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BM/E

THE MAGAZINE OF BROADCAST MANAGEMENT/ENGINEERING

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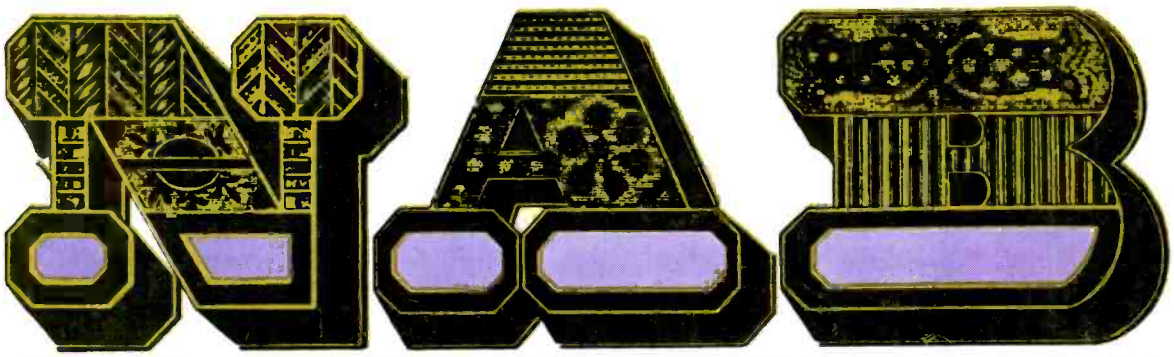

CONVENTION PREVIEW

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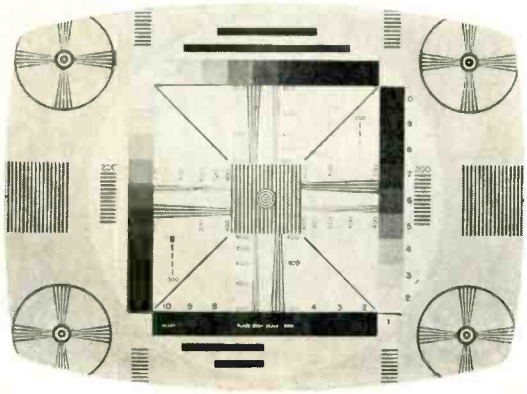
If you want to broadcast the sharpest TV,



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PRECISION MAGNETIC TAPE

Two important points of superiority you'll find in Memorex video tapes—both of which result in visibly better pictures—are their super-smoothness and their high-conductivity coating. These features result in absence of dropouts, picture clarity, and freedom from static build-up. You'll also get significantly reduced head-wear and a greater number of re-plays—a direct benefit from Memorex's experience in producing premium error-free tapes for computer use.

If you'll write Memorex Corporation at 711 Memorex Park, Santa Clara, California 95052, we will send you video tape specification data and a bibliography of technical information available from the Memorex library of reprints. Also let us know, by letter, if you'd like a free sample reel of Memorex video tape.

Memorex Branch Offices in New York, Philadelphia, Washington, Atlanta, Orlando, Dayton, Chicago, Detroit, Dallas, Los Angeles, San Francisco; Offices and Affiliates in London, Cologne, and Paris.

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MARCH 1966/VOLUME 2/NUMBER 3

BM/E

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The big event of the year for broadcasters, the 44th Annual NAB Convention, is just a couple of weeks away (March 27-30, Conrad Hilton Hotel, Chicago). What will you see and hear? BM/E has the scoop (see pages 40, 42, etc.).

And we'll again have our popular 16-page Convention Guide for you, in the April Convention issue. Be sure to pick up your copy when you register. Also, to keep you well informed during the Show, we'll have something new this year. You'll find our Convention Daily outside your hotel room door each morning (Mon., Tues, and Wed.). Registered yet? See you there!

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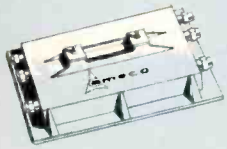
Facts about Ameco!

Do you know AMECO equipment is used in over 80% of the CATV systems?

Do you know AMECO has turnkeyed over 7500 miles of CATV plant?



Do you know AMECO manufactures over 207 basic CATV products?

Do you know AMECO has overnight, off-the-shelf delivery on most products?

Do you know AMECO has more experienced CATV engineers than any other leading CATV manufacturer?

Those are just a few of the facts...

More important are the people . . . Ameco people, who really work for you. 1000 skilled people able to foresee the needs of CATV. People who produce over 250,000 connectors each month — who assemble 3500 solid state amplifiers every month.

So let's add one last fact: Ameco is built on PERFORMANCE, PRODUCTS AND PEOPLE. Can you ask for a better foundation for your CATV system? *WHEN QUALITY COUNTS—COUNT ON AMECO!*

Performance-Proven Products

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OFFICES IN ALL PRINCIPAL CATV AREAS

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BROADCAST INDUSTRY NEWS

FCC's Plan for CATV Regulation

The FCC has reached agreement on a broad plan for regulation of CATV systems, asserting jurisdiction over all systems except those serving less than 50 customers or classified as an apartment house antenna. The new CATV rules, to be incorporated in a Report and Order soon to be issued, cover eight major points:

(1) A CATV system will be required to carry signals of all TV stations within whose Grade B contours it is located—substantially the same requirements now imposed on microwave-served systems.

(2) A CATV system will be required to avoid same day duplication of local station programs. This requirement will apply to prime time network programs only if they are presented entirely within what is locally considered to be prime time. Non-duplication protection will *not* be afforded programs carried in black and white by the local station if available in color from a more distant station on the cable.

(3) The Commission will continue to recognize private agreements between CATV operators and local stations. Also, it will give *ad hoc* consideration to petitions from local TV stations seeking more protection than afforded by the rules, or from CATV operators seeking waiver of the rules.

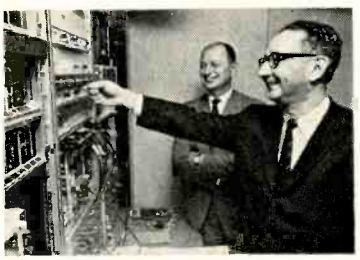
(4) CATV operations in the top 100 markets (ARB), where they would extend TV signals beyond Grade B contours, will require FCC approval. This decision is effective immediately, and applies to all CATV operations initiated after February 15, 1966.

(5) Smaller market systems will not need prior approval. However, the Commission will entertain, on an *ad hoc* basis, petitions from interested parties concerning the carriage of distant signals by CATV systems in such smaller markets.

(6) The Commission will require all CATV operators to submit the following data: (a) names, addresses and business interests of all officers, directors, and persons having substantial ownership interests in each system; (b) number of subscribers to each system; (c) TV stations carried on each system; and (d) the extent of any existing or proposed program origination.

(7) To the extent necessary to carry out its regulatory program, the Commission asserts its present jurisdiction over all CATV systems, whether or not served by microwave relay.

(8) The Commission will recommend that Congress enact legislation designed to express basic national policy in the CATV field, including those matters over which the FCC has exercised jurisdiction as well as those still under consideration.



FCC Commissioner Robert E. Lee throws the switch to put WFLD Chicago, on the air. UHF Channel 32 Chief Engineer Kusack (l) supervises the operation.

"Managing Your Money"

A daily 5-minute program series, "Managing Your Money" has been developed for radio by Better Homes & Gardens magazine. The show, available on a locally exclusive basis, is said to be appropriate for bank, savings and loan, and other financial organization sponsorship. Currently being sold for 13 and 26 week periods, audition tapes are available for interested stations.

D. H. Overmyer Communications Co., has contracted with Visual Electronics Corp. for complete studio equipment for up to 7 TV stations. Planned on-air date of first Overmyer station WDHO-TV Toledo, is April 1st. Other stations will be in Atlanta, Ga., Pittsburgh, Pa., Rosenberg (Houston), Tex., KBAY-TV San Francisco, Cal., and Newport, Ky. Robert W. Rader, Exec. vp of Overmyer (l) is shown signing the order in the presence of James B. Tharpe, Visual Pres. Observing are Morris A. Mayers (l.) of Visual and Arthur M. Dorfner, Overmyer vp.

Color Test Film

SMPTE has available a new color TV test film for use by telecasters, manufacturers, and others, as a reference print for subjectively evaluating color release prints and color transmission systems. The film, produced in 16 and 35-mm and 2 ″ x 2″ slides, incorporates a narrative sound track.

High-Band VTR Sales Up

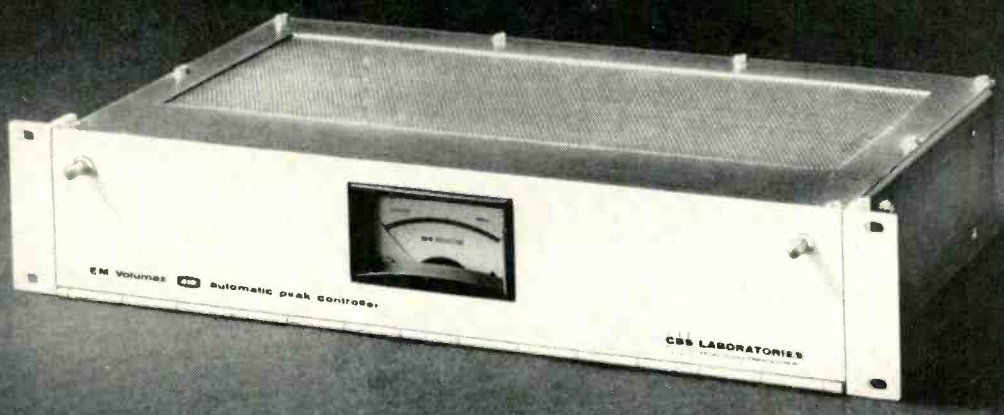
ABC Television has awarded Ampex Corp. a contract for more than $900,000 for ten high band color videotape recorders. The VR-2000 machines will be used for studio work and in Mobile vans in New York and Hollywood. The current order will bring the number of VR-2000's used by ABC to 17.

WKY Television Systems,

www.americanradiohistory.com

This is the new FM Volumax.
It prevents FM overmodulation without distortion.
It eliminates SCA crosstalk.
It solves your pre-emphasis problem.

It is yours absolutely free.
(for 30 days)



Overmodulation. An FM station engineer's headache. Use a clipper and you get distortion. Use a common limiter and you get pumping. You could reduce modulation levels. But that's not the answer.

So CBS Laboratories developed something new. A solid state FM limiting device that replaces common limiters and clippers. And it is unconditionally guaranteed to prevent FM overmodulation and SCA crosstalk *without distortion.*

Hard to believe it does everything we say? Just send this page and your station letterhead. We'll send you the FM Volumax free. (For MPX stations we'll send the stereo model.)

Use it 30 days. After that, send it back if you can part with it. We'll even pay the freight. Or keep it for only $695. Double that if you want the stereo model.

AM broadcasters were quick to respond to our free 30-day Audimax and Volumax offer. Now with the new FM Volumax we can make you the same offer. Be the first on *your* band.

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

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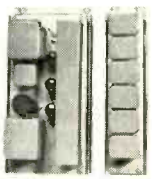
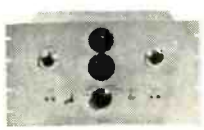
CINEMA
PRECISION AUDIO EQUIPMENT

AUDIO ATTENUATORS
Cinema's new compact rotary slide-wire attenuator is now available for your mixing consoles as single or ganged units. A must where smooth control is desired. Other standard types are also available for applications demanding precision noiseless attenuation, reliability and long term stability.

GRAPHIC EQUALIZER
The Cinema Graphic Equalizer offers a compact system of extreme flexibility. Each of the six controls permit the operator to equalize or attenuate that portion of the spectrum 8 db. This is an active unit having zero insertion loss and up to 35 db additional gain.



DIP FILTER
Features a notch depth of 50 db minimum and which is continuously variable from 30 to 9,000 cps. Extremely useful for removing single frequency noise and for harmonic distortion measurements.



PROGRAM EQUALIZER

Provides for accurate frequency response corrections in audio equipment. Easy operation of the two control knobs allow over 395 curve combinations. Detented action of the controls permits reference dial settings for future duplication of desired characteristics.

DEGAUSSERS
Cinema bulk degaussers are a favorite with sound men throughout the world. Provides erasure of program material and residual noise from magnetic tapes on reels up to 17 inches in diameter and 2 inches wide. Also, "Pencil" type degaussers are available for erasing small areas thus avoiding splicing.

Hi-Q's Cinema precision audio equipment is backed by an enviable reputation generated by over 25 years of outstanding service in critical sound recording, broadcast and laboratory applications. Many other custom audio products are available. Put the benefit of our experience to work for you. Write for Hi-Q's Cinema precision audio equipment literature today.

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owned by Oklahoma Publishing Co., has ordered four VR-2000 units. Three will go to KHTV Houston and the fourth to KTVT Ft. Worth. KHTV, a UHF, is scheduled to begin full color operations this year. Canadian Broadcasting Co. has ordered 27 VR-2000's for installation in CBC TV stations in major cities. Delivery is expected to begin soon. The units will be used to record network color shows for replay at convenient local times.

American Cable Adds

American Cable Television, Inc., affiliate of Ameco, has purchased the Cable-Vista CATV system at Elizabethtown, Ky., and will replace and expand the facilities to serve 2500 subscribers. The Savannah (Ga.) TV Cable Co. has also been added to the list of systems managed by American Cable, and 200 miles of cable will be added to the existing 50-mile plant.

New Projection System Patents

Fairchild Camera and Instrument Corp. has announced that the U.S. Patent Office will issue two patents for rear screen sound-photo projection systems. The patents will cover a film transport apparatus and cassette and feature no film threading, no rewinding, and a 2-second film change. Presently, the inventions are being used in the design of the Mark IV and Mark V 8mm projectors, but are applicable to a wide range of projection systems with different film sizes.

Engineers to Meet

The Society of Broadcast Engineers will hold their 3rd annual meeting March 27 at the Conrad Hilton Hotel, Chicago, during the NAB Convention. The meeting is scheduled for 2:30 PM in the Williford "C" Room. All members are requested to attend, and any non-member engineers who wish to join or obtain information about the Society are welcome. The Association will also maintain a hospitality suite, Room 1235A.

Pruzan Co. Stocks CATV Cable

The Jack Pruzan Co., Seattle, Wash., is offering Phelps Dodge coax cable for CATV trunk and feeder lines. Aluminum sheathed cable for overhead installation, aluminum cable with polyethylene jacket for direct burial, and RG59/U drop cable are being stocked in both the Pacific Northwest and in California to provide quick delivery. Pruzan Co. policy is to ship orders the same day they are received.

A contract for more than a half million dollars has been awarded by Western Electric to the Colorado Springs Div. of Hewlett-Packard to produce new precision waveform oscilloscopes, designed to meet Bell Telephone Labs standards for the next generation TV waveform monitors. New cathode ray tubes have been developed to produce easily-visible displays of hard-to-see signals, such as T/2 (62.5 nanosecs), T (125 nanosecs), and 2T (250 nanosecs) sine-squared test pulses. A commercial version of the new scopes, differing mainly in mechanical detail, will be shown at the NAB Convention.

San Juan Color Studio

WITA-TV, a new UHF station in San Juan, P. R., has ordered the Island's first color TV studio equipment from RCA. The $175,000 order includes a complete film system, film projector, and three TK-60 studio cameras.

Notice to Convention Goers

The April issue of BM/E, containing the "2nd generation" 16-page Convention Guide, will be distributed at the Convention. Be sure to look for your copy.

BM/E will also publish a Convention Daily on Monday, Tuesday, and Wednesday. Copies will be delivered to registrants' rooms by 7 a.m.—in plenty of time to read before breakfast.

All Convention goers are cordially invited to drop in at the BM/E Hospitality suite, 1105A Conrad Hilton.

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New from Wilkinson!

Model 4N-1

4 in 1 Portable Solid-State

FIELD INTENSITY METER + NULL DETECTOR + STANDARD SIGNAL GENERATOR + AM MONITOR RECEIVER!

At last a practical, extremely versatile instrument for broadcast stations and consultants. The new Wilkinson Model 4N-1 all solid state Field Meter combines all the features broadcast engineers have long been awaiting in a completely portable 12-pound unit.

As a Field Intensity meter, the Wilkinson 4N-1 measures field strength with 3% accuracy and reduces measurement time because no nulling is required. Long-term reliability is assured because all critical circuitry is passive.

As a Null Detector for use with a RF bridge to measure impedances, the Wilkinson 4N-1 eliminates the complexity of a multi-instrument AC test set-up. Visual null detection eliminates earphones and broken ear drums.

As a Standard Signal Generator, the Wilkinson 4N-1 is invaluable since its output accuracy of 3% from one microvolt to one volt is essential to many broadcast applications.

As a Monitor Receiver, the Wilkinson 4N-1 has sensitivity of 5 microvolts nominal, permitting excellent off-air monitoring in extreme fringe areas.

The frequency range of the complete Wilkinson 4N-1 is 535-1605 kc.

The Wilkinson 4N-1 is powered by dependable nickel cadmium batteries, rechargeable from AC or an automobile source. Ease of operation is assured by simplicity of procedure, oversized controls and meter, built-in speaker and illuminated panel. The Wilkinson 4N-1 is packaged in a sturdy and attractive genuine cowhide case. When the case is closed, the power is interlocked off.

For complete details write on your company letterhead to:

WILKINSON ELECTRONICS, INC. 1937 MACDADE BLVD. • WOODLYN, PA. 19094
TELEPHONE (AREA CODE 215) 874-5236 874-5237

See us at Booth 321, Continental Room, NAB Convention in Chicago.

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SOUNDMEN GET SOUND ANSWERS FROM FAIRCHILD!

FAIRCHILD DYNALIZER MODEL 673

The newest approach for the creation of "apparent loudness"—the Dynalizer is an automatic dynamic audio spectrum equalizer which redistributes frequency response of the channel to compensate for listening response curves as developed by Fletcher-Munson. Adds fullness and body to program material.

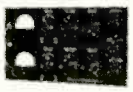
NEW! FAIRCHILD BASS-X

A dynamic low frequency roll-off filter – that can roll off high level low frequency information, starting at 500 cycles, with a maximum obtainable attenuation of 12 db at 30 cycles. Device is automatic, is in use only when needed – therefore it does not alter overall apparent low end response to the ear. THE FAIRCHILD BASS-X allows higher levels to be maintained in disc recording, and particularly assists AM stations in increasing their effective signal by automatically controlling the often troublesome low end response.

FAIRCHILD CONAX

The world-accepted way to control high frequency spillovers in FM due to pre-emphasis. Lets your station maintain real high levels even with brass and crashing cymbals and still avoid FCC citations.

FAIRCHILD LIMITER MODEL 670



Fast attack stereo limiter (50 microseconds) with low distortion and absence of thumps. Sum and difference limiting position eliminates floating stereo image. Includes regular channel A and B limiting. Dual controls, dual meters provided. Used throughout the world. (Mono model available).

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

FAIRCHILD

RECORDING EQUIPMENT CORPORATION
10-40 45th Ave., Long Island City 1, N. Y.

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BROADCASTERS SPEAK

I have just read your publication for January and noted in the Broadcast Industry News an article on the power failure of last November 9th. You mentioned several New York City radio stations and how they performed with emergency facilities during this crisis. It would appear that your editorial staff did not research the New York City market completely because you failed to mention the service which WCBS Radio gave its listeners that night. I would like to point out to you that WCBS Radio (etc., etc.).

Ralph E. Green
Director Technical Operations
WCBS Radio, New York, N. Y.

Tsk, tsk. Don't feel bad—a lot of other small stations weren't mentioned, either. Perhaps your nights will be brightened by the article beginning on page 28, which we were working on when the lights went out!

I am the Vice-President and Comptroller of a new 10,000 watt AM broadcast station, licensed to serve the Kindersley-Rosetown area of Western Saskatchewan. I would very much appreciate receiving your magazine, which I believe to be one of the best I have seen.

Wm. H. McVeigh
Midland-Osler Securities Ltd.
Drumheller, Alberta, Can.

Your magazine fits the industry like a glove and I keep a file of all the issues. I have lost or had borrowed the October issue and need a replacement. Please send a copy at the earliest. Bill any charges to this station.

Dean Loudy, Tech. Dir.
Northern Neck and Tidewater Broadcasting Co.
Warsaw, Va.

OK, but don't lose this one—we're about out.

Having moved to Annapolis from Indiana, Pa., where I was a happy recipient of your publication, I find I'm without your most interesting articles. The people down here read, rip and file most sections and by the time I get (the magazine) it's in too poor shape to read. Would you please (add) my name at the following address.

All broadcasters I've talked with say, and I'm in agreement, that your magazine is the most helpful in the industry. Many thanks for the publication and continued success in 1966.

Gary L. Portmess, Prod. Dir.
WYRE Annapolis, Md.

First may I compliment you on one of the finest broadcast magazines available anywhere today. Although you were kind enough to place both my Assistant Manager and Chief Engineer on your mailing list, our copies are still shop worn.

I think possibly your best service to the broadcaster is the FCC Rules page. It is with regard to this section that I make a request. Since we have an offset printer here at the station, I would like permission to reproduce this (January) article, with full cred-

Continued on page 64

NAMES IN THE NEWS

Election of three staff executives as vp's has been announced by **E. G. Gramman**, Pres. of Dynair Electronics, Inc. Appointments are **G. W. Bates**, vp Engineering; **F. P. Ciambrone**, vp Operations; **P. R. Seng**, vp Finance; **Robert N. Vendeland**, former sales mgr. for Conrac, has been elected vp Marketing.

E. G. Gramman

G. W. Bates

F. P. Ciambrone

P. R. Seng

John J. Zwald has been appointed Manager of New Product Planning for Sylvania Electric Products, Inc., Mr. Zwald joined Sylvania in 1950.

Frank B. Gorman has been named director of planning, CBS Labs. He recently retired from the U.S. Navy with the rank of Captain.

George W. Green has been appointed Ameco vp of marketing. Reporting to Mr. Green (seated) are **Don Hoffman** (l.), contract sales director, and **Richard Yearick**, vp product sales. **Arlo Woolery** has been named

special assistant to the president and director of public relations. He will establish a management institute for CATV managers and coordinate Ameco's technical school activities.

Three men have been promoted by Magnetic Products Div. of 3M Co. to audible range/videotape sales manager: **Sidney M. Adler** in Los Angeles, **John B. Hanks** in Philadelphia, and **John C. Traynor** in Chicago.

Continued on page 89

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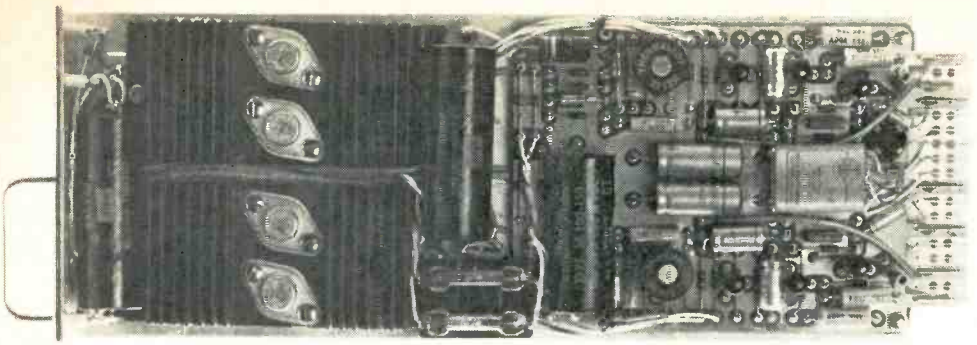
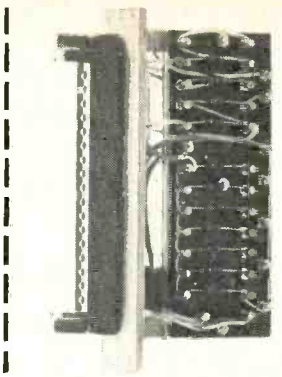


AA-601 Plug-in Audio Distribution Amplifier Module (with cover removed) — self contained, solid state design. Each module provides up to 6 outputs (60 in a 5¼" frame) at +24 dbm, 600 ohms balanced.



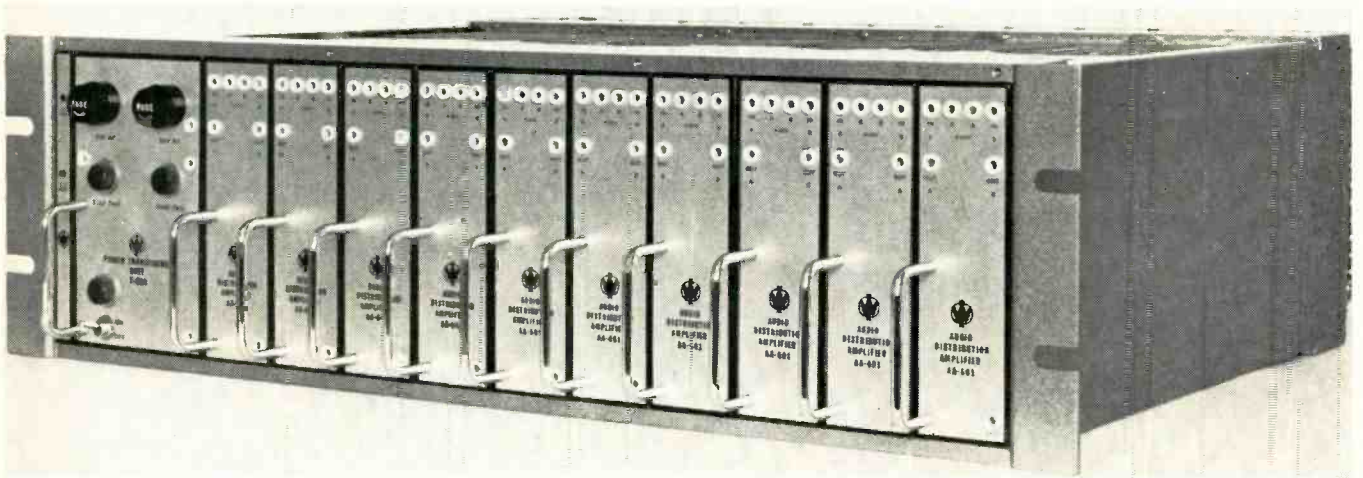
Connector Assembly mounted on rear of rack frame determines input/output configuration and provides all connection terminals needed.

The Audio Equivalent Of A Video Distribution Amplifier—Avoids Cross-Talk – Provides High Quality Performance and On-Air Reliability

AUDIO DA

- HIGH ISOLATION BETWEEN OUTPUTS AVOIDS CROSSTALK — 60 db or better across entire audio band width, balanced or unbalanced.
- ADVANCED, HIGH-RELIABILITY. SOLID-STATE CIRCUITRY — minimizes possibility of failures that interrupt or degrade audio.
- RESPONSE ±0.25 db 30-15,000 CYCLES — less than 0.5% harmonic distortion.
- INPUT MATCHING OR BRIDGING, BALANCED OR UNBALANCED, 600 or 150 OHMS.
- WIDE VARIETY OF OUTPUT NUMBER/IMPEDANCE/LEVEL CONFIGURATIONS AVAILABLE.

See this, and many other new exciting Ward products at the NAB Convention



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HERE ARE 8 GREAT WAYS KAISER-COX CATV EQUIPMENT MAKES MONEY FOR YOU

Pictured above is the full line of solid-state, all-band amplifiers (8 in all) offered in the great new Kaiser-Cox Phoenician Series. Its modular circuit design permits you to plug-in whatever is needed . . . from trunkline amplifier to 2 and 4-output bridging amplifiers to combinations of both, with or without automatic gain control and tilt. Also, standardized fittings are used throughout the series. This interchangeability saves you money on parts inventory, *today* . . . saves you money as you convert for expansion, *tomorrow!*

The Phoenician Series

Other money-saving Kaiser-Cox innovations:

- Space-age dependability. Less trouble-shooting time . . . fewer lost pay-hours.
- Superior design. Test point access ports, universal hinges, knob controls . . . all add up to ease of field-testing and maintenance . . . more money saved in manhours.
- Kaiser-Cox products are warranted to perform to published specifications . . . no money lost in rejects at your end.

SAVE GREEN STAMPS? TRY SOME OF OURS:

For all the rewarding facts, write, wire or phone collect:

KAISER-COX CATV

KAISER-COX PRODUCES CATV EQUIPMENT
IT IS NOT IN THE FRANCHISE BUSINESS

See you at the NAB Convention

KAISER-COX CORPORATION */ P. O. Box 9728, Phoenix, Ariz. 85020, Phone (602) 944-4411*

DEPEND ON KAISER-COX FOR CATV LEADERSHIP TODAY AND TOMORROW

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INTERPRETING THE FCC RULES & REGULATIONS

Radio Program Log Requirements

THE AMENDMENTS to Section 73.112 (AM) and 73.282 (FM)—commonly referred to as the "logging rules"—became effective December 1, 1965. In its Report and Order (FCC-65-687) in the instant matter (Docket No. 14187), the Commission did a good job of explaining the somewhat involved entries required under the new rules. Similarly, the NAB released an excellent pamphlet entitled *NAB Radio Program Log Recommendations*. To make proper log entries under the new rules, broadcasters should be familiar with both the FCC's Order and NAB's pamphlet. In addition, it is necessary to understand the Commission's *required* Program Type and Program Source Definitions.

Program Type Definitions

The definitions of the first eight types of programs (a) through (h) are intended not to overlap each other and will normally include all the various programs broadcast. Definitions (i) through (k) are sub-categories; the programs classified thereunder will also be classified appropriately under one of the first eight types. There may also be further duplication within types (i) through (k); e.g., a program presenting a candidate for public office, prepared by an educational institution, would be classified as Public Affairs (PA), Political (POL) and Educational Institution (ED).

Program Source Definitions

A Local Program (L) is any program originated or produced by the station, or which the station is primarily responsible for producing, *employing live talent* more than 50% of the time. Such a program, taped or recorded for later broadcast, shall be classified as local. A local program fed to a network shall be classified by the originating station as local. All non-network news programs may be classifed as local. Programs primarily featuring records or transcriptions shall be classified as recorded even though a station announcer appears in connection with such material. However, identifiable units of such programs which are live and separately logged as such may be classified as local. (E.g., if, during the course of a program featuring records or transcriptions, a non-network 2-minute news report is given and logged as a news program, the report may be classified as local.)

A network program (NET) is any program furnished to the station by a network (national, regional or special). Delayed broadcasts of pro-

Program Types

(a) **Agricultural** (A) includes market reports, farming or other information specifically addressed, or primarily of interest, to the agricultural population.

(b) **Entertainment** (E) includes all programs intended primarily as entertainment, such as music, drama, variety, comedy, quiz, etc.

(c) **News** (N) includes reports dealing with current local, national, and international events, including weather and stock market reports; and commentary, analysis, and sports news when an integral part of a news program.

(d) **Public affairs** (PA) includes talks, commentaries, discussions, speeches, editorials, political programs, documentaries, forums, panels, round tables, and similar programs primarily concerning local, national, and international public affairs.

(e) **Religious** (R) includes sermons or devotionals; religious news; and music, drama, and other types of programs designed primarily for religious purposes.

(f) **Instructional** (I) includes programs (other than those classified under Agricultural, News, Public Affairs, Religious or Sports) involving the discussion of, or primarily designed to further an appreciation or understanding of, literature, music, fine arts, history, geography, and the national and social sciences, and programs devoted to occupational and vocational instruction, instruction with respect to hobbies, and similar programs intended primarily to instruct.

(g) **Sports** (S) includes play-by-play and pre- or post-game related activities and separate programs of sports instruction, news of information (e.g., fishing opportunities, golfing instructions, etc.)

(h) **Other** (O) includes all programs not falling within definitions (a) through (g).

(i) **Editorials** (EDIT) includes programs presented for the purpose of stating opinions of the licensee.

(j) **Political** (POL) includes those which present candidates for public office or which give expressions (other than in station editorials) to views on such candidates or on issues subject to public ballot.

(k) **Educational institution** (ED) includes any program prepared by, in behalf of, or in cooperation with, educational institutions, educational organizations, libraries, museums, PTA's or similar organizations. Sports programs shall not be included.

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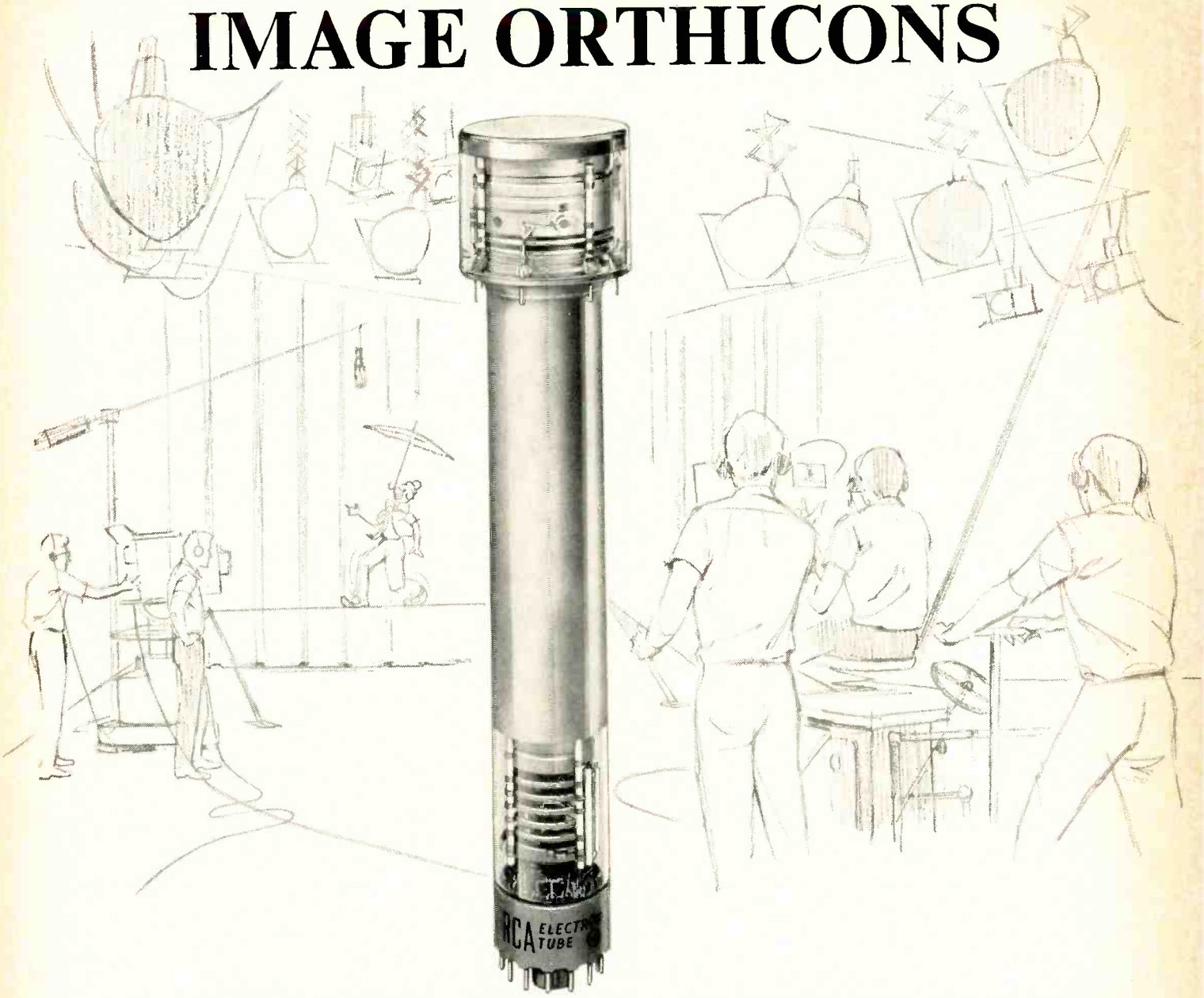

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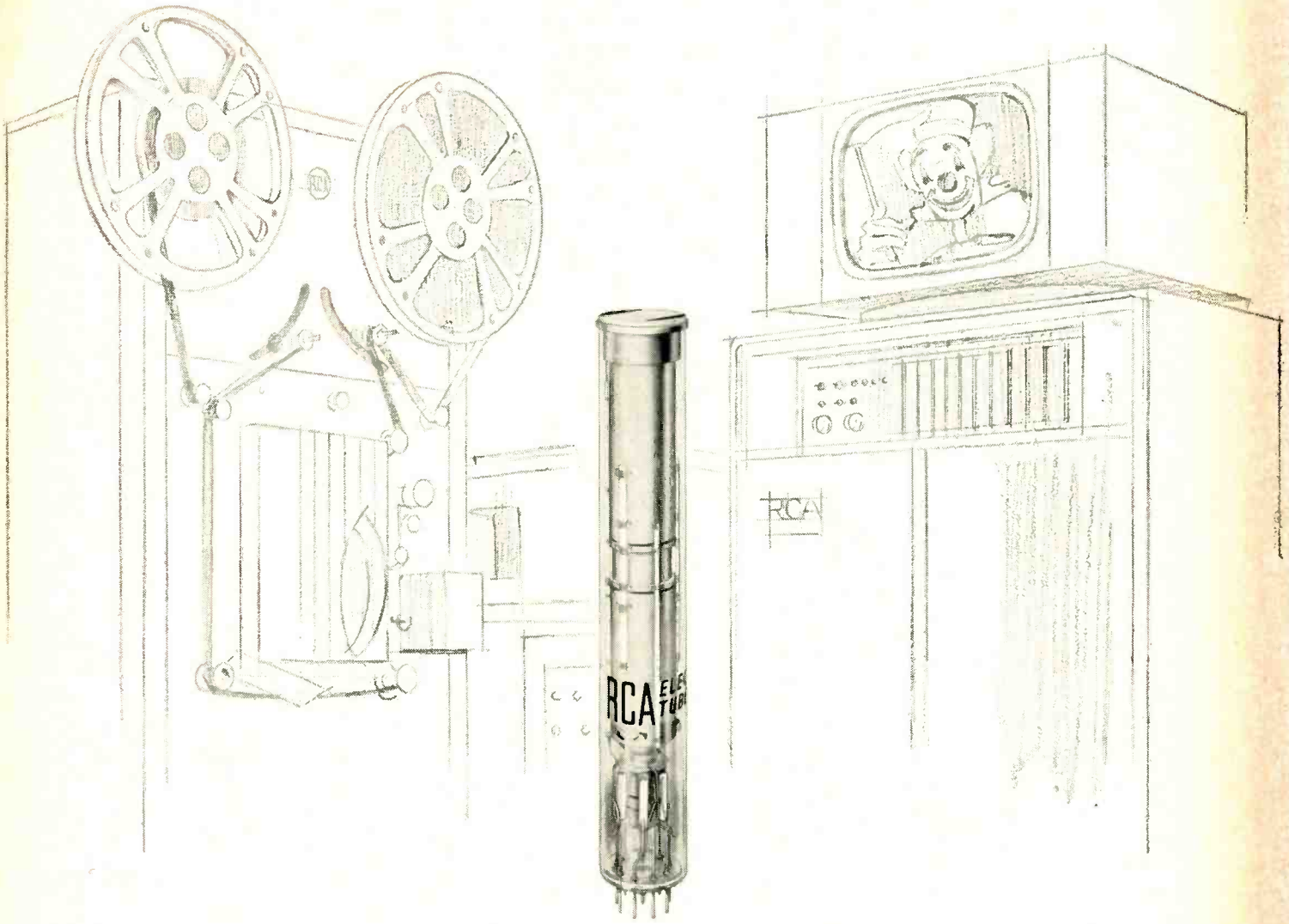

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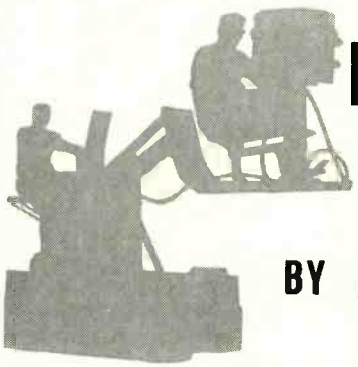

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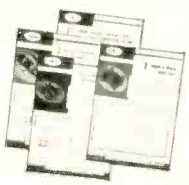

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grams originated by networks are classified as network.

A recorded program (REC) is any program not otherwise defined including, without limitation, those using recordings, transcriptions or tapes.

Designing a Program Log Form

With the above definitions clearly in mind, we must start with the rudimentary premise that there is no log form in existence that will meet the needs of all licensees. Commission personnel have repeatedly asserted that the FCC ". . . has no uniform logging system . . ." The NAB has stated that *its* suggested log is designed simply to provide a "minimum" form to comply with the new logging rules. Surely, most stations will find it necessary to add to the form or tailor the organization somewhat to satisfy their specific needs. Despite this fact, you should review your present log form carefully and, unless you are convinced that it meets all of the new requirements, *revise* your existing log form along the lines suggested by the NAB. Once you have incorporated the basic ingredients of the NAB log, you may *add any additional columns you deem appropriate and desirable* for station purposes. Once this is done, your logging system will be sufficient to comply with the new logging rules.

