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# BME

BROADCAST MANAGEMENT/ENGINEERING

ETV/ITV ISSUE



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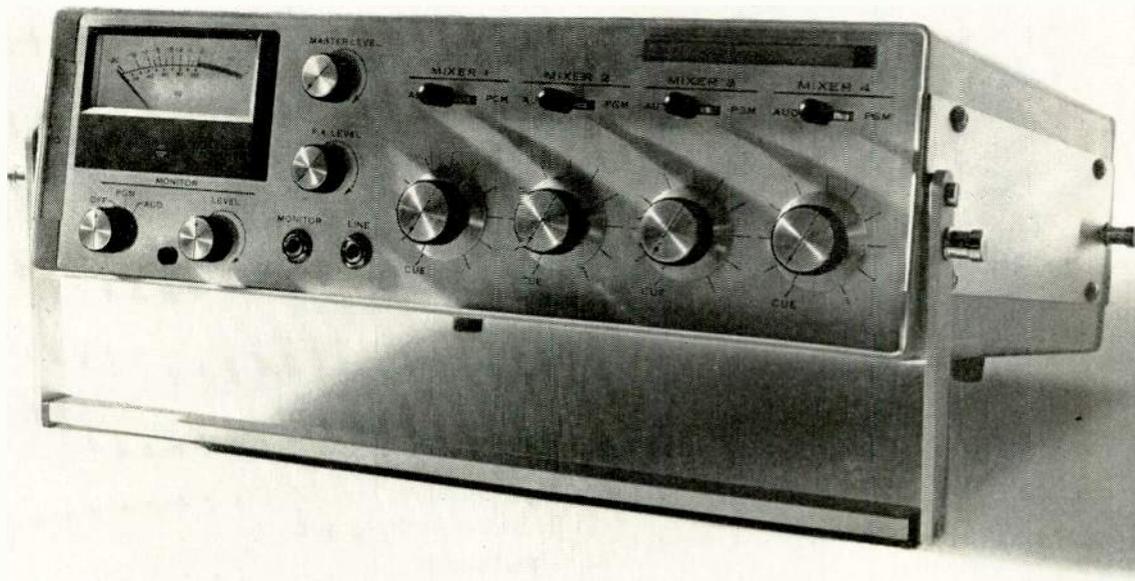
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**This month's cover:** Johnny seeing himself on TV is possible with today's low-cost VTRs, small enough for Johnny to pull around in his little red wagon as shown in Art Sudduth's cover design. For the latest developments in ETV/ITV, see pages 27-46.

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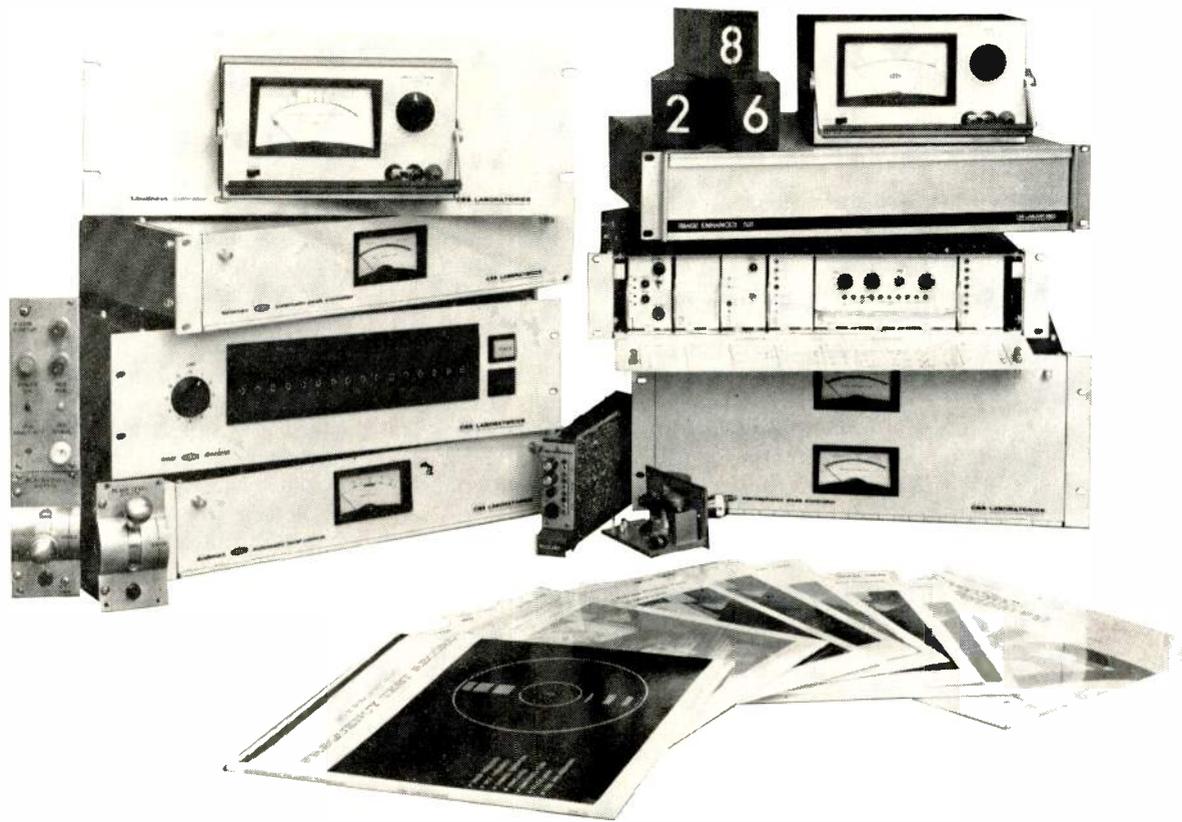
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# BROADCAST INDUSTRY NEWS

## Home radios with fm outsell a-m-only models

It's been called a first—fm-equipped home radios (including table, clock, portable models) have been outselling a-m only radios.

In the second quarter of 1969, combined import and U.S. factory home radio sales accounted for more than 8.9 million units, including 4.6 million, or 51.9 percent with fm; in the first quarter of the

year, fm represented 48.2 percent—8.2 million—of a market of 17.2 million.

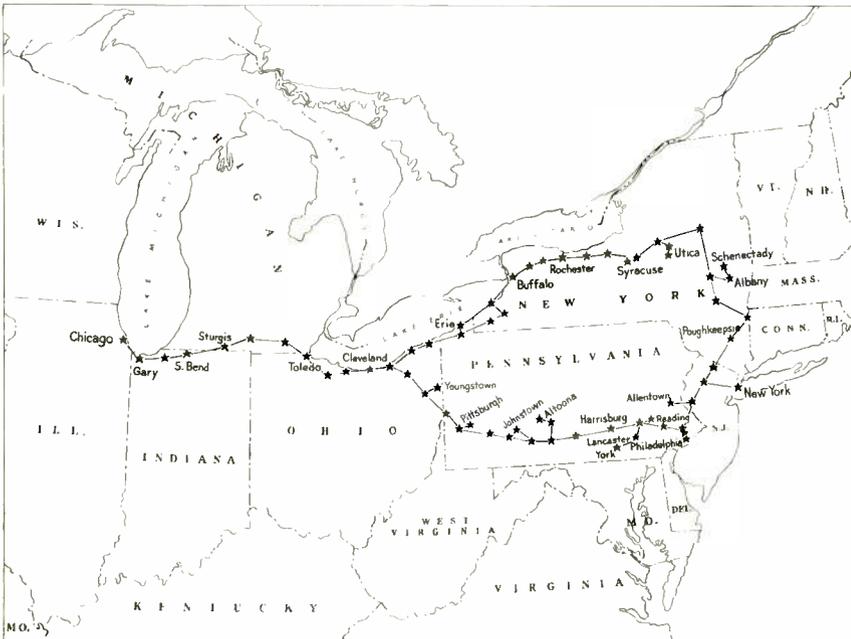
Fm auto radio sales, however, dropped from 13.4 percent in the first quarter to 12.9 percent in the second quarter of the year. In the first quarter, 439,597 fm auto radios were sold; 350,207 were sold in the second quarter. While imports had 89.2 percent of home fm sales in the first half, they accounted for 5.5 percent of the whole auto fm market.

crations, while cooperating on interconnecting services through arrangements with Microwave Communications of America, Inc., a Washington, D.C., national service organization created by MCI founders.

The first company in the series—Microwave Communications Inc.—was granted permission to provide customized microwave service between Chicago and St. Louis on August 14, 1969, in what has been called the first instance that FCC has allowed a company to compete with existing regulated monopolies in supplying private-line service.

John D. Goeken, president of both Microwave Communications Inc. and MCI New York West, Inc., said that the new company, whose system would initially cost about \$8 million, is not a telephone company and has "no relation to the public telephone service. We will be a communications pipe," he said, "providing subscribers with exactly the transmission capacity they need for all forms of information, whether it's data, facsimile, radio communications, teletype or voice."

## MCI seeks 2nd link in microwave network plan



Substitute relay stations for the 65 stars above and you'll see how MCI New York West Inc. proposes to link New York and Chicago with a "customized" microwave system. A like operation between Chicago and St. Louis, proposed last August by Microwave Communications, Inc., was the first private line service allowed by the FCC to compete with existing, regulated monopolies. Headed by the same man, both companies hope to interconnect in the future as the first part of a projected nationwide network.

If the FCC approves MCI New York West Inc.'s application for a microwave system license, "the first customized communications service between New York and Chicago" could be operating nine months later, according to the new company's chairman-treasurer, Thor W. Kolle, Jr.

This company is the second in a series of independent carriers

being formed by regional investors to create a nationwide communications network in which, it is said, subscribers leasing on a common carrier basis would select exact bandwidths and terminal equipment for their needs, rather than having to adapt their needs to facilities of existing carriers.

These systems would retain local interest and control of op-

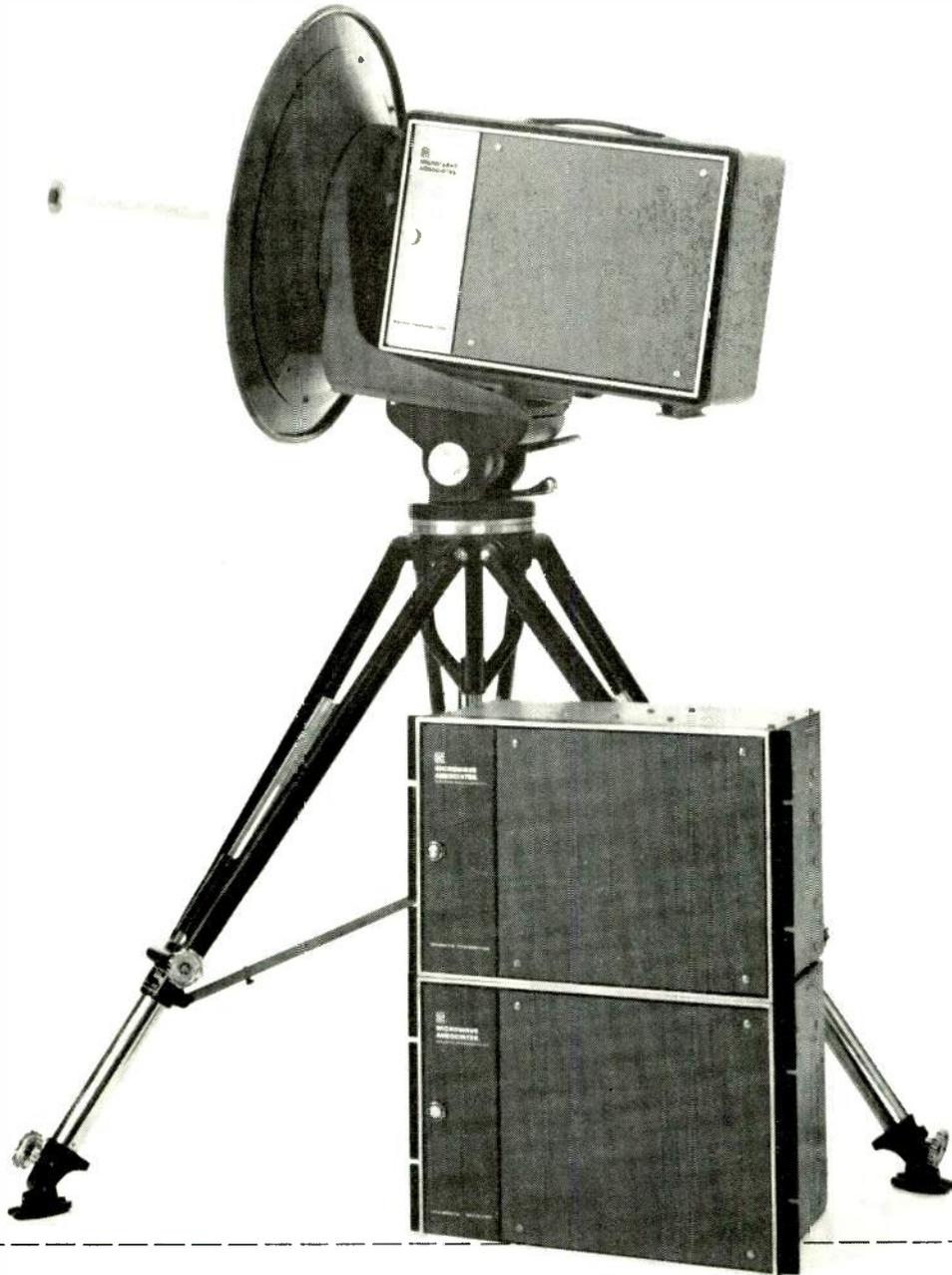
## 72 Basic Channels

MCI spokesmen said that "Compared to only three channels now available for point-to-point service from existing common carriers . . . basically designed for voice transmission . . . MCI New York West will offer . . . for less than half the rates now being charged . . . 72 basic channels that can be used in over 10,000 various combinations to meet the exact needs of each subscriber." MCI-type carriers were also said to offer an alternative to private microwave systems, whose more than 100,000 miles were built by companies with large communications requirements that existing carriers couldn't meet.

The MCI New York West system would offer point-to-point communications through use of 65 relay stations along routes including Philadelphia, Pittsburgh, Cleve-

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- 4.4 — 4.9 GHz
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land, Buffalo, Rochester and Albany. Up to five organizations would be allowed to share a single channel, so that the smallest communications users "could take advantage of the service." Subscribers could connect with MCI through local telephone lines, a microwave radio link, coaxial cable or mobile radio units.

Typical uses of the MCI system were said to include instant access to computer information centers, transmission of data, pictures and other graphic material, and radio communications with mobile units and remote control stations.

## FCC asks for a-m restriction and more

In early September, the Commission presented four major proposals in a combined Notice of Proposed Rule Making and Memorandum Opinion and Order: that new, restrictive rules be adopted for accepting a-m applications; that major changes be made in the facilities of authorized stations; that commercial a-m and fm be thought of as "part of a total aural service;" and that Class IV power increase requests be accepted a year from September 4, 1969, regardless of domestic interference.

### Provisions

The proposed rules which contain revision of a-m assignment rules in the FCC's July 17, 1968, "freeze" on a-m application acceptance, would require applications for new daytime stations (and for major changes in daytime or nighttime facilities) to provide a first service to 25 percent of the proposed service area, or 25 percent of the population within the area; that existing fm service of 1 mV/m or greater intensity, as well as a-m service, be taken into account in determining whether a substantial area or population would receive a first primary service; and that applicants for new facilities—not for major changes—show that there is no fm channel available and unoccupied that could be used by an fm station, which would serve substantially the same "white" (unserved) area proposed to be served by the a-m station.

Among other things, the Commission said that fm provides a full-time service which a daytime a-m outlet (sought by most a-m applicants) cannot offer, and that compared to any a-m service, fm

is technically better, cheaper and more orderly for both the FCC and applicants, freer from interference, and with stereo and Subsidiary Communications Authorization capability.

In a separate order, the Commission amended Note 2 of Section 1.571 of the rules to lift immediately the "freeze" on applications by existing Class IV stations for power increases and for new or changed facilities in Alaska. Unlike existing Class IV power increases, the "freeze" on new Class IV applications would continue pending rule making.

Comments on the proposed a-m rules are due on or before November 14, 1969; reply comments are due on or before December 15, 1969.

## Appeals court backs pay TV authorization

Although FCC technical standards and application filing guidelines for over-the-air subscription TV systems have been in effect since September 5, 1969, applicants can't receive authorization for an STV system until at least after November 30—60 days after the Court of Appeals' positive decision on the validity of STV.

At this writing, it is uncertain whether the Commission will issue STV authorizations on or around November 30, or whether it will wait for two decisions—of Congressional committees on some 20 pay TV bills and of the U.S. Supreme Court, to which the National Association of Theater owners is said to have appealed the court's pro-pay TV decision.

Docket 11279, of which the Fifth Report and Order on over-the-air STV systems was part, will not be terminated, says the Commission, until it has finished studying comments filed in response to the other part of the docket—the Third Further Notice of Proposed Rule Making concerning CATV systems' carriage of STV signals.

As for applications, the Commission says that it doesn't plan to adopt a special form for STV applications, each of which costs \$150.00. Applicants for STV authorization must comply with provisions of Sections 1.580 and 1.594 of rules governing local notice of filing or designation for hearing STV applications, according to the FCC. If an applicant wants to file the STV application

with an application for a CP for a new station, license renewal, assignment, or transfer of control, he may combine the required notice for both applications. The Commission will not grant STV authorization for thirty days after it has issued public notice of acceptance for filing.

According to the new rules, a proposed pay TV system can receive over-the-air authorization only after the technical division of the office of the chief engineer has given advance approval based on specific criteria requiring that:

- A signal comply with all FCC technical standards for color or monochrome transmission and the accompanying aural signal.
- There be no increase in the 6-HMz width of the TV broadcast channel.
- There be recovery of the encoded visual and aural programs without perceptible degradation as compared to the same programs transmitted under the Commission's monochrome and color standards.
- There be no internal modifications to subscribers' receivers.
- Reception of STV programs be no more susceptible to interference of any kind than reception of conventional TV programs.

STV system authorization requirements also ask that the application first be subjected to "certain conditions and limitations," including:

- A separate request for each different system.
- Field test checks, conducted without expense to the Commission or tests by FCC personnel, if necessary.
- The understanding that no system is considered approved until the FCC has notified the applicant in writing.

A list of information about STV systems submitted for Commission approval is maintained by the technical division of the office of the chief engineer but isn't open to the public.

## BEST seeks to better TV through "soul"

"To date, the [broadcasting] industry is a tool of the commercial and does not meet the needs and interests of the black community, nor, for that matter, of any community."

This time it wasn't FCC Commissioner Nicholas Johnson speaking, but a group called Black

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Efforts for Soul in Television (BEST) writing to Senate cosigners of the "Pastore bill." Sent a few months ago, the letter in which the quote appears was part of BEST's first project and is indicative of what the organization considers as its *raison d'être*—to work for TV programming that is "more meaningful" to black people. To members of BEST chapters in seven major cities, "soul" is synonymous with relevance.

### Anti Pastore Bill

The group's most immediate business has been opposing as "a form of backdoor racism" Senate bill S-2004, introduced by John O. Pastore (D-R.I.). In general, the bill recommends changing present FCC rules on license-renewal (which hold that the Commission consider at license renewal time competing applications before it grants a renewal to the licensee) to have the FCC accept competing applications for a channel license only after it has disqualified the licensee. At deadline, BEST chapters plan to join in some kind of public-attention-getting action when Senator Pastore's Senate Communications Subcommittee hearings on his bill resume.

The BEST letter said that the bill "seeks to protect" a "status quo" in which, by "depicting the black community via entertainment spectacles, a token colored reporter and the usual insipid, unreal TV programs with 'Negro' stars, the television industry has merchandised a lily-white image that perpetuates the doctrine of white conformity on which this country was built."

Besides active opposition to the Pastore bill, BEST has been coordinating to inform black people of their "rights" as to television service and what they can do to socially, politically and culturally get programming that is socially, politically and culturally relevant. Representing such black complainants in the Washington area, 15 men have already asked the management of three uhfs—WTOP-TV, WRC-TV and WTTG-TV—to meet with them and discuss charges of "offensive" programming. At this writing, the stations haven't met with the citizen group.

According to BEST's chairman, Absalom Jordan, if a station wouldn't "go along" with BEST suggestions and ideas, BEST would file protest petitions "or strike applications, if blacks want

the license for themselves."

Six of the eight members of BEST's Washington, D.C. chapter have already had experience with the petition phase—late in August they joined with nine members of the Black United Front (in which several prominent Negro organizations in Washington, D.C. combine), to petition the FCC for denial of ABC-affiliate WMAL-TV's license renewal. The petition charged that the station had failed to determine and/or fulfill the needs and interests of black citizens who make up more than 70 percent of Washington, and that it had misrepresented claims of having consulted over 100 black citizens on community needs and wishes.

### IPS Study

Several organizational studies have helped these Washington groups both indirectly and directly. Of most direct help was a study by the Institute for Policy Studies of all TV stations in Maryland, Virginia, West Virginia and the District of Columbia; statistical data from it was used as evidence in the petition against WMAL-TV. IPS ranked Washington stations WTTG, WTOP-TV and WRC-TV first, second and third respectively, and evaluated WMAL-TV 25th in overall programming service.

### WQXR drops butts

As of January 1, 1970, cigarette advertising printed in the *New York Times* and aired over *Times* stations WQXR-AM-FM, must carry the warning that appears on cigarettes—"Caution: cigarette smoking may be hazardous to your health"—and must reveal tar and nicotine content in the cigarette's smoke.

Among major cigarette manufacturers who have announced plans to cancel advertising after the January renewal date are American Brands, Liggett and Myers and R. J. Reynolds, Inc.

### MCA and Firestone cancel merger plans

In mid-September, Firestone Tire & Rubber Company and MCA Inc. called off plans to merge, saying that "the best interests of our respective shareholders would not be served by the proposed transaction."

One month before this announcement, Firestone had modified its original agreement in principle to issue debt securities totaling about \$320 million for MCA—it substituted preferred stock for the debt securities.

This was the motion picture-television production company's second failure in a year to effect a merger. About three months before negotiating with Firestone, and following extensive meetings with the antitrust division of the Justice Department, MCA had abandoned plans to merge with Westinghouse Electric Corporation.

While it is said that MCA was pressured into breaking off negotiations with Westinghouse by the Justice Department's crackdown on multimedia holdings and monopolies, it is said that MCA's second merger failure was due to lack of agreement among some Firestone investors.

Other recent cancellations of mergers between communications giants said to be traceable to Justice Department pressures, have included Metromedia and Transamerica, and American Broadcasting Company and International Telephone & Telegraph (see *BM/E*, August, 1969, p. 8).

### Quad stereo tested in N.Y., Boston

Four-channel stereo (quadrasonic stereo) is getting a workover by interested fm broadcasters and equipment manufacturers. It's also getting a mixed reaction from listeners and audio buffs. Big question: is it really a worthwhile improvement or just a gimmick to sell more home stereo gear?

Basically, the system adds channels 3 and 4 to the rear of the listening room to impart some of the concert hall's rear-reflected reverberation. In demo tapes used by Acoustic Research in the firm's demo room in New York's Grand Central Station, the reverb effect was noticeable and did indeed enhance the sound. But is it worth all the added expense and sophistication?

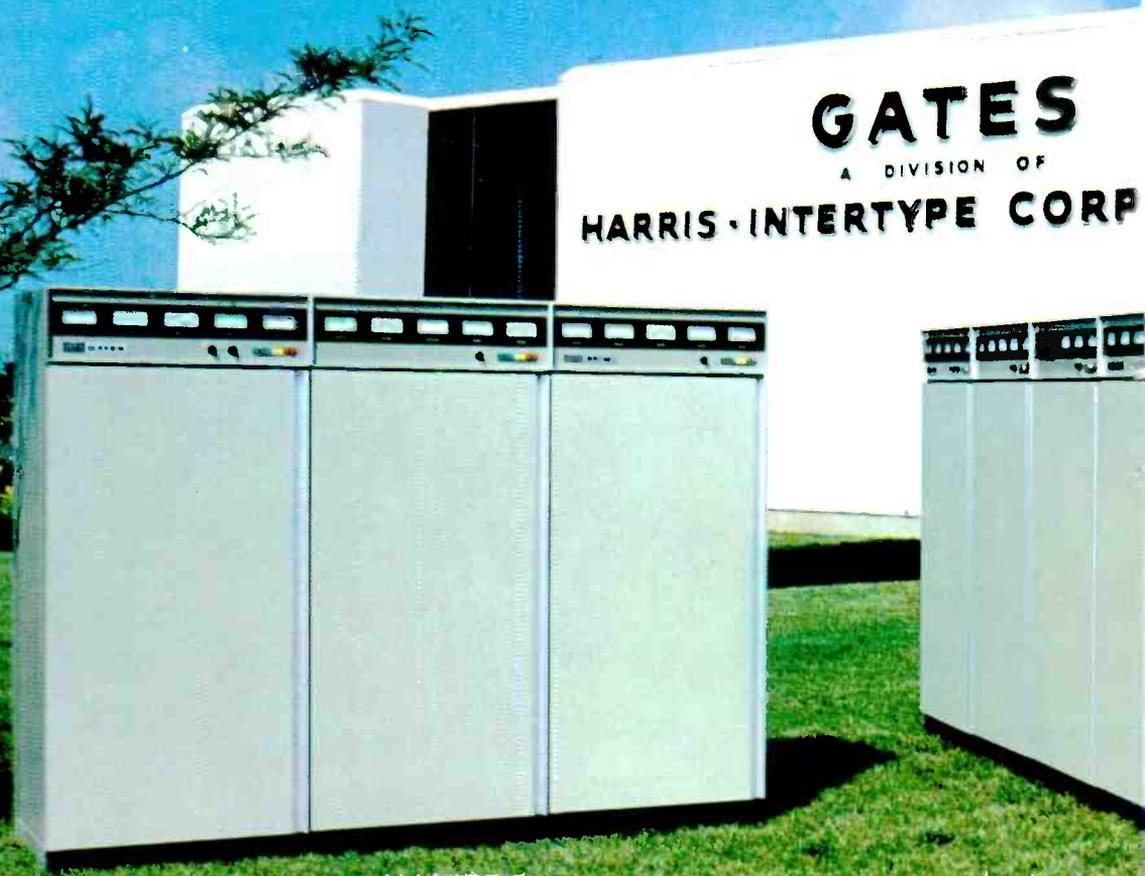
Right now, the principal source of quad music is on four-channel tapes, and there are precious few recorders capable of playing these tapes. Crown 3M Viking and Teac are the only firms currently producing such an animal. But fm

*Continued on page 70*

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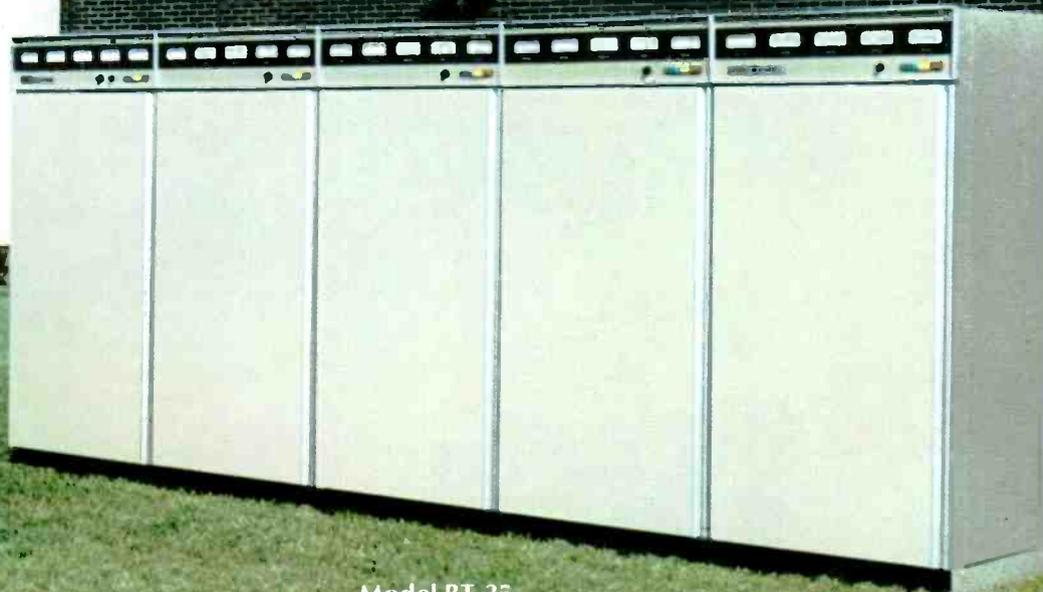
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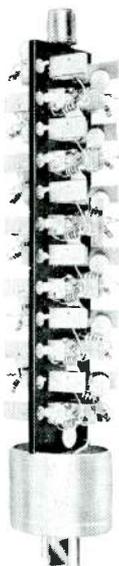


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## FOCUS ON CATV

### J.D. steps in a second time for CATV

In late September, the FCC received its second communiqué of the year from the Justice Department on CATV policy.

