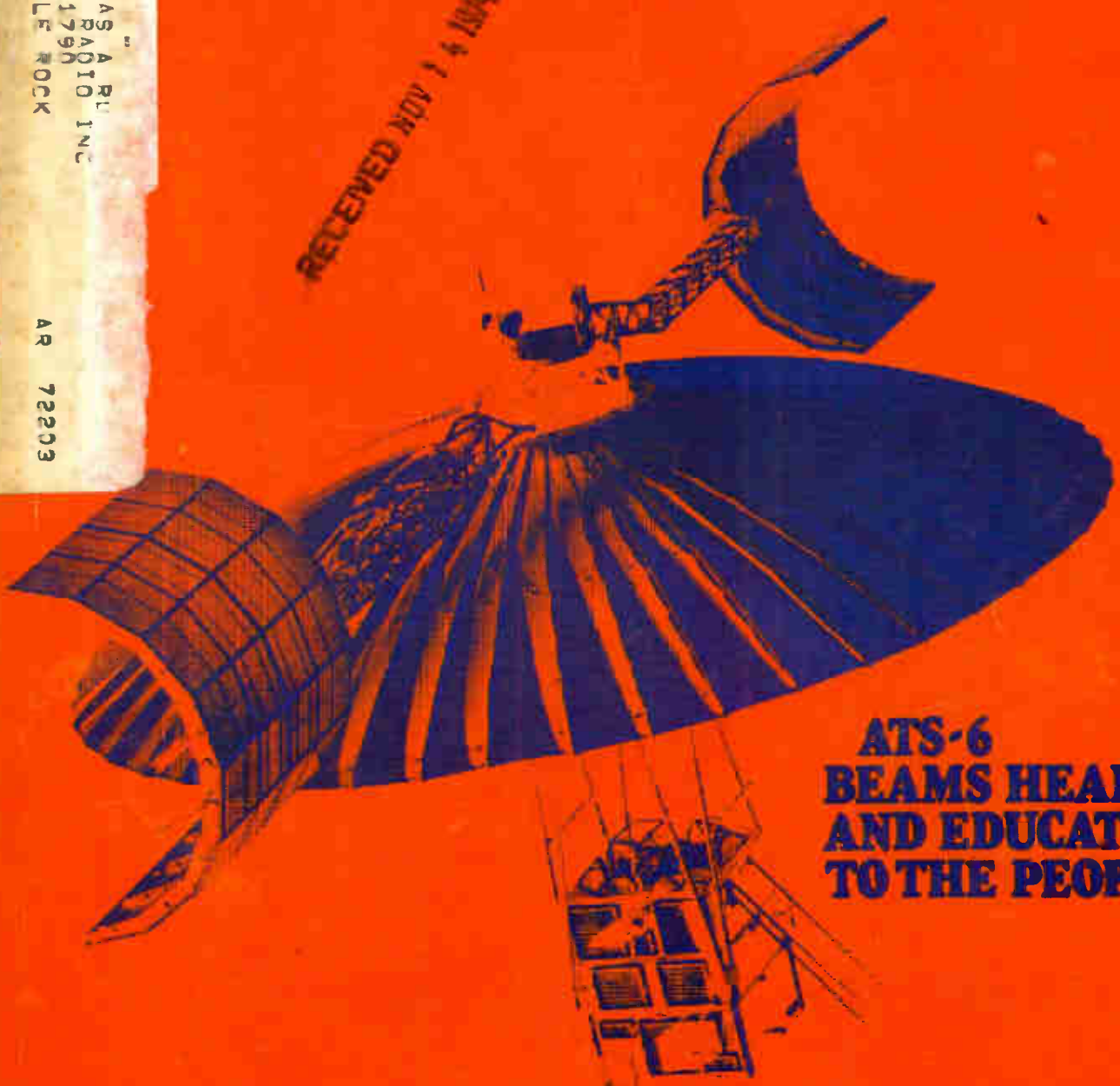
BM/E

BROADCAST MANAGEMENT/ENGINEERING



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