The remaining problem is one of application. Consider the following list of observations and recommendations:

(1) Of the countless logs reviewed in past years, the greatest problem has been misinterpretation of the Commissions' *definitions* of various log entries. Obviously, the log must be thoroughly understood by you, the traffic supervisor, the announcers, and any other persons who are required to make entries, changes, additions, and/or who will be required to sign Section IV-A of your renewal appplication.

(2) Pre-log as much data as possible.

(3) Maintain a legend, for abbreviations of program source, and type and commercial content, on the face or back of *each* page of your log.

(4) Divide your log into 15-minute segments by either (a) inserting a horizontal double line across the page or (b) setting up a *separate* column to insert 15-minute segment divisions. The divisions must be clear and consistently in evidence; in the absence of such time divisions, you are required to insert the duration plus the "on time" of each commercial (spot) announcement (CA).

(5) Be sure that all changes of and additions to the logs are initialed by the party responsible—the one making the change, the program director, or an officer of the licensee.

(6) It is unnecessary to insert the "on time," "off time," *or* duration of your public service announcements (PSA's), station promotional announcements, mechanical reproduction announcements (MRA's), and/or public notice announcements. You need not state the duration of your station identification announcements (ID's).

(7) Confine your program *source* classifications to those specified by the Commission; that is, local (L), network (NET), or recorded

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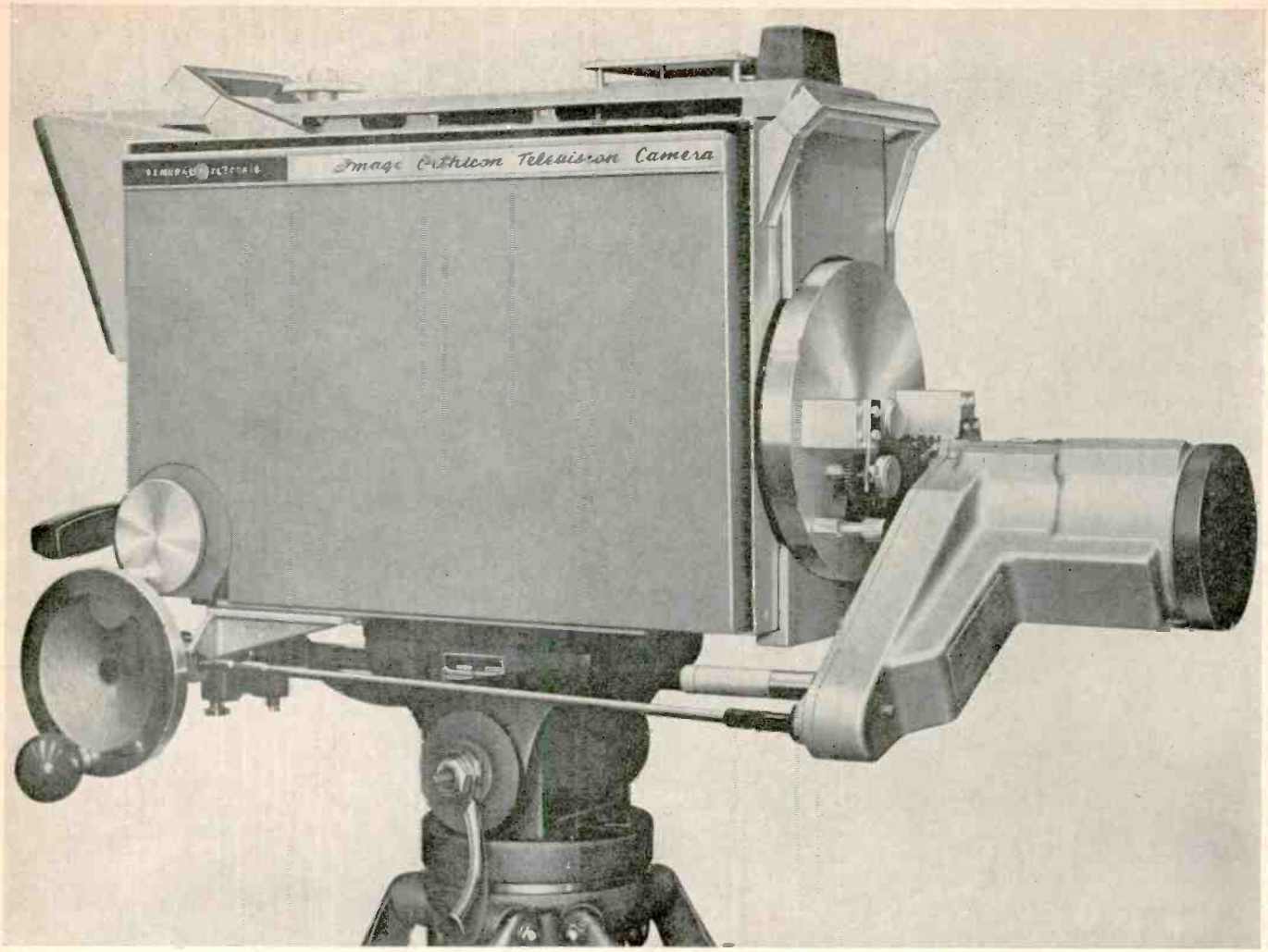

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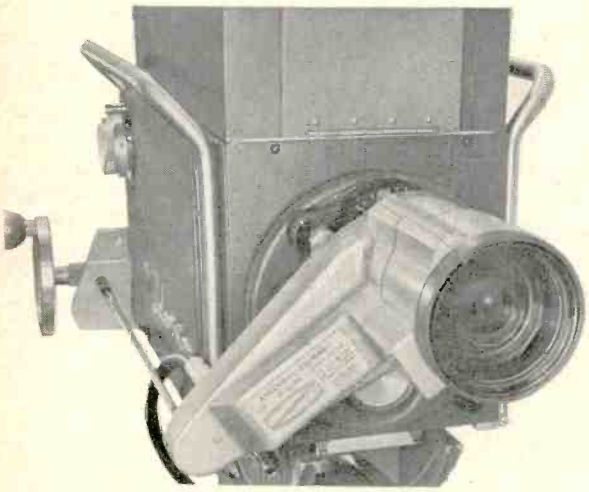

SPECIFICATIONS

Zoom Ratio—10 to 1
Zoom Range—40-400mm—1.6 to 16 inches
Minimum Focusing Distance—5 feet
Format Covered—Image Orthicon Frame Size—32mm x 24mm (1.28 x 0.96 inches) Diagonal—40mm (1.6 inches)
Maximum Relative Aperture—f/5
Linear Iris—f/5-22
Color Correction—Fully color corrected
Contrast and Resolution—Equal to or exceeding fixed focus lenses
Angular Field of View—Diagonal: 53° 8 minutes to 5° 44 minutes Horizontal: 43° 36 minutes to 4° 34 minutes
Zoom Control—Flywheel and rotating shaft zoom control
Focus Control—Flexible cable
Lens Weight—11½ lbs.
Lens Length—11 inches
Adapters—Adapters for 3" 1.0. Cameras using screw-type mount; TV88 mount with geared iris for 4½" 1.0. Cameras

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(REC). The old "Wire" (W) classification has been deleted.

(8) Confine your program *type* classifications to those specified by the Commission; that is, *one* of the basic eight with the possible addition of one of the sub-categories. There is *no* overlap of the eight major program types. We are advised by Commission personnel that the sub-categories designated "Editorials" (EDIT) and "Political Programs" (POL) should be combined *only* with the major category of "Public Affairs" (PA); however, the sub-category "Educational Institution Programs" (ED) may be combined with any major category except "Sports" (S).

(9) If you wish to add your own special designations and classifications, to facilitate station operation, you are well advised to *separate* such classifications from those of the Commission. Give the Commission the information it seeks in its *own* terms.

(10) There is no necessity to delineate that a program is "sustaining." Neither the word nor its abbreviation is *required* anywhere on your log.

(11) As to network programs, you need only log the time you join and leave plus the sponsors, if any, and any non-network matter broadcast during that time. The network will supply the information as to classifications of network programs and computation of commercial matter. However, if you are affiliated with a *regional, local,* or *special* network (e.g. those other than NBC, CBS, ABC, MBS), you should make certain that such networks will supply this data. If not, keep it yourself, because, in the last analysis, *you* are responsible.

Finally, make certain that you and your staff fully understand the distinctions between CM, CC, and CA. CM is any and all commercial matter; CC is commercial continuity, commercial announcements on behalf of a program *sponsor*; and CA is a commercial announcement on behalf of a *spot* buyer. (the old spot announcement). These distinctions are vital because, in the case of commercial continuity, you need only give the total commercial content during the sponsored show plus the sponsor's name, whereas in the case of CA (commercial spot announcements) you must give the advertiser's name plus the *approximate* duration of *live* announcements and the *precise* duration of *recorded* spot announcements.

The "approximate" time might be construed as a margin of error of plus or minus ten per cent (e.g., 54 to 66 seconds on a one-minute commercial and 9 to 11 seconds on a 10-second CA). The "precise" time is presently interpreted as just that—exact! However, an error of five per cent, plus or minus, would seem reasonable. Incidentally, the "precise time" requirement for recorded CA's has created such a furor that it may be modified or deleted in the near future. However, for the time being, you had better be "precise."

Since the Commission has never promulgated a recommended form for program logs, each broadcaster must determine the format best suited to his station's needs. A thorough review of the FCC's Reports and Orders on point, along with the NAB's recommendations and the above suggestions, should aid him in adapting to the new logging rules in a manner that will avoid fines or censure for violations in these areas. Naturally, *basic* changes should be made only after consulting with your attorney. ●

Policy Change on FM Channel Assignments

THE COMMISSION is becoming increasingly concerned over petitions for rule making which ask that FM channels be changed or deleted to avoid actual or potential interference to the reception of TV stations operating between 174 and 216 Mc (Channels 7-13). This interference can occur whenever the second harmonic of the FM signal falls within the channel of the TV signal or is generated within the TV receiver.

An Information Bulletin entitled "Potential Interference to Television Reception from the Operation of FM Broadcast Stations on Certain Frequencies," issued February 19, 1965 (FCC 65-130), explains how this type of interference originates, and what can be done to eliminate or alleviate it. The Commission called upon FM stations, TV receiver manufacturers, and the general public to take whatever measures are needed to insure that both of these important services could exist without adverse effect upon each other. Frequently, the problem involves TV receiver design and is one which ordinarily is not taken into account in assigning FM or TV channels. The FCC has made some frequency changes for FM stations where a simple solution was possible; however, it warned that as the number of FM stations increases this type of solution might not be possible.

As stated in an FCC public notice issued last month, "Our experience since the issuance of the bulletin has confirmed our views that FM channel changes are not a satisfactory solution to the problem. There are several reasons for this conclusion. Deleting the FM channel which is harmonically related to the TV channel receiving the interference, and refraining from assigning it to another community which might have the same potential problem, makes for an inefficient allocation plan and reduces the assignments available to the FM service. Often, moving an offending assignment or making changes in assignments will shift the interference to another area or to another high band VHF TV station." ●

Late Renewal Filers to Forfeit

STARTING with broadcast station renewal applications due to be filed by March 1, 1966, the Commission has instructed the Broadcast Bureau to bring attention to late filings. Except in cases where delay is found to be justified, the Commission intends to levy forfeitures.

Broadcasters are urged to take all possible steps to insure that renewal applications are filed on time, allowing *the full 90-day interval* for completion of processing prior to expiration. ●

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Building an FM Station —From CP to Sign-on

By Carl B. Haeberle and James W. Davis

Part 6: During the first 12 months on the air, we revised and extended our original plans. Also, we learned a few things worthy of passing on to others.

MUCH WATER has gone over the dam since November 1, 1964, and many kilowatts of FM stereo music have been radiated from our antennas. In some respects, it seems as though it all began just yesterday, but in others the beginning seems like ancient history. As one might expect, every single plan hasn't been fulfilled, and we still have goals to reach, but generally we have accomplished much of what we set out to do.

WAJR-FM is now a byword in many homes and a target for letters from a few others. More importantly, however, the station has become a fixture within the multiple communities in our coverage area. We have gloried in our first stacks of congratulations and weathered the opening blasts of criticism. During the first few weeks, we could have done nothing wrong; praises of the "new medium" were many. But once the newness wore off, we were just like the boys up the street. Everybody had his opinion. Our concept of joining classical, folk, and jazz into a single format suited to these varied tastes was not easily "sold." It took many personal letters, speeches to community groups, and some community-minded advertising.

Station Promotion

How do you tell people over a 17,150-square mile area that you are on the air without spending a fortune? Logically, you start at home. We utilized advertising media we felt we could afford; obviously, promos on our sister AM were used extensively, plus several ads in local papers. Beyond this, we worked hard to gain favorable editorial coverage. Since the FM investment was expected to be in excess of $100,000 it ranked with almost any new big business, and we planned our news releases accordingly. Every week or two for a period of three months before sign-on, multicolor ditto news releases were sent to each newspaper within a 40-mile radius. We also included mats in occasional releases (as inexpensive as photos, but give more assurance of publication). As we approached sign-on, a complete information package, including photos and mats, technical information, and news releases, was sent to each paper, As a result, our sign-on got front page coverage in many area publications.

Shortly after sign-on, we wanted to measure the size of our audience as well as reactions toward our programming. With our quality approach, the typical AM radio contest with lots of ballyhoo and prizes seemed unfitting. Accordingly, we developed a simple contest with FM radios as prizes; the only entry requirement was that the listener send his name, address, and if he so desired, the name of his favorite program. Contest promotion copy was slanted toward the humorous. We did not imply that the prizes were anything to be desired—just something nice to have. One promo per hour and short station break promos were the only means by which the contest was publicized; no other medium was used. Until the final week of the contest, we didn't describe second and third prizes by product—just that they would be awarded.

In conjunction with the contest, we conducted a poll of those people we knew listened and those who had written earlier, or were met on the street. From this we discovered that only one in 25 or 30 would bother to enter the con-

Mr. Haeberle is production director and Mr. Davis is C. E., WAJR-FM, Morgantown, W. Va.

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test. This compares to one in 10 to 15 who enter similar contests we had conducted on AM. As we had hoped, we received many comments indicating likes and dislikes, enabling us o better analyze our position and determine what changes were needed. Total cost of the promotion was less than $400, which was traded out in advertising.

Programming

Our initial program format remained basically unchanged; only minor adjustments in some segments were required. As we progressed, the overall music tempo seemed to drag; much of the available music for a quality format is naturally slow-paced and the rut is easily widened. Only through careful selection were we able to keep the tempo up in some blocks. We also discovered that many of the people who scream for more classical music don't recognize it when they hear it unless it is announced as such. The original vocal-instrumental ratio has not been increased, since the audience hasn't indicated a preference for it. The early morning program dragged almost from the beginning; therefore, we included more brass than we had originally intended had to use. The mid-morning Bon Jour has taken on, almost without a noticeable push, a distinct European sound, complete with foreign orchestras and a distinctive Mediterranean beat.

The hardest blocks to program turned out to be the quietest and least noticeable—the lunch and dinner hour periods. Since most suitable music has a tendency to sound like background material, we felt it necessary to give each block a distinct sound. We gave each show a different outlook; the noontime show has a light Vienna and sidewalk cafe touch, while the evening block has a quality supper club theme.

Our prime time period was found to be during the evening hours. The Jetstream feature is heavy with the big orchestral sound. We have edged some well-known classical music into this block; it is not announced as classical, so that the classical music hater is not scared away.

Specials and Remotes

No blocks of specialized programming were inserted until the end of the first 6 months, thus giving us time to size up what the audience might want. So far, we have added only three programs—a 2-hour classical show on Sunday afternoon, a 1-hour Broadway show on Saturday afternoon, and a 1-hour Saturday night jazz show.

We have not done as many stereo remotes as we originally planned, primarily because of the manpower and time required. To set up and record a stereo program takes at least two well-trained men and three times as long as a monaural remote. Under current staff conditions, two men sent from the station requires a virtual shut-down of some other operation (and there are 23 on the staff). Response to the two test programs which we did produce was overwhelming, and sharp increase in audience commentary was noticed after each program. This pretty well establishes the fact that if a fairly consistent number of remote programs from several of the major cities in our area were used, it would markedly strengthen our rating.

Music Library

A large basic music library is vital to a program format such as ours, and our initial image could have been improved had we purchased more records at the outset. Also, our plan to reprogram music blocks was curtailed; we had to wait until we had enough music on hand to build our basic blocks for repeat programming. At the end of 6 months, we had hoped to reuse the previous program schedules and start over again, changing only necessary selections. We finally had to settle for a 4-month program package which began in late March. By that time, we had enough material to build without padding. Changes are made only in the case of a record deletion or to insert some new material.

Record procurement was a major problem. After about 6 months, we had obtained records from all but two desired labels. Prices ranged from $.50 to an almost prohibitive $2.50 per album. Before we spent $2.50, though, we made certain that at least 6 cuts would be suitable to our format, and on the $.50 albums we made sure that two cuts were suitable.

Subscription buying can be expensive, even though the cost is only a dollar for each disc. By the time half or more of a proffered album selection is discarded, you quickly have the $2.00 investment per album again. So far, we have found only one company which will trade back unwanted discs. In view of this, we try to make quarterly record orders serve our purpose, except in the cases where we trade unwanted discs. We have also considered trading advertising for records, locally, on a dollar for dollar basis. This method has worked well in larger markets; however, few local agents want to spend that much money in advertising.

Our filing system works well, that is, if all available music is *filed*. In the beginning, we got behind in our filing, and it has only been in recent months that the mass of cards has become a usable fixture. Upon arrival of a new disc, we now mark each musical number according to program block. This immediately separates the selections and keeps the shows sounding as we think they should, as well as reducing programming time considerably. At the same time, discs are assigned to a particular day of the week; all orchestral records are separated into 7 groups, thereby keeping any repeats at least 7 days apart. All incoming music is carefully auditioned to determine its exact sound and how it will fit into a contemplated program.

Records have held up well; some have been used for more than a year, and with the limited number of discs at sign-on, some have had repeated use. Only nominal care is taken of records—no special gloves, cloths, etc. In fact, in all but seldom used albums, the paper liners were discarded shortly after the record went into use. At the suggestion of a California BM/E reader, we are using spray Windex to clean finger prints and other dirt from the record surface. The aerosol spray is used sparingly, then the residue is wiped off with a felt

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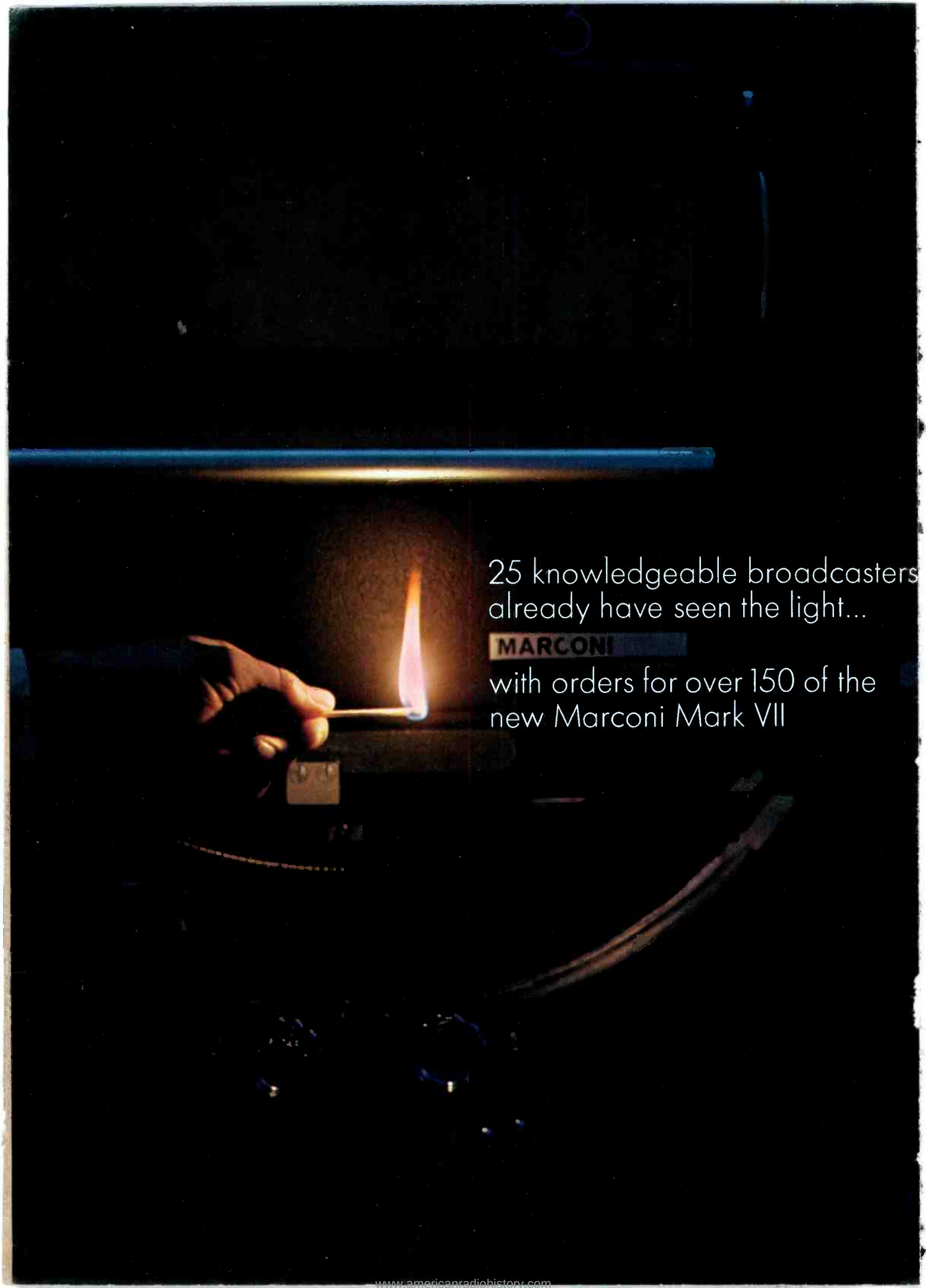

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The best one is the Marconi reputation— which you know from the proved performance of Marconi equipment. And there's more superior performance on the way...

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Weight? Less than 150 pounds, and it's compact for quick set-up and portability. Ease of operation? Same "hands-off" simplicity as other Marconi cameras. Precision and circuit stability? The new Marconi Mark VII belongs with Ampex high-band recording, will operate for hours without adjustment.

More exclusives? Built-in filters for simple, accurate color regulation. New mountings for perfect zoom operation (takes fixed lens or standard zoom lens: 10 to 1 or 40 to 1 with adapters).

SEE IT AT THE NAB SHOW IN CHICAGO.
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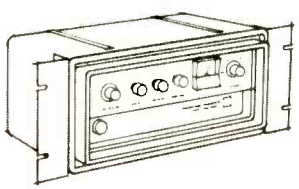
But it's more than an STL. In the field, it works with 12 or 24 VDC. It can run on a car battery. It has been flown in helicopters, been bounced in golf carts, newswagons, yachts and jeeps. Very wide band video circuitry assures stable top performance in widely varied environments.

Major TV networks and independents in the United States, Europe, and Latin America, as well as the U.S. military, have evaluated it, tested it, and bought it. Write for details.



Model	Band (Mc)	Nominal RF Power	Nominal RCVR Noise Figure without Preamp db	Nominal RCVR Noise Figure with Preamp db	Allocation
MA-2A	1990-2110	2 watts	10	5	TV auxiliary broadcast, STL, remote TV pickup
MA-6A	5925-6875	1 watt	12	5.5	Misc. common carrier, common carrier TV pickup
MA-7A	6875-7125	.75 watt	12	5.5	TV auxiliary broadcast, STL, remote TV pickup
MA-8A	7125-8400	.75 watt	12	5.5	Government, military, TV & wideband data
MA-13A	12,700-13,200	.1 watt	12	6	TV auxiliary broadcast, STL, remote TV pickup

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The Management Viewpoint: Soles Success

After 14 months of operation, General Manager L. W. Fleming, Jr. reports that he is quite happy with overall operation of WAJR-FM, particularly with the success of their recent sales efforts. And well he might be! An AM-oriented sales staff has taken the bull by the horns and developed enough accounts to just about "turn the corner." Mr. Fleming indicates that they have attained 25% of their desired commercialization. To accomplish and maintain this, each of the three salesmen must make a satisfactory number of FM sales presentations each week. It's the traditional sales approach; if you see enough people, you're bound to make sales.

The WAJR-FM salesman does not have to rely solely on his wits, however; he has access to a variety of prepared sales presentations, developed by the staff, which point out the salient features of each program segment. From this information, the salesman can tailor his presentation to each specific potential client. Also, a 6-minute recorded sales aid, detailing WAJR-FM's foreground sound ideals, is available for sales use. Thus, armed with the proper sales preparation and enthusiasm (which Mr. Fleming appears to be quite capable of instilling), the salesman can show his prospect how to put advertising dollar to good use.

The WAJR-FM commercial schedule allows a maximum of five spots per hour—before and after the hourly news summary and on each quarter-hour. Major news programs (7-8-12N-4-6), while simulcast with the sister AM, are sold separately. West Virginia Sports Network programs, originated by WAJR, are sold separately on AM and FM.

WAJR-FM's active client list includes two banks, a limestone company, numerous color TV and stereo equipment dealers, two of Morgantown's leading jewelers, and a Cadillac dealer. During the past holiday season, one dealer alone sold 43 stereo combination consoles, which is some sort of record in a town that size. Prior to the existence of WAJR-FM, the area had been at least partially indoctrinated with FM and there were quite a number of sets in operation. Since the advent of WAJR-FM, set penetration has increased markedly and is still growing, according to reports from receiver dealers.

As a further indication of WAJR-FM's growing success, several listeners have complained about commercials, a "brickbat" more FMers would be delighted to get!

cloth dampened with water. In cases of deep-seated dirt, the chief programmer uses a mild detergent and warm water.

Personnel

We quickly learned that a first class license holder was not necessarily capable of handling the programming part of his duties. During the first year, we lost three engineers and every student operator (full-time university students). Thus, we had to replace the full-timers and add another full-time man. In each case, a salary increase was necessary due to the additional ability required. We had allowed for a certain personnel turnover, but not for an increase in salaries. At sign-on, we had men working 9-hour shifts; this had to be reduced to 6-hour shifts to maintain program efficiency.

In programming, our luck was better. Two part-time programmers were phased out, although some months after we had originally planned. We did have to add a part-time recording engineer to handle necessary taping. Our programmer is an ex-musician who, although he had no radio background, had sufficient musical knowledge to set up basic programming and assume many duties formerly handled by other staff members.

Engineering

When our equipment was purchased, it was what we considered the best available for the money. At that time, however, there was only one recognized stereo console. Availability of professional stereo equipment for studio use was limited; in fact, much of it was still in experimental stages and not yet time-proven.

Our biggest problem has been with our turntables; the production turntables are noisy and the on-air turntables are extremely slow-starting. In addition, they cannot be used for back-cueing. Currently, we are considering several new models as replacement units.

Pickup cartridges have been changed three times in an attempt to obtain the response and gain required. It appears that the Shure M44-7 cartridges now in use give us better service and greater life expectancy.

The size of our physical plant is proving to be inadequate; both the downtown production studio-office complex and the on-air studio-transmitter location are just about half the size they should be. The programmer and his secretary should have a separate office, as should the FM director. The production studio should be sound-sealed from the office area. Presently, a partial (8') dividing wall is all that separates the studio from the office which houses all FM employees. Originally, we felt that the production studio would be used only for short periods; however, the FM studio is used as much for AM production work as the regular AM production studio. Consequently, there are many hours when FM office work must be confined to pen and pencil and "silent running."

It is hoped that others contemplating an operation such as ours will profit by our mistakes. It's very seldom that anyone ever started anything of this stature and scope and not wished he had made a few changes in his original plans. Fortunately, most of ours are of a comparatively minor nature. ●

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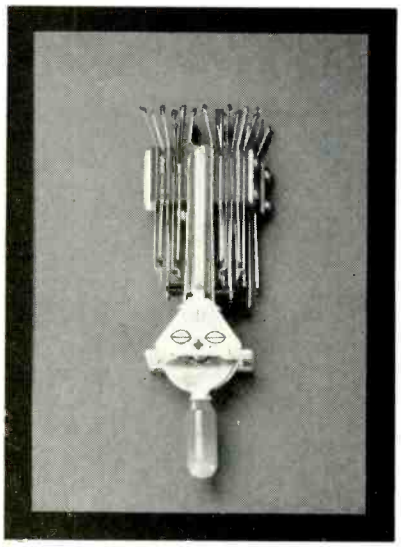

The pop-click-hum bug is dead.

Collins' new Speech Console hasn't a mechanical contact in the program circuits.

Photoconductive cells instead of relays and switches.
No contacts to wear and get dirty. Nothing at all to keep clean. Result: your most troublesome maintenance problem is ended. Also: no pops, clicks and hums from mechanical switches. Your audio is the cleanest, clearest audio on the air.

A lot less wire (and a lot less hum).
Audio doesn't have to travel to front panel and back. This means you have a lot less wire to pick up noise. (There is no noise, either, from attenuators. They are sealed in protective capsules.)

Module design ends time-wasting troubleshooting.
Simply take out one card and plug in another. Replace attenuator, input switches, and amplifier output switches with one quick shuffle of cards.

The Collins solid state 212S-1 is for stereo and dual channel operation for FM, AM and TV stations. The companion 212M-1 Console has fewer modules for mono program and monitor outputs.

For details, call your Collins representative. Or write: Broadcast Communication Division, Collins Radio Company, Dallas, Texas 75207.

Visit Collin's Exhibit at the NAB Convention, Booth 209, to see the finest in Custom Audio, Speech Consoles, AM and FM Transmitters.

This is the Collins 212S-1 that killed the pop-click-hum bug.

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Emergency Standby Power for Broadcasters

By Charlie Buffington, BM/E Associate Editor

Is standby power a necessity, or just something nice to have? This in-depth discussion will help you decide for yourself.

HUMAN nature being what it is, many of us neglect to "lock the barn door until the horse is gone." Thus, it is not surprising that some broadcasters have been "caught napping" during power failures. However, some recent events have made us more conscious of the value of electric power and quite aware that power failures are not limited to remote locations. The Great Northeastern Power Blackout last November 9 (plus several smaller scale blackouts around the country) has made it pretty obvious that it can happen almost anywhere, in spite of our vast interconnecting power distribution networks.

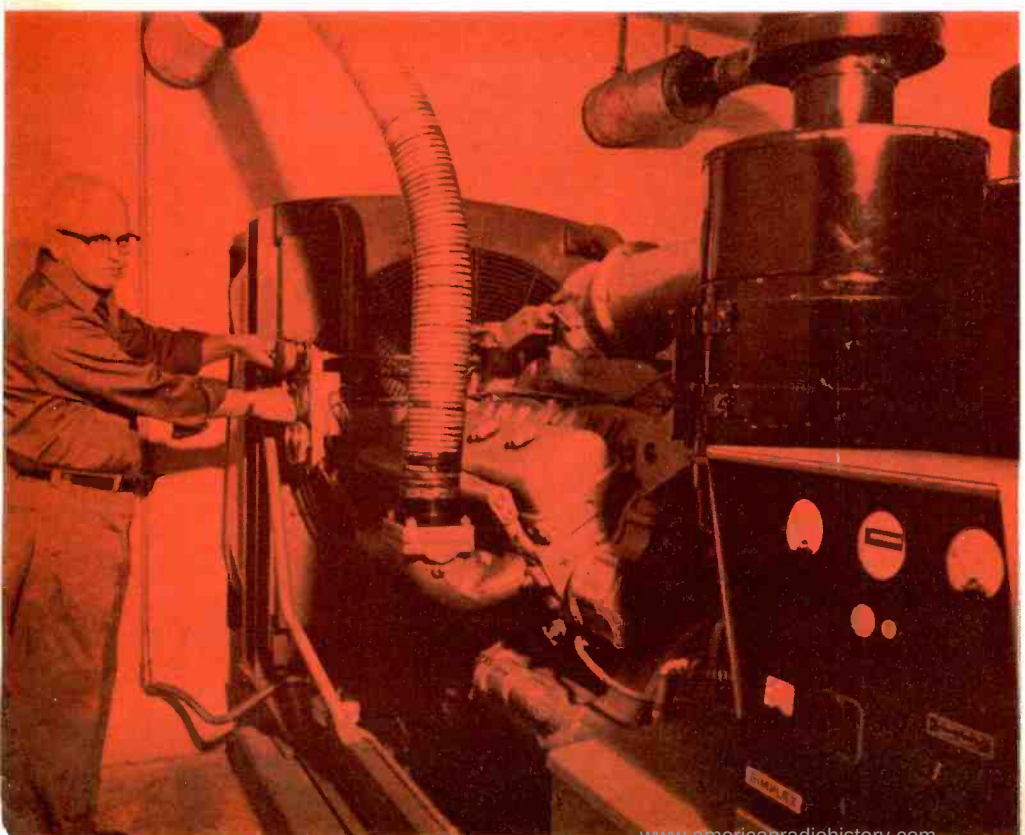
Is Standby Power Worthwhile?

A broadcast facility without electric power is about as useless as an announcer with acute laryngitis. Yet, some stations have no emergency power source; others have standby power at the transmitter, but separate studio facilities fall into ghost-like silence when primary power peters out.

Emergency power equipment represents a capital investment, and since most broadcasters are alert businessmen, such an expenditure must be scrupulously considered on the basis of its individual merit. There is understandable reluctance at the thought of investing anywhere from $3,000 to $35,000 (or more) in equipment which may not be used very often. However, considering what an extended loss of air time can mean, both in terms of lost revenue and in station image and prestige, the cost of standby gear may be nebulous by comparison. In many respects, an investment in standby equipment is similar to an investment in insurance; it comes in mighty handy when you need it.

How Often Needed?

In strict dollars and cents terms, it's not too difficult for any station to quickly determine what the periodic loss of even an hour or two of air time can mean in lost income. Assuming revenue on the basis of the NAB Code commercial limit of an average of 14 minutes per hour at $5.00 per minute, 72 hours of standby operation would pay for a $5,000 installation.



Detroit Diesel Engine Div. of General Motors offers emergency power units ranging from 13.5 to 430 kw. Automatic transfer equipment starts motor-generator and switches source within 3 to 5 seconds. Prices vary with automatic equipment requirements; 30-kw unit ranges from $6,000 to $10,000, while 400-kw unit is $30,000 up. Model 12V-71N 250/300-kw unit shown kept WHO Des Moines on air during recent prolonged power failure when virtually everything else in 5-state area was at standstill.

Wincharger Corp. 4-kw units provide enough power for studio standby. Other models to 15 kw are available.

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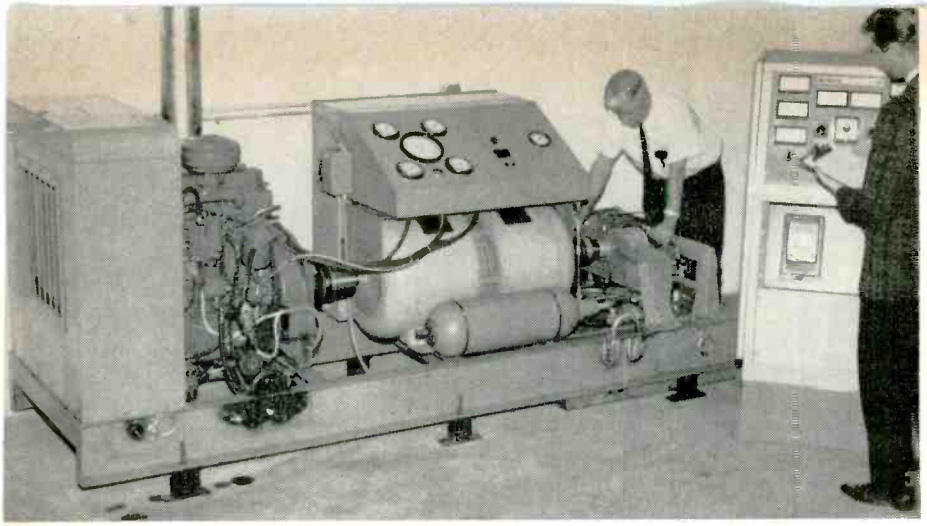
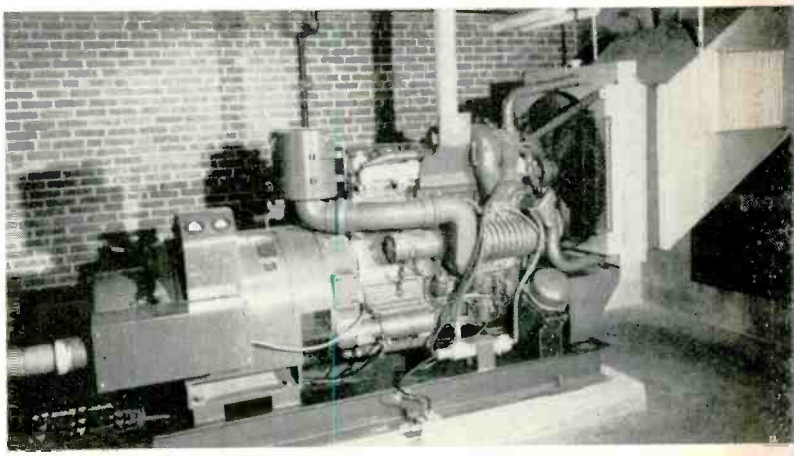


No-Fail Power System (NFP) developed by Fermont Div. of General Dynamics assures continuous flow of precise power regardless of commercial power conditions. Control console senses power line deterioration and instantly activates NFP system, consisting of motor-alternator, diesel engine, and pressurized hydraulic fluid stored-energy source. When outside power is interrupted, stored-energy source drives generator until diesel engine automatically starts and attains operating speed. Available in 10- to 250-kw capacities, prices range from $20,000 to $125,000. NFP equipment may be adapted to existing standby units. Other units, 5 to 300 kw, are available. System shown is rated at 10 kw with a 9-second stored energy capability.

Someone living in an area where power failure has been a rarity might scoff at the assumption that such equipment could actually pay for itself. Would he, however, scoff at fire insurance on his property? Certainly, a power failure may not *destroy* property, but it can rob the till, and permit a competitor to run up tremendous prestige gains while the doubter's transmitter is silent. In perhaps a large number of cases, it may take several years to amortize emergency power equipment solely on the basis of required use. But on the other hand it could happen almost overnight.

On December 28, 1959, a sleet storm struck communities in western New York State, causing power outages of 7 days—even more in isolated areas. Hurricane Cleo, which slammed into Florida on August 24, 1964, caused power failures lasting up to 5 days. Tornadoes and floods on April 11, 1965, crippled power distribution facilities in some mid-western areas for as long as a week. Power was unavailable for up to 10 days in sections of central and eastern New York State as a result of a snow and sleet



This 150-kw Cummins diesel generator kept WHDH-TV-FM Newton, Mass., on air during Nov. 9 power failure. Chief Engineer Phillip Baldwin has insisted on emergency power since he saw WHDH without power during 1937 hurricane. Prices for Cummins equipment vary from $100 to $125 per kw. Units lend themselves to any automatic power transfer switching.

Determining Generator Size & Engine Type

Load: Transmitter site power consumption involves either the main or standby transmitter, tower lights and de-icers (if used), monitoring and auxiliary audio (and video) equipment, plant lighting, heating and air conditioning. If studio is separate from transmitter, a standby unit should supply power for all audio (and video) equipment (including STL, if used), lighting, heating and air conditioning. Simplest and most accurate method of determining load is to install a demand meter available from most power companies (preferably a recording unit left in operation several days). Another method, while time-consuming, is to compute the total power consumption of all individual units. To prevent obsolescence of a standby unit, future equipment additions should be taken into account.

Partial standby operation: For reasons of economy, only vital equipment may be connected to the emergency power source: Transmitter, basic audio and video equipment, essential lighting, etc. Generator capacity may be kept to minimum, resulting in lower cost. Emergency operation equipment must obviously be on separate power circuits; in a new building this can be accomplished with ease (if not without some additional wiring expense); however, in an existing structure, the cost of running new feeders (and repainting, plastering, etc.) may exceed the potential savings realized by purchasing the smallest generator possible.

Generator ratings: Ascertain whether published ratings are continuous or intermittent (your requirements must be met by continuous ratings). Local altitude has a bearing on engine performance; with some units, output must be de-rated 4% for each 1,000′ above sea level.