Addressed to the presently abandoned NAB/NCTA staff agreement, the 21-page memorandum reemphasized a major point of the antitrust division's letter to the Commission last April on the CATV-Telco rulemaking—that the FCC should take steps assuring CATV's reaching its full potential as a communications medium (see *BM/E*, May, 1969, p. 6) And it spelled out at least two antitrust positions that had only been implied in the letter—that both suggested and implemented cable television policies overprotect TV broadcasters, and that CATV transmission is inherently monopolistic.

The department gave two reasons for formalizing its comments on an agreement that broadcasting and cable representatives had stopped rehashing (see *BM/E*, October, 1969, p. 70). It wrote that the compromise agreement contents "illustrate and encourage a number of overly protectionist solutions to existing problems and would thereby tend to limit seriously the competitive potential that CATV offers to the public," and that "the present draft might serve as the basis of further discussions and subsequent agreement between these two trade associations."

The J.D. cited two "general principles" that must be "achieved" in order for CATV to reach its full potential: "Those who are actual or potential competitors of the firms offering CATV system services should not control that system... and no restriction should be placed on the offerings of a CATV system unless such a restriction is absolutely essential to some clearly defined public interest."

In saying that the agreement revealed broadcasters' and CATV operators' interest in minimizing competition and protecting existing market power, the J.D. discussed what it called "four competitive issues of long range significance to the development of CATV":

- The right of access to cable

systems of those wishing to do their own program origination.

- The proper role of restrictions on importation of distant signals.
- Interconnection among CATV systems.
- The offering of other services to a community through a CATV system.

In concluding that program producers must have access to cable channels, the J.D. said that "in a case of a CATV system, transmission is the only element which is inherently monopolistic," and that "here, and here alone, duplication would be uneconomic." That operation of a system doesn't require any control over programming is proven, wrote the J.D., by "the fact that the basic fare of a CATV system is the programming of unrelated television stations."

Only minimal, market-by-market restrictions on importation of distant signals should be imposed, wrote the J.D. in its second discussion. The department also repeated here its charge of protectionism in saying, "It is clear... that the NAB/NCTA agreement proposes to deal with the issue [of an overall policy goal that 'unnecessary restrictions not be placed on the importation of distant signals, or other programming, by CATV systems,'] in a backwards, and protectionist, manner. It offers a concept of 'adequate' television service—not minimum service—to deal with the problem of distant signal importation."

The J.D. went on to "urge the Commission not to sanction... a prohibition" like the agreement's against interconnection of CATV systems. (The memo says that the issue is not "dealt with directly," but instead "has been injected by the general prohibition in the NAB/NCTA agreement against interconnection... 'for the purpose of distributing entertainment type programming.')" The J.D. wrote that such an interconnection "is a potential source of regional or even national networks offering quality programming alternatives to the existing broadcast networks."

As for the last issue undertaken by the J.D., CATV nonentertainment services were strongly recommended.

Signed by Justice Department Assistant Attorney General Richard W. McLaren and attorneys Donald I. Baker, Daniel R. Hunter and Peter C. Carstensen, the memo closed in saying that "the Com-

*Continued on page 69*



**CONVENTIONAL  
COLOR  
VIDEO  
CAMERAS  
HAVE  
SOME  
30  
CONTROLS.  
OURS  
HAS  
3.**

The new Sony DXC-5000 video camera is a marvel of simplicity.

To begin with, it uses two tubes instead of four to produce a high-quality picture: one tube for luminance, the other to generate all three color signals, red, green, and blue.

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And what are the DXC-5000's three controls? Vertical registration, horizontal registration, and electronic focusing. As many controls, it so happens, as it takes minutes to learn to operate the camera.

We urge you to take a quick lesson at your Sony color video camera dealer.



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Rare earth phosphors used in the 14-inch CRT display provide you with the truest colors possible today in a color monitor. Reds are really red—and flesh tones look like live flesh—not like muddy brown pancake make-up.

And once you have made your critical alignments—such as balancing separate color cameras—the highly stable TCB-14R monitor locks on without drift, so you know any change in color is the result of misaligned signals from other equipment—and not the

result of instability in your color monitor!

The TCB-14R monitor is a unit only 10½ by 19 by 18 inches that fits in your studio console in the space you used for your black and white monitor—or in a small amount of space in your mobile units. In either location, all-solid-state circuitry gives you maintenance-free reliability, day-in and day-out.

As an added feature, frequently-used controls are on the front panel—which pulls out to expose the critical controls used in initial set-up and adjustment.

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



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SUBSIDIARY OF BALL CORPORATION

BB9/1

# INTERPRETING THE **FCC** RULES & REGULATIONS

## The Lottery Statute: Contests and Promotions

WITH MEMORANDUM Opinions and Orders<sup>1</sup> issued June 6, 1969, the Commission relieved three stations of forfeitures assessed in letters dated January 10, 1968. The forfeitures (\$2000 against both WNEP-TV and WBRE-TV, and \$1000 against WMUU) resulted from violations of Section 1304 of Title 18, United States Code, which prohibits broadcast of lottery information. The reason given in the June 6 action for lifting the assessments was that there had been no prior judicial or Commission decisions from which the licensees could reasonably have anticipated that their broadcasts violated Section 1304. All three cases dealt with the issue of "consideration" in the contests promoted by the stations.

To constitute a lottery within the legal prohibition, a promotional scheme must contain three essential elements—a *prize*, whose winner is chosen by *chance* from a group of contestants who have furnished *consideration* in order to be eligible for the prize. If the element of consideration is absent from a scheme, it is not a lottery and thus avoids the prohibition of the section. To eliminate this element from the contests, the Commission said, "Nonpurchasing contestants must be able to obtain chances in the same places at the same times, and in the same number as purchasing contestants, in a setting which does not otherwise encourage a purchase." Since this was not the case in the contests advertised on the three stations, the Commission assessed forfeitures for broadcasting lottery information. The result of the cases was to expand the lottery rules somewhat, although the Commission decided it would not be appropriate to enforce the expanded interpretation of "consideration" against the three stations.

### WMUU Case

WMUU broadcast the following commercial announcement concerning a Pepsi-Cola "Bottle Cap" prize plan:

Pepsi is giving away 400 compact, portable tape machines in Greenville, Spartanburg, Laurens, Union and Cherokee Counties. If you're among the first 400 people to find the words 'transistor tape player' under a Pepsi cap, you'll be the proud winner of a tape player.

While paid chances were available wherever Pepsi-Cola was sold, free chances were available only from the local bottling company or local route salesmen. The standard, however, is that free

chances must have "reasonable equal availability" with paid chances, and the Pepsi promotion did not meet it. Nonpurchasing contestants must be able to obtain chances in the same places at the same times as purchasing contestants in a setting which does not otherwise encourage a purchase. Thus, in any "on-product" merchandise-sales promotion (where some chances are attached to the product and other chances are given free), "reasonably equally available" means that such free chances can be readily obtained from *all or at least most* of the customary retail outlets for such products—such as grocery stores and supermarkets.

Although the licensee has a responsibility to review announcements carefully for completeness and accuracy, the WMUU broadcast did not mention that free chances were available. Any announcement of this kind of promotional scheme should adequately describe the availability of free chances and the locations, times and manner in which they may be obtained. The Commission found that such cryptic phrases as "no purchase necessary" or "nothing to buy" do not meet this requirement. Further, the way the operation is carried out is as important as the way its rules describe it. The licensee must therefore make certain that the scheme is being carried out in accordance with the rules.

### WNEP-TV and WBRE-TV Cases

Here is an example of the promotions presented by WNEP-TV and WBRE-TV:

'I won \$25.00 in cash.'

'I won \$5.00 in cash.'

Yes, you can win cash from Vaughn's bread. Look for the 'win cash' coupon in Vaughn's white bread, in the thrifty king size, farm style and many more. If the number on your coupon ends in one or more zeros, you are a winner of up to \$25.00 in cash. Not only can you win cash but you'll enjoy the finest loaf of bread baked. Notice the firm texture, taste the good flavor, taste the extra freshness. No wonder Vaughn's bread is the No. 1 favorite. It is good for you and your health, and now, win cash. Choose Vaughn's bread and look for your lucky 'win cash' coupon. No purchase necessary.

The Commission observed that *participating grocers had been instructed to limit free coupons "one to a customer," whereas Vaughn bread purchasers could get as many coupons as they wanted* by purchasing loaves of Vaughn's white bread. Also, they could obtain the free coupon by requesting it. In order to remove the element of consideration in

1. FCC 69-608, FCC 69-609 and FCC 69-610.



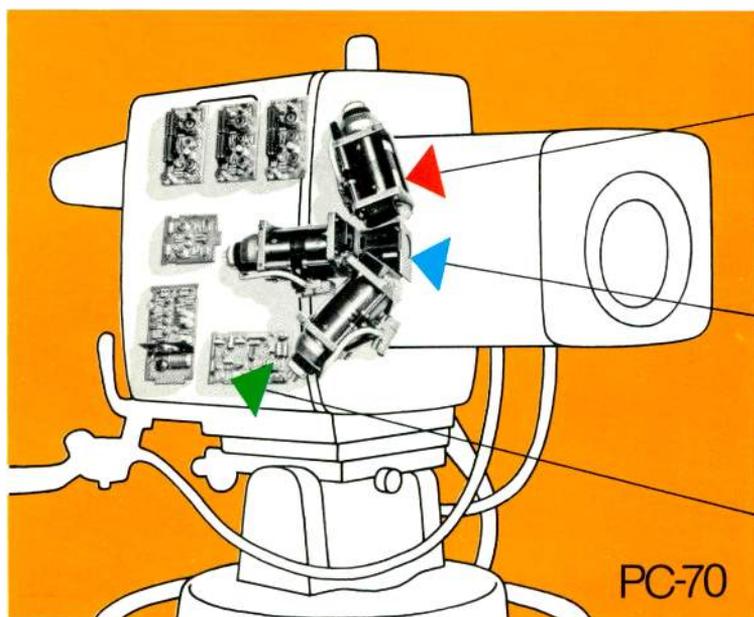
Now...  
the Innovators  
give your  
TV movies  
Plumbicon\* color.



\*Trade Mark for  
television  
camera tubes.

# Norelco PCF-701: The only 3-Plumbicon\* film camera.

There's 80% of a PC-70 inside it.



The same Plumbicon tubes  
for TV's truest-to-life color.

The same exclusive sealed-  
prism beam splitter.

The same solid-state  
electronics on inter-  
changeable circuit boards.

Film chain color was never so good before. The Norelco PCF-701 Color Film Camera gives all films, of any color balance, the color fidelity that the PC-70 studio camera gives to prime-time shows!

Key reason: they're both basically the same advanced camera. The PCF-701 is the only 3-Plumbicon color film camera. Like the PC-70, it's the color standard other cameras strive to match.

To get the most out of film, the PCF-701 also has exclusive features the PC-70 doesn't. Examples: The only built-in Automatic Light Control. And a Linear Matrix unit that facilitates accurate reproduction. With any other color camera these are separate extras. Inconvenient. Expensive.

Also built in: a lazy-susan picture monitor on top,

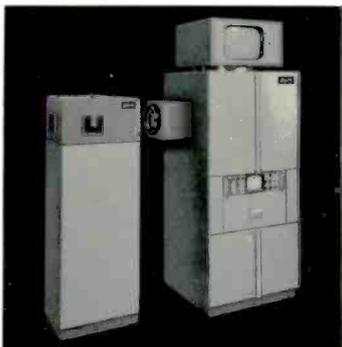
a side-mounted waveform monitor, plus drawer-mounted registration and operation panels. Signal-checking and set-up are easier. All controls and monitors can be mounted separately in racks or consoles if desired.

The PCF-701 has a multiplexer specifically designed for it...our PCM-800. With this combination, for the first time in color TV, slides can be supered over film on the same film island.

With its PC-70 inside, the PCF-701 is easily the most advanced color film camera available today. If you already have a PC-70 outside, in your studio, it's even better. Because you already have a complete maintenance set-up for the PCF-701.



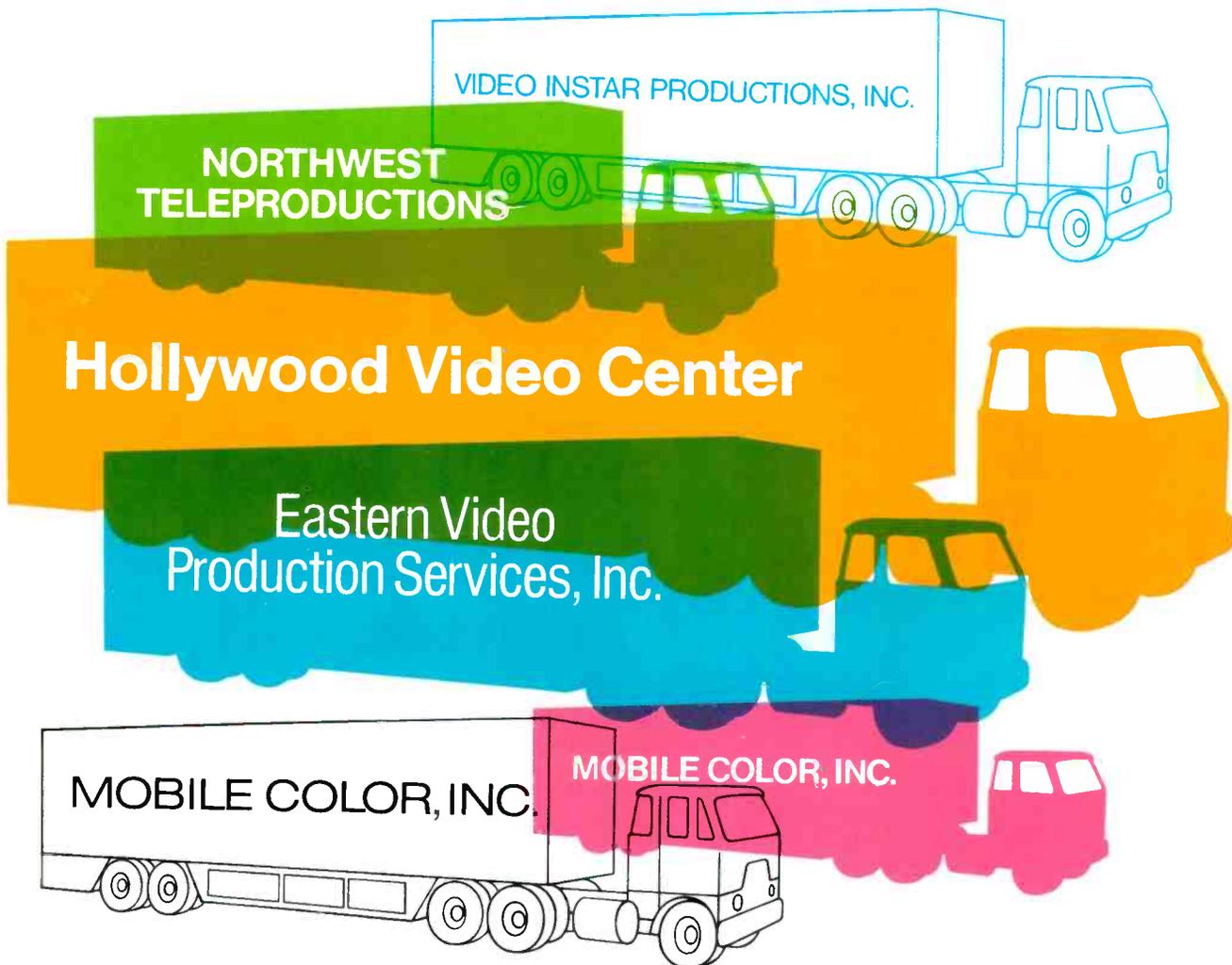
PCF-701



Norelco's PCM-800 Multiplexer is designed specifically for the PCF-701 Film Camera. Slides can be supered over film on the same film island for the first time in color TV.

\*Trade Mark for television camera tubes.

# Norelco turnkey mobile units on the move.



The swing to Norelco for ready-to-go mobile vans, from 27 to 40 feet, is due in large part to the color camera capability of Philips Broadcast.

This is the home of the all-time star performer, the Norelco PC-70. It is the home of the PCP-70 "Little Shaver" portable camera, and the PCF-701 film chain—both close kin to the PC-70. Add to that the non-viewfinder PCB-701, and the new, digitally controlled PCP-90 "Minicam" portable, and you have an unmatched capacity for meeting television's demands for the highest quality and the utmost versatility.

All are Norelco 3-Plumbicon color cameras, with the technology that has swept the industry. The most wanted, most used, and most imitated color cameras in the world.

Since Philips Broadcast delivered its first turnkey 40-ft. color unit last year—*ahead of schedule*—other

forward-looking producers have turned to Norelco for full vans as well as studios. This does not include the scores of vans already using PC-70's.

For vans and studios—complete and ready to operate—talk first with the innovators, the systems men from Norelco.

*Norelco*

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# Veni, Vidi, Vidicue

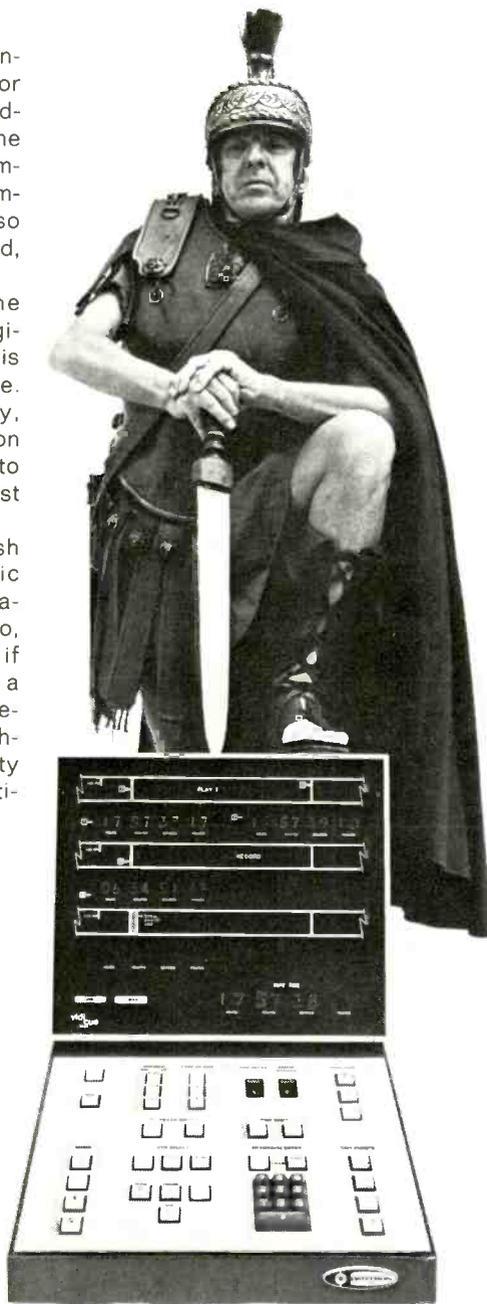
(We came, we saw, we edited)

Hail Vidicue!

Our new Vidicue editing and control systems have conquered major VTR problems for both the broadcaster and production facility. The Vidicue features precise, economical control of program and commercial construction... while also presenting a highly sophisticated, computerized editing capability.

Moreover, Vidicue gives the broadcaster the flexibility to logically add to his basic system as his requirements inevitably increase. And for the production facility, Vidicue lets the editor perform on tape what he had only been able to do on film in the past due to cost and technical restrictions.

How does Vidicue accomplish this? Vidicue offers automatic search and cue, frame synchronization, and editor control of one, two, or three recorders (or more, if desired, on an optional basis). As a universal editing system, it is designed to interface with any high-band broadcast recorder, quality helical, or servo-controlled, multi-channel audio recorder.



Four basic modes of operation are performed: **Cue/Preview** control of a single machine. **Sequential Edit** enabling the precise assembly of scenes on the record tape from the playback. **Insert Edit** of new material into a prerecorded tape. And a unique **A•B Roll** that eliminates the necessity of prerecording special playback tapes in proper sequence, thus saving a considerable amount of time and money.

Edit point entry is accomplished from three sources — keyboard, tape, or computer. And Vidicue's simplified controls and graphic simultaneous display of all edit points make editing easy and save time.

Want further information? Render unto Datatron your request for a detailed specification brochure today. Or call us directly. We'll gladly lend you our ears.

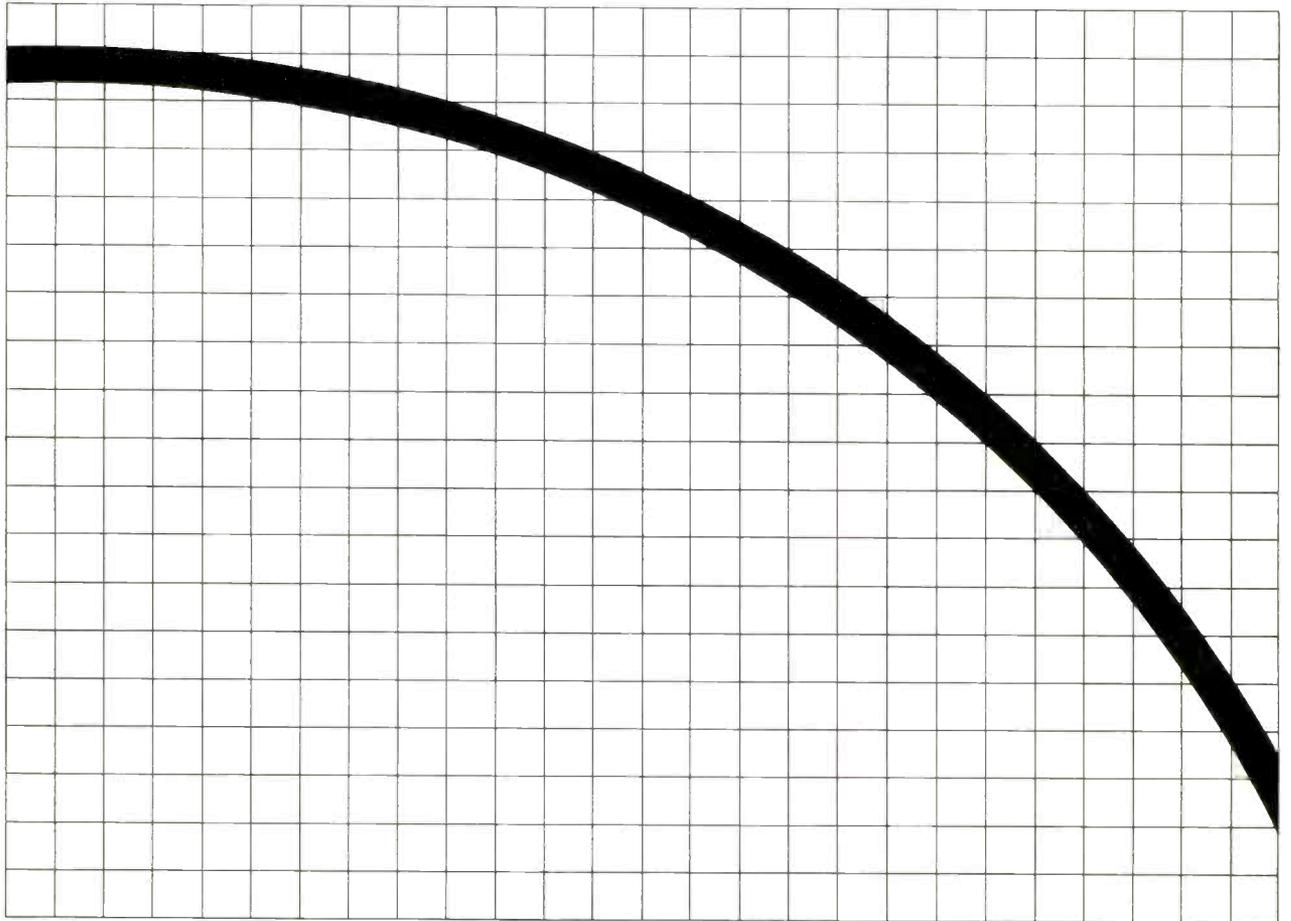
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Expanding Man's Capabilities With Data • Timing • Data Acquisition Systems • Microelectronic Testing • Broadcast Control

# Sylvania conquers the droop.



If you've been working with high-wattage incandescent lamps (the big, fat type), you know how fast their lumen output drops off.

You know how drastically their color temperature drops.

Now you can do something about it. Replace them with Sylvania tungsten-halogen lamps and get rid of the droop.

Tungsten-halogen lamps (they used to be called quartz-iodine) don't blacken with age, so light output and color temperature don't go into a slump. The color temperature of our lamps is stable for the life of the lamp. Compare this with a drop of about 40% for the fat incandescents.

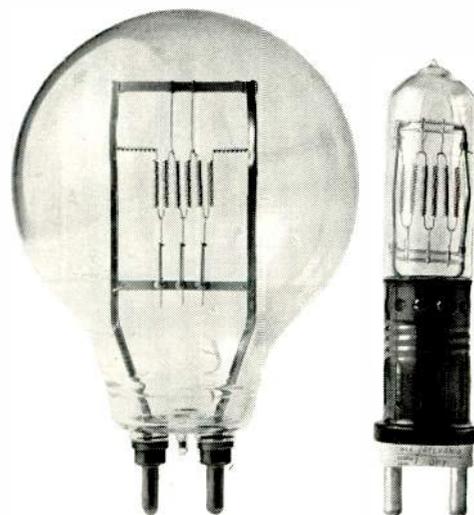
This means you don't have to bother with constant adjustments of studio lighting or camera settings. It means you can get constant color rendition on color film and save money on print correction.

And that isn't all.

Tungsten-halogen lamps have about twice the life of regular incandescents. They can actually outlast the fat ones 3-to-1 (considering that you may be forced to throw blackened lamps away before they've burned out).

And just compare the size of the lamps.

Instead of big, heavy glass balloons we give you slim lamps that are easy to store and handle. For one assignment (a TV special on the Taj Mahal) we were able to pack all the lamps needed into two hand-carried cases. It would have taken half a planeload of the old lamps.



fat incandescent

skinny tungsten-halogen

**The old lighting changeth, yielding place to the new.**

We've developed a whole line of tungsten-halogen lamps for movie and TV studios and theaters. Wattages: 200, 500, 750, 1000, 2000, 5000 and 10,000. You don't have to buy special fixtures; just plug them into the same ones you're using today.

Our lamps cost more, but they're worth more.

We can't say they never die, but they simply won't fade away.

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# ETV/ITV: A Progress Report

To make an impact on the quality of American education and American life is a yearning of every educational broadcaster. Success lies in giving up doing one's own thing—unless that thing is cooperation. Part I discusses ITV; Part II, PTV.

## Part I Make or Borrow in ITV?



THERE ARE HUNDREDS of research reports available proving that instructional television is as good as conventional classroom teaching. Rarely has it been found to be significantly better.

If a qualified classroom teacher isn't available, a TV teacher is a natural fill-in, but substitute teaching by TV occurs only at the college level. Presumably in

elementary and secondary schools, any teacher is better than a TV instructor.