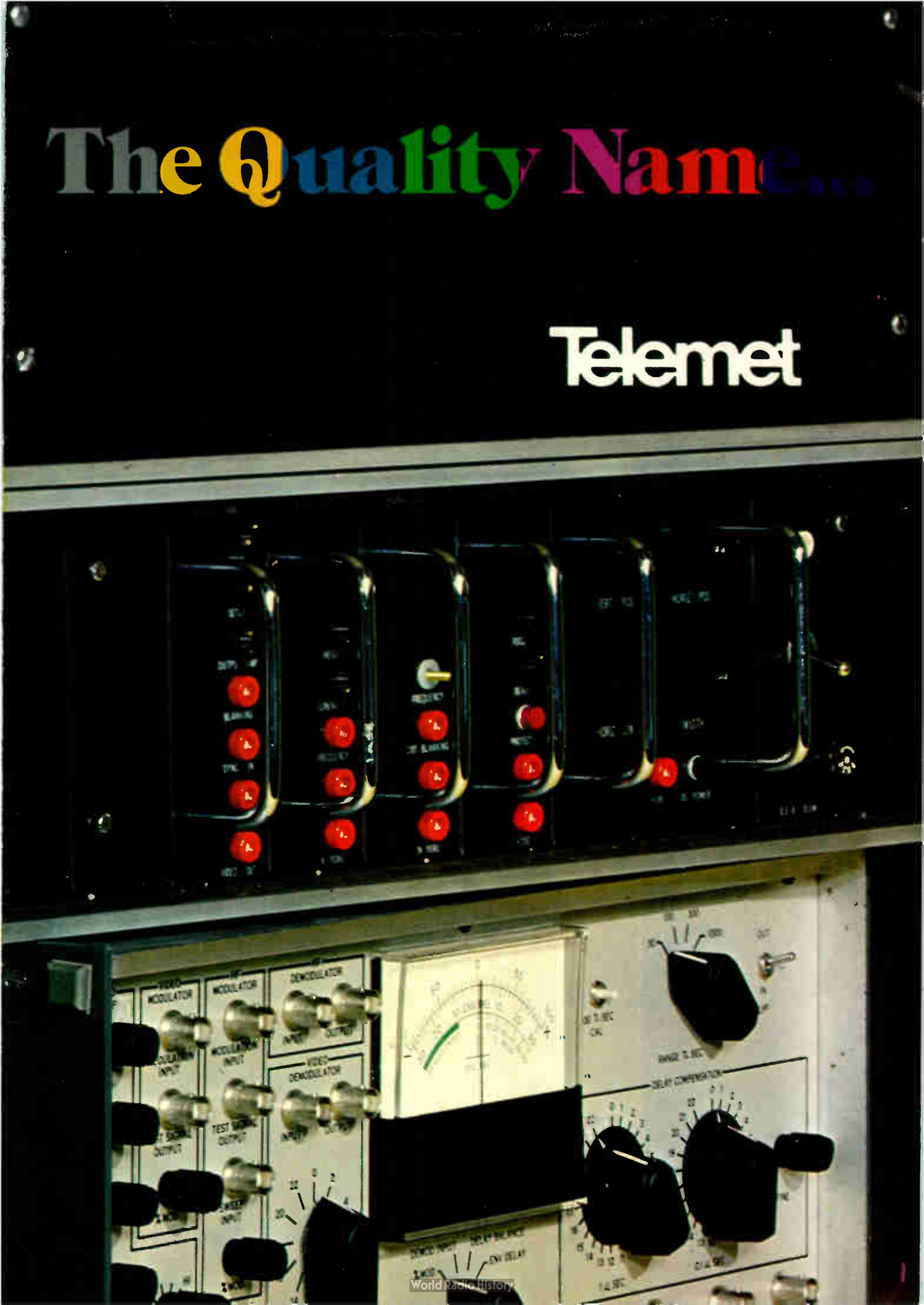

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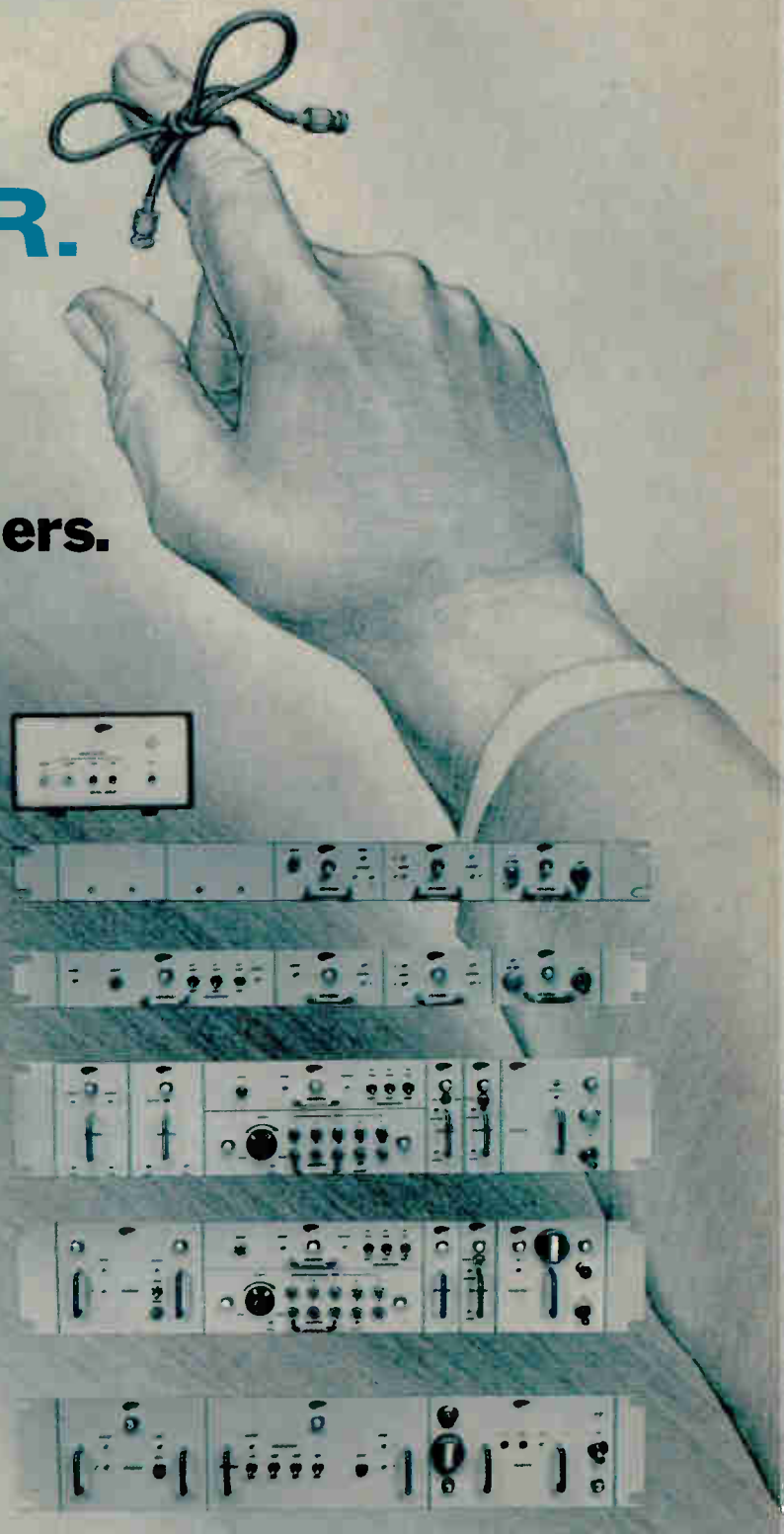