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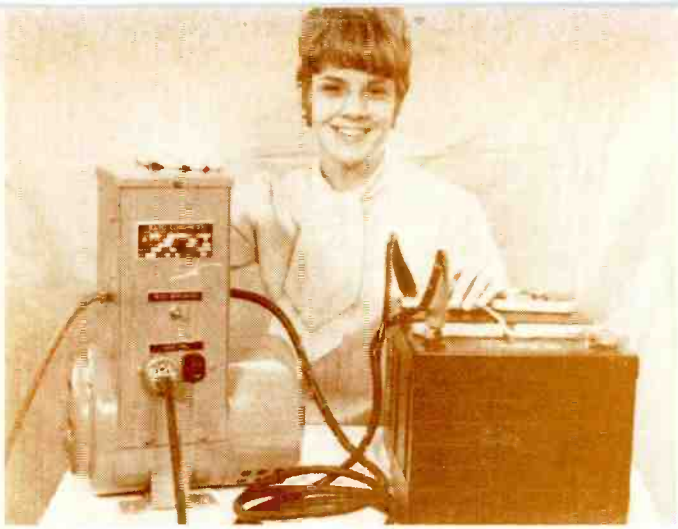
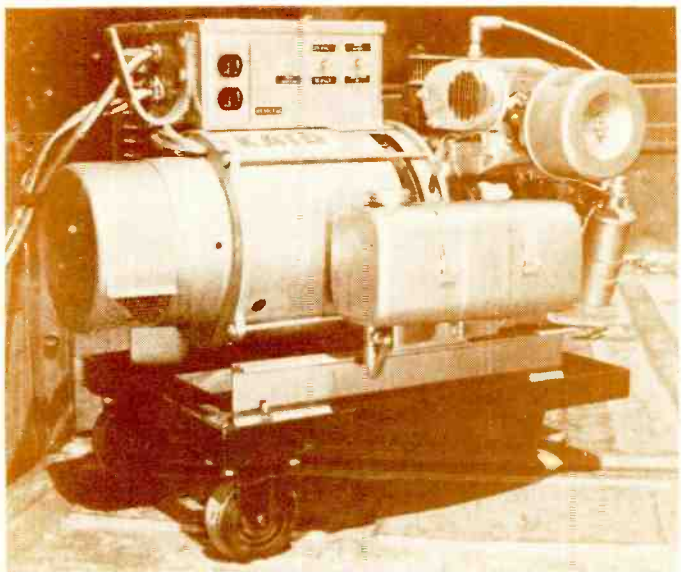
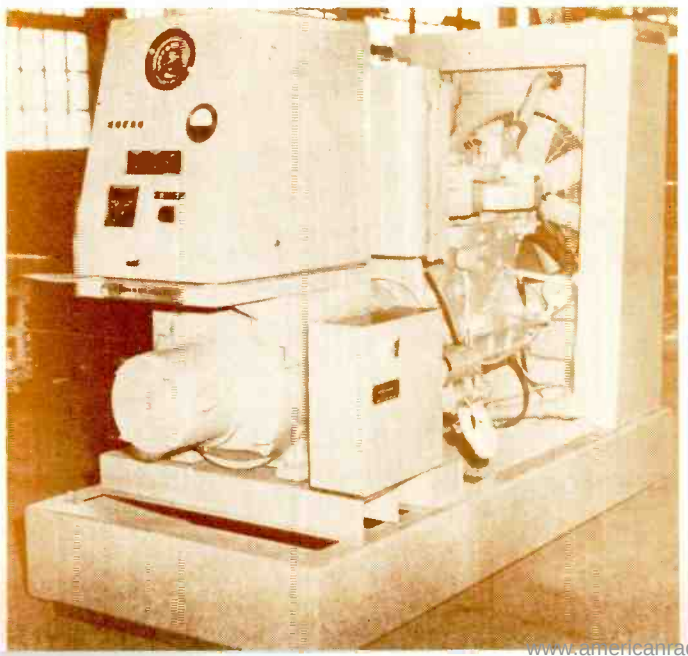




Standby power for smaller studio installations can be furnished by units such as these from Kato Engineering Co. Battery-operated DC to AC converter is available in units with up to 5-kw capacities, with optional built-in automatic transfer switch and battery charger. Portable motor-generator set can be used as studio standby power (up to 3.2 kw continuous rating) as well as for remote broadcasts where commercial power is non-existent.

Consolidated Diesel Electric Co. offers two methods of power switching with their standby units: conventional transfer and Uninterrupted Power Supply (UPS). UPS units utilize synchronous alternator and flywheel connected to diesel engine through magnetic clutch. Alternator normally operates on commercial power, but should it fail or fall below established minimums, magnetic clutch is energized.



storm December 4 and 5, 1964. Isolated incidents? That's probably what the victims of these power outages once thought, but most of them have changed their minds.

Studio Power, Too?

Recent power failures have pointed up what should have been obvious (as it was to some)—the necessity for studio standby power where separate studio-transmitter facilities are maintained. It is most certainly within the realm of probability that studio power could fail without loss of primary transmitter power. True, emergency studio equipment can be installed at the transmitter, but if the transmitter location is remote (as it is in many cases), there are two disadvantages. First, if the transmitter is unattended, an operator-engineer (or both) must be able to reach it—a factor in which weather can play a major role. Secondly, the remoteness of the location can present a problem in maintaining contact with developments in the "outside world." A station operating during a power failure must keep some sort of outside contact if it is to adequately inform its audience of developments.

On the other hand, telephone lines can be knocked out, rendering any studio standby equipment useless. In this case, the transmitter studio can serve as a back-up facility until the STL line is restored. Of course, if a radio STL is used, studio standby power will enable the station to continue operation. It's a fairly safe wager that enough revenue was lost in the recent 13-hour northeast blackout to pay for a fancy studio power unit which would have permitted normal studio operation. The irony in this case was that some stations with standby transmitter power didn't lose primary power at their transmitter sites, but their studio operation was severly restricted due to the lack of adequate emergency power equipment.

In contrast, a few stations like WCBS (which has the ultimate in emergency standby equipment) continued to operate almost as though nothing had happened. When power failed at 5:28 PM, the Manhattan studios were without power for only 10 seconds, the time required for the emergency diesel generator to come up to speed. The unit provided power for emergency elevator service and lighting in the building, in addition to full power for two studios and control rooms in the news area.

At the WCBS transmitter in the Bronx, an emergency generator started automatically, providing power for a 10-kw auxiliary transmitter plus the building and tower lights. Almost coincidentally, installation of a new generator, capable of powering the main 50-kw transmitter, was just about completed. This unit was pressed into service at about 8:30 PM and the station was operating with full power and two studios. WCBS Director of Technical Operations Ralph Green reported, " I would say we were quite luxurious under the circumstances."

Initial Equipment Costs

Initial equipment costs for standby power equipment varies widely, based on power capa-

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Installation Considerations & Maintenance

Location: Unit should be near primary power entrance, in area warm enough for easy engine starts during cold weather and where ambient temperature does not interfere with cooling. Where temperatures fall below 50°F, special accessories (electric water jackets or manifold heaters) are needed to insure dependable automatic starts. Smaller units (10-kw or less) should be mounted on concrete foundations equipped with anchor bolts; larger units with steel skids may not require separate foundation.

Cooling: Up to 15-kw plants may be efficiently air-cooled; larger units require water cooling. Adequate ventilation openings should be located so that a sufficient amount of cool air can be brought into the room, forced through the cooling system, then moved directly out without circulating around the room. If the room is too small, ducting (with forced air, if necessary) should direct air to and from engine cooling system.

Exhaust: Pipes should be cast or wrought iron or steel, and should terminate outdoors away from windows, doors, air conditioning intakes, etc. Care must be taken to prevent leaks in exhaust system; bends should be minimized using sweeping elbows and flexible pipe. Vertical runs must have a condensation trap.

Batteries: Should be mounted on a wooden base rather than on concrete, and accessible to facilitate frequent checks for condition and specific gravity. Trickle charge should be maintained, unless manufacturer's instructions indicate otherwise (some equipment has a built-in trickle charge). Load test and hydrometer tests for specific gravity should be carried out frequently.

Noise and vibration: Adequate mufflers will eliminate noise from exhaust system. Vibration transmitted through structure may be eliminated by using flexible connections between engine and fuel inlet lines, exhaust system, and air cleaner (if remotely mounted), and wiring conduit.

Maintenance

Test run: Should be started and run, preferably under load, at least once a week. Can be programmed by automatic control equipment.

Engine: Periodic check, according to manufacturer's specifications, of air cleaner, fuel filter, lube oil dip stick, lube oil filler pipe, lube oil filter, lube oil drain, fan belt adjustment, radiator filler opening, cooling system drains, battery charging generator, and voltage regulator. These factors should be considered when choosing generator location.

Cost of Standby Power Equipment

Radio stations require an average of 20-150 kw, TV stations an average of 100-300 kw. Prices vary from $100 to $125 per kw (in some cases this may cover installation costs). Some units run as high as $200 per kw, depending on automatic switchover equipment. Cost of a 30-kw generator may range from $6,000 to $10,000; prices for 50-kw units start at $30,000. A 10-kw unit offering continuous power (without even momentary interruption while the engine starts) is approximately $20,000, while a 250-kw rig with no-fail capability costs about $125,000. Automatic equipment, including transfer switching from primary power source, and installation situations (unique in each case), can cause considerable variation in overall system price.

Some Recent Power Failures in the U.S.

Geographic Area	Date	Length	Cause
Western New York State	Dec. 28, 1959	7 days—more in isolated areas	Sleet storm
East coast—parts of Long Island, Staten Island, N.Y., Conn., N.J., Mass., Md., Del., Va., and Fla.	Sept. 12, 1960	Few minutes to 36 hours (more in some cases)	Hurricane Donna
Mid-Manhattan	June 13, 1961	2½ to 4½ hours	Circuit breaker failure
San Francisco (downtown area)	June 13, 1961	28 minutes	Explosion in power sub-station
Cleveland vicinity	Aug. 4, 1961	2 minutes to almost 4 hours	Short circuit caused by falling tree branch
Louisiana & Texas	Sept. 11, 1961	Minutes to days	Hurricane Carla
Long Island, N. Y.	Sept. 21, 1961	Up to 24 hours, more in isolated instances	Hurricane Esther
Midwest—2/3 of Nebr., nearly all of Ia., parts of S.Dak., Kans., Wisc.	June 25, 1962	Few minutes to 2 hours	Breakdown on a 230-kva line from Missouri River Dam
Brooklyn, N.Y.	Aug. 20, 1962	Up to 3½ hours	Breakdown of 2 feeder lines caused by short circuit
Florida	Aug. 26, 1964	Up to 5 days	Hurricane Cleo
Teaneck, Englewood, N.J.	Nov. 30, 1964	2 to 4½ hours	Circuit breaker failure
Central & eastern N.Y. state, parts of Mass.	Dec. 4-5, 1964	Up to 10 days before restoration of full service in some areas	Snow, sleet storm
Midwest—600-mile belt, incl. Nebr., Ia., S.Dak., Ill., Mo.	Jan. 28, 1965	Up to 2 hours	Faulty protective relay at Ft. Randall Dam
Midwest—Parts of Minn., Ia., O., Wisc., Ill., Mich., Ind.	April 11, 1965	Few hours to a week or more in some cases	Tornadoes and floods
Northeastern U. S. & Ontario, Can.	Nov. 9, 1965	Few minutes to 13½ hours in most places	Relay breakdown at Sir Adam Beck distribution plant, Queenstown, Ont.

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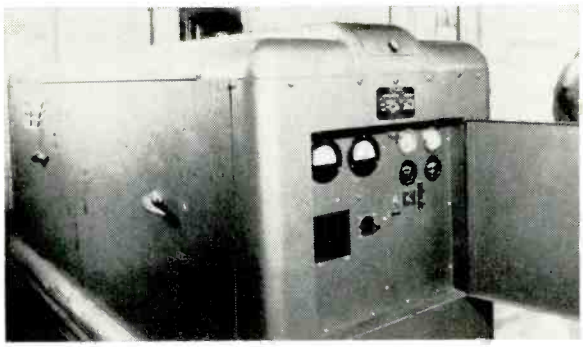
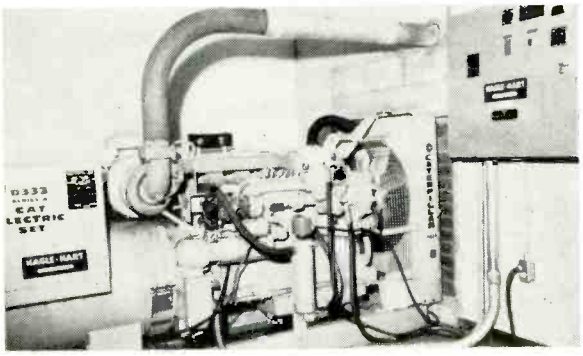
bility and installation requirements. The degree of power transfer sophistication also has a direct bearing on the overall investment.

The first step in estimating costs is to determine the electrical load the unit will have to handle; there are a couple of ways to do this (see box). Next, the method for achieving the power source changeover must be determined, either manual (where a switch is thrown by hand), automatic, or no-fail, no-break transfer (where power changeover takes place without even a momentary interruption).

Power requirements for radio stations will vary from only a few kw (for studio standby) to 150 kw. Studio standby operation obviously requires more power for TV than for radio, perhaps 10 kw, while transmitter equipment would need from 100 to 300 kw (perhaps as much as 400 kw in a combined studio-transmitter operation). When all the variables are taken into consideration, equipment costs will vary from $100 per kw to as much as $200 per kw with no-fail power switching. Obviously, the more automation included in the transfer switching arrangement, the higher the cost—as much as double.



This 35-kw Onan plant kept WTRY Albany, N.Y., on air during the Nov. 9 blackout. Due to regular maintenance, generator had the station operating normally within 45 seconds. (WTRY's tower beacons guided several circling planes into Albany Airport during power failure).



Caterpillar Tractor Co., Peoria, Ill., can supply virtually any size unit for any given application. Model D333 125-kw unit, installed in 1961 at WITI-TV Milwaukee transmitter site, has been used during several power failures in recent years. Unit cost $11,668 installed, including 400-amp transfer switch.

Continued on page 90

Engine Types

Diesel: Higher initial cost, but longer life and less periodic maintenance. Most larger plants use diesel; small unit costs may run as much as 50% higher than other types. Price differential gradually decreases with larger units. Fuel storage is safer; heating oil storage facilities may be used, provided oil grade is suitable for diesel use. Galvanized steel tanks should never be used for diesel fuel storage—chemical reaction causes flaking which clogs filters and causes fuel pump and injector failure.

Gasoline: Lower cost and quicker starts, but fuel storage presents more hazards. Local fuel storage codes must be checked. Amount stored should always be minimal.

Gas: Natural and manufactured gas driven types offer longer life and lower maintenance costs due to less carbon build-up, less sludge formation in oil, and no combustion chamber deposits. Piped-in natural gas eliminates fuel storage problems. Supply is dependable, except in cases of disaster when mains may be disrupted. Liquid petroleum gas (LPG) supplied in tanks or bottles presents storage problems, under strict insurance underwriter's regulations. Gas units offer quicker starts after long shut-downs—fuel stays fresher. BTU content of natural gas should be 1100 per cu. ft. for full-rated power; generator must be derated 15 to 20% for 850 BTU gas, 40-50% for 450 BTU gas.

Power Transfer Switching

A transfer switch is required in all emergency power installations, one that completely disconnects the load from the outside power mains when switched to standby. There are three basic ways to accomplish transfer switching: manual, automatic, and no-fail. Manual method is simplest, requiring only that someone start the standby power engine and pull the transfer switch when engine is up to speed. Automatic power switching can be accomplished with use of commercially available units which sense power failure or measurable change in regular supply. Such units start the standby engine, and when generator output reaches operating level, automatically transfer the load from commercial to standby power. Most units can switch the load within a fraction of a second and delay can be adjusted to several seconds so that more than just a momentary failure or change is necessary before the generator is activated.

No-fail power involves more than a simple motor-generator. System actually prevents even momentary power loss by having available a power source to drive the standby generator until engine is up to operating speed. If unit senses failure or change in commercial power, it switches immediately to standby. If condition exists for a second or two (period is adjustable) mechanical or hydraulic power drives generator until engine attains operating speed.

Simple automatic switching may leave the station off the air during a power blackout for a period of seconds or minutes, depending on time required for generator to reach operating speed (and for recycling required in some transmitters). In some cases time delay is one minute (or longer) before the carrier can be switched on after a total shutdown, as would be the case in an instantaneous blackout. Station's needs (and budget) should determine degree of sophistication in power transfer switching.

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Our Model TCA7 all transistorized preamps can replace tube-type amplifiers in your color camera.

Specifically designed for use in RCA TK-41 color camera chains, the all transistorized TCA7 has many benefits. For instance, there is complete elimination of microphonics caused by the amplifier; also a reduction of noise; higher gain-bandwidth product; a reduction in the amount of heat created within the camera and a much higher order of stability.

Yes, our Model TCA7 all transistorized preamps can replace tube-type amplifiers in your color camera. It can be installed in about thirty minutes. The mounting dimensions and hardware are identical to the replaced tube-type amplifier. The TCA7 can be powered by our TPS7 solid state power supply or directly from the 280 volt camera supply by using our TR7 dropping resistor with each TCA7. *Like we say, the Model TCA7 really can replace tube-type amplifiers in your color camera . . . and do a better job, too!*

MODEL TCA7 COLOR CAMERA AMPLIFIER, $316.00 EA., MODEL TPS7 POWER SUPPLY, $50.00 EA., MODEL TR7 PLUG-IN RESISTOR, $10.00 EA., ALL PRICES ARE F.O.B. NASHVILLE, TENNESSEE

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Design & Operation Of Directional AM Antennas

By John H. Battison

Part 3: Measuring pattern area and computing vertical radiation.

THE SHAPE of a directional antenna pattern indicates the *relative* radiation in each direction; it is used to determine the coordinate locations of nulls and lobes so that proper protection will be afforded co-channel and adjacent channel stations. Pattern shape computations do not specify the exact *area* which the pattern will cover, however, and additional computations must be made to prove that a proposed contour will not cause any objectionable interference in any direction.

Pattern Area Computations

One method of measuring pattern area is to use a planimeter, a small instrument designed to measure the area of an irregular plane figure.

Another way to determine pattern area is to lay the sketch over a sheet of suitable sized squares representing the proper scale.

For daytime operation, vertical (or high angle) radiation is generally of no consequence; an exception would be transition period radiation (2 hours before sunrise) of Class II stations. In such cases, vertical radiation must be limited to the point where it will not interfere with the dominant Class II station.

For nighttime operation, vertical radiation assumes much greater importance, so much so that the FCC charts are quite precise in prescribing allowable limits. (Even though strict control may

Simplified DA Calculations

If the currents in each tower are equal, the pattern formula can be reduced to:

$E = K \cos (S/2 \cos \theta + \phi/2)$

where E is the field in mv/m.

K is a constant that will produce an expected RMS from the antenna system, based on the experience of the engineer. In this case, we will assume it to be 200, which is reasonable for 500 watts.

S is the tower spacing in degrees.

θ is the azimuth angle.

RMS indicates the efficiency of the array in mv/m; in our example it is 134.4 mv/m.

Based on parameters in Fig. 2, the radiation at 60° would be 65.12 mv/m.

It then became necessary to amend the pattern slightly to reduce radiation in the null area. The antenna parameters were changed slightly to reflect a phase difference of 100° instead of 102°, and the line of towers was changed from 090° to 080°.

Everything else remained the same. The effect of the phase change is shown in Fig. 3.

Very little change has occurred in the broad main lobe values, but a very significant change has occurred in the null area—the "pip" has disappeared. Seemingly small changes such as this can play a major role in the success or failure of an application.

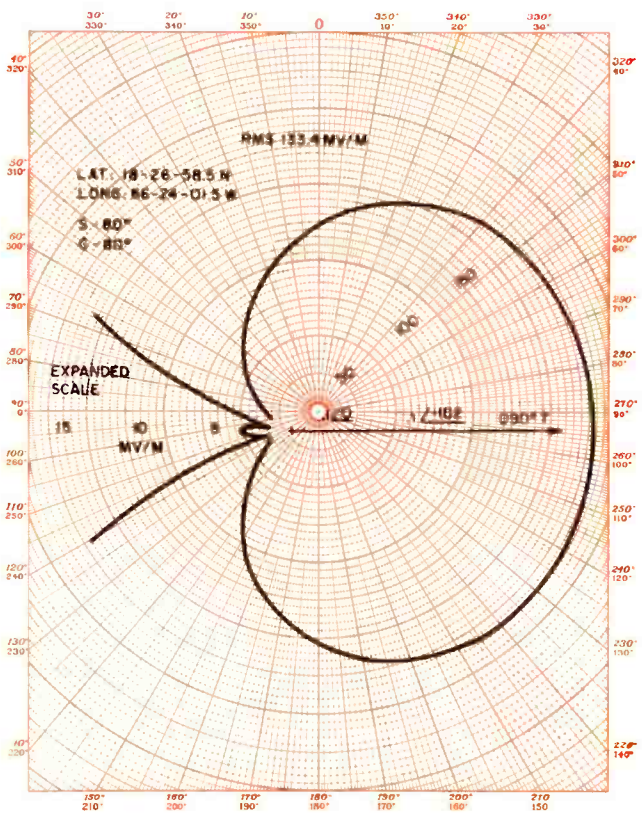

Fig. 2. Vertical shape factor for various antenna heights.

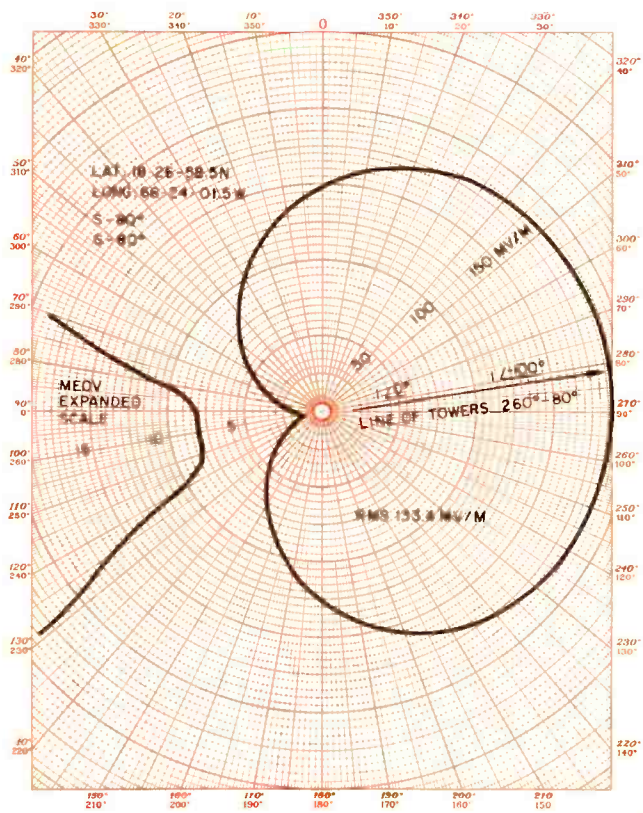

Fig. 3. Pattern computed by simplified method for towers with equal current.

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Two ways to get there

Short haul or long haul? Whichever way you go, you'll find one of Collins' microwave systems the best way to relay television programming.

Low differential gain, low phase distortion and excellent linearity of Collins' equipment assure you that the sharpness, clarity, definition and color hues will be faithfully maintained for transmissions sent over hundreds or thousands of miles.

Collins 5-watt i-f heterodyne microwave systems provide the capability for best long haul color television performance.

Collins 1-watt remodulating equipments offer economy for short to medium haul routes.

Both systems are available in either 6-gc or 11-gc frequency bands, and are completely transistorized—except for TWT's or transmit klystrons. Both have new advanced packaging techniques for ease of maintenance.

For technical information, call, wire or write Collins Radio Company, Microwave Marketing, Dallas, Texas, Area Code 214, AD 5-9511.

Visit Collins' Exhibit at the NAB Convention, Booth 209, to see the latest in Microwave for Broadcast Applications.

COLLINS

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be maintained over horizontal radiation, high angle radiation can literally blast the protected station off the air.) Eliminating objectionable vertical radiation usually requires cut-and-try methods, one of the main reasons that the preparation of nighttime applications is often expensive.

Vertical radiation must be computed at every horizontal radial. The high angle radiation characteristic is known as F (θ), and is published as a standard factor for every 50° of horizontal azimuth and vertical elevation. Fig. 1 shows how this factor varies.

Vertical radiation at any horizontal angle (θ) may be computed by:

$$V_{SF} = F(\theta)\ [\angle 0° + B \angle (\theta + S \cos \theta \cos V)]$$

However, because V, the vertical angle, and horizontal angle θ appear only as cosines in this expression, they merge and appear as the result of only one angle; thus, they can be treated as the cosine of a single angle. It is therefore necessary to compute only the horizontal shape and apply the vertical factor F(θ).

For example, let's assume that the horizontal angle (θ) is 100° and compute the vertical radiation at 30°. The cosine of 100° is −0.9848; the cosine of 30° is 0.8660. The product of these two values is 0.8540. A cosine table shows the angle equivalent to this value to be 148.6°. At this angle the horizontal value is 3.85 (see Part 2). In Fig. 1, the F(θ) value for 30° of elevation is 0.825, for a tower height of 90°. The product of 0.825 and 3.85 is 3.12. the vertical radiation in the same units as Fig. 1. To convert to mv/m, we multiply 148.6° by the power ratio, which equals 226 mv/m vertical radiation at 30° above the horizon.

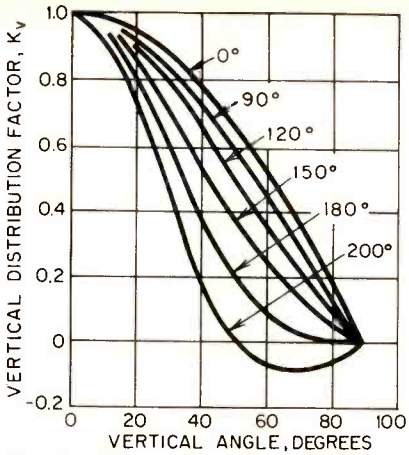

Fig. 1. Effect of phase angle change for the pattern in Fig. 2.

Towers of Unequal Height

Towers of equal height should, of course, be used wherever possible to avoid unnecessary complications. However, if an existing tower (or towers), must be used in a new array for increased power or for nighttime operation, compensating adjustments must be made in the tower feeder system.

The important thing to remember is that the ratio of the antenna fields, or the field ratio, determines the radiation pattern. The field ratio is, of course, directly related to the tower current ratio, and can be neglected only when it is unity (i.e., when both towers have the same currents and fields). If the tower heights are unequal, the actual current ratio required to produce the desired field ratio must be computed.

For example, if we want one tower that is 90° high and another that is 135° high, we must determine the field of each tower at one mile for 1 kw. This can be determined by referring to antenna radiation charts. Actually, it will be necessary to reduce the current in the taller tower to a value that will produce the same power as the shorter tower at one mile. Without any adjustment, the 135° tower theoretically will produce 213 mv/m at one mile whereas the 90° tower will produce 196 mv/m, with 1 kw fed to each tower. If the power in the shorter tower is 1 kw, then by application of Ohm's law we find that only 840 watts will be required to produce a 196 mv/m field from the taller tower (power varies as the square of the field intensity).

In making adjustments in the tower current ratio to equalize the radiation field, tower base resistances must be considered. The base resistance of the 90° tower will probably be around 37 to 40 ohms whereas the base resistance of the 135° tower will be around 300 ohms. Using these figures, we can compute the currents required to produce the 1 kw (for the 90° tower) and 840 watts (for the 135° tower) by using Ohm's law ($P = I^2R$). This gives us 5 amps for the 90° tower and about 1.7 amps for the 135° tower. Therefore, the current ratio for equal fields is 5:1.7, or about 3:1. The problem then becomes a matter of adjusting tower currents, which requires some cut and try, until the desired field (current) ratio is obtained. ●

Table I. Azimuth Bearings and Radiation for Fig. 2.

Azimuth	θ	Radiation MV/M
260°T	0	0
270	10	2.10
280	20	8.38
290	30	18.84
300	40	31.64
310	50	49.4
320	60	68.4
330	70	88.62
340	80	108.92
350	90	128.56
360	100	146.3
010	110	161.2
020	120	173.2
030	130	182.3
040	140	188.89
050	150	192.9
060	160	195.34
070	170	196.58
080	180	196.96

Table II. Azimuth Bearings and Radiation for Fig. 3

Az.	θ	Radiation MV/M
270	0	3.5
280	10	1.4
290	20	4.9
300	30	15.0
310	40	28.0
320	50	46.0
330	60	65.0
340	70	86.0
350	80	106.0
000	90	126.0
010	100	144.0
020	110	159.0
030	120	172.0
040	130	181.0
050	140	187.0
060	150	192.0
070	160	194.0
080	170	197.0
090	180	198.0

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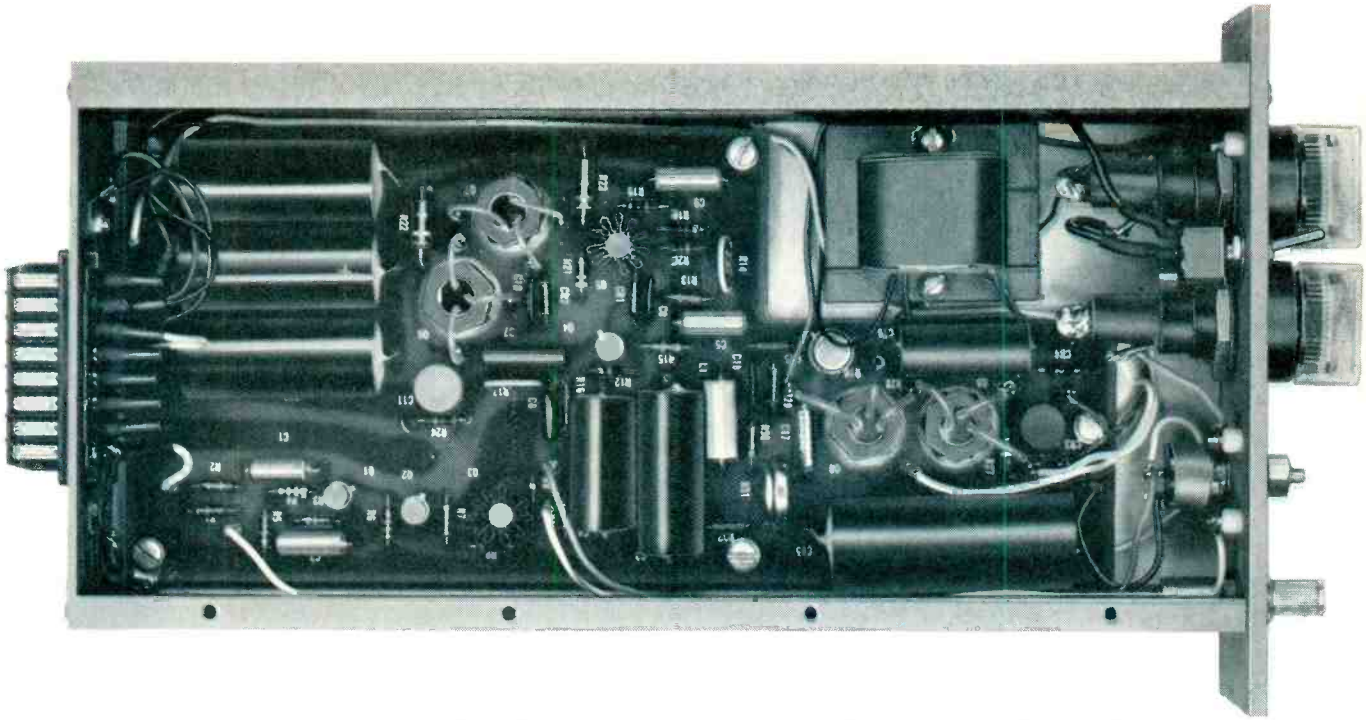
DYNAIR does it AGAIN!



...several revolutionary new products to be shown for the FIRST time at the 1966 NAB convention!

Yes, DYNAIR — as usual — is setting the pace when it comes to TV accessory equipment. We look for a need and then fill it; it's the secret of our success! Our latest equipment, to be demonstrated at NAB, consists of:

Sideband Analyzer. A low-cost, solid-state TV sideband analyzer which is very compact and operates on all VHF channels. This device is ideal for both the broadcaster and the CATV operator.

AGC Amplifier. A solid-state modular TV AGC amplifier with self-contained power supply.

Sync Delay Unit. A solid-state modular device which allows sync to be delayed up to 91 μSEC. Adjustable in .1 μSEC increments with front panel controls!

Video and Pulse DA's. Solid-state modular DA's with built-in power supply. These are the amplifiers the broadcaster has been waiting for.

Along with these, we will also demonstrate our BU-1029A Balanced Universal Amplifier — the inexpensive hum-cancelling device you've been hearing so much about — and our TX-4A Solid-State Audio/Video Modulator, TX-1B Audio/Video Modulator and the RX-4A Solid-State TV Tuner.

Don't miss us. We'll be in booth 211 at the NAB convention, Chicago Hilton Hotel, March 27 thru 30.

If you won't be able to attend the NAB convention, write or call today for complete information on our new products.

Make DYNAIR your first stop at NAB

Remember... Booth 211

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San Diego, California 92114
Telephone (714) 582-9211

DYNAIR ELECTRONICS, INC.
SAN DIEGO, CALIFORNIA

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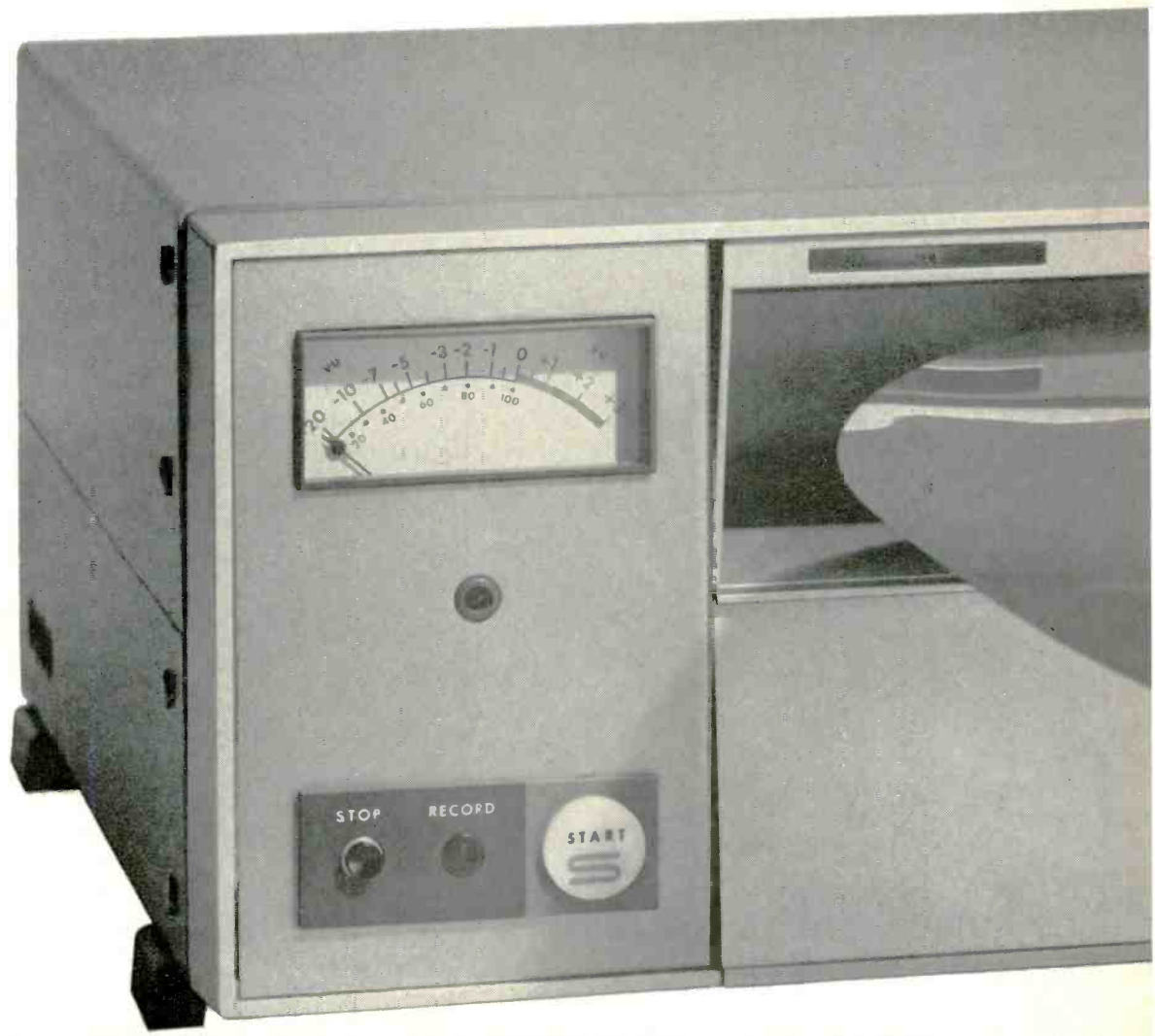
AN ENTIRELY NEW CONCEPT IN RECORDING/REPRODUCING



Ampex took a fresh look at one of the industry's most serious problems. Result: an entirely new solution, the CUE-MATIC. Now you can get first-play quality, absolute reliability and handling ease in a compact recording/reproducing unit. And the CUE-MATIC system offers extraordinary economy.

The CUE-MATIC has been thoroughly field tested by advertising agencies, recording studios, networks and independent broadcasters. After months of vigorous use, all acclaimed the performance of the CUE-MATIC.

Here's how CUE-MATIC works:

The CUE-MATIC system uses an 11¾-inch magnetic mat called a CUE-MAT* instead of tape cartridges for recording and reproducing sound. The CUE-MAT is easily inserted into a slot in the front of the machine. It is automatically centered and cued for recording or playback. The record/reproduce head is mounted on a carrier which moves in a straight line across the rotating CUE-MAT from the outer edge toward the center. Maximum playing time is 3 minutes and 45 seconds. This provides sufficient time for individual spot announcements, complete 45 rpm records, or excerpts from LP albums. Full stable speed is achieved in 0.1 second after start button is pushed. Indicator lights give visual confirmation of status. Another important feature is the automatic addition of an inaudible 30-cycle tone to the end of recording which releases the CUE-MAT on subsequent plays. It may also be used to start a second CUE-MATIC, or other equipment, or re-cue the same CUE-MAT. A final note: the new CUE-MATIC features all solid state electronics.

Why you need CUE-MATIC:

The CUE-MATIC system guarantees first-play quality broadcast reproduction for your advertisers. The ten-thousandth play is as good as the first. There is absolutely no loss of quality from electrical transcription to CUE-MAT.