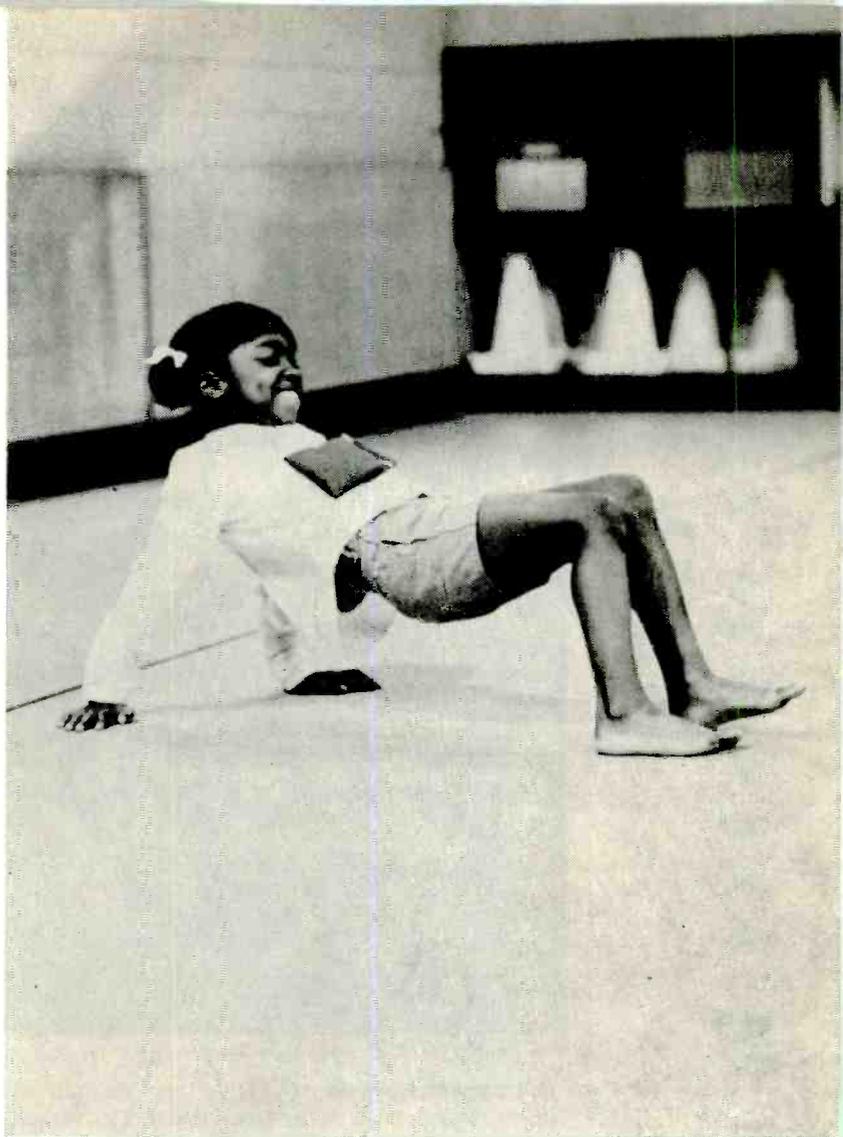
ITV is rarely used as a core component of the learning system; its chief use has to be classed supplemental or enrichment.

Even as an enrichment source, ITV hasn't really scored since the productions are often mediocre to bad. ITV in 1969 hasn't proven itself as a sure-fire medium for improving instructional effectiveness. It often just doesn't turn kids on.

### VTR is Effective Tool

ITV can be powerful though, as two recent uses involving video tape recorders demonstrate. With a VTR, teachers who try doing an ITV presentation can see how bad they really are while the kids can aim the camera at each other and discover themselves. In both cases, this experience is eye-opening. The event of self-discovery can lead to self-understanding and self-improvement. Father John Culkin of Fordham University sees portable VTR-camera equipment affording a new means of self-expression, the full value of which is just beginning to become clear.

As a tool for the professional to improve education, ITV has primarily shown up how poor or amateurish the professionals really are. Actually, many ITV productions are fascinating only to those who make them. At last year's NAEB, Dr. William Lybrand of the American University said that cottage-type productions have got to go. The product



Broad planning and joint efforts went into NIT's videotape program on elementary physical education which stresses basic movements. Concepts promise to reform curriculum.



## ETV=PTV+ITV=VTR (mostly)



Four Ampex VR-2000 video tape recorders at KCET, Los Angeles, are used for delayed playback of west coast NET shows.

**Educational television (ETV)** is now defined as being made up of public television (PTV) viewed in the home and formal instructional television (ITV) viewed in the classroom.

The video tape recorder is common to and synonymous with both. Some ITVs function without cameras and transmitters, but all installations use the VTR. Although there is now a nationwide interconnected system for ETV, the VTR still plays a vital role in delaying action so programs originating in the east all appear at identical local times.

PTV stations on the air in 1969 numbered 180. According to NAEB's Division of Educational Television Stations, 18 more will soon go on the air. Slightly more than half of the output

of these stations is beamed to the home; a little less than half is directed at schools. On the average, these stations broadcast 56 hours per week. School systems that were broadcasting on instructional channels only (2500 MHz, ITFS) numbered 150, filling 400 channels as of July. Ninety-four additional systems totalling 220 channels have been authorized.

During a week, at least 12- to 13-million home TV sets are tuned at least once to a PTV station. Some 2,963 elementary and secondary schools and 1,211 institutions of higher learning are equipped to receive TV according to the National Compendium of Televised Education, Vol. 15, with some 6,640,000 students viewing television for some part of their formal education.

of a local group most often isn't good, Dr. Lybrand charged. He saw the need for cooperative production among regional or state centers.

Trouble is most schools see themselves as unique; they think that they have special math or language problems because of the nature of their particular community. Maine's problems are presumed not to be the same as Mississippi's; hence, each school thinks it must do its own. This produces regional budget splitting, and far less money and effort goes into a TV lesson than a 30- or 60-second commercial spot. TV-reared children know this and are motivated to memorize advertising jingles rather than spelling rules or multiplication tables.

Fortunately for students, the trend is turning from "make" to "borrow" and those who survive on the make-and-lease end are those with a proven track record—such as the productions coming out

of the Denver school system, and available from the Great Plains library.

### Joint Effort at NIT

Most significant evidence of a joint-effort trend is the consortium cooperating with the National Instructional Television Center (NIT) at Bloomington, Indiana, to produce a TV series on early childhood development. This group includes individual stations, state education associates and a Canadian province.

The early childhood education project, which is now in production, came about after two years of assessing existing television efforts. A first step was to develop production guidelines.

The consortium, which numbers 13\* educational and television organizations, will provide financial

and advisory support for programming production. Never before has such a large unified effort been undertaken in school television in the United States. In the past, the practice has traditionally been one of overwhelming duplication of effort around the country as dozen of producers with minimum budgets all were doing pretty much the same thing.

Robert Fox, NIT's director of instructional development, who organized the consortium, says the group is highly important because "it provides adequate intellectual and production resources to capture the potential of television." Working alone, no group could accomplish as much.

### Early Childhood Development

The series is being developed around the most current educational concepts of early childhood development. Programs, called "encounters," will depict the actual conditions a child finds in his environment. The series is designed for use at the kindergarten and first-grade levels. NIT plans to distribute the series of 36 encounters to the nation's schools for use in the fall of 1970.

Chief content consultant for the series is Dr. Rose Mukerji, associate professor of early childhood education at Brooklyn College of the City University of New York. Continuing national consultants for the project are: Dr. Milton Akers, executive director of the National Association for the Education of Young Children; Dr. Elizabeth Ann Liddle, director of the Graduate Division, Wheelock College; and Mrs. Bertha Campbell of the Bureau of Child Development and Parent Education in the New York State Department of Education.

The childhood series will get national use because it was designed to meet the objectives of many educators. Ed Pfister of NIT says the main thrust of NIT for the past four years has been to develop just such quality productions. Broad usage will come partly since surveys show the national need for certain programs, and partly because of the high-quality production effort put into the programs.

For the 1969-70 school year, NIT has released its first series of tapes that are the result of broad research, expert planning and production. The series covers elementary physical education and promises to promote extensive curriculum reform in this area. It stresses basic movements, which are essential before attempting the more complex skills needed for athletics and dancing. In many schools, elementary physical education has not been much more than the usual morning exercise of jumping and clapping hands. The new series uses a superior on-camera teacher who provides an acceptable model for other teachers.

### Second Subject Series

Now underway is a series on art, music and social studies. The content for these was formulated

only after planning meetings which involved many experts on various subject areas from diverse schools.

The next subjects to be investigated will include elementary foreign languages, language arts, mathematics and science education.

MPATI, Inc., which evolved from the Midwest Program on Airborne Television Instruction, provides another example of a centralized production source. MPATI, located at Purdue University, designs and produces ITV materials for its members which come from the six states involved in the live airborne transmissions—Illinois, Indiana, Kentucky, Michigan, Nebraska and Ohio. MPATI also acts as a library and makes its tapes available to any school or ETV station. During 1968-69, over 90 ETV facilities in 31 states, including eight state networks, contracted to lease more than 290 tapes of some 31 courses.

New offerings for 1969-70, according to MPATI's Bill Fagan, include a series on art, composition, economics, music and typewriting. One of the largest video tape libraries is the Great Plains National Instructional TV Library. Although Great Plains has no production facilities, it has a three-shift duplication service and is very active in acquiring and distributing video tapes produced by the better independent school producers. Thus, Great Plains also is aiding and abetting a shift from do-it-yourself to use what's available. This last year some 42 series from Great Plains were broadcast on 103 ETV stations and 4 ITFS systems in 33 states. These represent about a 10 percent increase over the previous year.

Paul Schupbach of Great Plains doesn't believe that ITV will thrive with only a few national production centers. He sees instead a vital role being played by a number of school systems. Teacher talent will be found in schools, not national production centers, and no schools have a monopoly on the best TV teachers, according to Schupbach. Those larger school systems which have a strong background in producing interesting TV material will continue to do so, in Schupbach's opinion. **BM/E**

## Part II PTV Gets to the Public



THE CONSERVATIVE MOOD that has seemingly swept the country has cramped PTV. NAEB reports that a number of ETV stations have had to operate with less funding in 1969 than in previous years. Lack of funds curbs both equipment and program expenditures.

HEW currently has requests from 90 educational broadcasters asking for \$28-million in matching grants for equipment. Last year, only \$4.2-million was paid out. As of October 1, no funds have been appropriated for the 1970 fiscal year.

The Corporation for Public Broadcasting com-

\*Consortium members are: Educational Television Association of Metropolitan Cleveland, Ohio (WVIZ-TV); State of Florida Department of Education; Georgia Department of Education, ETV Services; Iowa Educational Network; Kentucky Educational Television Network; The Northern Virginia Educational Television Association; Educational Television Branch of the Ontario Department of Education (Canada); The Pennsylvania State University, licensee of WPSX-TV; WSBE-TV, Rhode Island State Board of Education; State of Tennessee, Department of Education; Vermont Educational Television Network; WETA School Television Service, Washington, D.C.; and NIT.

## Programs Distributed by ETS/PS



The world of skid row was probed by KVIE.



POT pourri: the Many Views of Marijuana, on KCET.



Drugs in the Tenderloin, produced by KQED.

The programs distributed by ETS/PS cover a myriad of subjects according to ETS' Karen Rosenberg. "Cancion de Raza" is a bilingual dramatic serial showing the day-to-day problems which Mexican-Americans living in the "barrio" of Los Angeles encounter in their search for a better life (KCET, Los Angeles). Maya Angelou serves as hostess on "Blacks, Blues, Black!"—a demonstration of the history, heritage, and habits of blacks and how black mores and values have been preserved and assimilated into our society (KQED, San Francisco). "Potpourri: The Many Views of Marijuana," gives the hard facts

—social and economic—of marijuana and its impact on contemporary society, along with satirical essays, a picture history of the use of the plant, and panel discussions (KCET, Los Angeles).

For all ages, how-to-do-it programs, such as "Folk Guitar," are offered covering beginning, intermediate, and advanced guitar playing plus beginning autoharp, banjo and recorder with Laura Weber. The "Folk Guitar" series is the ETS/PS all-time high; so far, 124 stations have booked this series (KQED, San Francisco). The viewer adventures into the mysteries of Chinese cooking on "Joyce Chen Cooks;" the inimitable Thalassa Cruso, the flower lady of Television, concentrates on different aspects of gardening and offers many tips for the would-be owner of a green thumb (WGBH, Boston).

"The Toy that Grew up," a nostalgic series of silent films shown in their entirety with informative commentary and authentic background music, is a favorite among the educational television stations (WTTW, Chicago). On a more modern slant, "Critique," a new series devoted to the presentation and critical analysis of contemporary works in the arts and humanities, is offered (WNBT, New York City). Among the many musical programs distributed by the Service is "North Indian Music," a concert on sitar by Nikhil Banerjee, part of a series on Indian Music produced by San Francisco's KQED. This year a special holiday program, "Circle of Lights," is being offered to the stations. Pete Seeger and his friends pay homage to the holiday season in a song fest (WGBH, Boston).

More than three-quarters of the stations capable of program production have submitted program proposals under one or more of the three program production projects sponsored by ETS/PS.

A 1966 Public Health Service contract administered by ETS/PS resulted in local station development of programs on the smoking and health problem. Anti-smoking announcements were produced by WGBH, Boston, and the Hawaii ETV Network has produced a program, "The Mark Waters Story," starring Richard Boone, which will be in ETS/PS distribution shortly.

An ETV Award Project for station production of new program ideas has been conducted annually since 1965 under a grant from the Reader's Digest Foundation. From these original ideas came such diverse programs as "Drugs in the Tenderloin," a hard-hitting documentary dealing with life in San Francisco's Tenderloin district which has become the ultimate refuge for drug users (KQED, San Francisco); "Comment," an original modern ballet based on reaction to form and space at the 1964 Pittsburgh International Exhibition of Contemporary Painting and Sculpture (WQED, Pittsburgh); and "The Marshes of 'Two' Street," an artistically done production dedicated to man's search for his own place and identity in the world—a probe of the world of skid row by talking with its inhabitants to expand an understanding of these people.

mitted its initial \$7-million to a variety of PTV projects in 1969. It is seeking \$20-million from Congress for next year. Should \$20-million be available, PTV will have a few more dollars with which to prove itself.

Contrary to the bent in ITV circles to cut the number of production sources, CPB's charter requires it to increase the number of centers that can produce programs for the public.

As a consequence, each PTV station got an outright grant of \$10,000 (not all of which was spent on programming). Further, some \$500,000 in grants was offered on a competitive basis to local stations for the best ideas for programs that could be produced locally but shown nationally. Some 13 stations won these grants (such as Ford's recent grant of \$750,000 for a Public Broadcast Service news venture). CPB funds plus Ford funds should help (although Ford's help may decline if foundations lose tax benefits). Many, however, feel PTV has a long way to go to make any real impact. Last year PTV spent about \$65 million compared to commercial TV's \$2.2 billion.

Prior to CPB's input, most of the PTV programs that got national distribution were produced by National Educational Television and its affiliates. NET was almost entirely dependent on Ford Foun-

dation Funds. CPB also granted \$100,000 to KQED, San Francisco, to establish the first National Center for Experiments in Television.

To bring the results of these inputs to a wider public, most PTV stations are now interconnected nationally two hours each evening and three hours on Wednesday evening—as a result of help from CPB, Ford Foundation and AT&T. Deciding what goes on the NET net calls for a major cooperative effort. NET administers the PTV net via an Interim Interconnection Committee made up of the cooperating stations and regional networks. Determining what programs preempt other programs by committee is a hairy business, as might be imagined. Those involved are quick to admit that there must be a better way.

It's a sad fact that not all stations can as yet count on an interconnection (a public TV event may be preempted by a higher priority telephone message). The hope is that current problems will be resolved by the end of the year.

### National Exchange Service

A cooperative program accompanied by less stress and strain is the ETS/Program Service. ETS/PS is the central agency for the national ex-

Youngsters discover themselves with Ampex portable VTR and camera at Aravelo's School, Huntington Beach, Calif.



## What is Videospace?

Coined by Brice Howard, Director of the National Center for Experiments in Television at KQED(TV) San Francisco, videospace is an esthetic television production technique.

Much of television production has its roots in movies, radio and the stage, because all early TV directors came from those three media. According to Howard, videospace is pure television, without following the conventions of movies, radio or the stage.

The first videospace production was scheduled to appear November 6, 1969, on NET Playhouse. The drama is entitled "Heimskringla!" or "The Stoned Angels," and concerns the discovery of North America by Leif Ericson. It was directed by Tom O'Horgan (producer of Broadway's "Hair") and performed by Ellen Stewart's La Mama Troupe of Greenwich Village.

Howard has worked for two years with artists to develop the techniques used in videospace. In most television, he says, you are concerned with what's happening in front of the lens. But what of the face of the camera tube, where light is converted to electron movement? Pure televi-

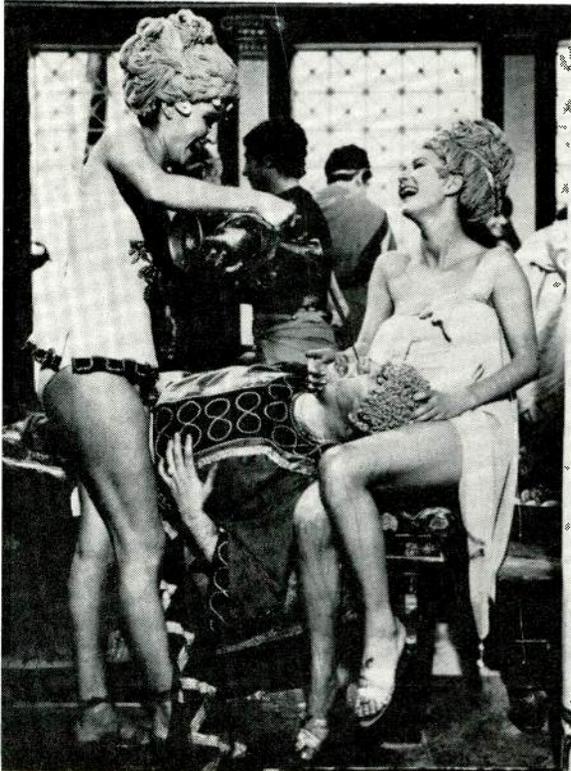
sion is two-dimensional, confined to a 4-to-3 rectangle. In videospace you accept that condition and work within it, rather than trying to mirror or copy the stage. Videospace is not photographic, Howard says; it is **videographic** and something like painting with electrons.

Specific technical examples include capping the lens of a studio color camera and rocking beam focus; turning off one or more of the color guns or shifting color phase artificially; using both fixed and variable time delays for certain areas of the picture and more conventional effects like Chromakey and supers. Sometimes a black-burst generator is deliberately punched up on air or mixed with other signals.

Sound plays a part in videospace, too, as the audio channel may or may not complement the picture. Howard calls the control room a "mixing center." He reports that the technicians are at first annoyed at doing things which go against their training, and must have patience to become accustomed to using videospace techniques. Often a sequence is not edited, but taped and aired in its entirety.

change of locally-produced PTV programs that don't get on the interconnected NET. ETS/PS is located on the Indiana University campus and is operated by the Indiana University Foundation in cooperation with the ETS division of NAEB. Its original funding came from the National Home Library Foundation and the W. W. Kellogg Foundation. It is now almost self-sustaining.

NET orgy—no violence, but plenty of corruption in recent production, "The History of Frivolity."



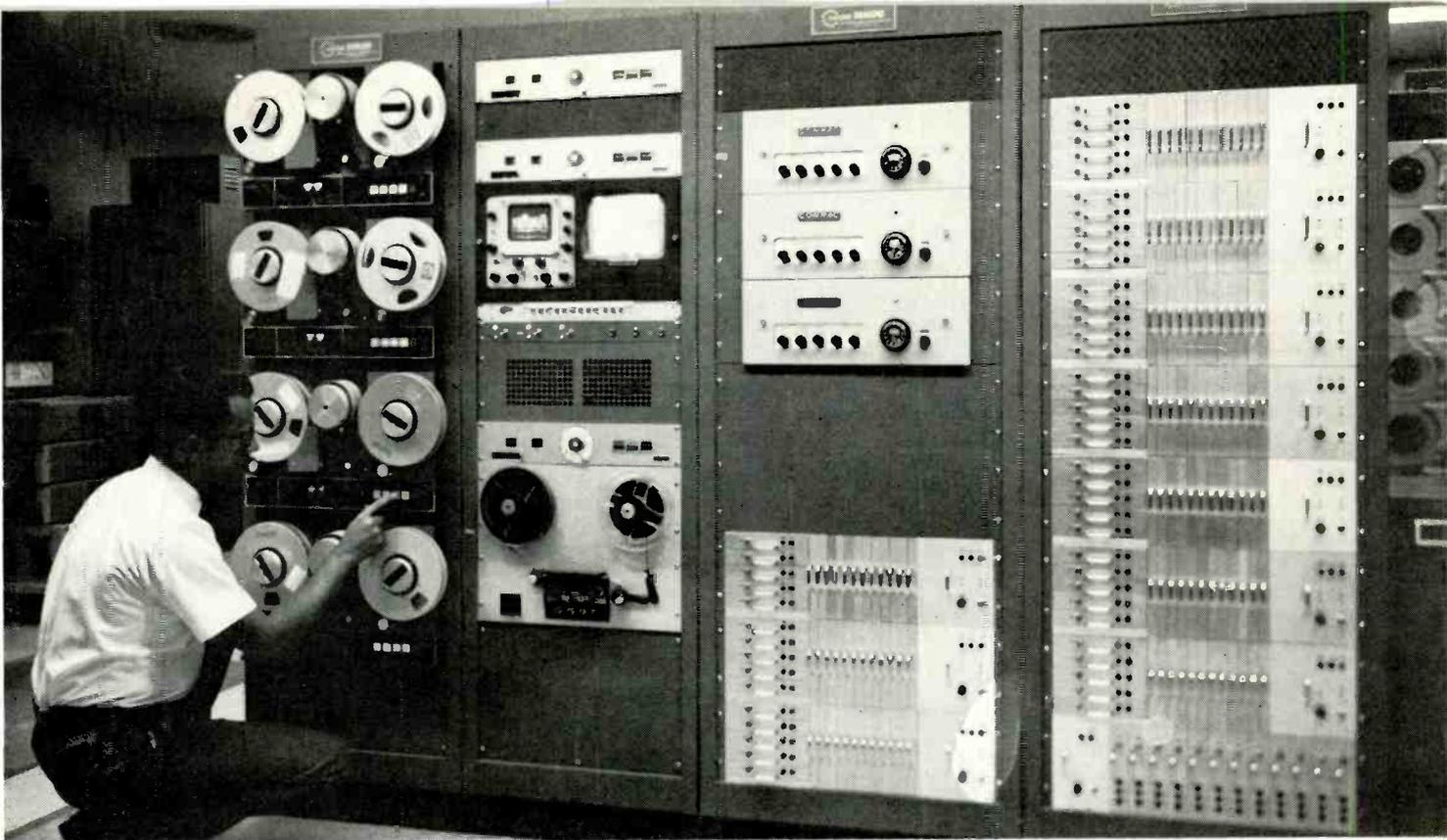
The ETS/PS Program Selection Committee, made up of program executives of major stations, screens possibilities several times a year and decides what will be available for distribution. Tape duplication is prepared by the Indiana University Radio-TV Service and distribution is handled by the Indiana University Audio-Visual Department.

The service is growing rapidly. During the past fiscal year, ETS/PS accepted 402 new programs for distribution. As of June 30, 1969, the service had 1130 programs available. The quantity and quality of locally produced programs has been increasing each year.

During the 1968-1969 fiscal year, 119 users—representing the 180 stations (including double-channel stations, entire state networks, etc.)—booked programs from ETS/PS. Each station used (on the average) 3.36 programs or just under two hours of programming per week.

Some of the most popular series have been put on the NET interconnection. Washington Week in Review and Book Beat are examples, although the former is now distributed directly by NET. Book Beat is distributed via the net but many stations tape it for delayed rebroadcast. A bimonthly Programming Report is prepared by ETS/PS to exchange ideas or innovate local production.

ETS/PS will, according to the organization's Robert Reed, undertake additional activities in the coming year. The Board of Directors changed the name of the service in late September to the National Public Television Program Library, and authorized stepped-up activities in national distribution. This includes acquiring programs from existing public television libraries including those overseas. The NPTPL will also undertake to serve as a stimulator by encouraging stations and regional programmers to prepare material for national distribution. The new NPTPL will strive to get pertinent timely programming on the interconnection NET. **BM/E**



Rack of IVC-800 VTRs are four of the 12 video sources available to South Florida U. students.

# Dial-a-Program Helps Studies

Several educational institutions are using massed information retrieval techniques for dial-access TV viewing by students. General acceptance and use by the student bodies involved seems high, and educators are looking forward to widespread use.



installed three bellwether dial-access video systems.

**University of South Florida.** Probably the largest and most sophisticated dial operation in the country is at the University of South Florida in Tampa. The university's learning lab is located in the College of Education building and has 130 carrel-type student positions. Each student position has access to 188 audio program sources. Fifty positions permit dial access to 12 video program sources.

Chester designed the initial system with four International Video Corporation IVC-800 video

tape recorders, two 16mm film chains and one slide chain. Live television is also available through the system.

Unusual in the dial-access audio system is a feature designed in cooperation with General Telephone that lets students hear the same 188 audio program sources at home. Using his home telephone, a student may dial a switchboard operator who connects him directly to a program source that starts playing the requested material. A missed lecture, a poetry reading, secretarial practice in shorthand or five different languages are just a few of the programs that can be monitored this way.

According to Dr. Gerhard Eichholz, Director of the Division of Educational Resources, "The Learning Lab is an unqualified success at the University of South Florida. Both students and faculty seem to grasp the potential of dial-access teaching immediately.

"Ours is probably one of the larger learning labs in existence and it's really just a start. I believe we will eventually have dial-access audio and video retrieval in every classroom and dormitory study location. I also feel that the day will come soon when students will both hear and view course material in their homes through present



Florida students use individual carrels, can dial program material wanted from 12 sources.

commercial telephone equipment," Eichholz added.

The Florida learning lab operates in conjunction with the university television station, WUSF-TV, and the radio station, WUSF-FM. In addition to purchased video tapes and films and tape prepared specifically for dial-access use, the complete WUSF-TV video tape library is available for use in the dial-access system. A video tape may be dubbed from the TV station's two-inch format to the IVC one-inch format and made available to students in less than a day. Radio programs are also available at the request of students and faculty.

SIDAC (Serial Identification Access Code) is an unusual control feature in the system that permits up to ten programs on a single one-hour video tape to be immediately dial-accessible. The equipment scans, locates and plays program material in less than 15 seconds. SIDAC was developed by Chester Electronics for use with IVC videotape recorders.

Eichholz estimates that 3000 to 4000 students per week will be exposed to the dial-access system during the next school year. Total enrollment at the university is 15,000. Program material ranges from the Columbia Broadcasting System's "Twenty-First Century" to English grammar and computer programming.

The University of South Florida's learning

lab is still in the development stage. By next March, students will have access to seven more video sources, including an additional IVC videotape recorder. Eichholz is now negotiating with General Telephone for experimental use of the university's Centrex system to allow students at home to dial directly to audio program material without going through a switchboard operator.

**Hinds Junior College.** Hinds Junior College in Raymond, Mississippi, is one of the few educational institutions in the country to make available internally produced color video tapes through its dial-access system.

Ewin Gaby, Director of the educational media lab, said, "In that the college science department is one of the most active users of our services, we feel that color has to be an important element in our dial-access video system. In addition, most students are oriented to color and it makes video tape a more effective communications tool."

Hinds currently has 10 video retrieval positions located in three campus buildings. Four video-equipped carrels and two large-screen TV receivers are in the library and there are two large lecture halls with color receivers in the fine arts building and other receivers in the science building.

Video sources are located in the library building which is connected to the fine arts and science

buildings via cable. Sources include three IVC-800C color videotape recorders, two 16mm film chains and one slide chain. One-third of the program material is on video tape produced by the college, one-third is on film purchased from outside sources and the remaining third is taken directly off the air.

As Hinds' video dial-access system is still under development, only four carrels are presently available for student use. However, the existing setup is substantially expanded through use of large-screen color receivers at the front of the carrel room. The audio portion of the program is transmitted to the student via earphones at his carrel. In the classroom, audio is transmitted by loudspeaker. Within the next few months, five positions will be installed in the academic building and eventually at least half of the classroom on campus will have access to the video retrieval system.

Hinds produces its color videotapes on campus using a Bell & Howell (IVC) convertible film chain/studio television camera. Program material is recorded on a master video-tape and then dubbed to an IVC format tape. The Hinds video dial-access system was also designed and engineered by Chester Electronics.

Says Gaby, "We used an unusual approach in developing our system. We didn't start by purchasing equipment and molding the system to it. Instead, we asked our instructors what course learning objectives they considered important and what types of learning experiences they felt were necessary to achieve the objectives. From these reactions, we specified equipment best suited to implement these experiences. The result is that the faculty makes maximum use of our services and we're always busy."

**Eastern Montana College.** Eastern Montana College's Remote Access-Instructional Learning System (RAILS) is in operation for the first time this year. Initially it includes 60 positions (10 video) and 66 program sources (10 video).

The positions include study carrels, study rooms, offices and classrooms. Video reception is accomplished by both monitors and video projectors. Audio program sources include audio tape decks, off-air a-m and fm tuners, record players and live microphones. Video sources include two monochrome IVC-800 videotape recorders, one slide chain and one film chain. The system also provides off-the-air television, cable television, live inputs and other sources.

