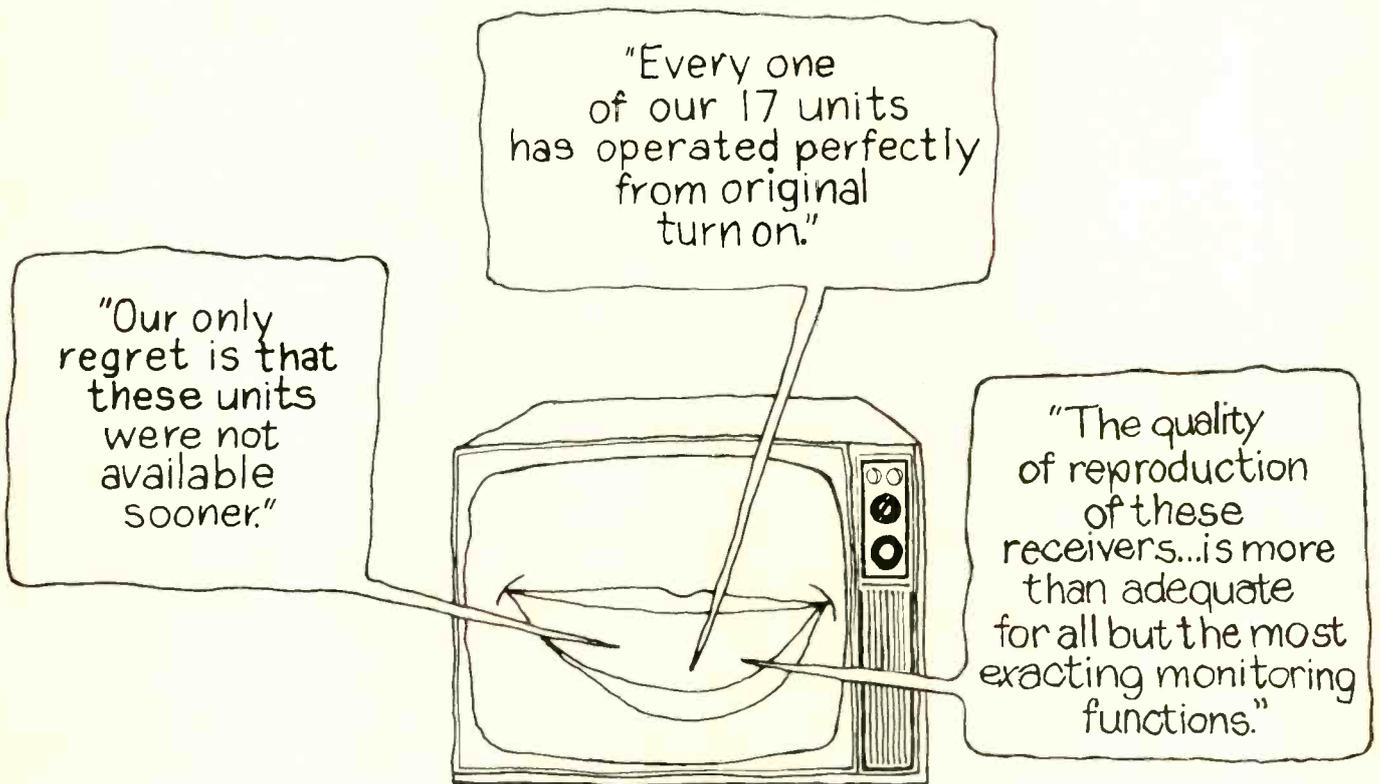
**Video switcher/special effects generator** is self contained, provides the functions for vertical interval switching and all the most useful special effects. Model 610C (color version—Model 610—is monochrome) will produce lap dissolves from the switcher fader; also, fades, super, horizontal, or vertical wipes with fader bar, corner inserts or wipes, split screens, and many others. CLEVELAND ELECTRONICS. **301**

**Solid-state phase-locked oscillator** for the 12 GHz region, originally designed for CATV local distribution system, is also well-suited to CARS-band applications. CARS/CATV Signal Source has a nominal 25 milliwatts output, delivered to a WR-75 waveguide output flange. Oscillator locks to either external or internal reference, has free-running frequency stability of  $\pm 0.02\%$ . A 50-mw version is available. MICROMEGA DIVISION/BUNKER RAMO. **302**

**Single-system portable 16mm camera** has a magnesium body and configuration aimed at comfortable hand-holding balance. CP-16 has a crystal motor, control circuit, and NiCad battery, all located within the camera body. The camera was designed for television news and the documentary film maker. \$3850 (lens and magazines additional). ALAN GORDON ENTERPRISES. **303**

# COLOR MONITORING FOR UNDER \$400 ...AND THE QUALITY SPEAKS FOR ITSELF!

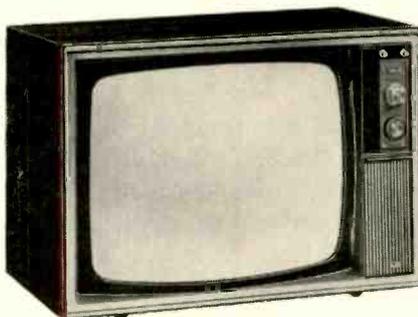
Listen to what Otto Claus, Chief Engineer, WBAL-TV, Baltimore, says about general purpose monitoring with RCA'S low-cost commercial color receiver:



Unlike color sets intended for home use, this receiver is equipped to accept RF or bridged direct video and audio line feed without the need for costly adaptors.