The CUE-MATIC is reliable. This reliability created tremendous enthusiasm among the many people who field-tested the system. There

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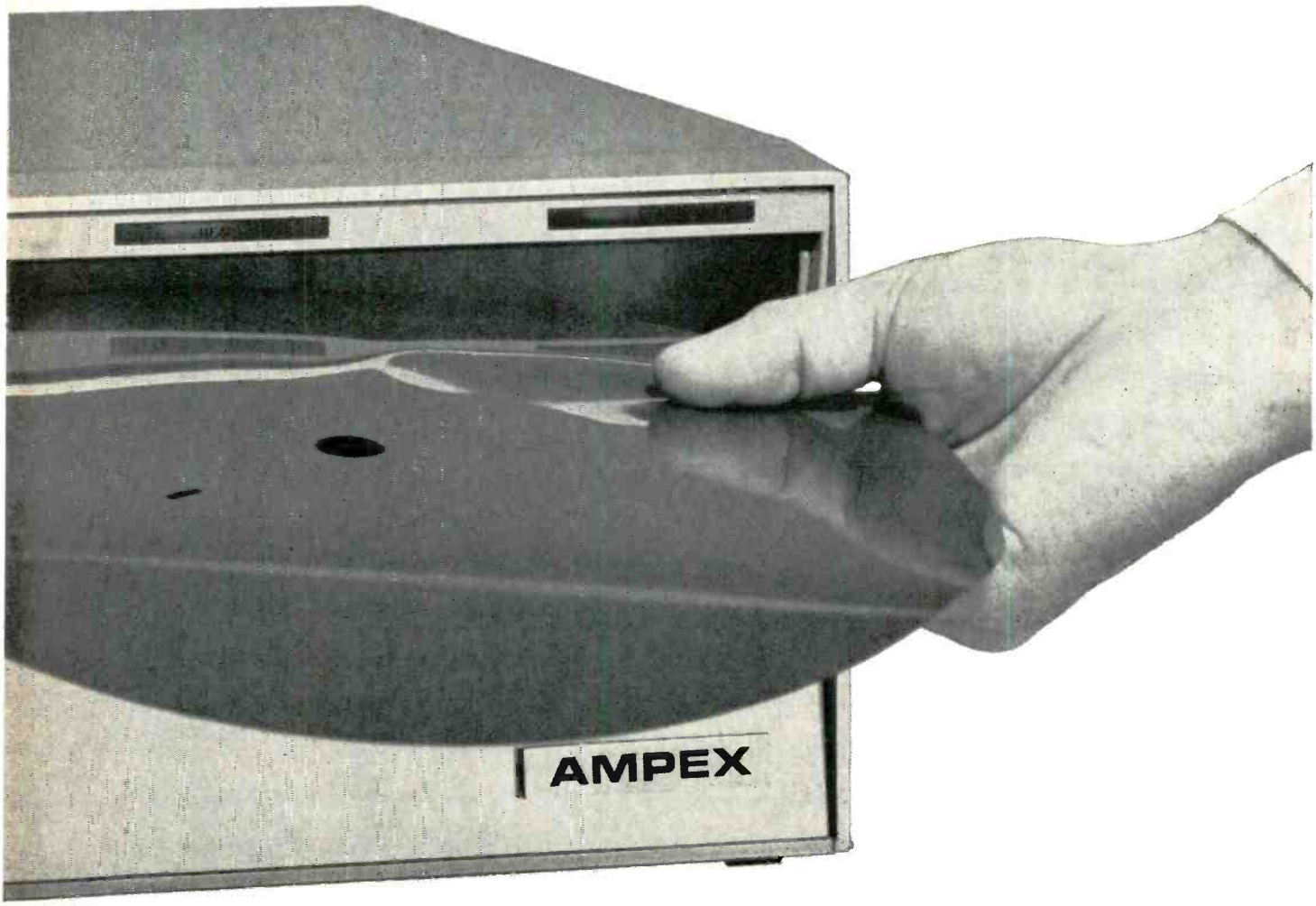
FOR RADIO BROADCASTING: AMPEX CUE-MATIC* AG-100 SERIES



© AMPEX CORP., 1965 *TM Ampex Corp. for Magnetic Mat Recorder & Magnetic Recording Mat

are no worries about missed cues or other malfunctions which have triggered industry complaints about the cartridge system.

The CUE-MATIC is very easy to operate. Cueing is completely automatic and the unit is push-button operated.

The CUE-MATIC offers economy. The mats cost less than ¼ the price of cartridges and are erasable and re-usable. They require less than 1/10 the storage space too. This alone can save you up to 90% in storage and related costs.

The CUE-MATIC system is in production now. To arrange a demonstration, or for an illustrated brochure, just send us the coupon. Term leasing and financing are available.

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401 BROADWAY
REDWOOD CITY,
CALIFORNIA 94063

AMPEX

☐ Please send me free brochure about CUE-MATIC.
☐ Yes, I'd like a demonstration of the CUE-MATIC system.

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Title _____

Organization _____

☐ Broadcast Station ☐ Recording Studio
☐ Agency/Advertiser ☐ Other

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NAB CONVENTION HIGHLIGHTS

Largest Broadcast Convention Ever

According to NAB officials, the broadcast equipment exhibit area at the 44th Annual Convention, Chicago Conrad Hilton March 27-30, will be the largest ever. At press time, Everett E. Revercomb, NAB's secretary-treasurer and Convention manager, advised that 98 broadcast equipment manufacturers were signed up to display the newest in radio-television gear. In addition, at least five other applications were pending, and several other manufacturers wer known to have made special arrangements to exhibit their wares.

Approximately 50,000 square feet of exhibit space, about 12,000 more than the record footage of last year, will be required. Attendance at this year's Convention is expected to surpass the record 4,175 registered in Washington last year.

The big attraction, of course, will be color TV equipment, particularly studio and film cameras and VTR'S. At least five manufacturers, including G.E., Marconi (in Ampex space), Sarkes Tarzian, North American Philips, and RCA, will be showing new color studio camera chains. Video switchers are also expected to be a major attraction, and will be featured by at least seven companies.

Radio's New Sounds Featured

New and profitable sounds in radio programs and commercials will be featured at NAB in two management radio assemblies. NAB's Sherril Taylor advises that two sessions for radio management registrants are planned, one for Monday afternoon, March 28, and the other for Tuesday morning. The program will include a presentation of radio "Sounds of '66," both live and on tape, from modern to country and western music, from talk and information shows to all-news and sports.

Another highlight will be a report on radio's past, present and future by Jack W. Lee, WSAZ Huntington, W.Va. Also, Earl Nightingale of Nightingale-Conant, Chicago, will give a presentation on programs that can be both inspirational and profitable.

Grover C. Cobb, KVGB Great Bend, Kan., will preside at the Tuesday assembly, which will feature a panel presentation by SRA on "The New Sound of Radio Commercials." Hastings Baker, SRA's managing director, will moderate a panel composed of Stan Freberg, of Freberg, Ltd., Steve Frankfurt of Young & Rubcam, and Howard Gossage of Freman, Gossage and Shea.

Rounding out the Tuesday program will be progress reports by Howard H. Bell, NAB Code Authority Director, on self regulation under the Radio Code, and by Howard Mandel, NAB vp for research, on the audience studies to more accurately measure the vast audience and selling power of modern radio. There will also be an RAB presentation on sales techniques by Miles David and Robert Alter.

Sales and Profits to Highlight FM Day

Reports on FM radio's tremendous pulling power as a local advertising medium, and on the profitable operation of FM stations, are among the program features scheduled for the traditional "FM Day" rally Sunday, March 27th. Sherril Taylor, NAB's vp for radio, will give a report on "The Changed Scene" in FM broadcasting. Mr. Taylor and Everett Dillard, WASH Washington, D.C., NAB Radio Board member and chairman of NAB's FM Committee, announced these agenda highlights for the meeting:

Big Sales in Your Own Back Yard With FM, a panel presentation moderated by Ben Strouse, WWDC, Washington, featuring three local FM advertisers.

Make Money NOW With FM, another panel presentation featuring Harold Krelstein, WMPS Memphis; David Polinger, WTFM New York; and Harold Tanner, WLDM Detroit. Mr. Krelstein, a member of NAB's Radio Board, will act as moderator.

As in the past, the NAB program is scheduled for Sunday afternoon. The morning session, presented by NAFMB, will be devoted to ideas on selling FM radio time.

How and Why of Colorcasting

The boom in color TV will be examined from the broadcaster's point of view at a "Color Conference '66" for TV management delegates, scheduled for Monday afternoon, March 28, in the Great Hall of the Pick Congress Hotel. William Carlisle, NAB vp for station services, said the color conference will delve into five main areas of colorcasting — the mechanics involved, decision-making on equipment purchases, problems and solutions in program production, and promotion and sale of the end product.

The Conference will be produced and moderated by Charles H. Tower, executive vp, Corinthian Broadcasting Corp., member of NAB Television Board of Directors and the 1966 Conference Committee.

Mr. Carlisle gave BM/E this rundown on the Conference:

The Electronics of Color. A visual presentation in layman's language on the mechanics involved in colorcasting, by John Wentworth, manager of RCA's Current Concept in Science and Engineering program at Camden.

How to Buy Color Equipment. Representatives of Ampex, G.E., North American Philips, and RCA will be queried by a management/engineering team headed by John T. Wilner, vp in charge of engineering, The Hearst Corp., Baltimore, and former chairman of NAB's Engineering Advisory Committee.

How to Program for Color. A presentation by Casey Cohlmia, pres., Broadcasters Promotion Association and promotion manager of WFAA-TV, Dallas.

How to Sell Color. A presentation by Norman E. (Pete) Cash, pres., Television Bureau of Advertising.

Mr. Carlisle advises that no tickets or special credentials will be required for attendance at the Color Conference.

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NEW SOUND IDEAS KEYED TO YOUR NEEDS

AS-500 Stereo
Studio & Remote Unit

BP-211
Portable Cartridge Playback

A-500
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Custom Turntable

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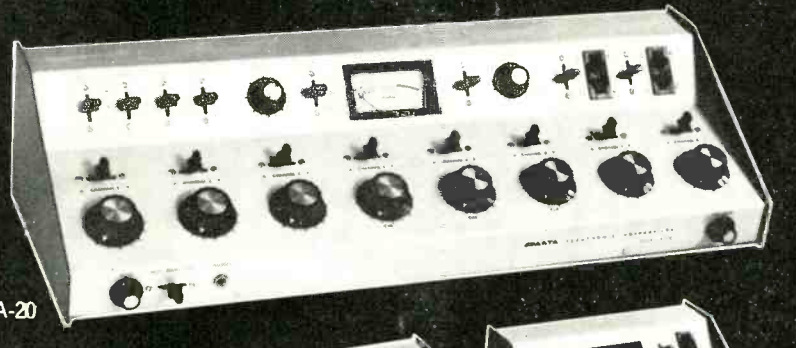
Cartridge System



A-20

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AS-30

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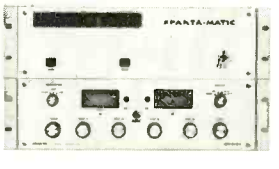
INTRODUCING THE NEW SPARTA FAMILY OF CONSOLES!

Four new consoles—each one keyed to the needs of broadcasters everywhere. Stereo and Monaural consoles for studio and remote use, all completely transistorized and designed with the ultimate in flexibility built-in. See the new SPARTA family and many other new innovations at NAB Booth 246.

NEW ADDRESS TOO!

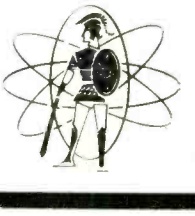


Sparta-Matic 600 Series
Stereo Cartridge System

SPARTA ELECTRONIC CORPORATION

5851 FLORIN-PERKINS RD. SACRAMENTO, CALIF. 95828

PHONE: (916) 452-5353



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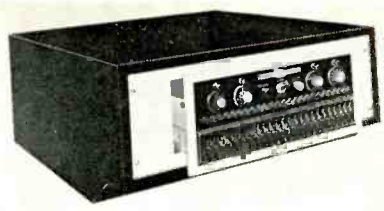

ATC Simplex Model 100 Programmer.

IX video pulse distribution amplifiers are of modular construction to allow up to 10 units to be mounted in one standard equipment rack; sync or blanking can be added to any video amplifier output. The Mark VIII automatic gain control video amplifier has been designed to compensate for various types of video signal deficiencies; it will ride video gain and setup over a 2:1 change in input level variations.

Circle 83 on Reader Service Card

Beckman & Whitley (Booth 401)

A portable 16mm sound camera with zoom lens and 400-ft film capacity will be introduced. The CM16 weighs 14 lbs., measures 3" x 8" x 15½", and is designed to be operated in sync with tape or film recorders for recording double system sound. The CM16 features reflex through-the-lens viewing and focusing, and produces a camera noise of 38 db at 3'.

Circle 84 on Reader Service Card

Belar Electronics (Booth 321)

To be introduced are three new products in building block FM monitoring system. The FMM-1 FM frequency and modulation monitor is the basic unit; the SCAM-1 SCA frequency and modulation monitor and FMS-1 stereo monitor may be added as needed. The SCAM-1 monitors deviation and modulation, plus subchannel injection and cross-talk. The FMS-1 monitors pilot injection and individual channel modulation, channel separation, cross-talk, distortion, and pilot phase setting.

Circle 85 on Reader Service Card

Bauer Electronics (Booth 222)

To be introduced is Model 605 7500 5000 watt FM transmitter, designed for monaural and stereo/multiplex operation, priced at $10,500. Other new products include: Model 910D dual channel console with 8 mixing channels and 30 inputs (price: $1450 wired, $1150 in kit form); Model 910S stereo console with 8 mixing channels and 24 inputs (price: $1950 wired, $1550 in kit form); Model 912 console with 5 mixing channels and 17 inputs (priced under $800); Model 912S stereo console with 5 mixing channels and 17 inputs (priced under $1000); and Model 440B Log Alarm automatic transmitter logging system featuring new packaging.

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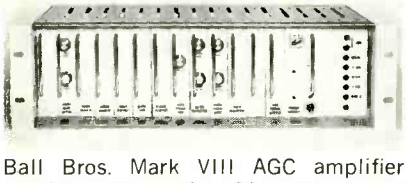

Ball Bros. Mark VIII AGC amplifier provides automatic video compensation over 6 db signal variations.

Broadcast Electronics (Booth 303)

New products to be introduced include improved versions of the popular Spotmaster Super B and Series 400A cartridge equipment, as well as a second generation version of the Ten Spot multicartridge machine. Also, a new solid-state audio distribution amplifier designed for individually controlled distribution of program material to multiple points with 60 db isolation between channels will be introduced. The amplifier has a pushbutton switch and single meter to check output. Also to be shown is a compact remote amplifier, the battery-operated Portapak I, the TP1A tape cartridge winder, cartridge storage racks, the TT20A equalized turntable preamp, and a number of accessory items.

Circle 87 on Reader Service Card

CBS Laboratories (Booth 236)

A wide range program monitor designed to measure audio levels over a 60 db range on a single scale meter will be introduced. Designated as Model 600, it can be used while program is on the line to measure noise and low audio levels and is also equipped with an output jack for connection to chart recorders. Price is $345. The FM Volumax, a new automatic peak controller, will also be exhibited. Model 410, priced at $695, is designed to replace common limiters and clippers for positive prevention of FM overmodulation and SCA crosstalk.

Circle 88 on Reader Service Card

CCA Electronics Corp. (Booth 237)

On exhibit will be a complete line of AM and FM transmitters, with emphasis on a new philosophy in AM broadcast transmitter design, a "dual reliable" 5-kw AM transmitter. With this system, two independent 2.5-kw transmitters are combined to produce 5 kw output. Should either develop trouble, the defective unit automatically shuts down while the other continues to feed its output into the antenna. Manufacturer claims maximum off-air time of 5 seconds for 2-year period.

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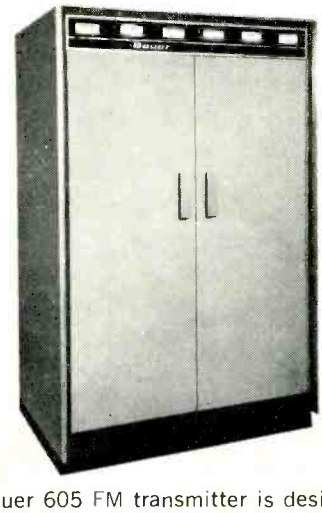
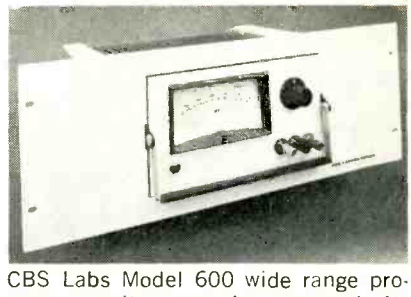


Bauer 605 FM transmitter is designed for monaural and stereo/multiplex operation.



CBS Labs Model 600 wide range program monitor can be removed for portable use.

Chrono-Log Corp. (Booth 103)

Exhibit will feature STEP system in conjunction with a Riker solid-state switcher. New features in the STEP system include automatic control of transitions such as WIPE, FADE, etc. Integrated with a Riker switcher, the Chrono-Log STEP System allows a TV station to obtain an operating automated switching system. Riker Industries is the national marketing representative for the STEP System.

Circle 90 on Reader Service Card

Cleveland Electronics (Booth 115)

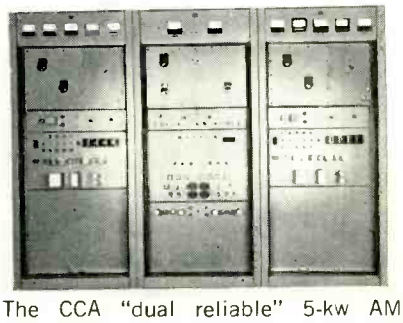
Complete line of vidicon, image orthicon, and plumbicon deflection components will be shown. Highlighting the exhibit will be a new plumbicon deflection assembly for use in color applications. The EDI Div. will display a line of transformers for broadcast transmitters, including a 50-kw plate transformer.

Circle 91 on Reader Service Card

ColorTran Industries (Booth 117)

Firm will introduce a compact hydraulic crab dolly (26¾" by 39") which can accommodate camera rigs as heavy as the BNC, plus operator and assistant. In addition to conventional crabbing and rear wheel tracking, the dolly also offers front wheel steering. The

Continued on page 50



The CCA "dual reliable" 5-kw AM transmitter.

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A Cummins Generator may cost you far less than one more power failure!

Loss of business. Pilferage. Loss of life. Lawsuits. Prevent any one of these power failure problems—once—and you've paid for the best diesel generator you can own. Cummins.

For hospitals, radio and TV stations, bottlers, stores, plants, homes, and wherever else electrical power is essential, Cummins emergency power units have proved their worth. One failure, cost paid.

But let's talk about your specific needs. Call or send the coupon—we'll prove our point.

For complete information on Cummins emergency power, send this coupon to:

Richard Jonson, Manager, Emergency Power Section,
Cummins Engine Company, Inc.
1000 Fifth Street, Columbus, Indiana 47201

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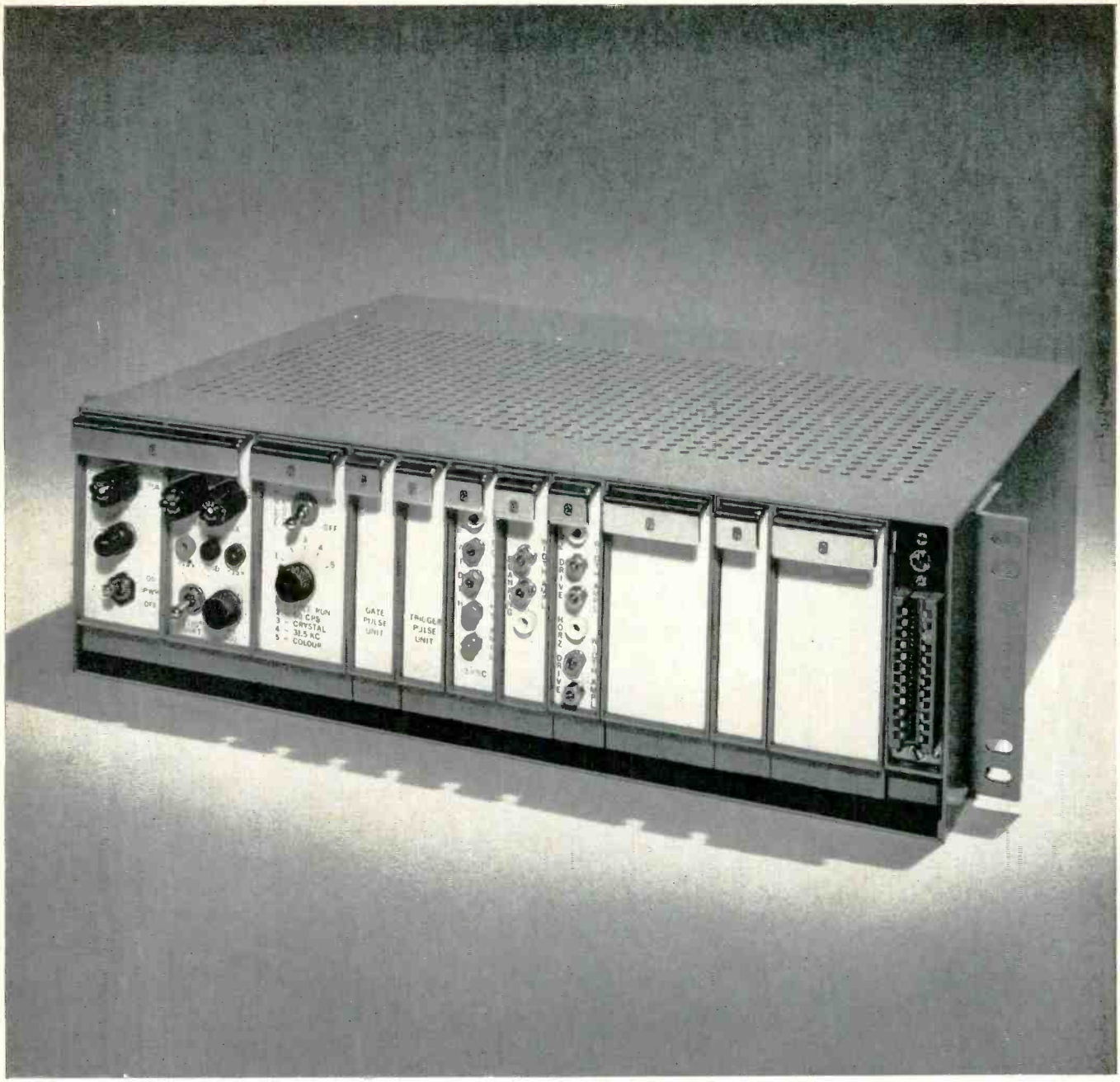

U.S. funds, FOB Toronto, duty and brokerage included: merely $1,990.00

Still wishful syncing?

Now you can stop feeling wishful — and *wistful*. Here's a *second-generation* solid state monochromatic synchronizing generator with optional plug-in modules for complete colour operation.

It uses special patented coincident gate solid state circuitry for exact timing, producing rock-solid stability and superbly shaped pulses. Provides all standard EIA pulses — and these pulses are impeccably clean, with virtually no overshoot or cross-talk. The quality-controlled solid state components are all mounted on epoxy-glass printed circuit boards, contained in diecast aluminum frames. Every module is plug-in — and you even have a plug extender when required for easy maintenance on all components from the front of the unit.

At a mere $1,990 for the monochromatic version you may well wonder just *how* good is it? For starters, remember that it's designed and manufactured by the same team that built the video routing system for CBS, New York. Then remember that this is a *second*-generation solid state unit, already thoroughly field-proven on network originations under the most critical conditions. For the definitive clincher, just write us for complete specifications on our R-22240B. You'll discover, incidentally, that our delivery dates are just as attractive as performance and price. 1065-4

Northern Electric
COMPANY LIMITED

For specifications, write: Department 9950, Belleville, Ontario, Canada

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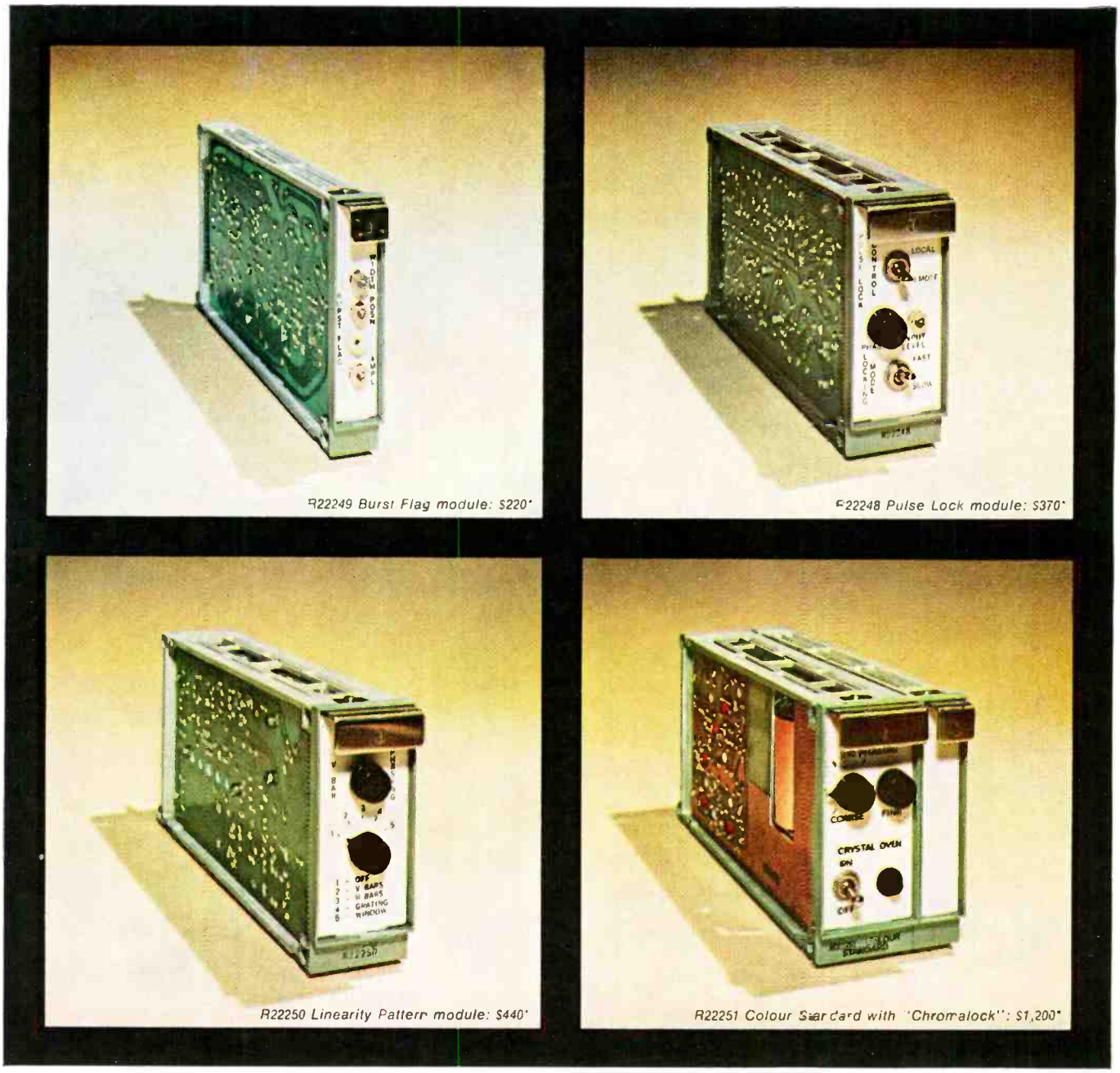

* All prices in U.S. funds, FOB Toronto, duty and brokerage included.

Here's your colourful answer!

Colour us economical! You can completely convert our sync generator to local colour for only $1,420! And look at these options: *BURST FLAG* module is fully adjustable for width, position and amplitude, locks to either internal or external 31.5Kc signal, provides 4V peak-to-peak negative going burst flag pulse for keying colour burst. *COLOUR STANDARD* produces two precise 3.579545Mc 2V peak-to-peak NTSC colour subcarriers. Phase is continuously variable through 360° to compensate for cable delay. A 31.5 Kc reference signal locks generator master oscillator to colour subcarrier. There's even a 2.5V colour subcarrier into 1,000 ohms test output. The *"CHROMALOCK"* synchronizes colour subcarrier phasing with network/remote colour burst on composite video signals . . . detects loss of master colour burst . . . automatically reverts generator to freerun colour operation.

If you're concerned with locking faultlessly to network sync, our *PULSELOCK* module locks local sync to any master network or remote sync, has slow and fast lock modes, has phase adjustment for local pulse positioning, provides *exact* vertical lock to any network or remote signal — monochrome or colour. Operate this pulselock module at the sync generator itself, or by remote control cable from any convenient point. Another optional module, the *LINEARITY PATTERN*, provides four convenient test patterns: vertical bars, horizontal bars, grating, and window; for monitor and camera alignment.

Northern Electric
COMPANY LIMITED

For specifications, write: Department 9950, Belleville, Ontario, Canada

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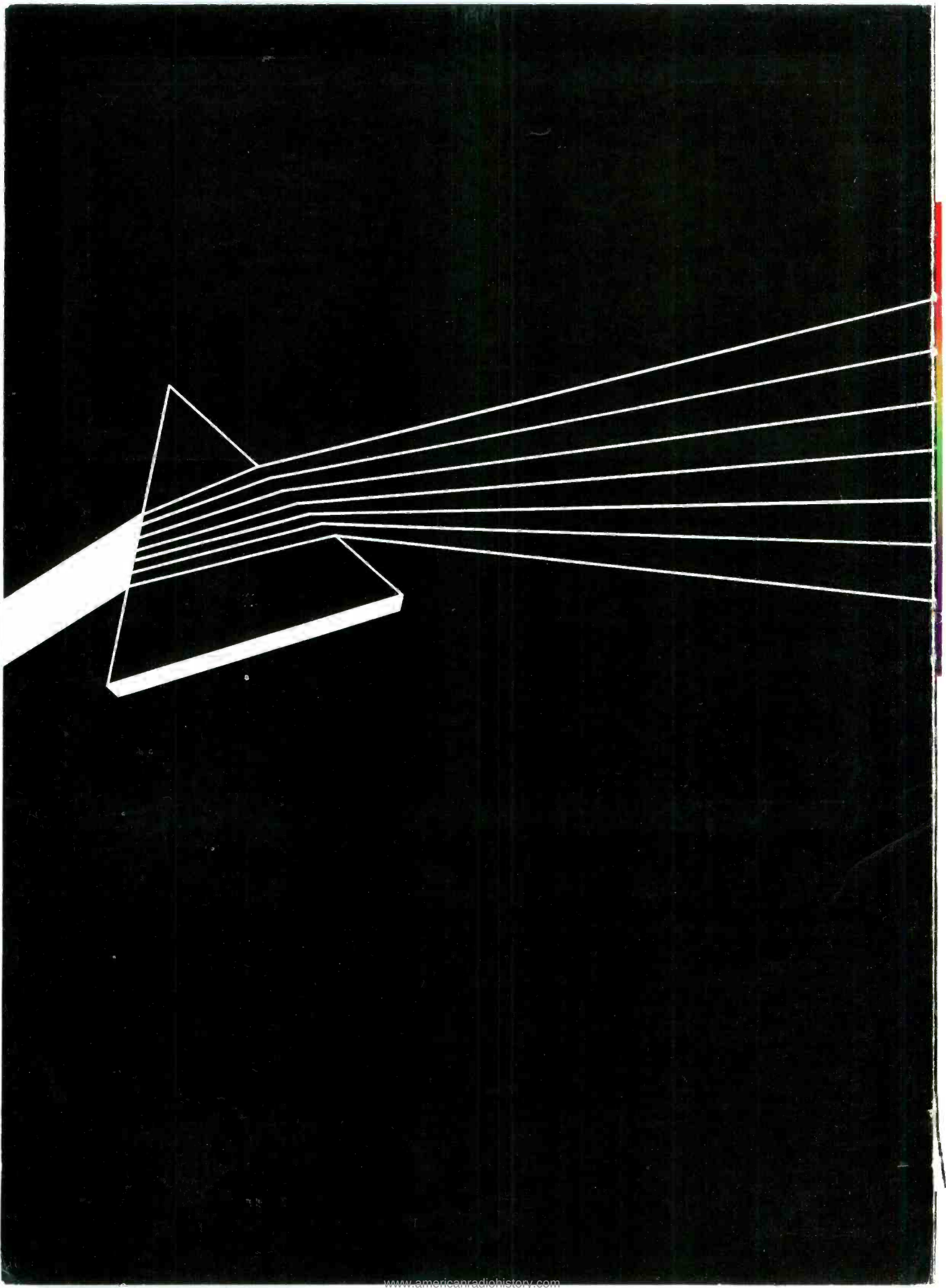

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COLOR TV TAKES A GIANT LEAP FORWARD WITH THE REVOLUTIONARY NEW...

Sarkes Tarzian, Inc. brought a fresh outlook to the problems of color television. We were free to explore all possibilities. We had no commitment—economical or philosophical—to an existing system, with its inherent faults.

We had no hesitation to innovate, where innovation was called for. Likewise, where we found a proven concept, we adopted it.

Results? The revolutionary, full-color Polychrome Camera system—the only color system offering a choice of tubes.

Here is color television previously unknown. Here is color performance to still the remaining skeptics. Here is rare purity of color . . . rigid stability . . . delicate detail.

And while our engineers were at it, they designed out heaviness and awkward appearance—giving the Polychrome Camera a trim, eye-pleasing silhouette in a unique magnesium housing. Like its monochrome predecessors, Tarzian's Polychrome Camera systems feature 100% transistorized circuitry.

The first Polychrome Camera systems are scheduled for June delivery.

Symbol of Excellence in Electronics

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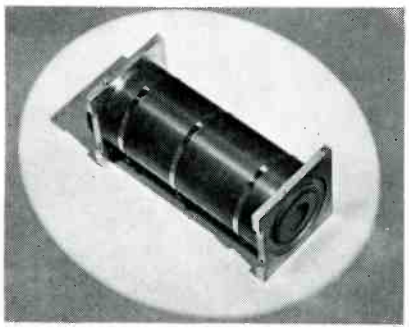
NAB PREVIEW

Continued from page 44



Cleveland Electronics will show this color deflection yoke assembly for plumbicon cameras.

camera lift operated by bottled CO_2 provides continuously variable lift and descent rates. Dolly can be dismantled without tools and packed in two carrying cases, transported in a standard automobile. ColorTran will also show new quartz-iodine lighting units and the latest types of electronic dimming equipment.

Circle 94 on Reader Service Card

Cohu Electronics (Booth 311)

Video switching and distribution systems will be featured with a sync generator, pulse amplifier, and a dot-bar generator. The 9000 Series video switcher is custom assembled from off-the-shelf components with capabilities for un unlimited number of inputs and outputs. The plug-in video amplifier ($195) distributes color or b & w video from one input to 4 outputs with provision for adding sync to noncomposite video. Cohu's 2470 Series sync generator and accessory system includes a 525-line sync generator, genlock, color standard with colorlock, and power supply ($2,240). Another plug-in unit, the 9800 Series pulse amplifier ($190) is a regenerative unit which processes and distributes sync from one input to 4 outputs. Test patterns for scan rates from 525 to 1029 lines is provided by the Model DBG-2 dot-bar generator ($450).

Circle 92 on Reader Service Card

Collins Radio (Booth 209)

A typical custom audio installation will be featured along with Collins speech

The Cohu Model DBG-2 dot-bar generator operates with composite video.

Collins 900C-1 FM stereo modulation monitor reads peak values of multiplex signals.

input consoles, transmitters, phasors, and monitors. The 212S-1 solid-state stereo console features photoconductive control, and will handle five local stereo inputs plus one of four remote or network stereo inputs. The monaural equivalent of the 212S-1, the 212M-1, will also be shown. The transmitter display will include the 820/F-1 5-10-kw AM with an ovenless crystal, the 20V-3 1-kw AM, the 830D-1A 1-kw FM, 830F-1A 10- kw FM, and the 81M single cabinet phasor. The 900C-1 FM stereo and multiplex modulation monitor, featuring plug-in circuit board construction, will also be shown.

Circle 80 on Reader Service Card

Conrac (Booth 107)

Exhibit will include a working demonstration of professional monochrome and color monitors, including transistorized monochrome models. Both cabinet and rack-mount units will be displayed.

Circle 95 on Reader Service Card

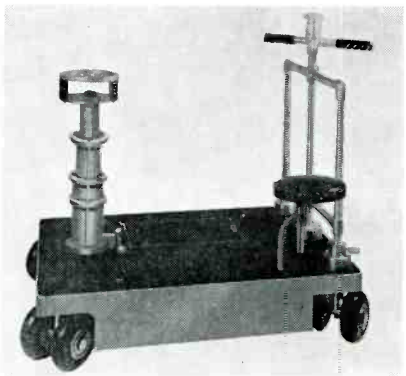
Continental Electronics (Booth 200)

Exhibit will center on improved PROLOG Automatic Programming and Logging Systems and 50-kw AM transmitter first introduced last year. Continental advises that some 26 PROLOG Systems and at least 10 Type 317C transmitters are now in use by various broadcasters.

Circle 144 on Reader Service Card

Craftsman Electronics

A complete line of CATV line amplifiers, couplers, splitters, tap-offs, and power supplies will be shown. Included are Model MD-2100 line extender which provides 40-db output, priced at



Compact ColorTran crab dolly weighs 185 lbs; camera lift weighs 45 lbs.

The Craftsman MD-2100 line extender available for strand or pole mounting.

$62.50, and Model CPS-4 remote power supply (priced at $39.95), which provides power for up to 4 line extenders in 4 different directions, or 15 MD-2100 units in cascade. Craftsman will also show a 300-ohm transformer, Model T-15 (priced at $1.20), completely potted and epoxy-filled in a plastic covered metal can.

Circle 96 on Reader Service Card

Cummins Engine Co. (Booth 227)

Featured will be a new Static Exciter Regulator. Based on the solid-state principle, it is designed to give faster response and closer output regulation. Cummins emergency power units are available in 1.5 to 400-kw capacities. The exhibit will stress the importance of standby power with examples of how Cummins generator sets helped keep many stations on the air during recent power failures.

Circle 97 on Reader Service Card

Dresser-Ideco (Booth 205)

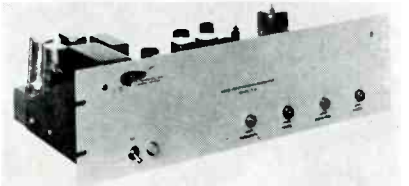
Information on towers up to 2000' will be available at the Dresser-Ideco Booth, including self-supporting towers with Candelabra tops. Engineers will be available to discuss maintenance and design problems, tower locations, soil investigations, or any problems concerning tower construction.

Circle 98 on Reader Service Card

Dynair Electronics (Booth 211)

Exhibit will include video AGC and distribution amplifiers, pulse distribution amplifiers, sync adder and sync delay amplifiers, TV sideband analyzer, a closed-circuit TV transmitter designed for vestigial sideband transmission on any standard or special VHF channel, a CCTV modulator, solid-state TV tuner, and a balanced-line, hum-cancelling universal video amplifier.

Circle 99 on Reader Service Card



The Dynair TX-1B CCTV transmitter has color and b & w capabilities.

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National attention on automatic broadcasting will center in Booth 201 at NAB Convention!

Automatic Tape Control's convention exhibit will be a gathering point for all broadcasters regardless of station size. Here will be demonstrated all the ATC equipment that provides broadcasters with an almost unlimited flexibility in station automation.

In operation will be:

- ☐ Punch card automation programmer and logger.
- ☐ Tape memory automation programmer and logger.
- ☐ Time/sequence automation programmer and logger.
- ☐ Standard Criterion tape cartridge equipment.
- ☐ ATC-55 multiple cartridge handler.
- ☐ The unique ATC automatic program logging equipment.
- ☐ Remote control panel which automatically indicates elapsed time in production recording.
- ☐ New efficient method of traffic control and program schedule preparation.

We extend a warm welcome to all broadcasters to visit Booth 201.

AUTOMATIC TAPE CONTROL ATC

1107 E. Croxton St., Bloomington, Ill.

Phone: 309-829-7006

Circle 26 on Reader Service Card

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Entron (Booth 320)

Firm will introduce a new in-a-line, all-band, solid-state CATV terminating distribution amplifier with a regulated power supply and four distribution line outputs. Also to be introduced is a new in-a-line multiple-tap directional coupler with variable attenuation and a new in-a-line solid-state repeater amplifier with automatic level control. Many solid-state equipment items recently introduced will also be shown, as well as high-gain, high-output tube types. Complete product literature will be available, together with a brochure which describes the principles of a CATV system and defines Entron services.

Circle 100 on Reader Service Card

Fairchild Recording (Booth 314)

A complete line of control devices, including audio level and frequency response equipment for loudness control, will be shown. The display will also include turntables, console components (preamps, equalizers, attenuators), and reverb units.

Circle 101 on Reader Service Card

Filmline Corp. (Booth 118)

Two new processors will be shown, the FE-50 and the FE-30 Ektachrome (ME-4). Both models are designed to meet the need for increased quality and speed in color processing. The units feature an extended development time, allowing ASA indexes of 250 at 50 fpm; 30-second changeover from standard to extended development time at 50 fpm; capability to process color emulsions at 30 fpm (FE-30) and 50 fpm (FE-50); and thermistor controlled temperature. Additional features include 8 recirculation pumps, oilless rotary air compressor, feed-in and take-up time delay elevators, dial thermometer, and impingement dry-box.

Circle 102 on Reader Service Card

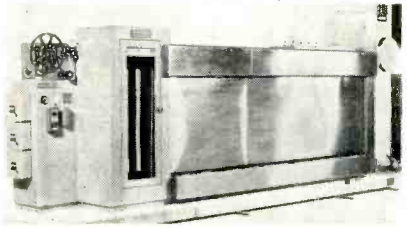
Fort Worth Tower Co. (Booth 315)

Towers designed for CATV, microwave, AM-FM-TV broadcast, as well as passive reflectors, will be displayed. The exhibit will also include equipment buildings and literature on the complete product line will be available.