Doug Nixon, college audio-visual director, said, "We designed our system for maximum expandability, in that we expect it to be used as a teaching aid for just about every course offered at Eastern Montana College. Of our 3,800 students, we anticipate 20 to 25 percent will have exposure to dial-access video in the first year. In our second year of operation, we expect the percentage to jump to 60 to 70 percent. Provision has also been made for future inclusion of computer-assisted instruction." **BM/E**



Bank of 188 audio recorders provide multitude of telephone-retrievable programs.

Switchboard handles outside calls for audio dial-access programs in Florida.





Operators monitor SURGE program that originates live in classroom for taping on 18 Ampex 5100 helical VTRs.

## Colorado's SURGE into ETV

**ETV has connected both on and off campus at Colorado State University. It's being cabled into 33 classrooms for about 10,000 students taking more than 80 courses via television. And thanks to the engineering college dean's brainstorming, it's started stopping up gaps between university, junior college and industry curricula with video tape—for one-tenth the cost of live CCTV programs.**



video tape for technical people working in industry more than 60 miles away from the CSU campus. Known as SURGE (State University Research in Graduate Education), the plan has established a mutually beneficial liaison between the two unlike communities, and has recently inspired the university's second off-campus venture in ETV, called CO-TIE (Cooperation via Televised Instruction in Education). But this time, the academicians are using video tape to close an educational gap between the like-but-separate

COLORADO STATE University got into educational television officially in April, 1965, with two video taped courses. Things didn't really take off, however, until the next year, when Dr. Lionel V. Baldwin, dean of the College of Engineering, started brainstorming a graduate program via

communities of the junior college and the university.

### SURGE

When SURGE started with the help of a \$26,800 National Science Foundation grant in the fall of '67, 198 students from seven companies enrolled in four courses. Students were attracted from the community of about 9500 technicians that had been massing since 1960 on the eastern slopes of the Rockies in metropolitan Denver. Students represented firms like Hewlett-Packard, IBM, Eastman Kodak and Monsanto, which had relocated in the area. Last year, nearly 1000 students enrolled in 130 sections of 40 courses at 14 different locations in Colorado; about 100 of them are planning to complete the SURGE program and obtain their M.S. degrees in atmospheric science, civil, electrical, industrial and mechanical engineering. Many students are just interested in the program's courses in business, psychology and physics, for which regular university credit is offered. Most participating companies are said to



Students watch monitors while professor changes slide in overhead camera and VTRs hum next door.

pay course charges (the same as on campus—\$11 per credit hour) for students as long as they maintain an average of C or better. Using video tape cuts company costs to one-tenth of live CCTV program charges.

SURGE programs originate live in CSU classrooms and are hand-carried every night at 7 from the campus to industry plants ranging from Colorado Springs to Cheyenne, Wyoming. Communication among professors and off-campus students is effected either through special telephone hook-ups at scheduled times, occasional visits by instructors to SURGE sites, or most frequently by couriers, who also deliver exams, quizzes and the same supplementary lecture material that students receive on campus. Off-campus locations usually use tapes two days after receipt. At the university, the tapes are usually erased and reused—no “canned” tape libraries are kept.

With SURGE an apparent success, the engineering college again took the lead in a second ETV project in fall, 1968. Dubbed CO-TIE,

the program is a collaboration between CSU and six junior colleges that CSU started by delivering one video tape of a sophomore electrical engineering class each academic quarter. The joint goal is to strengthen preengineering courses and to help alleviate in junior colleges the shortage of teachers qualified to prepare students for upperclass programs they would find at a full-fledged university. Participating junior colleges include at this time: Mesa, Otero Junior College, Arapahoe Junior College, Trinidad State Junior College, Fort Lewis College and Northeastern Junior College at Colorado. Spokesmen say that it's too early to generalize CO-TIE results.

Responsible for coordinating TV production at the university is the office of educational media, located in a new, \$2.8 million, pie-shaped social sciences building with room for 2500 students. According to Preston Davis, director of the communications nerve center, ETV exists at CSU more for professors than students; at least it isn't used merely to handle large numbers of students



In plant classrooms like this one at Hewlett-Packard, Loveland, playback difficulties have been less than 0.05 percent.

### CSU Scores Again

Colorado State University has added a new dimension to its work in ETV. In early October, Dr. Lionel Baldwin, the engineering dean who pioneered CSU work with video tape education on and off campus, and Dr. Donald Dobler, dean of business, proposed a plan that could lead the university into live ETV experimentation. The deans suggested that the university and Colorado industry form a nonprofit corporation called SCORE—State of Colorado Organization for Renewal Education—to provide regular CSU undergraduate and graduate courses throughout the state via microwave or cable.

SCORE would make factory and technician training at the job site feasible and credit and noncredit courses transmitted live or by video tape at either end of the system more than possible, according to Dr. Baldwin. "The possibilities are truly staggering," he said.

"The possibility of live broadcast makes this proposal more ambitious from an investment standpoint than the SURGE program," said Raymond Demere Jr., general manager of Hewlett-Packard's Loveland division. The company was among the first major Colorado industries to receive a review copy of the 40-page proposal.

at once. "Our goal is to improve the quality of instruction and the efficiency of the staff at the university," he says. For its on-campus work in ETV, the university has used over 4200 feet of rf cable so that 12 different programs can be seen simultaneously in 33 classrooms; 14 additional video channels provide more distribution to the 11 learning center classrooms and three remote locations. The university works in volume now because about 10,000 students are enrolled in more than 80 courses run by television.

Two classrooms on the second and third floors are equipped for cabling lectures to campus classrooms. Completely in charge, the professor can manipulate three Norelco cameras—one overhead for showing transparencies or other visual aids, one at the front for viewing students and one at the rear for following the professor. The class views the visual aid on two monitors and asks questions into microphones at each desk. Actual recording is monitored in the basement's teleproduction center, where three Ampex VR-1100s and 18 Ampex VR-5100s record the session for future dubbing. A room adjacent to the two studios contains 52 Ampex broadcast and closed circuit video tape recorders to record and reproduce tapes for SURGE and CO-TIE. In a 10-week period last year the off-campus programs accounted for the production of 2850 tapes.

Besides cabling and videotaping lectures for campus and off-campus programs, the media department has also used its facilities for private educational use. Hewlett-Packard, for instance, recently underwrote the cost of a videotape entitled, "Low-Frequency Network Analysis."

The university kept the future in mind when it designed the classroom studios—each camera in its film chain can be used for remote assignments where TV programs are transmitted by microwave to one of the VR-1100s. Besides hopes for remote assignments by microwave and a video van in the future, the university expects to convert the recording to EIA instead of random scanning and to provide each classroom with a split screen generator. Also targeted are a Ph.D. program and two more studios.

Like most ETV ventures, the future of this university's programs depends on money; now that the National Science Foundation grant is up, programs are financed from general funds and student tuition. The only sure thing for the coming year is renewed support for SURGE from last year's participating industries. Hewlett-Packard recently sent CSU a grant for SURGE as an indication of its enthusiasm for the program. Since HP's Loveland division is only 13 miles away from CSU's Fort Collins campus and since the company offers its own M.B.A. program, Hewlett-Packard isn't renewing SURGE for convenience and low-cost features only. Management has been pleased with the program enough to hope SURGE becomes a statewide program. First step in that direction may be a like program started early this year with a Hewlett-Packard grant to Colorado University in Boulder, Colorado. **BM/E**



**CONRAC**  
**Broadcast Television Equipment**

## OFF-AIR RECEIVERS



**AUDIO-VIDEO RECEIVER**  
Model AV12E/AV82E

Designed for off-air monitoring, video recording, or re-broadcast applications, Conrac's AV12E and AV82E supply composite video and separate audio from modulated RF signals. Available for crystal controlled single channel VHF, 12-channel selection VHF, or VHF/UHF operation. Furnished in rack hanger for mounting in standard 19" rack, 7" high, 12-1/16" deep.



**8-INCH DISPLAYS**  
CNB8 Series

The CNB series 8-inch television displays are high performance, broadcast quality units designed for continuous duty operation in broadcast, industrial and computer generated signal applications. The CNB8's are available in a portable carrying case, dual rack-mount and chassis models. Rack mounts fit standard 19" racks, using only 10-1/2" of vertical space, with a variety of front panels permitting installation of other equipment.



**14-INCH DISPLAYS**  
Models CKD14, CLD14

Conrac's CKD and CLD 14-inch displays are designed for continuous operation, with minimum maintenance, in broadcast studio, industrial and computer generated signal applications. 10mHz video response and total power regulation assures an extremely stable display. CKD14 is in a portable cabinet, CLD14 is a rack mount unit, taking up only 10-1/2" of vertical rack space.



**17- & 23-INCH DISPLAYS**  
CVB17, CVB23 Series

The CVB series are 17- and 23-inch industrial displays with 10mHz video response, total power regulation, differential input to minimize hum on long cables. 17-inch models are available in chassis, cabinet or rack mount (19" rack, 17" high, 18" deep) models; 23-inch in cabinet, ceiling or pedestal mounts, ideal for audience and classroom viewing, public information displays.



**25-INCH DISPLAY**  
Model CEA25

A large screen unit for audience viewing and public information displays, the CEA25 is a monochrome industrial display designed to give professional quality pictures in high ambient light areas. 10mHz video response, total power regulation, differential input to minimize hum on long cables, bonded and etched safety shield to minimize specular reflections, locking trapdoor to prevent tampering with operating controls. A compact unit for use where cabinet styling and picture stability are important.

Shown: Model CEA25/Y with speaker and pedestal mount.

## ACCESSORIES

**Speaker Enclosures:** 3" x 14" extended range speakers for field mounting to 23" and 25" displays.

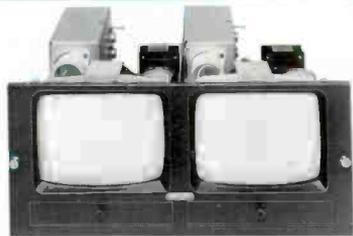
**Pedestal Mounts:** Permit installation of monitors to a permanent mounted base or portable base, for mounting 17", 19", 21", 23", 25" displays.

**Ceiling Mounts:** For suspending monitors with standard 1 1/2" pipe, for mounting 17", 19", 21", 23" displays.

**Rack Slides:** Generally available for any unit that will physically fit within a standard 19" rack.

**Dolly:** Three-wheel dolly, used in conjunction with pedestal mounts.

**GENERAL  
PURPOSE  
DISPLAYS  
SOLID STATE**



**9-INCH DISPLAY  
RND9 SERIES**



**14-INCH DISPLAY  
Models RKC14, RLC14**



**17- & 23-INCH DISPLAYS  
Models RVC17, RVC23**

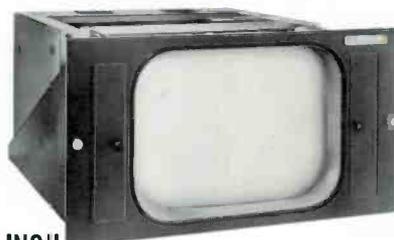
A high performance, solid state monochrome display, the RND9 features high reliability, low power drain, small size and minimum heat, with 10MHz video response, total power regulation, designed for continuous duty with broadcast, industrial or computer generated signals. RND9 series includes chassis, portable cabinet, rack mount and dual rack mount (19" rack, 8-3/4" high, 15-1/16" deep) models.

The solid state monochrome Conrac RKC and RLC 14-inch displays have high reliability, low power drain, 10MHz video response, total power regulation, a 70-degree tube to assure accurate picture geometry. The RKC14 is a portable cabinet model; the RLC14 is a rack mount unit using 10-1/2" of vertical rack space, 17-3/8" deep (can mount in any console designed to accommodate a CLD14 since all dimensions are identical).

Solid state monochrome RVC displays offer high reliability, low power drain, 10MHz video response, total power regulation, differential input to minimize hum on long cables, horizontal switch to select normal or fast AFC. RVC17 uses a standard clear laminated safety shield; RVC23 uses an etched laminated safety shield to minimize specular reflections, and a locking trapdoor to prevent tampering with controls. Chassis, cabinet and rack mount models are available.

Shown: Model RVC23/Y with speaker and ceiling mount.

**PROFESSIONAL  
MONITORS  
PULSE CROSS  
& PARTIAL  
SOLID STATE**



**8, 14 INCH  
Models CZB8, CZB14**



**405,  
525, 625,  
819 LINES—  
CCIR, NTSC STANDARDS  
CUJ14 Series**

A professional monochrome monitor, the CZB offers the broadcast engineer a dependable performance-stabilized picture with test instrument features. Solid state and vacuum circuitry, picture comparison capability with dual matched inputs, horizontal delay and pulse-cross displays for sync pulse analysis, 8- or 14-inch tubes in chassis, cabinet or rack mount models to fit standard 19" racks.

A 14-inch video monitor designed especially for use as a master monitor in facilities concerned with international television service. Relay switching is provided to enable operation on 525/60, 625/50, 819/50 or 405/50 scanning standards. It has fully regulated power supplies and will operate satisfactorily in areas having extremely poor power line regulation. Provision is made for horizontal delay and pulse-cross delay.

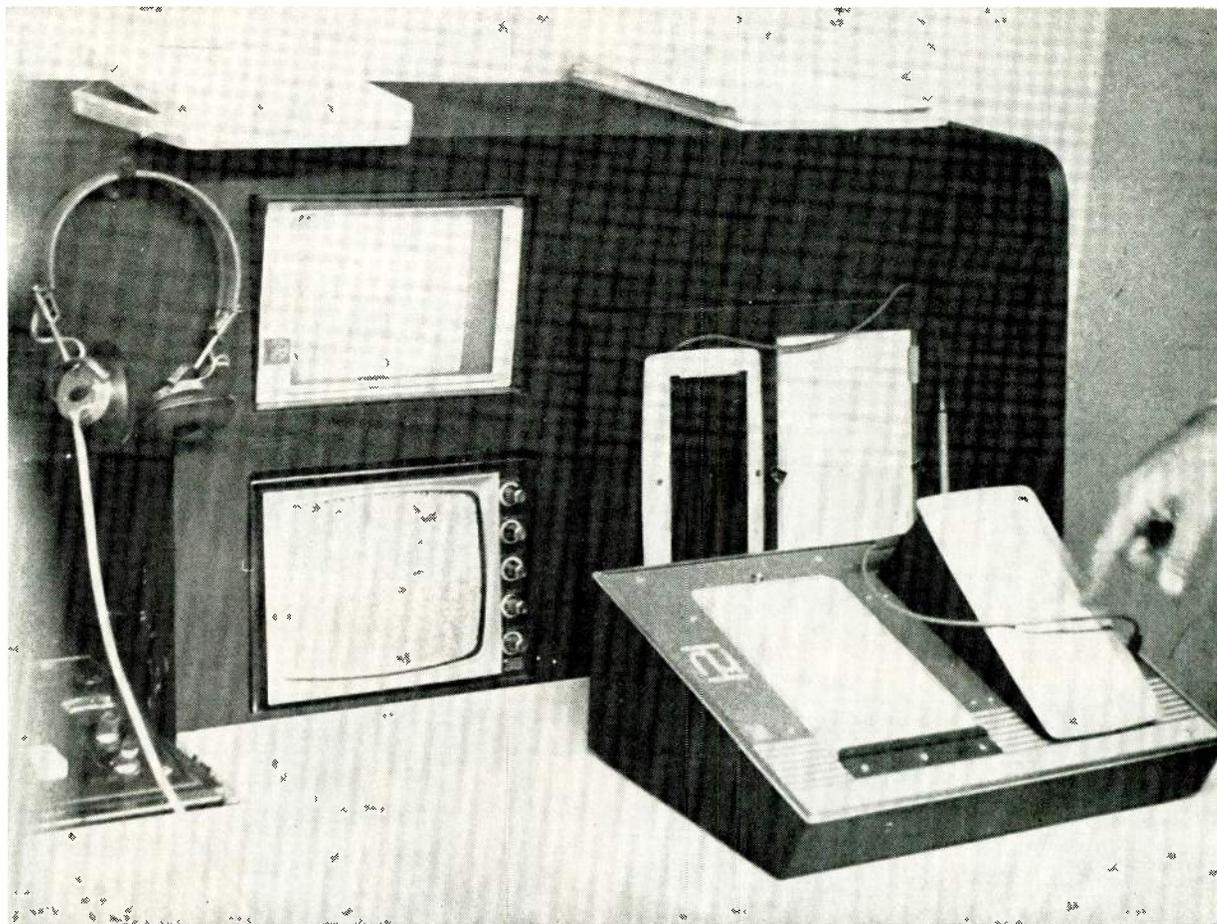
**CONRAC II  
SOLID STATE  
DISPLAY**



**9-INCH MONOCHROME  
Model KNB9**

A 100% solid state, 9-inch display ideal for both industrial and educational applications, the KNB9 series includes chassis, cabinet, rack mount and dual rack mount models. Dual mount models fit side by side in a standard 19" rack, 8-3/4" high, 8-15/16" deep. Video response 3dB down at 8MHz; low voltage regulation; 600 line center, 400 line corner resolution; high quality design and construction throughout, including glass-epoxy circuit boards with quick disconnects.

*A complete specification sheet is available for each product.*



Computerized physics course is structured for individualized learning. Carrel has TV monitor, slide projector and responder.

ual study. Because of the need for instant and continual evaluation of student progress and constant revision of instructional methods to suit the individual student, a computer is used. The Navy project is thus labeled a computer-managed instruction (CMI) program. (The "M" could stand for *mediated*, since the physics course at Annapolis could be said to be computer-mediated instruction.)

Although the course designers began with a set of personal preferences or biases as to what were likely to be the best methods of teaching, the program is being managed to show up original assumptions as either sound or faulty.

ITV was never considered to be a panacea. Stanley Schwartz, head of NYIT's Learning Material Resource Center, views TV as doing one of two things: reaching a mass of students where there are too few top-flight instructors; substituting for single-concept film loops during media evaluation. Schwartz says the first function is never quite as good as a live lecture since the TV lecturer gets no immediate feedback as to reaction or responsiveness of the audience. On the other hand, the latter function of using TV as a single-concept input is generally superior to the use of film loops because of the flexibility and low cost of producing video tapes. Video tapes are relatively easy to modify and Schwartz feels a video tape version of a single concept is

about 1/10th the cost of a film version. Until such time as the exact content and presentation of the single concept is validated as optimum, video tape is an ideal storage medium.

If one suggests to Schwartz that a well-rehearsed and pre-tested TV presentation might be superior to a live lecture even with feedback, he might agree, but he thinks in any event the all-lecture method is not optimum and that the proper use of TV will relegate it to be used only for special demonstrations of single concepts.

Schwartz reports no final evaluation of TV is in yet for the Annapolis project, but early tests indicate that the use of live or taped motion or action is not as important as assumed—at least not for the learning objectives defined by the physics course in question.

The same evidence that seems to prove that TV is not as hot as might be expected also puts down other audio-visual media. In short, in comparing TV or film-strip against a talking book (audio with printed illustrations), or against an illustrated book (printed text opposite a printed illustration), or against a live lecture in getting across pre-established concepts, no one method has a clear advantage *on the average*. On the other hand, the Annapolis project, and other experiments at NYIT, have determined that certain individual students are helped more by one type of presentation than others. That is, there

are apparently verbally-oriented students and print-oriented students, and each is more sensitive to one media or the other. The computer has identified each student and hence can prescribe the optimum medium for each individual student.

In short, instructional television plays an important role, but is definitely limited in teaching physics at Annapolis.

### Individual Tape Viewing

Notwithstanding TV's limitations, some 24 single-concept video tapes have been prepared and it can be asserted that this use of TV is optimum for at least some students. Those videotape presentations, incidentally, are viewed by students at an individual study carrel. Crucial to the evaluation of video tape, slide presentation, text, etc., is the student response system used by NYIT to test student progress. This response system, however, more than helps evaluate a study unit and such media evaluation is only a part of the process.

A very important purpose of the response system is to reinforce learning and to involve the student in the learning situation actively and deliberately. The reinforcement comes about by directing the student to react to a small amount of instruction that he has just received. The reaction is usually obtained by getting the student to register a decision to a multiple-choice selection. The decision is registered by one of two methods—either by punching a card or filling in a box with a colored chemical pencil. In the former situation, depending on which hole is punched, a circuit is completed and a page number lights up directing the student to turn to that page in the programmed text. If the colored chemical pencil is used, the box checked develops a latent image of the page number to which the student turns.

If the student gives a correct answer to the question, the page to which he is directed tells him he is right (reinforcement) and presents him with the next unit of instruction. If the student gives a wrong response, the page to which he is referred informs him that he's wrong and analyzes his error. Educators will recognize this method of teaching to be programmed instruction as developed by behavioral scientists.

### Adaptive Instruction

The form of programming is adaptive or branched, meaning the level of instruction is adapted to the student's need. Students having difficulty understanding a concept or problem are branched to more elementary explanations.

A video tape presentation may be called for in one of the branching sequences to help clear up a confusing point. After the viewing, the student will again be asked questions via the student responsive answer system. If he now grasps the explanation, he will continue to be branched to concepts, he will move forward. If he needs more

more fundamental material until the subject is understood.

The punched cards (or color-in boxes) that carry a record of the student responses are collected and evaluated at the end of the day by the computer. The computer thus keeps track of the progress of the student, but it is also spewing out information on classifying students who missed specific units of instruction. If nearly everyone missed the point being made, then the instruction unit is bad and has to be reworked. When only certain students missed, the computer can correlate this fact within the student's background such as his SAT score, I.Q., previous course grades, aptitudes and attitudes. It is from this analysis that the course designers conclude that some students are more audio-visual oriented and others print-oriented. As a consequence, ideal guidance can be given to the student.

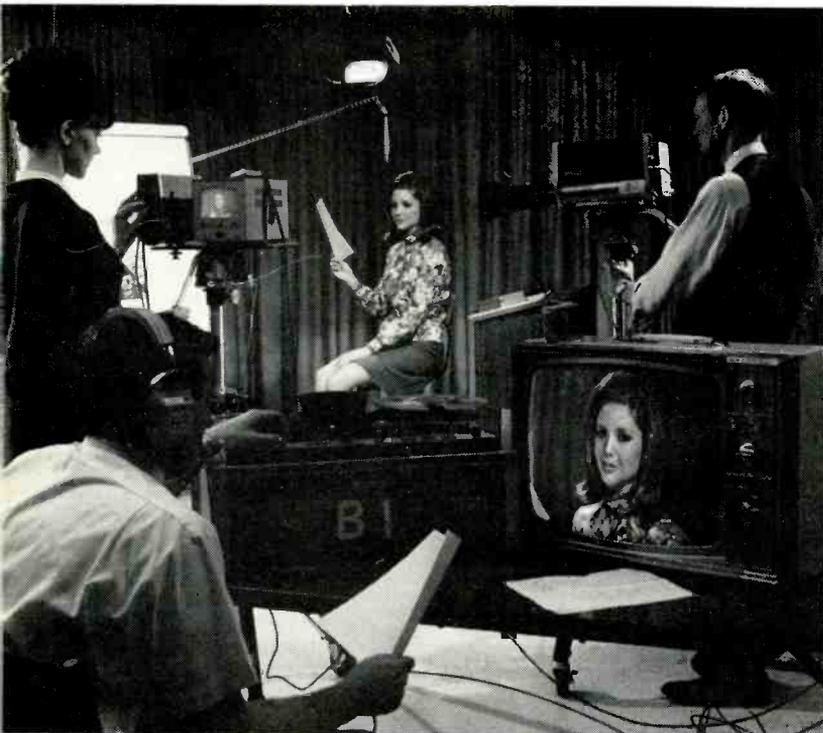
By digesting a mass of such inputs and by sophisticated matrix analysis, the NYIT evaluator can determine early in the game whether or not a teaching unit is effective—there is no need to wait until a course has run to completion.

Schwartz describes the process as an automated adaptive feedback system. The computer outputs reveal individual performance, group performance and course performance. Obviously, the end result of the computer-managed course is to get a high percentage of students to achieve a high grade. Any normal distribution curve of students versus grades should be peaked and shifted far to the right with CMI.

The Annapolis project, although geared to individual study, does have a number of constraints. Students can't spend more than nine hours a week on physics; they have to do lab work at a scheduled time; they have to pass the standard physics test. Periodically, the students have to assemble into a classroom for interaction between themselves and a live instructor. (Incidentally, the effectiveness of the live instructor during these sessions is also evaluated; some such sessions have been found to contribute less to student progress than equivalent time spent with other media.)

Some 300 students are going through the computer-managed courses. An equivalent number is taking the conventional course and thus serves as a control. Every member of the physics staff is involved either as a proctor or a remedial tutor or both. As a consequence of this involvement, the staff is both the evaluator and the evaluated.

Despite the constraints, and notwithstanding the fact that the final evaluation of the program has not yet been fully measured against conventional instruction (this will happen in January, 1970), the process has proven to be operationally and economically feasible. Improvement of instructional strategy is possible through the rapid feedback of hard data to a computer and learning of individual students has been improved. Optimization of instruction strategies is possible—and occasionally ITV has to take its lumps. **BM/E**



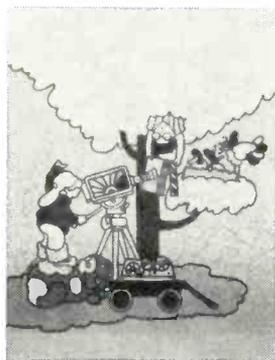
Workshop class at Ampex Video Institute produces a video tape at a practice session.



Camera control and switching are taught as part of some courses at several schools.

# Learn CCTV Operation and Maintenance

Everywhere you look, nonbroadcast video systems are used—in schools, hospitals and advertising agencies. Lots of neophytes have to learn how to use and take care of this CCTV gear. Here are some places to learn.



WHO OPERATES and maintains the many CCTV origination systems used today in education, CATV, business and medicine? When a school is outfitted with cameras and VTRs, how do teachers and assistants learn to run the system? Sometimes technically knowledgeable people are hired,

but more often existing personnel must learn video production and even servicing. There are generally three ways to do so:

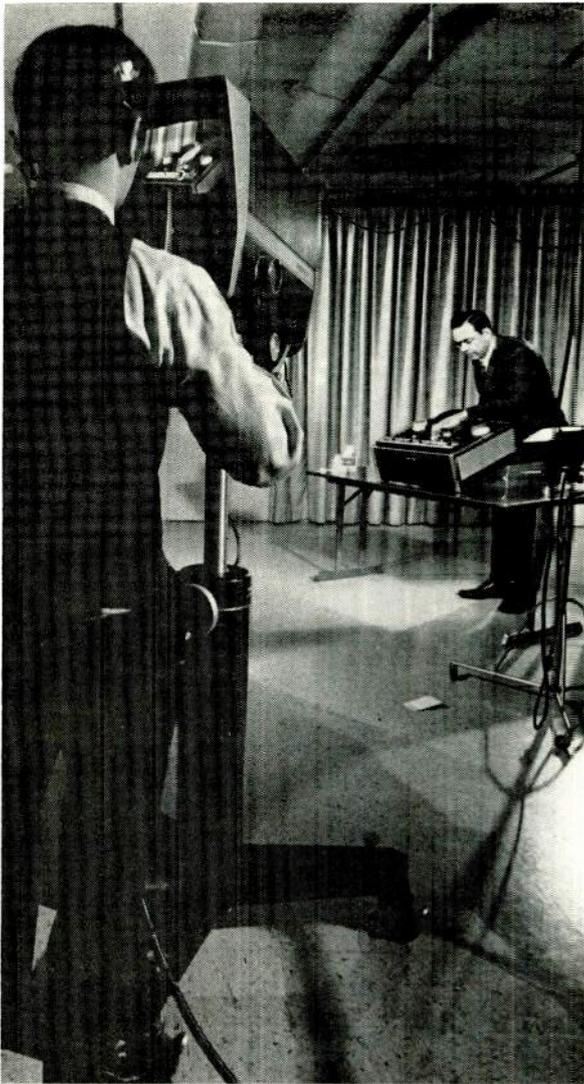
- The students go to a video school, staying at a nearby motel and attending all-day classes for a few days or a couple of weeks.
- A video school goes to several major regional cities in turn, and the students gather at these points, staying at nearby motels and attending all-day classes for a few days or a couple of weeks.
- A video school sends an instructional video tape to the students.

