how to simplify continuous quality control of television signals

Here's how every TV broadcast station can be assured of constant high quality picture transmission. Through use of a Riker Automatic Vertical Interval Test Set, you can keep a continuous check on transmission characteristics such as phase, gain and video level during actual program time. By transmitting the standard video test signals (multiburst, linearity, window, sin²) simultaneous with the program material even the slightest deterioration of transmission quality can be immediately detected and corrected. All the standard test signals are individually selectable and can be automatically sequenced into the composite video program.

The all solid state circuit design of the Riker VITS plug-in modules assures the utmost in long term stability and reliability.

If you're interested in building the video test and quality control capabilities of your station, write or call Riker—the one company in the TV broadcast industry offering a complete line of all solid-state instrumentation for video analysis, simulation and control.

RIKER PRODUCTS FOR VIDEO ANALYSIS, SIMULATION & CONTROL

RIKER VIDEO INDUSTRIES 100 PARKWAY DRIVE SOUTH HAUPPAUGE, L.I., NEW YORK 11787 (516) 543-5200

Circle 1 on Reader Service Card
A New Patterns of Performance

hp 17" Video Monitor Achieves Increased Reliability and Improved Picture Quality through Advanced Circuit Techniques

CONSISTENT IMAGE QUALITY
A. Keyed back porch clamp assures less than 1% black level shift for 100% video amplitude change.
B. Displays sine T/2 pulse without distortion (62.5ns).
C. Option 46 pulse cross position.
D. Less than 1.5% geometric distortion overall - feedback assures excellent gain stability over full video bandwidth - Unity interface results from novel sync circuitry.

EASE OF OPERATION
Display linearity independent of size adjustment - Unique deflection circuits have feedback active over entire raster - No sync controls - synchronization is automatic on both North American and CCIR Standards.

OTHER IMPORTANT FEATURES
Fully regulated high voltage and low voltage power supplies - Balanced input with loop-through facility - 46 db input common mode rejection - Size: 17¾" W x 15½" H x 20¼" D. Price: Model 6946A—$950. Option 46—$45.

For more information, call your local HP field engineer or write Hewlett-Packard, 100 Locust Ave., Berkeley Heights, New Jersey 07922. Europe: 54 Route des Acacias, Geneva.

HEWLETT PACKARD
COMMUNICATION INSTRUMENTS
Circle 4 on Reader Service Card
This month's cover. The 46th NAB Convention and Exhibit is wrapped up and packed up. By now even the debris is gone. For a wrapup of five themes at the Convention, turn to page 29.
Give everyone in your audience a new television set

Amazing new Image Enhancer installed in your studio "rides through" weaknesses and defects in home receivers. Delivers unbelievable picture clarity.

When anyone tunes in your newly-equipped channel for the first time, he'll think his old set is brand new. That's how remarkable our new Image Enhancer is. Color pictures (black and white, too) leap to life with incredible clarity. They have more snap. More sparkle. More impact.

Our Image Enhancer gives complete contour enhancement. Even fast-action sporting events are sharp. Clear. Well defined.

And a remarkable process called "crispening" works like an electronic retoucher. Puts light in the eye. Even darkens an eyebrow. And does it without noise or crosstalk.

Order our Image Enhancer for your studio, and deliver the "new television set" to your audience. Don't wait. Write us for details. Or better yet, call us collect: (203) 327-2000.

PROFESSIONAL PRODUCTS
CBS LABORATORIES
Stamford, Connecticut. A Division of Columbia Broadcasting System, Inc.

May, 1968 — BM/E

Circle 5 on Reader Service Card
Better Uhf Tuning?
Production of greatly improved all-channel television tuners that will substantially simplify uhf-TV tuning will begin in about a year, electronics manufacturers announced at a meeting recently held at the Federal Communications Commission. The All-Channel Television Society, the Electronic Industries Association and tuner manufacturers participated in the session with Commissioners and FCC staff observing.

The tuners embody completely new concepts, representatives of two electronics manufacturing companies stated, emphasizing that the newly-developed units will give uhf-TV the tuning ease and facility now available for vhf-TV. The tuners will be compatible with automatic frequency control devices to eliminate difficulty in precise tuning and will incorporate easy tuning, pushbuttons.

Later in Chicago, ACTS met with set manufacturers and accused them of failing to provide adequate tuners. Set makers said cost of better uhf tuners was the limiting factor, and that users didn't install antennas. Hopefully, the FCC will appoint a committee of broadcasters, set, tuner and antenna manufacturers to recommend steps for improving uhf receiving ability.

ACTS wants all price ranges of sets to be improved.

Color Picture Brighter
Termed the most significant advance in TV color tube brightness since the rare earth europium screen announced in 1964, Sylvania's new Color Bright 85 series is 23 to 69 percent brighter than other tubes. The result is a truer red even under high ambient lighting conditions. The new brightness levels are the result of a combination of developments involving major components of the tube including improved phosphors; a new electron gun; a new temperature compensated mask, and an advanced method of dusting the phosphors onto the faceplate of the tube.

The tubes are being used in 1968 Sylvania color TV models currently available and will be made available to other set manufacturers. Sylvania, one of the three largest manufacturers of picture tubes, provides color tubes to three out of every four set manufacturers.

On the basis of foot lamberts of brightness under standard industry test conditions, the Sylvania tube averages 23 percent brighter than the next brightest tube available. Brightness improvements over other tested brands were 25, 44, 51, 54, and 69 percent, respectively, Sylvania spokesmen said.

The patented dry dusting process permits Sylvania to use larger phosphor crystals on the tube face than can be achieved in any other method of application. The larger crystals produce higher brightness and the dry method of application permits a more constant phosphor thickness assuring more uniform light output, Sylvania reports.

Proposed End of Multiple Ownership
To promote program diversity, the Commission recently proposed to limit multiple ownership of stations in individual communities.

Proposed rules would forbid the owner of an a-m station to acquire a local fm or TV license. Fm and TV licenses would similarly be precluded from acquiring another kind of station.

The rules would apply to new stations and transfers but would not require divestiture by existing multiple licensees. Applications now on file with the Commission will be processed according to existing rules.

Interested parties have until June 26, 1968, to file comments on the proposed rules and until July 8 for reply comments.

Members at the 46th NAB Convention passed a resolution opposing the plan and said action should be based on individual applications.

Meter and Measurement Actions and Proposals
The Commission has issued a Notice of Proposed Rule Making to explore the possibility of using actual field strength measurements to determine the coverage of fm and TV broadcast stations, instead of conventional field strength prediction charts.

The Commission stated that it is aware of the shortcomings of the present method of estimating TV and fm station coverage with field strength charts and has, on a number of occasions, considered the possibility of permitting the use
if CAS isn’t shipping you new all-transistorized Channel Control head-end equipment you’re missing a good deal

...AND HERE’S WHY

Plenty of reliability-conscious CATV operators already have discovered for themselves that the versatile new all-transistorized CAS Channel Control is their best buy in head-end equipment.

As a matter of fact, well over a hundred Channel Controls already are either in actual system operation or in various stages of installation.

The CAS Channel Control gives you 12-channel processing without demodulation plus duplication switching, local origination, remote emergency alert and “flash” announcement capabilities.

Multiple channel capabilities
But that’s not all. The Channel Control is not limited to just signal sources available now because it is easily adaptable to process any number of channels or frequencies desired for future multiple channel systems.

Development and manufacture of Channel Control head-end equipment rounds out a total CAS capability to offer all-transistorized CATV equipment from head-end to subscriber TV set.

For example, CAS equipment made possible the first all-transistorized CATV system using heterodyne head-end equipment. This system, in Holdenville, Oklahoma, uses 11 CAS Channel Control head-end units including two for local origination, and other CAS transistorized equipment throughout the system.

Cost-savings and reliability, too
Here’s what Mr. J. B. Krumme, (left), president of Holdenville Cable Co. has to say about all-transistorized Channel Control head-end and other CAS equipment in his system:

"We were quite pleasantly surprised that the CAS all-transistorized CATV Channel Control head-end and line equipment cost a little less than leading vacuum tube gear.

The increased reliability of an all-transistorized system should reduce downtime considerably and we are especially looking forward to taking advantage of the unique remote capabilities of the CAS Channel Control.

CAS's technical assistance in helping us engineer this all solid-state system was an extra benefit."

Write for technical data
If you’re interested in a high reliability all-transistorized head-end capable of maintaining original sound and video quality from antenna, microwave or local origination sources, you’ll want to write for pricing and full technical data on the CAS Channel Control.

You’ll be glad you did.

May, 1968 — BM/E
of actual measurements. However, measurements taken by different engineers often yield widely different results and measurements made at the same location by the same engineer and under similar conditions but at different times, may differ substantially. Unless a method can be found that will yield substantially the same results when independent measurements are made on the same station by different engineers, the usefulness and accuracy of the measurements is open to challenge. It is claimed by the engineering firm of Kear and Kennedy that the Television Allocations Study Organization method will meet these requirements.

The TASO method requires that mobile measurements be made with the receiving antenna at 30 feet above ground. This poses a hazard of contact with overhead wires and restricts places where such measurements can be made and for that reason are not attractive. However, correlation with data obtained at 30 feet has not been satisfactory.

In another announcement, the Commission revealed a Notice of Proposed Rule Making to consider amending Section 73.50 of the Rules to eliminate the requirements for meters as indicators on a-m modulation monitors (RM-1208).

Collins Radio Company filed a petition for rule making on October 13, 1967, stating that a monitor developed by them which uses no meters has substantial advantages over conventional monitors.

The Collins monitor substitutes for the semipeak meter a battery of four indicating lights, calibrated to glow at various preset peak modulation levels. The company says the accuracy of its monitors is unaffected by substantial changes in carrier level.

The Commission also has announced a Notice of Proposed rule making modifying the calibration of output power meters for TV transmitters at 80, 100 and 110 percent of authorized operating power. The proposal affects Sections 73.689(b)(1) and (2) of the Rules.

FCC To Study Automatic FM Transmitters
A Notice of Inquiry into the use of automatic and self-monitored FM broadcast transmitters has been adopted by the FCC. It was issued in response to a petition by Collins Radio Co., Dallas, Tex., asking for amendment of Part 73 of the Rules to permit use of such equipment.

Noting the benefits of the automatic transmitters, the Commission pointed out that Communications Act requires transmitters to be attended by licensed operators. "Because of the significant implications of any departure from this concept," the Commission said it was asking for comments on an amendment to eliminate the licensed operator requirement or to allow use of minimum grade operators to perform limited functions.

Comments in the Inquiry may be filed on or before June 27, 1968, with reply comments due on or before July 26, 1968. See editorial on subject, p. 84.

FCC Amends Personal Attack Rules
Bona fide news interviews, and commentary and analysis in bona fide newscasts, news interviews, and on-the-spot coverage of news events have been exempted from the personal attack provisions of the fairness doctrine in action by the FCC amending Part 73 of the Rules.

The Commission acted to amend the Rules after receiving authorization from the United States Court of Appeals for the Seventh Circuit where the personal attack provision is under review in Radio Television News Directors Assn., et al. v. United States. The Commission noted that the revision was "of relatively narrow nature," and that its purpose was to avoid the possibility of inhibiting broadcast licensees in carrying out "journalistic functions."

The Commission emphasized, however, that the fairness doctrine remains specifically applicable to news programs. In applying the fairness doctrine to the exempt categories, the licensee may meet his obligations by "fairly presenting the contrasting viewpoint on the attack issues or by notifying and allowing the person or group attacked a reasonable opportunity to respond," the Commission said.

Presunrise Actions
A Notice of Proposed Rule Making, recently issued by the FCC solicited comments on presunrise operations before 6 A.M. by Class II a-m stations on U.S. I-A clear channels, located west of the co-channel dominant station. Petitions asking that presunrise operations limited only by the time of sunrise at the dominant station and 4 A.M. were denied late last year as inconsistent with the Canadian agreement.

In other action, major changes in Part 73 concern the national adoption of "advanced" or "daylight saving time;" a new definition of "nighttime" to cover the period from local sunset to local sunrise; and the listing of the 770-kHz channel with the other 24 I-A channels in the test of Section 73.25(a).

Tube X-Radiation Measurement Described
A recommended method for measuring X-radiation from receiving tubes has been formulated by the Electron Tube Council of the Joint Electron Devices Engineering Councils.

The method, described in JEDEC Publication 67 "Recommended Practice for the Measurement of X-Radiation From Receiving Tubes," applies to all high voltage tubes in both color and monochrome TV receivers, as well as industrial products.

JEDEC Publication 67 is available at 25 cents from EIA Engineering Department, and is a companion to JEDEC Publication 64, "Recommended Practice for Measurement of Radiation From Display Cathode Ray Tubes," priced at 30 cents. Minimum order is one dollar.

Hyde, Wasilewski Defend BC Spectrum Use
Chairman Rosel H. Hyde of the FCC questioned the wisdom of suggestions that the present system of radio and television be converted to wire in order to satisfy the air waves demands of point-to-point communications users.

Broadcasting is "directly serving the public interest," he said, and therefore has a right to spectrum space, he told a meeting of presidents of state broadcaster associations sponsored by the NAB.

Speaking of recent spectrum studies, Hyde said "there has been talk of wiring broadcasting "to provide spectrum space for other users of it. However, he added, "many spectrum users don't have the immediate purpose of directly serving the public interest as broadcasting does," noting that many
Monitor-Measure TV Characteristics
With Precision Pulse & Bar Signals

FEATURES:

- Generates T/20T and 2T/20T Signals
- Generates Auxiliary Horizontal Pulses
- Generates 3.58 MHz Color Subcarrier
- Ideal for K Factor Analysis
- Available for NTSC, PAL, SECAM Systems
- Distortion, $K_w: 0.25\%$
  $K_t: 0.5\%$

OUTPUT SIGNAL

NORMAL TWO-LINE OPERATION

1ST LINE: BAR SIGNAL AND T OR 2T PULSE
2ND LINE: 20T PULSE WITH COLOR SUBCARRIER

It is possible to monitor and measure television transmission characteristics in terms of K factor ratings. A special T/20T or 2T/20T sine pulse & bar signal is applied to the system under test. The deterioration of these special signals permits measurement of amplitude and delay distortions produced by the transmission system. In particular, the 20T pulse clearly reveals linear distortions in the range of the color subcarrier. The line frequency pulse & bar signal contains all essential components of a standard black/white and color picture.

The all solid state Type SPIF generates the required test signal. Sync pulses are internally generated or can be externally applied. Switchable one or two line operation is provided. The picture component can be attenuated by 10 dB. The pulse & bar signal can substitute for the picture signal applied to a mixer or test generator.

Price: $1600.00

ROHDE & SCHWARZ
111 LEXINGTON AVENUE, PASSAIC, N. J. 07055 • 201-773-8010

May, 1968 — BM/E
Supreme Court to Rule on FCC Control and Copyright Issues

Two issues vitally important to the future of CATV are now being considered by the Supreme Court. Some time before June, the Supreme Court is expected to decide the following questions:

1) Does the FCC have jurisdiction over CATV?
2) To what extent, if any, is CATV subject to copyright fees?

Presenting the case for the FCC, Henry Geller said that CATV impact on local service and the allocation plan makes regulation imperative.

Geller explained the rules to the Court, equated CATV with pay TV, and said that FCC authority over CATV is based on the Communications Act dealing with regulation of interstate communications by wire, as well as those sections on broadcasting.

Taking the CATV side were Robert L. Heald and Arthur Scheiner, attorneys for Trans-Video Corp. and Southern Cable Co., respectively.

They insisted that the FCC has no jurisdiction over CATV, pointing out that they have never claimed authority over interstate wired communications systems such as the press services and broadcast networks.

Famed attorney Louis Nizer argued United Artists' copyright case against Fortnightly Corp. He said that CATV is a big business that takes copyrighted material and doesn't pay for it. “CATV” said Nizer, “is waxing fat selling goods it hasn’t paid for.”

Answering a question from the Court, Nizer said that a homeowner with a special antenna could invite friends in to watch television, but if he charged a fee, he would be liable for copyright infringement.

The CATV side of the copyright problem, presented by Robert C. Barnard, contends that CATV is nothing more than an antenna service. He said all television systems include an antenna, a connecting link and a TV set, and that CATV is just a connecting link.

While this case has been pending, Congress has been considering new copyright legislation. A new copyright bill passed by the House in 1967 originally exempted CATV from paying fees for local TV programs, but this section was stricken before the bill was passed.

It is impossible to predict the outcome of these two cases, but indications are that the Supreme Court may uphold FCC authority over CATV, but limit copyright liability to distant signals only.

Will the Phone Companies Control CATV?

Many industry leaders feel that the phone companies represent a threat to independent CATV ownership. Recently, FCC Commissioner Kenneth Cox pointed out that phone companies are moving rapidly into CATV, currently building systems in 200 cities.

The FCC is trying to decide whether phone companies need their approval to provide trunk line for CATV systems. Cable operators argue that since phone companies apparently don't need authorization from local authorities, a regulatory void exists. They also complain about phone companies using control of the poles to force them into leaseback agreements.

Frederick W. Ford, president of NCTA, urged broadcasters and
cable operators to work together to prevent "the phone companies' attempt to take over all home communication channels."

**Cable TV Helps UHF**

FCC initial decision in three cases out of three that CATV helps—does not hurt uhf. In San Diego, California, the FCC hearing examiner ruled that investigations have failed to show that cable systems have adversely affected uhf stations. In Buffalo, they found that CATV would not even injure a potential uhf channel. And in Lexington, Kentucky Ex-aminer Forest McClenning found that uhf stations WLEX-TV and WKTY-TV have not been hurt and are not likely to be hurt by CATV car-riage of Cincinnati and Louisville stations.

Further, an ARB study showed that in Binghamton, N.Y., 80 out of 100 cable subscribers watch uhf, compared with only 47 out of 100 nonsubscribers who tune in uhf.

**FCC Tackles Waiver Backlog**

Scraping its policy of considering waiver petitions in chronological order, the FCC has decided to give priority to waiver requests from large (over 500 subscriber) sys-tems.

This is a break for the smaller systems, since they can go on de-veloping local channel programs until the FCC acts on their waiver requests.

In what many consider to be a long overdue step, the FCC has also decided to investigate the possi-bility of using actual field strength measurements, rather than to rely on predicted contours to determine station coverage.

**CATV Statistics Revised**

The latest NCTA figures indi-cate that as of January 1, 1968 about 5 percent of the nation's TV homes were being served by cable television. Earlier figures showed that the highest saturation was in the West (6 percent) and the lowest in the North Central States (2.1 percent).

Pennsylvania still had the greatest number of systems (223) and the greatest number of CATV homes (326,000) but Vermont had the highest saturation rate (26.3 percent).

The NCTA also revealed the results of their survey on program origination by cable systems. Out of 1500 questionnaires mailed, the NCTA got 324 replies. They found that 161 were originating programs and 65 more plan to. Most use time-weather channels, but many have sophisticated studio equip-ment, including VTRs and film chains. About 10 percent of cable casters now sell advertising time.

**Things Look Rosy For Colorado CATV**

In an effort to block importation of distant signals into the Colorado Springs-Pueblo area, the NAB petitioned the FCC to consolidate four CATV proposals and "Deter-mine their present and future im-pact upon free television broad-casting in a single evidentiary hearing."

They submitted an analysis which showed that a similar three-station market, Bakersfield, Cali-fornia, has suffered economic in-jury because of CATV.

The CATV forces were buoyed, however, by help from an unex-pected quarter. The FCC CATV Task Force said that the Colorado stations had ignored six other three-station markets, choosing the only one that seemed to support their case.

---

New products always upgrade a station's operation, make the work more efficient and faster. Here are some of the features that make the TBM-1000A a device that all up-to-date stations will want to have:

- All-transistorized receiver.
- Uses same circuitry as the TR-66A multiplex receiver with FET's in the front end and in-tegrated circuits.
- Has composite signal output. Provides left and right audio when used with the TBM-0360 stereo demodulator.
- Will provide SCA audio if two optional plug-in circuit boards are added. No wiring needed.
- Has true peak-reading meter.
- Monitor speaker can be switched to either main channel or SCA.
- Simultaneous recovery of main and SCA channels in audio form —600 ohms.
- Crystal controlled to one frequency within the 88-108 mc band.
- Rack-mounted; only 3½" high.
- Optional wooden cabinet for use in execu-tive offices as an off-the-air receiver.

---

**McMartin®**

McMartin Industries, Inc. 3104 Farnam Street Omaha, Nebraska 68131

Circle 8 on Reader Service Card
demands for spectrum space come from land mobile users such as delivery trucks, taxicabs and other commercial enterprises primarily concerned with their private interests.

FCC Amends Rule To Permit Auxiliaries
Amendment of Parts 2 and 74 of the FCC Rules Regulations has been ordered by the Commission to permit operation of low power broadcast auxiliary stations in the 942- to 952-MHz aural broadcast studio transmitter link band.

The rule change will facilitate short range voice communication and signal transmission required for operation of portable TV cameras. It permits use of such devices as wireless microphones and cue and control signal transmitters. It will enable a program director to control certain camera functions while leaving the cameraman free to concentrate on following the action. The low power stations will share frequencies allocated to broadcast auxiliaries and require no additional spectrum space.

A-m Nighttime Coverage Rule Relaxed
The Commission has amended its rule to conform nighttime coverage requirements for Class II and Class III station assignments with those for Class II-A stations operating on certain Class I-A channels.

The 1961 Clear Channel Decision required, for assignment of Class II-A stations on certain Class I-A channels, that they bring a first primary service to at least 25 percent of the area or population to be served. The Commission believes there is no reason why nighttime assignment standards for Class II and Class III stations generally should be more restrictive than those governing Class II-A station assignments. It is therefore aligning Section 73.24-(b) (3) with Section 73.22(b) of the Rules.

Reinsch Sees CATV, Satellite Advances
J. Leonard Reinsch, president of Cox Broadcasting Corp., recently told a group of leading Ohio businessmen how Cox is keeping pace with dramatic communications industry.

Speaking to members of the Newcomen Society in North America at Dayton, Reinsch said that in communications today, you cannot sit back and count your listeners, or viewers, or money, or you will be left behind.

Reinsch predicted that in the next 10 to 15 years, television stations will be receiving network programs via satellite, retransmitting them plus local program fare over the air and that the use of cable television systems to bring program fare directly into the homes will be greatly expanded.

The advent of satellite broadcasting, Reinsch said, does not mean the demise of the local station. Local stations will continue to be the "foundation for service to their respective communities."

Cable television as it is known today, he continued, may seem primitive in the light of technological advances that may allow viewers to purchase advertised goods through a computer at the cable system's office.

Waivers Granted To ITF Stations
The Commission recently waived Section 74.902(c) of its Rules to permit assignment of two Instructional Television Fixed channels to the Board of Education of Birmingham, Alabama, and also to allow the Archdiocese of New York to construct five additional instructional television fixed relay stations.

The New York relay stations are needed to serve schools located within the service area of the system but are now unable to receive transmissions because of signal path obstructions by terrain or tall buildings.

One of the stations in Birmingham (BP1F-136) will operate as an STL on Instructional TV Fixed channels G-2 and G-3. The other station (BP1F-132) will operate as a relay station on channels E-2 and E-3, and will transmit programming received from the schools in the Birmingham school district.

WQAM Wins News Award Again
For the second year in a row, the News Department of WQAM, Miami has been awarded the highest Associated Press award, an honor shared only by WBBR, Baltimore.

The News Department is headed by 10-year veteran, Bob Kaye.

Maryland Mobilizes for ETV
Maryland Mobilizes for ETV. At the conclusion of a two-day conference called by Governor Agnew, educators from across the State of Maryland decided that the installation of television antennas and distribution systems in all new schools should be a requirement for State approval of new school construction in Maryland.