Circle 103 on Reader Service Card

Gates Radio Co. (Booth 221)

Shown for the first time will be the Vanguard II 1-kw, 1-tube AM transmitter; the Stereo Statesman console; and the Producer and Diplomat Production Centers. Also to be included in the display is a complete line of AM-FM transmitting equipment, including 5- and 50-kw AM transmitters, and the Vanguard I. The FM transmitter display will include several models ranging in power from 1 to 20 kw. The complete line of solid-state consoles will be exhibited, including four solid-state remote amplifiers: the Dynamote 70 4-channel; Attache 70 3-channel; Courier 70 2-channel; and the Unimote 70 single channel. The Gates Cartritape II cartridge tape recording equipment will also be shown.



Filmline FE-50 features an exclusive overdrive transport mechanism.

The Hancock Telecontrol Unicon, an automatic TV programmer with a magnetic core memory.

Circle 104 on Reader Service Card

Hancock Telecontrol Corp. (Booth 403)

The Unicon, an automatic TV program controller said to be capable of coordinating all operations of master control, will be on display. It automatically selects, controls, and mixes video and audio sources as determined by an internally-stored real time program. The Unicon incorporates solid-state logic and a magnetic core memory, with provision for punched card information entry.

Circle 105 on Reader Service Card

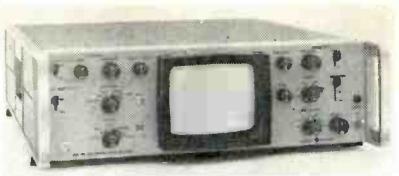
Hewlett-Packard (Booth 418)

Exhibit will highlight Model 191 TV Waveform scope, featuring solid-state design and new degree of sophistication with accuracy of 1% on most functions. Design includes special response filters for accurate display and measurement of differential gain for complex waveforms such as vertical interval test signals. Also to be shown are various meters and instruments for broadcast system tests and measurements.

Circle 142 on Reader Service Card

Ingersoll Products (Booth 217)

Modular-type electronic equipment racks will be shown, with ball bearing chassis slides to allow for easy chassis removal. Available units permit almost any configuration in a broad range of heights, widths, depths, and styles.



Hewlett-Packard Model 191A TV Waveform oscilloscope features solid-state design and accuracy of 1%.

Circle 146 on Reader Service Card

International Good Music (Booth 224)

Exhibit will feature Series 500 and Series 600 audio controls; the Series 500 will be demonstrated with a new Actan Memory Drum which permits voice and music from as many as 8 channels to be sequenced in up to 60 different steps.

Circle 106 on Reader Service Card

Jerrold Electronics Corp. (Booth 322)

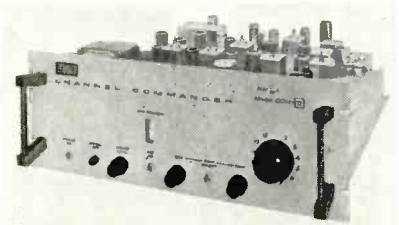
Featured will be the 440 Series solid-state microwave equipment designed for broadcast, CATV, and other applications. Display will show a complete transmitter, receiver, and power supply in 10½" rack space. Self-diplexing waveguide assemblies permit stacking transmitters and receivers with a single waveguide without the need for circulators or other accessory items.

Jerrold CATV equipment on display will include the Channel Commander, a unitized head-end for any VHF channel. The COM-Series is compatible with existing equipment and may be used to pick up an additional channel, replace obsolete equipment, or as a spare head-end. Starline distribution components will be included in the exhibit.

Circle 107 on Reader Service Card

Johnson Electronics (Booth 242)

On exhibit will be line of SCA multiplex equipment for the background music industry. Included will be a 10w receiver with or without mic input, a crystal-controlled tuner, and 10 and 25w audio amplifiers. The exhibit will also include installation calibration components, including a 200,000 ohms-per-volt tuner meter which permits tune-up and tuner analysis—on the bench or in the field—with only one plug-in connection, and a calibration junction box which can be inserted be-



Jerrold Channel Commander delivers crystal-controlled output on any desired channel.

www.americanradiohistory.com

General Electric announces a compact audio-console for all TV, AM, FM and recording applications

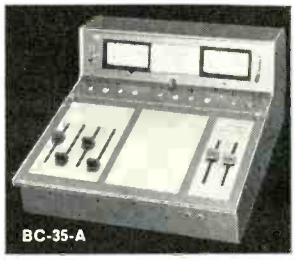
BC-35-B

The new BC-35 is the most compact audio console on the market. 19" wide, 21" deep, and 10½" high—a real solid design. The console base cabinet is optional.

Dual level input channels operate as low level (mike) inputs or medium level inputs (a tape, transcription, line or phone). A Hi-Lo Switch on the circuit board is your selector.

The new console sports such unique features as DC controlled audio switching, new and improved silicon transistorized circuitry, and built-in "cue" facilities.

It's used in single or dual program channels, and comes in 2 models—the "A" Model with 4 mixers and the "B" Model with 8 mixers. Otherwise they're identical.



BC-35-A

These key features make the new BC-35 the only audio console on the market that does what you want it to. Result? You get top performance, optimum operation, and minimum maintenance—all in one unit.

Write today for information on the new BC-35 A/B. It's for all AM, FM, TV and recording applications. General Electric Company, Visual Communications Products #7-315, Electronics Park, Syracuse, N.Y. 13201.

GE-28

Visual Communications Products

GENERAL ELECTRIC

Circle 27 on Reader Service Card

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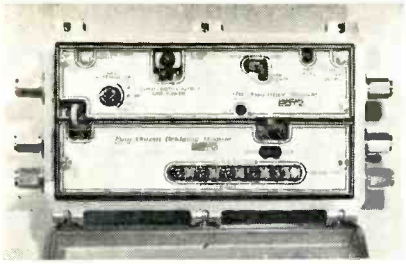


Kaiser-Cox Phoenician series CATV units house interchangeable major components. This housing contains AGC amplifier and 4-output bridger.

tween tuners and/or receivers and a VTVM to provide the convenience of the tuner meter for those who prefer to use a VTVM.

Circle 108 on Reader Service Card

Kaiser-Cox Corp. (Booth 409-11-13)

The new Phoenician CATV equipment series will be displayed in the Kaiser-Cox exhibit. Featuring die-cast aluminum housings with universal-type fittings, the series allows interchangeability from a trunklike amplifier to a 2- or 4-output bridging amplifier, or combinations of trunkline and bridging amplifiers with or without AGC and automatic tilt. Universal hinges on the cover allow it to be swung open without loose nuts and bolts. Detailed information regarding customer financing and turnkey construction will also be available.

Circle 109 on Reader Service Card

Kliegl Bros. (Booth 100)

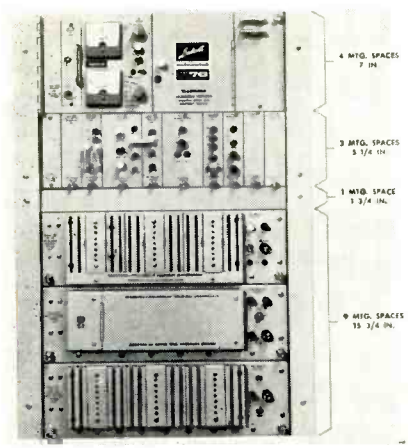
A new and complete line of TV studio lighting equipment will be displayed. The units, designed for studio color conversion, use quartz-iodine lamps throughout.

Circle 110 on Reader Service Card

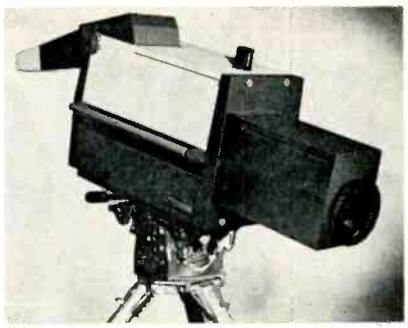
Eastman Kodak (Booth 231)

In addition to an equipment display, Kodak will have a staff of motion picture engineers and sales people to discuss the broad spectrum of color photography and its related problems. All station personnel with color TV photography problems are invited to visit the exhibit and talk with the engineering staff.

Circle 111 on Reader Service Card



Lenkurt 76TV receiver, equipped with auxiliary equipment.



Marconi Mark VII studio and remote color camera is designed for "hands off" operation.

KRS Instruments (Booth 215)

Featured in the display will be a cartridge only audio automation system based on a modular STACT-BLOCK concept designed for maximum flexibility. Random access programmers, cartridge group sequencers, auxiliary cue tone sensors, and companion production units can be included in the system to suit specific operational needs.

Circle 143 on Reader Service Card

Lenkurt Electric Co. (Booth 404)

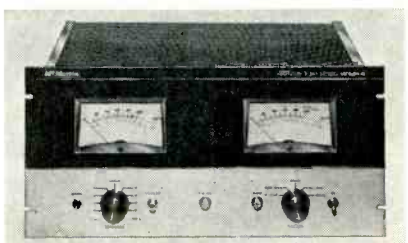
On display will be microwave equipment for the 7- and 13-gc bands. Type 76TV is designed for color and b & w transmission over great distances. Both demodulating (baseband) and nondemodulating (heterodyne) repeaters can be provided to meet individual TV system requirements. TV program audio may be carried with the video by means of an optional program channel operating at a baseband frequency of 7.5 mc. The 75A System uses heterodyne repeaters for heavy-density long-haul routes. Designed for the 5925-6425 mc band, the system exceeds CCIR noise performance recommendations for up to 960 voice channels or a color TV signal.

Circle 112 on Reader Service Card

Marconi (Booth 108)

Exhibit will be highlighted by the Mark VII color camera, a 4-tube unit designed for various zoom or fixed lenses and a minimum scene illumination of 50 ft. candles. Price varies from $80,000 to $85,000. Also included will be a Mark V picture and waveform monitor capable of displaying any of three composite or noncomposite inputs. The monitor will accept multi-step signal from a color camera channel. In addition, the exhibit will include a grating and dot generator and a special effects generator.

Circle 113 on Reader Service Card



McMartin TBM-4500 FM/stereo monitor.

Marti Electronics (Booth 252)

Display will feature 150- and 450-mc remote pickup gear packaged in various configurations for remote and EBS operations. SCA subcarrier generator and receiver accessory units for 950-mc STL and intercity relay equipment will be shown. Other units will include a new 450-mc yagi antenna, a new V-type antenna for the 88-108 and 150-170 mc bands, and several audio units, including turntable and mic preamps and program and monitor amplifiers.

Circle 114 on Reader Service Card

McMartin Industries (Booth 235)

The TBM-4500 FM/stereo monitor will be demonstrated under field conditions using a stereo generator. Also to be shown in operation are the TBM-3500A main channel monitor and TBN-4000A main channel and SCA multiplex monitor. Another feature will be the first showing of newly-styled and colored equipment. In addition to the special demonstrations, the full line of broadcast and SCA multiplex equipment will be displayed.

Circle 115 on Reader Service Card

Memorex Corp. (Booth 319)

Company personnel will demonstrate a new precision broadcast video tape. The Type 77V tape is magnetically and electrically compatible with other video tape and can be intermixed. Extra length is included in each reel to allow color bar and calibration signals to be recorded. Type 77V tape has been field tested and rated excellent by broadcasters because of its low drop-out characteristics, freedom from head clogging, and reduced head wear.

Circle 116 on Reader Service Card

Microwave Associates (Booth 111A)

Exhibit will feature prototype MLV7000 solid-state heterodyne 7-gc TV relay equipment which will be available on a production basis later this year. A working microwave relay system will be shown, exemplifying equipment available for STL, intercity relay, or remote TV pickup in the 2- and 7-gc bands. Both demodulating and heterodyne units are entirely solid-state; no klystrons or other tubes are used. The equipment is designed for fast changeover from 110v AC to 12v DC, 24v DC, 28v DC, or 220v AC by means of interchangeable power packs for both transmitters and receivers. All units feature weather resistant housings for outside TV broadcast applications. Price range of the equipment to be displayed is $8900 and up, depending on accessory items.

Circle 117 on Reader Service Card

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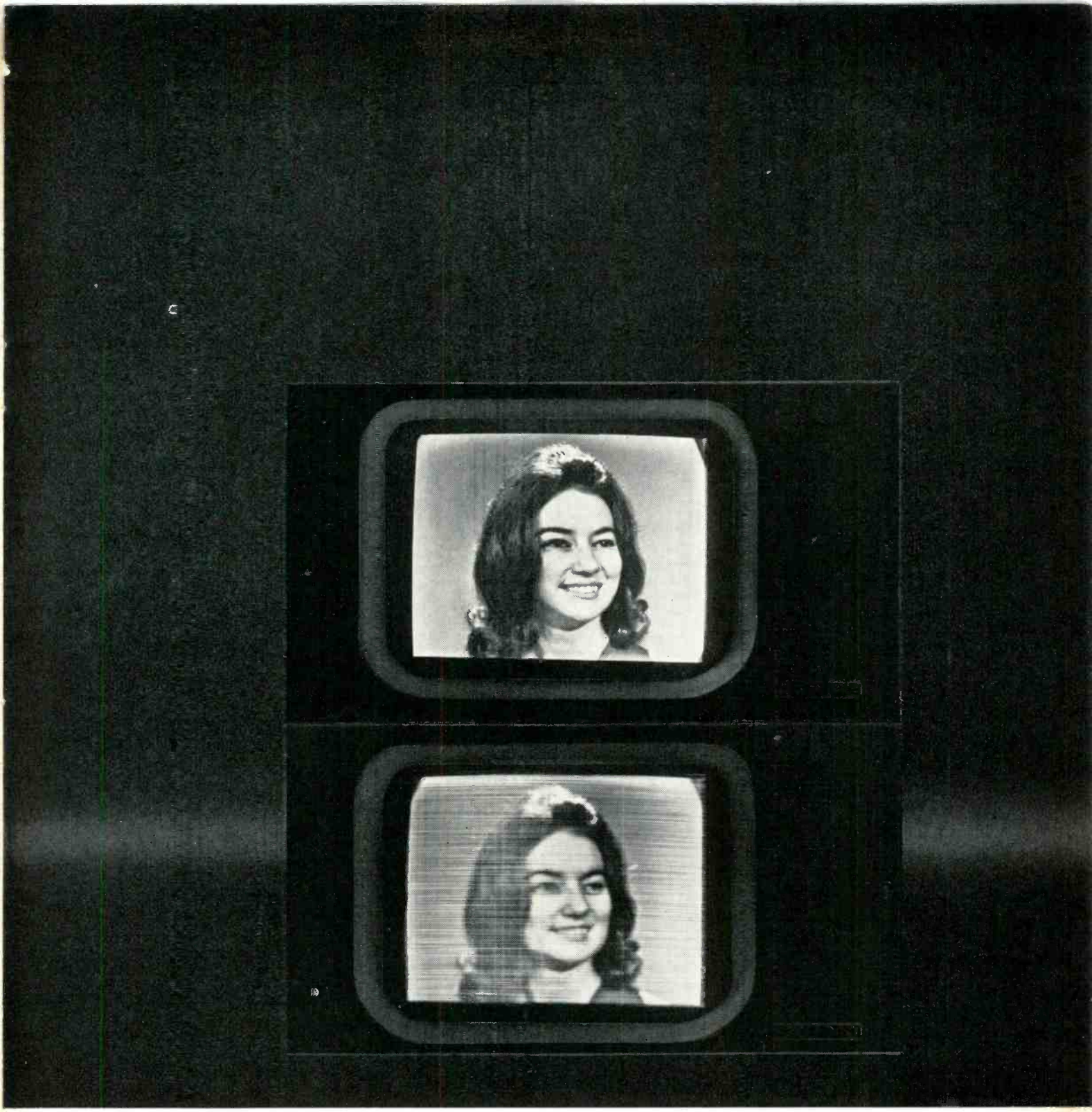

Which twin has the heterodyne?

IF you want to carry color programming for any distance at all you need clean color tones like those of our heterodyne "twin" in the top set above. (It *is* in color, in case your magazine's monochrome.)

Lenkurt's 75A microwave relay system will deliver color or black and white TV clear and sharp because its heterodyne repeaters are especially designed for heavy-duty long-haul routes.

Since there's *no* baseband demodulation enroute, there's less chance for degradation of signals on a long-distance hook-up. Yet you have the capability to drop TV channels for CATV or ETV operations along the way, which greatly extends the 75A's flexibility. It exceeds CCIR specs for noise performance, and meets both CCIR and NTSC requirements for monochrome and color television transmission. Frequency stability is held to within ±0.002%. And one-for-three path protection is available.

If top performance is what you're looking for, ask us about our true blue (not to mention red and green) 75A Microwave Radio. Lenkurt Electric Co., Inc., San Carlos, California. Offices in Atlanta, Chicago, Dallas, and New York City.

LENKURT ELECTRIC

SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS GT&E

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Microwave Associates units may be rack-mounted or used in portable applications (pull-out handle not shown).

Moseley Associates (Booth 223)

A solid-state RF amplifier designed to drive remotely located AM modulation and frequency monitors will be introduced. The RFA-1 uses a ceramic filter to achieve wide bandpass with high selectivity. Also on display will be the complete line of FM multiplex terminal gear.

Circle 118 on Reader Service Card

North American Philips (Booths 304 & 310)

A new PC-70 Plumbicon color camera chain will be featured in a live studio setting. Improvements in the system include a much smaller console and completely transistorized circuitry. Demonstration units will feature zoom optics, prism beam split, and modular printed circuit construction. Monochrome camera Model PC-50 will also be demonstrated. Other items to be exhibited include AKG/Norelco mics, D-202 "woofer-tweeter" dynamic model and D-109 lavalier design.

Circle 119 on Reader Service Card

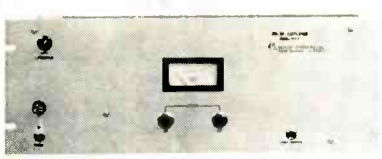
Northern Electric (Booth 200)

A program controlled amplifier, a preset automatic mixing system (PAMS), and an event sequence storage module (ESSM) will be shown. All the units will be integrated into an operating color/monochrome video switching display. The exhibit will also include a video mixing amplifier and a portable broadcast console.

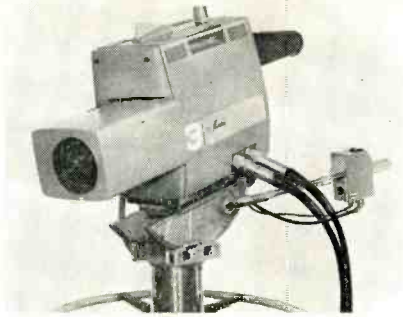
Circle 120 on Reader Service Card

RCA Broadcast Div. (Booth 101)

Complete color studio systems and color origination equipment will be continuously demonstrated. With "matched" color broadcast apparatus as the exhibit theme, the central attraction will be the TK-42 color camera which lists for approximately $75,000. Backing up TK-42 demonstrations will be operating exhibits of the TK-27 4-tube color film system and several operating color tape units. In addition, a



Moseley Associates RFA-1 RF amplifier will allow complete system proof-of-performance measurements.



Norelco PC-70 Plumbicon camera head, including 42 lb. lens, weighs 162 lbs. Power consumption for complete chain is only 350w.

complete studio control system will be shown, featuring the "New Look" styled console and switching, special effects, and automated control equipment. In the transmitter display area, RCA will unveil new and higher power equipment for VHF, UHF, and FM service.

Circle 121 on Reader Service Card

Reeves Soundcraft (Booth 204)

A full spectrum video tape for high-band color and critical monochrome applications will be shown for the first time. Known as Type 303, the tape will be available in 2400-, 4800-, and 7200-foot reels. The 2" quadruplex tape features a low dropout and high signal-to-noise ratio, and Reeves Microplate process which is said to assure perfect tape-to-head contact. Included in the display will be a helical scan video tape for slant-track recorders, available in ¼", ½", 1", and 2" widths in lengths from 600′ to 3600′.

Circle 122 on Reader Service Card

Riker Industries (Booth 103)

A new video switcher and an automated master control switcher will be shown in the Riker Booth; the master control switcher will be operating with a Chrono-Log automation system. A portable special effects generator will be used to demonstrate special effects systems, including a color bar generator and a colorizer. The encoded color bar is expected to find its greatest use as a standard for monitor alignment and recording on the leader of video tape presentations. The colorizer will

TK-42 color camera will highlight RCA exhibit, along with 4-tube film chains.

The Rust AP-12 alarm panels provide continuous supervisory monitoring of transmitter parameters.

be used to demonstrate effects of inserting color into a monochrome picture and will also demonstrate color call letter slide generation without a color camera or encoder, using the Thomson Houston flying spot scanner as the video source.

Other new units will include a sync generator and test set, as well as the standard line of test equipment. The Mincom dropout compensator will be shown working with an Ampex 660 helical scan VTR.

Circle 123 on Reader Service Card

Rohn Systems (Booth 229)

Featured product will be line of angle towers, first introduced last year, basically for use in microwave field. A new product catalog will be available in the booth.

Circle 124 on Reader Service Card

Rust Corp. (Booth 245)

Automatic transmitter logging systems for AM, FM, and TV will be displayed. Augmenting the Autolog equipment will be a new series of AP alarm panels for continuous supervisory parameter monitoring, including expanded scale upper and lower limit power and current unit alarms, plus frequency alarm circuits. The alarm series also includes the BCR-11 system designed to monitor directional array base current ratios and will be in actual operation in conjunction with a phase monitor. Rust will also exhibit its full line of remote control equipment and samplers, including directional AM and UHF-TV units.

Circle 153 on Reader Service Card

Sarkes Tarzian (Booth 104)

A new live studio color camera and a color film camera system will be introduced. The studio camera will use either a plumbicon or image orthicon in the luminance channel, and plumbicons, vidicons, selenicons, or any other tube which becomes available, in the chrominance channels. Similar in size to present monochrome units, the studio camera has a 10:1 zoom lens, with optional features of zoom, focus, and remote iris. The color film camera system, using a 1½" vidicon in the luminance channel and three 1" vidicons in the chrominance channels, is transistorized and can be used with any optical multiplexer. The TASCOM traffic availabilities computer and the APT-1000B programming computer, incorporating advanced features, will also be available for demonstration.

Circle 125 on Reader Service Card

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v.i.t. displays with TEKTRONIX® video-waveform monitor

frequency responses—Four response characteristics necessary to monitor Video Test Signals are provided:

1. FLAT to 5 MHz ±1%, to 8 MHz ±3%. *This flat response position to 8 MHz assures waveform fidelity and makes the video-waveform monitor ideally suited for sine-squared testing.*
2. HIGH PASS 3.58 MHz center frequency, 30% down at ±400 kHz.
3. LOW PASS -18 dB at 500 kHz.
4. IEEE 1958 STD 23-S-1. Color subcarrier -20 dB.

YRBG or RBG display capability—For monitoring output of color processing amplifiers.

line selector—Provides stable displays of the Vertical Interval Test signals. Adequate brightness is provided even at the fastest sweep speed. Can display any line desired. Brightening pulse automatically intensifies the displayed line as viewed on the associated picture monitor. No modification to the picture monitor is required.

field selection—Positive acting circuit allows selection of field one or two for display. Noise will not cause random field changing.

dc restorer—A feedback-type restorer acts during the backporch time. Not affected by presence of color burst. Does not distort the burst. Front-panel switch can disable the restorer—when other than video waveforms are viewed.

Cabinet Model also available. Same features as RM Model and designed for side-by-side mounting with a picture monitor in standard racks. Takes only 8¾" of rack space. Field case offered as an optional accessory for Type 529.

Type RM529 Video-Waveform Monitor	$1100
Type 529 Video-Waveform Monitor	1050

U.S. Sales Prices, f.o.b. Beaverton, Oregon

VISIT THE TEKTRONIX BOOTH 202 AT NAB

Available throughout the world

Tektronix, Inc.

Circle 29 on Reader Service Card

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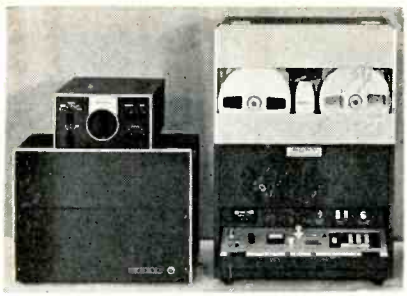


Sony BV-120 incorporates slow-motion speed variable from stop to 1/3 normal.

Shure Bros. (Booth 213)

To be introduced is a unidirectional dynamic mic with built-in windscreen and pop filter. Designated as the SM58, it is recommended for remote interviews, news and sports pickups, and a variety of field and studio applications. Its uniform unidirectional pickup pattern is said to minimize effects of studio or location acoustics and background noise.

Circle 126 on Reader Service Card

Sony Corp. (Booth 114)

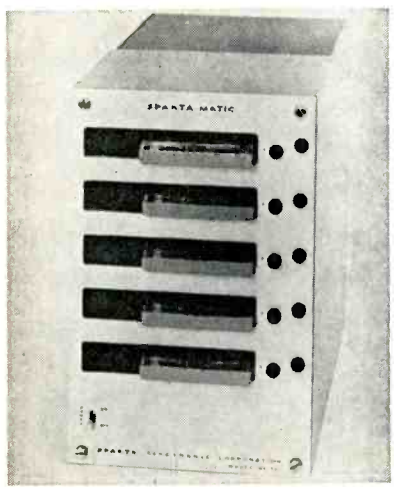
Exhibit will feature new electronic editor for the BV-120 VTR and the BV-120 itself. The Videocorder features variable slow-motion and stop-motion capability. Portable equipment includes a waverform monitor and signal stabilizer, and records at 4¼ ips on 2" tape.

Circle 127 on Reader Service Card

Sparta Electronic Corp. (Booth 246)

On exhibit will be a broadened tape cartridge equipment line, including the stereo 600 Series. The display will also include the new A-20 audio console with 8 channels and 22 inputs, the A-15 4-channel, and the AS-150 4-stereo channel consoles; the latter two have undergone major electronic changes to increase their input capabilities. In addition, the Model RA-5 2-channel, 3-input, battery-powered remote amplifier/mixed will be introduced. A new line of turntable cabinets and a console desk will be shown as accessory items to provide a custom installation with mix-and-match versatility. As broadcast distributors for Vega Electronics Corp., Sparta will also exhibit a capacitor mic. wireless mic, and the Vega Sound-Servo compressor/limiter.

Circle 128 on Reader Service Card



Sparta prototype model cartridge machine with individual motor and capstan for each deck. Price range is expected to be $1500 to $1700.

In long-line applications, more than 50 SKL Model 265 amplifiers may be cascaded.

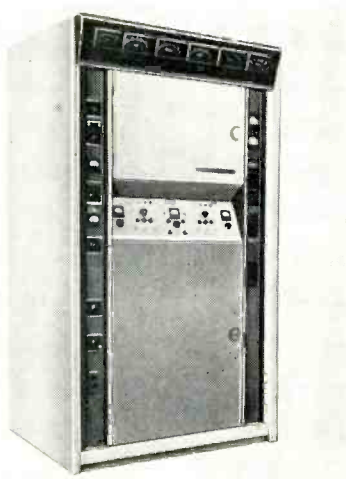
Spencer-Kennedy Labs (Booth 417)

Several new CATV distribution units will be displayed, including a wide-band transistorized trunk amplifier with built-in Temporator gain control; a wide-band line extension amplifier with line-loss compensation controls; a multitap directional coupler designed for many feeder cable types; a multidivider line splitter which may also be used as a signal combiner; and a solid-state wide-band automatic level control designed to maintain constant output from a trunk amplifier.

Circle 129 on Reader Service Card

Standard Electronics Corp. (Booth 307)

Firm will show the first production model of their solid-state (except final stages) TV transmitter with transmitter and driver in a single cabinet. Presently available for channels 7 to 13, the unit has an output of 5-kw visual and 500w aural. Amplifiers may be added to the driver for multiple power output and visual/aural ratios without replacing or modifying any existing equipment. Display is expected to include a 25-kw visual amplifier which increases power to 35 or 50 kw when used in pairs. Part of the Standard FM transmitter line will also be shown.



Standard Electronics solid-state TV transmitter.

Circle 130 on Reader Service Card

Sylvania TV mobile unit features a stable camera platform for traveling shots.

Sylvania Electric Products (Booth 402)

Display will include ETV Series mobile TV production unit, a self-contained studio control room on wheels housing a VTR and two vidicon viewfinder cameras as well as complete control equipment. Van equipment also includes a portable lighting unit and a 2-channel microphone mixer/amplifier and camera interphone audio system. Sylvania will also demonstrate the Model SC10A CCTV camera, designed to withstand shock, vibration, and acoustic noise. Incorporated in the SC10A system are a transmitter and synchronizing unit designed to EIA specifications. Manufacturer's suggested list price is $5900.

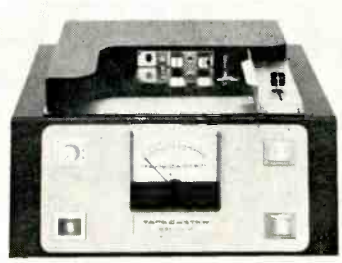
Circle 131 on Reader Service Card

Tapecaster Electronics (Booth 230)

On display will be new 700 Series tape cartridge machines, incorporating such improvements as secondary tone output, remote control of all functions, regulated power supplies, and plug-in Sigma relays. Included are Model 700-P playback units, priced at $300, and 700-RP record/playback unit, priced at $450. Also available in stereo at $450 for playback and $700 for record/playback unit.

Circle 132 on Reader Service Card

Continued on page 63



Tapecaster 700-RP has been designed to comply with NAB Standards, as is entire 700 Series.

Circle 30 on Reader Service card →

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High-Band Telecasting for Low-Band Investment

The new Ampex VR-1200 Videotape Recorder now brings you both high-band and low-band . . . color or monochrome . . . and the investment economics will make sense to any broadcaster in any market.

Here are a few of the features that will now make the VR-1200 the color workhorse of the industry; all band, switchable, solid state electronics. Multiple generation dubs in color and mono. Low "K" Factor rating. Simplified controls for "hands off" operation. Compact size, ideal for mobile work.

The new VR-1200 shares parts and accessories with other Ampex machines—reduces your parts inventory. Yet with all of these advantages it is totally new—the latest state of the art!

Get the full story from your Ampex representative now, or see us at the NAB show in Chicago.

(That monitor? We showed color to make a point; it's actually a monochrome Conrac CLD-14.)

AMPEX

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color!
the new
Ampex VR-1200

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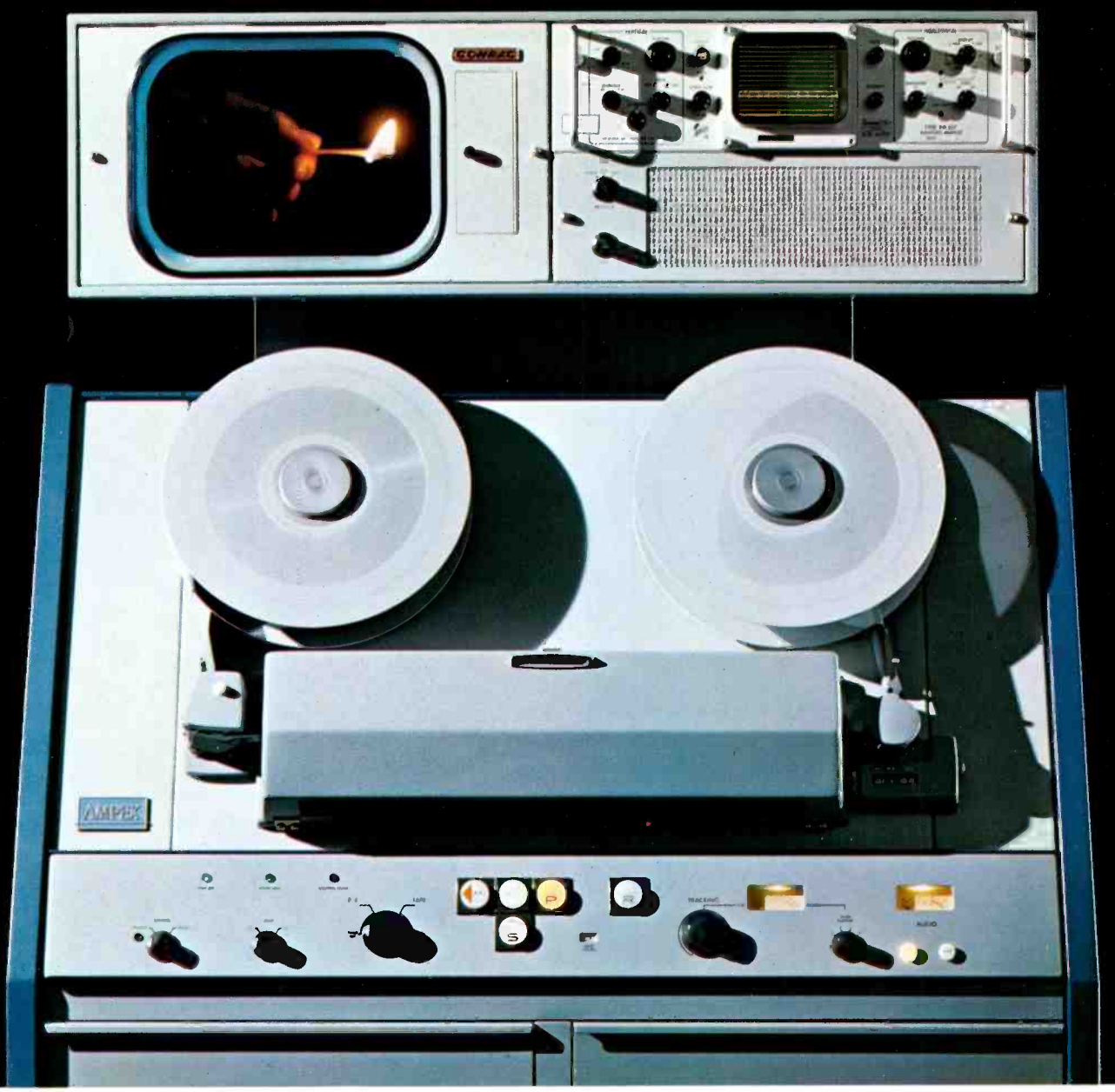
now you can convert your Ampex VR-1100 to striking high-band color



The new Ampex Color Conversion Kit now offers broadcasters high-band capability with existing Ampex tube-type and solid state monochrome recorders. ☐ Color programming comparable to the best! ☐ This *all*-band color and monochrome kit includes switchable signal system (featuring famous Ampex high-band color), solid state intersync, Amtec* time element compensator, Colortec*, video head assembly, head air supply. ☐ See your Ampex representative now, or see us at the NAB show in Chicago, March 27, 28, 29 and 30. ☐ (That monitor? We showed color to make a point; it's actually a monochrome Conrac CLD-14.)

AMPEX

*TM Ampex Corporation

www.americanradiohistory.com

NAB PREVIEW

Continued from page 58

Telesync Corp. (Booth 218)

On display will be a visual tape transport projector featuring the Telesync crawl system; transparent letters on a black background are projected for pickup by vidicon cameras. Information is typed on an office electric typewriter and played back on the transport. The system, priced at $2600, may also be used for rear and front screen projection. The exhibit will also include a 3¼ x 4" slide projector with single and dual head projection, priced at $2500 and $4200, respectively. A new ¾" videotyper designed to produce large, legible prompting copy for use with Telesync equipment will be shown. Price of a two prompter package, including videotyper, is $4300.

Circle 133 on Reader Service Card

Television Zoomar (Booth 105)

On display will be the Angenieux Zoomar 10x40 lens for I.O. cameras. With a 10:1 zoom ratio, the 10x40 has a minimum focusing distance of 5', which permits zooming in from a wide angle 30" view to a 3 x 3" telephoto view. The Autocam, a servo remote control pan-tilt head and zoom lens system, will be included in the exhibit. Evershed Power Optics equipment will also be on display, as will various other Zoomar lenses.

Circle 134 on Reader Service Card

Trompeter Electronics (Booth 406)

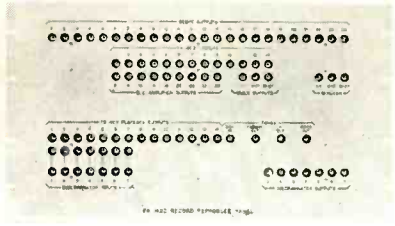
On display will be interface equipment for RF and viedo distribution systems, and a product line comprising a complete series of patching and switching components. The exhibit will also include basic connectors and cable in coaxial, twinaxial, and triaxial configurations. Complete switching systems in matrix, multipole, and multithrow arrangements are available to meet specific or custom requirements.

Circle 135 on Reader Service Card

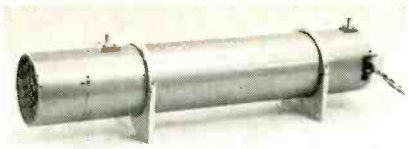
Utility Tower Co. (Booth 234)

New leg splice insulator for sectionalizing AM towers will be shown. Other products to be exhibited include standard tower sections for AM-FM-TV-microwave, and the Microflector microwave reflector.

Circle 136 on Reader Service Card



Trompeter FR 1400 Record/Reproduce panel.



Varian VA-651A UHF-TV TWT will operate on Channels 14 to 83 with 300w output.

Varian Associates (Booths 408-10-12)

Display will feature the Eimac 4 CX 1500B super linear tetrode rated at 1 kw with a 1500w maximum plate dissipation rating, and Eimac and Varian power klystron for UHF-TV applications. The klystron display will include three new 55-kw units, three new 30-kw units, and a 300-watt TWT for UHF-TV.

Circle 137 on Reader Service Card

Visual Electronics (Booth 301-02-03)

Several new products will be shown. An Allen Model V/A 100G high band VTR with many new features will be one of the exhibit highlights, along with the Norelco PC-70 plumbicon camera. Other products scheduled to be introduced are McCurdy portable consoles, British Electric Valve Elcon color tubes selected for use in red, green, and blue channels as well as matched sets of vidicon color tubes, Round Hill CS-10 Wireless Cueing System for inter-studio communication, and Norelco mics. Visual will demonstrate advanced video switching techniques, a 5-kw AM transmitter said to be capable of 120% continuous modulation on positive peaks, a 20-kw FM transmitter with grounded-grid driver and output stages, and program automation equipment. Visual will again hold a post-NAB Technical Seminar this year.

Circle 138 on Reader Service Card

Vitro Electronics (Booth 207)

New solid-state-Nems-Clarke Field Intensity Meter for the AM broadcaster will be introduced. The FIM-135 employs optional crystal operation which eliminates tuning but not tuning capability. Unit features dial locks (eliminates recalibration for each reading), a front panel speaker, and mercury battery power. Vitro will also introduce its new line of stainless steel jacks and plugs. Phase monitors for DA systems, HF and VHF field intensity meters, spectrum display monitors, and FM rebroadcast receivers will also be displayed.

Circle 139 on Reader Service Card

"Allenized" VTR is capable of all-band operation at the flip of a switch.

Nems-Clark FIM-135 uses taut-band meter movement to eliminate meter face-tapping.

Ward Electronics (Booth 220)

A solid-state audio distribution amplifier will be introduced with several other new products, including a color phase equalizer, demodulator, audio preamp, audio monitor amplifier, and audio program amplifier. The audio distribution amplifier is similar to a video distribution amplifier with identical isolated high-level outputs. Each module (60 mount in a 5¼" frame) provides up to 6 outputs at +24 dbm, 600-ohm balanced. The AA-601 is priced at $325.

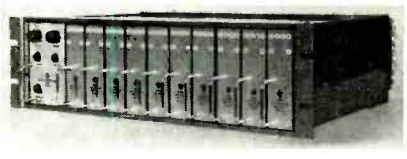
The display will also include a vertical interval switching system, a master control-station break switching system, and a TA-860 color phase equalizer system designed to pre-compensate transmitters for video signal phase errors introduced by the transmitter, sideband filter, notch diplexer, and receiver (price is $3,450).

Circle 140 on Reader Service Card

Wilkinson Electronics (Booth 321)

New solid-state field intensity meter to be introduced, known as the TM-1A, it weighs less than 12 lbs, including rechargeable batteries, and features a free-running receiver and a passive, attenuated, calibrated oscillator. The oscillator can be used separately as a standard 535- to 1605-kc signal generator. Price is $995.

Circle 141 on Reader Service Card



The Ward AA-601 audio distribution amplifier features a frequency response of ±0.25 db 30-15,000 cps.

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Wilkinson TM-1A has a built-in speaker for station ID.

LAST MINUTE DATA

Alford Mfg. Co. (Booth 208)

Display will include a complete line of VHF, UHF, and FM broadcast antennas, diplexers, coaxial switches, vestigial sideband filters, hybrids, transfer panels, power dividers, and RF measuring instruments.