A video production course requires no previous training or experience—only the need to know. The course usually begins with a simplified explanation of how a television system operates. Next the students are introduced to and operate cameras, switching and mixing consoles, microphones and audio mixers, lighting equipment and perhaps some color gear. They also learn visual effects, graphics and tape editing. Working as a team (and often changing roles), the students produce one or more video tapes to demonstrate their grasp of production techniques.

CCTV maintenance courses, by contrast, are designed for people with general electronics or television receiver servicing experience. Students learn to align and troubleshoot vidicon cameras, helical VTRs and associated equipment. Often there are basic, intermediate and advanced courses.

## Schools Are Far-Flung

Advanced Communication Techniques Seminars, 37 Franklin St., Westport, Conn. 06880 (ACTS) conducts a yearly program of traveling



Student learns camera operation at the Ampex school, as on-camera instructor demonstrates operation of a helical VTR.

seminars in video production techniques. Each course lasts three days and is limited to 48 students. Tuition is \$375 and includes all course materials and daily lunches. ACTS uses cameras, VTRs and related video/audio/lighting equipment from some 22 manufacturers, to broaden students' operational knowledge. The 1970 program begins in January and includes sessions in or near New York City, Chicago, Washington, D.C., Dallas and San Francisco. A two-week resident course is planned for the school's Westport location early next year.

Ampex Video Institute, 2201 Estes Ave., Elk Grove Village, Ill. 60007 (AVI) is a resident school, with courses in both video production and CCTV maintenance. Basic and advanced production courses are offered, each running five days and each is limited to 20 students. Tuition is \$350 and includes all course materials and daily lunches. Several servicing courses are offered. Basic course ST-1 covers the Ampex VR-5000 and VR-7000 series of VTRs, cameras and accessories; it lasts five days, is limited to 12 students, and costs \$175. Advanced course ST-2 deals with the VR-7500

and VR-7500C VTRs, color correctors and switcher/faders. ST-2 is a three-day course, limited to ten students and costs \$125. Advanced course ST-3 covers the VR-7800 recorder, lasts two weeks, is limited to ten students and costs \$300.

Bell & Howell Video Center, 7235 No. Linder Ave., Skokie, Ill. 60076, a resident school, conducts five-day courses priced at \$275 (which includes all course materials and daily lunches). Classes are offered in both production and maintenance of CCTV cameras, VTRs and associated equipment. There are basic and advanced production sessions. Separate maintenance courses cover black-and-white and color cameras, one-inch and half-inch VTRs and camera/recorder combinations.

Educational Broadcasting Institutes, National Association of Educational Broadcasters, 1346 Connecticut Ave. NW, Washington, D.C. 20036 (NAEB) has scheduled a 30-hour, one-time session on operation and maintenance of helical VTRs. It will be held January 25-28, 1970, at the Sir Walter Raleigh Hotel, Raleigh, N.C. No previous training or experience is necessary except for elementary knowledge of television in general.

Reeves/Actron Corp., 565 Fifth Ave., New York, N.Y. 10017 currently offers a one-day workshop at its Manhattan location—an introduction to TV production limited to ten persons. The company plans additional courses on CCTV operation and maintenance in the near future.

Sony Tape Production Center, 165 Tuckahoe Road, Yonkers, N.Y. 10710, does not conduct classes, but furnishes many instructional video tapes covering production, operation, application and maintenance of its video equipment. These tapes are available at dealers and distributors of Sony video gear. The company plans to start resident workshops at its suburban New York location in the spring of 1970.

TeleMation, Inc., 2275 SW Temple, Salt Lake City, Utah 84115, between now and June 1970, will conduct three regional CCTV workshop seminars. Each will last three days, is limited to 35 persons, and costs \$50. The course covers basic production and fundamental maintenance. The first seminar will be held in Titusville, Fla. When TeleMation's new Salt Lake City plant is completed in the spring of 1970, the company will offer regular video production courses—both elementary and advanced—on a monthly basis.

#### Other Instruction

In addition to the intensive short courses offered by these organizations, many colleges and universities provide video and CCTV production instruction. Most courses are given an hour or two once or twice a week for a period of several months. Many sessions are held at night.

Also, some video and CCTV equipment dealers and distributors conduct occasional seminars which teach video and CCTV operation and servicing. **BM/E**



Mentally retarded children in Ft. Wayne, Indiana's Johnny Appleseed School participate in videotaped recreation period.

# Planning the ITFS System

**For efficient and economical operation of an ITFS system, proper planning is a must. Learn how to avoid interference when channels are shared by heterodyne repeaters.**

By Allen Pawlowski



PROPER ENGINEERING of Instructional Television Fixed Service (ITFS) systems, which depend upon heterodyne repeaters, involves some out-of-the-ordinary considerations. Conservation of precious channels is a foremost consideration with savings on installation costs as a side effect.

This objective can be achieved by carefully planning a 2500-MHz ITFS system to avoid or minimize co-channel interference.

**Allen Pawlowski** is a senior systems engineer with Jerrold Electronics Corporation.

- Such planning can include:
- Selective siting of transmitters to minimize potential co-channel problems.
  - Cross-polarized radiation patterns between channel-sharing areas.
  - Antennas on high ground for added co-channel protection.
  - Minimum-height transmitting antennas which are adequate for effective local coverage.
  - Minimum-height receiving antennas which are adequate for reliable reception from transmitters.
  - Transmitting antennas with shaped-beam patterns to minimize interference.

In the microwave ITFS band reserved by the FCC for educational purposes, 31 channels are available from 2500 to 2690 MHz. Usually, the FCC licenses an institution to use enough of these channels to carry up to four simultaneous programs.

No problem of co-channel interference is likely to arise unless it is necessary to use heterodyne repeaters to extend coverage from the main omnidirectional transmitting antenna. Because effective coverage of the low-power ITFS signals (maximum 10 watts) is limited to 15 to 20 miles, depending upon terrain and line-of-sight obstacles, school systems and colleges with large geographical areas find it necessary to repeat the signals.

To avoid interference with just one repeater installation, a set of four channels of the ITFS band different from the base station channels must be assigned to the repeater. Typically, the base station might be assigned the four Group A channels from 2500 to 2542 MHz and the repeater station assigned the four Group E channels from 2596 to 2638 MHz.

Recent technological developments in solid-state circuitry have made it possible now to use two repeaters in tandem from the main transmitter. An example is the Jerrold Model SRH-2 heterodyne repeater. A number of multihop repeater chains can be fanned out in several directions to reach far corners of extensive school districts.

Unless another group of ITFS channels is assigned to the second repeater, the system might—but won't necessarily—have problems of co-channel interference.

The assignment of a third group of channels to the second repeater should be avoided. These channels can then be made available to another institution in the area, for more efficient use of

the spectrum. Conservation of channels is quite important in large metropolitan areas where several institutions might want ITFS systems. Already, the ITFS frequency band has become overcrowded in some areas.

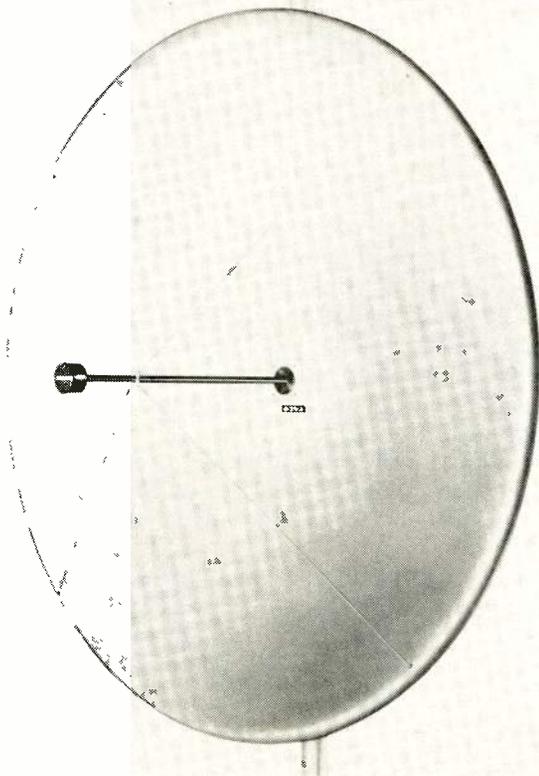
With proper engineering planning, the use of additional channels can often be avoided. In such a case, the same Group A channels of the base station can be considered for use by the second repeater.

### Siting Is Important

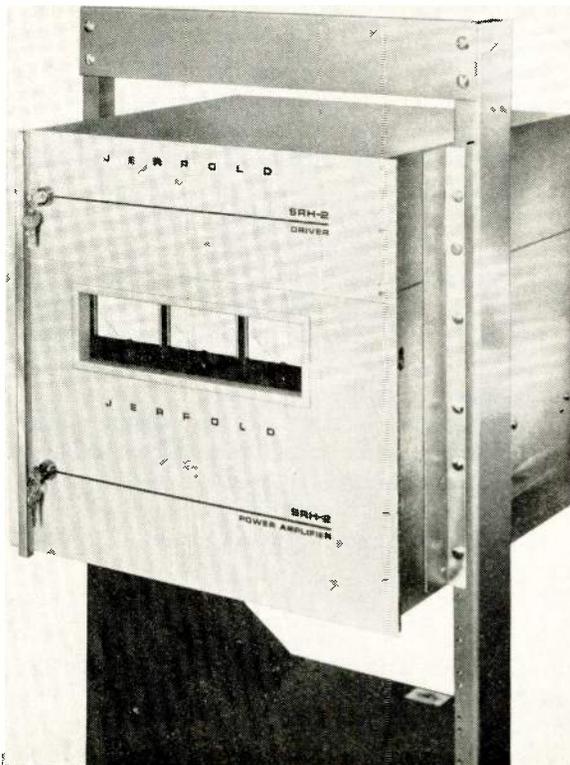
Selective siting of transmitters is the most effective way of minimizing or eliminating co-channel interference (overshoot) when the same channel group is used both at the base station and at the second repeater. The common method of solving such problems in straight-line microwave is to zig-zag the route. This is not possible with ITFS which uses omnidirectional transmitting antennas radiating energy to receivers clustered around the transmitter.

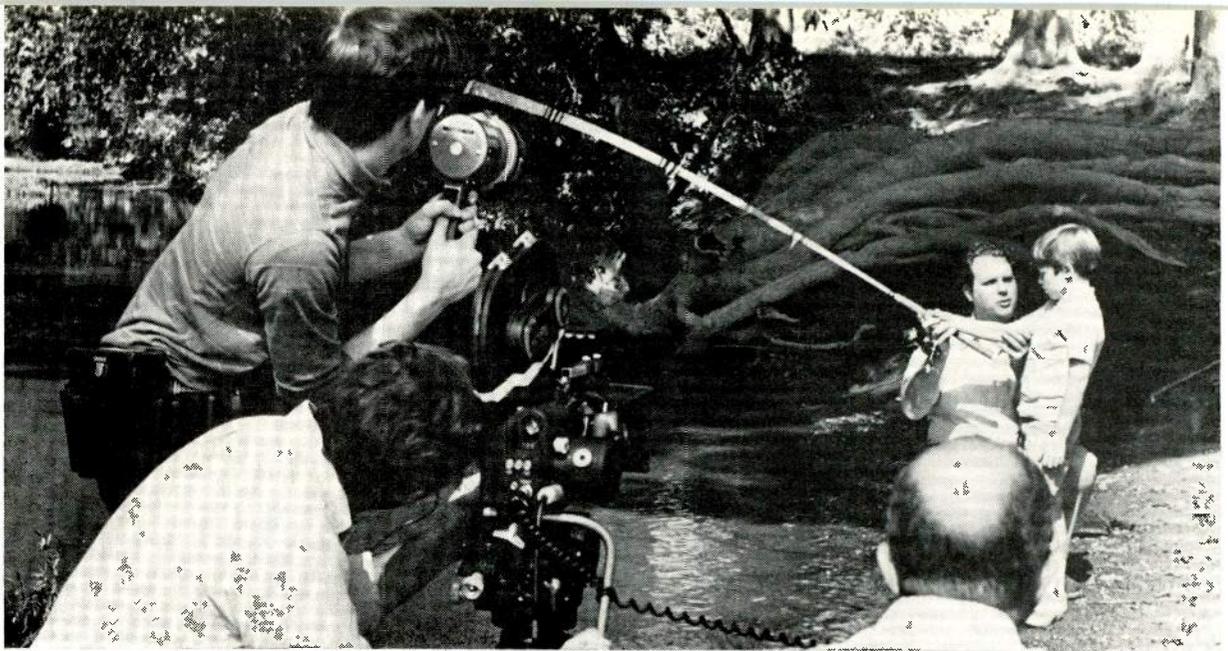
To determine the extent of possible interference, draw a line on a map between the two frequency-sharing transmitters. Extend the line beyond each site to the coverage-area limits of each station. Any receiving sites located on or near the line extensions will have their antennas directed at both transmitters. Co-channel interference is most likely to occur at these locations. Receivers located between the transmitters, how-

Designed for repeater station use, this six-foot diameter antenna, the Jerrold TACO EPA-6 parabolic is similar to smaller receiving ITFS antennas used at school locations.



Recent developments in solid-state technology make it possible to use two heterodyne repeaters—such as this Jerrold SRH-2 in tandem with the main ITFS transmitter.





NIT production unit working on first segments of early childhood series slated for next fall.

ever, will not experience difficulty because of the high front-to-back ratios of typical ITFS receiving antenna dishes.

#### Calculated Interference Probability

Complete protection by means of ideal transmitting site selection is not always possible. The amount of protection required varies with the co-channel beat frequency. Even under the worst conditions, however, 60 dB of protection assures interference-free operation.

Assume a receiving site five miles from the desired transmitter and 35 miles from the co-channel location. Considering only the free space loss, the loss for five miles is 119 dB and for 35 miles is 135 dB, or a differential of only 16 dB. Additional protection can be designed into the system by using cross-polarized antennas. The technique adds a reliable 20 dB measure of protection, for a total of 36 dB. This is still 24 dB short of the ideal.

The curvature of the earth, or ground shadow, must provide the remaining desired amount of interference protection. That is, the system can be designed to take advantage of earth curvature and the natural terrain to block main antenna signals from directly reaching receiving antennas at the system extremities.

To do this, it is necessary to calculate the amount of earth curvature for a given distance and to consider the amount of bending of radio waves caused by atmospheric refractivity.

Earth curvature can be calculated with the following formula:

$$EC = \frac{0.66 (D/2)^2}{K}$$

where D = distance in miles, K = atmosphere refractivity constant (true earth = 1) and EC = earth curvature in feet.

Thus, for the example of a receiving site at

35 miles from a co-channel base transmitter, the formula shows:

$$EC = \frac{0.66 (35/2)^2}{1} = 191 \text{ feet}$$

This shows theoretically that if the individual heights of the main transmitting antenna and the receiving antenna are less than 191 feet each, co-channel interference is no problem.

However, this is assuming that the signals travel in a straight path. Atmospheric refractivity tends to bend radio waves downward into an arc related to earth curvature at an average constant of 4/3 or 1.33.

Applying a K factor of 1.33 instead of 1, as above, the formula shows:

$$EC = \frac{0.66 (35/2)^2}{1.33} = 147 \text{ feet}$$

With the new factor of atmospheric refractivity taken into account, there is 44 feet less protection available from earth curvature.

Unfortunately, the effect of atmospheric refractivity varies considerably, and the K=1.33 or less condition exists only half of the time. Studies made by Environmental Science Services Administration (ESSA) and the National Bureau of Standards of the U.S. Department of Commerce show that atmospheric refractivity frequently causes greater downward bending of radio waves.<sup>1</sup>

With K valued at 2, the earth curvature formula shows only 95 feet of protection for a 35-mile, path, 53 feet at K=3 and only 40 feet at K=5.

Averaging the Department of Commerce findings on the variability of the effects of atmospheric

*Continued on page 82*

1. U.S. Department of Commerce, Environmental Science Services Administration (ESSA), Monograph No. 1, 1966, "A World Atlas of Atmospheric Refractivity"; U.S. Department of Commerce, National Bureau of Standards, Monograph No. 22, 1960, "Climate Charts and Data of the Radio Refractive Index for the United States," and Monograph No. 92, 1966, "Radio Meteorology."

# Look at the Difference



Unretouched photographs of 21" studio monitor. Photographic data: Rolleiflex C-3. CPS color negative film — ASA 100, 1/15 second at f/5.6

## ...after 3M Color Dropout Compensation

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

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

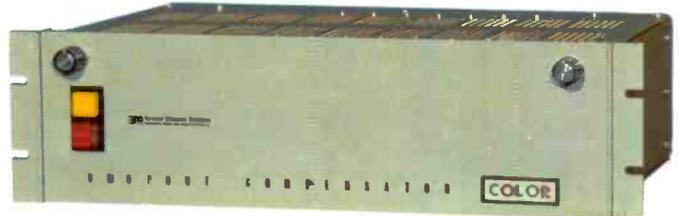
The black dropouts shown on the left are followed by a complete loss of color-lock in the direct color recovery equipment. Since these dropouts include horizontal sync and color burst, they cause transient color flashing not ordinarily attributed to the dropouts themselves. Even shallow dropouts can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

**Only the 3M Color DOC corrects all these effects.**

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

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

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



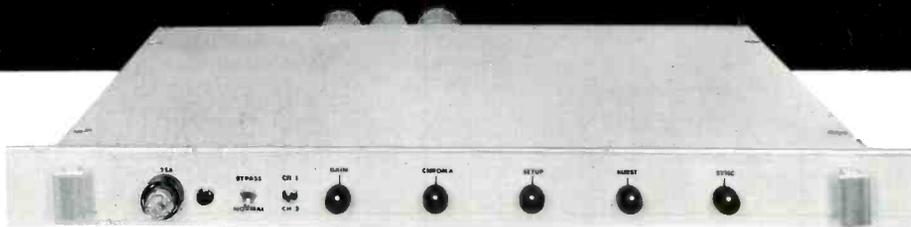
**The 3M Color Dropout Compensator is the only system available that can provide proper color and luminance replacement.** For details write for the booklet, "Compensating for Dropouts in Color Television Recording."

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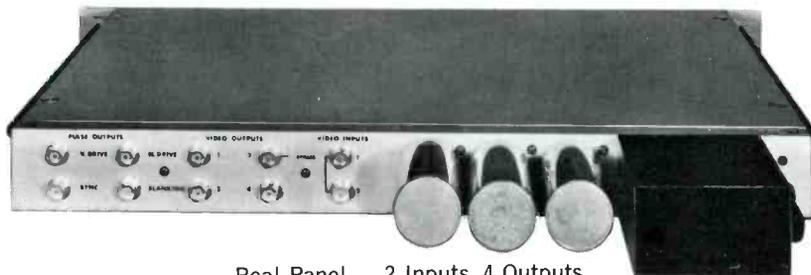
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# The VI-750 Video Tamer

## PROcessing AMPLifier



Front Panel Knobs Readily Set at Unity Gain



Real Panel — 2 Inputs, 4 Outputs

- Digital Sync Generator with extensive use of IC's re-generates all pulses to EIA Standards.
- Phase-locked color burst regenerated with correct breezeway and constant amplitude.
- Dependable AGC action maintains constant peak level without clipping. Uses no LDR's.
- White stretch with differential phase compensation for transmitter use.

- Noise immune clamping removes low frequency disturbances.
- Applications: Input to transmitters, VTR's, microwave, output of switches, off-air pickups, remotes, network and helical scan recorders.
- Thirty-day free trial with no obligation.

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

GOOD ENGINEERING IS VITAL



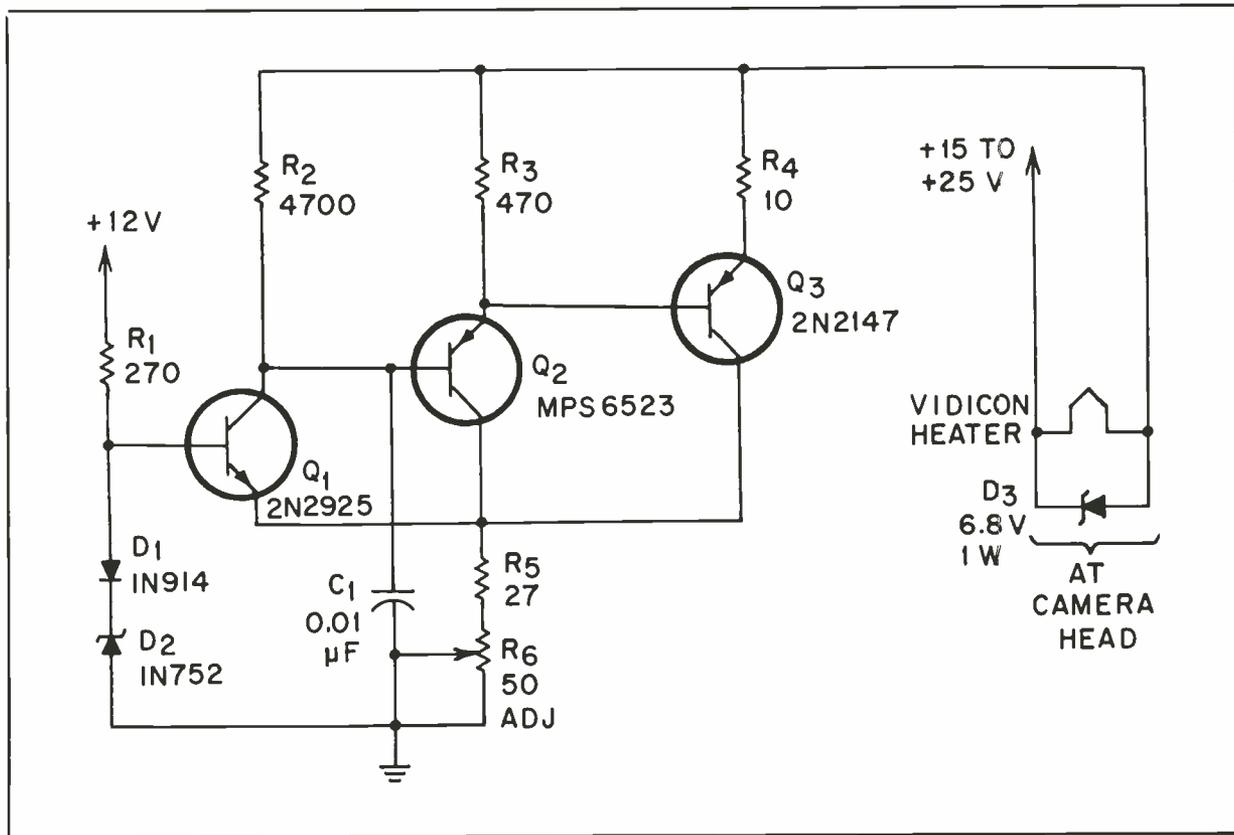
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Circle 118 on Reader Service Card



In this heater regulator circuit, resistor values are in ohms. Note that both leads to heater are above ground.

## Baby that Vidicon!

One of the few non-transistor components in television is the vidicon camera tube. Like all fire bottles, it's sensitive to power supply variations. Here's a circuit that prolongs the life of the TV eye and keeps pictures stable.

By Walter G. Jung

THE VIDICON camera tube operates best when its heater power and cathode emission are constant; power variations cause picture degradation, while overvoltage and overcurrent shorten tube life. The circuit shown is a stable, constant-current supply which provides no-surge controlled heater warm-up, complete independence from line-voltage and temperature variations, and the capability of setting heater current and/or voltage precisely to a desired value. Excepting D3, the circuit is built into the camera control unit, and vidicon heater current is then constant regardless of camera cable length.

Referring to the diagram, D1 and zener D2 furnish a voltage reference to common-base amplifier Q1. Q2 and Q3 are current amplifiers

**Walter G. Jung** is an engineer with the MTI division of KMS Industries, Inc.

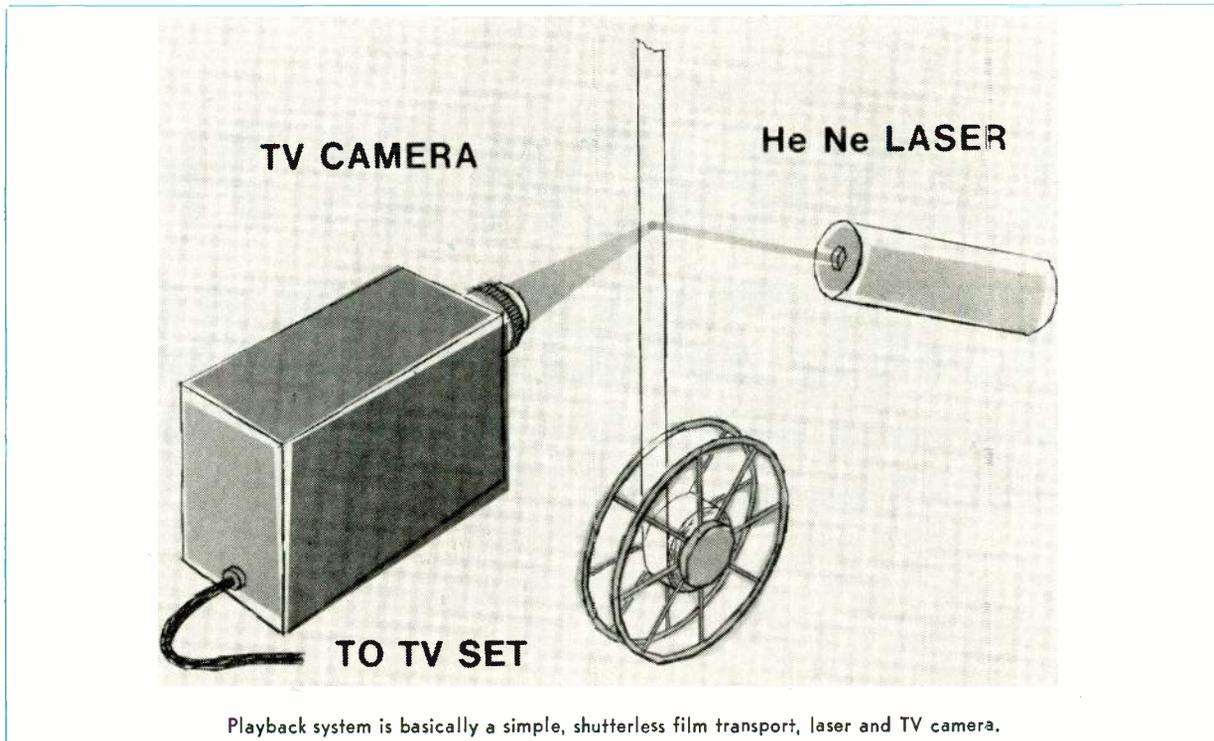
which increase the small collector current of Q1. The total output current of the supply passes through R5 and R6, and R6 is used to precisely set the voltage and/or current at the vidicon heater. D1 and D2, in conjunction with Q1's  $V_{be}$ , act as a temperature-independent reference voltage controlling current output of Q1 and ultimately the whole supply. Load current through R5 and R6 develops a comparison voltage at Q1's emitter which maintains a constant current through the external load.

To protect against misadjustment or overvoltage, zener D3 shunts the vidicon heater. In normal operation the heater voltage is 6.3 volts, below D3's threshold, so the diode is effectively out of the circuit. Higher current develops a higher voltage drop, which causes D3 to break down, shunting the overcurrent and protecting the heater.

**BM/E**



# What Is It?



Playback system is basically a simple, shutterless film transport, laser and TV camera.

main beam sidetracked and angled to cause multipath interference with the main beam as it strikes the photosensitive film. The interference patterns thus created are recorded. The film is then developed and a relief pattern is formed on one surface. This pattern contains no visually decipherable images—just a bunch of microscopic “mountain ranges.”

From this film, a nickel metal master is made, and this master is used to press thousands of replica films at high speed and low cost. The “mountain range” pattern is highly redundant—there are many recordings of the same image. Thus, the tape/film can be severely mishandled and still the picture quality will remain unchanged. In the press demonstration, a holograph film was punctured repeatedly with a pin, then sandpapered—while on camera—with no apparent change in the TV resolution chart that it contained.