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BM/E
BROADCAST MANAGEMENT/ENGINEERING

The ATS-6 Satellite launched in May is now being used for a variety of educational and health demonstrations. See article page 30.

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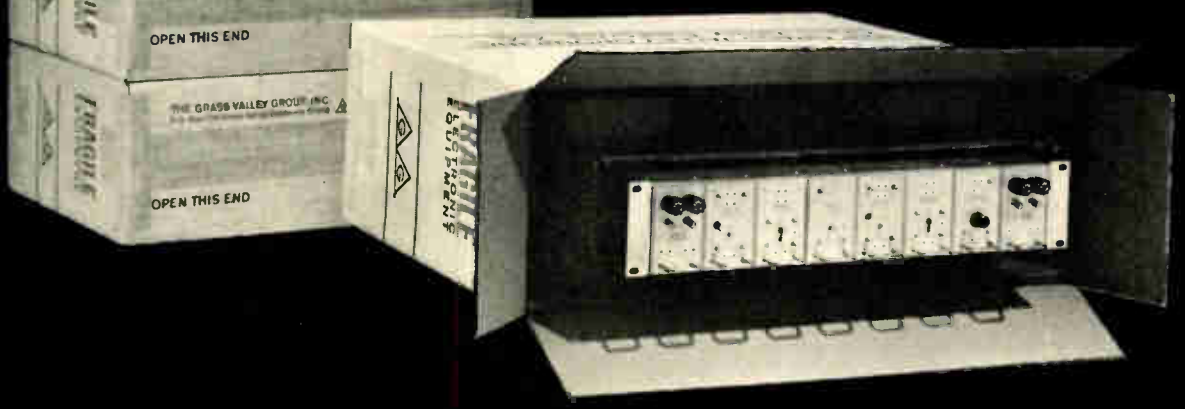

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BROADCAST INDUSTRY NEWS

Wiley Rejects "Sweeping Divestiture" Order, Predicts Action in Some Cases

In what appears to be an important clue to the Federal Communication Commission thinking on the hotly-contested cross-ownership rule-making now under way, Chairman Richard E. Wiley, in a mid-September speech, said his "personal" opinion was against a "sweeping disvetiture order" that would cause widespread disruption in the industry.

Addressing the International Radio and Television Society in New York, Mr. Wiley said that FCC decisions on general cross-ownership policy, under Docket 18110, were close to resolution, and promised official action in "this most difficult matter" by the end of the calendar year.

Although rejecting blanket divestiture at this time, Mr. Wiley strongly endorsed the principle of preventing undue concentration of media control in one community, and said that FCC studies indicated there were some communities in which divestiture would be in the public interest and would be ordered. Despite the Fairness Doctrine and other protections, cited by the NAB as making divestiture unnecessary, Wiley maintained that these cases presented "... an acute danger that the multi-media owner will dominate the marketplace of ideas and opinions in that community."

But he added: "Divestitures does not mean forfeiture," and he promised that licensees would be given a reasonable perios—probably five years—to dispose of their holdings, and would have ample opportunity to present evidence against the order. He also said he was not against newspaper ownership of broadcast stations in separate communities: "... if you are the New York Times, (buy your station) in Memphis and not Manhattan."

Mr. Wiley promised FCC action within "my first year in office" on a number of other issues: the Fairness Doctrine, the Prime-Time Access Rule, Children's Television, Pay Television and Pay Cable. He noted that license renewal policy was not on his list because he had decided to wait the outcome of Congressional activity on that issue.

ABC Buys 13 Frame Sync Units From TeleMation

TeleMation, Inc., announced the sale to the American Broadcasting Company of 13 of the NEC FS-10B Frame Synchronizers, introduced at the NAB exhibit in Houston last March. Five will be delivered in early 1975, and one important application will be in network news and sports coverage.

The unit brings remotely-originated TV signals into sync with studio reference. Ac complete frame of video information is stored digitally, and read out in step with local sync. This allows switching between local and remote signals with no sync discrepancies or signal degradation.