Circle 147 on Reader Service Card

General Electric (Booth 102)

New products to be introduced include a PE-250 4-channel studio color camera, PE-240 film color camera, TV-112 transistorized color encoder, BC-35 A/B audio console. TT-530 VHF 30-kw TV transmitter, and a TE-21 two-unit CCTV camera. Among other products G-E will exhibit are the popular PE-26 3" I.O. monochrome camera, PE-27 monochrome film camera, PF-11 and TV-86 film multiplexers, TT-59 UHF 50-kw TV transmitter, film and slide projectors, and BC-31 audio console.

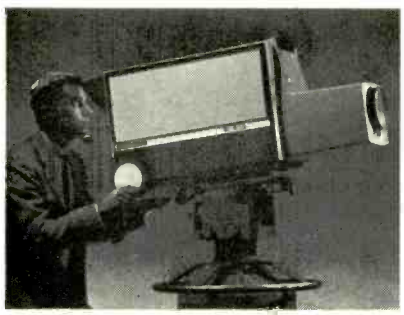
A complete line of transistorized audio equipment and transmitter remote gear will be displayed, and helical and zig-zag panel antennas for UHF and VHF will be offered.

Circle 148 on Reader Service Card

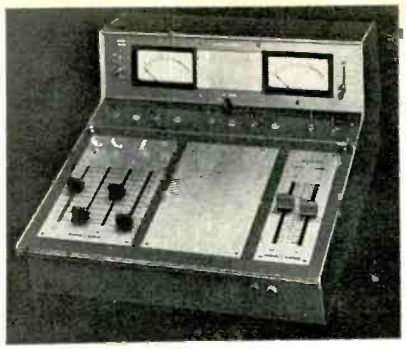
Harwald Company (Booth 225)

A completely solid-state Mark IV Inspect-O-Film will be introduced. The Mark IX automatic film inspecting and editing machine and the Protect-O-Film cleaning machine will also be demonstrated.

Circle 149 on Reader Service Card



New G-E PE-250 color studio camera includes 4 identical pick-up tubes, weighs under 150 lbs. fully equipped, including a built-in 10-to-1 continuous zoom lens.



G-E BC-35-A/B audio consoles are designed for maximum flexibility in AM, FM, TV, and recording applications. "A" model is console-mounted, with 4 input channels and 4 mixers. "B" model is cabinet-mounted, has 8 amplifier channels and mixers.

Jampro Antenna Co. (Booth 305)

"The most complete line of broadcasting antennas" is the theme of this year's Jampro exhibit. Designs to be displayed include VHF batwings, UHF zig-zags, and a 2.5-kmc microwave educational antenna. For FM, both horizontally and vertically polarized antennas will be shown. Technical personnel will be on hand to answer questions about types of patterns, power gains, mounting and pricing.

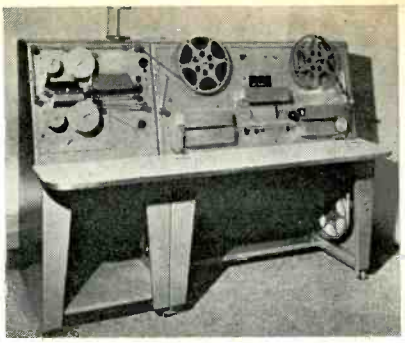
Circle 150 on Reader Service Card

Tektronix (Booth 202)

A refined version of the Model 526 Vectorscope, designed for making accurate color TV subcarrier phase measurements, will be featured. Also on display will be Model 529 waveform monitors, sync separator units, and other auxiliary oscilloscope equipment.

Circle 151 on Reader Service Card

New Jampro zig-zag antenna for 2.5-kmc educational microwave has a power gain ratio of 20 and a horizontal pattern circularity of better than 2 db. Safe power handling capacity is 100 watts. Shown is 3-bay unit without protective radome.



Harwald Mark IX film inspection and editing machine allows commercials to be inserted and removed easily, permits film to be viewed at up to 400 fpm.

Telemet Company (Booth 247)

New items to be demonstrated include Model 3209A1 color processing amplifier, Model 3203B1 shunt feedback clamper amplifier, and Model 3806A1 electronic pointer. Other equipment in the operating display will be transistorized special effects generators, a complete line of video terminal gear, as well as a color video monitor, color encoder, and a differential phase & gain receiver.

Circle 152 on Reader Service Card

Broadcasters Speak

Continued from page 10

its to BM/E of course, for mailing to all of our co-op sponsors. I think it will explain fully why we have to say no at times, while some of our competitors in the printed media possibly laugh all the way to the bank.

J. T. Whitlock, Mgr.
WLBN Lebanon, Ky.

Permission granted.

We are looking desperately for a "wireless microphone," and have tried without success to get info as to who makes them. Would you help me find the companies who make such units?

Congratulations on your fine magazine; the industry has long needed such a publication.

Karl R. De Rouen
Ass't Gen. Mgr., KEUN
Eunice, La.

Surely you'll find one at this year's NAB Convention.

My compliments to BM/E for the excellent job it is doing. Your magazine is read regularly from cover to cover, and I particularly appreciate "Interpreting the FCC Rules & Regulations"—one of the finest feature of this type I have ever seen.

William Franzman
Program Director
WTTS & WTTV-FM
Bloomington, Ind.

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Belden wired broadcasting console logs over 11,000 trouble-free hours

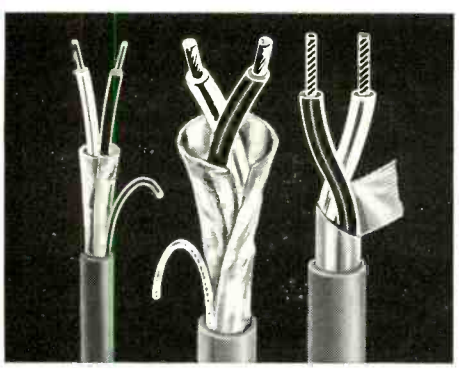
At radio station KDWB, St. Paul, Minnesota, where the disc jockeys are their own engineer and production man, a compact, highly reliable, and flexible broadcasting console was required. For flexibility, a custom console was designed to the critical specifications of the station's chief engineer.

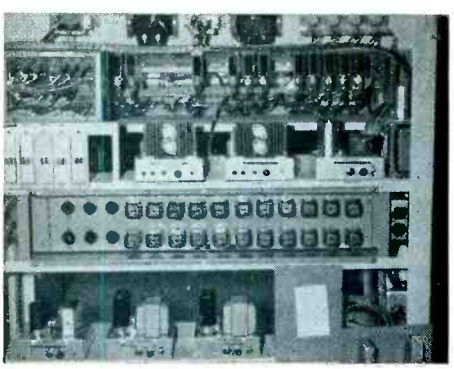
To assure highest operating reliability and facilitate the console's compactness, Belden Beldfoil* shielded broadcast audio cable was used throughout the unit. Beldfoil is "the total shield." For extremely sensitive circuit applications, it is superior to all other types of shielding for guarding against crosstalk and spurious signal impulses. Beldfoil also reduces cable diameters up to 66⅔% . . . increases electrical integrity . . . and provides faster and easier shield termination.

Belden manufactures the most complete line of wire and cable for all radio and TV broadcasting, recording studio, remote control circuit, and similar applications. Ask your Belden sales representative for complete information or write for Catalog 865.

*Belden Trademark—Reg. U.S. Pat. Off.

In the studio, the disc jockey is in complete control. Looking over the installation are (left to right) Dick Halvorsen, Chief Engineer, KDWB; Sam Bridges of Electronic Design Company, console designers and builders; and Steve Gabor, Belden territory salesman. The disc jockey is Don DuChene.





The compact KDWB console is a solid state unit having complete broadcasting features and standby power. It provides mixing facilities for fourteen inputs including five cartridge tape machines, three turntables, microphone, news effects, tape machine, auxiliary, news room, and disc jockey studio.

Belden

8-8-5

BELDEN MANUFACTURING COMPANY **P.O. Box 5070-A · Chicago, Illinois 60680**

power supply cords • cord sets and portable cordage • magnet wire • lead wire • automotive wire and cable • aircraft wires • welding cable

Circle 31 on Reader Service Card

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Transition to Color —Challenges in Every Department

By Robert W. Flanders

The changeover from monochrome to full color is complex, and expensive. Adequate planning and preparation, based on prior experience of others, will help minimize major problems.

WITH APOLOGIES to Shakespeare —To be or not to be color is not the question! The question is: How do we get into color? How much will it cost? What pitfalls can I avoid? What preparations *can* I make and which *must* I make?

It is apparent that color is here to stay, that its quality is superb, and the state of the art is such that most of the trials and tribulations are gone. I don't mean to imply that it is all cut-and-dried routine. It does take skill, money, and manpower to jump into the rainbow—but it is worth it.

Most stations have taken the first step—transmitting network color. You already know the cost of doing this—increased Telco line charges, a transmitter capable of passing color and capable of passing the more stringent FCC standards for color, a few color monitors, and some special test equipment.

Color Film & Slide

The second step generally would be origination of color film and slides. Here, your costs will be more substantial. You will need such special technical equipment as a color frequency standard, a burst flag generator, a color bar generator, a vectorscope, etc. All these are necessary before you light the first projection lamp.

It is possible to use existing projectors and it may well be the most economical method, but it is worth your time to investigate what the newer projectors may offer in the way of clarity, stability, and more precise operation. Your existing monochrome film or slide camera will not be usable for color; you will have to add a special camera. With proper multiplexing, one camera can be used with one or more film and/or slide projectors.

Best quality is obtained from 35mm film. However, with very few exceptions, we must be satisfied to use 16mm. Most available movies are 35mm and have to be reduced to 16mm; you can be sure that this process does not add to the quality of the print color. While 16mm prints are getting better, there certainly is room for improvement.

It is strongly suggested that the film prep department carefully screen each print for color quality, in addition to the usual monochrome routines, with particular attention to flesh tones. Nothing causes more irate telephone calls than to show people with purple faces . . . unless it is people with green faces!

The same basic problem exists with color slides; however, it is not as acute. Slides seldom require reduction and therefore, colors generally are true—that is, until the art director starts getting "arty" and decides to use mood effects, and Alfred Hitchcock promos hit the air with ghastly green or magenta facial tones. Every color set owner makes a mad dash to adjust his set for proper flesh tones, and the next show is loused up until he readjusts the tint.

Another general word of caution—avoid undue use of fine detail color. Remember that color is put on with a broad electronic brush and detail has a way of getting lost. If you need detail be sure it is passed through the monochrome portion of the system.

If you plan to shoot color film, a major question will be, "Should I do my own processing or have it done outside?" Basically, the answer resolves itself to a matter of economics vs time, with a tint of quality as the frosting. If you are filming in a modest way, no doubt the solution will be outside processing. This will cost about $130 per thousand feet, including raw film. But you avoid purchasing and maintaining an expensive color processor ($35,000 vs $7,000 for comparable monochrome unit); you will not need a skilled color lab man; you may not need precise water temperature control (plus or minus ½° for color); and you can use simpler refrigeration and water heating equipment.

On the other hand, you may be interested in getting the best possible quality. The outside developer, while professional, may not always be able to give you the finite personal touch or quickest delivery. No one has your interests at heart as much as yourself! Inside or out, color processing costs are about twice that of monochrome.

Almost all film camera lenses since World War II are color corrected. Your existing news cameras are capable of shooting in color. However, if you are shooting sound on film, the use of magnetic stripe or double system sound is greatly preferred over optical sound. Hence, you may have to convert your film cameras and your playback air projectors. Conversion of either is

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Mr. Flanders is Director of Engineering, WFBM Stations, Indianapolis, Indiana.

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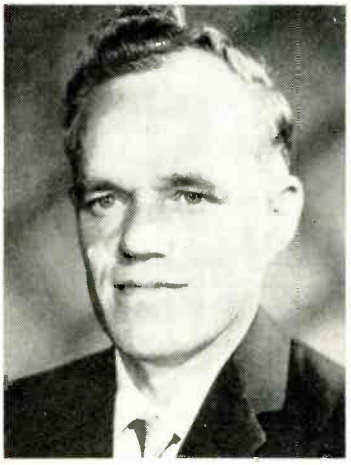
Albin R. Hillstrom, Dir. of Eng'g, KOOL-TV, Phoenix, Ariz.

Challenge is the correct word—if all departments meet the challenge objectively and with determination, the transition to color will be relatively smooth; however, to convert to a full color operation overnight, even if it could be done, would produce nightmarish problems. Carrying network color involves the engineering department, primarily, but local color origination involves virtually all departments. It will take time and experimentation for the art and photography departments to learn color values and techniques. Obviously, artists, set designers, technical, and production people must have proper color vision.



Live color presents the hazard of getting carried away with color for color's sake. In my own experience, I recall being trapped in this dilemma: the newscaster's podium was pea-green with a pink border and a brown world cut out in the center, yellow lettering, and a pastel blue background between two red drapes. The newscasters wore bright red ties and blue or brown suits, except one whose outside vocation required more conservative dress (he was the only one who looked natural). Finally, this set had to be redesigned—still with color, but more natural. Existing sets and backdrops do not necessarily have to be redesigned—just modified in many cases. Colored lights can add unlimited variation to backdrops. The set design, lighting, and camera make up the picture; if any one is incorrect, the whole scene is ruined.

about $1,000 each.

Color filming under controlled lighting conditions is not difficult. Color film that is best when viewed optically is usually best for TV. Lighting conditions will not always be ideal when shooting color film—especially so for news film. The color temperature of the light may vary; hence, the resulting film will vary and perhaps not look true to life. For example, you may be in an office with fluorescent lights. They may be blue, green, pink, or combinations of these. Our photographers carry a Kelvin Temperature meter which helps them detect this condition. Currently the industry is trying to standardize on a brand of tungsten film giving high speed for indoor usage, and usable outdoors with proper filters.

Training of film personnel may be required. If you have sufficient time you may send one or more to available seminars. Most processor manufacturers offer at least a week's training with purchase of a processor. Under the sponsorship of the National Press Photographers Association, the University of Oklahoma offers a week's course for photographers, and I'm sure other courses are available.

Those of us who have been in color for many years did have one advantage; we could really learn how while on the air. Hardly anyone had a color set and even those who did were amused by our manipulations. At least, that is what we told ourselves! But today, if this is a new venture for you, I suspect that you must make other arrangements. One way or another, time must be made available for training your engineers—be it during out-of-service periods, during network shows, in the supplier's plant, etc. However, it is a comforting thought that almost every member of your existing engineering staff can grasp and competently handle every tail feather of the peacock, after he is shown how. And, with the possible exception of the one who is color blind, he will be able to do it without ruffling or shuffling a single feather!

Seriously, if you do not have a well-prepared engineer to lead the way, you may do what others have been doing recently — hire an experienced, color-trained engineer. This is a quick way to

Benjamin Wolfe, V.P. of Engineering, Westinghouse Broadcasting Co.

A lot of new terms will be coming from the engineering department: hue, saturation, luminance, etc. Hue is that characteristic whereby color may be separated into groups (red, green, blue, purple, etc.). Saturation refers to the degree of purity of a color, or to its lack of dilution by white light. Luminance is an evaluation of that aspect of color which controls the brightness sensation. To maintain the proper relationships and balances, there is little or no room for error in the quality of technical maintenance. For example, in monochrome systems, it doesn't make any difference to the viewer if local slide or film material is not in phase with the network picture. But, in color, if viewers have their "hue" control set for good color on the net picture, and then, during the net break, the local origination happens to be out of phase, the local color will be anything but proper. Throughout the day, this, and many other measurements, must be made several times if a station is going to transmit good color.

Color film made for TV is better on 35mm than on 16mm because the contrast and density range is held within the 50:1 contrast range of the color system. Color film produced for the theatre can have range of 5000:1; therefore, when 16 mm prints are made from 35mm, the result is a smaller format, less resolution, and greater contrast, of course. At best, 16mm film capabilities leave something to be desired insofar as fully utilizing the capabilities of a color system.

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George St. Andre, Engineer-in-Charge, WHDH, Boston, Mass.

As color receiver sales increase, the lone local station without color will soon be at a disadvantage. Color has strengthened the sales position of WDHD by creating an impression that the station

is more progressive and better equipped to serve its advertisers. One direct sales tool that color has provided us is the use of chroma key for video tape commercials. Studio color cameras along with chroma key enable stations to produce commercials as effective and interesting as the best network ones. Chroma key, besides providing a means to key in backgrounds, allows your production people to create all sorts of special effects. It has been the means by which we have convinced more than one reluctant client that he should get into local TV advertising. The chroma key generator itself is not expensive, costing about $1,000. It is designed to work with a special effects generator and color camera. Once you have these, the rest is easy.

Transition costs do relate to present facilities; a studio installation that has not been updated within the last 10 years could require large scale replacement or improvement of switchers, amplifiers, and test equipment. The greatest increase in operating costs is for camera pickup tubes. Also, individual tubes generally cost more and need more frequent replacement. Replacement cost for I.O. tubes in the TK 21B cameras is $4500 compared to $1000 for black and white, and because of use, they are replaced at least twice a year (tube replacement for four studio cameras costs $36,000 annually). The vidicon replacement budget (for the three color and one monochrome chain) is $2500 annually. Camera tube replacement takes the better part of a full day for two men to install I.O.s in two cameras.

solve the problem. He will get you started immediately, train the rest of the staff, and be a valuable addition. The extra work with color will require some additional personnel anyway.

Local/Live Color

By far the most exciting and challenging step is into live color. Likewise, it becomes the most expensive and requires the greatest capital outlay. Both 3- and 4-tube cameras are available, with IO's, Plumbicons, Vidicons, Selenicons, solid-state and vacuum-tubed. Each is as good as its end product. There are some differences in camera sizes and weight. However, this makes little difference in required studio size. It might be of interest for remotes. Generally, the solid-state units require much less control room space and can be much easier to incorporate into existing control rooms, which by some apparently divine order, are always already too small.

In the early days we made great use of fluorescent lighting in the studios. It created less heat and gave a good flat base light. But fluorescent lights had to be retired with the arrival of the live color camera; like the film color camera, you simply can't get proper flesh tones with them. Generally, incandescent lamps are a must. 3200° Kelvin is a proper temperature, and in many cases this change adds a heat load in the studio.

In the early days of color it was fairly normal for the network to use up to 1000 ft. candles of illumination on major scenes. Since our depth of field requirements were somewhat less, we were able to get satisfactory pictures with 450 ft. candles or less. With the advent of the more sensitive IO's, light levels went down to about 250 ft. candles. This is still 2 to 3 times the light used for monochrome, but more sensitive tubes and cameras will be

R. A. Holbrook, C. E., WSB-TV, Atlanta, Ga.

The problems, while many and knotty, are not actually so different from those we had when monochrome was getting its start. At that time it became a well established practice to do a little visiting with other stations to see what they were doing and why they were doing it. This method of educating program and technical personnel is still a valuable tool in preparing them for the more complicated equipment and procedures necessary for color operation. Video control operators have the most difficult transition; they must learn to make more precise adjustments on the many controls. This requires time, and a generous period of dry runs helps develop techniques before on-air programming is attempted. Projectionists have little difficulty in making the change. Cameramen must allow more time for setup, but otherwise should encounter a minimum of problems. It is good practice to provide a video engineer for each two camera chains, including film cameras; otherwise, additional technical personnel requirements are minimal.

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Max H. Bice, Gen. Mgr. KTNT-TV, Tacoma, Wash.

Programming in color film is expensive, **much more** expensive than in black and white. At present, the supply of good color product is limited, the demand is growing, and it is pretty much a seller's market. There are five types, or sources, of programming available in film:

FEATURES: The supply of acceptable features, whether in color or black and white, is "drying up." The color percentage is small and will probably remain so. Feature packages can be classified as:

1. Packages that offer **NO** color at all. Many features were made in color for theatrical release but are not available to TV in color.
2. Packages that offer **ALL** color. These range in size from as few as 5 to as many as 40 or more titles. The majority are usually of the "Spear and Sandal" type production with a few adventure, science fiction, or horror thrown in. They are generally foreign-made and, therefore, usually carry a dubbed sound track. It could be time well spent to screen a print of each of these features for an honest evaluation of both color and sound track.
3. Packages that offer a "sprinkling" of color. For example, a package contains 20 titles, 15 are in black and white, 5 are available in color. They can be anything—foreign-made adventure, American made westerns or musicals, or those produced with American money in anywhere from Hong Kong to darkest Africa. The fact that the feature is in color should not make it a mandatory buy. Color is a plus, not a must.
4. Good or poor, color features are expensive. The average cost per run, on top of the contract, is around $75. (One color feature a week for 52 weeks could cost $3,900 EXTRA!) Or you can buy your own set of prints at so much per foot lab fee. However, this cost can be reduced by sharing the set of prints with another station.

SYNDICATED SHOWS: The present supply of off-network color product is almost non-existent. A review of the network programming "discards" from past seasons quickly explains this. The biggest source of color, at present, lies in the travel-adventure type programming. Packages currently being offered range from excellent, to fair, to lousy! On top of the basics involved in the evaluation of a black and white series, there must now be added such questions as: Was the film shot by amateurs or pros? How old is the series and, therefore, the film? Will the color be "faded" with age? And, as always, how is the sound track?

CARTOONS: Here is another fairly open source of color film. Print charges for a library of cartoons can run from twice to two-thirds above those of black and white prints. Prices and values in color cartoons vary greatly. They range from the Warners made for theatrical release to those of minimum animation and background made in Japan.

"FREE" FILMS: These are generally available in both quarter and half-hours. The major bookers are Modern TV and Associated Films. The supply of these films in **color** is limited, although more and more companies are going the color route (and have reduced the commercialism) to get their films before the public. Subject matter will vary from Travelogs (air lines and railroads) to agriculture. These "free" films are handy to have and can be used as an occasional "filler" or for holiday or other times in non-prime. They can't be used as spot carriers, so you can't make money using them.

FILM SHOT BY THE STATION: This is an excellent but **costly**

source of color programming material. It has one big plus. It is the station's property and can be run and re-run as long as the film is physically usable. A prorating of cost over a period of years could bring the per-run dollar within reason. In every market there are certain annual events that lend themselves to color. It is the station's decision as to how much or how little of this will be shot in color. The costs of raw film processing and man hours will dictate. But there is always the opportunity of exchanging certain of this film with stations in other markets which could help with the overall cost per hour.

Here might be a good place to mention the local "outdoors" show. There is an endless source of color film to be shot on hunting, fishing, camping, boating and skiing activities. A gradual building up of a backlog of this film in **color** is a good investment.

VIDEO TAPE: This is the newest and most limited outside source of color. I have heard of only three shows that might be available. I don't know whether any got beyond the talking stage.

As I see it now, and in the future, color adds up to two basics: 1. Is it available? 2. Can a program budget afford it?

available soon.

Construction of studio sets becomes more time-consuming. Attention is required to create pleasing color, but you must not forget that there are still a lot of monochrome receivers in use. Many sets that look good in color are most obscure when viewed in monochrome. Your Art Director and the engineers will spend a lot of time resolving this in the beginning. It was most common for us and others, when we first began live programming, to overemphasize (saturate) color. The reds had to be blazing, the blues the bluest possible, etc. We gradually retreated from this. We now strive to have people, places, and things look natural. Pastels are used; full color is used to accentuate. We no longer use color just for the sake of color.

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The make-up of performers need not be a difficult task, but it does require some cut-and-try until you learn the proper fundamentals. Summertime, and its resulting darker skins, generally requires more time to brink back pleasing shades. (For a start on this problem, we also keep handy that old comedy prop—the flour barrel!)

Probably the most difficult transition from monochrome to color has to be made by the personnel who electronically control the cameras. While a color camera is basically three monochrome cameras in one, it does require a rather sophisticated technique to combine these three pictures into a faithful reproduction of the scene. Operating one color camera is a stringent task, but operating two or more together is a precise art and more than a simple multiplication of duty. Camera matching is time-consuming and hence, somewhat costly.

The costs of getting into local color can be as varied as your needs. Once you have decided the extent of your participation, your chief engineer and various suppliers can tell you how much you can expect to spend. A color film island costs up to $100,000. Perhaps you only need the color camera, which by itself is $55,000. A live color camera chain can be obtained for $50,000 and up, depending upon the type. You may or may not need additional studio lighting.

Operational costs will be greater. For example, three image orthicons may be needed instead of one, as in monochrome. Local film processing costs will be double that for monochrome.

Studio space requirements should not change (unless you do additional programming), but you will need additional control room space and the size of added units should be carefully considered.

Your added manpower requirement is certainly subject to your manner of operation. Many manufacturers claim no additional manpower is needed, but a good rule of thumb would be an additional maintenance engineer at least.

In conclusion, you can see that, like a beautiful woman, the "peacock" is also an expensive bird; and whether you are past 40 or not, it too will bring a new, exciting way of living to you. ●

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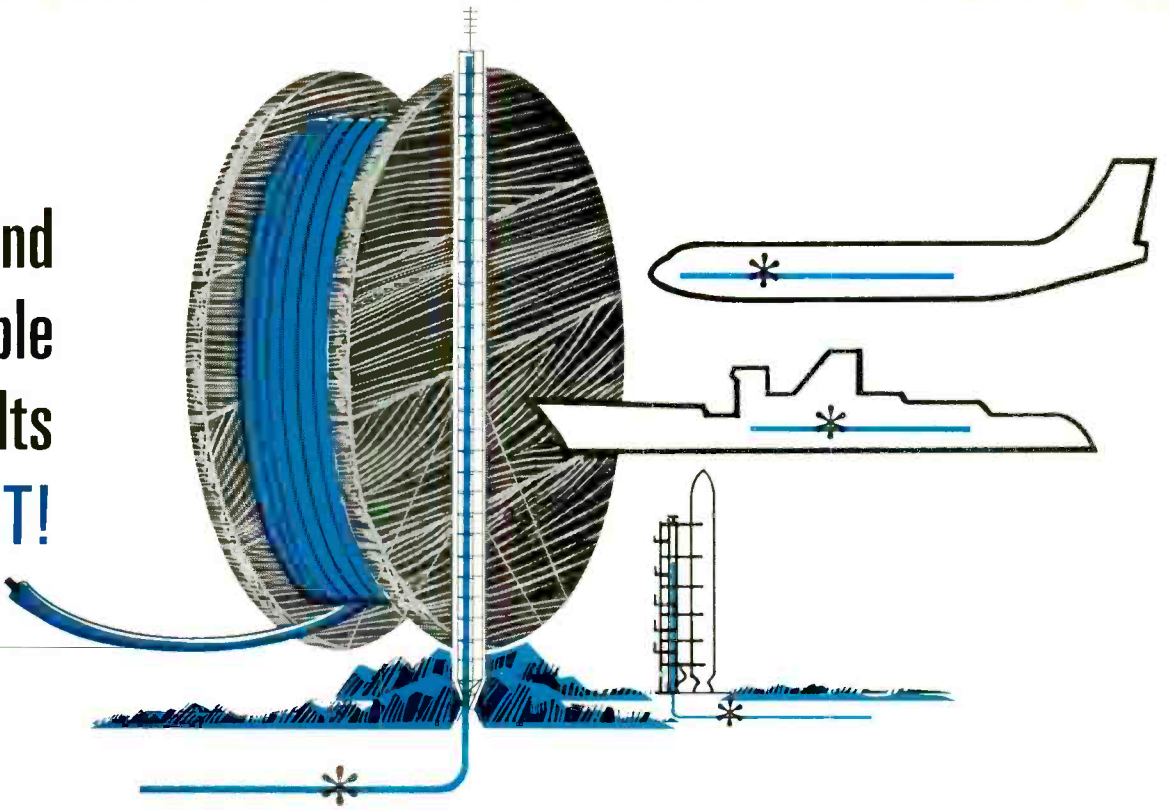

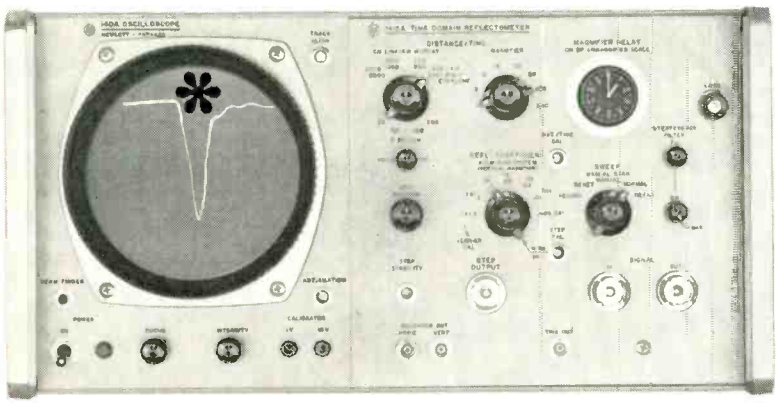

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Cable TV Poles— Lease or Install?

By Robert B. Cooper, Jr.

Utility pole leasing agreements are becoming more costly and increasingly more difficult to obtain. When is it wise to consider installing your own poles? Here are the factors to consider.

IN THE EARLY DAYS of CATV many operators chose (for one reason or another) *not* to utilize existing poles to support their cables and associated equipment. Over the years, however, joint use of utility poles has gradually developed into a fairly widespread practice. Today, many operators are faced with the problem of negotiating favorable pole-line rights. Depending on the nature of the local telephone company franchise, and possibly their degree of interest in CATV, what they will allow you to transmit through *your* cable varies from town to town and state to state. Some Telco pole attachment contracts seriously limit the use of auxiliary features such as weather and news, background music, and local origination video. Naturally, if you promise the city any such auxiliary features, you want to be certain you can deliver after you have the franchise in hand.

Mr. Cooper is V.P. of engineering, Valley-Vision, Inc., Modesto, Calif., and President of R. B. Cooper & Associates, CATV consulting firm.

CATV cable (second trunk up) installed on relatively clean Telco pole such as this one presents few rearrangement problems.

Most discussions about pole attachment agreements in CATV circles concern only the telephone utility, not the power utility. Why? In many areas both utilities use the same poles, under a joint agreement. The terms usually give the telephone company the right to sublet space on its portion of the pole to other communication type services. Thus, as an offshoot of the communications media, CATV operators must deal with the telephone utility. In those areas, or on those streets where there are no telephone or joint telephone -power poles, you may be able to deal directly with the power utility for space.

The pole-line agreement is a contract between a non-public utility and a public utility. In some states the contract will require PUC approval, although in most cases this is a mere formality. The contract will either be accepted or rejected within a certain period of time after submission (usually 30 days), as set by state statute.

The telephone company usually does not have a set period of time in which to complete their portion of the contract negotiations, although the contract you negotiate probably will be identical to those signed with other CATV operators in the state. Processing of the agreement, from start to PUC submission, should not exceed six weeks. After PUC acceptance of the contract (in those states where PUC must approve), the contracts are available for public inspection. If you have not inspected such a contract, a visit to the PUC office in your state capital is advisable.

In some areas, pole-line leasing rates are negotiable, although the rates themselves are seldom changed from those already being charged other CATV operators in the same state. If the state has a CATV association, find out who heads up the "Joint Pole-Line Committee." This individual, usually a fellow CATV operator, makes it his business to keep abreast of all the latest problems, and his help will prove invaluable. If you feel pole-leasing rates are unfair, or that your own situation is special, you would be well advised to discuss the problem

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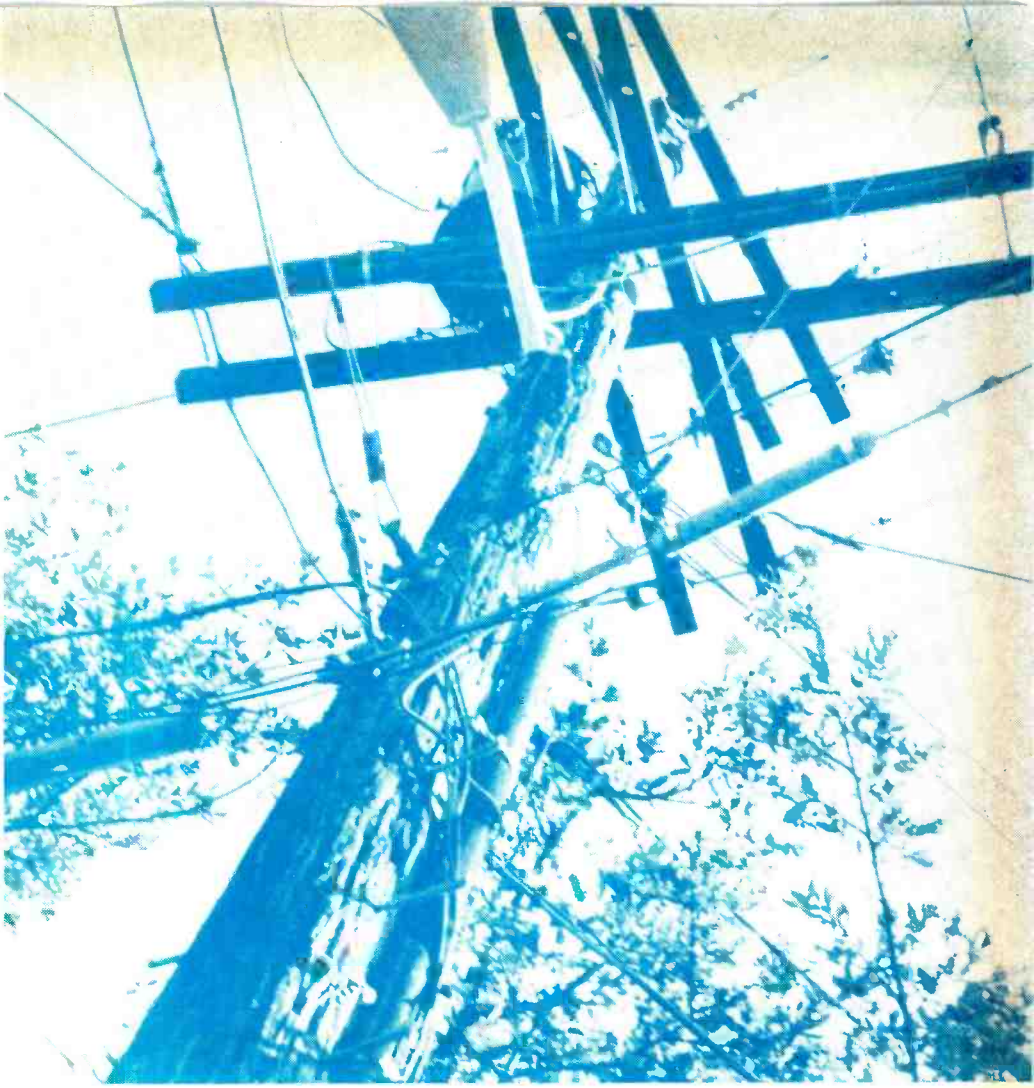
with this individual rather than try to continue negotiations on your own. Going it "alone" is an excellent way to land your entire pending contract in a pigeon-hole at the telephone company office, and to wind up with work on your pending CATV system at a standstill.

One of the more ticklish problems is that of easements. When your franchise is let, the city will usually give you the right to utilize *dedicated easements* within the city. Unfortunately, dedicated easements are not the only type available; you may find that you have to cut across the corner of a yard, over a building, and so on, using *private easements*. In most states the private easement situation is sort of a "squatter's rights" problem. And in the case of prior-negotiated private easements, chances are they will not be transferred for your use through the joint pole contract with the telephone utility. This means, simply, that you will have to negotiate with each of the private property owners who have deeded private easement rights to the utility. This problem is usually further complicated by inadequate records at either the telephone company or the town office. *If* you can swing it, the best answer is a rider clause in your telephone joint pole contract dedicating these private easements to your use, where required.



It would be difficult to fit a CATV cable into this maze of telephone trunks and power lines. Notice the condition of the pole. When room is lacking and the pole is scheduled for replacement, the CATV operator will pay for replacing an antiquated pole.

Contract Terms

Most pole attachment contracts open with a paragraph defining the limits of the contract. Some specify in no uncertain terms that the use of telephone company pole space by your firm shall be limited to the distribution of off-the-air television signals. The biggest roadblock to auxiliary CATV services is the fairly long term existence of a Telco tariff which allows them to install and lease out closed-circuit educational (inter-school) video circuits. Telco doesn't want to find your CATV plant offering the same service on a lower or competitive rate basis one fine day!

Recent contracts from Louisiana Bell and Ohio Bell have loosened up in this area; they specifically authorize the carriage of background music, FM and information channels, in addition to the off-the-air signals. Here again the precedent in your area has probably been established by existing operators and existing contracts. In some areas, even where there are restrictions against running information channels or music, operators have ignored these provisions and the telephone utility, in turn, has ignored the violations.

Most existing Telco contracts carry a provision that non-strict enforcement of one section of the contract does not invalidate the entire contract, nor does it imply consent to a waiver of that section. In other words, should Telco ever choose to enforce that specific section in question, they reserve the right to do so. The best answer, and the safest, is to have a clear definition of the limits of your contract, and to make sure that your promised service to the city stays within the bounds of these limitations. If you cannot come to terms with Telco on these points, you can consider putting in your own poles.

In other operational areas, Telco will hold your company liable for any damage to their plant by your workmen or crew; you want to be certain that you in turn are able to hold them liable for any damage they might cause to your plant.

If the telephone company has a section in their contract regarding *their* abandonment of existing poles, your firm should reserve the first right to purchase that pole as it stands at its depreciated value.

Some contracts specify that you cannot change equipment on the pole without going through a great deal of red tape. This section of the contract should be sufficiently broad to allow you to change, for example, from a tube-type amplifier to transistor-type without getting bogged down

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in telephone company paperwork.

Most pole use contracts are carried on a year to year basis with renewal rights held exclusively by Telco, and with Telco also retaining a 30-day right to terminate the contract for alleged infractions. There has been considerable effort expended by NCTA and state and regional associations to extend this type of contract to a five or ten year basis with at least a joint option to renew.

Financial Aspects

When all is said and done, reaching agreement on a pole line contract usually boils down to money. How much will it cost you in the short and long run? The annual rental fee per pole is set within each state or operating area by the PUC. The fee of $2.50 per pole per year has been pretty standard on Bell System contracts, with an extra dollar tacked on where a pole also supports an amplifier station. Cable-powered amplifiers, mounted at poles or between poles on the strand, are usually exempt. Recently, however, some independent phone companies have insisted that rates of $3.50 and $4.50 are necessary and reasonable. This is particularly true where a Telco has no prior agreement with a CATV company.

Unfortunately, the pole attachment rental is only the beginning of the funds you will expend annually. The Telco system will have an engineer present during your plant installation, almost always at *your* expense. They will inspect your use of their poles at least once each year, again at your expense. You will be required to post a bond or buy insurance against possible damage to their poles or plant equipment by your crews or equipment. This insurance is difficult to obtain, and often expensive, but it is seldom waived. You will also be required to post a performance or "Equipment Removal Bond." If your company has a

Approximately 5% of the Valley-Vision holes dug in Jackson required the services of a jackhammer. This pole, located at the end of a concrete pier, had to go through 18" of concrete.

Some holes may end up like this. This water-filled expanse started out like the others; then the auger hit a 6" water main.

Questions About Leasing

- Will issuance of a Telco pole-line agreement take an inordinate period of time, say, more than 60 days?
- Is average annual pole rental rate too high, more than $3.50?
- Are present poles already overcrowded, with little or no room for a CATV plant?
- Will the agreement prohibit you from offering news and weather information, and other auxiliary program material of local public interest?
- Are clauses covering penalties, contract cancellation, renewal, etc., unnecessarily "stiff"?

Every "yes" answer is a vote for installing your own poles. It will cost $1,000 to $1,200 per mile, roughly 10 times the usual annual lease expense (at $2.50 per pole), but the poles will be yours, permitting you to operate at a reasonable profit and with far fewer restrictions on additional services you may offer.

Availability of Pole-Line Space

Your agreement with the communications utility is simply a lease on space. Obviously, space must be available on the poles. Often it is, but equally as often poles must be "made ready" through the laborious process of moving existing telephone company lines so that spacing will conform to state regulations for minimum "between-services safety spacings."

If space must be made on the pole, your CATV firm must pay for the rearrangement. This is usually done on the basis of either a table (showing total number of poles vs. the general category of rearrangement required), or on a pole-by-pole survey and an estimation of time and material required to make each pole ready for the CATV cable. If space cannot be made available on a specific pole (or poles), the pole must be replaced with a larger (taller) one, which involves considerable expense.

Rearranging an existing plant to make room for CATV cables varies from plant to plant, depending largely on its age, design and how fast and how much the area has grown in population. Generally speaking, you can expect to pay an average of $15.00 for each pole rearranged. If the Telco plant is vastly overburdened and each pole is already loaded with its maximum or near maximum number of trunks, taller poles will have to be installed at your expense. This may run as high as $100 per pole! With approximately 40 poles per mile of cable, your plant construction costs could easily be doubled by this added expense (and you wouldn't own the poles).