Conferes urged the immediate budgeting of funds for classroom TV sets and the development of a State purchasing plan which would assure the acquisition of compatible equipment and the economy possible in large quantity procurement.

Jerrold To Install ITV System at Monroe Community College.
What is claimed to be one of the most extensive instructional television systems ever installed in a junior college will be in operation when the Monroe Community College, Rochester, N.Y., opens this September. The system will enable the college to originate programs on 12 rf, 5 video and 2 subcarrier TV channels and distribute them over a coaxial system to every teaching station on campus—156 in number. The system has the capability of providing up to 17 simultaneous TV programs.

NAEB President Testifies on Fairness Doctrine.
President William G. Harley, president of the National Association of Educational Broadcasters, recently testified before the Special Subcommittee on Investigations of the House Interstate and Foreign Commerce Committee. He emphasized that if the FCC were to follow a practice of close over-the-shoulder surveillance of controversial programming and insist upon second guessing the reasonable judgments of licensees, then educational broadcasters and others might ultimately have to avoid the discussion of important issues in their programming.

He went on to say, "Although there has been some misunderstanding of the nature of the doctrine and considerable dissatisfaction with the hypertechural nature of certain procedures educational stations are, nonetheless, readily attuned to the necessity, and indeed, the desirability of presenting opposing conflicting viewpoints on controversial issues."
a studio production console
and remote pickup amplifier in one unit

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

Completely solid-state, the 212J-1 offers:
• Four input channels, each with selectable switches for hi-level, microphone, or phone (RIAA equalization).
• One program output channel.
  • Switch-selectable monitor amplifier with internal speaker.
  • Cue on all mixers overriding into monitor channel.
    • Local and studio speaker muting.
    • Public address system feed with level control.
Careful, your income tomorrow may be limited by the cable you install today.

Buy Superior Continental's E-X-T-E-N-D-E-D Spectrum Coaxials and take the lid off!
Standard Coaxials have limited range with many areas of hidden discontinuities.

SUPERIOR EXTENDED SPECTRUM COAXIALS cover the full range to 300 MHz and beyond with no discontinuities.

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

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

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

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

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

SUPERIOR CONTINENTAL CORPORATION
Non-Communications Act Violations By Applicants And/Or Licensees

During the past 35 years, broadcasters, as well as all other segments of the business community, have been subjected to increasingly stringent governmental regulation. Today, an alert broadcaster must have a good working knowledge of numerous legal fields including labor laws, Internal Revenue laws, antitrust laws, false advertising, etc.

We have witnessed a great many hearings at the Commission whereby applications for (1) construction permits, (2) transfers and/or assignments, and (3) renewals have been designated for hearing on the grounds that the applicants and/or licensees had been found by a federal court to have violated laws relating to monopoly, restraint of trade, unfair competition, etc.

The Commission has not promulgated exact rules in this area; consequently, what can a licensee expect from the Commission when he (1) intentionally or (2) unintentionally violates local, state, and/or federal laws? What criteria does the Commission employ? Should there be a difference in procedure or result in any of these situations:

(a) Whether the finding of the violation is in a civil or criminal case;
(b) Whether the finding of violation is by the United States Supreme Court or some lower court;
(c) Where, after the finding of violation, a decree is entered by an appropriate court which results in the elimination of the practice which was a violation of state or federal law;
(d) Where there has been no finding of violation or no filing of suit, but the Commission is in possession of information which shows that there has been a violation of state or federal law.

In approaching these issues, the Commission is concerned with two basic considerations: (1) Under the Communications Act of 1934, as amended, licensees are required by law to operate radio stations in the public interest; (2) the Commission, in its licensing functions, is obligated to see that this legislative mandate is carried out in order to encourage the larger and more effective use of radio in the public interest. It is in the light of these requirements that the problems presented must be considered.

Section 307(c) and 310(b) of the Communications Act provide that the Commission may grant applications only if the public interest, convenience or necessity will be served. No intelligent appraisal of applicants in terms of this standard can be made without an examination of the basic character qualifications of these applicants, and Congress, in §308(b) of the Act, specifically gave the Commission authority and imposed upon it the duty to make such examination in evaluating applicants for broadcast facilities.

An important aspect of this examination is the conduct of the applicant. (KKFB Broadcasting Association, Inc. v. Federal Radio Commission, 44 F.2d 670.) Obviously this does not include every phase of an applicant's behavior, but only that part which has some reasonable relationship to ability to operate a broadcast station in the public interest. As pointed out in Mansfield Journal Co. v. Federal Communications Commission, 180 F.2d 28, 33, "... in determining whether a particular applicant should be permitted to operate so important and restricted a facility as a radio station ... it is appropriate that the Commission examine pertinent aspects of the past history of the applicant."

The Commission believes a pertinent part of this history would clearly include any violation of State or Federal law. In the past, it has considered various types of unlawful conduct including violations of Internal Revenue laws, conspiracy to violate antitrust laws, false advertising and other deceptive practices, in passing upon qualifications of applicants. In this respect, the Commission has been sustained by the Courts. In Mester, et al v. United States, et al., 70 F. Supp. 118, affirmed per curiam 332 U.S. 820, the U.S. District Court for the Eastern District of New York stated that the Commission might consider as one element of evaluation the applicant's flagrant disregard and violation of various U.S. government regulations designed for public protection. In National Broadcasting Company v. United States, 319 U.S. 190, 222, the Supreme Court stated that the Commission is permitted to exercise its judgment as to whether violation of the antitrust laws disqualify an applicant from operating a station in the public interest; and "... might infer from the fact that the applicant had in the past tried to monopolize radio, or had engaged in unfair methods of competition, that the disposition so manifested would continue and that if it did it would make him an unfit licensee." It must be concluded, therefore, that the Commission's authority to consider violation of Federal laws, other than the Communications Act of 1934, in evaluating applicants for radio facilities is well established and that a positive duty is imposed upon it to exercise authority.

As the Courts have held, by exercising such authority the Commission is not encroaching upon the administrative and enforcement jurisdictions of other governmental agencies or the courts. Thus, in the above-mentioned National Broadcasting Company case the Commission pointed out to the Court that in adopting the network regulations it was not attempting to apply the antitrust laws as such, but was concerned only with practices violative of the antitrust laws to the
BBRC's New TCB-14R Gives You
More Monitor In Less Space

Ball Brothers Research Corporation has designed a color broadcast monitor to fit EIA rack space of 10 1/2 inches high by 19 inches wide and 18 inches deep. It has a 14-inch display. Its minimum vertical rack space greatly increases critical viewing and placement possibilities. Another thing you'll appreciate: all operating controls are front-accessible on an extendible PC card. More? Solid-state; high performance; I and Q demodulation. And more. Write for our data sheet on the TCB-14R. There's nothing else like it. Yet.
extent that they "had a hearing upon the matters which were entrusted to the Commission." The Supreme Court expressed its approval of this interpretation. In the Mester case, supra, the Commission was not attempting to impose penalties for violations of laws administered by the Federal Trade Commission. However, it considered such violations along with other conduct pertinent to a determination whether the applicant had the qualifications to operate a broadcast station as required by the Communications Act.

A very recent Commission decision (March 27, 1968) concerned the application for assignment of license of station WFMT, Chicago, Illinois, from Gale Broadcasting Co., Inc., to WGN Continental FM Company (BALH-1039), a wholly owned subsidiary of a series of subsidiaries of a larger newspaper, The Tribune Company and owner of an a-m and TV station in the same market. Although this case is known in the industry because it instigated the proposed new rules limiting future a-m, fm and TV ownership in the same market to a single license (this subject to be discussed in a future article), the grant of the applicant is contingent upon the following language:

The Commission noted there is pending civil action against the Chicago Tribune-New York News Syndicate, Incorporated (wholly-owned by the Tribune Company) which furnishes comic strips, columns, and specialty and variety features to 1700 daily newspapers in the United States. Grant of the WFMT (fm) assignment application was made without prejudice to such further action as the Commission may deem appropriate as a result of

The contention has been made by many parties that no blanket policy should be adopted by the FCC which would absolutely disqualify applicants for radio facilities where they are found to have violated a federal law or which would attempt to specify the exact weight or significance to be given by the Commission to such violations. Such evaluations should be made only on a case-to-case basis in the light of the specific facts involved in and related to the violation, and the Commission has agreed with this argument. As mentioned above, the Commission must be satisfied that an applicant has the requisite qualifications to assure that public interest will be served by a grant of his applicant. This determination cannot be made on the basis of isolated facts but should include a careful, critical analysis of all pertinent conduct of the applicant. It believes that if an applicant is or has been involved in unlawful practices, an analysis of the substance of these practices must be made to determine their relevance and weight as regards the ability of the applicant to use the requested authorization in the public interest. It does not believe that the outcome of this determination should be prejudged by the adoption of any general rule forbidding any grant in all cases where unlawful conduct of any kind or degree can be shown. Nor does it believe that any rule could adequately prescribe what type of conduct may be considered of such

---

Oxide dust is more costly than gold dust... but who wants it?

Loose oxide shortens the life of magnetic tape heads. It degrades tape. And it breeds still more dust as it is ground into fast-running tape.

MS-200 Magnetic Tape Head Cleaner sprays oxide dust away. MS-200 is recommended by leading tape head manufacturers, prescribed by a major broadcasting network, used at hundreds of data processing installations. So, don’t lose your head; use MS-200 Magnetic Tape Head Cleaner.

Price: $2.75/can in cartons of 12 16-oz. cans.
Trial order: 4 cans @ $3.60/can.
Prices f. o. b. Los Angeles, Chicago or Danbury, Conn.

miller-stephenson chemical co., inc.
Route 7, Danbury, Conn 06813

U. S. and foreign patents pending.

Circle 12 on Reader Service Card
For the moment, forget the price. We'll get back to that. Consider the product. The IVC-100 NTSC-type Color Television Camera. It's a full-featured studio camera that makes live color television practical in education, medicine, industrial training, CATV, and advertising. The IVC-100 is virtually as easy to operate and as inexpensive to maintain as standard monochrome cameras. It offers features normally found in cameras costing many times more. It has three vidicon tubes, integral view-finder, sync generator and encoder. Available now, the IVC-100 is by far the lowest priced professional-quality color camera on the market.

Now, look again at the price. $12,600 complete. Nothing like it in the industry. Turn the page for details.
IVC-100
Color Television Camera
NTSC-type color
for $12,600.

Designed for complete flexibility, the IVC-100 can be used as a self-contained color camera or with external components.

Check these options:

**Easy, Direct, Economical Method**
Using the built-in closed circuit sync generator and encoder, the IVC-100 requires only "two wires" (power in, video out) to produce NTSC-type pictures for distribution to monitors or for input to IVC-800 Video Recorder or other VTR. Internal EIA sync generator is optional.

**For Use with Systems Components**
An optional CCTV Junction Box permits complete intercom system and allows remote operation of the recorder through a control panel on the camera. For more sophisticated systems a Camera Remote Control Panel and Studio Junction Box are offered that provide for control room operation of multiple cameras and for use of external encoder and sync generator.

**RGB System**
RGB outputs are provided which bypass the encoder and feed separate red, green, blue and sync signals from the camera directly to the RGB-type monitors, providing superior color pictures.

The IVC-100 is available in a film chain version.

Basic camera is supplied complete with image tubes; 6:1 zoom lens; focus, zoom, and iris controls extended to rear of camera; and 25 foot power and video cable.

All solid state circuits (except image tubes and nuvistor preamplifiers).

Sync sweep panel opens 90 degrees allowing all registration controls to face operator, has fewer internal adjustment controls than any other professional quality color television camera.

Viewfinder with switcher permits viewing of red, green, blue or luminance signal.

Second tally light at viewfinder for operator convenience.

Electronically regulated supply voltages assure excellent stability.

Extremely stable sweep circuits eliminate registration problems.

All video outputs source-terminated.

Minimum hueshift across frame and minimum sensitivity to color shift with polarization.

Camera measures 10" W x 12" H x 28" L, weighs 67 pounds.
a nature that in all cases it would be contrary to the public interest to grant a license.

While the Commission has determined that no blanket policy should be enunciated, in view of the apparent confusion which has existed with respect to the subject, and the concern expressed by those interests that have been or may be affected in the future, the Commission has set forth what it believes is the correct approach for properly determining on a case-to-case basis the weight to be given violations of State or Federal law other than the Communications Act. By so doing, the Commission has not instituted a "trick substitute" for the exercise of administrative discretion. There is no easy formula or slide rule which can be used to give the answer to every such case that comes before it. However, as discussed in the following paragraphs, the FCC has stated a general policy or philosophy that it employs.

Commission Criteria Analyzed

Many have argued that the violation of a U.S. or State law raises no presumption adverse to an applicant. With this point of view, the Commission disagrees. Violations of Federal laws, whether deliberate or inadvertent, raise sufficient question regarding character to merit further examination. While this question as to character may be overcome by countervailing circumstances, nevertheless, in every case, the Commission must view with concern the unlawful conduct of any applicant who is seeking authority to operate broadcast facilities as a trustee for the public. This is not to say that a single violation of a State or Federal law or even a number of them necessarily makes the offender ineligible for a grant. There may be facts which are in extenuation of the violation of law; or, there may be other favorable facts and considerations that outweigh the record of unlawful conduct and qualify the applicant to operate a station in the public interest. In all such cases, a matter of prime concern is whether the violation was committed inadvertently or willfully. Innocent violations are not as serious as deliberate ones.

Another matter of importance is whether the infraction of law is an isolated instance or whether there have been recurring offenses which establish a definite pattern of misbehavior. A single transgression of law, particularly if inadvertently committed, might raise little question with respect to qualifications; however, a continuing and callous disregard for laws may justify the conclusion that the applicant cannot be expected in the future to demonstrate a responsible attitude toward his obligations as a broadcast licensee. In this connection, the matter of time is important. There necessarily must be more concern with recent violations than with those which occurred in the remote past and have been followed by a long period of consistent adherence to law and exemplary conduct on the part of the applicant. Cases which must be viewed with most critical scrutiny are those where the applicant has been involved in violations over a long period of time or is presently engaged in illegal practices. In all such cases a strong presumption of ineligibility is raised and a heavy burden of proof is imposed on the applicant to show he is qualified to operate a broadcast station in the public interest.

new broadcast production capabilities...

☐ 12 microphones or line inputs using straight line attenuators.
☐ Four main output channels with illuminated VU meters.
☐ Illuminated pushbutton channel and cue switching.
☐ Four echo return controls.
☐ Talkback microphone.
☐ Four straight-line sub masters.
☐ A four ganged monitor control.
☐ Walnut cabinets and engraved panels.
☐ Complete six position equalization with echo send and cue on each input channel.
☐ A four ganged straight-line master attenuator.
☐ Mode switch for direct or tape output monitor.

with the ELECTRODYNE ACC-1204 Integrated Circuit Audio Control Console. Your station now can produce 4 track commercial or station spots with the quality of production and recording studios. In-house production allows you to diversify and use your creative people to the fullest. The ACC-1204 has been proven to be the most reliable and flexible console in its field.

For complete information and literature on the ACC-1204 as well as other Electrodyne Modular components contact your local representative or write:

Electrodyne Corporation
7315 Greenbush Avenue • North Hollywood • Calif. 91605
Phone: (213) 875-1900 • Cable Address: "Electrodyne"

Circle 14 on Reader Service Card
Brand-New, Enlarged Third Edition!

Anatomy of Local Radio-TV Copy

Guaranteed the most valuable thing a radio-TV writer can get his hands on...next to a typewriter!

- Brand New
- 16 Chapters
- Up-to-Date
- 96 Pages
- Only $5.95

Indispensable for:
- Radio-TV Writers
- Program Directors
- Sales Personnel
- Advertising Agencies
- Executives
- Disc Jockeys
- Producers
- Sales Directors
- Continuity Directors

Here it is—the new, enlarged, updated THIRD EDITION of a real industry classic—"Anatomy of Local Radio-TV Copy," by William A. Peck. This new edition contains over 40% new material, and is loaded with hundreds of ways to increase station billing with sales-proven copy.

Contents

What Does Madison Avenue Have That I Don't Have?
The Foundation: Building Ideas
The Cliche: To Think or Not to Think
Paint a Picture With Words Write Like You Talk: Be Natural
Repetition Builds Reputation Keep It Simple: Keep It Short: Put a Hook on Your Line
The Singer: Motivating the Straight Commercial
The Situation Commercial Writing Sale Copy
The Short Spot: Production Technique
The Video Side of the Picture
What Is a Commercial?

Leading station executives have said of this book:
"It sets the standard for radio-TV copy at the local level."
"I have seen the principles in this book literally turn to gold...should be required reading for every media sales and creative staff."
"I have personally profited many times from the ideas in this book. Only one of its kind."
"...one of the two or three really practical books on copywriting..., a practical, hard-hitting and immediately usable manual."

Yes, you and your clients both will profit from the ideas in this invaluable volume...ideas which have sold "impossible" prospects. Includes more than a hundred sample commercials for all types of accounts, making the book a veritable copy library!

Available for Immediate Shipment—Order "Anatomy of Local Radio-TV Copy" now at the introductory price of only $5.95...AT OUR RISK...FOR FREE 10-DAY EXAMINATION! Send no money! Simply fill in and mail the NO-RISK coupon below for this indispensable volume.

Publisher's Guarantee

Put the information in this book to work for you for 10 days. If it doesn't prove to be worth several times its cost, return it and we'll cancel invoice.

NO RISK COUPON—MAIL TODAY

Return, No Risk, for 10 Days

Tab Books, Blue Ridge Summit, Pa., 17214

Please send me...copies of "ANATOMY OF LOCAL RADIO-TV COPY" at the special introductory price of only $5.95.

I enclose $ .

Please invoice on 10-day FREE trial.

Name

Company

Address

City State Zip

Save postage by remitting with order BA-58

Circle 15 on Reader Service Card

May, 1968 — BM/E
This is a Varotal V?

If you own a Varotal V TV lens, we want you to keep it

It now can be adapted to fit most any camera you might plan to buy

Remember when you first bought a Rank Taylor Hobson Varotal V lens? A big move. And the longer you kept it, the more confident you became that it was a perfect move.

But now you'd like to get a new camera. One that matches your broadcast needs of today. One that has advanced features that cameras didn't have a few years ago.

The big question: Will your old friend, The Varotal V, fit the new camera?

Good news. It will. For, in addition to all monochrome cameras and RCA color cameras, our Varotal V can be modified to fit General Electric, Norelco, Sarkes-Tarzian and Marconi color cameras. Virtually all 2-tube, 3-tube and 4-tube color cameras. Image Orthicon, Plumbicon and Vidicon formats.

How did we make it fit all these cameras? With the new RTH Lens-Pak. In addition to saving you money you'd normally have to spend to buy a new lens, this new accessory actually makes your Varotal V work better. For instance, the focal length can be easily changed by fingertip control. And the Lens-Pak has a "ride the rails" device that allows close-up focusing to less than 1 inch.

After all, we'd hate to see a new camera come between you and your lens. If you'd like to know more about the Rank Taylor Hobson Lens-Pak, write or give us a call.

albion

rank taylor hobson

Sole Distributors: Albion Optical Co.,Inc.
260 N. Route 303, West Nyack, N.Y. 10994
(914) 358-4450 Telex 137442
Proceedings of the 1968 National Ass'n of Broadcasters Engineering Conference

Now—the Official Proceedings of the 1968 National Association of Broadcasters Engineering Conference—available in durable, bound format, typeset in uniform style. This complete transcript includes the technical papers presented at the Conference, plus a transcript of the FCC/Industry Panel Discussion. It is profusely illustrated, containing all the photos, slides and drawings presented in conjunction with the technical talks. The presentations, all by industry experts, constitute a virtual encyclopedia on the current state of all phases of radio-TV broadcast engineering.

All the very latest developments are covered. Here is a volume that belongs on the shelf of every station library—something every broadcast engineer should read... and re-read... several times. It's a wonderful source of ideas, and provides the answers to many troublesome problems. Invaluable as an aid in helping stations make important buying and engineering decisions.

If you attended the Conference, you'll want the Official Proceedings for those talks you missed... and as a permanent, written record of those you attended. If you missed the Conference, then you simply must have the Official Proceedings in order to keep pace with what's happening in the industry today and tomorrow.

The Proceedings is 224 pages, 8½ x 11", and is comb-bound for convenient use. The Special Prepublication Price of $7.95 prevails through July 31, 1968, thereafter the regular list price is $10.00. Three copies or more ordered at one time obtain a 10% discount.

LISTING OF CONTENTS

DUAL RELIABLE A-M TRANSMITTERS
J. C. Chabrandro, CCA Electronics Corp., Gloucester City, N.J.

DIGITAL FREQUENCY MONITORING FOR A-M TV
Gert Bowling, Collins Radio, Dallas, Texas.

AUTOMATIC LOGGING OF DIRECTIONAL ANTENNA PARAMETERS
J. Opden E. Plesholt, CBS Radio, New York, N.Y.

PERSIFLANED STEEL AND PAINT SPECIFICATION FOR TRANSMITTER ANTENNA TOWERS
Thomas F. Shaffer, American Zinc Institute, New York, N.Y.

A NEW MODULAR POLARIZED FM TRANSMITTING ANTENNA

ASPECTS OF AUDIO TESTING
Fred L. Zeiner, Jr. ABC, New York, N.Y.

OPTICAL MULTIPLYING THEORY AND PRACTICE

A NEW MODULAR PORTABLE LIGHTING SYSTEM
Charles L. Benjamin, CBS Television, New York, N.Y.

PROCESSING TECHNIQUES FOR CORRECTING VIDEO SIGNAL DEFECTS

NEW ADVANCES IN THE ART OF TELEVISION MEASURING TECHNIQUES
Dr. Herbert Mongold, Rohde & Schwarz, Passaic, N.J. (Presented by R. Feld, president)

COLOR VIDEO SWITCHING SYSTEMS
Robert Butner, NBC, New York, N.Y.

PLUMBICON BROADCAST COLOR TV EQUIPMENT

THE WAGA-TV FACILITY
Huber A. Bondy, WAGA-TV, Atlanta, Ga.

A NEW APPROACH TO TV COLOR CAMERA DESIGN
John Poole, Ampex Corp., Redwood City, Calif.; Max Berry, AEC, New York, N.Y.

NEW TV MEASUREMENT TECHNIQUES USING EXISTING STUDIO MONITORING EQUIPMENT

REVIEWS OF VHI-TV REMOTE CONTROL TECHNIQUES

FCC/INDUSTRY PANEL
Moderator: Malcolm M. Burleson, Metromedia, Inc., Washington, D.C.

PUBLISHER'S GUARANTEE

For the information in this book to work for you for 10 days If it doesn't prove to be worth several times its cost, return it and we'll cancel Invoice.

NO RISK COUPON MAIL TODAY

TAB Books, Blue Ridge Summit, Pa. 17314

Please send me copies of '68 PROCEEDINGS OF NAB ENGINEERING CONFERENCE at the prepublication price of only $7.95, (10% discount on 3 copies or more)

I enclose $ __________

☐ Please invoice on 10-day FREE Trial Name ___________________________ Company ___________________________

Address __________________________________________ City __________________________ State Zip__________________________

SAVE POSTAGE by paying with order. BNSB

Circle 17 on Reader Service Card

May, 1968 — BM/E
SPARTA'S new look is here!

A-20 8 CHANNEL MASTER CONTROL CONSOLE
Advanced transistorized design
- Self contained power supply
- Monitor & cue amplifiers
- Accommodates 22 separate inputs.

MULTI CARTRIDGE SYSTEM
Each deck module is independent from the others with separate direct drive/capstan drive transport • Monaural and stereo models. • 19" rack or custom cabinet mounting.

A-15 CHANNEL CONSOLE
Modestly priced, but offers a wide range of features usually found only in larger consoles • Speaker muting • Self contained monitor/cue speaker system • 14 audio inputs

300C SERIES CARTRIDGE SYSTEM
Solid state plug-in electronics • Super silent operation
- Continuous duty rated
- Rack or custom cabinet mounting.