The synchronizer is made by Nippon Electric Company in Japan. TeleMation is the exclusive U.S. distributor.

Pictured above (from left to right) are Julius Barathan, VP in charge of Broadcast Operations & Engineering, ABC, Vern A. Pearson, National Broadcast Sales Manager, TeleMation, Inc., R. L. Pointer, Director of Broadcast Engineering, ABC, Saburo Oyama of the Board and Chief Executive Officer, NEC America, Inc.

Rising Productivity Answer To Inflation, Says Sarnoff

In an address to the 30th International Convention of the International Brotherhood of Electrical Workers, Robert W. Sarnoff, chairman of RCA, said that greater productivity is the most direct route to new and better products, less inflation, and more jobs. He also said that many foreign manufacturing operations of domestic companies are now "more costly and less efficient than manufacturing at home," so that in some cases American companies will return manufacturing to this country. However, he pointed out that large-scale industry is now world-wide, and "... if we fail to compete effectively anywhere, we risk losing ground everywhere .... we have our work cut out for us to develop the potential of technology to help us deal with our long range problems and opportunities."

Foster Hails Copyright Bill, Deletion of Sports Blackout

David Foster, president of the Na-

continued on page 8

Strangely Enough, At This Years's NAEB Show We're Most Excited About Something We Don't Even Make

It's the new ⅔" Plumbicon* tube that will be at the heart of our advanced Hitachi-Shibaden FPC 1000P 3-tube color camera.

The Plumbicon design is famous for producing remarkably faithful images comparable to broadcast quality. And combining the new Plumbicon tube with our superb FPC 1000B camera will result in what we honestly believe to be the finest color camera in its price class. This new instrument will become a proud addition to the precision line of Hitachi-Shibaden video equipment that also includes our popular FP 1212 1" Plumbicon camera.

Come see the first and only color camera ever available with ⅔" Plumbicon tubes at the Hitachi-Shibaden booth (#16) at the NAEB show in Las Vegas. Or send in the coupon for complete details.

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NEWS

tional Cable Television Association, praised the action of the U.S. Senate in approving a copyright revision bill with provisions for cable television. "We are particularly pleased that the Senate saw fit to (reject) the controversial CATV sports blackout amendment," he said. "That action is a victory for the millions of Americans who receive their sports programming via CATV."

CPB Committee To Study "State of the Art"

A Committee on New Technology, appointed by James R. Killian, board chairman of the Corporation for Public Broadcasting, establishes ". . . a clear priority to apply new technology to improve communication services to the public," according to a CPB announcement. Dr. Killian named Neal B. Freeman, vice president of King Features Syndicate, chairman of the Committee, and Michael A. Gammino as a member. Mr. Freeman said: "We are in the business of providing broad educational services and we have the duty to match up those services with whatever technological means seems best suited to the task. . . . Clearly our first attention must be to cable and satellite, . . . we will begin our work at once."

SMPTE Toronto Conference Will Cover Many TV Topics

Plans for the 116th Technical Conference of the Society of Motion Picture and Television Engineers, scheduled for the Four Seasons Hotel in Toronto November 10-BJth, include sessions on television systems and on television film. A day long symposium will consider tv monitoring, emphasizing the needs of various groups for proof of performance (ad agencies, advertisers, etc). There will also be sessions on tv lighting, on satellites in broadcasting (with live demonstration of transmission from a NASA satellite) and on cable television, among many others. There will be an exhibit by equipment manufacturers; forty-one had signed up by mid-September, including eight Canadians. Info: SMPTE, 862 Scarsdale Avenue, Scarsdale, NY., (914-472-6606).