For under \$400, you get every non-critical monitoring function you can ask for — picture, sound, live or tape, color or monochrome. It's especially suitable for monitoring needs backstage, for the band, for the audience, and similar applications.

For complete details, send the coupon. We'll show you cold cash reasons why RCA's commercial color TV is your best answer.



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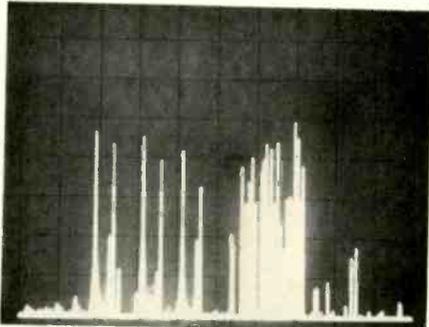
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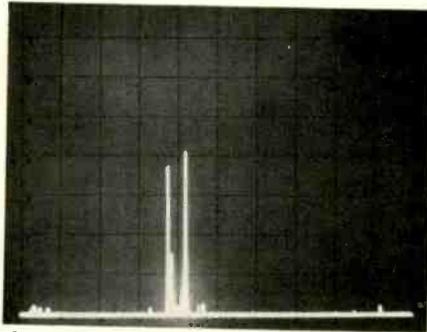
Please furnish further information about RCA commercial color sets for broadcast monitoring purposes.

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Title \_\_\_\_\_  
Station \_\_\_\_\_ Phone \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

# What San Francisco's Channel 5 looks like from San Jose



Signals received using an RF amplifier front end



Signals received by a TFT Model 701 TV Monitor (no RF amplifier)

The test results shown here tell the story—no RF amplifier means greater accuracy. Both photos are unretouched and were made under identical conditions with a HP 8555A Spectrum Analyzer: vert. = 10 dB/div.; hor. = 5 MHz/div. The test: to monitor San Francisco's Channel 5 from 40 miles away.

The photo on the left shows the result using a 20 dB RF amplifier. You not only get the channel you're after, you also get other stations and intermodulation products.

The photo on the right shows the performance of a TFT Model 701 (no RF amplifier). You pick up only what you want to measure—the visual and aural carriers, plus the color sub-carrier. And TFT monitors—with advanced receiver design—are the only ones that give you this kind of off-the-air performance—on both UHF and VHF.

You can also get this kind of accuracy in an Aural Modulation only unit: Model 702. It fits right in with existing frequency monitoring systems.

So, if you want "3rd Generation" accuracy in TV monitoring, specify TFT. More than 40 stations have installed TFT instruments—for both local and remote monitoring—since introduction at the '71 NAB. And the number's growing all the time. We'll be glad to send you a current list.

For full specifications and/or a demonstration on your frequency (it takes only 20 minutes), call or write TFT. Representatives throughout the U.S. In Canada: Tele-Radio Systems. In Mexico and Central and South America: Carvill International Corp.

The TFT Model 701 carries FCC Approval No. 3-187; Model 702 carries FCC Approval No. 3-189. Both comply with all relevant FCC requirements for local and remote monitoring.



Model 701 rack mounted with Model 705 Automatic Logging Adapter and Digital Clock.

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## NEW LIT

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

**Thin rotary thumbwheel switches** are covered in an 8-page catalog, including mechanical and electrical specs, truth tables, mounting drawings. Electronic Engineering of California. **200**

**Directory of FM Stations in U. S. and Canada** lists them alphabetically by city and state, and also by assigned frequency. 79 pages. Price, \$1.95, from Sherwood dealers or Sherwood Electronic Laboratories Inc., 4300 North California Avenue, Chicago, 60618, directly.

**How to use television character generator** is described in brochure, including production of TV captions, CCTV training material, betting odds displays for racetracks, and many others. Datavision. **201**

**Hard copy messages from a mobile radio**, using the Xerox mobile printer, is the subject of a booklet, showing how to incorporate the unit into existing communication networks. Xerox. **202**

**Detailed technical description of new noise measuring unit—EGT, and methods for precise wave analysis to 500 MHz**, are two main articles in "News 47," which also carries a number of other equipment descriptions and application notes. Rohde and Schwarz. **203**

**"Underground Systems for the '70's"** is the title of a booklet showing many combinations of equipment to handle trenching, direct-burial line-laying, horizontal boring, digging, backfilling, dozing. Davis Mfg. Co./Div. of J. I. Case. **204**

**Industrial receiving tubes, as well as those for entertainment equipment**, are covered in new receiving tube manual, Technical Series RC-28, which has 784 pages and describes more than 1600 tube types. Application notes have been updated since the previous edition. RCA. **205**

**Flat-bonded, round-conductor ribbon cable** is subject of a data sheet which supplies complete technical specifications and ordering information on wide range of conductor numbers, gauges, colors, etc. A sample of the cable is attached to the data sheet. Bi-Tronics, Inc. **206**

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## THE SANSUI QSE-1 IS ALL YOU NEED TO ENCODE 4 FULL-FIDELITY CHANNELS — AND NOTHING ELSE.