A5-30 STEREO 5 CHANNEL CONSOLE
Ultra flexible • Completely transistorized 5 channel • 9 stereo inputs incl. mic. turntable & aux. sources. All channel cue system.

800C SERIES CARTRIDGE SYSTEM
Ultra modern design with advanced transistorized circuitry • Direct motor/capstan drive transport • Plays any size endless loop NAB tape cartridge.

CD-15 CARTRIDGE TIME DELAY UNIT
Unique device for censorship of live programming • Delays 3 sec. to 31 minutes • Also produces "echo" and reverberation effects.

TURNTABLES
Heavy duty professional quality • Positive 3 speed lever control. 12" & 16" models • Choice of motors • Instant acceleration.

This is only a glimpse of SPARTA'S NEW LOOK of professional audio equipment.

WRITE OR CALL NOW FOR OUR NEW PRODUCT BROCHURE.

SPARTA ELECTRONIC CORPORATION
5851 FLORIN-PERKINS ROAD SACRAMENTO, CALIFORNIA 95828
A DIVISION OF COMPUTER EQUIPMENT CORPORATION

Circle 18 on Reader Service Card
May, 1968 — BM/E

Circle 19 on Reader Service Card
When the record’s being broken,
the tape must not fail.

Some things don't happen twice. And if you don't record it the first time, you don't record it at all.

Take, for example, the Olympic games at Grenoble.

When a champion comes charging to the finish, he creates a dazzling moment that can never be recreated. Except on something like tape. Wouldn't it be a shame to miss it with tape that couldn't handle the video or the sound?

That's why we designed 78V as carefully as we did. It captures once-in-a-lifetime events the second they happen. Faithfully.

And that's why ABC chose 78V to tape the Winter Olympics at Grenoble. 78V, the high-chroma tape for critical applications. The non-fail tape.

(For information, write us: Memorex Park, Santa Clara, Calif. 95050.)

MEMOREX
Our **VG 2100**
special effects unit

gives you 32 wipes with 12 rewipes....plus outstanding design and performance

If station operators got together and designed their own special effects unit, it would probably look and perform like the VG 2100—with operator-oriented design features like these: color matting with single joystick control of color hue and saturation throughout the full NTSC spectrum; positioner unit designed to allow smooth motion in any direction, with audio oscillator to modulate any wipe pattern; exceptional frequency response and differential phase and gain specifications.

The VG 2100 easily integrates into any existing switching system. And the price is so low for a unit of this quality that it simply cannot be met by any other manufacturer. For complete technical information, write:

**CENTRAL DYNAMICS CORPORATION**
HEAD OFFICE: 903 Main St., Cambridge, Mass. 02139
Broadcasters in Ferment

It was a mixed bag at the 46th NAB Convention but five themes got most of the play:

- the immense social responsibility of broadcasters in these troubled times;
- the assaults on broadcasters from those who want more spectrum, more control, and part of the profit;
- ideas for growth in fm;
- ideas for growth in smaller markets of all media;
- new equipment ideas for smoother, more profitable operation with ever more competition.

BM/E's NAFMB and NAB Convention report is divided into five sections covering these themes.
1. Broadcasters Shape the Nation's Dialogue

The call to broadcasters to face up to the social issues of the day came from a surprise "keynote" address by President Lyndon B. Johnson. President Johnson declared "...the broadcast industry (has) enormous power — to clarify and confuse...." "Broadcasters shape the nation's dialogue," the President charged, and he expressed the hope the words and commentary provided by broadcasters would give real meaning to the issues of the day instead of distortion.

"By your standards of what is news, you can cultivate wisdom or you can nurture misleading passion," the President said. He called for a healing of the deep emotional division in the land, and asked that stories of quiet progress be aired along with the dramatic.

The President told broadcasters that they were the keepers of a trust and that the defense of the medium was the broadcasters' responsibility. NABers applauded when the President said the Government should not interfere in their role.

An hour later, NAB President Vincent T. Wasilewski, in his annual address to the convention, responded by asking for resumption of presidential debates in view of President Johnson's decision not to seek re-election. Wasilewski asked that Congress immediately suspend the equal time doctrine so that a broader dialogue among the major candidates might be possible. He also urged broadcasters to do more electronic journalism. "There is much more muscle than has been used," he said.

Although President Johnson made his appearance at the official Convention opening on Monday, he was not the first to stress the awesome responsibilities of broadcasters. At a pre-Convention breakfast seminar sponsored by Mark Century, Ltd, Broadcasting's President Fred Gray described the world as in ferment. "The four freedoms we proclaim are not simple," Gray said, "but complex." He declared that the mass media can change man and asked broadcasters to pay more attention to the needs of the community in a "judicious and responsible way." Gray also said that the plight of low income families cannot be ignored.

Fin broadcasters attending the NAFMB, held two days before NAB, were repeatedly advised to find a particular audience segment and then serve it well.

The final NAB session on Wednesday closed on a strong note of responsibility as news authorities shared their experiences with other fellow broadcasters. Commentator Edward P. Morgan, speaking last on the panel said, "Despite the fine efforts of the networks and independent stations we still dodge controversies." He cited oil-rich Oklahoma as "unable to afford carriage of NET's PBL broadcast on the one hand and unwilling to do so in any event since they were "too controversial." Morgan said he felt broadcasters were "largely to the right of center rather than in the center" to support the idea advanced by Matt Culligan, president of Mutual Broadcasting System, that the anthropological point of view should be presented to give perspective to current events.

Broadcasters are "the most sensitive barometer of public opinion...since you are the public," said S. Campbell Ritchie, president of the Canadian Association of Broadcasters. He called broadcasters a new breed of leaders that will "frighten educators, politicians, and other present leaders just as the clergy was frightened when the printing press came into being." Ritchie told broadcasters to use this sensitivity confidently and constructively in the interests of the broadcast community.

From a slightly different tack, Rev. John M. Calkin, S.J., of Fordham University, told educators their responsibility was to train "a discriminating and intelligent" television audience. Father Calkin said the media can't be much better than its audience. His remarks were made to the Association for Professional Broadcasting Educators meeting held prior to NAB. Had Ritchie and Father Calkin appeared on the same panel, the confrontation would have been symbolic of today's ferment. Ritchie's assumption was that audiences were "wonderfully wise and patient."

At the APBE meeting, NET's John White said news programs designed for various age groups would be prepared and shown during school hours to aid classroom learning. Violence on TV and creation of status symbols was criticized by Dr. John S. Silber, dean of the University of Texas' college of arts and sciences. "Instead," Dr. Silber said, "television should make us insatiable for learning new approaches in race relations, and for new ways to deal with Red China."

More Free Time From Broadcasters

Broadcasters were called upon by FCC Chairman Rosel H. Hyde to offer reduced rates to political candidates to permit them to obtain the fullest possible use of the broadcast medium in bringing issues before the public. He also urged broadcasters to make greater and more effective use of free time in political contests by consulting and cooperating with area working groups. "Broadcasters have the capacity to extend and broaden the community of interest to the individual," Hyde said. He urged broadcasters to take up the challenge of the report of the National Advisory Committee on Civil Disorders to cover more adequately the causes and consequences of civil disorders and underlying problems.

Stockton Helffich, Code Authority director of the National Association of Broadcasters, told radio and television broadcasters, "We can organize ourselves so that our self-regulatory effort offers a better service to the audience, to the advertiser and to the broadcast industry." He said the audience is best served "by program standards which are expansive rather than inhibiting; which give latitude to the changing needs of our times."

The mass media was urged by Sam Zagoria, a member of the National Labor Relations Board, to broaden its coverage of labor news from items about unions and union leadership to include the day-to-day problems of working people. Noting that 95 percent of the people in ghetto areas have TV sets and average six hours a day watching them, Zagoria said, "If only a small percentage of this tremendous audience views a program, isn't this a marvelous opportunity to excite interest in how people make a living, how they cope with the problems of finding a job, learning skills, progressing and prospering in a workplace where constant change is inevitable?"

"Shouldn't there be," he continued, "reflection of the problem of the industrialist in training ghetto youth, the problems of the working wife or the 'moonlighting' father?"
2. Assaults Alarm Broadcasters

"We are facing a confluence of developments and pressures that could radically change our system (of broadcasting)," NAB President Vincent T. Wasilewski told those attending the Management luncheon, the first day. Threats include direct satellite-to-home broadcasting and common-carrier wire system.

"We cannot be nay-sayers accepting no change," Wasilewski said, "...but we must not allow the proven values of the past to be abandoned for the glittering possibilities of the future. Progress, yes—but not at any price."

Four fixed principles from which to evaluate alternatives were offered by the NAB president:
1. Broadcasting must be free of program controls by government or any organized group. We are part of the free press. We will accept no censorship. We will bow to no intimidations. Broadcast programming should be responsive to public desires, never to a determination by someone of what is good for the public.
2. Broadcasting must continue to be decentralized and multivoiced. Our present system assures that there will be strong, competitive broadcast entities of various kinds and sizes to serve public needs and tastes.
3. Broadcasting must continue to be... a free service available to all.
4. Broadcasting must combine local and national elements to provide full and balanced service.

Other threats to broadcasting enumerated by Wasilewski included the possible requirement to pay additional copyright fees to recording companies, musicians and actors; the FCC proposal to forbid the licensee of one station in a market from acquiring another—a-m, fm or TV; public broadcasting; CATV; American Bar Association curbs on broadcasting; and the FCC’s fairness doctrine.

The position taken by Wasilewski on these issues is:
- Satellite-to-home and a national wired system would reduce local programming, damaging, if not destroying, local stations.
- Fees to recording artists would be an unjustified third payment on top of recording fees and royalties.
- One station per market—unnecessary. Already ample competition. Evils can be handled on case-by-case basis.
- CATV—OK, if it delivers broadcasting services to underserved areas. No, if it displaces local programming, or becomes pay-TV.
- Public broadcasting—OK, if kept free of government control.
- Curbs on broadcasting—the ABA is attempting to isolate the people from a public process.
- Fairness doctrine—It smothers initiative and discourages debate. When it covers advertising, it is specious and capricious.

The threat of the "wired city" was underscored by John F. Dille, Jr., as chairman of NAB’s Future of Television Committee. Dille said the advocate of wired cities were powerful coalitions including those seeking more spectrum space for local mobile use, large CATV interests and intellectuals who sought multichannel capability as a means of getting more and allegedly better programming. The extra channels are also offered as a means for shopping by wire. Although the advocates of the wired city approach admit the cost of such wiring could run $60 per home, they claim saving by eliminating receiving antennas, high-power transmitters, towers, etc., and by reducing the cost of tuners of TV sets. Dille reported NAB will form a war chest to battle for the great free system developed by broadcasters.

3. Fm: Radio with a Quality Sound and a Quality Audience

Fm broadcasters no longer hide behind Brahms and Beethoven as their contribution to program variety and diversification. The group known as SPPFMCWM, The Society for the Preservation and Promotion of Frequency Modulation Come What May, is dying.2 To cover up the past is today’s mood.

Suddenly fm is radio, but quality radio. Its audience is rivaling that of a-m in some markets. Six hundred fm-ers are stereocasting but licensees are no longer stereotyped as eggheads or longhairs. In fact, last year’s RADAR, Radio All Dimension Audience Research, and BRI Brand Rating Index, research slays a number of myths, which if they ever were true, were true of old fm only.

Joshua J. Mayberry, director of Research, ABC Network, who presented the data, declared that for the first time fm has a foundation of acceptable research upon which

1. Congressman Lionel Van Deerling.
2. Edwin D. Gimzek.
it can attract national, regional and local advertisers.

RADAR's studies, conservative because they are a year old, showed the following:

For an average quarter hour, 2,148,000 adults 18+ listened to FM (total population 125,100,000). AM's coverage for a quarter hour was 14,464,000. FM had 15 percent of AM's audience. The average FM listener spends seven hours and 20 minutes weekly with the medium.

In terms of cume (i.e., unduplicated) listening, 32-million different adults listen to FM during a seven-day 6 A.M. to 12 midnight period. Total radio listeners (AM and FM) number 118-million. Unduplicated radio audience is 27 percent as great as unduplicated audience of all radio.

A surprise over prime time was turned up by the research. The 9 P.M. to 4 P.M. quarter hours with 2.5-million listeners rates higher than the evening periods which average 1.5-million. The morning and afternoon drive periods are strong, 2.3-million and 2.4-million respectively. Nighttime FM does make more inroads on AM-listenership—21 percent of all adults, 25 percent 18 to 49 group.

The audience distribution of adults listening to FM, on a percentage basis, is higher than all of total radio. Mayberry reports that for the 18+ age group FM is 7 percent above average in its pull compared to 2 percent total radio. Specifically for the 18 to 49 adult group, FM is 17 percent above norm, while total radio is 7 percent. Conclusion: FM audience is more adult.

Product usage data disclosed by Mayberry showed more revealing characteristics about the FM audience.

Toilet soap: 13 percent more FM homemakers fall in a high usage category (7 or more bars per month) than the average. Conclusion: FM homes have large families.

Soft drinks: 26 percent more FM homemakers drink one or more glasses of diet drinks and 7 percent more of regular soft drinks than the average. Conclusion: FM homemakers indulge in the "good life."

Wine: FM men are 44 percent higher than the average in use of domestic wine and 80 percent higher in consumption of foreign wines. Conclusion: FM listeners pay a premium for products they want.

Automobiles: More FM listeners are above average in ownership of high-priced cars—48 percent. As the price gets lower, the FM listener gets closer to the average and falls below average for compacts.

Cars in household: FM men are 28 percent above average in ownership of two or more cars. On nonownership they fall 52 percent below the national average. They also buy new cars rather than used cars and drive considerably more miles.

Conclusion: FM listeners are on gasoline consumption of 30 or more (19 percent) or 40 or more (23 percent) gallons a month.

Other conclusions: FM households use more soap for baby clothes, more soap for automatic dishwashers, more soap for fine fabrics; possess more credit cards; take more air trips; more trips to foreign countries; do more car renting. Mayberry said he expected product usage data and RADAR to become available on a continuing syndicated basis.

Armed with these data as well as local station research, how can FM-ers sell more? The NAFMB convention agenda was devoted to just that. Here are some of the answers:

FCC Commissioners Boost FM

FCC Commissioner, Lee Loewingr, predicted FM radio will emerge as a separate and independent broadcast service because of its "efficiency, audio superiority and dependability of transmission," in a talk given before members of the National Association of FM Broadcasters March 30 at the Palmer House.

Loewingr said that in Europe FM is the predominant radio medium. In Italy, he said there are now 1500 FM stations compared to 750 AM stations. Germany's entire population is covered by FM stations with a total of 166 FM stations and 77 AM stations. France has 146 FM stations and 104 AM stations.

Loewingr said that although there were still many frequency assignments available to FM stations, there are still only about 500 FM stations operating outside large metropolitan areas.

He predicted that a new FCC ruling will allow FM stations to be completely automated.

Speaking a day later at the NAB Convention, Commissioner Robert E. Lee reminded FM broadcasters that while their medium is radio, it is different from AM and "it is this difference that makes it worthwhile."

Selling

Today's media selection is changing from one of mass reach to one that dictates which plan will give the least waste, thereby securing the best return at the best price. RADAR's surprise over prime time, though, while an indicator of the potential of FM, is not a warning of its possible eclipse in time.

For one thing, the concept of the "selective audience" is not new. AM radio has been attracting the "right" people for years. Also, the smallest medium radio stations can be heard in the smallest city market.

Paul Martin, Triangle Stations

Programming

Maintain consistency in programming and control it...image...keep it simple and straightforward and uniqueness—he different, but if you are copying, do it better. Interest—you must maintain an air of enthusiasm on
the part of your staff . . . Common sense—your program must appeal to your audience's taste; programming should not be done for your staff's pleasure.—Marlin Taylor, Kaiser FM stations WJIB, Boston; WFOG, San Francisco

For effective promotion through your own station try Radio 97 (rather than 97 MHz) as an id . . . cross promote programs . . . build consistent station image and plan promotions well ahead of time . . . promote group tours—John T. Lawrence, Taft Broadcasting, Cincinnati, Ohio.

To close your identity gap select the segment of the population that is right for your interests, character and objectives and then shape everything about the station to this segment . . . If there is room in your community, identify with a group such as the educated and affluent laboring segment; women of responsibility and intelligence; youth; libertarian-oriented adults who feel the hopes for the future is maximum permissiveness or discipline-oriented adults who feel we must regain recognition of individual responsibilities if we are to avoid destruction of our civilization . . . Work constantly to associate the station in the minds of the public and the advertising fraternity with your specific purpose and specific identity . . . you attracted people who are not satisfied with mediocrity and air pollution . . . know and sense how your audience feels and will react to whatever you do.—Philip Leisy, The Philip Leisy Corp.

4. Ideas for Small Market Broadcasters

Panelist Gary Gielow, KPEN, San Francisco, appearing on the Operation Go presentation during the FM day on Sunday, reverently thanked his audience before he addressed them. Gielow said he comes to NAB to carry back new ideas and new concepts as gleaned from speakers and attendees. This year, Gielow said, he was grateful for the opportunity to share some of his ideas. On a similar note, Robert E. Thomas, WJAG, Norfolk, Nebraska, on the small market radio panel, asked for a selective exchange among noncompetitors of program, promotional and innovative operational ideas. What follows are a collection of ideas as gleaned from the many presentations.

Idea: Invest in people. That's Gielow's answer to success. As an FM only station since 1957, KPEN has done well. It's fifth in ARB ratings (in a field of 40) and is number one on Sunday. KPEN was first to go stereo, first to use dual polarization and first to show in rating standings. When you're competitive with well-staffed a-m's, you don't skimp on people, (salesman, talent and engineers) and you put out a quality signal, Gielow said. KPEN programs middle-of-the-road with three interruptions per hour. News is given every hour on the hour. Not enough time can be spent on programming in Gielow's book, and engineers who can get the best out of the system are a necessity. To do otherwise is to discourage the listeners. Since you've created the world's greatest radio station, promote it, said Gielow.

Idea: To improve ratings, Marshall Pengra, KLTV (TV), Tyler, Texas, urged secondary market broadcasters to "involve your viewers with as many special programs as possible, including weather, news, interviews, city commission discussions" and to use "as many local names and places as possible" in news broadcasts. Pengra said that reading listeners' letters, both complimentary and uncomplimentary, over the air, is a good way to achieve community involvement. And he urged that stations editorialize.

Idea: To meet FCC requirements that licensees know community needs and provide programming to meet these needs, Thomas L. Young, KWWL-TV, Waterloo, Iowa, holds public service clinics. Clinics are held in both Waterloo and surrounding towns in which civic and community leaders are given information on how to supply material for local news items and public service announcements. In return, those registering for these clinics provide suggestions and ideas to the station.

Idea: If you're doing what is good for the community, you can't go too far wrong" even if you have opposition. This is the view of Allan Land, WHZ-TV, Zanesville, Ohio, who told how his station editorially supported a city income tax over considerable opposition. The tax was approved in a referendum. In secondary market TV stations, he continued, the personnel involved in editorializing should be the "top people."

Idea: To get regional and national advertisers to recognize secondary markets, competing stations should work together, advised Ray Johnson, KMED-TV, Medford, Oregon. The objective is to acquaint advertisers with the market because advertisers must become interested in the market before considering media within it. Johnson said an annual three-day food fair as a community event was a way to build advertising revenue.

Idea: Build a separate identity for your FM station if you own both an a-m and FM outlet, advised Charles F. Boman of WLJM (FM) and WJBY (a-m). In announcing a new FM station, emphasize that your community is going to have its fourth or fifth (or whatever number) radio station. Even though facilities are shared, the stations keep identities separate—different addresses (side street address is used for one), different statements, different microphones, even if you send only one tape recorder to an event. Although Boman uses a common sales force, no one salesman is able to call on the same account for both stations.

Idea: The small market radio broadcaster should get together with a local CATV system. "The results can spill profits all over the place!" said John W. Jacobs, president of WOPEN, Gainesville, Georgia. It requires little imagination and less expense to have any one of your news programs televised, he said, "merely by putting an inexpensive closed-circuit camera in front of the radio personality doing the news." Any interview, sports commentary or talk show can similarly be transposed live to TV.

By simulcasting, Mr. Jacobs said, a broadcaster gets more revenue for the same program. Also, he added, a radio broadcaster associated with local television takes on new prestige in his community.

Idea: Do more commercials in stereo, urged Harold I. Tanner, WLDI, Detroit. FCC Commissioner
Automation,
Yes
But When

Automatic transmitters for fm broadcasters have been possibilities for years. Why doesn't the FCC permit them? Harold L. Kassens of the FCC's Broadcast Facilities Div. says other parts of the Communications Act have to be amended first, including requirements for licensed operators, standards to guarantee proper operation and modifications that would be necessary on existing transmitters. That is why the current inquiry is out in industry. Later, in an industry-FCC panel discussion, industry spokesmen urged the FCC to speed up the process of rule making.*

The NAB's Secondary Market Television Committee, through NAB, will petition the FCC to authorize remote control of uhf-TV transmitters. Remote control tests on uhf-TV reported by Richard Anderson, KTTV, Los Angeles, William Kelly, WNEW-TV New York and Wallace Wurz, KMBC-TV, Kansas City, Mo., were all successful.

Automation from "front door to antenna" was predicted by George H. Brown, RCA executive vice president of R&D, during an engineering luncheon address.

Automation will encompass everything "not just programming but rather the whole process—from time availabilities, to scheduling, to programming, to billing, to preparation of FCC forms, yearly statements and tax returns—will be carried on continuously from a single computer," he said.

Such a computer could be interrogated by the station rep to determine availabilities, by the network for clearances, by group station management for daily or hourly reports," Mr. Brown said.

Brown said use of integrated circuits will eventually reduce circuit costs so that all kinds of automatic self compensating circuits will be practical. The miniature ICs will reduce equipment size limited only by the size of controls needed for human operation.

As a prelude to automatic a-m operation, Ogden Prestholt of CBS described an automatic antenna monitoring system which logs phase, loop currents and current ratios of an antenna's various elements.

Automatic radio programming is here and successful according to panelists appearing in the Radio Automatic Workshop, Automation, said N. Elmo Franklin of Gates Radio, is an aid to more efficient operation. It's no panacea for poor programming and incompetent personnel. Ronald Crider, WMJR, Ft. Lauderdale, Florida, said it was less expensive to automate than to hire a full time staff to operate a 24-hour station.

Danny Coulthurst of IGM and Paul C. Schafer of Schafer Electronics indicated that what will be designed is what broadcasters want. Schafer sees tremendous progress toward total automation in the near future.

Panelists of the TV Automation Workshop could report less progress. Broadcasters Dean B. Moore, CBS-TV, New York; Ted Sorrels, WMAL-TV, Washington, D.C. and Jim Wulfman, WJMJ-TV, Milwaukee, described their operations which permitted presetting of program events and automatic or semiautomatic signal switching between events. (See BM/E September 1967 for similar examples of operation.) Kenneth P. Davies of Central Dynamics reported that a successful broadcaster in Australia used automation for traffic control, automatic program log preparation, pre-event programming, actual switching and billing. (A forerunner of such a system for a U.S. station was displayed on the exhibit floor by Central Dynamics.)

A building block approach to automation is being taken by AMP, Inc., said B. van Benthem, so that a station can start and then add pieces later. A general purpose computer can fit into this concept, he said. Jim Moneyhun, Sarkes Tarzian, said automation should be an integral part of station control and not an appendage. People are an integral part of the operation. Automation should reduce psychological stress on operators and improve the on-air look.