FCC Affirms Order To Bell To Serve Domsat Firms

Acting on a petition of the American Satellite Corporation, the Feder-

continued on page 12

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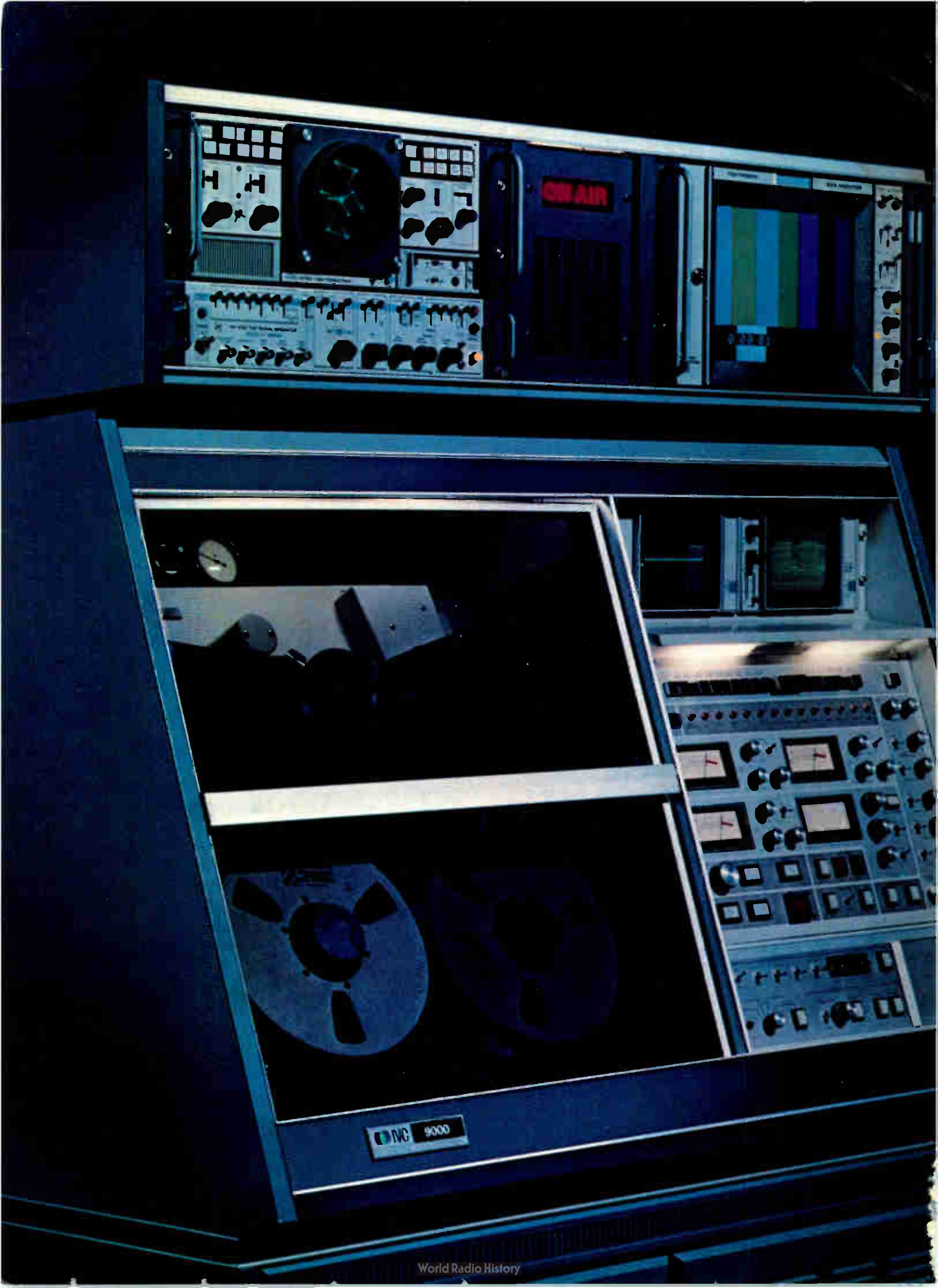

INTRODUCING THE NEW ECONOMICS OF BROADCAST TELEVISION... AND A PRODUCT LINE THAT BREAKS WITH TRADITION

Here are two important new broadcast television products that make sense for today and the years ahead. They are the result of fresh creative thinking and the belief that today's broadcast environment demands a substantial reduction in equipment operating costs, lower initial purchase price—*plus* performance that exceeds the best the industry has known. The IVC-9000 Broadcast Videotape Recorder accomplishes these goals by challenging and surpassing existing quad concepts. The IVC-7000 Camera offers performance that equals or exceeds that of the best cameras now in use yet at a mid-range camera price.

That's what we mean by "the new economics." Let us help you break with tradition.

Changing the Picture in Broadcast Television

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al Communications Commission early in September strongly affirmed its order of some six months earlier that AT&T and the Bell companies must supply interconnection service to domestic satellite common carriers. The FCC statement said that the original order constituted a "firm obligation to interconnect with domestic satellite carriers . . . for all the authorized services provided by the satellite carriers to their customers . . ." The FCC has, in fact, made the good-faith interconnection efforts of Bell a condition to approval of Bell's own requests for domsat authorization. The FCC also rejected a Bell plea that "technical difficulties" prevented the interconnection service, referring technical questions to Chief of the Common Carrier Bureau for consideration "outside of this proceeding."

Music Group Fights Switch To Rock At WNCN, NY

Another coalition-vs-broadcaster conflict emerged in New York late in September when a group calling itself the WNCN Listener's Guild petitioned the FCC to revoke the station's license, on the grounds that a proposed switch from classical to rock programming entailed a deception of the public and the FCC, The Guild charged that Starr Broadcasting Group, Inc., the licensee, would fail to adhere to the terms of its license, based on a promise made when the station was bought, in 1973, that 70 percent of the programming would be classical. The switch, said the Guild, would be a "substantial loss" to the stations's 400,000 listeners and to the "entire musical community of New York."

NCTA Asks Four-Year "Hands-Off" For Pay Cable

In comments on the Federal Communications Commission's proposed rules for pay cable, the National Cable Television Association urged that all restrictions be removed for at least four years, so that "marketplace experience" could accumulate for determination of the necessity for any restrictions. "While pay cable will grow without restrictions, it will hardly attain such growth in the next four years so as to make it immune to corrective action if it proves necessary," the statement added.

Also included in the comments were pleas that present sports program and movie program restrictions be relaxed. The pay cable industry does not want to, and will not, deprive the public of sports now telecast on commercial television, NCTA said, but aims to supply additional sports programming. On movies, the comments attacked the "warehousing" of films by networks, and the two-to-ten year blackout now imposed. The 92-page statement concluded: "The Commission has imposed severe regulatory restraints on competition and then demanded that proof be shown that no regulation is needed. This is the perverse logic of the Commission's regulation of pay cable."