Just add it to your existing equipment for instant conversion and here's what you have going for you:

(1) It yields **accurate** sound-source location in every direction for startling live-sound ambience.

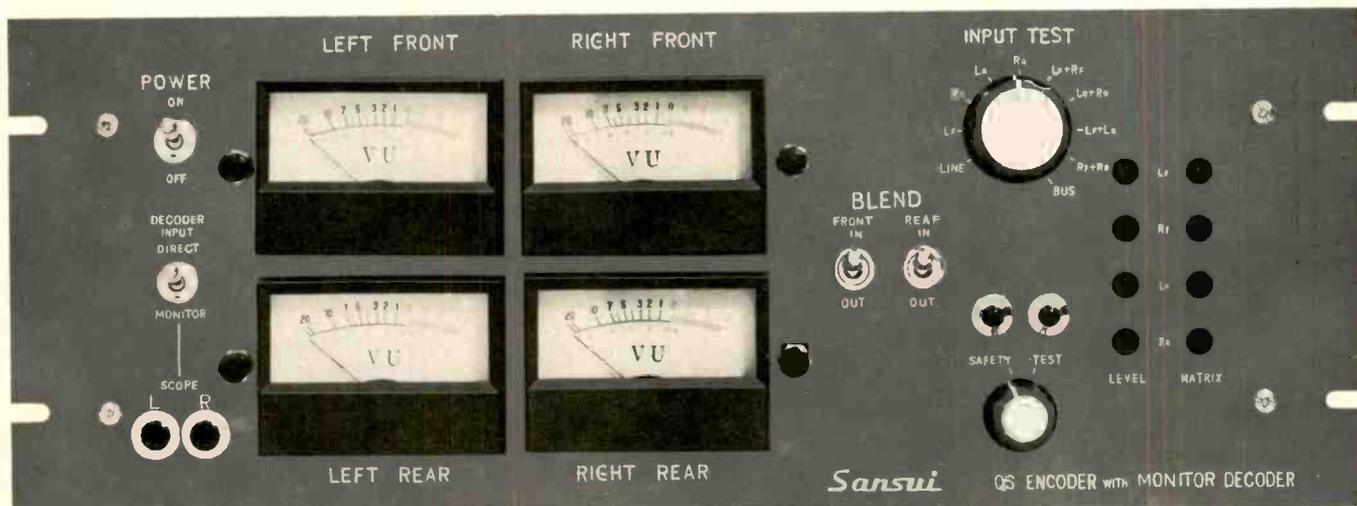
(2) It's in broadcast and recording use **today** with outstanding results.

(3) A **complete** line of complementary Sansui home hardware is available now. In fact, thousands of Sansui decoders are in users' homes already.

(4) It's compatible with 2-channel stereo and other four-channel matrix systems.

To be more specific:

Its ingenious  $\pm$ "J" phase shifters completely eliminate the signal dropouts and shifts in sound-source location that plague other matrix systems. Its symmetrical treatment of all four channels can **accurately** pick up **and relocate in reproduction** any sound source over a full range of 360°—so there are no limits to total free-



The Symbol of Sansui 4-Channel Sound.

dom and flexibility in using creative studio and psycho-acoustic techniques. And present standards of frequency response, signal/noise ratio and dynamic range are maintained.

It reproduces flawlessly on present two-channel stereo and monophonic equipment. And it will produce four-channel output not only through matching Sansui hardware, but through all other available decoders—and there are 600,000 of them world-wide today.

Thousands of them are Sansui QS-1 Synthesizer/Decoders that will decode it flawlessly. So will any of the full line of matching Sansui 4-channel receivers and converters for existing two-channel systems—made by the most respected name in stereo today throughout the world, and a recognized pioneer in four-channel sound.

Can you afford **not** to make this simple addition? Experiment with one right now. Learn what other recording and broadcast studios everywhere, now working with the QSE-1 Encoder, are finding out for themselves. Confirm their astonished conclusions.

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## Audio file Continued from p. 36

recently emphasized this in a statement aimed at the confusion on the subject. *All Pickering cartridges are designed for use with all two- and four-channel matrix-derived systems,*" he said, and the same applies to high-quality stereo pickups of every make.

**Matrixing systems themselves.** A more basic kind of compatibility problem now weighing on the FM station operator is that created by the various matrix systems that are slugging it out for domination of the four-channel stereo scene. The Electro-Voice system has made a sizable impression in broadcasting, but Sansui, and later Columbia's SQ, have begun to fight for a place on the map.

Electro-Voice has made a commendable response by announcing a new decoder (to be ready shortly after this sees print) that will work with *any* of the prominent systems, including the Columbia. Aside from formal announcement, however, *BM/E's* conversations with some of the principals (not yet publishable) give the strong impression that the major contenders are working along converging lines. The theory of matrixing is getting an intensive going over; all the major makers are putting in steady improvements (whether announced or not); it seems likely that sometime in 1972 we will have arrived at the strain-relieving situation, for the FM broadcaster, that almost any system

## NAEB Continued from p. 38

camera which incorporates automatic color correcting features.

Crowds also gathered at the Gates exhibit to see compressed television (otherwise known as slow-scan TV). Gates transmitted pictures (one every seven seconds) over an FM SCA channel. The bandwidth compressing equipment was made by Colorado Video, Inc. Telestrator showed several devices that would transmit graphics data at audio frequencies.