*See Editorial on broadcasters' role in changing rules for more automatic operations.
5. Wrapup: NAB Exhibits

President Johnson's surprise appearance at the NAB, if anything, heightened the already heady excitement at the show. On opening day alone (Sunday), Ampex officials who had worried about their "bad" location in the Normandie Lounge ticked off an incredible 8700 visitors to their display area. And small wonder, for this was the grandest NAB ever with rampant speculation about new technological trends typified by engineering prototypes on the show floor.

Miniaturization and mobility were keynote features of much equipment. Transistorization was almost passé being foreshadowed by integrated circuits making their debut in some gear.

Show stoppers included:
- Two-tube color cameras from Ampex which used only two Plumbicon imaging tubes for all three primaries and luminence channel.
- A developmental ultraminiature (6½ lb) hand-held three-tube color camera from Philips and the promise of one from CBS labs.
- A three-tube Plumbicon camera, the TK44A from RCA.
- A $50,000 three-tube Plumbicon camera from Shibaden.
- A large screen color TV projection system from General Electric using a...
Technical Papers/Ideas

This report does not include condensation of papers given at the technical sessions since they are currently available in "Highlights" published by NAB and will later be available as full texts. Ideas for action now include:

- use of video standard level generator and other advanced instruments (Rohde and Schwarz);
- purchase of one film island multiplexer with 4 inputs and two color outputs as an alternate for two film islands (GE);
- purchase of new video processor which corrects or minimizes 10 common distortions such as hum, glitches, vertical rate tilt, noise, frequency response, and pulse timing and width (paper given by Baum of RCA; other sources available);
- use of dual or circular polarized fm transmitter antenna (paper by Onnigian of Jampro; other sources available);
- use of proper primers for painting galvanized steel towers (American Zinc Institute);
- use of two identical half-power a-m transmitters rather than a main transmitter and an emergency standby (CCA Electronics).

Special Reader Service for NAB

You can receive more information on any of the products described in this NAB roundup by circling the appropriate numbers on the Reader Service card. The numbers are the ones in parenthesis at paragraph ends in the text. Where several companies are mentioned, the numbers are in the order of the firms within the text.

Latest development in station automation is computer-controlled video switching. Standouts in this genre were (1 & 2) AMP, Inc.'s brand-new system, (3 & 4) Central Dynamics' switcher control and computer tape memory, and (5) the latest Sarkes Tarzian entry.

new light-valve (fluid-layer) system.

- An electron beam film recorder from 3M.
- A videotape animation system for preparing commercials and other short takes from Ampex.
- A slow-motion/stop action disc recorder from Visual.
- New methods of controlling automated radio programmers—a computer (Shafer), punched card (IGM), metal control cell, MacTar.
- A complete automated radio station from Gates.
- Computer-controlled video switching equipment from AMP, Central Dynamics and Sarkes-Tarzian.

Color cameras again appeared to dominate the show mainly because of the race to show the smallest portable. Ampex captured top attention on Sunday by revealing that only two tubes were necessary. CHS Labs opened with a photo of a miniature three-tube camera on Sunday and put out a wooden mockup on Monday. Philips then became the center of attraction by unveiling on Tuesday its 6½ pounder using experimental ¾ in. Plumbicons.

Gains in automated video equipment vied for top attention as working demonstrations took place at exhibits of Sarkes Tarzian, Philips, (Telecontrol switcher), AMP and Central Dynamics.

Color Cameras: Everything Else Was Secondary

The Plumbicon tube has emerged as the predominant imaging device for virtually all new color cameras, with some companies half-heartedly hiding this fact behind the mask of "lead-oxide mesh vidicons."

In unveiling its three-tube (lead-oxide vidicon) TK-44A camera, as successor to the four-tube TK-44 shown last year, RCA demonstrated what they termed "the industry's most advanced" full-size color camera. The 98-pound (less lens) star performer alternated with improved versions of the TK-42 in the RCA color theater as local lovelies posed for camera quality tests, pom-tommes and fashion shows. There was no lack of spectator interest in this or any of the other color studios that were sprinkled liberally over the Convention floor. The TK-44A has been slimmed down by using integrated circuits extensively, plus a simplified optical system with a single dichroic prism instead of the usual complex mirror/filter arrangement. The new camera also features a special "comb" filter for high-frequency picture amplification without increasing video noise levels. (205)

The four-tube General Electric PE-350 camera offers chroma enhancement, new preamplifier lineup for better S/N ratio, and improved video processing amplifiers for better operating stability. GE also introduced a retrofit outfit for updating their PE-250 cameras to equal the new unit's performance. GE's color theater featured—in addition to the usual bevy of gorgeous gals...
a frowsy, almost middle-age housewife-type character who marveled at the "wonderful reception" on the Fernseh (54000) color monitor and wanted to buy one for her living room. The theater's monitors were handled by a full-scale video switching control complex, which also piped in a signal from a remote-controlled color camera on the Conrad Hilton's roof. (206)

Sarkes Tarzian—prey to troubles getting good color pictures in previous years—surprised many visitors with their color cameras this time. Their cameramen, with an almost cavalier nonchalance, focused on very difficult reds to demonstrate the S.T. cameras' superiority. (207)

Pretty girls were also on abundant display in the main-floor Continental Room where the Philips studio stage featured a comedy trio as co-stars to their Plumbicon cameras. Using three handmade super-small Plumbicons (3/4 in. diameter x 5 in. long), an experimental featherweight camera that registered an incredible 6 1/2 pounds, was easily handled by one of the very pretty models. Color rendering was exceptional. The major part of the camera's electronics is stuffed into a junior-sized nine-pound backpack. With weights like this, Philips designers could easily afford to add a compartment for sandwiches and a vacuum flask of coffee. Also on display at the Philips theater were their standard three-plumbicon studio and portable cameras, equipped with new extended-red-sensitivity pick-ups. (208)

The two new Ampex entries—the BC-100 hand-held portable and the BC-200 studio version of the 100, which both use just two Plumbicon tubes for total color imaging, attracted plenty of attention. The studio model uses a lightweight camera cable which permits flexibility and freedom of camera movement. The camera's small size and weight are made possible by the double Plumbicon design along with widespread use of integrated circuits in the camera head. Some of the camera's electronics have been moved to the operator's backpack, while additional electronics may be located at the control or processing equipment location. Ampex engineers describe the camera's two-tube operation as "simul-sequential," with the luminance signal produced simultaneously while the three color primaries are matrixed sequentially. A special processing circuit produces a standard NTSC color output. (209)

Triple Plumbicons starred in Shibaden's new PMZ12C-3 camera. Its compact package size is attributed to a mirror/prism system that lines up all three Plumbicons in the same direction. Camera electronics include integrated

Typical control room console set up to show off RCA's new cartridge tape players and audio console, is sampled by visiting deejay.

Radio automation gear showed up with some unusual ideas this year. These included (1) Schaefer's computer-controlled system and logger; (2) Macart's ventilated deck of metal cards for control functions; (3) a complete package from Gates with cartridge carousels, vertical cartridge picker and automatic logger; (4) Disen's dialable random access selector.
Left and above in order: Video switching and special effects equipment—set up in "try it yourself" displays—were show-pieces for new sophistication and human engineering. Ball Brothers Research offered an ultra-compact special effects system that occupies practically no room at all; new from Vital was the VIX-108 high-performance switcher with integrated circuits; plug-in cards custom-tailor Alma control system and allow room for expansion; Grass Valley Group also featured modular construction in their 1400 series switcher/generator; visitor participation was invited in GE's switcher display/control setup; Richmond Hill (Riker) showed its switching and special-effects gear and invited visitors to try it out; combination panel by Ward provides effect preview and a wide range of switch-selected inputs.

Top to Bottom: Lighting equipment on exhibit: Berkey-Colorran, with a wide selection of light sources; Kliegl's all-new lighting control panel; Mole-Richardson's line including quartz focusable spots; Century's Fresnel quartz lights; Sylvania's tungsten-halogen lamps and pocket lighting guides distributed by blonde harem belle.
Top to bottom: Film and slide equipment’s growing sophistication was evident in: Bauer (Allied Impex) automatic 16mm telecine projector; Listec’s TC-501D Hokushin telecine projector; New 2X2 Selectroslide multiplexing projector by Spindler & Saupe.

Top to bottom: “Sold” signs blossomed on such equipment as: Filmline’s FE15 news-film processor; CCA’s 1-kW a-m transmitter; Houston Fearless color film processor; Grass Valley Group’s video switcher.

Top: Shibaden’s 3-tube color camera and some local scenery. Middle and below: Tape Editing Programmer by RCA has guts housed in compact slide-out drawer, uses 250 flat-pack integrated circuits.
circuits and a red-correction circuit that compensates for any poor sensitivity to low-frequency reds. (210)

Another Japanese company, Nippon Columbia, released details on a frankly incredible system for color TV, using a single-vidicon camera. While this camera wasn't on display, technical information available indicated that engineering prototypes may create quite a stir in the TV industry when they're ready to be demonstrated. (211)

Also on hand was a new rf package from Microwave Associates, designed for wireless operation of hand-held portable color cameras. Initially designed around the Ampex BC-100, the microwave link weighs 15 pounds, and can be added to the backpack of most portable color cameras. Called the MA-85PV, the rf packs will debut on Ampex cameras at this year's presidential nominating conventions. (212)

A hand-held wireless color camera by CBS Laboratories was present at the Convention in spirit only. CBS showed a photo and a wooden model of an engineering prototype of their "MiniCam" three-Plumbicon camera. According to CBS, the camera provides studio quality performance, and all camera functions can be digitally controlled. Using digital control and the wireless rf package, a single base station can operate up to six such cameras. The wireless version has a battery life of two hours and can also work up to a mile from the base equipment in its wired mode with 1/4-inch-diameter RG-59/U coaxial cable. (213)

Videotape Equipment: Portables and Discs Glitter

Quad-head studio recorders had to take a back seat to more sophisticated and special-purpose video recording equipment at this year's NAB. Oh they were there, all right—the high-band studio quads from RCA (the updated TR-70A and the all-new TR-50) and Ampex (the VR-2000 workhorse)—and they were better than ever with crisp, "near-perfect" color picture rendering. But sprinkled through the exhibits were more innocuous and more startling VTRs: high-band color in battery portables, helical units with broadcast quality, and several new editing systems.

RCA's new Tape Editing Programmer uses selective cueing so the operator can preselect splicing points, preview the splices and readjust the splice points until the edited version is satisfactory. The programmer includes 250 flat-pack integrated circuits and a maze of wiring. (214)

A highly versatile editing system was demonstrated by EECO (Electronic Engineering Co. of California) which uses any two compatible VTRs. A pair of Sony helical machines were used in the booth setup, but the editor works equally well with full-size studio quad machines. The EECO editor accepts digital indices to splice points, cueing the videotape appropriately. The editing is electronic—from tape to tape—completely eliminating cut and splice operations. (215)

In the Normandie Lounge, Ampex added its Videodisc with its stop/slow motion capability to the editing function. Called the HS-200, it's especially good for doing animated commercials and creating other special effects, stop motion, single framing, and short takes up to 30-seconds' duration. Like many products exhibited, the disc editor was an engineering prototype brought to the show to test broadcaster's reactions and glean suggestions. (216)

Ampex's VR-3000 high-band battery-powered portable backpack VTR was reintroduced this year. One of the new features added even before the first delivery was made, is playback monitoring (in mono) to let field cameraman know he has something on the tape. Used with the hand-held monochrome BC-300 camera, the backpack VTR makes many cameraman walking "mobile vans." The recorder, camera combination weighs in at 70 pounds. Tapes can be replayed in color on any compatible quad machine. (217)

Another versatile video disc was shown by Visual Electronics, along with an enormous display of TV broadcast equipment. The new disc uses a rhodium flash-coated aluminum disc with upper and lower record/playback heads. The VM-90 system is self-contained and includes monitoring and operating controls in a single cabinet. (218)

There were two standout helical entries at the NAB. One was the Shibaden SV-727, primarily designed for CCTV, ETV and medical applications. It can record and play back NTSC or PAL color signals with either 50- or 60-field systems. A 10-inch reel holds enough one-inch wide tape for 90 minutes' running time. (219)

One nonexhibitor, International Video Corp., covered some floor space with their IVC-800 helical VTR, which is being marketed by RCA. Unlike most helicals, this unit has full-circle tape wrap around the head drum, eliminating once and for all the problem of lost scanning lines. Color reproduction on the IVC-800 was demonstrably excellent, working with a 4.2 MHz (±1 dB) video bandwidth and 1-inch-wide tape. (220)

Video Control Systems: A Button to Push the Buttons

Program automation is fast becoming a way of life in TV broadcast stations, and understandably so; there are just too many operations to perform and too many buttons to push in the wildering sequence for any one or two human operators to handle faultlessly.
Time pressures also can wreak havoc with the human and all-too-fallible control room engineer, and it's usually during a break with many short commercials that these errors are likely to crop up. Most automated programming equipment manufacturers can point to the savings in unneeded make-goods as a principal economic factor in going full automatic.

Of the new entries in the TV automation field, AMP, Inc.'s Automatic Broadcast Programmer is one of the most ambitious. At the heart of the system is an electronic digital computer that gulsps paper tape or punched card with programming instructions. These inputs are further simplified by using an "English-like" language very similar to ordinary broadcasting terminology. The computer, with its 8192-word memory, can control up to 150 sequential scenes, and logs each event on a teleprinter output as it occurs. (221)

Central Dynamics showed the key elements of new equipment that's destined to make wax (Scheneectady, N.Y.) the most automated TV station in the country. By using Tally Register-produced computer equipment, identical data inputs can prepare the program log and preset the video switcher for automatic operation. (222)

Designed as an add-on control unit for already existing systems, Telecontrol's "Unicon" can handle up to 100 video sources while coordinating them with the proper mixture of audio material. The Unicon can be loaded by the control room operator and can also be programmed automatically by punched tape, punched cards or computer. Complete system capacity is 30 events plus "next event" and it can be continuously loaded even while on the air. Special operations include preset, pre-roll, preview, on-air and end event. Actual control can be full automatic, full manual, or combinations of both, changeable at any time. The Philips stage performance was stored in the Unicon on Tuesday and the control operator watched the show with their feet on the console. (223)

APT 100 automation system, a system concept with all equipment integrated for a master control by Sarkes Tarzian demonstrated the ability to handle various video switching effects and many types of audio feed. This system includes delegation control, warnings to operator in event of devices not delegated to him, and gives the operator complete manual or complete automatic control as well as varying degrees of mixture of both. (224)

Video switchers and special effects controls were exhibited by a number of major suppliers. Such units are showing a tendency to become less complex and easier to operate. This is certainly the case with Ward's TS-200 series, which uses solid-state electronics, has interchangeable plug-in modules, an expandable switching matrix, and in the TS-206SE (intro) includes 29 different special effects. All functions can be previewed on a monitor, and transitions are a snap with two split-lever fader controls. (225)

Modular construction is a main feature in Grass Valley's 1400 series video switchers. Offered with several different circuit combination options, GVG's units can be custom-ordered with any of the firm's standard options. Special effects options include a dual mix/effects system, chroma key, positioner, insert coloring and contouring. (225)

Billed as a "custom" switcher, the Alma AS6500 series sports a modular plug-in card design that's excellent for customizing for user requirements or for "in situ" changes by station engineers. The vertical interval switcher that has up to 14 different wipes, video inserts, sync add, and an 18-station remote control panel option. Wipes can be reverse-keyed by flipping a switch, and the modular unit can be purchased with as few as three wipes for openers. Other options include a color synthesizer for mono and color matching effects, a nomadistic mixing module, and a sync card that can be deleted from any of these systems where composite video isn't needed. (226)

General Electric unveiled a video distribution switcher (model TS-301-A) with capacity expandable from 10 studio inputs and 6 outputs to 100 inputs and 96 outputs. Minor modifications will provide even more expansion if needed. The system relies on computer-type logic and makes extensive use of integrated circuits. (229)

Other new switchers: Vital's high performance unit (introduced at NAB), Dynair's remote fader switcher, Telescope's system switcher, and Richmond Hill's (Riker) expandable switcher.

### Video Processing: Color Adds Complexity

A variety of switches and multiplexers were shown by Cohu Electronics, including what they call the world's first video multiplexer. The series 2600-4000 multiplexer permits viewing of four separate video signals simultaneously on a single waveform monitor, while any of the four signals can be viewed on a TV monitor. Using integrated circuits in its four-count generator, clamp pulse generator and staircase generator, the unit provides pushbutton video select switches along with a rotary sequencer. (230)

Cohu's solid-state video switcher section...
ability, Unif©Illif5, and exhibit Photos extensive actuated equipment. Introduction of system; single program automatic modulation monitoring reproducers, Equipment included automated program complete glass -walled row -band so caused whether automated radio No objectionable tion lap. The unit model Visual and technique territories it. Distribution system to the system uses one distribution amplifiers. The Central Dynamics Sync-Line system uses one cable from the pulse distribution system to the camera by sending one signal and then decoding it. Sarkes Tarzian showed a similar system called the Compulse distribution (system). (210, 311)

Sync generators were exhibited by Visual and Dynair, while CBS Laboratories announced a new electronic technique for increasing sharpness and color detail on home TV receivers. New from CBS Laboratories is the model 538 color masking processor. The unit can be used in all types of conventional color TV cameras and electronically corrects color distortion caused by optical color filtering overlap and response characteristics of the camera pickup tubes. Masking correction is applied in all three color channels, and the processor signal is narrow-band so corrections don't add any objectionable noise to the picture. (233)

No-Hands Automation Radio

If there ever was a doubt over whether automated radio is for real, Gates dispelled it. Inside a people-less glass-walled room they showed a complete operating automated station. Equipment included automated program reproducers, an automated program log printer, a 1-kW transmitter intended for remote control and logging, and automatic modulation and frequency monitoring printout equipment. The program system included rotary and single-cartridge reproducers for spots and multiple cartridge reproducers for music and running it all, a 1000-event programmer. (234)

Schafer demonstrated a typewriter-input computer-controlled automatic system; IGM showed punched card inputted equipment. Introduction of extensive radio automation equipment by RCA was another indication of the growing significance of the equipment. Visual Electronics’ display included several racks of cartridge and reel equipment that could be pre-programmed and one of the lowest-speed loggers on exhibit—15/32 in./s. Tape-Athon also showed a 15/32 in./s. logger. (235, 236, 237, 238)

Although Continental has dropped its Prolog line, a new company at NAB, Disan Engineering Corp. was there with complete automation systems. Disan sells a complete system but also specializes in memory units and a talking clock. The programmed memory selector (various models to handle as many tape decks and cartridges as you may have) returns to its memory at the end of each selection to deliver the next function selected. The series 405 offers 1728 possible combinations. A continuously operating computer calculates possible time error arising from readout position and automatically compensates. Thus, time is always correct, Disan says. The 411 with “pinmister” memory offers demand time and random select handling. The talking clock is a separate module that gives time on the hour and half-hour. (239)

M-Car-Ta caught the visitor’s attention with some simulated leather tape decks and then captivated him by showing a new metal card control cell for random select programming of automation systems. The new cell was invented by William E. Mauls of Sono Mag Corp. The unit consists of a metal chip reader system and a photoelectric readout which in turn controls a decoder. The metal cells are loaded in the same sequence as the order of events are to occur. (240)

Audio Consoles: How Complex? How Compact?

Audio equipment designers seem to be reaching for extremes in large size and complexity on the one hand, and streamlined, compact formats on the other. Certainly today’s stereo broadcaster needs a fair amount of sophistication in signal-handling gear, but it’s hard to imagine even the most competent of deejays operating some of these new systems without a road map, or better, a well seasoned Indian guide. Any stereo station that continues to operate with a nonautomated format is moving in the direction of this ultra-complexity—especially due to the tendency to cluster many diverse functions in a single control room to save floor space. Piling still more straw on the camel’s back, this same control room may contain the station’s transmitter, the standby emergency transmitter, standby power equipment, racks of monitors, and so on, and on, and on...

Among the new breed of ultrasonicated consoles is Electrodyne’s ACC-1608. Designed primarily for 8-track audio recording, this console has more functions, controls, knobs, pushbuttons and meters than the cockpit of a Boeing 707. Among other things, it has 16 microphones or line inputs, expandable to 20; 6-position equalization with echo send and cue on each channel; independent outputs for 8-channel, 2-channel and mono; 2 push-pull, illuminated pushbutton switches. (241)

A scaled-down version of the ACC-1608, Electrodyne’s ACC-803 has a reasonable number of control functions for broadcast station use. Standard equip-
Tape Cartridges: 'Look Ma, No Hands'

As an integral part of automatic radio programming, the continuous-loop tape cartridge is hard to beat. In addition to the stacks and carousels of automatic cartridge-handling and playback gear, some new console-size designs have appeared to make manual operation that much easier.