Fall Conferences Underway; Meetings Have "New Look"

The National Association of Broadcasters Fall Conferences, day-and-a-half meetings aimed to supply vital and usable information to station managers, program directors, sales managers and chief engineers, were underway as this issue went to press. Each of the six meetings presents an FCC Commissioner to discuss FCC activity and answer questions; workshops on tv spot produc-

continued on page 14

If you waited for a portable color videotape dream machine...

Here it is! The incredible AKAI VTS-150 color videotape system—only 22 pounds light, yet featuring automatic editing that smacks of magic! Start with our 5.76 pound camera with built-in everything—servo controlled iris, automatic/manual aperture, built-in microphone, wide angle to telephoto 6X zoom lens (F2 to closed), 300 line resolution, white balance switch, electronic viewfinder/playback monitor, and two vidicon tubes for ultra sensitivity. Add our truly portable, battery powered videotape recorder/playback with automatic editing, stop motion, and sound dubbing. Throw in a reel of inexpensive ¼" full-color tape and you're ready to roll. Ordinary playback on TV monitor or regular color TV set—with a time base corrector, commercial telecasts from field to air with incredible speed, and no processing along the way. Put it all together, and you have a color videotape system that lets you tell it like it is, *whoever* you may be. News, sports, medicine, communications. Now that you know, don't keep it under your hat. Find your nearest AKAI video dealer, or write AKAI America, Ltd., 2139 East Del Amo Boulevard, Compton, California 90220. Phone (213) 537-3880. Video Department.

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From AKAI™ The Innovators

NEWS

tion, sales, legal and management problems, children's programming; a day-long engineering conference; and other activities. The conferences were held in New York, Atlanta and Chicago in October. Upcoming dates are November 14–15, Dallas (Fairmont Hotel); November 18–19, Denver (Brown Palace); November 20–21, Las Vegas (Sands Hotel).

FM Stations, As Well As AM, To Be on Road Weather Signs

At the urging of the NAB, the Federal Highway Administration has agreed that FM stations, as well as AM, can be listed on highway signs as offering weather data during stormy periods. To be included in the listings, the station must agree to broadcast weather warnings at no more than 15-minute intervals during bad weather, and road information, as supplied by an official agency, every half hour. State highway departments will erect the signs; broadcasters arrange to be included through state broadcaster associations.

Rules On Remotes Up For Major Revision

The Commission has opened an inquiry aimed at comprehensive revision of the rules on remote pickup broadcast equipment, used to transmit program material from on-scene locations to studios for broadcast. The proposal, says the FCC, may affect "Virtually every rule in Subpart D of Part 74 of the regulations." Among important topics to be considered are: channel splitting in the 450 MHz band, with some frequencies for program transmission and some for operational communications; provision for licensing of station groups under one license; revision of logging requirements; additional frequencies for low-power broadcast auxiliary stations. Comments are due on or before November 21, 1974 and reply comments on or before December 20, 1974.

Prime-Time Waivers To Continue in 1974–75

Blocked by the U.S. Court of Appeals from ammending the prime time access rule, the FCC announced continuation in the 1974–75 season of a waiver policy, generally like that of previous years, that would be consonant with the Court's

continued on page 18

Enter Stage Two of the U-Matic Revolution... Teleproduction!

The Sony U-Matic Videocassette System revolutionized people's thinking about many uses of television. Distribution and playback of videotape became easy, economical, reliable.

And now, another Sony breakthrough. The Sony VO-2850 U-Matic mastering recorder and editor that will change traditional thinking about teleproduction. A mastering and editing machine that is superior in performance to any existing 1" high-quality reel-to-reel unit.

Technically Superior.

Signal to noise ratio of 45db for video and audio. Separate editing capability for video and *two* audio channels, independently or together. AGC or manual control. Stop-frame. Slow-motion. Feather touch push-button controls. Proven reliability.

And much more.

Precise Electronic Editing.

Achieved through the use of a vertical blanking switcher plus capstan servo system with V-lock coupled to rotary erase heads.

Tape to Tape Editing.

Accomplished by combining two VO-2850 units and the RM-400 automatic editing control unit. This combination provides search (slow speed playback), pause (precise frame location) and automatic tape back spacing for glitch-free edits.

Lower Cost.

The VO-2850 costs substantially less than comparable 1" equipment and affords the continued economy of using ¾" tape.

The VO-2850 can also edit your field-recorded cassettes made on the VO-3800 portable U-Matic recorder. Your finished master is ready for duplication and can be played back on any U-Matic unit. And, in addition, you've saved a generation by working within one format.

Evidence of how significant this new development is can be found in the broadcast industry, which has already begun to change its traditional methods of mastering and editing (for electronic news-gathering) to include the VO-2850.

Hard to believe? We'll prove it. Write today on your letterhead and we'll arrange a demonstration. Once the VO-2850 is in your studio, you'll never let it out. The address is:

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Inside the studio the TKP-45 can give you extra dimension.