Kliegl Bros. staged some interesting demos using its Q-File—a random-access memory control for TV studio lighting. Aiming an array of lights at plastic sculpture, visitors saw 73 scene changes take place in 2-1/2 minutes.

Broadcast studio equipment was

## Your best buy in a Professional 10-1/2" Stereo Broadcast Recorder



TEAC 7030 SLM

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he adopts will be viable for all decoder-equipped listeners, and at a considerably higher level of efficiency than in the past. This may be a bit too optimistic, but the trend is real; we should pray that it accelerates.

—Robin Lanier

noticeably absent, except for quad VTRs at the Ampex booth and IVC's broadcast-quality helical scan VTRs.

For more information on new products at NAEB, circle the corresponding number on the reader service card:—

- Sony 3/4-in. cassette VTR 400
- Panasonic 3/4-in. cassette VTR 401
- Sony tape duplicator 402
- Telegen SECAM system 403
- Dynasciences tape editor 404
- Dynasciences video processor 405
- Dynasciences image enhancer 406
- Danscoll production switcher 407
- TeleMation super 8mm projector 408
- TeleMation NTSC color encoder 409
- Magnavox color cameras 410
- Commercial Electronics CEI 280 411
- IVC-150 color camera 412
- Ampex CC-500 camera 413
- Cohu automatic telecine chain 414
- Gates compressed TV 415
- Kliegl random-access lighting control 416

# ALTEC'S NEW REAL TIME AUDIO ANALYZER



## A major price breakthrough at \$3018!

The same acoustical display that you get with instruments costing many thousands of dollars more is yours with the new Altec model 8050A Real Time Audio Analyzer. Altec quality, through and through, this fine precision instrument offers you these important features.

Frequency range: 40 Hz to 16 kHz in 27 contiguous 1/3 octave bands.

Dynamic range: (3.16 mV to 3.16 V rms)

Display range: 20 dB on self contained 1½" high by 2½" wide cathode ray tube screen. Continuously adjustable by means of a front panel control.

Detection Mode: RMS SLOW or RMS FAST  
The dynamic characteristics are in accordance with IEC 179.

Detector accuracy: For tone burst signals with crest factors of less than or equal to 3:±0.5 dB with respect to the steady sine wave indication.  
For Gaussian random noise ±0.2 dB with respect

to steady sine wave indication.

Input: Input impedance is 100 kilohms. For steady sine wave signals the preamplifier will accept levels up to 30 dB above full scale indication.

Scanning: Internal scan covers the 27 channels in approx. 30 ms.

Dimensions: 16¾" wide, 5" high, 11" deep.  
Weight: 18.7 lbs.

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B-1

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pears to have been strongly influenced by the U.S. space program. The new WMCA broadcast center has a complete set of back-up systems for all technical facilities, any of which can be activated by an engineer simply by flipping a switch. Every control console is equipped with two channels per input, A and B. Additionally, every tape recorder in the station can be switched to any studio. And, in case of failure of the routing switcher, a patch panel could be used.

In addition to special lines provided by Con Edison, the station has its own emergency standby generator to provide power for the entire studio area in event of a blackout. And, as mentioned, the multi-line call director is backed up in case of failure with a complete set of call-in lines. Even the air conditioning has its own back-up system.

With all this redundancy, Kanner is positive he'll never have to ask the mayor, or any other distinguished guest, to relocate to another studio because of technical difficulties.

And, if Kanner does have a failure in one channel, he's sure he can repair it quickly. The principal reason for using dc control on the console was to simplify the audio line routing and make everything more accessible. All audio signal cables go directly to the distribution rack which stands free in its control room so it can be gotten to readily from the front or back. Most amplifier modules are

## Keeping Callers Captivated

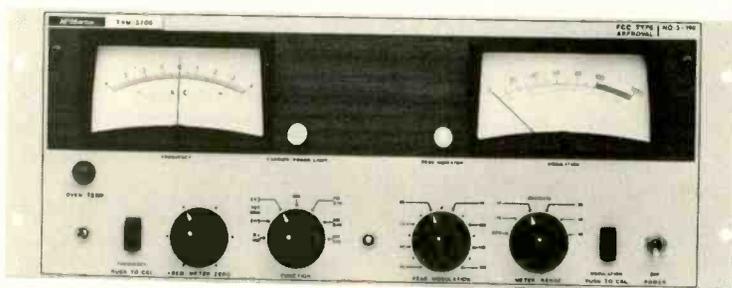
As described in the text, WMCA keeps its callers' language clean with a panic button which can interrupt a delayed broadcast. Keeping callers' conversation sparkling is another matter. WMCA relies on top-flight air personalities to keep programs fast-paced and far from boring.

There are pros like Bob Grant (10 a.m. to 1 p.m.) who followed in Joe Pyne's footsteps until he took over for himself at KLAC before coming to WMCA. Fred Gale, whose style has been described as mellowed acid, creates an interplay with listeners between 1 and 4 p.m. that's never dull. Jack Spector keeps a Sports Call hot every evening. Leon Lewis keeps night owls tuned-in with warm, easy-going conversations with many interesting guests.