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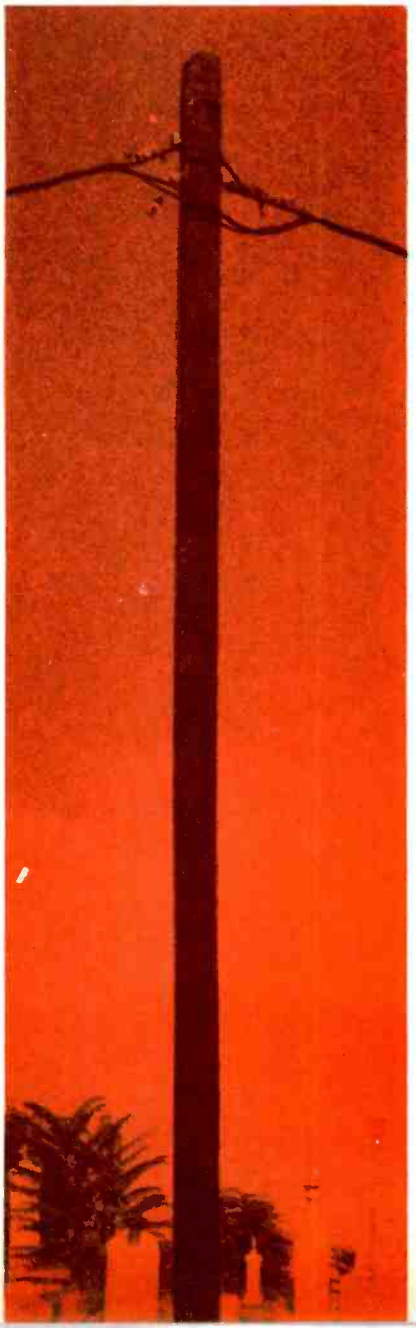
good financial history in CATV, this bond may amount to less than $10.00 per pole per year. On the other hand, if you do not have an operating history, the bond may amount to $24.00 per pole or more.

The utility company can usually be persuaded to lower the bonding requirements at the end of a year or so. At the outset you should try to establish a bond-per-pole rate based upon the actual costs of removing your plant equipment. Pole line construction firms will gladly submit a bid for this type of work, and their bids should, in turn, be your basis for discussion with the telephone company on this point. It has been our experience that such work can be done for as little as $3.00 per pole (average) and not the often arbitrarily chosen $24.00 per pole.

The pole attachment agreement will also specify that your firm stand good for any and all attorney fees required. This is a pretty broad provision and for your protection it should be pinned down as to definition in legal areas and amounts involved.

The contract will probably also specify that nonpayment of any regularly due amount shall constitute default of the contract. Naturally, you want to pay your bills, and maintain the contract. *But*, you also want to be able to withhold payment on all or part of the amount due if you have a disagreement, provided that the disagreement is in good faith. This should be written into the contract.

A "CATV only" pole has a clean, uncluttered look.



Miscellaneous Provisions

In some situations you may want to serve two adjacent towns from a common head end. Perhaps your head end is on the far side of one town, and you want to extend the trunk into the next community. This is called *trunking*, and you must go to the telephone company for permission to do it. Most Bell System firms will allow you to trunk, provided that 90 per cent or more of the two systems (jointly or separately) are in common ownership. If you own one system, and someone else owns the other system, Telco considers that the first is selling the head-end signal to the second. Under some vague PUC section common in many states, Telco can deny you the right to use their poles for this type of operation.

Setting Your Own Poles

Suppose — just suppose that: (A) the franchise will allow you to set your own poles, if you wish; and (B) your firm and Telco have not been able to get together on joint use of poles. What about setting your own poles?

Valley-Vision, Inc. of Modesto, Cal. is presently building several systems with its own poles from head end to finish of plant. These poles are being installed in California's Mother Lode country, in rolling and mountainous terrain. In the three towns where these poles have been installed to date (some 725 in all), the Telco plants were deemed substandard, badly in need of repair and heavily overloaded with trunks that left little or no room for an additional CATV trunk.

Most systems work on the basis that there will be approximately 40 poles to the mile. In the Valley-Vision systems, where poles could be spaced from beginning to end at optimum CATV spans, 32 poles per mile were installed on the average.

Pole installation problems break down into three categories, as follows: planning and layout, pole acquisition and setting expense, and installation procedures.

Planning and Layout

In a franchise with dedicated easements, you may utilize rights of way for your poles and lines. At this point you will want the best available records on the locations of these easements and rights of way so you can proceed to "stake out" your own pole locations.

You will also need the advice of the city's sewer and water department to locate underground pipes. In some cities these municipal pipes are located directly under the street, and in others they are located parallel to the street just outside the pavement area. Even with the best planning and the aid of the best maps (the best of which are none too accurate), Valley-Vision found that 1% of all holes drilled ran into some underground appurtence (varying from six inch water mains to 500-pair telephone trunks).

When you set your own poles, you space them to accommodate your own cable spans, and your own plant layout. This results in approximately 20% fewer poles per mile of cable. You must respect the safety regulations of the state, however, which specify between service line distances and between-pole distances (these vary from state to state).

The only real roadblock in planning your own pole locations is the restriction (in California anyhow) placed by the State Highway Department. The State usually will not allow you to set poles for CATV in the state controlled easements along state highways. In California this easement extends 40 feet either side of the pavement, which makes running parallel to state high-

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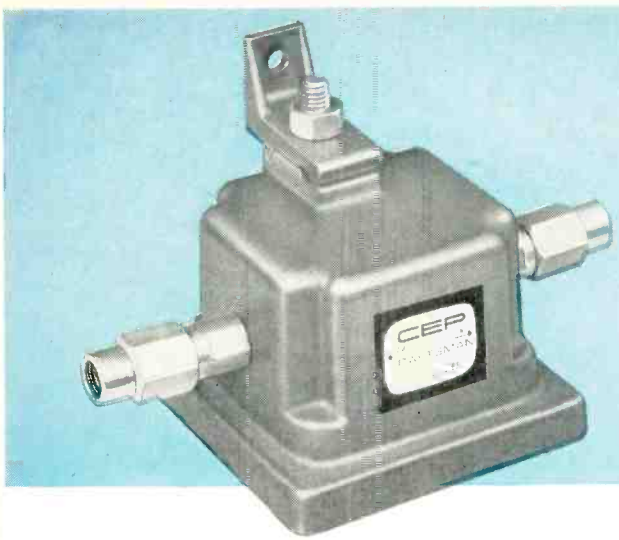


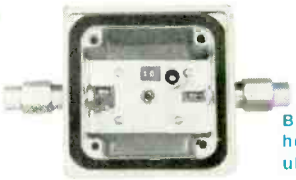
THE NEW CRAFTSMAN MODULAR DIRECTIONAL TAP

Here's one way to keep your labor costs down, profits up. Craftsman's new Modular Directional Tap, shown above, is one proven way to easily, surely, service subscriber line changes using labor that can change connections from one to four subscribers in less than five minutes, tops. Here's all there is to it.

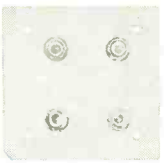
Don't Disconnect . . .

INTERCHANGE!

The four plates shown here are the outlet connecting plates for use with our new Modular Directional Tap. They are easily interchangeable in the bottom of the housing, a simple matter of unscrewing four permanently held screws, removing one plate and replacing it with another. Each bottom plate has a cut-off corner which allows it to be connected in only one way—the right way. They provide a perfect connection every time, even when the subscriber is not home. Each unit has a radiation-proof gasket to prevent signal leakage. And these new Craftsman Modular Directional Taps provide extremely low through loss (only .25 db for 18 db tap attenuation), and high return loss. Try a few of these Modular Directional Taps on for size in your system. We believe you'll find they are among the most significant advances ever made in CATV. We'll be glad to send you more technical information. Just write to us at the address below or call us collect.



Bottom view of housing with module plate removed.



Four way module plate

Three way module plate

Two way module plate

One way module plate

CEP

CRAFTSMAN ELECTRONIC PRODUCTS, INC.

133 WEST SENECA ST., MANLIUS, N.Y. 13104 AREA CODE 315—OVerbrook 2-9105

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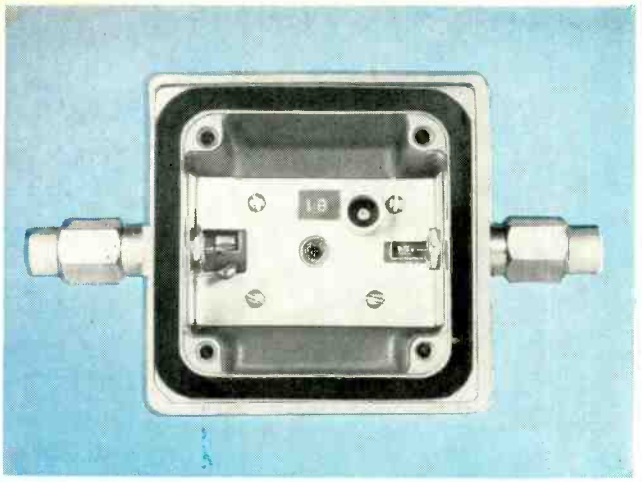
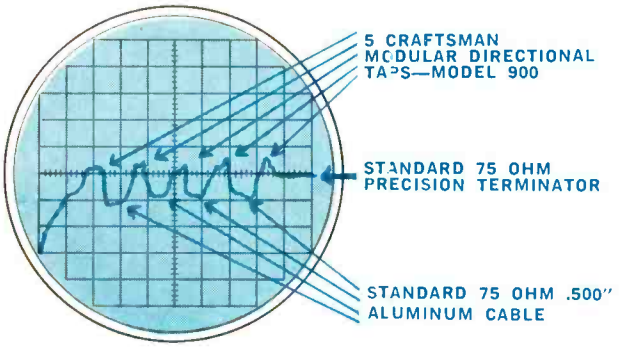


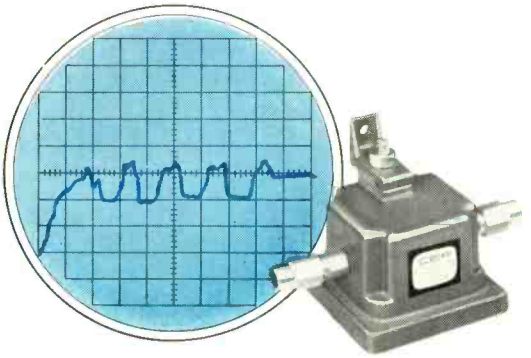
Bottom view of housing with module plate removed illustrating RFI gasket.

THE CRAFTSMAN QUALITY STORY...

Aside from the prospects of faster service, lower labor costs, and resulting higher profit margins for subscriber service changes, perhaps the most intriguing features of the new Craftsman Modular Directional Taps are the extremely low through loss (only .25 db for 18 db tap attenuation), and high return loss. We feel the easiest and most believable way to show this to you is to show you a TDR test simulating actual field conditions, terminated and unterminated at the tap.



In the top scope trace, 5 Craftsman Modular Directional Taps (14, 18, 22, 26, and 30 db tap units) are connected to a section of standard 75 ohm .500" aluminum cable. They are unterminated at the tap port. Notice how the peaks representing the Modular Tap Units are closer to the ideal 75 ohm reference line than the .500" aluminum cable. Thus we may reasonably state the Craftsman Taps are more ideally matched than the cable itself.



In the bottom scope trace the only difference is the tap off ports of the five units are terminated. As you can see, the difference between the two scope traces is negligible. No appreciable impedance mismatch is introduced to the feeder line in either case.

Now add this to the lower labor costs, and faster changeover from 1 to 4 units (less than five minutes), and you'll begin to see why we believe this Craftsman Modular Directional Tap is a uniquely significant advance in CATV. We'll be glad to send you more technical information. Just write to us at the address below or call us collect.

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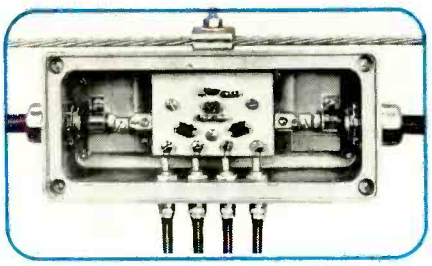
DROP MAN'S DELIGHT

SKL

MULTITAPS

True Directional Couplers



- Economical
- Easy-to-Install
- Undistorted Color Transmission
- A Must For Wide-Band Systems

Retaining the electrically superior directional coupler principle in a compact printed circuit tap and tap adder combination, SKL Multitaps can be used with various feeder cables. They are packed complete with no mating parts to buy.

Available in values of 10, 16 or 22 db tap loss, they fit aluminum, copper, corrugated or braided feeder cables, ⅜" to ½" o.d. without coaxial connectors.

SKL tap adder inserts serve up to four subscribers from one location with one low through loss. Purchases in lots of 100 or more reduce cost per subscriber tap to as low as $3.59.

Try some in your system. Once you do, we think you'll want more. Call 617-254-5400, write today or plan to see the complete SKL line at Booth 417, NAB Convention, Chicago, March 27-30.

SKL

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BOSTON, MASS. 02135

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ways decidedly difficult. Burial of cable in the state highway easement is also not allowed.

Purchasing and Setting Poles

In purchasing poles, chances are you will go to a wholesale pole supplier. Valley-Vision utilized "Grade 5" poles, the majority of which were 25 feet long with a 7" to 8" base diameter. In a few remote sections, and in back alleyways, 6 x 6" poles were utilized; they are also 25 feet long. 25-foot galvanized, 3" diameter steel poles can also be used; they are available for about the same price as the round 7 to 8" diameter 25-foot wood utility type poles. All wooden poles were *press treated* for weather and environmental conditioning.

Pole holes can be dug with a medium-sized farm-type tractor outfitted with a 9-inch auger. Holes should be 44" to 48" deep; the exact depth will depend on the soil type in your area. Roughly 5% of the Valley-Vision holes required the services of a jackhammer, either due to the presence of very rocky soil or asphalt covered parking and street areas. A three-man hole-digging crew can manage 25 to 30 holes per day; a three man pole-setting crew, if the holes are clean and ready, can install approximately 15-20 poles per day.

One out of four (25%) of the Valley-Vision poles required guying anchors. The anchors utilized were 1" diameter steel rods of 40" length with a ring on one end and auger teeth on the bottom 15 inches. Arms to hold cable runs away from the poles (where required) were fabricated from angle iron and galvanized. They were pre-drilled for mounting with two bolt clamps which fasten the messenger strand to the arms.

Operating Your Pole System

It will be necessary to insure your own poles against loss or damage. Press-treated poles should last as long as any medium to good grade telephone utility pole, 20 years or more without special care. On your own poles you can distribute anything the city will allow. You pay no annual rental, and need no bonding or telephone company protection insurance (against damage to their plant). Nor do you need to be concerned about the joint pole contract being terminated at some future date.

Typical Costs for New Poles

25' long, 7-8" press-treated	$19.00
25' long, 6 x 6 press-treated	11.50
25' long, 3" steel galvanized	19.50
Digging cost per hole, cleaned	5.00
Cost per hole setting	5.50
Cost per guy, installed	6.00
Management cost per pole	4.70[1]
Cost per galvanized arm, installed	5.40[2]
Average cost per 7-8" pole, installed	$34.20
Overall plant average, per pole, installed	35.25[3]

1 Includes pole-location staking and supervision of entire installation process.
2 Includes material and labor for placing arm on pole, required on approximately every fourth pole.
3 Includes all costs for installed poles, including guys and arms, averaged over entire system.

Setting your own poles, drilling your own holes, and accepting all the headaches that go with it are taxing to both mind and body. However, you can begin to install poles immediately after obtaining your franchise, without waiting for a Telco agreement. And, should you decide to sell your plant, it is yours from start to finish, including the poles. This will make the plant more valuable at sale time.

On Telco poles you depreciate the plant equipment and expense the pole rental for tax purposes. On your own poles you depreciate the entire plant, including the poles.

Conclusion

Very few systems are installing their own poles today; however, in a new system installation, it can and is being done. The initial expense can be no more (and perhaps less) than joint Telco poles when you consider all the costs for rearrangement, 5-year rental, bonding and insurance. ●

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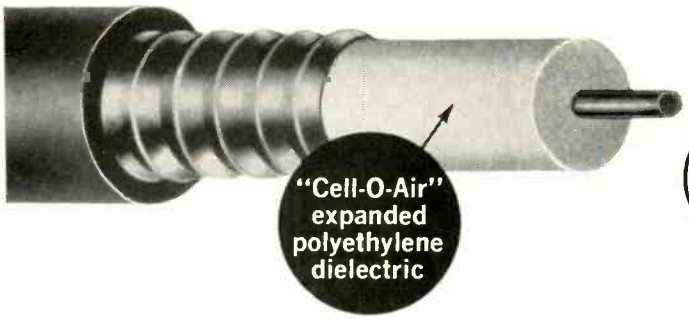
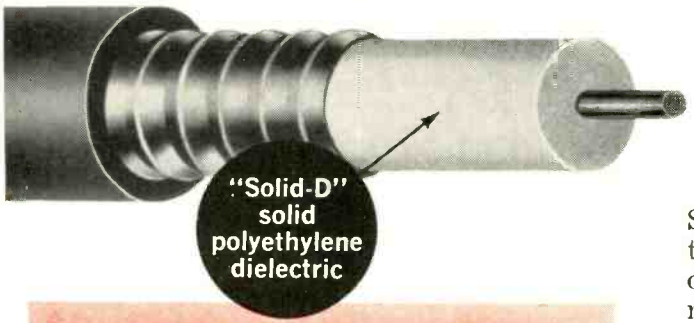
The CATV Cable that GUARANTEES FULL-SPECTRUM CAPABILITY





SUPERIOR Coaxial Cable

with "Coppergard"

Superior Coaxial Cable with Coppergard guarantees no attenuation discontinuity over the continuous range — through 219 MCS *and beyond!* This means you can *use* all the frequencies available to you. Unlike ordinary cables, which offer only the television band, Superior Coax was specifically designed for CATV to provide for full utilization of the frequency range in aerial and buried plant.

When you buy cable, insist on the brand that gives full-spectrum capability at no extra cost. Install Superior Coaxial Cable with "Coppergard," the cable your system will never outgrow.

CHOOSE SUPERIOR CELL-O-AIR® COAX FOR AERIAL PLANT

Guaranteed Maximum Attenuation db/100′ at 68° F					
	Ch. 2	Ch. 6	108 mc.	Ch. 7	Ch. 13
4920	0.75	0.93	1.09	1.41	1.57
4930	0.58	0.68	0.80	1.07	1.20

CHOOSE SUPERIOR® SOLID-D COAX FOR BURIED PLANT

Guaranteed Maximum Attenuation db/100′ at 68° F					
	Ch. 2	Ch. 6	108 mc.	Ch. 7	Ch. 13
6020	0.74	0.91	1.05	1.38	1.55
6030	0.56	0.67	0.79	1.05	1.19

Every Reel Sweep-Tested Over Its Full Length

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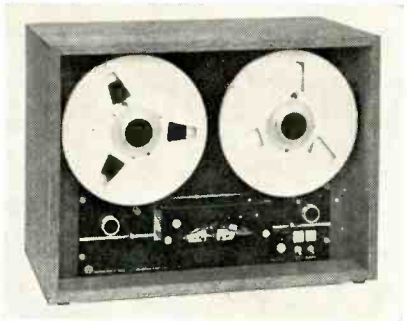
BROADCAST EQUIPMENT

Audio Logger

Metrotech, Inc., Mountain View, Cal., has developed a new two-direction tape recorder which provides up to 288 hours (12-16 operating days) of continuous,



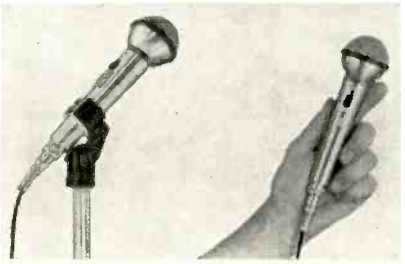
unattended logging time for any broadcast or communications requirement. The Logger, part of the firm's new 500 Series of professional recorders and reproducers, surpasses NAB specifications. Said to be truly automatic, requiring no attention whatsoever, it has a fully sequenced logic for all record and playback functions, including end-of-play cutoff. It also incorporates the latest solid-state switches and plug-in modular circuits for maximum reliability and ease of maintenance. Overall frequency response is 3 db from 200-4000 cps at 15/32 ips or 200-2700 cps at 5/16 ips, with fully adjustable equalization. Signal-to-noise ratio at logging speeds is 40 db minimum.

Digital Measuring System

Hickok Electrical Instrument Co., Cleveland, O., has announced a digital measuring system which consists of a main frame display unit capable of accepting any number of plug-in units to measure a variety of parameters. The DMS-3200 main frame, priced at $320, uses a 3-digit display with all-electronic biquinary display tubes, automatic decimal point indicator, over-range indicator, and polarity indication. The DP-100 integrating type DC voltmeter plug-in, priced at $175, has an accuracy of ±0.1% F.S. ±0.1% of reading in 5 voltage ranges from 0.1 mv to 999 volts. The DP-170 ohmmeter plug-in, priced at $240, has 9 ranges covering measurements of 0.01 ohm to 1000 megohms with an accuracy of ±0.1 F.S. ±0.2% of reading. The DP-200 capacity meter plug-in, priced at $240, measures capacitance from 1.0 pf to 10,000 mfd with an accuracy of ±0.1 F.S. ± 2% of reading.

"Ball" Type Mic

A "ball" type microphone, called the Spher-O-Dyne, is available from Shure Bros., Inc., Evanston, Ill. The 533SA high-impedance and 533SB low-impedance models



are omindirectional and include a built-in wind, breath, and pop filter that permits close-to-mouth use. The mics are equipped with on-off switches and an adjustable swivel adapter which permits a 90° tilt from vertical to horizontal when stand-mounted. Both models are supplied with 15-foot detachable cables and weigh 11 oz each. List price of the 533SA is $50; the 533SB is $47.50.

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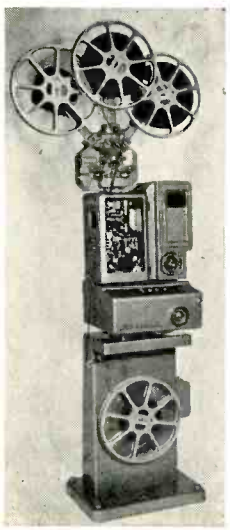
New Film Projectors



A 16mm projector, featuring optical and magnetic double and single system sound, and an 8-point Geneva intermittent sprocket drive, has been introduced by the Hortson Co., Los Angeles, Cal. Said to maintain picture steadiness at less than .003 of screen dimensions, instant-change film channels and gates offer any aperture ratio desired. The photoelectric cell light-slit has a micrometer adjustment, and the projectors are available with 13, 20 and 40w amplifiers. A choice of lighting is offered—xenon, carbon arc, quartz arc and incandescent. The portable unit, Model 11-30, is priced at $1,000 and the heavy-duty Model 46-10 is priced at up to $3000, depending upon accessories.

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Video Analyser

Two breakthroughs in TV waveform display are said to be incorporated in the Model 301

video analyzer developed by Colorado Video, Boulder, Colo. The equivalent of "line selection" provided at field rates presents a clear scope pattern, and the 301 can display a video waveform on the screen of a normally operating picture monitor, providing a direct correlation between picture content and video waveform. The instrument includes both vertical and horizontal marking signals for conven-

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* UHF Now Available in AIR COOLED High Power Combinations.

Now, thanks to SE's advanced transistorized design, you can build almost any power level and aural/visual power ratio that you need to meet the new FCC ruling and your pocketbook.

COMBINE THEM ANY WAY YOU WISH . . . The only "building blocks" you need are a transistorized driver and one or more SE amplifiers. These highly compatible units can be grouped in countless combinations to give you aural/visual power combinations varying from 10% to 50%; at any power output level.

SE AMPLIFIERS COMPLETELY SELF-CONTAINED . . . All SE amplifiers are identical regardless of their output power . . . and each is completely *self-contained* in a newly designed unit that includes power supply, cavity, blower, control circuits, metering, etc.

SIMPLY ADD AMPLIFIERS TO BOOST POWER . . . Thus, whenever you wish to add to your present transmitter, regardless of make, or change your aural/visual power ratio, you simply add to or change your *amplifier* combination.

SAVINGS UP TO 50% . . . Best news of all . . . SE amplifiers are compatible with *any* driver/transmitter. Savings to you can be as much as 50% in equipment costs!
Like more details? Drop us a line.

SE ADD-A-UNIT CAN SOLVE YOUR FM PROBLEMS, TOO!
Ask us about our quality line of FM Multiplex Transmitters, Amplifiers and Multiplex Exciters. They'll help you put more punch in your signal!

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Circle 37 on Reader Service Card

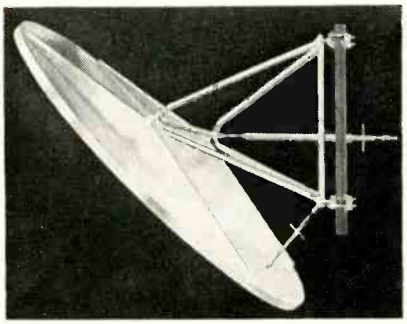
www.americanradiohistory.com

ience in making a point-by-point scene brightness analysis. Price is $875.

Circle 62 on Reader Service Card

Microwave Reflector

An elliptical tower-mounted reflector for periscope use to 13 gc is available from Microflect Co., Salem, Ore. The TM series employs a new panel and mounting concept; the reflector panel is

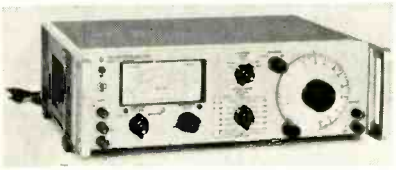


fabricated of solid aluminum, without perforations, utilizing construction techniques found in aircraft monocoque design. The gimbal mounting structure (omni-mount) is designed to support the reflector at a point near the center of gravity and the wind load; this concept is said to separate the loads on the support structure from the adjustment mechanism, as the omni-mount carries the reflector weight and environmental loads, leaving the azimuth and elevation rods free for adjustment. Five models are vailable: TM-46 (4x6′), TM-68 (6x8′), TM-812 (8x12′), TM-1015 (10x 16′), and TM-1217 (12x17′). All units mount on a 4½″ O.D. pipe (supplied with tower) or directly to tower members.

Circle 57 on Reader Service Card

Distortion Analyzers

Hewlett-Packard Co., Palo Alto, Cal., has designed harmonic distortion analyzers, with 0.1% full-scale display at maximum sensitivity, for measurement of



distortion down to 0.03% at any frequency from 5 cps to 600 kc. Noise and hum levels as low as 50 microvolts can be detected. Models 331A and 332A have solid-state tunable circuits, which reject fundamentals by more than 80 db while passing harmonics as high as 3 mc. Model 332A has a precision AM detector for analysis of modulation envelopes on carriers as high as 65 mc.

Circle 64 on Reader Service Card

Mobile Radio Equipment

G.E.'s Communication Products Dept., Lynchburg, Va., has announced the availability of several solid-state FM mobile units suitable for use by broadcasters.

The units are compact, with receiver, transmitter, and power supply packaged in 12½″ x 12¾″ x 4″ enclosure. Transmitter and receiver plug-in modules are said to be interchangeable to facilitate quick servicing. Units are available for either 132-174 or 25-50

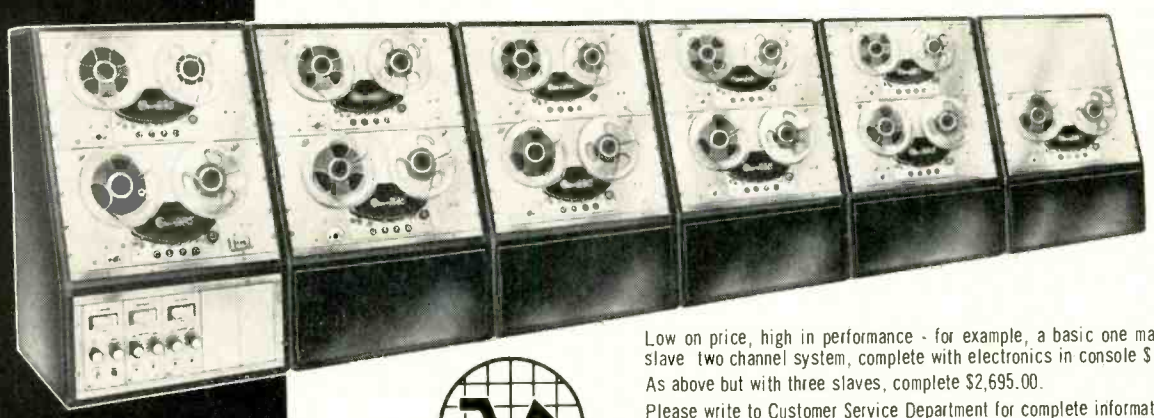
EXPANDABLE SOLID STATE TAPE DUPLICATING SYSTEM

SERIES 235 TAPE DUPLICATING SYSTEMS FROM $1,995.00

A Viking 235 tape duplicating system takes the worries out of your tape reproduction problems. You are assured of high quality copies every time.

The 235 system has built-in fail-safe protection so even unskilled personnel can operate the simple push buttons and calibrated controls. Choose from models for one, two or four channel simultaneous duplicating, at speeds to 15 IPS. As your production grows, add up to 10 slaves without changes or additions to the original electronics.

Series 235 tape duplicating systems are priced and specifically designed to meet the needs of independent studios, electronic teaching and audio visual departments.



SERIES 235

Low on price, high in performance - for example, a basic one master, one slave two channel system, complete with electronics in console $1,995.00.

As above but with three slaves, complete $2,695.00.

Please write to Customer Service Department for complete information.

Viking OF MINNEAPOLIS®

9600 Aldrich Ave. S. Minneapolis, Minnesota, 55420

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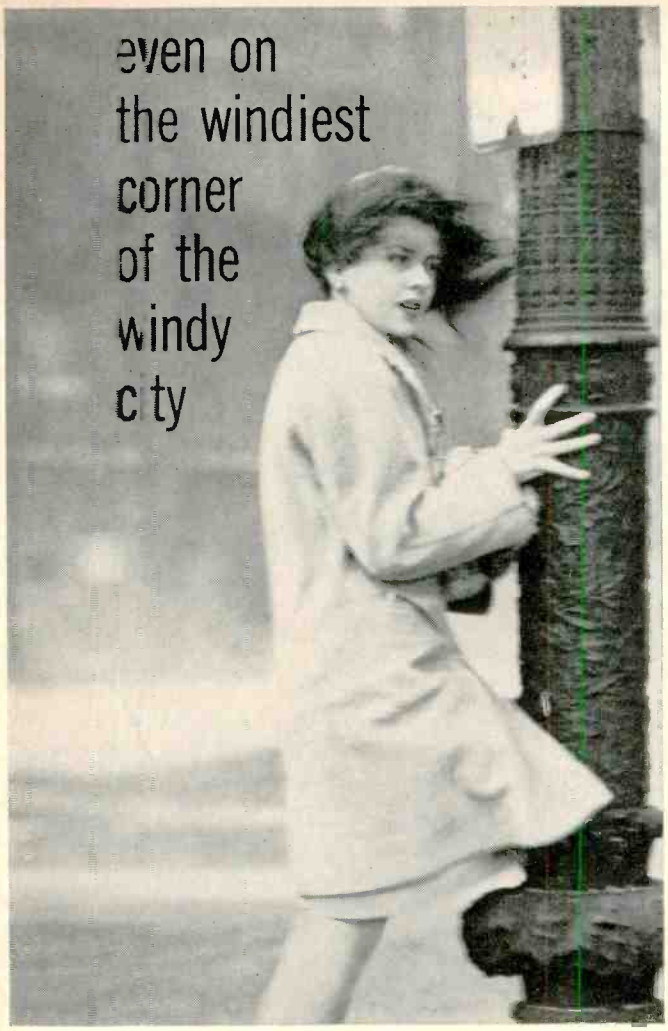


Shure's remarkable new SM50 omnidirectional dynamic microphone is SELF-WINDSCREENED! It is strikingly immune to wind noises and explosive breath sounds—making it ideal as a dependable "workhorse" microphone for remote interviews, news, sports pick-ups and a variety of field and studio applications. The five-element built-in windscreen makes it virtually pop-proof in close talking situations. And unlike other "built-in" windscreens, this one is "unitized" and self-contained with no bits or pieces to re-assemble after cleaning. In fact, you can actually rinse dirt, saliva, lipstick and other screen-clogging foreign matter out of the windscreen assembly under running water as often as needed—or replace the "unitized" assembly if necessary in a matter of seconds.

Additionally, the SM50 is the cleanest sounding professional microphone at anywhere near its price class. It delivers highly intelligible, natural and pleasing speech and vocal music that is especially full-bodied and rich in the critical mid-range.

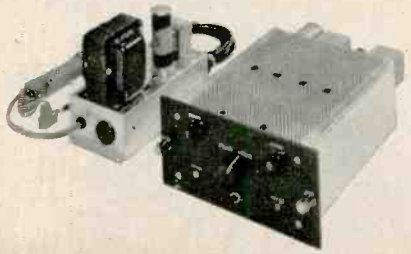
It is extremely rugged and will require little or no down time as the years go by. Too, when comparing it to other moderately priced omnidirectionals, it is lighter in weight, supremely well-balanced for "handability," has a detachable cable, and a rubber mounted cartridge for minimizing handling noises. The SM50 is worthy of your most serious consideration.

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

SHURE SM50

OMNIDIRECTIONAL DYNAMIC MICROPHONE

SHURE STATION-TESTED AUDIO CIRCUITRY EQUIPMENT



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

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

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

Circle 39 on Reader Service Card

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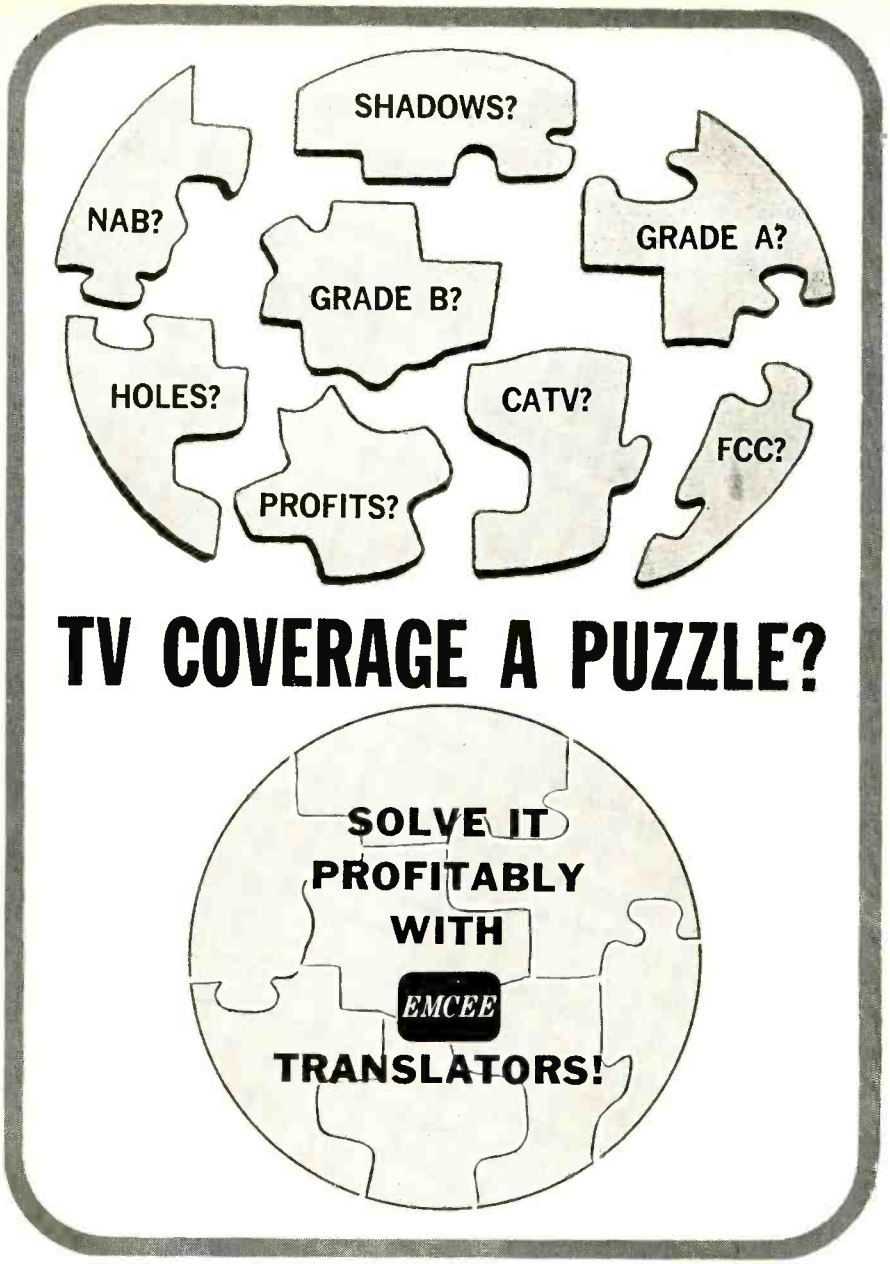


Forward-thinking broadcast executives have been calling upon EMCEE Translators, for the past ten years, to solve coverage problems. And, EMCEE has delivered the widest possible range — at low cost with little maintenance! Here are a few reasons why you should consider EMCEE equipment to solve your coverage problems:

EMCEE Translators extend signal range under the complete control of the station.

EMCEE Translators remove coverage problems within the framework of existing broadcast principles . . . and the public doesn't pay for the service!

Available in all authorized FCC types, EMCEE Translators come in 1 watt VHF to 100 watt UHF, including the newly authorized 100 watt VHF Translators. If you would like to discuss the application of EMCEE Translators to your station coverage problems, call us. There's no obligation. Yes, most of the translators installed in the U.S. today are EMCEE products.

EMCEE Electronics Missiles & Communications Inc.
160 EAST THIRD STREET, MT. VERNON, NEW YORK 10550 TELEPHONE: (914) 668-3012

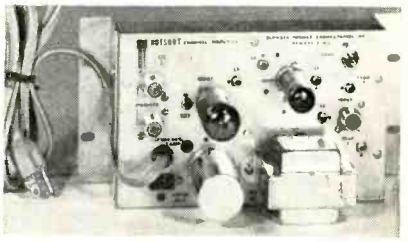
Circle 40 on Reader Service Card

mc operation, frequency-controlled by G.E. ovenless plug-in crystals. A typical basic unit, a 50w low-band model, is priced under $600.

Circle 56 on Reader Service Card

MATV Amplifier

A single-channel/FM VHF amplifier has been introduced into the Blonder-Tongue MATV line. The HS is a self-powered, manual gain-controlled amplifier designed to amplify a single VHF channel



while the FM unit amplifies the entire band. It is adjustable to 4v (72 dbmv) at both outputs simultaneously (v—or 74 dbmv—with audio carrier suppressed 12 db). Three MATV accessories are also available: the CR-2 installation tool designed for improved crimping and cutting for HR-5 and HR-11 holding rings, plus 2 splitters, Model TS-772F and TS-774F each housed in a chrome and wrinkle-finish case. Prices are $60 for low band unit, $66 for high band, $72 for FM unit.

Circle 70 on Reader Service Card

CATV Demodulator

Ameco, Phoenix, Ariz., has designed a solid-state demodulator which consumes 3w of power from 117v AC or 24v DC. Said to offer a new concept in remote powering of head-end equipment, the demodulator's oscillator is crystal-controlled with an output of video and 4.5 mc sound. All controls are front-mounted, and include video level control, 4.5-mc sound level control, manual RF gain control, on-off switch, and meter selector switch. The unit, says Ameco, will precisely control the amount of signal going into the cable system in cases where input signals vary widely. Another application is providing video and sound to modulate a microwave carrier.