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For more inside information on the TKP-45, write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

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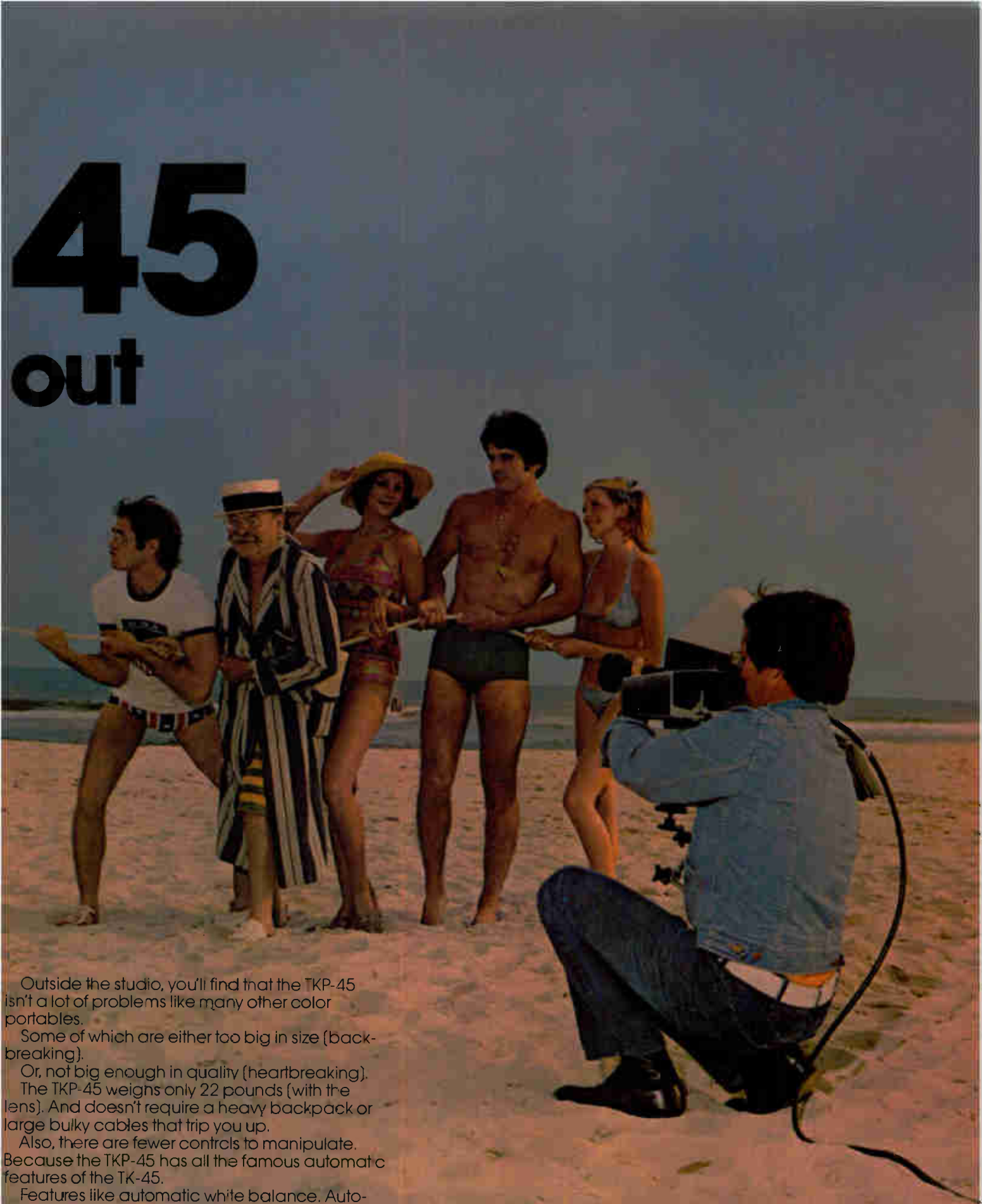


Outside the studio, you'll find that the TKP-45 isn't a lot of problems like many other color portables.

Some of which are either too big in size (back-breaking).

Or, not big enough in quality (heartbreaking).

The TKP-45 weighs only 22 pounds (with the lens). And doesn't require a heavy backpack or large bulky cables that trip you up.

Also, there are fewer controls to manipulate. Because the TKP-45 has all the famous automatic features of the TK-45.

Features like automatic white balance. Automatic black balance. And automatic iris.

That all works out better for you because it's less work for you.

All for more convenience. More operational simplicity. And greater performance.

The TKP-45. Another reason why users of high quality color cameras buy RCA more than all other makes combined.

For more outside information on the TKP-45, write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

RCA

NEWS

action. Exceptions to the basic rule must be considered on a case-by-case basis. Waivers already granted for the coming season are principally for certain "off-network" programs (or parts of them) such as the *Wild Kingdom*, and *Animal World*, and some individual children's specials formerly on NBC or CBS. Denied was a request for the *Famous Adventures of Mr. Magoo*, 26 off-network programs, because "it would extend the waiver policy beyond that granted previously, and tend to undercut the mandate of the Court of Appeals." Network news can be given in the first half-hour of prime time without counting on the three-hour quota, if it is preceded by a full hour of local news or local public affairs material. One-time network news or public affairs, not part of a regular series, are also exempt. Other special cases on news (such as runovers on sports programs) might be granted by staff action, said the FCC, but permission must be applied for in each case.