The day starts off with Bill Scott on News Call, 6-9 a.m., who spices things up with his own observations. Callers take off on him at times. Dr. Joyce Brothers takes calls on sex, drugs, money, working mothers, wandering husbands and disobedient children. There are daily celebrities (along with Barry Gray and his famous nightly Barry Gray show). Other personalities appear on weekend shows. The Paul Harvey news show is also run.

interchangeable. All announcer turrets, described earlier, are interchangeable. It's like that throughout the station. If there ever is any down-time at WMCA, it probably won't cost Kanner more than one puff on his pipe. **BM/E**

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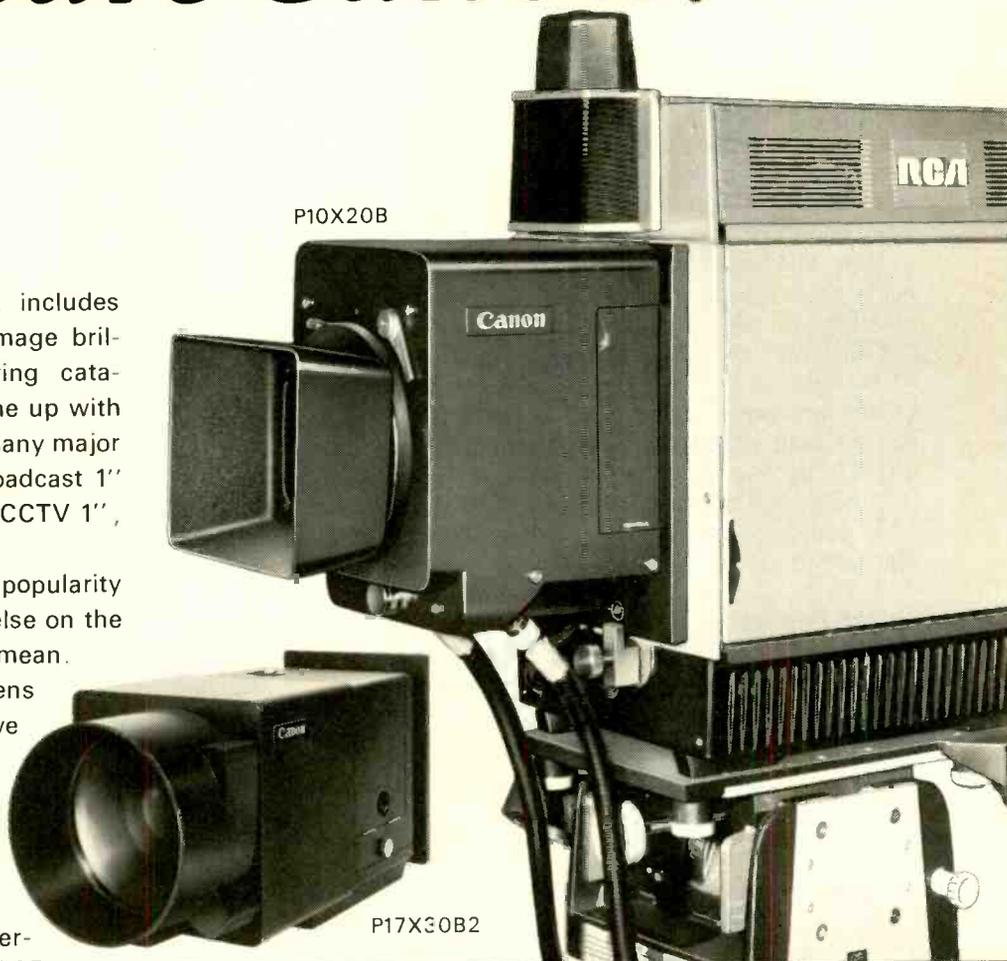
Draw up a checklist that includes price, specifications and image brilliance, then start comparing catalogues. You'll probably come up with the Canon answer, like so many major camera producers—for broadcast 1" or 1 1/4" PLUMBICON® or CCTV 1", 2/3" vidicon.

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The Canon TV Zoom Lens P17X30B2 has an impressive 1:2.5 relative aperture at focal length range (440-500mm), in spite of its 17X zoom ratio. At 30—440mm it's a remarkable 1:2.2, offering the same performance as our P10X20B, specially designed for maximum versatility with three different range extenders.

Both are ideal for a variety of situation, including dim lighting and open areas like field events.

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	P10 x 20	20—200mm	1 : 10	F 2.2
1" PLUMBICON	PV17 x 24B	24—400mm	1 : 17	F 1.8
	PV10 x 16	16—160mm	1 : 10	F 1.6
	PV10 x 15B	15—150mm	1 : 10	F 2.0
1" Vidicon	V10 x 15	15—150mm	1 : 10	F 2.8
	V6 x 16	16.9—95mm	1 : 6	F 2.0
	V5 x 20	20—100mm	1 : 5	F 2.5
	V4 x 25	25—100mm	1 : 4	F 1.8
2/3" Vidicon	J10 x 13	13—130mm	1 : 10	F 2.8
	J 6 x 13	13—76mm	1 : 6	F 1.9
	J 5 x 15	15—75mm	1 : 5	F 2.1
	J 4 x 12	12.5—50mm	1 : 4	F 1.8
Servorized/Motorized				
	Name	Range of Focal Length	Zoom Ratio	Maximum Relative Aperture
1 1/4" PLUMBICON	P10 x 20B4	20—200mm	1 : 10	F 2.2
1" Vidicon	V10 x 15R (DC)	15—150mm	1 : 10	F 2.8
	V6 x 16R (AC/DC)	16.9—95mm	1 : 6	F 2.0
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# Canon

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## Studio on wheels continued from page 33

made. Since the truck is often parked in the sun, we really need a high-capacity air conditioner for the fullest comfort.