Introduced by Collins as the "twin-tape" cartridge system, a doubled equipment approach lets the audio engineer work the Freduces much the same way he'd handle a pair of turntables. The 642E playback and the 216D record amplifier combine in a system that provides playback on both cartridges simultaneously; records one cartridge from an independent signal source while playing the other; or dubs from one to the other. The system has two independent transports in a single housing for simultaneous record or playback plus cartridge duplication—all without any auxiliary gear. (250)

Rack-mounting RT-27/BA-27 cartridge systems from RCA feature a roll-out tape deck, separate record and playback heads, remote control capability, plug-in circuit boards, all transistor design, provision for later expansion. (251)

A series of cartridge players and recorders from Disan provide flexible building-block setups if the station wants to design a custom hookup. Disan also is marketing a unit for background music systems. (252)

Sparta Electronics proudly showed its new Sparta-Matic tape cartridge system along with their complete system of audio control equipment. (253)

Audio Components: Making Life Easier For Meter Watchers

Some deejays who are tired of riding the gain, now can take their coffee breaks when they please if they use one of the new breed of audio limiters. The "Solid Statesman" M-6543 from Gates Radio features a 3- to 5-microsecond attack time, which eliminates the several milliseconds of clipping normal in most limiters—so states the manufacturer. The unit is available in asymmetrical or symmetrical limiting versions for a.m., fm and TV operation. (254)

CBS Laboratories, the one who started it all, have upgraded and updated versions of their own baby—the Audimax III. This latest model is all solid-state, with computer-type logic circuits to do the fancy figuring. Using what they call the "gain platform" principle, Audimax can work over a wide range of input levels. Audimax III can handle mono or stereo fm, while the EM Volumax controls peaks. For general-purpose audio, the model 710 Automatic Loudness Controller is a valuable contribution toward keeping

Photos top to bottom: TV picture stabilizer by Dynasciences
Dynaht's Mini-Sync equipment
Moseley microwave link equipment
Retrofitted transmitter by Standard Electronics

May, 1968 — BM/E
down those extra-loud TV commercials. Maybe this one'll keep Uncle Jack away from the "commercial killer" switch on his TV set. (255)

A wireless microphone that works at microwave frequencies was introduced by Microwave Associates. Dubbed the "Portamike," the fm unit operates at 950 MHz, with a cigarette-pack-size transmitter that weighs in at 10 ounces. The companion receiver is crystal-controlled and includes a preselector filter and double-heterodyning. The transmitter can run for 6 hours on its battery pack, and system audio frequency bandwidth is 50 to 15,000 Hz ±1 dB, with distortion placed at less than 1 percent. (256)

Films and Slides: Old Standbys Get Better

A film island shown by General Electric has a four-input, two-output color optical multiplexer. One such island is an attractive alternate to two conventional islands. Called the PF-12-A, the self-contained island handles two film and two side projectors and two color cameras in any combination. The compact system permits quick changeover in film chains, and provides film backup in case of equipment breakdown. (257)

Nippon Columbia demonstrated a breakthrough development in color photography using black-and-white movie film. Called "Monocolor" by its developers, it uses a special color filter sandwich that optically multiplexes the colors onto the black-and-white film. The film is processed as ordinary monochrome film in a fraction of the time (and with vastly less expensive processing equipment) required for color movie film. Playback is through a monochrome film chain to a decoding circuit which has red, green and blue outputs; then through a color processing amplifier which produces a standard NTSC signal. (258)

Technical Materials Corp. showed their "TV Program Center," a film chain island with a three-videicon color pickup and a 35mm side/sound strip projector, 35mm and 16mm movie projectors. They also displayed a 35mm sound strip projector with multiplexer or uniflex film chain. (259)

An electronic-beam recorder for motion picture film from JM Co. provides very high quality movie film from TV sources. Although expensive, it offers better quality than kinescope recording methods. Less expensive film can be used. (260)

Compact Ektachrome economy movie processors were introduced by Houston Fearless and Filmline. (261, 262)

TelePro model RA-500 random-access slide projector with 500 (2 × 2)

slide capacity uses drum-type magazines. (263)

"Spectrum 32" is a multiplex color slide projector for standard 35mm color slides from Spindler & Sauppé. The virtues of this projector are best emphasized by pointing out that they have been built into the latest film islands of GE, Philips and Teleman. (264)

Color Monitors

Solid-state design has invaded the professional monitor field as Conrac points the way with two new all-transistor units. Their new KN9 offset (first introduced at NAEB) is an economy model for closed-circuit systems on a tight budget that needs better quality than possible with modified consumer products. Screen size is 9 inches. (265)

A second Conrac entry is the CUI14, with switch-selected TV standards for use on almost any color system in the world. The professional color monitor works with any of these standards: 405 lines/50 fields; 525 lines/60 fields; 625 lines/50 fields; 819 lines/50 fields. Screen size is 14 inches. (266)

Brand new from Balt Bros Research, the TCB-14R color broadcast monitor is a transistorized, high-performance unit with controls placed for easy accessibility. Picture tube is 14-inch size, and the monitor is designed for relay rack mounting. (267)

Also shown by Conrac: model AVR1 regenerated sideband receiver, which removes quadrature and phase distortion in vestigial sideband reception. Video output is both vestigial sideband and dual sideband. (268)

Broadcast Monitors

Gates Radio exhibited a long line of fm monitors for most broadcasting needs. They include: GTM-88S stereo modulation monitor for mono or stereo measurements, with provision for adding SCA; mono modulation monitor with most of the stereo monitor's features; fm frequency monitor type GTM-88F, with crystal-controlled wideband pulse signal comparator; fm frequency comparator GTA-88F for measuring frequency stability of pilot and SCA channels. GTA-6741 SCA modulation adaptor as add-on unit for the modulation monitor. (269)

New from Collins is a transistorized fm modulation monitor, model 900C-3, which tunes through the standard fm broadcast band. Unit includes demodulating circuit for measuring carrier modulation percentage on the main channel, stereo subchannel, pilot carrier and SCA subcarrier. It also measures channel separation, crosstalk, S/N ratio and stereo subcarrier suppression. (270)

Calling their equipment "Gremlin Chasers," McMartin showed a wide line of fm monitors and receivers—mainly for checking modulation, separation, subcarrier characteristics, frequency and other vital fm broadcasting parameters. (271)
The IVC-800, engineered and manufactured by International Video Corporation, Mountain View, California, is the first helical-scan video recorder to offer this exciting combination of features at any price. A recorder that's not only low-cost, but is versatile, easy-to-operate and maintain. NTSC color system results in more faithful reproduction with chroma stability not previously attainable. The IVC-800 is a significant breakthrough in helical-scan recorder design. Turn the page for price and details.
All this for $4200 complete! (monochrome $3800)

Full NTSC Color capability
All monochrome machines will record NTSC color signals. Single plug-in circuit board instantly converts unit for NTSC color playback. Conversion may be accomplished by anyone in the field purchasing a plug-in circuit board for $400.00.

High resolution
Patented pulse interval modulation signal system provides bandwidth exceeding 4.2 MHz resulting in 400 lines of picture information.

Just thread it and push the button
Electrical push-button control of transport permits all tape motion functions to be remotely controlled. Advance “Alpha” helical-scan tape path configuration with precisely fixed tape guides eliminates “lost” picture information and allows easier threading.

Full electrical remote control
Electrical push-button control with interlocked logic circuit permits all tape functions to be remotely controlled. Tape is automatically relaxed when stopped thereby eliminating unnecessary wear. These features permit the IVC-800 to be used in dial access applications.

90 second fast forward and rewind
Separate turntable motors for take-up and supply permit rapid fast forward, rewind and shuttling. Dynamic braking eliminates the possibility of tape damage. End of tape sensor activates stop circuit preventing tape spillage.

30% less tape, 8” NAB reel
Full one hour recording requires only 2150 feet of 1” tape operating at 6.9 ips, an average saving of $15.00 per hour.

Operates rack mounted
IVC-800 is the only recorder which can be rack mounted in 12¼” of vertical space. Maintenance is made easier through use of full-suspension, pull-out mounting slides.

60 second head replacement
Video head may be quickly replaced by anyone anywhere using the special tool that is stored under the scanner cover. The head automatically seats itself in the correct position. Advanced design ferrite head is guaranteed for 500 hours (or six months).

Audio cue track
Second audio channel is provided for secondary audio or dial access control signals.

Weighs only 52 pounds
Precision casting and state-of-the-art engineering techniques have produced a rugged, yet truly portable recorder. Dust-proof cover eliminates tape contamination possibility.

Machine-to-machine compatibility guaranteed
All tapes recorded on any IVC-800 can be played back on any recorder using the 1” IVC format.*

Stop-Motion feature
All units are equipped with stop-motion as standard feature. Electronic editing and slow-motion are options available.

NATIONAL SERVICE PROGRAM Field service, applications engineering, and systems engineering back-up are provided every IVC customer. Factory trained service personnel are available through our franchise distributors or on a direct factory basis. Standard industry warranty on all IVC products.

FULL NTSC COLOR SYSTEMS CAPABILITY WITH THE IVC LOW COST CCTV NTSC COLOR CAMERA. A demonstration of the complete IVC CCTV color system can be arranged by contacting IVC Marketing Operations, (415 — 968-7650). International Video Corporation, 67 E. Evelyn Avenue, Mountain View, California 94040. Detailed product literature on request. *Bell & Howell/GPL/RCA
Studio Displays

An electronically-generated TV character display format was demonstrated by Visual Electronics. The system can include a number of ancillary devices for short- and long-term storage and instant retrieval. Principal participant is the 990 Display Control unit which generates the alphanumeric characters. Unit consists of a typewriter-like keyboard and edit monitor. Messages can be flashed instantaneously on TV screens for weather reports, sports scores, stock market prices, etc., or stored for instant recall. Special effects are also provided which make the words crawl, roll and blink. (272)

A flexible display system from CBS Laboratories uses a series of electro-mechanical display units. The system's x-y matrix wiring allows easy for quick reconnections needed for different display configurations. The characters are white on a glare-free black background and the displays will hold up to 12 different items. (273)

A system for in-station weather data is the Mark IV-C "Weatherminder" by Texas Electronics. The accurate instrument board has four instant-readout dials calibrated in wind-velocity, wind direction, barometric pressure and outside temperature. (274)

Studio Aids and Equipment

Called a "major advance" in TV and motion picture studio lighting, two new series of tungsten-halogen lamps from Sylvania can make a considerable dent in lighting costs. Available in 2000- and 5000-watt sizes, the lamps are smaller and more efficient than conventional studio incandescent lamps of the same rating. Color temperatures available are 3200 K to 3350 K. Cost, temperature and light output do not drop off as the bulb ages, adding considerably to the bulb's useful life. (275)

An image motion compensator called the "Dynamals" by Dynasciences Corp, stabilizes images from telescopes, handheld or vehicle-mounted movie and TV cameras. The Dynamals can be used with any lens having a clear aperture 58mm or less and can operate from a variety of battery packs. (276)

Videotape almost got lost at 3M and Ampex displays while it was pushed hard by Memorex and Visual. Brand new in the tape market, Visual Electronics' "Visual Tape" is a broadcast high band formulation and was used throughout the company's huge exhibit area. Special features of the new tape are high S/N ratio, improved video sensitivity, low-abrasive tape surface, antistatic binder, high pliability for maximum head-to-tape contact. (277)

Memorex was loaded for bear with several different TV tape formulations. Standouts among these were type 78V high-contrast tape for high-hand color recording and the 79 series for all helical-scan recorder. (278)

Evereshed's "Servopak" for zoom and focus control of studio TV cameras was a prominent Power-Optics exhibit. Also shown was a variety of other camera servo controls and a new power zoom converter unit RCA TK-42's. (279)

Transmitters and Antennas

Gates drew fresh attention to a-m transmitters by claiming its new 50-kW (VP-50) is the first new thing in 50 kilowatts in a decade. A new vapor-cooling system which takes advantage of liberation of heat produced in converting water to steam produces a cool, quiet (no water pumps), efficient high-power transmitter. Power consumption is only 85 kW at zero-percent modulation. (280)

The CCA exhibit was popular since that's where lowest prices were found. CCA claims it's now number 3 in transmitters. (On the final day every rig on display was market sold.) The highest priced a-m transmitter exhibited was a military designed 10-kW unit displayed by Technical Material Corporation. The BCT-10KA sells for $50,000. A feature that's hard to figure out how to use is its ability to tune anywhere from 450 to 2000 KHz. Call it a universal spare! (See p. 90, April/68 BM/E.) (281)

Granger/Bauer showed new low-powered fm transmitters and Wilkinson Electronics showed a small satellite transmitter for use inside steel-framed areas (transmitter rebroadcast).

Uhf TV news for 1967 was the introduction of 55-kW and 50-kW uhf transmitters by RCA and GE respectively. This year Visual Electronics showed, for the first time, a 55-kW uhf transmitter. The solid-state heterodyne driver incorporates into one compact package, vestigial sideband filter, linearity and phase adjustments, envelope delay pre-correction, etc. Eimac's five-cavity, integral-cavity klystrons, with vapor cooling, are paired in the power amplifier stage. (283)

A 55-kW uhf transmitter from Pye Ltd., was exhibited by Philips. RCA claimed the most powerful uhf system by combining a new 60-gain five-sided antenna with its 110-kW transmitter. Result: 5,000,000 watts in all directions. RCA also showed how to parallel two vhf transmitters so that one could stay on the air even if one transmitter failed. GE introduced solid-state drivers for both vhf and uhf transmitters. (284, 285)

Standard Electronics showed retrofits kits that could convert old standby aerial vhf transmitters into visual units. The converted unit can become half of a new parallel transmitter setup at very little cost. Standard Electronics also showed a new 250-W fm transmitter. (286)

Collins showed an entire line of

Photos top to bottom: McMartin's "Gremlin-chasing" SCA gear Easy-assembling rf connectors by Trompeter Eight-channel recording console by Evidyne Microwave Associates' pocket size microphone transmitters Videodisc animation unit by Ampex
am and fm transmitters, most of which were introduced in 1967. American Electronics Labs featured its new 20-kW fm transmitter priced at $21,500. A direct solid-state exiter was used. A stereo and STL generator is available. Only two tubes, the driver and the power amplifier, are used. (287, 288)

CCA, Jampro, Gates and Collins have prominent displays of fm circular polarized antennas.

**Test Equipment, Frequency Monitors**

The test equipment found on broadcasters’ work benches is an indication of the quality of his on-air signal. Fortunately or unfortunately, depending on your point of view, there was more equipment on display racks at NAB than generally found on work benches.

Tektronix, Hewlett-Packard, Rohde and Schwarz and Marconi had large displays devoted to test equipment. It is significant that European made test equipment was prominent—Europeans pay more attention to quality than do some American broadcasters. From the other side of the world, Shibaden brought for display a color bar dot generator and other TV test equipment.

Tektronix premiered its solid-state Vectorscope and waveform monitor. Hewlett-Packard drew special attention to its new impulse (as well as RMS and peak) sound meter (based on an imported design we understand). Videometrics, in the Central Dynamics exhibit area, showed a new polyburst generator to facilitate system checkout. Central Dynamics showed a production version of a portable color calibrator originally developed by the National Research Council of Canada. This device gives a “white” standard for checking color television studio monitors.

Tektronix, Hewlett-Packard, Rohde and Schwarz and Marconi had large displays devoted to test equipment. It is significant that European made test equipment was prominent—Europeans pay more attention to quality than do some American broadcasters. From the other side of the world, Shibaden brought for display a color bar dot generator and other TV test equipment.

Tektronix premiered its solid-state Vectorscope and waveform monitor. Hewlett-Packard drew special attention to its new impulse (as well as RMS and peak) sound meter (based on an imported design we understand). Videometrics, in the Central Dynamics exhibit area, showed a new polyburst generator to facilitate system checkout. Central Dynamics showed a production version of a portable color calibrator originally developed by the National Research Council of Canada. This device gives a “white” standard for checking color television studio monitors.

Very stable digital-type frequency monitors drew special attention at Collins’ booth (a paper was given on the technique). An fm frequency monitor displayed monitors the carrier frequency and indicates errors in 100-Hz increments. (294)

**CATV-CCTV On The Fringe**

Transmission of TV by cable was featured by Anemo, Entron, Kaiser

Photos top to bottom: New pickup equipment from Gray

Inside McCurdy’s audio control console

Regenerated sideband receiver by Conrac

AEL’s 20-kW fm transmitter

“Twintape” dual cartridge unit from Collins

Rust Corp.’s remote control

CATV, Jerrold, Vikoa, and Craftsman. Little brand new equipment was shown. Vikoa stressed underground installations. Jerrold stressed its educational systems as well as general capability.

Exhibitors featuring CCTV equipment for schools or CATV local origination were numerous and busy. Scanlin drew attention by demonstrating color TV receiver displays of electronically-generated alphanumeric characters. The equipment was suited for TV studios that wish to inject titles and news directly into the video system but was being promoted heavily as an all-electronic news service for CATV systems. Television Presentations, Inc., is the distributor to CATV systems. (295)

Dynair showed a solid-state TV demodulator, a remote switcher-fader and other miniature video components including a new mini sync generator. TeleMation showed its new optical multiplexer, a new monochrome camera and other video processing equipment suitable for CCTV and broadcast work. (296, 297)

Philips and Sylvania both had portions of their exhibits aimed at the CCTV educational market.

**Microwave Relay & STL**

Microwave Associates used the NAB to introduce its new B-line—a total solid-state (no klystron) fm microwave communications link for color television and other data transmission. The compact units, featuring modular construction, are available in seven models covering the frequency bands of 0.7 to 13.3 GHz. The company also showed a mobile microwave relay system used in Vietnam but suitable for broadcasters use such as in helicopters. (298)

Raytheon announced 30-day delivery of its standard dual link 2A microwave equipment (solid-state except for a klystron). The 2A is “hot standby” TV equipment providing automatic transmitter switching and duplicate receiver protection for STL’s. Collins showed its MW-808D microwave system intended for short-haul transmission of color. (299, 300)

Lenkurt stressed its system’s capability for long haul as well as STL. Marri and Moseley also featured STL equipment. (301, 302, 303)

**Cable and Accessories**

Boston Insulated Wire focused attention on damage-proof connectors (introduced last year): Brand Rex on lightweight cable (featured on Ampex’s portable and lightweight cameras). Andrew Corp. showed low loss 8-w. helix cable. (304, 305, 306)

Coaxial cable handling was stressed by both Cooke Engineering Co. and Trompetter Electronics—Cooke showed cutaways of its coaxial patch jack and Trompetter featured a new crossbar panel and easy-to-assemble rf cable assemblies. (307, 308)

May, 1968 — BM/E
CATV operators and broadcasters have strong opinions about the FCC nonduplication and carriage rules. Here’s a sample of the CATV side of the story. Next month broadcasters have their chance.

A good deal of the controversy generated by the FCC’s Second Order and Report has been centered around the local channel carriage and nonduplication requirements.

CATV operators and TV station owners alike have been screaming that they are being driven out of business.

However, most charges and counter charges have been vague. Amid the noise and confusion, few solid facts have emerged.

In an effort to close the evidence gap, the FCC recently requested TV stations and CATV operators to report on how the new rules have affected them.

The FCC Notice of Inquiry stated that most CATV operators have been able to live with the new rules “without undue difficulty.”

They did express concern that the rules may “unnecessarily inconvenience subscribers or CATV operators.”

With respect to broadcast stations, they wanted to find out if the rules have “been sufficient to accomplish the purpose for which they were designed.”

So far, the FCC has accumulated four volumes of replies in Docket 17505. The bulk of evidence submitted indicates the following:

1. The FCC is right. Most CATV systems can live under the new rules. No system has actually gone out of business. But several say that if they comply with the new rules, they will be forced to shut down and a few give concrete evidence of economic injury.

2. Most stations feel they would get enough protection if the present rules were enforced. A few, however, presented persuasive arguments for even more protection.

3. A large percentage of CATV systems are not yet complying with the new rules. Some have sought relief by requesting waivers and others have simply ignored the rules.

4. Switching equipment and labor are so expensive that small systems cannot afford it. They must either delete the offending channel entirely or ignore the FCC Rules.
5. Where the rules have been adopted, subscribers are very, very unhappy.

Subscriber Complaints

Since the public interest must be a prime consideration for any government agency, let's consider the effect of the new rules on CATV subscribers. (Nonsubscribers have never expressed themselves either way.)

For example, Lawrence Flynn Jr., who operates a system in Vestal, N.Y. said, “Subscribers are frustrated and annoyed with nonduplication switching. Often TV stations change schedules, switchers don't function right . . .”

C. E. Murray, of Niagara, Wisconsin, reported that channel 12 Rhinelander asked his system for protection from channel 5. They provided protection for about 45 days “but the complaints from our membership were so great” that they have put channel 5 back on the system.

The cable system in Huntsville, Texas stated: “Our subscribers are very unhappy over the deletion rule. The telephone is constantly ringing . . .”

“Our customers feel they should be able to view the station of their choice. Approximately 75 percent of our customers call the office and express their opinion in no uncertain terms . . .”

“Sports warmup programs usually start 15 minutes before the game. Usually the game starts on the hour or half hour and there is no way of knowing how long it will last. This causes the viewer to miss a part of the program following the sports event.”

The Selingsgrove, Pa. system is trying to satisfy both subscribers and the FCC by rebuidling to 12-channel capacity.

S. W. Camp, manager of the system, reported “. . . we did delete WFBG Altoona in order to provide WTPA full time carriage. WFBG had been carried on the system for 13 years. When this change was made, hundreds of calls and oral expressions were received in our office about taking off the Altoona stations . . .”

“We created an additional uproar when we deleted channel 8 Lancaster to provide WITF channel 33, ETV from Hershey . . .”

“If we are forced to make further changes due to several stations' requests for nonduplication, our subscribers are going to lose two additional stations that they have viewed for 14 years.”

Mark K. Shadle, general manager of the cable system in Lykens, Pa. said, “Subscribers have become very indignant over the removal of two vhf Philadelphia stations, channel 6 (WFIL) and channel 10 (WCAU) which provided excellent non-network programming. The uhf stations, channel 15 (WLYH) Lebanon and channel 21 (WHP) Harrisburg, do not. The news broadcasters of the uhf stations do not have the high professional demeanor or presentation manner that the viewers have been accustomed to over the past 12 years . . . The movies carried on the uhf station channels cannot be compared to the vhf stations.”

One of the big problems of the Lykens system is that no switching is used. Instead, the U's are substituted for the V's on a full time basis.

The local editor was so upset by the situation that he not only wrote angry editorials, but took a reader poll. The result: 587 to 2 preferred the TV schedule as it had been before the Second Order and Report had gone into effect.

Many editors in CATV towns were angry. An editorial in the Daily Times Herald, Alliance, Nebraska said, “As we understand it, the free air has been let out of this portion of the Nebraska panhandle to protect the Scottsbluff station from the economic impact of cable systems.

“Sterling, Colorado had cable service some 9 years before the same Wyoming people built a TV station there last year.”

“Cable TV forced the Wyoming people to make something of their Scottsbluff outlet.”

“To this newspaper, free enterprise is being flouted by this whacky blackout . . .”

“Federal agencies . . . have the perogative to protect the public interest—not to protect private industry or individual gain.”

Economic Injury To CATV Systems

CATV systems claim that the new rules hurt them in three basic ways:

1. Switching equipment and labor are expensive.
2. They lose subscribers, or fail to add subscribers.
3. System expansion and new systems are not economically viable in many areas.

American Cable Television, Inc., with systems in Waco and Temple, Texas, gave an excellent breakdown of the cost of complying with the nonduplication rules.

2. $20 per month in switching circuits and switching costs.
3. 4-6 hours per week extra technician's time.

American Cable Television's president, Arlo Woolery, also did a good job of documenting economic injury. He stated that a careful analysis had been made of a 32-week period after the rules went into effect. During this time, 287 subscribers were lost. This is a loss of $1500 per month in income. Looking at it another way,
since systems often sell at the rate of about $300
per subscriber, Mr. Woolery feels that the new
rules so far have cost his company more than
$86,000 ($300 × 287) in lost subscribers.

B.F. O'Connell, who runs a cable system in
Menominee, Wisconsin claims that he cannot
comply with the rules.

He said, "The cost of required equipment is
prohibitive at this point in our operation. Present
financial obligations preclude any other pay-
ments."

Many people are of the opinion that CATV is
a sure road to riches, but Mr. O'Connell said, "We
show a loss of $63,000 for the first five years of
operation. To be forced into compliance would
cause loss of system control for me. This is
something I've worked toward for six years."

Several other systems also reported noncom-
pliance, claiming that they would have to go out
of business if they tried to follow the new rules.

The Marion, Virginia Cable System com-
plained about the cost of switching equipment and
added, "... in previous years we have en-
joyed an annual net gain of 50 to 75 subscrib-
ers. We have no net gain or loss this year."

"Compliance with the rules has stopped the
growth of the CATV system, eliminated any plans
for expansion of the system, and has slowed the
sale of TV sets, especially color sets."

They also gave an example of economic
injury to CATV subscribers: "In several instances
home owners had erected high towers to bring in
signals from Roanoke, Virginia and Bluefield,
West Virginia. They were pleased to be able to re-
move these structures, connect to the cable and
receive a much higher quality picture. Now, they
are left without the right to view the stations of
their choice, due to the nonduplication act."

They report that the usual complaint from
subscribers is that "it is odd that subscribers who
pay for their service are denied their right to view
the station of their choice, while those with private
antennas are not in any way protected."

Wenton F. Stewart of GT&E Communications,
Inc. in Angola, Indiana provided excellent
documentation of the costs of compliance.

He said, "the programming of the nondupli-
cation switcher each week is difficult and time
consuming (approximately 12 hours per week)
and, therefore, extremely expensive."

"The total investment in the Angola system
is nearly $250,000, or in excess of $27,000 per
channel carried. One third of our investment is
affected by the nonduplication rules. This $83,-
333 worth of equipment is only being used 38
percent of the time. It is idle 62 percent of the
time. This represents an investment of $51,666
in equipment which is idle due to the nondupli-
cation rules."

Due to the customer confusion associated
with the nonduplication, we feel a program sched-
ule must be provided to our customers other than
the TV guide and newspaper listings. This is
an expensive process. Estimated cost for this pro-
gram is $5.00 per year per customer."

One respondent pointed out that his system
was so small that "reliable (switching) equipment
would cost more than my entire head end."

In Kernville, California, Pearson TV Antenna
Systems claimed that their growth rate has suf-
f ered by 25 percent.

"In order economically to service some 550
subscribers in an area this size, we had to erect
three separate head ends," they pointed out.
"Programmable switching for these head ends is
not economically feasible for this size system."

Therefore, they have totally deleted Los Angeles
channels 2 and 4.