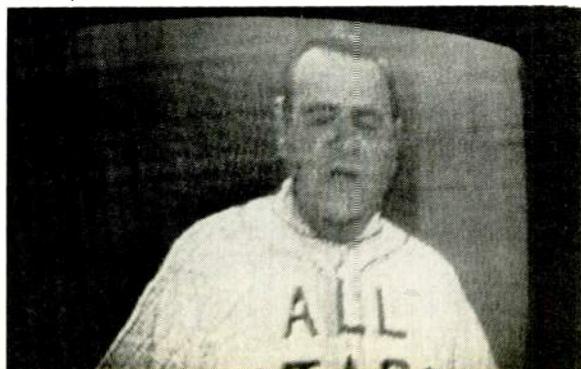
## Playback Laser

The playback system uses a laser to “illuminate” the hologram and a vidicon TV camera to pick up the image and convert it for viewing. The camera provides an rf output, so it can be connected directly to the antenna terminals of any TV set, mono or color. The holograms can provide color of sorts, but colorimetry as demonstrated has a long way to go before it’ll be accepted in the home. There were reds and blues,

sort of, with an occasional glimpse of elusive green. The NBC peacock was red/blue with varying shades of both. Monochrome rendering was more believable, but seemed to suffer from the very thing that was cited as an advantage—the lack of discrete individual frames of picture information. The hologram instead moves smoothly along with no shutter to create single frames. If stop-motion is wanted, the single “frame” viewed is apparently a composite of “frames” A, B, C and D, with very noticeably poor detail and motion blurring. Yet, fine detail is possible with SV as demonstrated with the resolution chart.

What of the future? That’s what RCA marketing people are really banking on. Perhaps this announcement was a bit premature. Perhaps it was to take some of the edge off the “competing” EVR system. SV and EVR are totally non-compatible and are in two different leagues. **BM/E**

SV motion picture has granular interference patterns and rather poor resolution.



# TELEVISION IN THE INSCRUTABLE EAST

THE CONCEPT OF THE WIRED CITY IS NOTHING NEW—THE FREE WORLD'S GATEWAY TO MAINLAND CHINA HAS BEEN TV CABLED FOR YEARS.

IF HONG KONG is a country, it's probably the only one in the world which has all wired TV and aural programming and no domestic wireless broadcasting service. Throughout the British Crown Colony, two TV channels and four sound programs are distributed by cable. Over 110,000 subscribers are served by two coaxial cables and four audio pairs in a system operated by Rediffusion (Hong Kong) Ltd.

From an engineering standpoint, the Hong Kong system is excellent, as the entire affair—from studio camera to viewer's receiver—is controlled by the same organization, simplifying technical coordination. Rediffusion originates all programming from its new Television City location on the Kowloon peninsula. The company also operates and maintains trunk lines, repeaters and drops—and it sells and services receivers. Television is distributed as direct video, and the sound programs are handled as speaker-level audio. Thus the TV receiver sold by Rediffusion has no front end or i-f strip. The company will also modify tuner/antenna type receivers that some customers use to pick up programs from the nearest broadcast TV transmitter—a mainland Chinese station.

## Bilingual Programming

The first Hong Kong television channel was put on the Rediffusion cable in 1957, with bilingual audio in English and Chinese (Cantonese dialect). In 1963, a second, all-Chinese channel was added, with the first reverting to all-English programming. (Chinese subtitles are used on cer-

tain high-interest English programs.)

Some Chinese programming consists of European or American film or tape which is lip-sync dubbed by Rediffusion using local translators. However, most oriental programs are live, as dubbing is expensive and little Chinese film is available.

Another unusual aspect of the Hong Kong TV system is its use of the near-obsolete British 405-line standard since the network was installed before most of the world standardized on the CCIR's 625 lines. Furthermore, the Rediffusion system handles only black-and-white material. There is no problem with live or filmed programs, but if an American or European video tape is to be used in the system, it must be fed through a line-store standards converter in Rediffusion master control.

Keeping more than 80 miles of feeder cable in good operating condition in a climate which regularly includes typhoons and heavy rains is quite a job. Test patterns are fed through the system at specified times during the day and the picture quality is monitored throughout the network. About 80 percent of Rediffusion's engineering staff is concerned with network and subscriber equipment maintenance. Nearly 700 engineers and technicians are employed by the company in a variety of capacities.

Television House—the company's origination point—contains nine TV and eight audio studios, all built expressly for programming. There is also a large telecine room to feed films and slides to the two video channels. **BM/E**

# MANAGEMENT ROUNDTABLE

## Techniques That Sell

By Fred Herman

Part 1 of a two-part series describing basic sales techniques for the broadcaster.

Many negative factors constantly brainwash salesmen and make it a real battle for them to keep going from day to day. The salesman responds to the same motivational forces as the buyer. In creating a desire, a salesman must work with the mechanics of putting the right picture of the future in the mind of the buyer—the same factor which influences and guides the actions and success of a salesman.

### You Are as You See Yourself

What can be done to condition the mind to have the right attitude? There are two methods: The pep talk and the faith talk; the differences between the two are in duration and basic purpose of the talk. The pep talk is a short, let's-go-get-'em thing. The faith talk is more serious and longer. Basic outline of a faith talk:

- Set your objective.
- Count your blessings.
- Reaffirm your faith in your ability to achieve your objective.

Actually, what you go through in preparing the faith or pep talk is the process of seeing in advance an event which has not yet happened, and the energy you develop from the belief makes it come true. This is voluntary use of imagination for yourself. In fact, it's a good idea for every salesman to give himself a pep talk before he begins his daily rounds. In so doing he will fortify his ego against those tough customers and their negative attitudes. Occasionally—particularly for the beginner—it's a good practice to indulge in a faith talk dwelling upon the objectives that we've outlined here.

---

Fred Herman is a sales-training and public-speaking consultant in Torrance, Calif. This material has been adapted by the author from his book, *Selling Is Simple*, TAB Books, Blue Ridge Summit, Pa. 17214.

### Have a Selling Plan

To be successful, every salesman must follow a plan. No matter how much experience, product knowledge, or sales training a salesman has, it must all be organized so that he can find the right idea at the right time. Here are five steps; use them in the right order and you'll make more sales:

- Draw the prospect's attention away from what he was thinking about. He must know why you're there.
- Arouse the prospect's interest by suggesting that he will benefit from your sales effort.
- Convince the prospect by pointing out what your plan will do for him and that it's a *good* plan for him.
- Create a desire by appealing to the right motives; point out that advertising on your station will result in increased business for him.
- Close the sale by helping the prospect make the decision, and get the signed order.

Many salesmen barge in on a prospect, simply hoping something will happen, when they could be in real command of the interview if they had a plan and followed it. The point is to sell smarter, not harder. This point is of supreme importance when you realize that the salesman's job is to help the prospect make the decision.

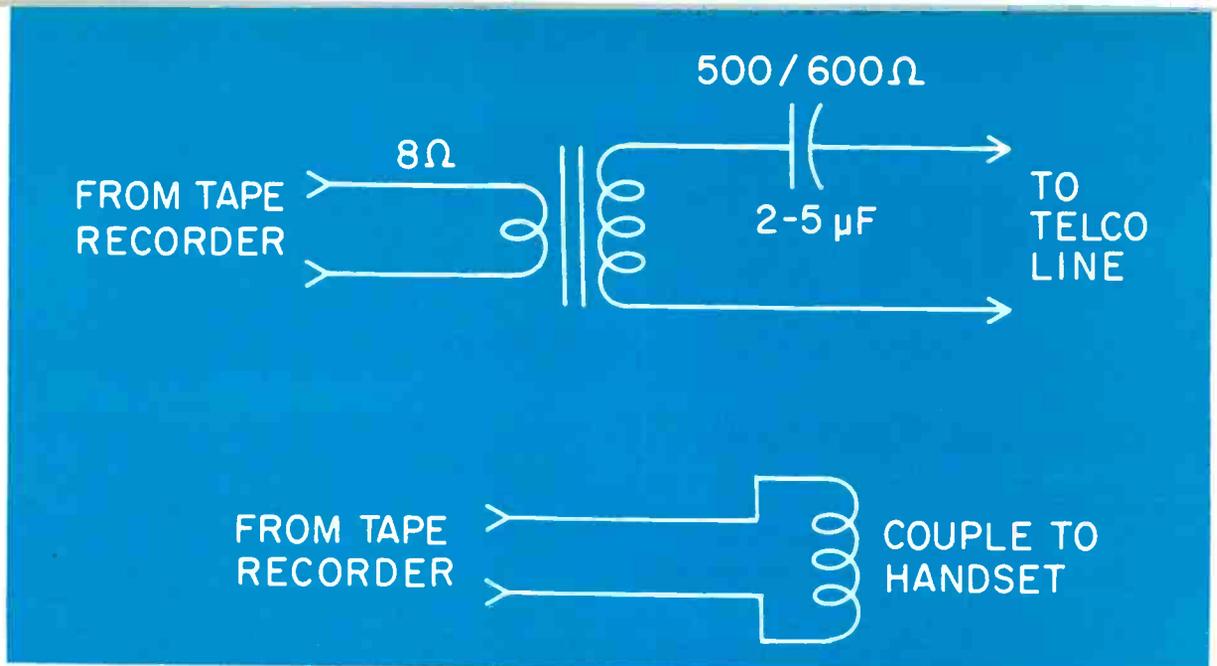
### Breaking the Ice

The prospect is certainly not thinking of you before you make a call. His mind is on his own problems and interests. So the first step is to get his attention. Most salesmen are prone to fall in love with their own ideas. When you make a cold call, show an interest in the prospect's business by saying "I'm calling to see if I can be of any possible service to you and your organization."

Here is a suggestion which is contrary to what nine out of ten salesmen do: give your station's call before your name. Say: "I'm from WXXX. My name is Bill Brown." This is sound practice because your name probably creates no picture in the prospect's mind, but the station call letters might. But this is only the introductory phrase, not the actual attention-getting step. Here are some ideas to get the prospect's attention:

- Give the prospect a token of your product, a sales brochure, or some small, inexpensive memento. It will attract his attention and remind him of your call.
- Exhibit something the prospect can look at. For example, I have used a small, steel mousetrap which suggests that even if you build a better mousetrap, you still have to tell the story.
- Talk about the prospect and pay him a compliment. Call attention to what he *does* instead of what he *is*.
- Ask questions. The prospect automatically gives his attention to you when he answers your questions. A lot of time can be wasted talking about the weather. The best question, of course, is one that suggests the possible use of your product.
- A startling statement about something the prospect may be missing or about a special deal which you have to offer can be used as an attention getter.
- A testimonial from a satisfied advertiser, which also becomes an exhibit, often attracts attention—particularly if the advertiser happens to be a competitor or someone in a similar business.
- Arouse the prospect's curiosity with a statement regarding broadcast advertising. You might mention talking to someone he knows who's done something great. It's

*Continued on page 74*



Transformer-coupling method (top) requires blocking capacitor. Coil method (bottom) is simpler but puts less audio into line.

# Fast Phone Feed from Tape

A busy radio newsmen often doesn't have time to hand-carry his tape back to the studio before covering another event. Here are two fast ways of feeding a telco line from a portable tape machine.

By Jack B. Thornton

OFTEN A RADIO newsmen in the field must send back a taped item to the studio. Holding the telephone handset up to the recorder speaker is hardly the answer. Several methods are suitable for such temporary line feeds. One is to use a matching transformer and blocking capacitor, as shown in the diagram.

To do this, connect a plug that fits the tape machine's earphone or speaker jack to the eight-ohm winding. Use alligator clips on the 500/600-ohm leads, with a blocking capacitor in series with one side of the circuit. For small size, use a miniature transistor output transformer and a miniature paper or nonpolarized electrolytic capacitor of about 2-5  $\mu\text{F}$  at about 50 volts.

In use, connect the clips to the telco terminal block. If you can't get to the block, unscrew the cap on the handset microphone, exposing the terminals inside. Attach the clips to those terminals. The audio level feed should never sound louder in the handset earphone than voice volume in normal telephone use.

### Avoiding Direct Connection

A faster method which avoids direct connection is induction. Wind a coil to fit on a telco handset earphone (receiver). Use a form the same size and wrap a layer of plastic electrical tape around the form, sticky side out. Use small wire (#26 or so). For the usual low-impedance tape output, 100 turns of wire is suitable. For a 500/600-ohm output, use 300 to 500 turns. Cover the completed coil with more tape and solder leads to the tape plug.

Slip the coil over the handset earphone and

play back a tape. The signal will be inductively coupled into the line. As you may have guessed, by plugging the coil into the tape machine input, you can also record a telephone conversation, but you can't legally use that recording on the air unless the other party knows the call is being taped.

Another use for such a coil is an emergency feed into sound or PA systems where you can't get at a high-level input or don't have the required connector. Just slip the coil around a dynamic microphone, which will inductively pick up whatever audio you feed to the coil. **BM/E**

### Build or Buy?



Hard-pressed for construction time? A commercial version of the phone patch, called "Fone-Feed," is available from Blossomland Electronics Co. The induction loop has its own jumper cable and Japanese-size plug for use with most battery portable recorders. For more information on this \$10 item, circle number 302 on Reader Service Card.

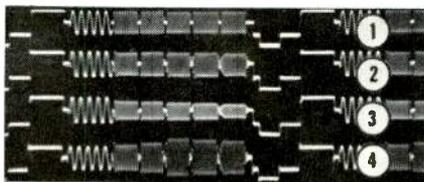
**Jack Thornton** is chief engineer of KBND, Bend, Oregon.

# Proof that DYNA-TUNE can cure many of your head-end headaches.



Now you can have high-fidelity off-the-air color from your head-end. Utilizing completely new filtering and signal-restoration concepts, the DYNA-TUNE provides superior adjacent-channel color performance in either micro-wave-fed or demod-mod systems. These important developments allow the DYNA-TUNE to actually improve the color signals in many critical areas over that produced by the broadcast RF transmission system.

You can also forget the problems inherent in outdated tube-type tuners . . . the DYNA-TUNE uses a field-effect front end and the latest in integrated circuits to provide performance and reliability previously unattainable in this type of equipment. A completely new approach to off-the-air color . . . for only \$1275 (fixed-tuned model \$1350).



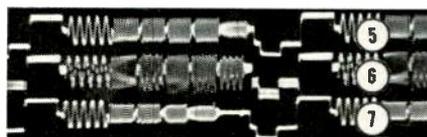
## COMPARATIVE TESTS

The unique color compensation function of the DYNA-TUNE is evident in waveforms 1 through 4. The test set-up for these waveforms consisted of an off-the-shelf DYNA-MOD modulator supplying a modulated 4.2-MHz multiburst signal to the DYNA-TUNE. Waveform 1 is the output of

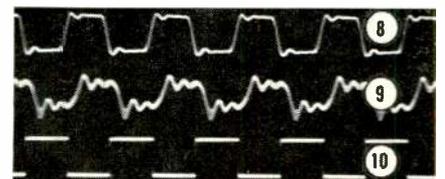
the multiburst generator. Waveforms 2 through 4 are the demodulated outputs of the DYNA-TUNE with (2) proper compensation, (3) no compensation (note the inherent roll-off in the higher frequencies) and (4) overcompensation, such as might be desirable to compensate for remodulation. All waveform photographs were taken with the tuner oscillator set for maximum aural rejection.

Waveforms 5 through 7 show the results of a conventional CATV demodulator tuned for the best overall picture (note the roll-off in the color region). Waveform 6 was taken with the demodulator tuned for the best 4.2-MHz response (note overall distortion, including degradation of sync pedestal) and waveform 7 was taken with the demodulator tuned for best overall sync. Remodulation of this output would result in even further degradation.

Another significant indication of the superior overall frequency-response characteristics of the DYNA-TUNE can be seen in waveforms 8 through 10. In this test set-up, the multiburst signal was replaced with a 500-kHz square-wave. Waveform 8 was taken at the output of the DYNA-MOD/DYNA-TUNE combination and waveform 9



was taken at the output of a conventional CATV demodulator driven by the same DYNA-MOD. Waveform 10 is the squarewave source. (Note the overall improvement in ringing and overshoot in waveform 8.) No external envelope-delay correction equipment or filters were used when performing any of the above tests.



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speeds—7½, 3¾ and 1⅞ ips—and are equipped with inputs for mike and auxiliary and outputs for line and headphones. The Mark II retails for less than \$230, the Mark III for under \$260 and the Mark IV for less than \$330.

Circle 283 on Reader Service Card

## Remote pickup gear

Porta-Mobile fm two-way radio base stations are designed for semifixed applications such as temporary head-

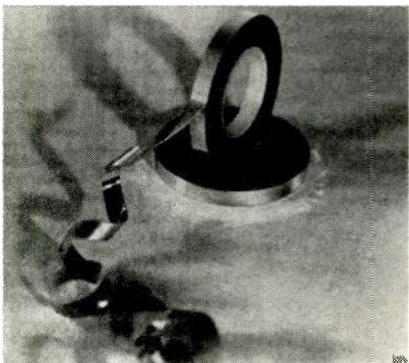


quarters, but are also recommended for portable and vehicle-installation use. The equipment, which has ac power as well as battery packs, may be used in 25-30, 132-174, 406-420 or 450-470 MHz systems. Base stations include noise-canceling mikes, handsets, two-frequency transmit and receive, solid-state channel guard, decoding equipment, jacks and cable. GE Mobile Radio Dept.

Circle 296 on Reader Service Card

## Conductive tape

Adhere-on Tape Type CC-3807 is made of .0005-in. aluminum foil on the top side laminated to one mil thick Mylar. Including the adhesive, the tape has a thickness of .0025 in. The adhesive isn't affected by aging, affording uniform adhesion characteristics. Applications for the tape include cueing and stopping movie



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

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Managing owner Richard Jakle, shown at right with Pam Backey, program director, finds WRMN-FM's IGM automation system easy to program and to promote.

Below, WRMN-FM's advance promotion included full-page newspaper announcements, listener contests, effective direct mail and news bulletins, all on the "Golden Sound" theme.



## "Our IGM 500 system really produces the 'Golden Sound' for WRMN-FM"

An IGM Model 502-4 audio control system and IGM taped music services combine to produce a profitable new sound for WRMN-FM, Elgin, Ill. Formerly a monaural FM with extensive AM simulcasting, the station is now separately programmed and all-stereo, from 6 a.m. to 11 p.m. seven days a week.

WRMN-FM's control system includes a carousel that permits scheduling an entire day's commercials a day in advance; automatic logging of each event as it's aired; an ID machine that stores and airs up to 30 different "breaks," including the specially recorded "Golden Sound" musical logos heard every quarter hour; a unit that automatically airs up to 15 minutes of pre-recorded news; a time announcer and two music tape decks.

Says Richard Jakle, managing owner of WRMN, "The IGM 500 system is producing the 'Golden Sound' on our books, too. The system has given us something promotable in addition to our air sound. And, its ability to produce the sound we want, consistently, has helped us sell the station to advertisers. Without reservation, I recommend IGM automation equipment to any profit-minded station owner or operator."

If you're looking for a golden answer for your station, find out about the IGM automation systems and taped music services. Write or call International Good Music, P.O. Box 943, Bellingham, Wash. 98225. Telephone (206) 733-4567.

### IGM audio control systems

Advanced, state of the art design, "human engineered," wide choice of optional features and accessories.



### IGM taped music services



Contemporary to classical, announced or unannounced. World's largest, highest-quality taped music service for radio.

"Tomorrow's engineering today"

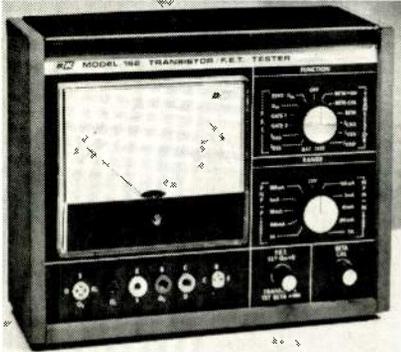


film and video film for TV station broadcasts. A free roll of the sensing tape is available. Adhere-on Tape Corporation.

Circle 294 on Reader Service Card

### FET tester

Model 162 transistor/FET tester, introduced by B & K Division of Dynascan Corporation, offers capability of in-and out-of-circuit tests (aside from testing diodes, unijunctions, SCRs and triacs). Another feature is

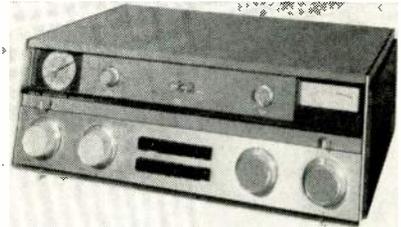


a special balancing circuit that permits balancing out as low as 6 ohms circuit impedance for incircuit Beta test. It carries higher current capabilities up to one ampere and Beta readings from one to 5000. It also offers three leakage tests,  $I_{cho}$ ,  $I_{ceo}$  and  $I_{ces}$ . \$99.95.

Circle 292 on Reader Service Card

### Audio mixing console

Visual Electronics Corporation offers a 4 X 1-in., solid state, four-mixer audio console featuring: pushbutton selection of high-level inputs to either of two mixers; built-in, plug-in, eight-W monitor amplifier; two switchable mike inputs on mixer four (plug-in modules allow for mike pre-



amps to be substituted on mixer four); and full cue facilities. Console includes a built-in clock. Ideal for production uses and small studios.

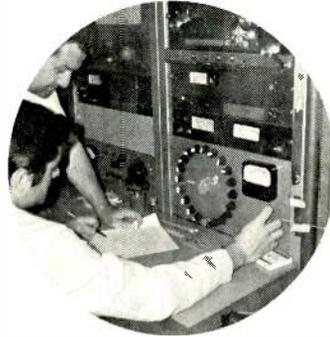
Circle 287 on Reader Service Card

### Color editing VTR

Model 2932 color editing video recorder has been added to Bell & Howell's line of closed circuit television products. Tapes recorded or assembled on the editor can be played on any other Bell & Howell video recorder that uses one-in, tape. Slow motion and stop motion are standard. \$7600.

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### STL Tapes Measure Up!



One reason why STL tapes measure up to published standards is the professional pride of specialists using equipment designed exclusively for test tape production.

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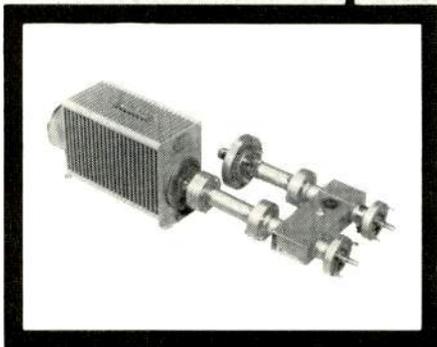
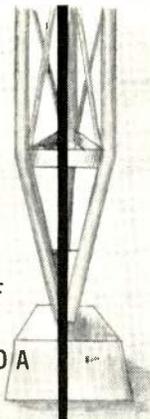
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# NEW LIT

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

**TV lenses**—vidicon, Plumbicon and orthicon—are delineated (in both French and English) in chart form in a bulletin from Angenieux. **200**

**Antennas**—20-60 ft "Astrocat" types—are discussed in a bulletin from RF Systems Inc. **201**

**CATV television cameras, control equipment, switchers, film and optical systems** from TeleMation, Inc., are featured in two short-form catalogs. **202**

**Model 82-25 MPR** 16mm combination optical/magnetic sound projector is described by The Kalart Company in bulletin No. 2701. **203**

"A New Solid-State TV Demodulator" is the title of a paper which was presented at the 1969 NAB Engineering Conference by George Weber and George Stoeppel, and which is being offered by Rohde & Schwarz. **204**

**Lenses for 16mm-TV-APO-reproduction and view cameras** are described in bulletin from Karl Heitz. **205**

**Television accessories** for studio combinations are offered in a Cohu data sheet 6-469. **206**

**Three "Case Histories"**—G323, G-356 and G326—present how new Ampex magnetic recording equipment is being used to produce commercials and TV programs at Lewron Television, Inc., National Teleproductions and Teletronics International. **207**

**TMV-708 Broadcast Camera Control Unit** for remote control of TMC-2100 monochrome TV camera is described in a brochure from TeleMation. **208**

**Special lenses** as well as 16 and 35mm, vidicon, Plumbicon and orthicon lenses are included in extensively diagrammed and charted brochure from Karl Heitz. **210**

**Color TV camera**—model VP3—is described in Visual Electronics' eight-page brochure. **212**

**Switchers**—broadcast video, audio and video distribution types—are detailed in a six-page brochure from TeleMation. **213**

**Coaxial cable** is described by Uniform Tubes Inc. in bulletin. **211**

# Stay up-tight!

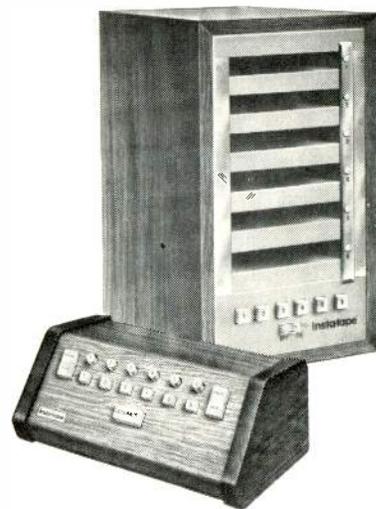


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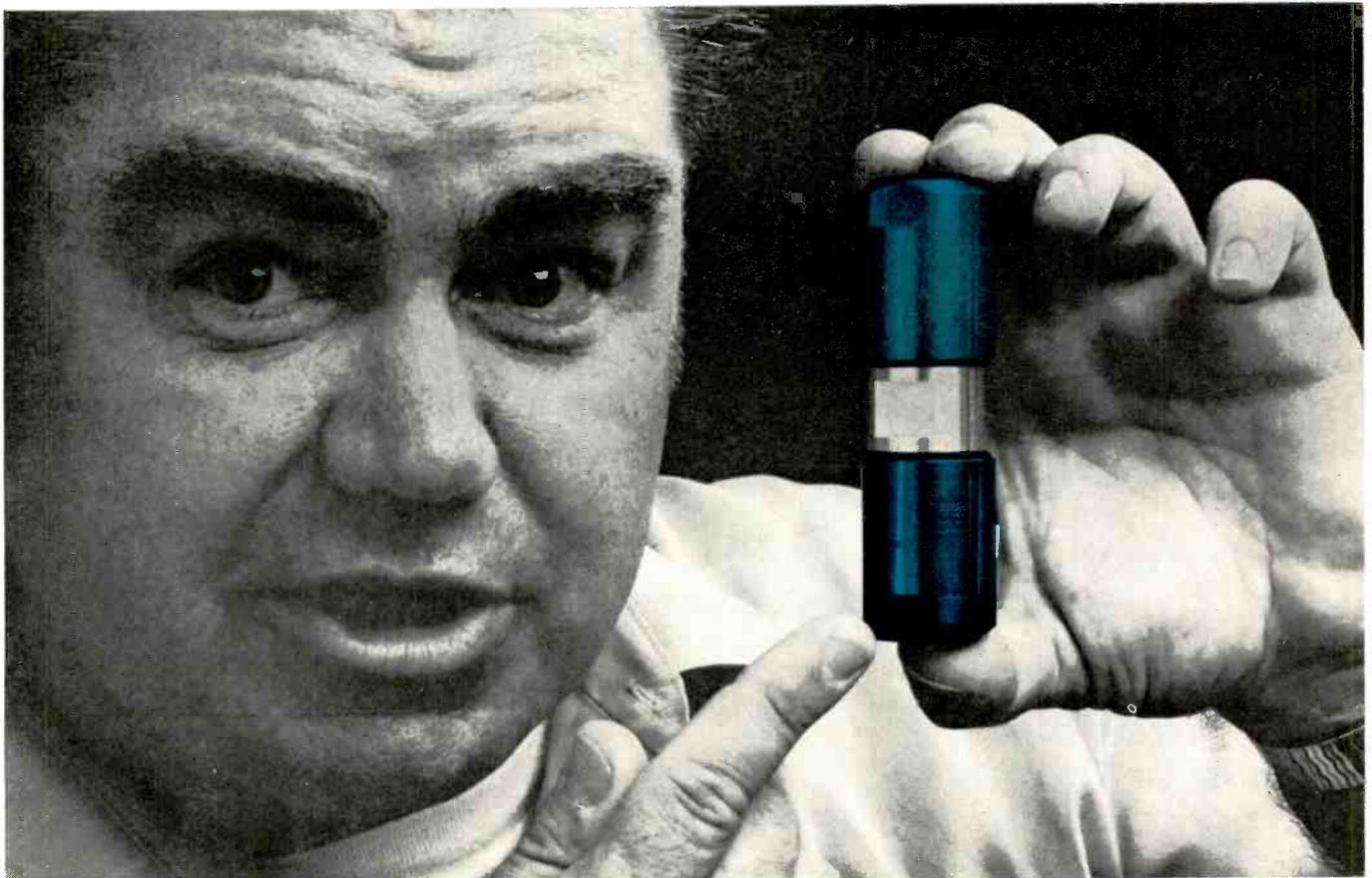
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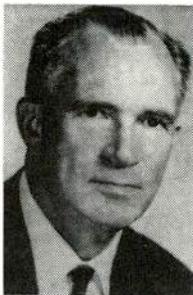
Have a health checkup every year. It'll improve your chances of enjoying your retirement. To a ripe old age.