Fig. 7 shows the interior of the complete truck.

### Platform on top

For our top platform, we mounted two pairs of roof luggage carriers, and put on them eight-by-six feet of all-weather plywood, with a one-by-eight piece on each side for stiffening. Rubber suction cups went under the platform to help support it. We have had four people on the roof at once with no signs of overload.

The antennas can be seen in Fig. 8. The heavy pole on the back takes the Yagi; the ring antenna is mounted a little forward on the left.

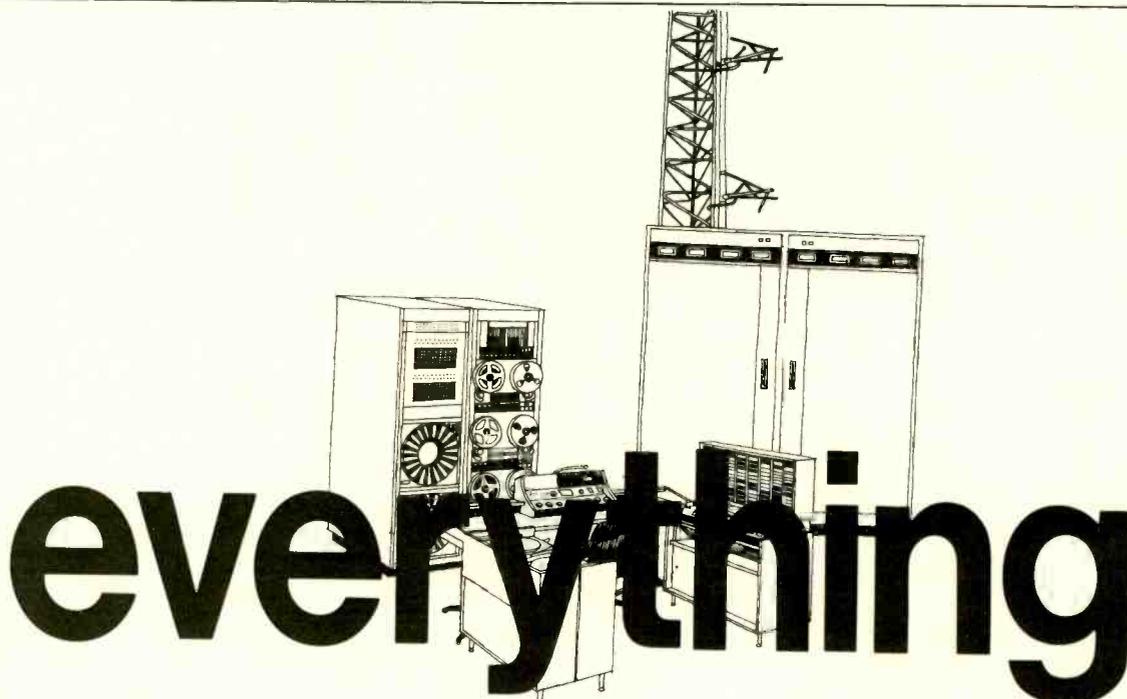
Call letters and other identifying data are painted on the sides of the truck. In addition, we put the call letters in reverse on the front of the truck, so they can be read in the rear-view mirror of a car just ahead of us!

During the three years we have used the van, we have added a considerable number of other items that turned out to be useful—among them:

- Roll of single conductor wire
- 250 ft of ac cord and smaller extension cords
- 800 ft of microphone cable in assorted lengths

- Six pocket transistor radios for portable monitors
- One good all-band transistor portable with headphone outlet
- Wireless microphones
- Bogen RTP-1 remote amplifier
- Two Shure 565 microphones
- Two RCA lavalier mikes
- Various lengths of coax for antenna feed
- An extra ring antenna on a tripod
- A tripod for the Yagi
- Two storage batteries wired in parallel to operate the Marti away from truck for long periods without running the truck engine
- Two-way radios from Department of Defense surplus
- Two five-watt CB walkie-talkies and two smaller units
- Patch cords and connectors to match almost any equipment
- Spare phono styli
- Hand tools and soldering gun
- Compass for setting Yagi direction

The van, known here as the "Martinmobile," has been an outstanding success. We can, indeed, go just about anywhere and do just about anything we want. If I had it to do again though, I would get a truck with a bigger, more powerful engine, with a non-slip rear end, and have the interior finished by the manufacturer. Live and learn! **BM/E**



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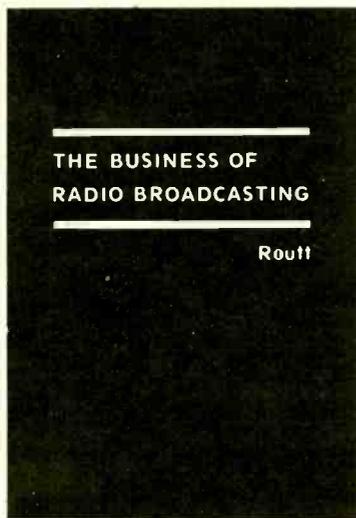
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Instructor in Station Management, Southern Methodist University.