Tehachapi TV Cable, in Tehachapi, California
said, "The time clock and relays are a large in-
vestment for a small system ... The very mini-
mum cost of a decent clock and all other equip-
ment necessary is over $2000, plus at least
another $4000 for something to fill in the black-
out, for instance a weather channel. The opera-
tion and maintenance is one of the most time
consuming tasks our technicians have."

Robert L. Pace, manager of a system in Taft,
California has been providing exclusivity since
March 1, 1967. Since then "the Taft CATV
system has sustained a net loss of 92 subscrib-
ers in previously served areas."

He attached to his filing an unsolicited peti-
tion protesting the exclusivity ruling.

Benjamin Conroy, Jr. submitting comments
on a Genecoe, Inc System in Abilene, Texas
summed up a long history of subscriber com-
plaints and switcher frustrations saying, "At this
writing we have made 12,812 connections and
have kept only about 55 percent of them or 7072;
our turnover, therefore, is about 45 percent com-
pared with an industry average of from 32 to 35
percent.

"We certainly cannot attribute all this attrition
to our program protection problems, as the normal
transience of population will account for much of
it. We are forced to conclude, however, that our
higher attrition average, backed up by comments
of subscribers and viewers who no longer choose
to subscribe, is attributable to the fractured and
unpredictable network scheduling our subscribers
must endure in the program duplication protection
process."

This article has told the story primarily from
the point of view of the CATV system operators.
The second article in this series will cover the
comments of the TV stations and discuss other
related issues.
LBJ Kicks Off NAB

This year's NAB Convention featured many highly frustrated broadcasters—frustrated because of the fast-breaking explosive news at home and abroad that they had to hear about second-hand from newspapers and other people's radio and TV stations. But they too had their breaks; some of the news came to them first hand as President Johnson made a surprise visit and speech at the NAB's General Assembly only a day after his world-shaking announcement about curtailing the bombing and not running for re-election.

The NAB Newsroom was bulging at the seams that Monday as hordes of reporters waved their police press passes and ran for the typewriters and telephones. BM/E's editors were there too, wedged in among TV and movie cameras on the balcony to bring you this on-the-spot report.

First word of LBJ's impending arrival flashed through the massive Conrad Hilton at about 9 a.m., and by 10 the hotel began to fill with hordes of Chicago police. Workmen ran up the thickly carpeted stairs to the Grand Ballroom carrying lumber for makeshift stage accessories and camera platforms. Police cordons were formed and advance elements of the Secret Service arrived and began to map out the presidential appearance. Walkie-talkies appeared from nowhere to add radio-directed coordination to the proceedings. Rust Corp.'s micro-skirted girls gaily pranced up and down the police lines pinning tiny roses on lapels until they, too fell prey to the Secret Service's humorless directives.

The General Assembly's program started as had been originally planned, complete with the WGN orchestra and the necessary contingent of NAB officials and guests, including Convention co-chairman Daniel W. Kops and Dr. Norman Vincent Peale. The NAB's Distinguished Service Award was presented to Lowell Thomas. If Thomas had any prepared comments, they went by the board as he ad-libbed about the surprise visitor who would upstage him at any moment. One of the famous newsmen's comments: "You undoubtedly know why I'm here. I'm here to welcome LBJ back into the broadcasting industry."

He went on to say that people used to listen to him on the radio only because he was on just before Amos and Andy; this time people were listening to him only because . . . and right on cue, the WGN orchestra struck up Hail to the Chief, a brace of White House staffers and reporters scurried into the roped-off front seats in the audience, and a very tired Texas broadcaster mounted the steps to the stage.

In keeping with the humor of the situation, LBJ quipped about taking elocution lessons from Lowell Thomas and about an aide who told him he thought he was going to the wrong convention in Chicago. Focusing on the presidential lectern were dozens of newsreel, newspaper and magazine cameras. Live TV coverage for the network pool was afforded by monochrome equipment—all that the local stations could muster on a moment's notice. The show stealers were the Ampex color cameras—moved only a few hundred feet from their demonstration areas in the Normandie Lounge. There wasn't time to set up a live color transmission link, so Ampex's color videotapes were used for later news programs.

On hand in the Grand Ballroom were Ampex two-Plumbicon color cameras—one BC-100 (hand-held portable) and one BC-200. Also used in the Ballroom was the VR-3000 backpack video recorder, while four studio quad-head machines in the Normandie Lounge were slaved to the color cameras by extra cable furnished by Brand Rex.

Carefully planned schedules went awry as President Johnson made a surprise visit and addressed General Assembly. LBJ's podium is flanked by NAB officials and guests who somehow let him get in without a registration badge. Only color coverage of presidential appearance was by cameras moved only a few hundred feet from their display area. Four Ampex quads were slaved to hastily strung cables.
Grenoble: ABC’s Trial and Triumph

Mountainous snow drifts, mercury forever below zero, color cameras tossed like driftwood on the waves of a blizzard’s winds, camera locations accessible only by helicopter... the result: a brilliant and epoch-making TV coverage by one of the industry’s most dedicated technical groups.

ABC-TV’s year-and-a-half of advance preparation for the Winter Olympics paid off handsomely in sporting event coverage on a grand scale. The network’s massive technical effort coupled with the “largest single use to date” of Comsat’s orbiting relay provided American TV viewers with a never-to-be-forgotten experience. The Olympic coverage used many new technical innovations and products—so much so, that the transmission was not only a fabulous sporting event—it also was a showcase for new broadcasting technology.

In a joint effort with ORTF, the government-owned French TV network, ABC’s technical personnel manned a variety of equipment and used techniques that may well point the way for all such special-events coverage in the future. The pickup was made with both ABC’s and ORTF’s equipment. The American gear included one mobile unit, nine additional color cameras and camera chains, special effects generators, master control equipment and five videotape recorders (Ampex 2000’s and RCA TR-22’s). Also packed off to Grenoble were several portable videotape machines and the Ampex-developed slow-motion and stop-motion videodisc.

The French TV network supplied mobile units at several locations and color tape machines (Ampex VR-2000’s) and audio facilities at the switching centers. All of the European equipment had been modified to accommodate NTSC color. The network’s mobile rigs are all dual-system units—designed to be used with either NTSC or SECAM, and quickly switchable from one system to the other. Since U.S. equipment doesn’t have this dual compatibility, it had been up to the French to build NTSC compatible broadcast hardware for the frequent trans-Atlantic satellite telecasts.

In the forefront of the technological effort were the new Ampex BC-100 portable color broadcast cameras. Weighing in at 35 pounds (camera head 20 pounds, backpack 15 pounds), these cameras provided ABC with a degree of portability that added an immediacy and closeup coverage that would have been impossible with larger conventional color cameras. This hand-held color camera will be equipped with a microwave pack for total portability at the upcoming political conventions and the Summer Olympics in Mexico City. ABC engineers are currently checking out first production models of this rf package put to...

Chained down to wooden platform for easy helicopter lifting, General Electric color camera with directional mic up front, captures action on the slalom.
together for them by Microwave Associates. The camera uses a semidirectional antenna, and the associated mobile van or other control station is equipped with a highly directional dish antenna. The camera's rf package transmits audio and video at 13 GHz, and receives camera sync, cueing, communications and iris control on a 950 MHz channel. Total weight of the battery-powered package is 57 pounds, which includes batteries, zoom optics, harness and other hardware. About 35 pounds of this weight is in the back pack.

The camera itself uses only two Plumbicon tubes in a matrixing three-color system. The luminance signal is simultaneous, while the red and blue are sequential, making it a simul-sequential camera.

**Over 21 Miles of Cable**

Preparations for the Winter Olympics included purchasing and installing some 84,000 feet of a special 85-conductor TV cable supplied by Boston Insulated Wire & Cable Co., along with the highly critical connectors needed. ABC also used about 24,000 feet of coax purchased in France. Much of the cable-laying was done by French Alpine troops, a group of highly trained army specialists who are well qualified to work in the deep snow. ABC officials indicated that about 80 percent of this cable will be salvageable, and by March 6, had already retrieved some 24,000 feet of it. Cable runs ended at mobile units equipped with Holland Electronics switching equipment.

In anticipation of the adverse weather conditions, ABC ordered newly designed cable connectors from BIW. ABC spokesmen indicated that in conditions such as they found at Grenoble, the cable connector is potentially the most troublesome single element. BIW's new 85-pin design overcame a great many possible problem situations, while providing helpful extra features.

Cold weather wreaks havoc with all kinds of TV production gear and personnel. Says Merle Worster, ABC-TV's Technical Operations director, "The working conditions in some locations were just beyond description. We lost Joe one day (Joseph DeBonis, Television Field Operations manager)—he sank in snow over his head running cable, there was that much snow. To give you an idea . . . we were looking for some cables one day and we dug down 12 feet and we were still digging in the snow to find the cables that we'd put in last November.

"We started to lay cables in November . . . using French Alpine troops . . . to assist. We also used helicopters to move our equipment from location to location, and we used snow cats when the helicopters couldn't fly."

Underscoring the choppers' importance, Joe DeBonis pointed out that, "This whole endeavor was successful because of the use of helicopters . . . We'd put a camera on a platform . . . chopper'd come along, pick it up and fly it to the new location. Seven locations on the hill had to be covered on a daily basis—giant slaloms, special slaloms, giant downhill, and so forth . . ."

The cold generated a host of equipment problems. Cameras had internal electric blanket-type heaters turned on 24 hours a day to keep them from freezing. Hair dryers were used to defrost ice-covered lenses, and cameramen were kept from freezing by propane gas heaters. Many camera locations were nearly inaccessible. Crews would ride chair lifts up the mountain, and then climb down to the camera locations. In some cases they had to ride to work on snow cats, while others had to be air-lifted to work by helicopter.

**Language Barrier Crumbled**

Altogether, ABC used about 70 of its own technical people in Grenoble, in addition to personnel supplied by ORTF. The French TV workers were most cooperative in spite of the language barrier. As Worster explained, "The language barrier was always a problem, although a great
May, 1968 — BM/E

New Generation of Color Cameras Stresses Compactness

As if on cue from a teleprompter, three different studio equipment suppliers announced similar miniaturized broadcast quality color cameras and associated rf equipment for wireless operation. First in the circle were RCA, Philips and Ampex, and now CBS Labs has unveiled their portable, handheld rf color camera.

All four entries weigh in at about the same avoirdupois—from 35 to 45 pounds in the cable version and 50 to 60 pounds in the wireless models. The camera head itself weighs from 18 to 23 pounds, and the rest of the weight is distributed over a backpack frame. (See BM/E Dec. '67, p. 6)

The RCA camera was primarily designed for astronauts in lunar exploration forays. It's been through some rigorous environmental testing, and it may be suitable for broadcasting.

In virtually all cases, color quality has not been sacrificed. The miniaturization is possible through the use of integrated circuit technology and uses a new approach to color imaging or a rearrangement of camera head elements. The Philips unit has been trimmed by putting the bulk of the circuitry into the backpack, but uses essentially the same Plumbicon setup as the studio color camera.

The Ampex unit uses just two Philips Plumbicon tubes for all three primaries and the luminescence signal. Based on work done by Dr. Hughes at Oklahoma State University on color matrixing, the camera's two pickup tubes matrix the primary colors sequentially. The luminescence signal is matrixed simultaneously; thus the system has been dubbed "simul-sequential."

The microwave link strapped to the backpack in wireless versions includes a battery power supply, which adds substantially to the total weight. Typically, the batteries and rf package tip the scales at 20-plus pounds, and while the total weight is still small as color cameras go, at least one industry wag is vying for the mobile van laminent concession.

many people spoke some English... the understanding of (certain technical) terminology would present a barrier... We used quite a few French technical personnel, in many cases intermixed with Americans... The language barrier was more of a delay... than an obstacle..."

The only ABC casualty during the entire Winter Olympics meeting was one engineer who broke his leg skiing on his day off. It could have been much worse. Weather conditions changed drastically in 15 minutes' time. The French, in describing the situation, said: "They built the ski-jump where the most wind blew, the bobsled run where the sun was shining all the time, and the downhill Alpine events where the fog came and went that fast." In the midst of the Olympics, as if to prove a point, a blizzard struck with such ferocity that a camera was blown off a tower and the tower was ripped apart. Providentially, the camera landed in a tree and was repairable, and once again, helicopters came to the rescue by placing an entire new camera installation on location.

Signal Processing

Actual shooting started with the individual camera locations, which sent signals via cable to switching centers and the central control in ABC's mobile van. Instantaneous transmission to the U.S. was impractical because of the six-hour time difference, so everything was taped in Grenoble, with backup tapes made in the mobile vans. The tapes were edited and transmitted via satellite to New York where the program was again taped and transmitted at a later hour. ABC sent two separate programs—one a running coverage of the events, and the other a condensed wrapup version for evening viewing.

Satellite transmission was called "entirely satisfactory" by ABC engineers, except for the very first day which was beset by some noise problems. No other broadcaster had previously used the Comsat satellites so much in a given period of time. ABC used two different birds—one for video and audio, the second for audio backup only. Further audio backup was made via undersea cable. Total cost for satellite transmission ran close to a half-million dollars—this in addition to some $3-million in equipment and production costs and $2-million paid for the TV rights.

More Equipment Needed

According to ABC officials, the rf pack for the Ampex cameras could have been ready to use in time for the Winter Olympics, but it was felt that there was no real need for it there. The rf camera will be used extensively at the two national nominating conventions and at the Summer Olympics. ABC men feel that the Grenoble experience was merely a door-opener for the conventions and Mexico City coverages which will both require much more in the way of equipment and technical personnel, although the problems of deep snow and subzero temperatures will be absent.

Of the equipment used at Grenoble, ABC will be using practically all of it at the Mexico City Olympics, plus a great deal of additional gear. These extras are a must since there's no ready source of supplemental equipment in Mexico as there had been in France. The switching apparatus is ABC-designed for portability and forms the backbone of their control operations—both at the conventions and at the Summer Olympics. The required extras at Mexico City will virtually double the amount of equipment that ABC freighted to Grenoble. At the Winter Olympics, microwave links carried program material from the mobile vans to Grenoble itself for taping. In Mexico City, cable will be used, and microwave relays are being built to connect with stateside TV links. A few things will be missing, though—no electric heaters, no snow cats, no parkas, and most of all, no snow!
Better product balance, accurate sales projections, internal accounting, billing, revenue forecasts and sales commissions, accurate logging—KTLN’s computer does it all and more economically.

Denver’s KTLN Grows with

By Richard Wheeler

Radio station KTLN in Denver has reached a point in its growth that calls for more efficient methods of processing and utilizing the complex, voluminous records required by a broadcasting operation.

The station, which is celebrating its 20th anniversary this year, recently moved into a new headquarters building. On November 1, 1967 it became the Mutual Network affiliate in Denver, and manual record keeping was no longer efficient or effective.

The system installed was designed for KTLN by William Cole of Denver, a broadcast industry data processing consultant who has installed about 30 similar systems in radio and TV stations throughout the country. Cole also designed a number of forms for specialized KTLN operations.

The new installation consists of only three pieces of low-cost IBM punched card equipment: 402 accounting machine, 026 card punch and 082 sorter. The equipment, as it stands, is capable of handling considerable volume growth without additional personnel.

The accounting machine prepares reports and records, in both numerical and alphabetical form, from punched cards. It reads 80-column cards, recording details, and printing any desired combination of totals. The sorter groups cards of similar classifications in numerical or alphabetical sequence. The card punch has special new features that punch alphanumeric data and special characters from source documents into cards.

Benefits already provided by the system include automatic printing from punched cards of complete daily program log by the 402. The log includes time scheduled on and time scheduled off, program title and sponsor, elements, spot length and commercial type, program source and type, actual time, and a provision for announcer sign-on/sign-off.

The system also provides automatic printing of more than 250 statements and affidavits of performance each month. Both of these are on specially designed forms. The affidavit includes date of broadcast, description of spot, time of broadcast, length of broadcast, and rate for all spots per account in the past month. The statement shows date of charge and payment, description, gross, agency commission, and net amounts for current charges, net balances forward and net balance due. For added efficiency, both these forms are on the same roll of paper for input to the printer; they are rouletted for separation.

The machine handles automatic printing of accounts receivable aging notices 30, 60, 90 and 120 (delinquent) days after billing. Accounts receivable aging is performed on a specially designed form which includes salesman number, customer name, total bill, current due, and amounts running 30-60 days, 60-90 days, 90-120 days, and over 120 days.

Another specialized service is total revenue forecasting nine weeks in advance for both local and national billing. Formerly, this was less accurately estimated to only 30 days in advance. There is also individual revenue forecasting up to nine weeks in advance for each time salesman, along with automatic printing of salesmen’s commission reports.

Author Wheeler is president and general manager of KTLN, Denver, Colorado.
Computer Accounting

Automation and high accuracy is also provided for logging repeat spots—formerly done by hand. Time availability schedules that list open spots in the current broadcasting day and projections as far as a month in the future are printed automatically. Also automated is distribution of spots in the program log without conflict.

Generally, the new system permits the station to make more accurate analyses and projections; to determine strengths and weaknesses and to take remedial measures in time for them to be effective. This technique has the potential to strengthen the entire operation, including spot density and distribution, product mix and total sales.

Primary source of data is the traffic order form, prepared by hand when a spot is ordered. Data from this form is transferred by key punch to a set of several commercial cards. Each of these cards is a master card, containing all data on the account, including names of both salesman and client, contract number, source, type, program identity, sequencing code, commercial type, trade, product code, schedule, day, time scheduled, length in seconds, sponsored program length, rate, rate change or adjustment, expiration date, time and date performed, and the weeks scheduled throughout the year.

The card punch has several special features which permit use of multiple punched card files efficiently. One of these features is the ability to use a master card for automatically transferring selected data columns from one card to another. When basic information is transferred, special information may be entered on each card at the keyboard.

Properly sorted in the 082, these cards provide complete records to perform all of the operations described. The scope of the information available is impressive. In product categories alone, KTLN uses the standard Radio Advertising Bureau list of more than 50 product areas. This in turn provides good data for comparisons with national statistics by product, by spot frequency, etc. Thus the station not only has a good standard for measuring its own performance, it also has a good data base for sales promotions.

Cornerstones of the system is a group of forms specifically tailored to KTLN's operation. These forms offer maximum flexibility and utilization of the equipment. In addition to these, there are several forms designed to facilitate report preparation on the accounting machine. These include an availability schedule, printed as desired for the current day, same day a week away, two weeks away, or three weeks away; and a single form which serves as salesman commission form, cash receipts journal, or sales journal. Standard columns are set up for salesman number, client number, description, collection date, gross, agency commission, net, date of charge, and type of charge.

Most important is mechanization of daily program log preparation, end-of-month billing and affidavit preparation, accounts receivable aging, and forecasting. The station now obtains more detailed reports in many areas that could never be reasonably compiled by hand before the system was installed, and the reports are delivered quickly and efficiently.

Immediate results: better balance product-wise; harder hitting in special areas indicated in the forecasts, relating both to time and products. The new projections help salesmen keep their billings up, and show management where special attention may be necessary.
There's nothing like

Especially in the multiple channel transmission business.
So if you’re in, or thinking of going into multichannel TV transmission, you ought to know the professionals from ITC.
International Telemeter Corporation.
Because this is a group of highly skilled engineers, technicians and businessmen who know what makes the business of television tick.
From the ground up.
These are the men who gave the industry FOCUS 12, the 12 channel V to V ghost breaker.
These are the men who gave the industry PLUS 13, the 13 channel Channel expander.
These are the men who gave the industry GAMUT 25, a 25 channel converter free from all
outside interference.

And these are the men who can solve the problems that exist in multiple channel transmission. From the Head-End set-up, through a trouble-free installation, plus smooth consumer sales-service. And they can provide or recommend the finest equipment in the industry at the lowest possible cost.

They are what you might call the smart set. America's first experienced TV Set. Ready now to save you time, trouble and money at every turn.

You ought to turn them on soon.

International Telemeter Corp
2000 Stoner Avenue, Los Angeles, Calif 90025
a subsidiary of Gulf + Western Industries, Inc.
A New Vectorscope from Tektronix

- New measurement capabilities
- Push-button operating convenience
- Accurate measurements of chrominance and luminance amplitude
- All silicon solid-state reliability. Cool, quiet operation

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

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

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

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

Type 520 NTSC Vectorscope .................................................. $1850
Rack Mount Type RS20 ..................................................... $1850

U.S. Sales Prices, FOB Beaverton, Oregon

...part of the Tektronix commitment to progress in the measurement sciences

Research and development

Circle 22 on Reader Service Card

Circle 23 on Reader Service Card

May, 1968 — BM/E
CCTV VTR Recorder

A portable videotape recorder for continuous, automatic recording and playback with remote control operation for business and industrial applications has been introduced by Concord Communications Systems, Los Angeles, Calif. A major feature is the hand-size remote control panel which allows all functions of recorder to be controlled remotely. VTR-700 records picture and sound simultaneously and may be programmed to record automatically or play back on a continuous basis, or for a selected time period. It automatically records or plays back, stops, rewinds, then begins again, or shuts off automatically. The VTR-700 is a helical-scan, dual rotating head system operating at 12 in./s with 1/2-in. magnetic videotape. Weight is 60 lb; dimensions, 16 1/2 X 16 1/2 X 10 in.

Circle 100 on Reader Service Card

Compact Waveform Monitor

Type 528 solid-state television waveform monitor, made by Tektronix, Inc., Beaverton, Ore., requires only 5 1/2 in. vertical height and 1/2 rack width mounting space. Either of two video inputs, selectable from the front panel, may be displayed. Calibrated, 1-V and 4-V full scale (140 IRE Unit) sensitivities are provided for displaying standard video input levels. A variable sensitivity control permits uncalibrated displays from 0.25-V to 4.0-V full scale. Horizontal sweep selection provides 2 H (two line), 1 µS/div (expanded line), 2 V (two field) and 2 V MAG (expanded vertical blanking). A 9-pin connector for applying external staircase and relay control signals is provided on the rear panel for YRGB and RGB displays. Price is $800.

Circle 101 on Reader Service Card

'Shock Shield' Video Case

3M Co., St. Paul, Minn., has announced the development of a "shock shield" videotape shipping container designed to eliminate damage to tapes and reels as the result of rough handling in transit. The container features two molded plastic discs which suspend a roll of videotape and allow it to turn freely when vibrated, dropped or bumped. The new free turning approach drastically reduces problems of tape windowing and chinching. The discs also have a ribbed surface designed to absorb shock and eliminate flange dishing. The container is made of molded high impact plastic which is high in resistance to impact and puncturing. The plastic also is highly stable under a wide range of temperatures.

Circle 102 on Reader Service Card

IC Stereo Receiver

Sansui Electronics Corp., Woodside, N.Y., announces the introduction of its completely new Model 5000—a 180-W a-m/fm stereo receiver. Featured in the all solid-state receiver are four integrated-circuit components in the r-f section plus a specially selected FET fm front end.

Specifications include 180 W of I HF music power, providing 75 W per channel of continuous power at 4 ohms. Fm tuner sensitivity is 1.8 µV (I HF); selectivity better than 50 dB at 98 MHz; stereo separation better than 35 dB. The amplifier section provides a frequency response from 10 to 50,000 Hz ± 1 dB. Price is $439.95.

Circle 103 on Reader Service Card

Brackets for CATV Construction

Pruzan Co., Seattle, Washington, is introducing two CATV brackets that meet new pole clearance requirements present in many areas. The P-1592 hot-dipped galvanized bracket provides 15 in. pole clearance, requiring only 9 in. of pole mounting space. The top holes are centered so mounting may be done with double arming bolt for added reinforcement on heavy loads or corners. Outside mounting hole may be used for attaching one-bolt or three-bolt clamps, Figure 8 clamps, or other fittings. Bracket gives linemen greater clearance and is more durable than wooden crossarm. Type-1950-1 Specifications include 180 W of I HF music power, providing 75 W per channel of continuous power at 4 ohms. Fm tuner sensitivity is 1.8 µV (I HF); selectivity better than 50 dB at 98 MHz; stereo separation better than 35 dB. The amplifier section provides a frequency response from 10 to 50,000 Hz ± 1 dB. Price is $439.95.