**american cancer society**

*This Space Contributed by the Publisher*

## NAMES IN THE NEWS

Effective since October 1 is the resignation of **Douglas A. Anello** as general counsel for the NAB; expected to remain available this year as a consultant, Anello was with the organization for 12 years.



Glenn Koger



Charles Kunkle, Jr.

**Glenn Koger** will assume the newly created post of senior vice president and **Charles R. Kunkle, Jr.**, will assume the position of vice president of manufacturing of Rome Cable Division of Cyprus Mines Corporation.



Michael Fuller



Arie Landrum

Visual Electronics Corporation has announced that **Michael H. Fuller**, a sophomore at Stanford University, has been awarded its 3rd Educom Scholarship Award. Presentation of the scholarship grant and plaque will be made during the 1969 NAEB Convention on November 10.

Joseph N. Tawil, president of Berkey-ColorTran, has announced the appointment of **Arie Landrum** as regional marketing manager for the California based division of Berkey Photo.

**Kurt H. Oppenheimer** has joined Reeves/Actron as vice president, engineering.

**Kenneth R. Giddens**, president, WKRG-TV-AM-FM, Mobile, has been appointed director of Voice of America; Acting Director, **Richard G. Cushing** has been named assistant.

## GOOD SHOW!

**New "Cam-Link"® Heads Provide Cradle Head Performance at Lower Cost!**

**Controls your heavier cameras more quickly and easily . . . prevents "nose diving" without springs.**



**Samson® "Cam-Link" Head**

*For equipment up to 40 pounds . . .*  
Separate drag and brake controls for pan and tilt . . . independent disc brakes. Adjustable and reversible handle. Adjustable mounting screw. Weighs 5 pounds. \$195.00



**Hercules® "Cam-Link" Head**

*For equipment up to 80 pounds . . .*  
"Quick-On" mounting plate for instant equipment mounting and removal. Pan and tilt mechanisms operate on sealed ball bearings . . . caliper disc brakes . . . separate drag controls. Weighs 11 pounds. \$260.00

A complete line of instrument positioning equipment.

**QUICK-SET**  
INCORPORATED



8121 Central Park Avenue SKOKIE, ILL.

Circle 135 on Reader Service Card

Circle 137 on Reader Service Card →

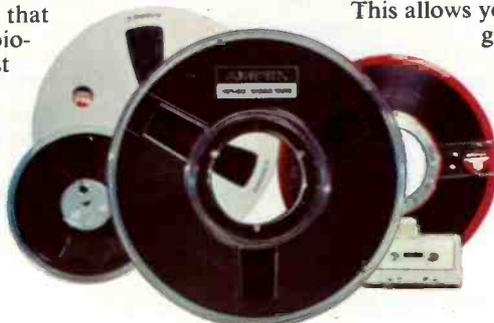
Pat Hewitt, Ph.D.,  
is looking for pictures,  
not problems.



Picture by courtesy of Mental Research Institute, Palo Alto, California

When psychologist Pat Hewitt is studying recorded interviews on closed-circuit television, she wants to concentrate on the patient, not the tape. It stands to reason that she looks to Ampex, the company that pioneered videotape recording, for the most trouble-free video tape.

Our Ampex helical scan tape is produced in the most modern, surgically clean facility the state-of-the-art permits. Here we give meticulous attention to formulation and tape coating to bring you excellent drop-out performance, high frequency response, unparalleled picture clarity.



To assure continued high performance, Ampex smooths every reel of Ferrosheen® tape with an exclusive finishing process. This allows you to rerun tape many times without head clogging, tape wear or head wear.

So, if you're too busy to bother with tape, come to the people whose number one business is tape recording. Call or write: Ampex Corporation, Magnetic Tape Division, 401 Broadway, Redwood City, Calif. 94063.

**AMPEX**

TAPES FOR EVERY NEED

INSTRUMENTATION • COMPUTER • AUDIO • CCTV • VIDEO • STEREO

## QUESTION:

# What is an INSTANT BUILDING?

## ANSWER:

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



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

### ADVANCE INDUSTRIES

2301 BRIDGEPORT DRIVE  
SIOUX CITY, IOWA 51102  
PHONE 712 943-5081

Circle 142 on Reader Service Card

## News

Continued from page 11

quad is another story. Boston's WGBH recently tested the system—broadcasting channels 1 and 2 on its own fm outlet, channels 3 and 4 on another station (WCRB-FM).

More recently, test broadcasts in New York were to use city-owned WNYC-FM for channels 1 and 2 and Columbia University's WKCR for channels 3 and 4. At press time, an application for experimental quad subcarrier broadcasting was before the FCC, and if granted in time it would enable WNYC-FM to carry all four channels on its single station. This system would use William Halstead's method—channel 3 on a 72-kHz subcarrier and channel 4 on a 92-kHz subcarrier.

This can get a little sticky, though. Quad broadcasting kills any possibility of carrying an SCA channel, and the upper frequency swing would carry signal dangerously close to the edge of the fm channel if not actually spilling over into adjacent channels.

Ultimately, four channels on a single station will probably be the accepted technique, says Van Sintchak, president of Kenrich Purchasing. But the method remains to be seen. Also in the act is a concept created by Murray Crosby, and this may line up in competition with the Halstead system. This in turn could lead to an engineering battle before the Commission that would be like 1960 history repeating itself. Sintchak believes that four-channel stereo is as much an advance over two-channel as two-channel was over mono. Eardrum tests have tended to verify this, but we may be in for an era of ping-ping/pong-pong demos first.

### Nixon names Burch and Wells to FCC

As press, industry and government leaders had been predicting for weeks, President Nixon has nominated attorney Dean Burch and broadcaster Robert Wells for FCC posts. If the Senate approves the late-September recommendations, the Commission would still comprise three Republicans and four Democrats.

Burch, who would replace retiring Commission Chairman Rosel H. Hyde (see *BM/E*, August,

## Perfect Your CCTV System with COSMICAR® lenses



Focal length 15~145mm  
Aperture f/2.5

### A new member to the superb COSMICAR lens family!!

The most efficient 10:1 zoom lens, unmatched for its optimum performance, both optically and mechanically with impeccable definition and resolution throughout its entire zoom range.

Also available are scores of other lenses, ranging from 8.5mm to 1,000mm telephoto, zoom and those motordriven among them, for immediate delivery, after being tailored to your specifications.



### COSMICAR OPTICAL CO., LTD.

568, Shimoochiai, 2-chome, Shinjuku-ku,  
Tokyo, Japan

Cable Address: "MOVIEKINO TOKYO"  
Circle 143 on Reader Service Card

Circle 136 on Reader Service Card for Varian ad →



# Varian klystrons hold back the cost of doing business.

You might say that UHF TV klystrons from Varian cost about a buck an hour. Although Varian warrants its UHF TV klystrons for 5,000 hours video, their average operating life is 8-9,000 hours . . . at an average cost of about \$9,000 per tube. If that's not a bargain, think of the UHF stations that get 20,000 hours per tube, or the one in Texas that's logged over 30,000 operating hours on one tube.

It's a fact that since the first commercial UHF TV station went on the air back in the '50's, Varian has more than doubled the operating life of UHF TV klystrons.

And the price hasn't changed much since then. No wonder over 90% of the stations use Varian tubes.



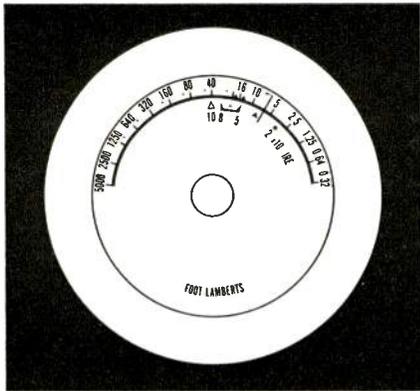
**varian**

palo alto tube division

You can get all the figures on Varian klystrons from any one of the more than 30 Electron Tube and Device Group Sales Offices around the world.

Or write the Palo Alto Tube Division,  
611 Hansen Way, Palo Alto,  
California 94303.

# The TV spot meter that never was.



It's called the Minolta Auto-Spot 1° TV Exposure Meter. And it's the only spot meter in the world with illuminated, continuous and motorized IRE and foot-lambert scales in the viewfinder.

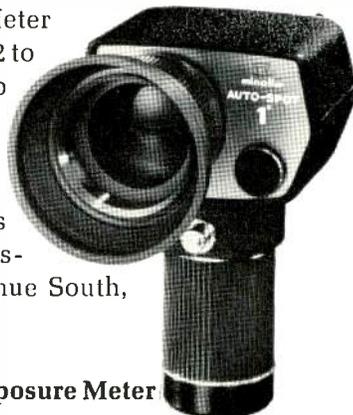
It'll give you quick, precise 1° readings that speak your language. Just aim, squeeze the button and watch the scales turn. With-

out taking your eye off your subject or switching from low to high brightness ranges, you're getting a perfect 1° reading. And the IRE scale makes it easy to keep the right balance between skin tones and the brightest area of your subject. This makes color work a snap.

Your subject is magnified 4x with focusing from 3.3 feet to infinity. And because of the 1° angle of measurement, you can pick out details for tight shots or long telephoto work without leaving your camera position. (This came in handy when the Apollo 8 astronauts took a version of the Auto-Spot 1° along for measuring moon and earth light.)

So thanks to Minolta, TV work will never be the same. After all, just because something never was is no reason to think it can never be.

The Minolta Auto-Spot 1° TV Meter with IRE and foot-lambert scales (.32 to 5000), under \$250 with wrist strap and hard leather, velvet-lined case. (Also available with shutter speed, lens opening, and EV scales for still and cine uses.) For details write Minolta Corporation, Industrial Sales Division, 200 Park Avenue South, New York, N.Y. 10003.



**Minolta Auto-Spot 1° TV Exposure Meter**

Circle 144 on Reader Service Card

1969, p. 11), would serve until June 30, 1976; Wells would complete Commissioner James J. Wadsworth's term ending June 30, 1971. Burch, 41, is a partner in a Tuscon law firm. Wells, 50, is general manager of the Harris Radio Group, whose stations are in Kansas, Iowa, Illinois and Colorado.

## Hyde proposes cabinet spot to supersede FCC

In his second farewell address before the International Radio and Television Society at New York City's Waldorf-Astoria in late September, FCC Chairman Rosel H. Hyde suggested a cure for the spectrum management split between "the Executive, for government use, and the FCC, for non-government use"—the creation of a Cabinet-level Secretary of Telecommunications to coordinate both government and nongovernment communications.

"I frankly do not know whether this arrangement would prove out—whether the disadvantages would outweigh the advantages," said Hyde. "My point is that if we do seek to improve the present governmental mechanism—we must seek to effect that centralized improvement which best serves the public interest. And we must not settle for changes that merely fragmentize the present situation and represent simply bureaucratic shuffles of authority," said Hyde, in rebutting suggestions for mending the Executive-FCC spectrum management split that call for assigning spectrum allocation to the Executive branch and regulation and licensing to the FCC.

Among the "obvious disadvantages" of the new Cabinet post, said Hyde, would be foregoing "the benefits flowing from the formulation of policies and their implementation by an independent, bipartisan, multimember Commission."

Hyde's suggestion of a possible deterrent to such disadvantages was "the use of independent panels similar to the FCC's Review Board, whose members would be removable only for cause . . . that would implement the policies formulated by the Secretary in areas like fairness or political broadcasts, comparative cases, or rate cases."

Present at the luncheon were Commissioners Robert E. Lee and Kenneth Cox.

Circle 145 on Reader Service Card →

# When you care enough to send the very best.

We could tell you that our microwave systems are the world's greatest. But you'd expect us to be partial.

So we'll just give you some facts and let you judge for yourself.

For example, our new 78A for the telephone industry. It's pretty much like everybody else's 960-channel system. Except that the linearity and delay characteristics are so good that it handles 25% more voice channels. That's 1200 on short-haul routes. It's the only baseband system that does.

Or our 75C and new 78J for government applications. They're the only heterodyne and baseband systems of their kind that can handle 600 DCS circuits with 100% data loading.

Then there's our 76 and 78 baseband systems for railroads, electric utilities, pipe lines, and TV. Their noise performance is so good they're even used for transcontinental routes.

It's no coincidence that you'll find Lenkurt microwave systems in AUTOVON, AUTODIN, INTELSAT, and COMSAT networks.

Or that more than 200 commercial, industrial, and government customers are operating more than 600 separate Lenkurt microwave systems in 40 countries. Over a quarter of a million route miles.

There are plenty of "good" microwave systems around. But maybe you're in the market for something more. Call it experience. Call it reputation. Whatever it is, a lot of people think Lenkurt has it.

So if you care enough to send the very best, just tell us your application. We'll do the rest.

Lenkurt Electric Co., Inc., San Carlos, California.

***LENKURT ELECTRIC***  
GENERAL TELEPHONE & ELECTRONICS

## Microwave Systems from Lenkurt

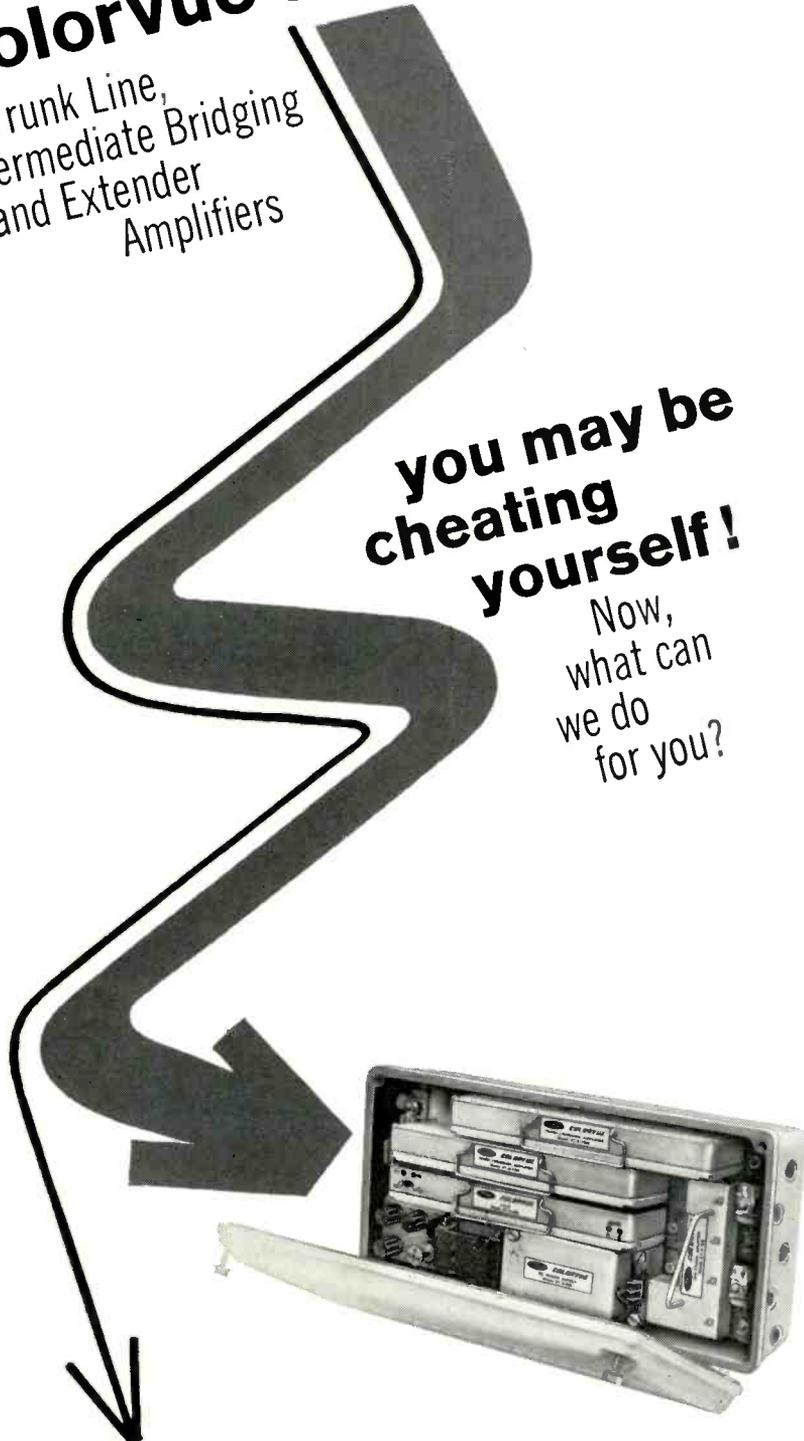


if you haven't investigated **AEL's**  
**colorvue expanded band**

Trunk Line,  
Intermediate Bridging  
and Extender  
Amplifiers

**you may be  
cheating  
yourself!**

Now,  
what can  
we do  
for you?



CATV DIVISION



C-102

**AMERICAN ELECTRONIC LABORATORIES, INC.**  
P.O. Box 552, Lansdale, Pa. 19446 • PHONE: 215 / 822-2929 TWX: 510 / 661-4976

Circle 146 on Reader Service Card

## Management Roundtable

*Continued from page 53*

more helpful if you can tie the achievement in with your station, of course.

- Render a service by showing the prospect an advertising plan that has been used effectively. However, the ideas should come from a distant source, not in direct competition.

- Tell the prospect what you can do to benefit or serve him. Show or play a commercial you have prepared which follows a specific plan tailored to his needs. In some cases, a claim of what he will gain by listening to the sales presentation will get you a solid interview.

### Motivate Interest in Your Prospect

No prospect buys an advertising schedule. What he actually buys is a picture of future business resulting from advertising. In the same way, a salesman must picture the situation he may face when he presents his proposal to the prospect. It is quite important that a salesman be prepared to present a convincing proposal—one that he really believes in. Otherwise, the salesman may visualize a rejection. And as so often happens, when a rejection is visualized, that call is passed up. Such negative visions defeat many before they even get started.

Showmanship is helpful in getting the prospect to visualize his company obtaining benefit from your proposal. If he can't visualize the future benefit, he won't buy. The burden of carrying the prospect's mind through the mental process and creating a desire rests on the salesman. Here are the sales mechanics that can help to do the job:

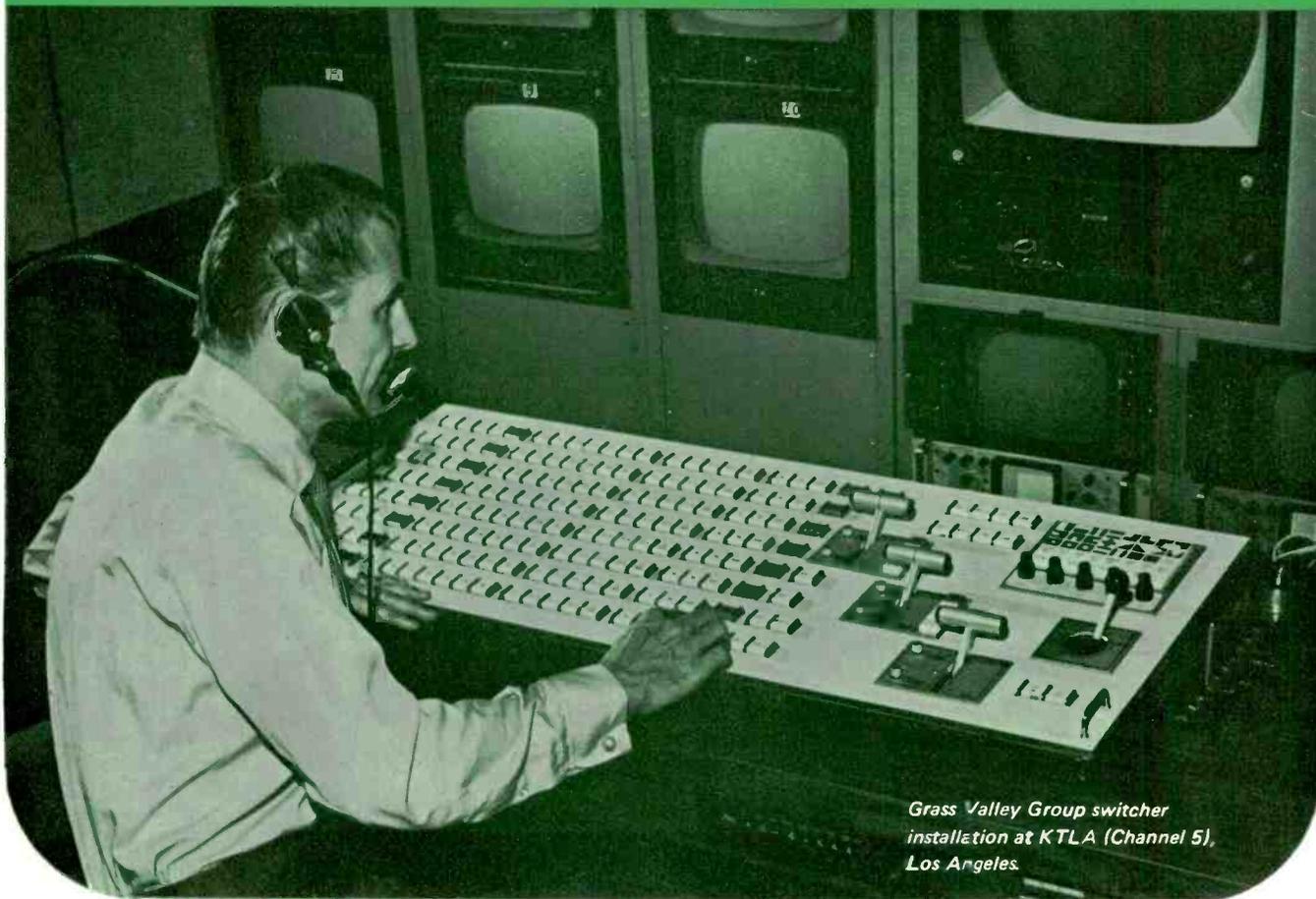
- Visualize the benefit to the customer.
- Transfer the picture from your mind to the prospect's mind.
- Keep the picture in tune with the prospect's buying motives.

Fine-tune the picture in your prospect's mind with the right buying motive. If there is any magic-selling patter, this is it. It verges close on the techniques of the confidence man, who in reality

*Continued on page 76*

# Our best advertisements... are our satisfied customers!\*

\*COMPLETE LIST ON REQUEST



*Grass Valley Group switcher  
installation at KTLA (Channel 5),  
Los Angeles.*

We could spend a lot of money telling you that the Grass Valley Group manufactures the finest production and routing switching systems in the world. We know it's true. But why take our word for it? Ask the people who have them.

On request, we will be happy to send you a complete user list. Not a select few but a total user list. To receive this information, just contact your nearest Gravco Sales office.

Sold exclusively by GRAVCO SALES, INC. Regional Offices:

6515 Sunset Blvd.  
Los Angeles, Calif. 90028  
(213) 462-6618

2626 W. Mockingbird Lane  
Dallas, Texas 75235  
(214) 352-2475

1314 W. Northwest Highway  
Arlington Heights, Ill. 60004  
(312) 394-1344

Station Plaza East  
Great Neck, N. Y. 11021  
(516) 487-1311



## THE GRASS VALLEY GROUP, INC.

P.O. Box 1114 • GRASS VALLEY, CALIFORNIA 95945

Circle 147 on Reader Service Card

# 3-Plumbicon color to Zanesville...from

Broadcasters throughout the country are saying great things about a new camera from IVC. Take for instance WHIZ-TV in Zanesville, Ohio, and KTAL-TV in Shreveport, Louisiana.

They're using a new television camera that delivers superb color — color that is equal to any broadcast camera in use today — yet available at a sensible price. The camera is the IVC-300 "Maverick."

IVC's new three-Plumbicon camera is proving itself both as a front line studio camera and a

"winner" for remotes.

In Zanesville WHIZ-TV General Manager, Bob Hodous, comments:

"We were on the air four times a day with live, half hour presentations from the Muskingum County Fair. The IVC camera was easily remoted to 'capture' the various events and the color was excellent. The importance of this camera is evident in one fact — all 20 program segments were completely sold out."

From Lee Bryant, General Manager of KTAL-TV in Shreveport:

"A quality camera at a reasonable price . . . the IVC-300 is increasing our profits. It has enabled us to offer a wider variety of color programming than ever before and stir-up a great deal of enthusiasm and excitement with our local advertisers."

The IVC-300 weighs only 72 pounds and is easily operated by one man. Pick up of fast action is outstanding. All the sophistications are built-in — Varotal XX 10:1 zoom lens, with local or remote servo driven iris . . . negative registration



# ...from Shreveport studio to remote ...

... four-step gamma correction ...  
filter wheel ... R/G/B sequencer  
... color masking.

The complete IVC-300 system includes tubes, vertical aperture equalizer, intercom, encoder, camera control and junction unit, and 100 feet of camera cable including all interconnecting cables.

Priced complete at \$36,000, the IVC-300 "Maverick" is an ideal combination of three-Plumbicon color, light weight, and high sensitivity.

Let us tell you more about

how the IVC-300 can satisfy your production requirements. IVC sales offices around the U.S. and in Canada are at your service. Interested in demo? Call collect.

In the East phone Jim Landy in White Plains, New York at (914) 761-7820. In the Southwest, Clarence Deal in Dallas at (214) 357-1881 will work with you. In the Southeast call Dick Rex in Atlanta at (404) 633-1462. Midwesterners can phone Coyle Dillon in Des Plaines, Illinois at (312) 297-5160. Jim Jensen in Englewood, Colorado at (303) 761-

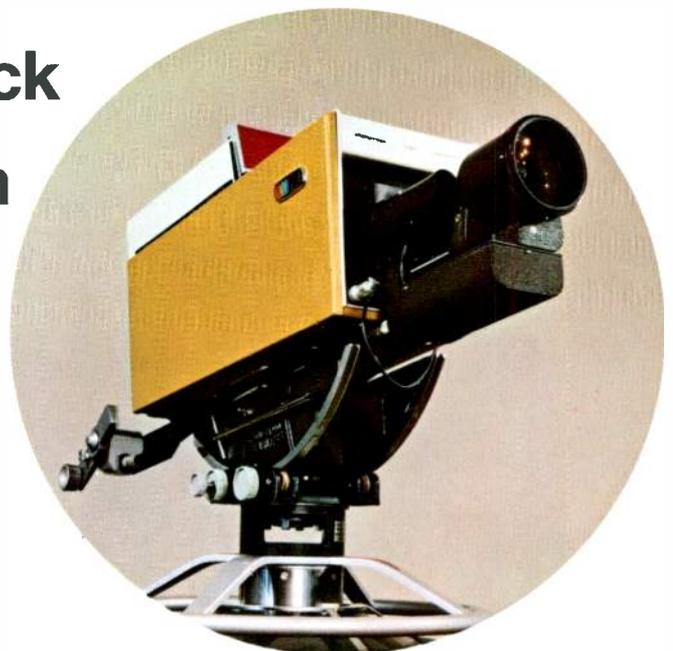
3850 serves the Rocky Mountain area. Dick Reilly in Sunnyvale, California at (408) 738-3900 handles Western sales. Emil Adamyk in Montreal at (514) 636-4480 serves Canada.

IVC has the broadest line of studio and film chain cameras available today. Prices range from \$14,000 to \$76,000.

Last year IVC built and sold more color television cameras than any other manufacturer. Our friends in Shreveport and Zanesville can tell you why.



**the  
Maverick  
makes it  
happen**



Attention TV Stations:

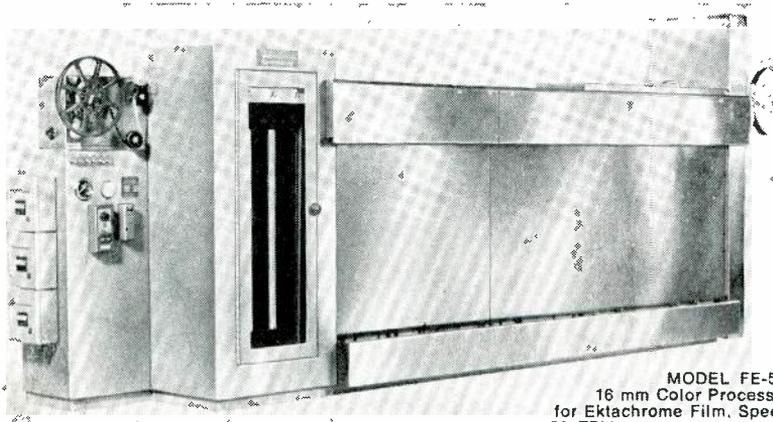
# We've got news for you!