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The style of this long-awaited publication, although conversational and informal (it reads as easy as a novel), teaches the terminology peculiar to the broadcasting industry. Actual case studies, taken from the author's own experience, add realism and practical guidance. Destined perhaps to become the classic of the industry, this complete and com-

prehensive text is a must for every person now working in broadcasting, as well as station libraries, broadcasting schools, teachers, and students.

Edd Routt...broadcaster, educator, and administrator...is a veteran of more than twenty years in the business of radio broadcasting. He has worked as a disc jockey, newscaster, political reporter, news director, salesman, assistant to the president of the McLendon chain of radio stations, and also as a general manager and owner. In addition to his current duties with McLendon, Mr. Routt is an instructor in Radio Station Management at Southern Methodist University.

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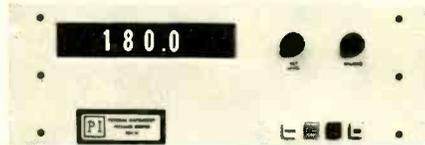
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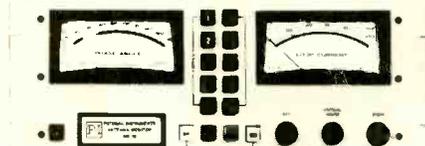
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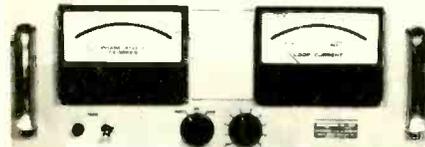
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# FROM THE EDITOR

## Renewals: On Being Responsive To Your Public

In this month's column, "Interpreting FCC Rules and Regulations," our FCC counsel tries to make clear the FCC's thinking on renewals, particularly as it applies to TV broadcasting. Our counsel looks at the problem from a legalistic point of view—what you have to do to stay out of trouble. From our ivory editorial tower, we'll look at the situation from the perspective of what-you-ought-to-want-to-do.

We won't go quite as far as the Court of Appeals (in the *Citizen's* case) where they ask for "unusual attention to the public's needs and interests." The FCC's guidelines—for profitable stations—of local programming 10-15% of the time; news, 5-10%; and public affairs, 3-5%; with a corresponding proportion in prime time, seems reasonable enough.

We know broadcasters are mightily worked up about challenges to renewals. Some view what's happening as some kind of an organized, concerted attack. We're inclined to believe that most challenges are simply part of the broad consumerism movement. "Power to the people" sums it up. Roles have been traded. Sensitive people, who have heretofore felt they were disenfranchised, are now able to pressure communicators to recognize them. Although some individual broadcasters may feel they are being extorted, it's more accurate to say they are being hit by a counter-reaction to industry practices. Earl Moore (counsel for the Office of Communications, United Church of Christ), says this reaction was brought on by an increasingly centralized and unresponsive broadcast industry (there is no strictly-local ownership of any station in the top-ten markets), and a steady decrease in public service (as sponsored programs sought mass tastes and good programming became occasional specials). It also appears broadcasters place a growing emphasis on profits to the exclusion of other values. While all of this has been developing, the FCC remained ineffective as a regulator.

Challenges will continue, but it is the policy of both the FCC and Dr. Everett Parker (United Church of Christ), the initial instigator of challenges, to have licensees meet with community-oriented groups and settle complaints. If broadcasters feel they are being extorted, it is because they don't have a sufficiently good past reputation to be able to trade on their good faith—popularity polls notwithstanding.