Circle 103 on Reader Service Card

Brackets for CATV Construction

Pruzan Co., Seattle, Washington, is introducing two CATV brackets that meet new pole clearance requirements present in many areas. The P-1592 hot-dipped galvanized bracket provides 15 in. pole clearance, requiring only 9 in. of pole mounting space. The top holes are centered so mounting may be done with double arming bolt for added reinforcement on heavy loads or corners. Outside mounting hole may be used for attaching one-bolt or three-bolt clamps, Figure 8 clamps, or other fittings. Bracket gives linemen greater clearance and is more durable than wooden crossarm. Type
Optical Multiplexer TMM-211
For trouble-free operation in television broadcast service

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

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

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

Write for complete details — request Form TPB 170

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

Eight-In. Panel Meters

A new 8-in. line of panel meters has been added to the Ambassador Series of Ideal Precision Meter Co., Brooklyn, N.Y. With a 7.4-in. scale length, the new meters are easier to read and provide better reading accuracy because of their uncluttered scales. Meters have movements as sensitive as 50 µA, and an accuracy of ±2 percent full scale. Either rear or internal illumination is possible, and the zero adjust is positioned in the front of the meter. Both shielded and unshielded movements are available.

Compact Fill Lamp Has Barndoors

Berkey-ColorTran, Inc., Burbank, Calif., announces the introduction of a new lightweight and compact Mini-Lite "6" and "10" with integral...
BESIDES PRESTIGE, WHAT DID FULL-COLOR NEWS GIVE WFBM-INDIANAPOLIS?

A SPONSOR WAITING LIST.

In April 1967, WFBM-TV in Indianapolis changed to full color for all local news.

Station Manager Don Menke says, "We are in a favorable sponsor position." News Manager Bob Gamble was even more graphic. "Advertiser interest in news is at an all-time high."

Gamble tells why WFBM decided to switch to color in the first place. "We figured we couldn't afford not to go to color. It's an important new dimension in broadcast journalism, and if you're going to do your job right — sooner or later you have to add that dimension."

Gamble knows whereof he speaks about doing a job right. For two years running, WFBM has been chosen The News Film Station of the Year by the highly respected National Press Photographers' Association. Do they shoot color exclusively? "All the footage is in color. We just don't shoot black-and-white anymore."

A Kodak engineer helped WFBM set up for color processing with the Kodak ME-4 chemicals. They are pre-packaged — everything is a snap. Kodak engineers are as near as the phone to answer questions. Sooner or later everyone's local news will be in color. Why don't you make it sooner? Contact Kodak.
What can you expect from another broad?

Great things, when it's the new TRU-BROAD from Berkey-ColorTran! This newest member of Berkey-ColorTran's extensive line of floodlighting luminaires is perfect for motion picture and television applications to illuminate large surfaces in confined areas. Flick the switch. TRU-BROADS produce wide... smooth coverage with single ended Tungsten-Halogen "Quartz" lamps.

There's no peaking and the center of the beam is flat. At 10 feet, coverage is variable from 12 to 16.5 feet, using a 1000 watt lamp. Coverage at 10 feet is continuously variable from 21 to 30 feet in width.

Choose from 16 long life, low cost, constant color temperature Tungsten-Halogen "Quartz" lamps. 500 to 1000 watt lamps are available, operating directly from 120 volts AC or DC.

And TRU-BROADS operate easily and smoothly. Readily accessible, full focusing controls are used for hand operation in the motion picture model (LQTB-10), and for hand or pole operation in the television version (LQTB-10/TV).

Accessories include a four leaf barndoor, diffusion glass, dichroic daylight conversion filter that converts tungsten (3200°K) to daylight (5500°K).

This new rugged, compact, portable, well ventilated broad is a beauty. TRU-BROAD.

Write for complete data.

Berkey-ColorTran

Solving your lighting needs worldwide:

Berkey-ColorTran, Inc., U.S.A. • Berkey Photo Ltd., Canada • Berkey Technical (U.K.) Ltd., England • Berkey Technical, Denmark • Berkey Technical, West Germany • Berkey Photo, Italy • Motran Film Services Ltd., Israel • Berkey-Australia Pty. Ltd. • Berkey-RDS Co. Ltd., Japan.

Write Dept. BME 568 for Berkey-ColorTran new 1968 catalog and price list

Circle 25 on Reader Service Card
There are 50 sound reasons why you should look to FAIRCHILD for Professional Audio Components...

and here they are!

1. Integra I Card Cage (692 RM)
2. Integra II Power Supply (624)
3. Double Remote Attenuator Card (692 D2)
4. Remote Compressor Card (692 AGC)
5. Remote Equalizer Card (692 EQ)
6. Double Preamp Card (692 AD/TX)
7. Preamp, Remote Attenuator, Mix, and Out Card (692)
8. Ten SPST Relays with Mix Net Card (692 SW-10)
9. Five DPST Relays with Mix Net Card (692 SW-5)
10. Mixing Network (692 MX)
11. Mono Cartridge (225 A)
12. Remote Stereo Board (669 ST)
13. Rotary Attenuator (669 II)
14. Rotary Stereo Attenuator (669 ST)
15. Remote Attenuator Board (658 RAB)
16. Slide Actuator (658 ACT II)
17. Slide Attenuator (658 II)
18. Slide Stereo Attenuator (658 ST II)
19. Remote Attenuation Cell (658 RAC)
20. Integrated Mixer Control Module with EQ, AGC, and other features
21. Rack Frame (663 RM)
22. Blank Plate (663 BP)
23. De-Esser (675)
24. Ambient Noise Control Unit (653)
25. Dynalizer, Automatic Loudness Control (673)
26. Compact Compressor (663)
27. Passive Program Equalizer (664)
28. No Loss AGC Equalizer (664 A)
29. Rack Mfg Frame (662 RM)
30. Preamp, Line Amp (662)
31. Preamp, with 2 Remote Attenuators (692)
32. Blank Plate (662 BP)
33. Autotenu, Signal Controled Switch (661 TL)
34. Industrial “Handoff” Gain Shift Intercom Electronics
35. 10-Watt Monitor Amp (610)
36. Phone Equalized Preamp with HF Equalizer (674/600)
37. Single Channel HF Limiter, Conax (600)
38. Stereo Conax (602)
39. Mono Limiter (666)
40. Stereo Limiter with Matrixing (670)
41. 100 MA Power Supply (667 A)
42. 6.3V 3A DC Regulated Power Supply
43. 24V 2A DC Regulated Power Supply
44. Custo Shell for Mixing Console
45. Reverberation Device, Complete (658 A)
46. Reverberation Generator (658 B)
47. 16” Professional Turntable"
48. Turntable Base (751)
49. 12” 2-speed Turntable (755)
50. Turntable Base (756)

Write to FAIRCHILD — the pacemaker in professional audio products — for complete details.

FAIRCHILD RECORDING EQUIPMENT CORP. 10-40 61ST AVENUE + LONG ISLAND CITY, NEW YORK 11101 PHONE (212) 794-6163

May 1968 — BM/E
ZOOM-PAN-TILT simultaneously
(with only one hand)

UNLESS YOU HAVE A TELECASTER
9200 VIEWFINDER CAMERA, you're
missing the practical approach to
program production. Only Packard Bell
offers all these advantages—think
how much one-hand operation plus
eye-level viewing with built-in 60° tilt
improves sports event coverage.
What's more, you can slip on an
adapter in 30 seconds to increase
zoom lens range to 500mm. And
fingertip control of the iris lets you
simulate professional fadeouts. Write
today for full information and prices.

Packard Bell
Lawrence & Arnold Drive, Newbury Park, Calif. 91320 • Tel. (805) 498-6601

High-Power Balun
Kappa Networks, Inc., Carteret.
N.J., announces a series of high-
power baluns, offered for applica-
tions in matching unbalanced trans-
mittance outputs to balanced antennas
or transmission lines. Models are
currently available in 100-, 500-
and 1000-W ratings for the fre-
quency range of 2 to 30 MHz.
Photo illustrates Model PB 500,
conservatively rated at 500 W aver-
age power at maximum frequency.
Packaged in a 2 × 1 3/4 × 3 1/2 in.
hermetically sealed enclosure, unit
is designed to meet applicable mili-
tary specification. Price is $65.

Zoom and Focus Drive
Zolomatics, Hollywood, Calif., has
developed a combined zoom and
focus drive for the Angenieux 12 to
120 zoom lens. The zoom and focus
motors are mounted on the same
bracket and operated from a hand-
held battery pack that provides for
low and fast speeds. Zolomatics also
has similar controls for other types
of zoom lenses. Price is $750. 

Circle 106 on Reader Service Card
Circle 108 on Reader Service Card
Circle 113 on Reader Service Card

Circle 27 on Reader Service Card
Equalize 16-MHz Video Through 10,000 Feet of Balanced Cable for under $3000!

...with DYNAIR'S EQUA-DYN System

LDA-1001A Balanced Line-Driving Terminal for short-run applications. Has 75-ohm unbalanced input and 124-ohm balanced output with complex termination circuitry. Use with LRA-3035A for distances to 5,000 feet. Price: $620.00

LRA-3035A Equalizing Line Receiver Terminal. Has precision clamper and 35-DB adjustable equalizer, with 75-ohm unbalanced or complex-terminated 124-ohm balanced input. Use alone for RG-11/U runs to 5,000 feet, with LDA-1001A for balanced runs to 5,000 feet, or with LDA-1025A for balanced runs to 10,000 feet. Price: $1,985.00

DYNAIR's new solid-state EQUA-DYN system is ideal for studio-to-transmitter links and other short to medium run applications. Equalization is easily adjusted, making the system very useful for temporary transmission of video from special events. The differential phase and gain problems encountered in most systems of this type are avoided due to the extended 16-MHz bandwidth of the EQUA-DYN system. Transmission over distances greater than 10,000 feet is possible by cascading EQUA-DYN systems. Video may be passed through several systems with negligible signal deterioration.

Mail the coupon today for complete information on the EQUA-DYN system and a variety of other products DYNAIR manufactures for the educational, industrial, broadcast and community antenna TV industries.
What FM transmitter power do you need?

Gates has the most complete line of FM transmitters in the industry. From 10 watts to 40,000 watts. All with a 100% solid-state exciter employing DCFM (direct carrier frequency modulation) where modulation occurs at carrier frequency. The TE-1 exciter is the heart of all H series transmitters - one tube (1kW), two tube (3, 5 and 10kW), and three tube (20kW). All FCC-type accepted, ready for prompt shipment. Tell us the power you need and ask for data on our FM antennas. Write, or phone (217) 222-8202 today.

General Electric recently announced the following series of appointments: William R. Weber as manager of Business Planning Operation for the Consumer Electronics Division; Stanley W. Wickliffe to the position of supervisor for Western Region of Closed Circuit Television Business Section; George J. Kazacos as district representative for the Cleveland office of the Visual Communications Products Department; O.A. (George) Lively to the position of manager, marketing research and planning, Visual Products Department; and Harry J. Craig as district sales representative for the Cleveland office of VCPD.

Gates Radio Company
QUINCY, ILLINOIS 62301, U.S.A.
A subsidiary of Harris-Intertype Corporation
Circle 29 on Reader Service Card

NAMES IN THE NEWS

The Ampex Corp. announces the appointments of Albert Slater as northeast regional sales manager, Audio/Video Communications Division, according to A.A. Sroka, national sales manager; Nationiel M. Marshall as vice president, Industrial and Educational Products Division, according to Rein Narma, president and general manager; and Paul J. Weber as marketing manager, Magnetic Tape Division, it was announced by Leonard R. Salisbury, vice president and general manager.

Amperex Electronics Corporation announces the appointments of Albert H. Katz to the position of vice president of marketing, Professional Tube Division and Allan L. Merken as general manager of the Component Division.

Murray Tucker Kenneth W. Taishoff

Murray Tucker has been named director of Technical Operations and Kenneth W. Taishoff has been

Audio Devices, Inc.
233 E. 42nd St., N.Y. 10017
Gentlemen:
I've joined the big switch to Audiopak. Send me my free coffee (pencil holder) cup for this award-winning ad.
(MISC: Write on separate piece of paper if you have a lot of good things to say.)

Name ____________________________
Title ____________________________
Station __________________________
Address __________________________
City _____________________________
State ____________________________ Zip __________
My supplier is ______________________

Circle 30 on Reader Service Card

May, 1968 — BM/E
"Audiopak's all-around performance is better than any other cartridge I have used."

"The quality is better and they outlast all others."

Here's a new, exciting, comprehensive source of information—a thesaurus of ideas on radio showmanship—written for everyone involved in radio programming by a seasoned broadcast veteran. For the program director who is looking for a fresh source of ideas, this volume is loaded with suggestions to help him push his station's ratings to the top. For the ambitious announcer or deejay, this brand-new publication will help accelerate his progress.

10 BIG CHAPTERS

Included in the 10 Big Chapters are scores of unique ways to give your audience a reason to listen—the do's and don'ts of good programming and commercial success. You'll learn what constitutes really good programming and how to spot those audience losers, how to conduct a newspaper column, how to publish a newsletter, and how to start fan clubs. Longly treatment is given to production—what to do and what not to do. Audience-chasing practices, prevalent in so many cases, are exposed. Numerous ways to revitalize programming are included to help you pump new life into your station's sound and bank account!

HUNDREDS OF IDEAS

To help stations program more efficiently, "Radio Program Ideabook" contains tested and proven methods of systemizing the program department, of handling traffic and program scheduling, advertising standards and presentation, news standards, etc. Much of the content deals with sure-fire program ideas—audience participation, educational and cultural programs, agricultural programs, music programming, women's and children's programming, etc. A Chapter on informational programming discusses the program department and local correspondents, public service programming, special, holiday programming, etc. Hiring good announcers is fully explained. Included is the final Chapter, along with suggestions on developing cooperation with the commercial department and a number of ideas to help the program department operate more smoothly.

ORDER AT OUR RISK!

Yes, there is everything a station needs to set up, organize, and successfully operate its programming. 256 pages of tested and proven methods, and unique, fresh programming, and audience-building ideas.

"The Radio Program Ideabook" will be available for shipment on May 1. Order now at the Special Prepublication Price of only $9.95 (regular price $12.95) at our risk for FREE 10-day examination.

SEND NO MONEY! Simply fill in and mail NO-RISK coupon below for this invaluable book! (Note: 3 or more copies ordered at one time are subject to a 10% discount.)

PUBLISHER'S GUARANTEE

Put the information in this book to work for you for 10 days. If it doesn't prove to be worth several times its cost, return it and we'll cancel invoice.
NOW . . . NEW PERFORMANCE STANDARDS IN SYNC PULSE STABILITY
with Visual's CSG-1 Digital Sync Generator

Incorporating the latest state-of-the-art components—including digital design techniques and the reliability and simplicity of integrated circuits—Visual's CSG-1 Digital Sync Generator offers vastly improved time-base stability which eliminates loss of color-lock on video tape recording.

An unusually high frequency clock allows digital frequency division only, without the need for frequency multiplication with its inherent time-base errors. Other features include: Dual Outputs, permitting pulse assignment to Operation and Production; Built-in sync changeover for standby operation; Synclock, to provide uniform positive lockup to external color or monochrome sync, and Bar-Dot, a switch-selectable test signal for monitor linearity and color convergence alignment.

For that extra edge of performance and reliability at a practical price, upgrade your video signal origination and transmission with this state-of-the-art development from Visual Electronics!
QUESTION:
What is an INSTANT BUILDING?

ANSWER:
Hundreds of communication sites across America are now using the newest, most practical, most economical way to house electronic equipment. The "Instant Building", fabricated of aluminum and fully equipped to house your electrical and electronic gear before it leaves our factory. It's installed at your site by trained, experienced Advance crews "instantly".

For complete details on towers, reflectors, and buildings, contact:

ADVANCE INDUSTRIES
2301 BRIDGEPORT DRIVE
SIoux CITY, IOWA 51102
PHONE 712 943-5081

assistant plant manager of the Company's North Dighton, Mass., manufacturing facility.

Dr. Frederick Breitenfeld, Jr., executive director of the Maryland Educational-Cultural Broadcasting Commission, has been appointed to the Federal Communications Commission's National Committee for the Development of International Television Fixed Service. He has received a simultaneous appointment as chairman of a statewide committee on ITFS for Maryland.

Richard Estell, manager of WKar-AM-FM, East Lansing, Mich., and Jack D. Summerfield, general manager of WVR-FM, N.Y., have been elected to the advisory board of directors of the National Educational Radio Division of the NAEBC.

Elia Manchester, Jr., has been named vice president and general manager of Boston Insulated Wire Co.

Albert P. Fredette has been named to the editorial advisory board of Educational/Institutional Broadcasting, a new radio and television journal for educational broadcasters.

Jack Dichtenberg has been named to handle technical-commercial operations for the Norceco Radio Department of North American Philips Co., Inc., it was announced by William B. Keepin, department manager.

Carl W. Claras has been named vice president of International Video Corporation, according to Donald F. Eldridge, IVC president.

Robert H. Jones Jr. has been appointed chief engineer of WBLG-TV, Lexington, Kentucky, it was recently announced by Roy B. White, president.

RCA announces the following series of appointments: Kenneth T. Giebel as sales manager of RCA Parts and Accessories; John P. Taylor as Division vice president, Marketing Programs. Commercial Electronic Systems Division; and Fred E. Folsom to the position of staff vice president, Southern Distributor and Commercial Relations.

For complete details on towers, reflectors, and buildings, contact:

ADVANCE INDUSTRIES
2301 BRIDGEPORT DRIVE
SIoux CITY, IOWA 51102
PHONE 712 943-5081

Circle 33 on Reader Service Card

Circle 34 on Reader Service Card

Circle 35 on Reader Service Card

For complete details on towers, reflectors, and buildings, contact:

ADVANCE INDUSTRIES
2301 BRIDGEPORT DRIVE
SIoux CITY, IOWA 51102
PHONE 712 943-5081

Circle 33 on Reader Service Card
You can earn more money if you get a Government FCC License

...and here's our famous CIE Warranty that you will get your License if you study with us at home

NOT SATISFIED with your present income? The most practical thing you can do about it is add to your Electronics know-how, pass the FCC exam and get your Government License.

The demand for licensed men is enormous. Today there are over a million licensed broadcast installations and mobile transmitters on the air, and the number is growing constantly. And according to Federal Law, no one is permitted to operate or service such equipment without a Government FCC License or without being under the direct supervision of a licensed operator.

This has resulted in a gold mine of new business for licensed service technicians. A typical mobile radio service contract pays an average of about $100 a month. It's possible for one trained technician to maintain eight to ten such mobile systems. Some men cover as many as fifteen systems, each with perhaps a dozen units.

Opportunities in Plants
And there are other exciting opportunities in the aerospace industry, electronics manufacturing, telephone companies, and plants operated by electronic automation. Inside industrial plants like these, it's the licensed technician who is always considered first for promotion and in-plant training programs. The reason is simple. Passing the Federal Government's FCC exam and getting your License is widely accepted proof that you know the fundamentals of Electronics.

So why doesn't everybody who "tinkers" with electronic components get an FCC License and start cleaning up?

The answer: it's not that simple. The Government's licensing exam is tough. In fact, an average of two out of every three men who take the FCC exam fail.

There is one way, however, of being pretty certain that you will pass the FCC exam. That's to take one of the FCC home study courses offered by the Cleveland Institute of Electronics. CIE courses are so effective that better than 9 out of every 10 CIE graduates who take the exam pass it. That's why we can afford to back our courses with the iron-clad Warranty shown above: you get your FCC License or your money back.

Mail Coupon for Two Free Books
Want to know more? Send the coupon below for free copies of our school catalog, "How To Succeed In Electronics," describing opportunities in Electronics, together with our special booklet, "How To Get A Commercial FCC License." If coupon has been removed, just send your name and address to us.

ENROLL UNDER NEW G.I. BILL
All CIE courses are available under the new G.I. Bill. If you served on active duty since January 31, 1955, or are in service now, check box in coupon for G.I. Bill information.

Cleveland Institute of Electronics
1776 East 17th Street, Cleveland, Ohio 44114

CIE Cleveland Institute of Electronics
1776 E. 17th St., Cleveland, Ohio 44114

Please send me without cost or obligation:
1. Your 40-page book "How To Succeed In Electronics" describing the job opportunities in Electronics today and how your courses can prepare me for them.

Name_________Age_________
(Please Print)
Address__________________
City__________________
State__________________Zip_________

☐ Check here for G.I. Bill information

Accredited Member National Home Study Council
A Leader in Electronics Training...Since 1934

May, 1968 — BM/E

Circle 36 on Reader Service Card

Circle 37 on Reader Service Card ➤
Videotaping has gotten so good, it has a new name!

Tape is more versatile than ever! Everybody knows the key advantages of video tape. You work fast. You see your work as you go. You can be more daring and experimental.

But perhaps you didn’t realize how sophisticated the art of videotaping has really become: You can edit instantly... electronically... frame by frame. You can use slow motion, fast motion, stop motion and reverse action. You can go out on location. And you can combine all types of existing footage (stills, film) with new footage.

Now, the most life-like color yet: "Scotch" Brand Color Tape Plus.

"Scotch" Brand Video Tape No. 399 gives you the ultimate in color fidelity. The brightest, clearest, most life-like color ever. Color Tape Plus is so ultra-sensitive, you can use the most subtle lighting techniques. Copies are perfect. Blacks and whites are stronger. And No. 399 is almost impossible to wear out.

So please don't call it videotaping any more. There's now a new name for this complete creative medium...electography!

Want more facts? Write: 3M Company, Magnetic Products Division, 3M Center, St. Paul, Minn. 55101.
We apologize for—oops! We goofed). Our March 1968 guide to cable selection included the statement (p. 52) that the dielectric in seam welded cable is not compressed as much as it is in solid aluminum sheathed cable. This was a misstatement. Modern manufacturing techniques make seam welded cable the equal of seamless in this report.

This excerpt from a letter by F.W. DeTurk of Phelps Dodge explains the matter in full:

“In the manufacture of seam-welded aluminum sheath cables, flat tape is formed into a tubular construction and welded. Due to heat at the weld point the tube must be greater than its final diameter. The tube then is drawn down to final size. The drawing operation is the same as the drawing operation utilized in the manufacture of seamless cables. The amount of compression on the foam dielectric material is a function of the individual manufacturer’s practices. The amount of compression has nothing to do whatsoever with the seam-welding operation.

“At Phelps Dodge we have and still are manufacturing both seamless and seam-welded cables. The amount of compression placed on the foam dielectric material is the same for each operation.”

John E. Thomas of Lindsay Specialty Products—also writing on the subject—provides a plus for welded cable: “Welded cable also overcomes the serious shortcomings of seamless cable—that of excess hardening, which is caused by the work hardening of the extrusion process to which seamless cable is subjected.”

On p. 53 of the same article, we said that hermetically sealed cable uses an aluminum strip less than a thousandth of an inch thick. Actually, it is 8 thousandths of an inch thick.

Sirs:
Thank you for my subscription to Broadcast Management/Engineering. It seems, however, that some others have taken my copy of your magazine and, therefore, I would appreciate it if you would send further issues to my home address . . .
Thank you very much.
J.C. Allison
WLAP-WLAP-FM
Lexington, Kentucky

Sirs:
You are to be congratulated on the series, “Interpreting FCC Rules and Regulations,” which began the March issue of BM/E. The interpretation of FCC rules and policies can become rather hectic, and the clarification provided in your series is most enlightening.

I realize that your historical review and interpretation is no substitute for legal counsel, but it is certainly of value to the broadcaster who is trying to fully comprehend FCC rules, policies and regulations.