Circle 63 on Reader Service Card

Audio Relay

An audio relay designed for automated program control, program failure alarm, automatic recorder start/stop, or any function where expedient to control equipment by the presence or absence of audio. Manufactured by

www.americanradiohistory.com

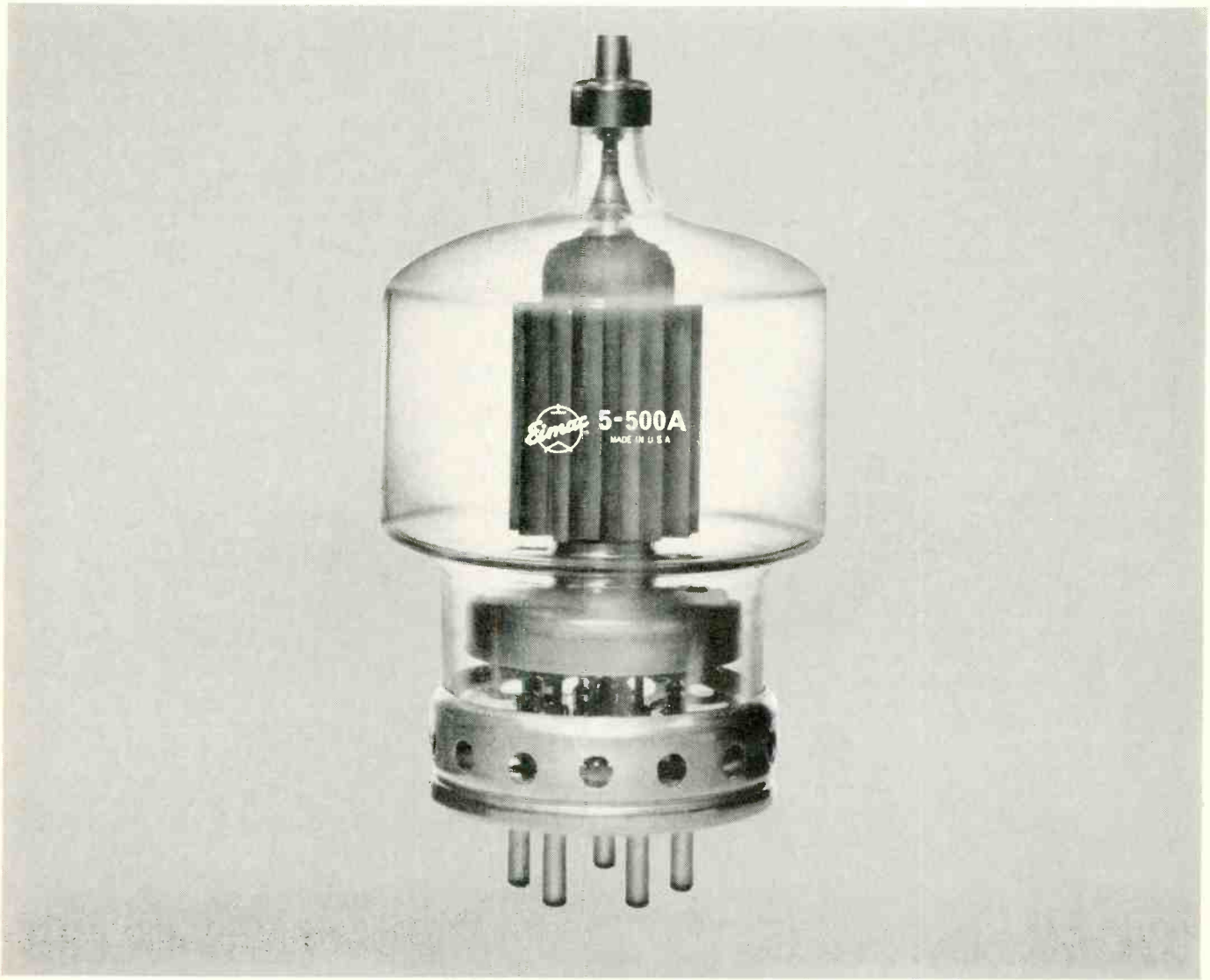
EIMAC introduces 5-500A pentode for retrofit into 1 kW AM transmitters

If you use 400 feet of RG8U coax between transmitter and antenna, your 1 kW AM transmitter using a pair of 4-400A's has to work harder to generate 1200 watts so you'll have 1 kW at the antenna base. That's marginal operation. There's no need for marginal operation with EIMAC's new 5-500A power pentodes. Running well within ratings, this inexpensive new 500 watt tube is ideal for retrofit in 1 kW AM transmitters: just change the filament transformer and readjust bias and screen voltage. The 5-500A features a balanced filament which comfortably exceeds FCC hum and noise specifications. As a linear amplifier, the 5-500A will provide a two-tone signal with third order products of —39 db at 450 watts PEP, or —32 db at 600 watts PEP. Write Power Grid Product Manager for details or contact your local EIMAC distributor.

5-500A CHARACTERISTICS CHART

Maximum Ratings Plate Modulated	
Radio Frequency Amplifier	
DC Plate Voltage	3200 V
DC Plate Current	340 mA
Typical Operation (Carrier Conditions)	
DC Plate Voltage	2700 V
DC Screen Voltage	475 V
DC Plate Current	280 mA
Carrier Power	600 W

EIMAC
Division of Varian
San Carlos, California 94070



See EIMAC at NAB, Booth 408-410-412

Circle 41 on Reader Service Card

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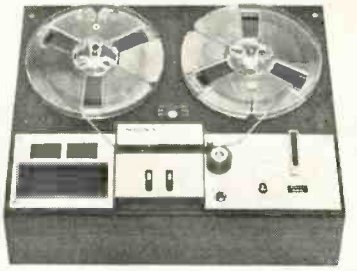
Teletronix Engineering Co., S. Pasadena, Cal., Model AR-1, will operate on an input level from 0.005 to 20v. Release time is adjustable from 100 ms to 75 seconds, pull-in time is less than 5 ms, and pull-in and release time is independent of input level. The relay's drop-out time is said to be consistent enough for automation control or subcarrier keying, and the input threshold may be set above noise level by use of the level control. The DPDT relay contacts are rated at 2 amps-115v AC, and the unit is designed for rack mounting.

Circle 66 on Reader Service Card

Stereo Tape Deck

A solid-state 4-track stereo and monoaural record playback tape deck is being marketed by Superscope, Inc., Sun Valley, Cal. The Sony 350, with 3-head design, features sound-on-sound and tape and source monitoring, a pause control and digital tape counter for editing, cueing and indexing, automatic power shut-off at the end of a reel, and rim-drive capstan flywheel. Operating at 7½ or 3¾ ips, frequency response is specified as ±2 db 50-15,000 cps and signal-to-noise ratio is said

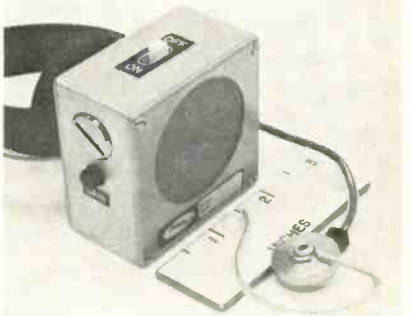


to be better than 50 db. Mounted in a low-profile base, price is $199.50; in carrying case, $219.50.

Circle 68 on Reader Service Card

Microwave Receiver

A miniature (2¼ x 2¼ x 1¼") portable microwave receiver capable of monitoring pulsed or AM modulated RF, has been announced by American Electronic Laboratories Inc., Lansdale, Pa. The



Model CMR-312A has a greater than 50 db RF input range without blocking, and a tone output which indicates signal presence in the 2 to 12 gc range. The receiver is solid-state including a printed-circuit Archimedes Spiral antenna. It is powered by two mercury button-type batteries which, the manufacturer says, will last for 30 hours.

Circle 67 on Reader Service Card

CCTV Videotape Unit

A low-cost videotape recorder and a mobile videotape recording system suitable for CCTV or CATV use are being marketed by Ampex Corp., Redwood City, Cal. The VR-7100 Videotrainer combines the VR-7000 recorder with a camera, receiver, and related equipment necessary for production and display of videotape programs. The VR-7000 employs the helical scan principle and records at 9.6 ips (63 minutes on 3000' reel), using 1"

A STAR IS BORN

FILMLINE'S EKTACHROME PROCESSOR—MODEL FE-50

Processes 16mm Color Emulsions at 50 FPM.

Who knows more about building film processors than Filmline? Nobody. And everything we've learned has gone into our newest Ektachrome processor, the FE-50. It is top quality equipment at a sensible price . . . the result of Filmline's productive know-how. Designed and engineered to fulfill the requirements of both large and small TV stations the FE-50 is the most versatile, fully automated Ektachrome processor ever built.

- **EXCLUSIVE OVERDRIVE SYSTEM** — guarantees against breaking or scratching film. The system is so sensitive that film can be held manually while machine is in operation, without breaking film or causing lower film assemblies to rise.
- Provisions for extended development to increase ASA indexes to 250 and higher are incorporated. Machine threadup allows use of standard ASA indexes or accelerated indexes because of Filmline's Film transport system features.
- **EASY-TO-OPERATE**—automated controls make this an ideal machine for unskilled personnel.
- **VARIABLE SPEED DRIVE**—speed range of 5 FPM to 60 FPM for Ektachrome emulsions.

ADDITIONAL FILMLINE FEATURES:

▪ Stainless steel air squeegee ▪ Impingement dry box ▪ Torque motor for takeup ▪ Leakproof pumps for chemical solutions ▪ Temperature controlled by precision thermistor controllers ▪ Construction — all metal ▪ Tanks and component parts are type 316 stainless steel.

Recent FE-50 Installations: WEAT-TV, WCKT-TV, WMAL-TV, NBC, CBS, WTOP-TV, A-1 Labs, Precision Labs, Film Service Lab.

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

For more details write: Dept. BMM-66

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wide Series 147 tape developed for the recorder. Bandwidth is 3.5 mc, S/N ratio is 42 db, and

horizontal resolution is 310 lines. The VR-7000 is priced at $3150, the VR-7100 trainer at $5945.

Circle 69 on Reader Service Card

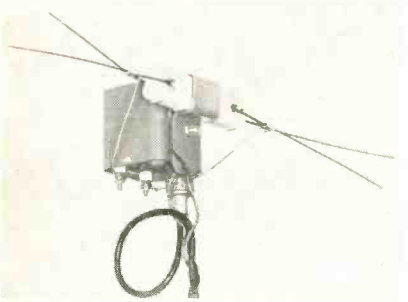
Video Switcher/Fader

Dynair Electronics, San Diego, Cal., has designed its switcher-fader Model VS-121A for the smaller broadcast studio. A wide choice of switching-control techniques are possible from the 12 video input lines: fade-in, fade-out, lap, dissolve and superimposition with any desired degree of signal mixing. The equipment has a preview buss, enabling the operator to route any input to a monitor prior to switching to the program line. Program and preview amplifiers have a bandwidth of better than 32 mc. Price is $1650.

Circle 58 on Reader Service Card

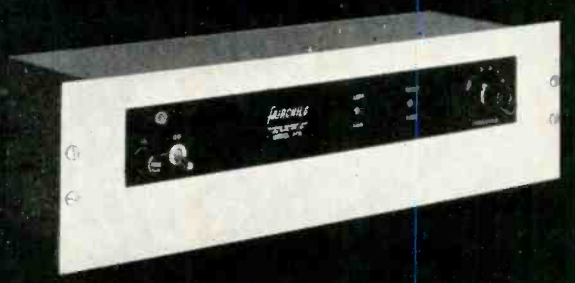
3-30 mc Receiving Antenna

Delta Electronics, Inc., Alexandria, Va., has introduced a receiving antenna system designed to be particularly useful when installed in close proximity to a transmitting antenna. The RAS-10 antenna consists of a 40-foot fan dipole terminated in its cen-



ter with a coupling compensation unit. The system is said to be designed so that impinging fields of one-volt-per-meter will produce approximately 1.8 volts across a

NOW! GIVE YOUR FM STATION 100% MODULATION CAPABILITY



WITH THE FAIRCHILD CONAX!

■ Now! The FAIRCHILD CONAX enables FM radio stations to increase their signal strength and apparent loudness potential by the effective control of high frequencies which cause trouble when pre-emphasized. High frequencies add sparkle and "bite" to program material and pre-emphasis improves signal-to-noise ratios. When the two are combined, however, it often becomes necessary to decrease the station's power to eliminate over-modulation possibilities.

■ How can high frequencies, which normally contain less energy than mid or low frequencies, cause trouble when pre-emphasis is applied? Simple! High frequency information, such as the jingling of keys, the sharp "s", the muted trumpet, cymbals, or other high frequency sounds, often become high frequency "spikes" when pre-emphasized thereby exceeding the FCC 100% modulation limitation. By making high frequency information "spike-free" (through the use of inaudible super fast attack and release times) the FAIRCHILD CONAX now allows the use of the full high frequency pre-emphasis curve.

HERE'S A STEP-BY-STEP GRAPHIC ANALYSIS OF THE FAIRCHILD CONAX IN ACTION...

FIG A – Normal program material with program information distributed in mid range—500 to 5000 cycles.
FIG B – Same program material pre-emphasized. Still trouble-free.
FIG C – Program material with a high percentage of high frequency material in its content – such as found on today's records.
FIG D – Same high frequency program material (hot) after pre-emphasis. Note high frequency "spikes" now exceed 100% of modulation.
FIG E – Same program material now controlled by the FAIRCHILD CONAX action.
* Note even with pre-emphasis the lack of troublesome high frequency "spikes" that normally would cause over-modulation.

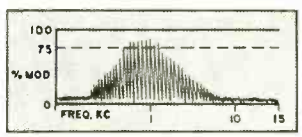


FIG A

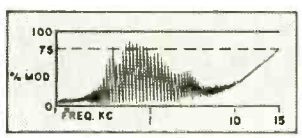


FIG B

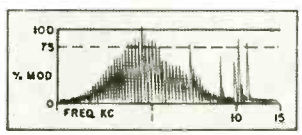


FIG C

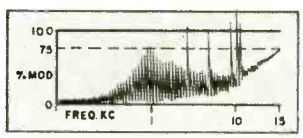


FIG D

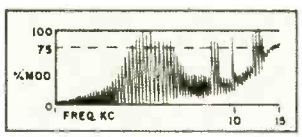


FIG E

■ The FAIRCHILD CONAX has an exclusive patented preview circuit which applies a standard pre-emphasis curve to any entering signal. The patented FAIRCHILD CONAX frequency dividing and controlling network allows accurate and inaudible control only of the troublesome high frequency "spikes". This means you can transmit a signal with high average modulation level up to 3 db higher, utilizing the full apparent loudness possibilities of your rated power. In FM stereo and SCA transmission, the FAIRCHILD CONAX prevents splatter between the SCA channel and the stereo channel, allowing you to use both of these dollar producing signals to their fullest. Now full modulation capabilities can be realized without the danger of FCC citation or any change in the transmitted sound of your signal. Now FAIRCHILD CONAX gives your station that brighter and louder sound... the sound that sells. **AVAILABLE IN MONO OR STEREO COMPACT SIZE!**

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

FAIRCHILD RECORDING EQUIPMENT CORPORATION
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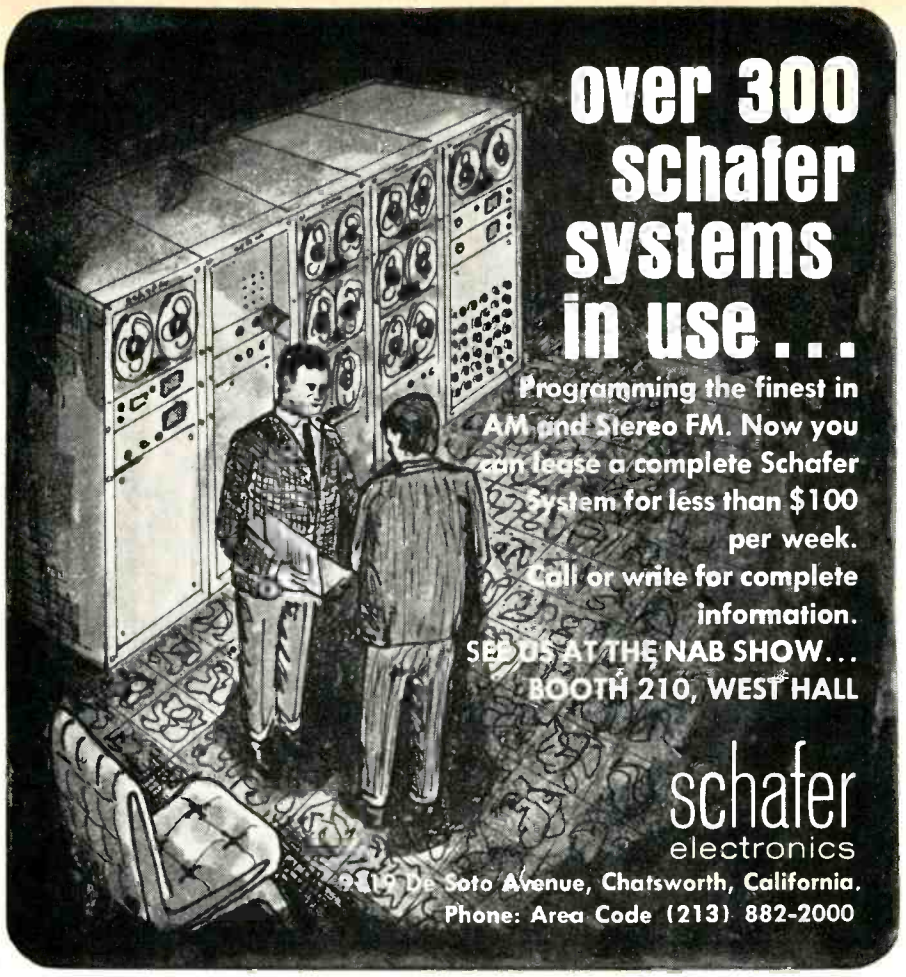

Circle 44 on Reader Service Card

Full Track, 2 Track or 4 Track in Record, Playback or Erase Heads as well as 3 or 4 Channel Heads in Record or Playback Types for...

AMPEX, MAGNECORD, CONCERTONE, RCA, CROWN

Now you can reduce "downtime" by using Nortronics replacement heads—available locally and immediately from your distributor! Pick the head and track style YOU want from Nortronics' full professional line. After initial changeover, replace heads or convert track styles in minutes! Precision engineered adapters and mounting brackets let YOU make the initial changeover... let YOU service your recorders according to your needs.

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Booth 233
West Hall, Conrad Hilton

Circle 45 on Reader Service Card

75-ohm termination. The coupling unit, consisting of a ferrite balanced-to-unbalanced matching transformer, is enclosed in a weatherproof container which mounts directly on the center insulator of the antenna, and in turn, supports the antenna feed line.

Circle 65 on Reader Service Card

Improved Cart Unit

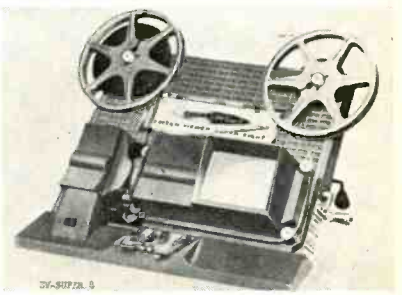
Sparta Electronics Corp., Sacramento, Cal. has added technical improvements to their table-top tape cartridge system. Formerly manufactured as the 400 Series,

the 800 Series includes Nortronic tapeheads and headmounts for faster adjustment. All amplifier modules are constructed on individual epoxy-glass PC boards. The transistorized units have brushed aluminum control panels and illuminated stop-start buttons, and require only a 10½" x 14" space.

Circle 60 on Reader Service Card

Film Splicer/Editor

Kalart Co., Plainfield, Conn., has introduced a complete line of super 8mm editing and splicing equipment. Included are EV-Super 8 Editor/Viewer, S-5 Su-



per 8 Splicer, Craig Master 6 Splicer. All accommodate three film sizes; standard 8mm, Super 8mm and 16mm. Kalart and Craig splicers have an exclusive dual feature which permits splicing with either tape or cement. The EV-Super 8 editor/viewer is made of die-cast construction and features a larger viewing screen, a built-in Super 8 splicer, 400′ reel capacity, and straight-line filmgate threading.

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Names in the News

Continued from page 10

A. C. Sofe has joined Koss Electronics as vp of Engineering, according to **John C. Koss**, pres.

Gay C. Kleykamp has been named assistant to v-p and general manager of Kaiser-Cox Corp. **Earl Hickman** was named V-P in charge of marketing. **Eleanor Hellrung** has been named marketing dept. coordinator.

G. C. Kleycamp

Duane Crist

Duane Crist has been named vp in charge of general administration and finance for Kaiser-Cox Corp. **Richard MacMillan** has been appointed chief engineer. **Robert Lemon** has been appointed sales engineer for northern Cal., Ore., and Wash.

Sony Corp. has announced a change of officials for its wholly-owned American subsidiary, Sony Corp. of America. **Akio Morita**, president of the U.S. company and executive vp

Akio Morita

E. Schwarzenbach

and co-founder of the parent company, has been elected chairman of the board. **Ernest B. Schwarzenbach** succeeds Mr. Morita as president.

Entron, Inc., has established a regional office in Dallas, to be headed by **Robert L. Taylor**, who will be responsible for sales activity in the southwestern region.

R. L. Taylor

E. G. Wildanger

Edward G. Wildanger has been appointed product manager, Video/Instrumentation for Memorex Corp.

Donald F. Eldridge, vp, has been presented an International award by the Audio Group of the IEEE. **John C. Lory** has been named Memorex sales engineer for the Florida region.

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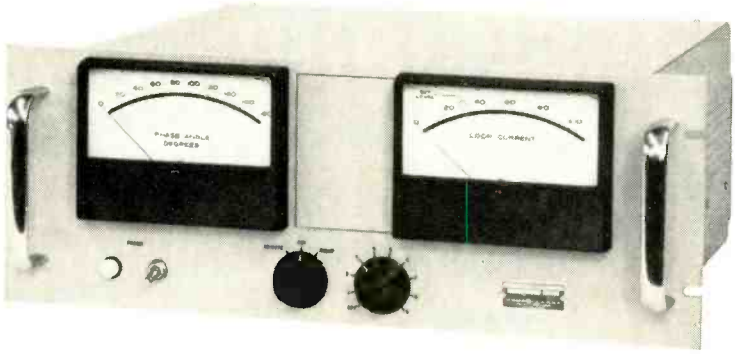

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EMERGENCY POWER

Continued from page 32

As those who have experienced power failures have learned, reliable operation during an emergency can contribute mightily to the community image and prestige rating of a broadcast station. An appreciative audience will long remember the ultimate effort expended by a station and its staff in the endeavor to gather and disseminate information during a crisis. Municipal officials, community leaders, and the public in general have generously applauded broadcasting's contribution to the prevention of disorder and chaos, often the result of the growing hysteria of an uninformed populace during an emergency.

FCC Commissioner Lee Loevinger, in his Defense Committee report on the much publicized northeast power failure, said: "Broadcast licensees, the radio and television networks and the press wire services provided the public with vital information for which they have received praise and commendation from Federal, State and local officials and the general public. The report makes clear that radio played a major role in telling the general public what was happening and what to do in the early hours of the blackout. At the same time, it recognized that many broadcasters were unprepared for the predicament in which they found themselves and were at a loss to know what to do." In spite of the odds, the blacked-out area was completely covered within two hours with 153 broadcast signals, providing reassuring information and instructions from government officials and public utility officials concerning the commercial power blackout.

A survey conducted for the National Association of Broadcasters among New York City area residents showed that three out of four persons interviewed were tuned to radio during the power failure and that many felt radio's calm and cheerful reports averted panic.

Perhaps some broadcasters grow weary of hearing about their obligation to serve public interests and needs, but it's unthinkable that a station would risk going silent at a time when it is needed most.

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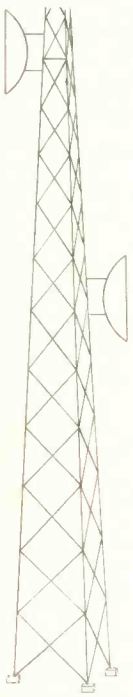

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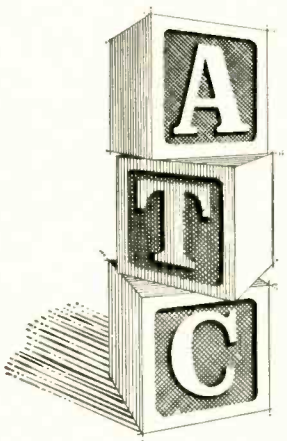

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LITERATURE of INTEREST

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

10:1 Zoom lens for I.O. TV camera described in illustrated brochure from TV Zoomar. Includes prices, operating data. **159**

Video switching system, Cohu 9000 Series, described in data sheet, including typical outputs to inputs, specifications. **160**

Measuring equipment catalog from B&K describes audio voltmeters, distortion analyzers, level recorders, and other instruments. **161**

Audio compressor, solid-state, described in catalog sheet from Melcor. Includes specifications and operating data. **162**

Microwave equipment, KTR III, for TV relay. Catalog sheet from Raytheon CADPO includes specifications and operating data. **163**

Line Treatment Equipment described in new 24-page condensed catalog from Lynch Communication. **164**

Electrolytic capacitors designed for multiple-unit loudspeaker cross-over networks described in brochure from Sprague Electric Co. **165**

Switching and connecting components listed in 24-page catalog from Switchcraft. Includes jacks, plugs, and audio accessories. **166**

Acoustical door catalog from Overly Mfg. Co. describes sliding, swinging types; frame and seal systems with sound transmission class ratings of 35 to 62 db. **167**

Test instrument catalog from Hewlett-Packard lists scopes, signal generators, meters, impedance bridges, analyzers, amplifiers, microwave test gear. **168**

Shielded cable connector, one-piece "wobble action" construction, described in bulletin from Thomas & Betts Co. **169**

AC-DC tong test ammeter described in catalog from Columbia Electric Co. Models ranging from less than 10 to more than 1000 amp. capacity. **170**

Remote control systems, wire and radio, described and illustrated in 6-page brochure from Moseley Associates. **171**

CATV buried cable system, pedestal housings and closures described in 4-page catalog from Channell Splicing Machine Co. **172**

Newscamera body brace shoulder pod described in fact sheet from S.O.S. Photo-Cine-Optics. Holds cameras with large magazines: Auricon Pro-600, Arriflex, Maurer, etc. **173**

I.O. camera tubes, 4½", described in brochure from EMI Electronics. Includes detailed operational information. **174**

Capacitor rating selector designed to complement component selector, offered by Cornell-Dubilier. Pocket-size reference to standard stock components. **175**

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Background music, motivational sound, described in information from Magne-Tronics. Explains franchise and sales promotion ideas. **176**

The Experimenter, published monthly by General Radio, presents discussions on topics of interest to engineering personnel. **177**

Power Supply Handbook from Trygon Electronics describes line of transistorized DC power supply modules. 52-page publication also discusses remote voltage programming, constant current regulation, series and parallel operation of power supplies. **178**

Spanish language catalog from Gates Radio lists broadcast transmitters for AM, FM, shortwave, TV, communications, including accessories. 48-page publication also includes section devoted to audio equipment. **179**

Resistance decades described in 4-page brochure from Clarostat. Ranges from 0.1 to 900K in seven miniature boxes. **180**

Antenna system mounting components, clamp assemblies, masts and booms, couplers, guy wire kits, mounting ring kits and adjustable bearings, described in 4-page catalog from Taco. **181**

Tube reference guide containing basic specifications and "Push-To-Talk-Service" ratings for 11 mobile communications tubes available from Amperex Electronic Corp. **182**

TV film recorder described in brochures from W. A. Palmer Films, Inc. Includes descriptions and prices of portable and console models. **183**

Line transfer switches for emergency standby generators described in catalog from Automatic Switch Co. Includes engineering data and specifications. **184**

"The Directional Microphone Story" published by Electro-Voice. 22-pages of directional mic characteristcs. **185**

Books on all phases of radio-TV-CATV, many unavailable from other sources, fully described and illustrated in 8-page catalog from TAB Books. **186**

Film inspection machine, all solid-state, Model S/S Inspecto-O-Film, described in flyer from Harwald Co. **187**

UHF-TV translator systems described in brochure from Litton, Ind. Outlines advantages to commercial and educational television. **188**

Background music programming brochures from National Musitime Corp. includes library and franchise information. **189**

2-way radio information, application publication, "The Mobilizer" and "Success Report" from Aircraft Radio Corp. **190**

Pickup cartridge literature, Stanton 581 Calibration Standard series, lists specifications, prices. **191**

Tape recorder specifications, performance data on Magnecord recorder/reproducers listed in 6-page brochure. **192**

VTR, portable broadcast type MVR-65, illustrated in brochure from MVR Corp. **193**

Spectrum analyzer plug-in units, offering phase lock, 100-mc dispersion, described in technical data from Tektronix. **194**

Prefabricated buildings for housing tower site equipment described in brochure from Ft. Worth Tower. **195**

CATV advertising and promotional aids offered to CATV operators in AD-101 literature package from Ameco. **196**

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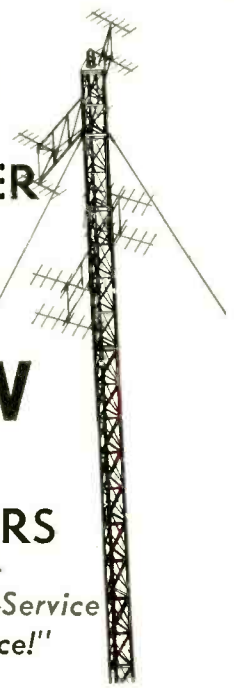

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ENGINEERING
CASEBOOK

The Case for Primary Voltage Regulation

by Ronné Waudé

CONSTANT SUPPLY voltage of the right magnitude can improve and continuously maintain a station's signal coverage, and at the same time, reduce operating costs by lowering tube replacement requirements.

The portion of the market most affected by voltage fluctuations is, of course, the fringe—the Grade B contour of the broadcast radiation pattern. As transmitter output power weakens or fluctuates, the market area represented by this fringe will tune to other stations transmitting a stronger and more consistent signal. With a circular radiation pattern the coverage area is proportional to the square of the radius, and radiation is a function of the square of the transmitted power. *Thus, market coverage is directly proportional to the fourth power of the voltage.*

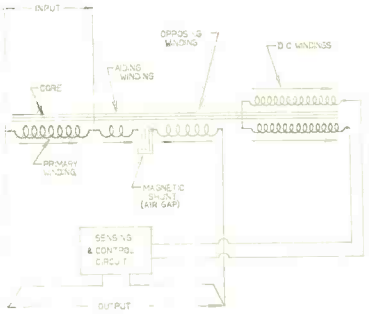
Frequency Deviation

Fluctuations in voltage can and do cause transmitter carrier frequencies to drift beyond FCC restrictions, making retuning necessary. Such carrier frequency fluctuation is more prevalent with TV and FM stations, although it occurs in some AM transmitters. Frequency variation caused by voltage fluctuations is due, in varying degrees, to:

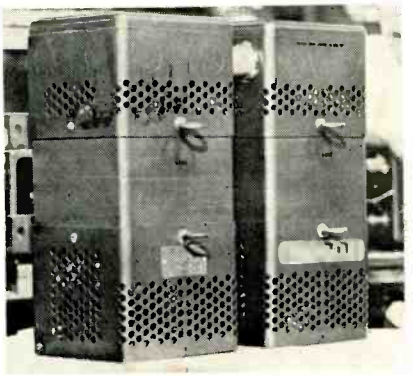
1. Inconsistent electron emission of the oscillator-tube filament. Electron emission is proportional to the filament temperature which, in turn, is a function of the voltage applied to it;

2. B+ voltage changes in the oscillator circuit, and erratic stabilizing-crystal oven temperature. The latter occurs when the voltage supplying the oven's heating elements changes abruptly and causes the crystal to change its frequency characteristic too rapidly for thermostatic compensation to be effective.

With a constant filament voltage of 100%, average oscillator tube life is estimated at 100 hours. When filament voltage is increased to 105%, tube life is reduced 50%, to 50 hours. At 10% overvoltage, tube life is cut to 26 hours, skyrocketing the replacement cost to more than four times normal.



Wiring diagram of Solatron electronic-magnetic voltage regulator unit. Any change in source voltage at the input is sensed and automatically compensated for so that output remains constant.



The Solatron regulator is a fast-response, electronic-magnetic device developed by Sola Electric Co. Available in 1 to 100 KVA range, it will produce 90% correction in less than 5 cycles and complete correction in 10 cycles or less for 20% line voltage changes and/or load variations of 0 to 100%.

Other Voltage Problems

Some TV cameras are powered from unregulated supplies, resulting in the need for continual adjustments to compensate for light variations. This problem also can exist when telecasting film or video tape material. In addition, the life of expensive transmitter equipment is shortened by overvoltages, greatly increasing the possibility of down time.

Transistorized equipment, too, is susceptible to damage from voltage fluctuations; as a matter of fact, a sudden line voltage surge could cause the operating limits of transistors to be exceeded, resulting in permanent component damage.

The Solution

All of these problems can be solved through proper regulation of primary voltage. For example, many TV stations use a regulator to overcome line-voltage fluctuations at their studio facilities. One midwestern station using an electronic-magnetic regulator reports a 30% saving in the cost of tube and other component replacements. In this case, annual savings amounted to $700.

For transmitter operation, properly regulated voltage permits oscillator tubes to function within ±1% of the rated voltage, extending tube life and resulting in constant carrier frequency. An excess supply voltage of 5% may reduce tube life as much as 50%; a 10% under-voltage may reduce cathode emission to 60% of normal.

Regulated voltage will go a long way toward increasing equipment life and holding transmitting power constant. This not only saves money and aids in improving reception, but in particular helps to increase the station's audience. ●

Mr. Waudé is with Sola Electric Co., Elk Grove Village, Ill.

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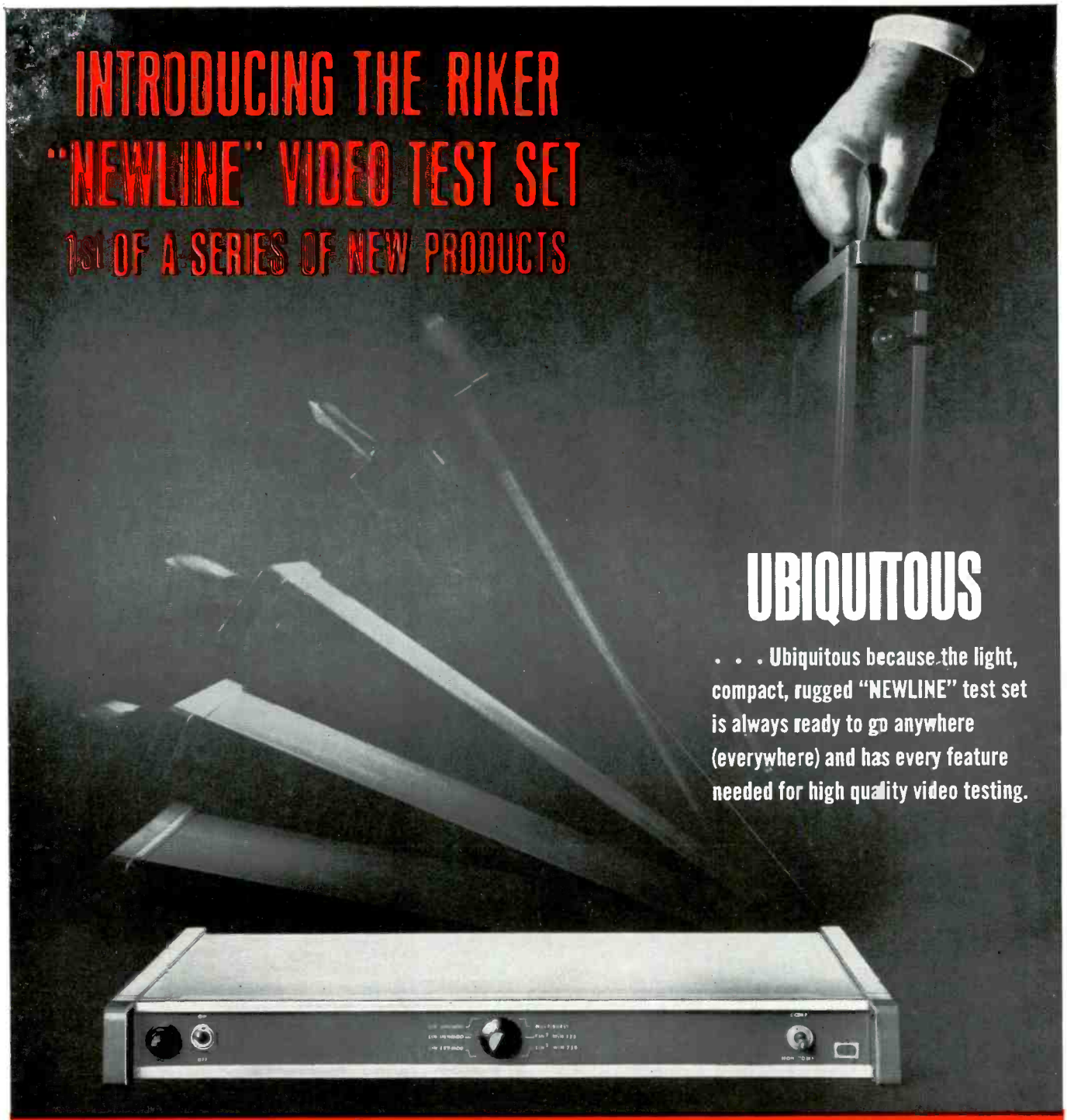

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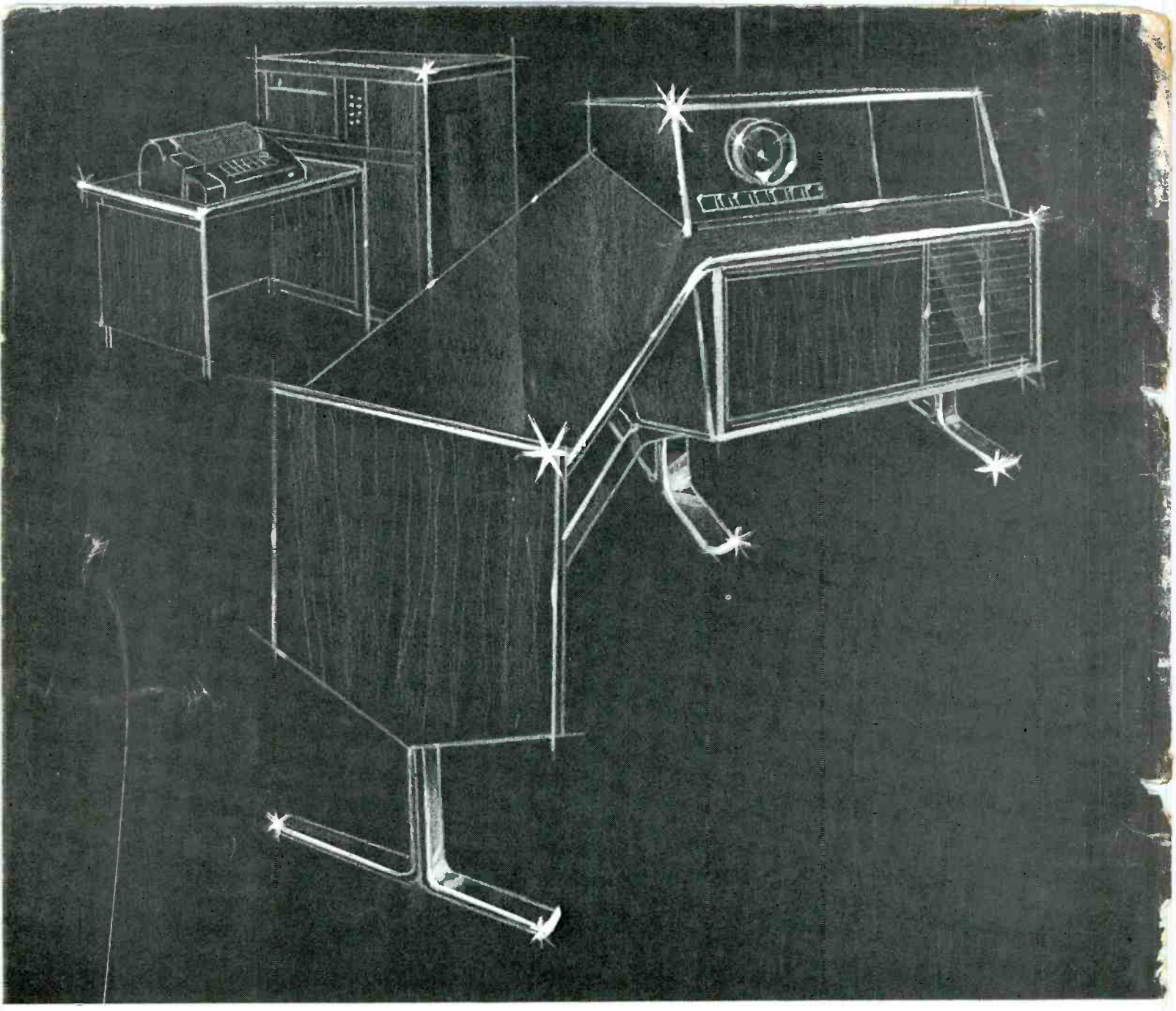

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