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

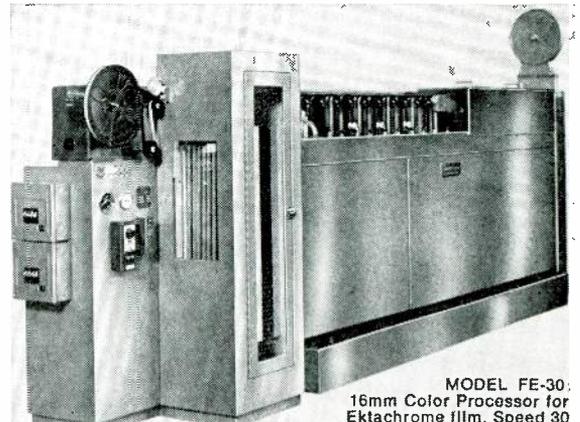
The FILMLINE Models FE-30 and FE-50 are exciting new color film processors designed specifically for use in television station news departments. The design is backed by Filmline's reputation as the world's leading manufacturer of professional film processors for the commercial motion picture laboratory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

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

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



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



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

● **"FILMLINE OVERDRIVE FILM TRANSPORT SYSTEM"**

This marvel of engineering completely eliminates film breakage, pulled perforations, scratches and operator error. The film can be deliberately stalled in the machine without film breakage or significant change of film footage in solutions. The heart of any film processor is the drive system. No other film drive system such as sprocket drive, bottom drive or simple clutch drives with floating lower assemblies can give you the performance capability of the unique Filmline Overdrive Film Transport System.

● **"TORQUE MOTOR TAKE-UP"** gives you constant film take-up and does not impose any stress or strain on the film itself. Completely independent of the film transport system. This FILMLINE feature is usually found in professional commercial processors but is incorporated on the FE-30 and

FE-50 models as standard equipment. Don't settle for less!

● **"TEMP-GUARD"** positive temperature control system. Completely transistorized circuitry insures temperature control to well within processing tolerances. Temp-Guard controls temperatures accurately and without the problems of other systems of lesser sophistication.

● **"TURBO-FLOW"** impingement dryer. Shortens dry-to-dry time, improves film results, and carefully controls humidity content of your valuable (and sometimes rare) originals. Immediate projection capability is assured because the film dries flat without the usual curl associated with other film processors.

● **"ZERO DOWN TIME"** The reputation of any film processor is only as good as its reliability. The

combination of the exclusive and special added Filmline features guarantees trouble-free operation with absolute minimum down-time and without continual operator adjustments. Recapture your original investment in 2 years on maintenance savings alone. Filmline's "Push the button and walk-away processing" allows inexperienced operators to turn out highest quality film.

● **"MATERIALS, CONSTRUCTION AND DESIGN"** All Filmline machines are constructed entirely of metal and tanks are type 316 stainless steel, heliarc welded to government specifications. The finest components available are used and rigid quality control standards are maintained.

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

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

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

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

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

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



Send for Literature.  
BMN-69  
Time & Lease  
Plans Available.

**"When you buy quality Filmline Costs Less"**

Circle 152 on Reader Service Card

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

## Management Roundtable

Continued from page 76

prospect will realize from the advertising schedule.

The technique used to transfer the picture from one mind to another is to describe the picture in terms of the senses. This is called *concrete* language, and the more senses appealed to the more concrete the language. Therefore, the main job in selling is to put ideas in the prospect's mind and keep opposed ideas from arising. You can capitalize on this type of motivation by getting pictures in your mind, then transferring them to the prospect's mind by describing the scene in terms of seeing, hearing, smelling, tasting, etc. Remember: in this step you do not describe broadcast advertising as such; rather you describe what broadcast advertising can *do* for the prospect.

The next step is to fine-tune the picture by appealing to the right buying motive, an inner force or urge that causes the prospect to do something. A salesman can be most persuasive if he can locate the right (or dominant) motive for each prospect. Here are several principal motives: self-preserva-

tion; desire for gain; desire for prestige; fear of undesirable consequences; vanity; ambition; bargaining instinct, etc. Knowing what a prospect wants or needs is important, but even more important is knowing *why* he wants it. Therefore, it is vital to ascertain as quickly as possible the dominant motive of each prospect and then develop your proposal to appeal to that motive.

### Change Suspects into Prospects

The broadcast advertising salesman is usually surrounded by potential clients. So his first task is to isolate one or two from the mass. This is often called prospecting, but it is really *suspecting* until you finally learn something of the firm that makes them a prospect. How can a salesman accumulate data about potential advertisers? The surest way is to maintain a general awareness by keeping your eyes and ears open and picking up what you can through contacts with clubs, organizations, telephone directories, etc. A salesman should be constantly aware of what is going on in his territory, the

changes, the new buildings, and he should secure a number of prospects through his contacts. This means work, but it saves time and prevents frustration by aiming your sights on the most likely prospects in the multitude of suspects. Doing a good job of suspecting often bridges into the next step of turning the suspect into a prospect. Of course, there are cases where it is impossible to learn absolutely whether a suspect is a prospect without an actual visit, but careful analysis will hold these to a minimum.

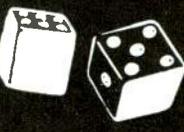
Many salesmen tend to forget, and need to be constantly reminded of even the most simple and obvious parts of the selling picture. What they know about the prospect influences their approach and every other aspect of the sales presentation. It is impossible to talk intelligently to the suspect until you know what he wants or needs.

Part 2 of this series will suggest ways to get the prospect to believe in your product, and will demonstrate how to use showmanship, overcome objections, and help the prospect reach a decision—a favorable decision for you. **BM/E**

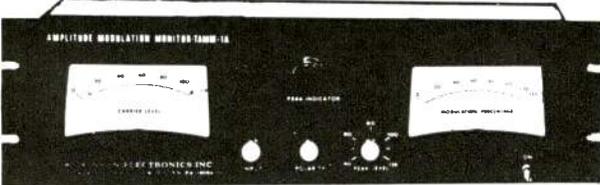


# DONT BET YOUR LICENSE ON OLD MONITORS

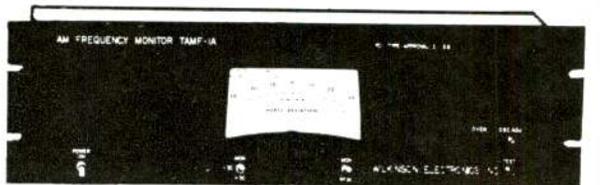
# PASS FOR SURE WITH WILKINSON



## SOLID STATE AM FREQUENCY AND MODULATION MONITORS



**TAMM-1A MODULATION MONITOR FCC APPROVAL 3-156**  
Uses 5-1/4" Rack Space, Wgt. 11 lbs., RF Range .1-30MHZ  
Measures Pos or Neg Peaks • Equally precise remote or local  
Built-in demodulator provides two audio outputs • Audio  
Response 30HZ-45KHZ 1/2 db. • Distortion .25%



**TAMF FREQUENCY MONITOR FCC APPROVAL 3-158**  
Uses 5-1/4" Rack Space • Requires only 15 watts  
Calibrates and tests itself • Instant operation • Approved  
for modulated RF input and remote use • Engineered for  
digital read-out adaptation



**WILKINSON**  
ELECTRONICS, INC.

**NEW AS TOMORROW - SURE AS TODAY**  
1937 MacDADE BLVD. • WOODLYN, PA. 19094  
TELEPHONE (215) 874-5236

Circle 153 on Reader Service Card

## ITFS

Continued from page 46

refractivity, the table below shows the percentages of time that the K factor can be expected to be exceeded.

K Factor	Per Cent of Time K Factor is Exceeded
0.7	99.0
0.8	98.4
0.9	96.5
1.0	94.0
1.3	50.0
2.0	12.0
3.0	6.0
5.0	4.0

Thus, for example, with tower heights of approximately 95 feet and  $K=2$ , radio wave line-of-sight interference could be encountered 12 per cent of the time at receivers 35 miles away from the interfering transmitter. This is too much interference for a quality ITFS system. It can easily be seen from this analysis that higher towers increase the problem.

A combination of steps can be taken to reduce this frequency of interference, the specific ones

depending upon the local situation.

Careful siting of the transmitters is the most effective way. Locating transmitters on high ground helps. Best spot is preferably along a ridge perpendicular to a line between interfering stations. This takes advantage of natural earth shadowing effects.

Other steps that help reduce interference are (1) use of transmitting antennas of minimum height adequate for effective local coverage, (2) use of receiving antennas of minimum height adequate for reliable reception from transmitters and (3) use of transmitting antennas with shaped-beam patterns.

Thus, skilled engineering in planning an ITFS system can pay off handsomely in conservation of channels and in prevention of interference.

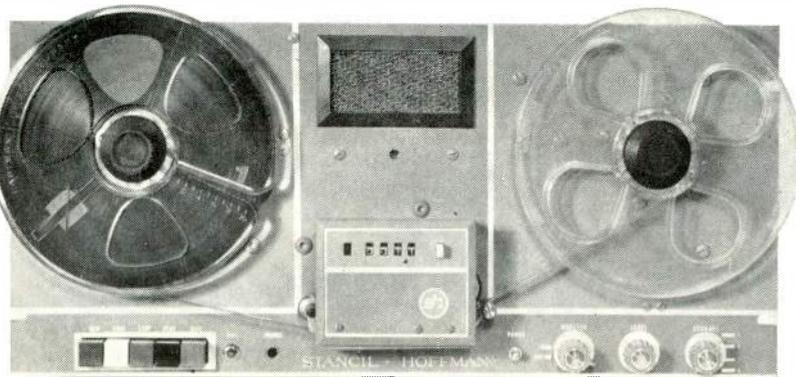
Where frequency-sharing repeaters are used, short-cut system designing cannot be tolerated. Tower heights for each transmitter must be determined accurately as based on a complete engineering survey, as opposed to a few quick checks, plus a 10 or 15 per cent safety margin added to the tower height. That method might assure local coverage but could easily double the chances of co-channel interference into other channel-sharing areas.

Skilled engineering will avoid such a problem as well as keep initial installation costs at a minimum consistent with quality reception. **BM/E**

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### 24 HR. 4 TRACK RECORDER



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

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PRECISION  
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WORLD'S FINEST  
PROFESSIONAL  
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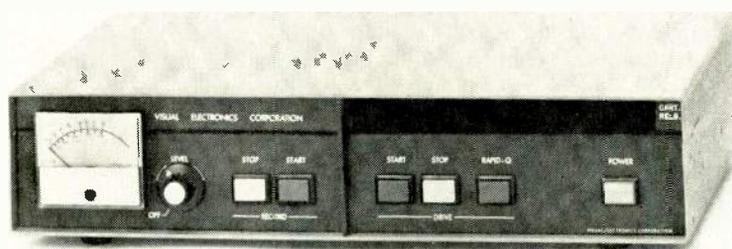
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Circle 155 on Reader Service Card

November, 1969—BM/E

## the end of the pregnant pause



The Rapid-Q cartridge tape unit: It has done away with the corpulent chunk of time that lays there between the end of one recorded message and the beginning of the next.

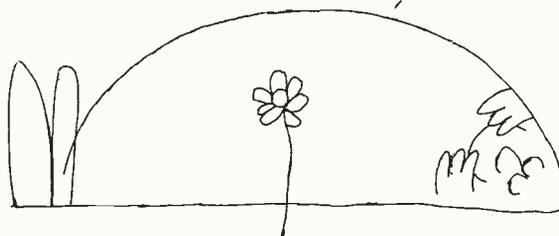
Rapid-Q, in fact, gets there better than 100% faster. Automatically. Without relays, mechanical engagements, switching, or fat packages. And it always stays very cool.

The quick and the slim also has a few more firsts going for you: Like doing

all of this for the price of most inexpensive tape units . . . while sacrificing nothing in playback quality, versatility, and reliability.

And it comes ready for rack mounting or desk-top operation. It can even be remoted.

To find out how Rapid-Q can keep the pregnant pause off your station's signal, write **Visual Electronics Corporation**, 356 West 40th Street, New York, N.Y. 10018. Or call your local Visual representative today.



Circle 156 on Reader Service Card

# FCC ACTIONS

The FCC has filed a petition with the U.S. Court of Appeals and has had the petition denied. The Commission was petitioning for a rehearing in the WLBT (TV) case (written by District Justice Warren E. Burger), in which the Court reversed the FCC's decision renewing the station's license (see *BM/E*, August, 1969, pp. 6, 8). WLBT's petition for rehearing was also turned down by the Appeals Court.

**Forfeiture of \$2500** for repeated violation of its authorization terms and of amended Section 73.87 of the Rules about operation hours, has been asked of Kiro Inc., licensee of station KIRO, Seattle, Washington.

**Construction permit granted** BCU-TV, Battle Creek, Mich., for TV station to operate on channel 41, has been cancelled, its application for construction time extension

has been dismissed, its call letters have been deleted and BCU-TV applications for assignment of the permit to West Michigan Telecasters Inc. (licensee of WZZM-TV, Grand Rapids), has been returned as unacceptable for filing.

**Application** for assignment of WIBG, Philadelphia, license from Seaboard Radio Broadcasting Corporation (wholly owned subsidiary of Storer Broadcasting Company) to Buckley Broadcasting Corporation of California, has been granted. Purchase was \$5,700,000.

**Fairness doctrine complaints** filed against ABC and Television Members of the NAB by Anthony R. Martin-Trigona of Champaign, Ill., have been denied. Martin-Trigona had charged ABC O&O station WLS, Chicago, with refusing his request to broadcast opposing views to Red Skelton's recording, "Pledge of Allegiance," which was made first on Skelton's WLS(TV) program.

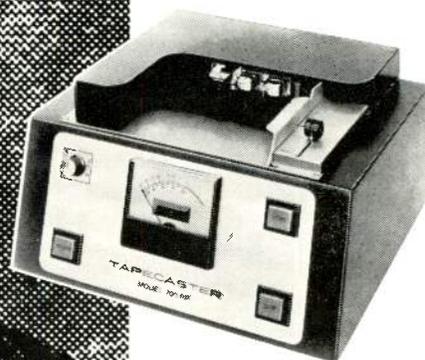
**Application** by Midwestern Broadcasting Company for a new commercial TV station to operate on channel 60, Toledo, Ohio, has been

granted, as well as Midwestern's request to locate the main studio at Oregon, Ohio,—outside the main community—at the studio site of its a-m station, WOHO.

**Application** for voluntary transfer of control of WJOI Radio Inc., licensee of WJOI-AM and WQLT-FM, Florence, Alabama, from Cecil Batchelor and Claude E. Sparks to Seven Points Investment Company, has been granted. Consideration was \$141,523.23, with \$29,000 in cash for present owners. The buyer assumed former owner's long term debt of about \$71,959.28.

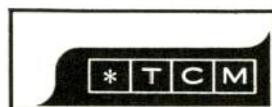
**Forfeiture** of \$7500 has been asked of International Broadcasting Corporation, Rio Piedras, Puerto Rico, licensee of radio station wvoz, Carolina, Puerto Rico, for "repeated failure to observe terms of its station authorization and of provisions of sections" that concern modulation.

**Petition** of Mutual Broadcasting System asking reconsideration of an authorization that ABC continue to operate four radio net-



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wanted it that way...*

We think the inventor of the radio would have liked the TAPECASTER cartridge machine. We were a little too late to get Marconi's opinion, but what really matters is what our customers think of it and they like it.



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Box 662 — 12326 Wilkins Avenue, Rockville, Maryland 20851  
Phone: 942-6666 Area code 301

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works, has been denied; also turned down was a request that the Commission rescind a waiver granted to ABC. Mutual alleged that the FCC had reversed its position on specifying that there be no group sales or common rates established for the multiple networks, that each network be sold separately under its individual rate card and that no internetwork discounts be permitted.

**CP has been given** to RKO General Inc., licensee of WHCT-TV, Hartford, Conn., for 100-W, uhf TV translator station to serve Hamden, Conn., on output channel 83 by rebroadcasting WHCT-TV programs. Vying petition of Connecticut Television (licensee of WHNB-TV, New Britain, Conn.) for denial of RKO's application has been denied.

**Further action** by the American, Columbia and National broadcasting companies is not warranted, according to the Commission, following the networks' submission of reports in response to complaints of alleged staging of news events during coverage of the Democratic

National Convention in Chicago in August, 1968.

**Petitions** by the Citizens Committee to save WFMT, Chicago, asking withdrawal of WGN Continental Fm Company's temporary authority to operate the fm station and asking that the record be held open until completion of FCC investigations of allegations about WGN Continental Broadcasting-controlled station WPIX-TV, New York, N.Y., have been denied. A motion filed by Lorraine Perman, Harry Booth and others supporting the Citizens Committee petition and asking that another hearing examiner be assigned to the WFMT hearing, has also been denied.

**Requests for waivers** of the 50 percent a-m, fm nonduplication rule by licensees of WHOM-FM and WEVD-FM, New York, N.Y., and WFLN-FM, Philadelphia, have been denied and the stations have been given until Dec. 31, 1969, to bring their operations into compliance. Each station presently duplicates all a-m programming on its fm facilities in the same city under waivers granted in the March 9,

1966, order—*A-m-Fm Program Duplication*, 2 FCC 2d 833.

**Applications** of Iowa State University of Science and Technology, Ames, Iowa, licensee of Ames' educational standard broadcast station WOI, for extension of its special service authorization and for regular authority to operate with 1 kW power from 6 a.m. local time until local sunrise, have been denied.

**Petition** by Mission Cable TV Inc., holder of CATV franchises in San Diego, Calif., asking reconsideration of an order dismissing Mission's petition against renewal of KFMB-TV, San Diego, license, has been denied.

**Petition** by Boone Biblical College, licensee of station KFGQ-FM, Boone, Iowa, for reconsideration of Commission's action of Jan. 15, 1969, of returning Boone's application and denying a request for waiver of the mileage separation requirements of Section 73.207(a), has been denied and its application has been returned.

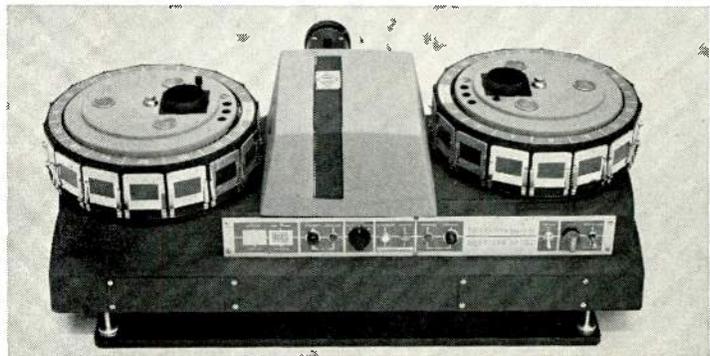
## 2x2 slide projectors for the television film chain

by **SELECTROSLIDE**

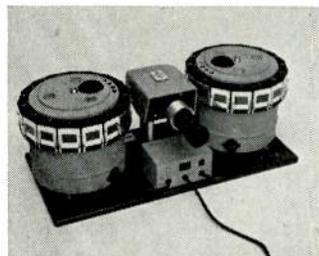
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## D. J.'s... Combo-Men... Station Managers... Technical Assistants... Want to move up faster in Broadcasting?

### Get yourself a First Class FCC License the CIE way!

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If you're a D.J. or Combo-Man looking for a better job and a chance to make a name for yourself—you'll find it's easier to get the spot you want at the station of your choice if you can say that you also have a First Class Ticket. Ask around and see.

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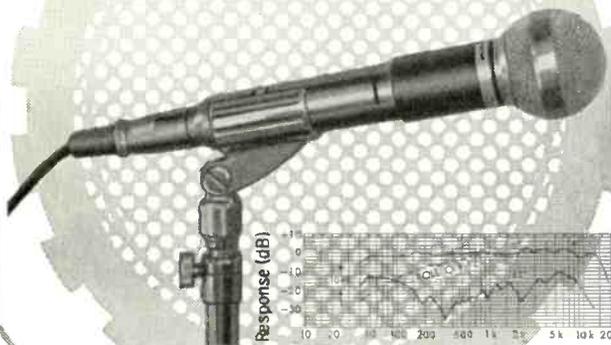
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Major cartridge users are running the MARATHON. They're under constant tension, and they love it. In every detail of design and performance, MARATHON cartridges demonstrate quality which assures MARATHON performance. Can we send you complete engineering specifications and prices today?

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**Built by perfectionists  
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Model Benfeed — a high grain, low distortion CATV amplifier with four-stage transistor construction. Ideal for sub-trunk, trunk, feeder or distribution line.



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### VIDEO TAPE ENGINEER

Professional Video-Tape Engineer: immediate opening for applicant with strong professional supervisory background in maintenance and operation of video tape and sound recording equipment. Modern, new facilities at large 4A Advertising Agency, New York City location.

Salary commensurate with education and experience; probably \$17-20,000 range.

Send resume to Box 1169-8 c/o BM/E, Blue Ridge Summit, Pa. 17214.

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Gravco Sales, Inc. is looking for the right man to head the Atlanta Sales Office. Sales experience is desired but Broadcast Engineering qualifications are essential. Gravco Sales, a subsidiary of The Grass Valley Group, Inc., is offering this opportunity to the person who wants to become a member of a progressive National Sales organization. Send qualifications to: R. N. Lawrence, Gravco Sales, Inc., 6515 Sunset Blvd., Hollywood, Calif. 90028.

News Director for strong local news operation. Take charge of smooth functioning local news bureau. Above average pay for man unafraid of hard work with ability to gather, write and deliver local news. Opportunity for play-by-play sports, WCOJ, Coatesville, Pa. (215) 384-2100.

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Field service engineers, full or part time openings throughout U.S. enable you to share in exciting new Automation generation. Write L. Wortman, Schafer Electronics, 9119 De Soto Ave., Chatsworth, Calif. 91311.

Southeastern AM-FM-TV station offers above average salaries for experienced engineers. First class licenses necessary. Must have TV experience, AM-FM experience desired. Reply must be complete with references, photograph and salary requirement. Reply Box 1169-5 BM/E.

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Wanted: Engineers with FCC first class license. Only technically experienced need reply. Fully colorized station operation. AMPEX, GE and Norelco equipment. Excellent pay and benefits. Send resume to C. Iannucci, C. E., WNHC, 135 College St., New Haven, Conn. 06510.

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KWWL-AM-FM-TV, Waterloo, Iowa is expanding its engineering staff. Position is available at both studio and transmitter for 1st Class engineer having aptitude in the area of operations or maintenance. Contact E. M. Tink, Vice President of Engineering.

First Class licensed technician strong on maintenance for 10 Kw stereo station. Send resume and salary required to Mr. Patrick, WCLV, Penthouse East, Terminal Tower, Cleveland, Ohio 44113.

### POSITION ANNOUNCEMENT #2

Assistant TV Engineer—New southern university CCTV, kinescope and soon FM radio facility. 1st Phone and VTR experience required. Send resume. 1169-6 BM/E

Due to expanded operation of new broadcast center being constructed, we have immediate openings for licensed engineers. Salary commensurate with experience. Send resume: Director of Engineering, KETC-TV, 6996 Millbrook Blvd., St. Louis, Missouri, 63130.

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#1 engineer for Pennsylvania CATV. Get in on ground floor of expanding operation. Box 1169-9, c/o BM/E, Blue Ridge Summit, Pa. 17214.

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Broadcast Engineer presently employed by major network. Five years color operations, maintenance and system experience. First Class Radio Telephone. Seeks position South-Midwest, Southwest commercial or educational station. Complete resume and details upon request. Box 1169-3 BM/E.

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SOLID-STATE AUDIO PLUG-IN OCTAL (1 1/2" Dia x 2" H) modules. Mic preamps, disc & tape preamp-equalizers, tape bias osc. & record ampl., power amps & power supplies. Send for free catalog and audio applications. Opamp Labs., 172 So. Alta Vista Blvd., Los Angeles, California 90036.

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ONAN 35Kw 3 phase Delta with 220/120 single phase takeoff. Gasoline powered, 150 hours running time, 1958 model. Generator, automatic line transfer switch, automatic battery charger. \$2,000 F.O.B. Farmington, Connecticut.

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203-677-8521

2" Helical VTR—Ampex VR-660. Low mileage, mint condition. Call collect (716) 732-2100.

Rust #108 Studio-Transmitter remote control units \$400.00. 24-position type. Moved transmitter—using microwave. KUTE Radio, Los Angeles, Calif. 90015.

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Ampex 300, 350, 352, 400, 450 users, for greater S/N ratio, replace first playback stage 12SJ7 with our plug-in transistor preamp. For specifications write VIF INTERNATIONAL, PO Box 1555, Mtn. View, Ca. 94040.

TRANSLATOR POWER Now put your translator where antenna should be for best coverage not where power line happens to be. Use a TELAN thermoelectric generator. No moving parts, simple to operate, leave unattended 6-12 months. General Instrument Corp., Thermoelectric Division, Dept. BM, 65 Gouverneur St., Newark, N.J. 07104, 201-485-2100 ext. 481.

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Visual 6000 TV Automation system-true time and elapsed time switching, 12 pre-rolls 2-punch tape readers, one tape punch-audio switcher for mixes and audio follow. Unit in service and can be seen by appointment. Also —GE PF 10-16 mm continuous motion TV projector; GE TV86 optical multiplexer; GE PE21 vidicon film chain. John Neeck, WPIX, 220 E. 42nd St., New York, N.Y.

SCULLY TAPE RECORDERS: Mono., 2, 4, 8, 12, & 16 track models plus 270 automatic players. Some models in stock now. W.A.L. custom audio control consoles & console modules. Solid state 120 Watt power Amps. We buy and rebuild Scully lathes. WIEGAND AUDIO LABORATORIES, INC. 3402 Windsor Road, Wall, N.J. 07719. Phone 201/681-6443.

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AUTOMATION SYSTEM IN GOOD CONDITION WANTED. TERMS DESIRED. 1169-7 BM/E, Blue Ridge Summit, Pa. 17214.

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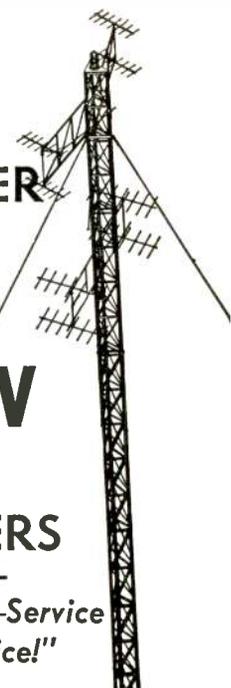
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# FROM THE EDITOR

## ITV: Integral Rather Than Supplemental?

The cost of public education has exceeded the taxability of property owners and our schools are in trouble. About 80 percent of any school budget is for teacher salaries, and the situation is worsening. Teacher productivity has not risen over the years and cost per student hour of instruction has gone up. Could ITV reverse this trend?

It won't happen, not with the way ITV is now being used. Below the college level, the addition of ITV facilities *increases* the annual cost of education per student. The only argument for the medium in elementary and secondary schools is that it improves the quality of education—for a few pennies, it enriches the learning experience.

We don't wish to denigrate the contribution that ITV has made so far. TV has made it possible for ghetto kids to learn that milk comes from cows and not stores and, when the camera has been directed not on cows but on the ghetto itself, the medium has helped explain to middle-class whites the frustration and anger that so often inflames the inner city inhabitant. TV as the "now" medium can bring about understanding. But, as a means for lowering the cost of education, ITV is a failure that nobody seems to be concerned about.

The major thrust in educational research today is toward IPI (individually prescribed instruction). There are two great hopes for IPI: *one*, that each individual will more nearly be able to fulfill his potential as a result of individualization, and *two*, the teacher will become more effective as a director of learning rather than as a fount of all knowledge.

Right now the average teacher spends 85 percent of the classroom hour talking. This method of dispensing cognitive knowledge is inefficient. There are numerous other media available that are faster and more efficient. Sometimes TV is that ideal medium. It would thus seem logical that ITV leaders should be heavily engaged in efforts to determine how and when ITV could best service IPI. This means helping to set instructional objectives so that the TV medium is used when it is the most logical choice. ITV should become an integral, rather than a supplemental, part of the curriculum. It appears instead that the ITV establishment has decided that it will not gain acceptance except as an enrichment resource.

This attitude does nothing to help reduce the cost of instruction—a crucial factor in this year of wholesale taxpayer revolts with new school budgets as the primary targets. ITV should not be outside the curriculum-planning core. That may be its proper place when it's used ineffectively. Used well, ITV can make a major impact on both the quality and cost of education.

James A. Lippke  
Editor

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