Thank you for making this information available.

Robert K. Avery
Assistant to the President
WQED-WQEX
Pittsburgh, Pa.

Sirs:
WCHC is a carrier a-m student-operated radio station here at Holy Cross. Just last January we moved into new facilities in a new campus center building. We began receiving BM/E in September of last year and have been very pleased with it—the ear-marked issues in our magazine rack give plenty of evidence.

Early this week the regional executive from United Press Interna-

SPECIAL COSMICAR LENSES FOR YOUR SPECIAL CCTV CAMERAS

COSMICAR lenses have improved in quality as CCTV cameras have improved. There is no problem whether your cameras are with a built-in EE mechanism or a viewfinder mechanism.

COSMICAR will make whatever new lenses you need for your CCTV cameras to satisfy your every CCTV purpose.

For example, COSMICAR lenses can be adopted to automatic or rear control system by one hand.

Superb lenses of proven ability from 12.5mm to 1,000mm and Zoom lenses are on sale.

For further details, write to:

COSMICAR OPTICAL CO., LTD.
(Former name: ICHIZUKA OPTICAL CO., LTD.)
568, Shinozaki, 2-chome, Shinjuku-ku, Tokyo
Cable Address: “MOVIEKINO TOKYO”
Circle 39 on Reader Service Card

SPOTMASTER Tape Cartridge Winder

The new Model TP-1A is a rugged, dependable and field tested unit. It is easy to operate and fills a need in every station using cartridge equipment. Will handle all reel sizes. High speed winding at 22½" per second. Worn tape in old cartridges is easy to replace. New or old cartridges may be wound to any length. Tape Timer with minute and second calibration optional and extra. Installed on winder or available as accessory. TP-1A is $94.50, with Tape Timer $119.50.

Write or wire for complete details.

SPOTMASTER
BROADCAST ELECTRONICS, INC.
8800 Brookville Road
Silver Spring, Maryland

Circle 38 on Reader Service Card

May, 1968 — BM/E
The information requested is for □ Immediate Use □ Future Use

COMPLIMENTARY SUBSCRIPTION QUALIFICATION CARD

1. I would like to receive BM/E - Broadcast Management/Engineering □ Yes □ No

2. □ I ☐ specify ☐ purchase □ Capital Equipment □ Replacements Parts □ Services □ None of the above
   □ I ☐ approve the purchase of: □ Replacement Parts □ Services □ None of the above

3. My company is □ AM □ FM □ TV Station(s) ☐ CATV Facility □ Telephone Company □ Other □ (Specify)

4. I am responsible for □ Multiple Facility □ Single Facility

5. Your signature □ Title □ Date

6. □ The address below is correct
   NAME □ STATION or CO. □ STREET
   CITY, STATE, ZIP

7. □ For Address Change — Give OLD Address below
   Is this your business address? □ Yes □ No
   If not your business address, please give us your business address so that we can avoid sending duplicate copies.

READER SERVICE CARD

BM/E - Broadcast Management/Engineering

GET MORE INFORMATION on products, free of charge. Just circle appropriate number below and mail card today.

Tell us what you like or dislike in this issue.

Good until 7-31-68
nitional paid us a visit, and in the course of our conversation he mentioned an article in BM/E that dealt with setting up a newsroom properly. I was especially interested in this article as I am news director here. I checked all of our back issues and did not find the article. The man from UPI said it must have been the August issue—a month before we began receiving the magazine.

If it is possible, I would very much appreciate a back copy of the magazine, or a reprint of the article. Thank you very much.

Thomas Milewski
News Director
wcnc Radio
Holy Cross College

July/67 BM/E on the way, T.M.

Sirs:

With reference to the Akerman, McAulay, Roycroft comments, something has been overlooked in the discussion by Mr. Roycroft of the comments of Mr. McAulay to Mr. Akerman. Mr. McAulay rightly raised the specter of heat as the probable cause of most premature tube failures in equipment using 4-400’s, 3X2500’s, etc. I submit—based on 15 years of living with a BC 5B Gates a-m on 1590, and three different transmitters, an RCA BTF-250, ITA FM-1000, and RCA BTF 10D, over the same 15 years—that heat and excessive filament voltage contribute to the early failures. Our tube life in the BC 3B, using 3X2500F3’s runs 12,000 to 15,000 hours.

In our fm transmitter, the first tube shorted at 300 hours, which I believe was due to vibration in shipping. The second tube was removed from service at 11,000 hours, when filament emission started to drop. This was a 4CX5000A. I understand this is not an unusual length of service. Two factors are helping here, and I believe that our methods could be used to advantage at any station, 250 W to 250 kW. First, we run our filament voltages at the low range of the manufacturer's specs. This aids in reducing the inrush current to the tube. We leave filaments on in extremely cold weather, during periods when the station is off the air.

To keep things cool in the summer, each of our transmitters has its own exhaust fan (3500 ft²/min.) ducted directly to the top of the transmitter cabinet, and to the outside. Besides keeping the transmitter cabinet cool enough to touch in 90-degree weather, getting that heat outside has kept our staff cooler to the touch as well. Incidentally, if one reads the instructions, the equipment manufacturers specify the volume of cooling air and size of fans required.

One other thing: make certain your transmitter is properly tuned and loaded. This is particularly true in fm service, and will keep those 4-400’s et al happy much longer, thus station owners will smile.

I feel attention to these items is doubly important to stations operating by remote control; and to those, an investment in some sort of automatic power line voltage regulation should be considered.

Virgil M. Royer
Operations Manager/Chief Engineer
WTVB, WANG Radio
Coldwater, Mich.

Sirs:

Will you be so kind as to inquire with KLTZ about the brand and price of the microphone stand illustrated on page 49 of the November/67 BM/E.

Incidentally, please also tell them that we plan to copy their control room layout.

Jose Arturo Fernandez
Woro-FM, Puerto De Tierra
Puerto Rico

KLTZ tells us it's a Luxo-Lamp—made in Sweden and available from Crabtree Electronics, Dallas, Texas. There cost was less than $15 at the time of purchase. KLTZ suggests that you specify a wall mount or a desk base.
LITERATURE OF INTEREST

For additional data, circle No. shown on Reader Service Card.

Automated programming case history, explaining how system made uniform program and improved efficiency possible at KNBT-FM, is available from Ampex (Bulletin 6276). 150

Terminal facility hubs used to provide interface between multiplex channelling and radio equipment are described in Term-Fac-1, Issue No. 2, from Radio Engineering Laboratories Div.

"Hot Lights and Cameras—Basic Techniques for Educational Television" is a 35-page bulletin from Hub Electric Co., covering architectural considerations, electrical guidelines and lighting principles and other useful data for ETV broadcasters. 152

Audio-visual system from CBS Laboratories—the Viewlex-10—is attractively presented in Bulletin AVS10-268(4623). System uses "unbreakable" one piece combined sight and sound program cartridge. 153

"What CATV needs is a selling tool that pays for itself" is the title of a brochure from Television Presentations, describing Alphanumeric News, the first all-electronic news service for home TV sets. 154

Mimeographing Model 530, capable of producing 7200 copies/hr is presented in Brochure 67-145 from A.B. Dick Co. 156

Revised resistor standard (RS-344) is a revision of REC-117, and includes power ratings of 1- through 15-W ratings with resistive tolerances of ±0.5 and ±10 percent. Standard is available from EIA Engineering Dept. for $2.20. 157

Wall-clip (PLL-1), listing specifications on wire-cable tubing, electronic hardware and switches, and radio-TV accessories is available from Birnbach Co., Inc. 158

Latest edition of English Electric Valve's 78-page "Abridged Valve Data Book" covers power, microwave, light conversion and other products such as lasers, cold cathode tubes and vacuum capacitors. 159

Audio connector adaptors are the topic of Bulletin No. 171 from Switchcraft. 160

Use of CCTV in conjunction with X-ray equipment at U.S. Naval Hospital, San Diego, Calif., is covered in 4-page Bulletin 8-96 from Coher. 161

Jacks, plugs, switches, connectors, indicating devices and audio accessories are topic of 55-page short form catalog from Switchcraft. 162

Lightning arresters standard for alternating-current power circuits, IEEE No. 28 (USAS C62.1—1967), provides transmission line discharge and a pressure relief tests for station and intermediate arresters. Standard is available from IEEE for $3.00 (members, $1.50). 163

Elapsed time meters are topic of Bulletin P-601 from Simpson. Ac and dc types are presented. 164

"The Use and Abuse of Children's Time"—a psychiatric examination of the beneficial and harmful effects of television viewing on child audiences—is a reprint available from NAEBRAT for 25 cents. 165

Solid-state X-Y monitors are topic of a 2-page bulletin from Measurement Control Devices. 166

Modular enclosures for electronic equipment are topics of Emcor I and Emcor II catalogs. 167

"Printed Circuit and Electronic Packaging Products" is a 64-page catalog describing over 23 product families containing a total of more than 1000 individual components. 168

Audio distribution amplifier (Model AA-60)—with one input and a number of outputs, like a video DA—is topic of brochure from Ward Electronic Industries. 169

Balun amplifier (Model BUDR-1), accepting balanced and unbalanced inputs and eliminating frequency interference, is topic of data sheet from Applied Electro Mechanics. 170

Rear projection 16mm projectors with continuous loop film magazines, and attachments for converting standard projectors for continuous operation are topics of data sheets from Kahle. 176

"A Little Less Hypocrisy, Please," first of a series in defense of television by Eric Severeid—is a reprint from TV Guide available from the Television Information Office. 179
How to train personnel with the new 3M 11:1 TV Zoom Lens

Training customers’ personnel is just one reason Giddings & Lewis Machine Tool Co., a division of Giddings & Lewis, Inc., in Fond du Lac, Wisconsin, uses a new 3M 11:1 TV Zoom Lens. It also helps them with sales training, sales meetings and with recording service manuals on video tape.

Giddings & Lewis designs and builds numerically controlled machine tools for heavy industry. These tools, as big as a two story building, will be operated by personnel who must be trained.

G & L video tapes information about their products with a closed circuit television system. Taping is done right in the shop using available light. In turn these tapes are made available as instruction guides to companies buying the machine tools.

The 3M 11:1 TV Zoom Lens allows a broad look at the huge machines, as well as extreme closeups. At f/2.2, it allows use at low light levels. The focal length range of 11 to 1 maintains perfect focus. And the lens’ ‘‘C’’ mount will fit any Vidicon camera.

The 3M 11:1 is American made, and available in motorized and manual models.

Discover what this remarkable lens can do for you. Write to R. V. Clapp, Product Sales Manager, 3M Wollensak Television Products, 3M Center, St. Paul, Minn. 55101.
The Scully 280. Station engineers tell us that "its beauty is in its simplicity". Minimum gadgetry means minimum downtime. Simple, close-tolerance construction of the transport deck on a sturdy base means longer periods between alignments. Simple plug-in assemblies mean instant repairs. Simple operating procedures mean less chance for human error. There's a lot of meaning in simplicity. Call your nearest Scully Distributor and talk it over with him soon. Simply.

Scully
Recording Instruments Company
A Division of DICTAPHONE CORPORATION
480 Bunnell Street
Bridgeport, Conn. 06607
(203) 335-5146
Makers of the renowned Scully lathe, since 1919
Symbol of Precision in the Recording Industry

Circle 44 on Reader Service Card
HELP WANTED (continued)

PRODUCT PLANNING MANAGER
TV BROADCAST EQUIPMENT

Company: Radio and TV transmitting equipment manufacturer.

Position: Product Planning Manager reporting to the General Manager. Responsible for the product planning activity including establishing product concepts, prices, sales requirements and guiding product development.

Qualifications: College graduate preferably in EE. Indepth knowledge of TV broadcasting equipment market. Strong background in sales and marketing responsibility required. Some product development experience desirable.

Compensation: Salary commensurate to background plus executive incentive participation. Full fringe benefits and profit-sharing retirement plan.

Future: Full opportunity to guide personal growth in relation to the growth of a new product area while functioning within a fast-paced, profit oriented company.

Location: Medium-size midwestern city with excellent schools and full facilities for the finest of family living.

Send resume or call Robert T. Fluent, Employment Manager, 217/222-8202.

Gates Radio Company
Quincy, Illinois 62301
An equal opportunity employer (M/F)

POSITIONS WANTED


Have rare card will fly. Seeking management position where these qualifications will be utilized. Broad and diverse sales experience, creative programming, Bachelor Science degree, radio/TV, developing active advertising, commercial pilot license, instrument and multi-engine rating. Resume is in Box 568-3, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Graduating June with degree in Management. Seek position with aggressive organization. Ambitious, reliable, hard working, 3rd class with four years college and commercial experience including two years as manager of highly successful college station. Box 568-4, c/o BM/E, Blue Ridge Summit, Pa. 17214.


POSITIONS WANTED (cont'd.)


Creative TV Producer/Director, 36, with heavy experience videotaping productions, remotes, music scoring, desires position with production center or station, or as production manager Box 568-5, c/o BM/E, Blue Ridge Summit, Pa. 17214.

Disc Jockey, newscaster, salesman, experienced, authoritative, aggressive, versatile, run tight board with third endorsed, dependable family man. Box 568-6, c/o BM/E, Blue Ridge Summit, Pa. 17214.


Available June 1—College student with first, transmitted and camera experience, cor. Desire morning, afternoon or daytime schedule. Midwest. Box 568-10, c/o BM/E, Blue Ridge Summit, Pa. 17214.
EQUIPMENT FOR SALE

EQUIPMENT FOR SALE (cont'd)

Video tape recorders slightly used helical scan all makes—Contact King. 201-267-9400. 201-777-8180. Box 228, Kinston, N.C. 28501. 201-777-8180.

Brand new remote amplifiers, 2 channel remote microphone amplifiers, 1/2 inch VU meter, battery operated, includes plugs and free 20Q FQL Kokomo, Ind. 46024. BOX 207, 46024.


"Broadcast equipment"—Audio visuals packages, bought and sold. SOS, 270 North Street, Chattanooga, Tennessee.

TRANSLATOR POWER back, all three, in excellent condition, Newark, N.J. 213/795-8881.

NEEDS A newscaster, mature sound. 3rd class endorsement. Looking to settle. Box 960-13, c/o BM/E, Blue Ridge Summit, Pa. 21724.

Soul R&B. top DJ. Needs start—authorized news—excellent contacts available. Contact Collier, 58272, Chicago, Ill. 701/223-0900.

MEASURING SERVICES

MEASURING SERVICES

TECHNICAL SERVICES (cont'd)

CRAMBERT CRISTALYS

PRECISION FREQUENCY MEASURING

SPECIALISTS FOR AM/FM-TV

445 Concord Ave.

Phone 876-2810

Cambridge, Mass. 02136

PROGRAM SERVICES

CATV SPECIAL

New lab prints free with each order

Contact the CATV program specialists

American Diversity Services

Box 975. Kingtons, Tennessee 37662

Phone area 615 239-9301

Background Music Service

For FM Multiplex-Wire Line-CATV Systems

Magne-Tronics, Inc.

21 East 40th Street, New York, N.Y. 10016

Something slipping? Try Vita Drive rubber drive cleaning on your tape drives. Vita Drive is recom-

ommended by many stations. $1.25 in 1 oz. bottle. Write Vita Drive, Dept. 9001, 6347 S. Western Avenue, Chicago, Ill. 60638.

DEEJAY MANUAR™ is a photo of Guss. Ideal. Brochures, gimmick Fun for the working deejay. Special $3.00 with this ad. Write for free "Broadcasting Comedy" catalog. Slow-Biz Comedy Service (Dept. E) 1735 E 26 St., Brooklyn, New York 11239.


DEEJAY...new exclusive gay line for radio. $5.000 COMEDY CATALOG FAB-FE! E. Orion. Boyer Road, Mansfield, Calif. 93538.

CONSULTANTS

JOHN H. MULLANEY and ASSOCIATES

Suite 71, 1150 Connecticut Ave., N.W.

Washington, D.C. 20036

Phone 202-223-1180

Member AFCC

ROSNER TELEVISION SYSTEMS

ENGINEERS

CONTRACTORS

120 E. 56 St.

29 South Muff.

New York

Plainview

N. Y. 10122

N. Y. 11803

VIR JAMES

CONSULTING RADIO ENGINEERS

Applications and Field Engineering

345 Colorado Blvd.

Phone: Area Code 303 333-5567

DENVER, COLORADO 80206

Member AFCC

TWA 910 931-6514

JANSKY & BAILEY

BROADCAST TELEVISION

ENGINEERING

Atlantic Research Corporation

The Susquehanna Corporation

1812 1 St. N.W.

Washington, D.C. 20006

Member AFCC

264-6400

May, 1968 — B/W/E

82
INSTRUCTION

R.E.I.'s famous (7) week course for the First Class Radio Telephone License is the shortest, most effective course in the nation. Over 98% of R.E.I. graduates pass F.C.C. exams for 1st class license. Total tuition $350.00. Job placement tree. Write for brochure Radio Engineering Incorporated Schools. 1316 Main Street, Summerville, South Carolina; or 1523 Glenn Road, Kansas City, Missouri; or 809 Caroline Street, Fredericksburg, Virginia.

FCC License in six weeks from the nation's largest license school. Compare reputations and success rates before you invest. Professional, announcing training on the nation's only fully school-operated commercial station used solely for training. School locations in Dallas, Atlanta, Chicago, New Orleans and Minneapolis. Write Elkins Institute, 2035 Inwood Road, Dallas, Texas 75215.

First phone through tape recorded lessons at home then one week personal instruction in Minneapolis, Atlanta, Washington, Houston, Detroit, Seattle or Los Angeles. Sixteen years FCC license teaching experience. Proven results. 95% passing. WRITE DEAN, Mutual Telephone, Calif. 90266 Telephone 379-4481.

FCC License preparation by correspondence. Also, associate degree in electronics by three semesters in correspondence and two semesters in resident classes. Free details on either course. Write: Grantham Institute, 7th & 19th, 1260 N. Western Avenue, Hollywood, Calif. 90027.

GUARANTEED FIRST PHONE. 4-6 weeks. Broadcast Engineering Academy, 703 Lemay Ferry, St. Louis 63125. 314/992-1155.

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

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

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

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

☐ Check enclosed ☐ Please invoice

Name
Station or Co.
Address
City State

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

May, 1968 — BM/E

ADVERTISERS' INDEX

**SONY CORP. OF AMERICA, INDUSTRIAL DIV.** Cover 4

**SPARTA ELECTRONICS CORP.** 25

**SUPERIOR CONTINENTAL CORP.** 14, 15

**TAB BOOKS** 22, 24, 70

**TEKTRONIX INC.** 60

**TELEMAXION, INC.** 62

**ULTIMATION SYSTEMS** 78

**VISUAL ELECTRONS CORP.** 71

*See ad also in BROADCAST EQUIPMENT BUYERS GUIDE*

ADVERTISING SALES OFFICES

NEW YORK CITY 620 Second Avenue New York, New York 10017 212-661-0450

New York State

Charles C. Lenz Jr.

Northern New Jersey

Richard M. Millar

Philadelphia Area

Frank McDonald

Southeastern States

Charles C. Lenz Jr.

NEW ENGLAND

41 Stevens Lane

Cohasset, Massachusetts 02025

617-393-0029

Donald B. Kennedy

MIDWEST

612 North Michigan Avenue

Chicago, Illinois 60611

312-642-3774

Charles E. Moodhe

Ralph Bergen

WEST COAST

1245 East Walnut Street

Pasadena, California 91106

213-795-1521

213-684-0590 (Los Angeles)

Lawrence C. Papp

Thomas Boris

Jules E. Thompson Co.

1111 Hearst Building

San Francisco, California 94103

415-362-8547

William Healey

JAPAN

Nippon Keinou Inc.

P.O. Box 410

Central Tokyo, Japan

Yoshi Yamamoto
FROM THE EDITOR

A Rerun, or, Same Old Story

At last year's NAB, the fiercest session was the industry-FCC panel discussion. Manufacturers and broadcasters agreed that the pace for approving new ideas or new equipment was too slow. The FCC had to get with it, they said.

Last year at this time, Collins Radio had filed a petition to change the FCC rules to permit automatic fm transmitters. The first action, some 377 days later, was not a proposed FCC rules change, but simply the mailing of a Notice of Inquiry to the industry. Will it be another year before regs catch up with technology?

Last year, broadcasters and manufacturers agreed that the FCC rules were largely obsolete. FCC panelists agreed, but said it didn't have the budget or manpower to tackle the problem.

Last year, broadcasters said they'd pitch in and recommend where and how the rules should be changed. One year later, what correspondence did the FCC get? "Damn little," said one FCC panelist.

The FCC panelists, both last year and again this year, were not easily intimidated. Harold Kassens said the FCC doesn't change rules until it thoroughly understands how the change will affect most operators and how on-air performance is likely to be affected. That's why broadcasters have to respond by filing comments. And, partly to get off the hook, the FCC said it couldn't do such a good job of handling daily matters promptly if it diverted its manpower.

So, will it be another year of the same? Will the groups meet again next year and find catharsis by sounding off vituperatively, then go back to business as usual?

There's some hopeful reform move afoot. Panelist A. Prose Walker of Collins proposed that a committee be constituted in 90 days, that it establish milestones and target dates for rule revisions, that it file three quarterly progress reports, and that a full report be given next NAB. Moderator Malcolm Burleson said he would urge the proposal at the NAB Engineering Committee.

But, let's not let "George" do it (in this case of NAB's George Barrett). Engineers must give their views on FCC letters of inquiry. Do not let management put you off by saying the station's legal attorney has to file and that it will cost $500 or more. Follow the advice of John Hurbut, president of WWMR, Mt. Carmel, Ill., who, at the small market radio panel, said that to be heard at the FCC, it isn't necessary to go through intermediaries and file legal briefs. Hurbut said just "start talking."

James A. Lippke
Let's put a stop to all those off-color remarks about your station.

Color television, as you know, is pretty popular these days. Otherwise, you wouldn't have spent a fortune installing color equipment. But, if you're in a multi-station market, viewers may be reluctant to turn to your channel because they know they'll have to fiddle with the color to make it right.

Now, with International Nuclear's brand new TPC2 Burst Phase Corrector, you can bring your station's color hue into phase with F. C. C. standards and other stations in your market, — without costly transmitter investigation and modification. But maybe everyone's color hue in your market is different.

Then take a tip from Nashville, where the three stations in the market got together and standardized their color hue.

Now folks in Nashville have stopped all that "off-color" talk. They're back to cussing the Dove in Mrs. Murphy's kitchen.

For more information, write or wire or phone collect:

Ray Weiland, President
International Nuclear Corporation
608 Norris Avenue, Nashville, Tennessee 37204.
Ph: (615) 254-3365

the Cuss Stopper.

Circle 2 on Reader Service Card
KCBY-TV, Channel 11, Coos Bay/North Bend, Oregon, serves 23,000 homes in the sparsely settled logging areas stretching over 100 miles along the Pacific Ocean in southwestern Oregon. A prime function of the station is uniting these scattered viewers via intercommunity activities of general interest.

A Sony BV-120 Videocorder® is helping to knit this audience together.

Says KCBY's commercial manager Gary Young: "We hope to help newcomers become adjusted to our region so that we can have a more unified community spirit. This can only happen if they see us and themselves in action. That's one reason why our Sony Videocorder is so valuable to us."

Chief engineer Glynn McCready states: "The Sony Videocorder fits in perfectly with our type of operation, where simplicity, portability and sturdiness are important. The BV-120 meets all these requirements. We have over 700 hours on the Videocorder and have not had a single major problem. When 70 percent of your programming is on tape and you have only one machine, you know how important it is!"

No matter how large or small your audience, to find out how you can bring them together—profitably and practically—call or write us today.

For complete details on this application, ask for APB 107.