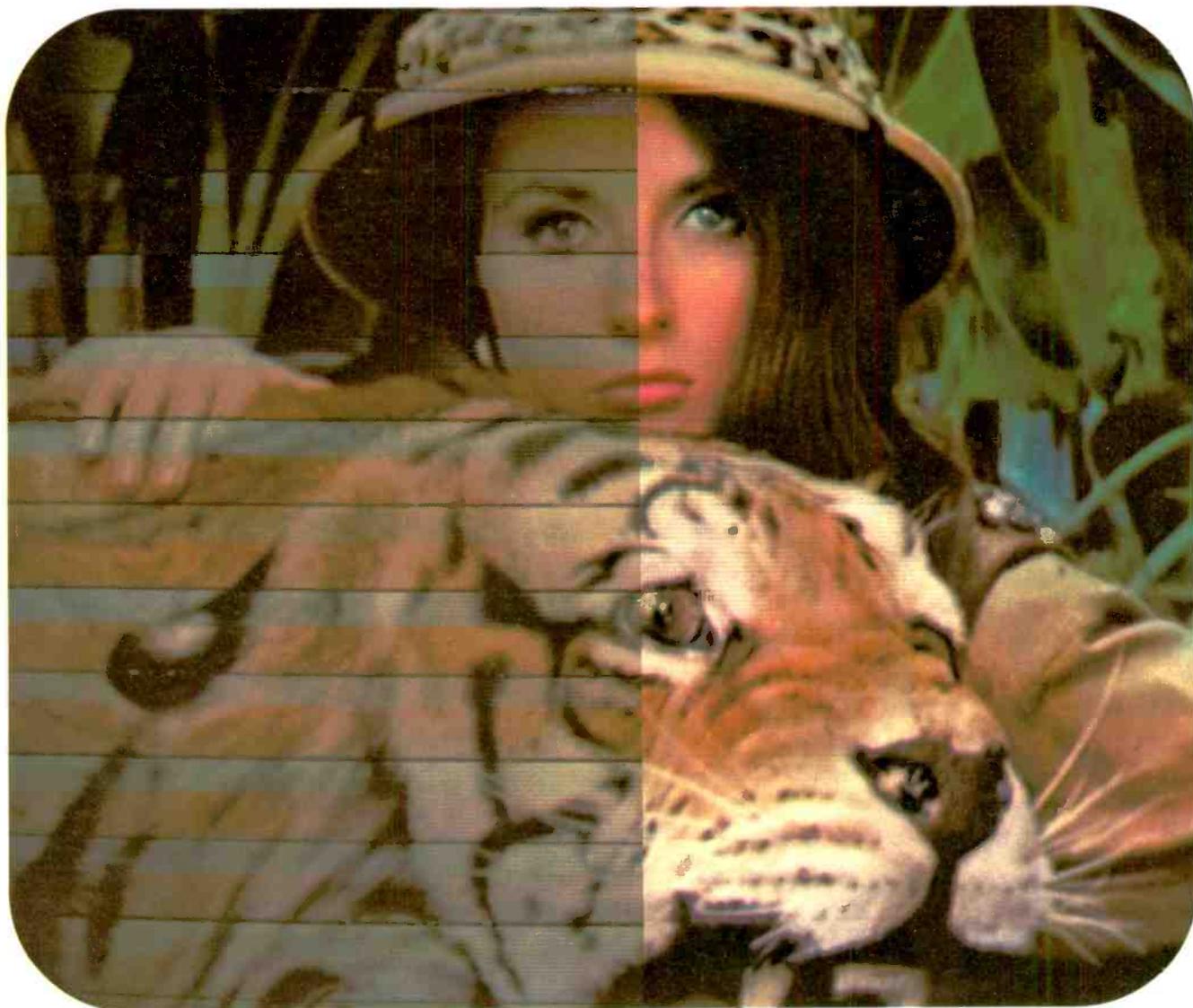
Chief Justice Burger has said, when a lower-court judge, a broadcast license is a public trust subject to termination for breach of duty. Duty means being responsive to community needs of merit. Broadcasters are still free to interpret this need. The FCC guidelines don't say every station has to cover every issue for every segment of the population. Hopefully, the FCC will even try deregulating radio in markets where there is ample competition.

More important than any specific agreement reached between citizens and stations is that the *process* of discharging public responsibility must be refined and improved. Broadcasters should help inform the public how the process can be aided and abetted.

There are many dedicated broadcasters who are constantly at work improving their service to their community. We hope to publish some of these stories in *BM/E*, along with full descriptions of the equipment that is used. We look forward to a contribution from you.

**James A. Lippke, Editor**

# Look at the Difference



Unretouched photographs of 21" studio monitor. Photographic data: Rolleiflex C-3, CPS color negative film — ASA :00, 1/15 second at f/5.6

## ...after 3M Color Dropout Compensation

Here's what 3M's Color Dropout Compensator does for your VTR reproduction:

Look at this unretouched composite photograph of a studio monitor. It shows, at the left, a videotape playback with 13 electronically recorded-in dropouts. These dropouts were created by a special test generator which attenuates the RF level to the record driver. On the right, these dropouts have been completely restored by the DOC.

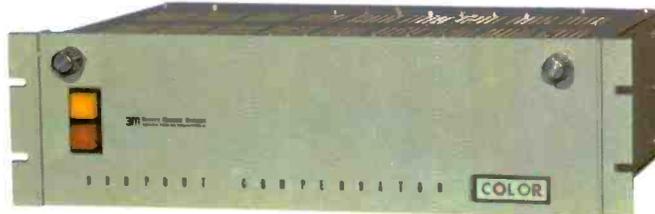
The black dropouts shown on the left are followed by a complete loss of color-lock in the direct color recovery equipment. Since these dropouts include horizontal sync and color burst, they cause transient color flashing not ordinarily attributed to the dropouts themselves. Even shallow dropouts can create a similar problem due to loss of side-band information.

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After compensation, note the precise color match and complete freedom from switching transients. Also, the dropout disturbance to the time correction unit has been eliminated. Proc amp and

servo stability are improved to such a degree that it is possible to play this tape in full intersync or pixloc mode.

In the compensated half of the photo, compare the replacement material with the original signal two scan lines above the dropout due to a *complete* frame being photographed. Try to find the 13 switching transients.

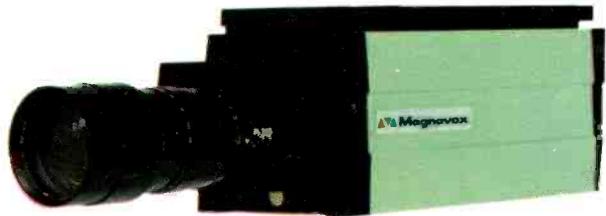


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