All waivers will terminate September 15, 1975, the order said.

Cable Can Import After Broadcasters Sign Off

In a new rule on cable program importation, considered "too narrow" by cable interests and "too broad" by broadcasters (according to the FCC), cable systems have been authorized to import late-night programming when no local stations are on the air. Leapfrogging and certification rules do not apply to the after-sign-off importations. The rule, says the FCC, applies to all cable systems whatever their television market locations. The "free time" runs from the sign-off of the last station the cable system must carry to the sign-on of the first one it must carry; but a program can be carried to completion. Moreover, when a broadcaster signs off less than 30 minutes after the hour or after the half hour, the sign-off for purposes of the rule is on the preceding hour or half-hour, respectively.

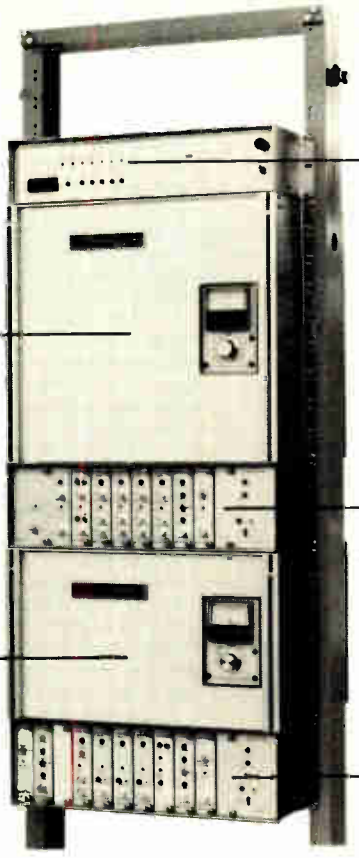
The FCC added that if a broadcaster could demonstrate actual harm from application of the new rule, special relief would be considered.

PEOPLE

Roger W. Ponto was promoted to National Sales Manager, and **C. L.**

continued on page 80

Farinon Makes It..



With Practical Advantages..for video relay from 2 to 13 GHz

FV13F All-Solid State Fixed Microwave is one of the new Farinon series of IF Heterodyne microwave systems for point-to-point relay (intercity and STL) of video signals in all frequency bands from 2 GHz to 13 GHz. Practical advantages include:

• **The High Selectivity** inherent in the advanced dual-conversion design allows close parallel-channel spacing without spurious tones.

• **Excellent Video Performance** is assured with such typical figures as: 65 dB signal-to-noise ratio; 56 dB signal-to-hum ratio; 0.5 dB differential gain and 0.7 degree phase differential **(over a seven-hop-system).**

• **Interchangeable units** greatly simplify spares maintenance; on that same seven-hop system all units are interchangeable (even local oscillators if you change the frequency generating crystals).

• **Equipment may be arranged** as terminals or heterodyne repeaters, one-way or duplex, with complete baseband access optional for drops and re-insertions at repeaters.

• **A -24 v. battery plant** (or commercial mains) will power any terminal or repeater configuration. The transmitters' injection-locked power amplifiers provide 1-watt output, conservatively rated.

• **And you can add transmitters and receivers** without disturbing existing systems.

For complete details of these and other Farinon video and message transmission systems and accessories contact:

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Farinon MICROWAVE MULTIPLEX

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INTERPRETING THE FCC RULES & REGULATIONS

"Fairness Doctrine: 1974" Part II

Last month this column presented the first part of a Fairness Doctrine update. The Doctrine's background, including legislative and case history, was discussed. General Fairness Doctrine issues were examined, followed by a treatment of Fairness Doctrine specifics including the "reasonable time" and "opposing viewpoint" requirements.

This month's column examines in depth (1) what constitutes a "controversial issue of public importance"; (2) what specific issue has been raised; and (3) what is a "reasonable opportunity" for contrasting viewpoints. The Commission's complaint procedure as it relates to the Fairness Doctrine as well as the application of the Fairness Doctrine to the broadcast of paid announcements is also discussed.

What Is A "Controversial Issue of Public Importance?"

The Commission readily admits that it has not been able to develop detailed criteria which would be appropriate in all cases to aid broadcasters in recognizing whether an issue is "controversial" and of "public importance." Thus, the Commission continues to rely heavily on the reasonable, good faith judgments of the individual licensees. Nonetheless, there are some guidelines which must be remembered.

First, it is obvious that an issue is not necessarily a matter of significant public importance merely because it has received broadcast and newspaper coverage.[1] However, the following must be taken into account in making your determination of whether or not an issue is "controversial" or of "public importance": (1) The degree of media coverage; (2) the degree of attention the issue has received from government officials and other community leaders; and, most importantly, (3) *not the extent of media or governmental attention, but rather a subjective evaluation of the impact that the issue is likely to have on the community at large.* The Commission suggests a test when the issue in question involves a social or political choice: "The licensee might well ask himself whether the outcome of that choice [that is, the choice of whether or not the matter is a controversial issue of public importance] will have a significant impact on society or its institutions." Of course, a case-by-case analysis will be necessary when utilizing the above guidelines.

Second, a more objective approach to determination of what issues are controversial has been suggested by the Commission. The broadcaster, by *objectively* assertaining the degree of attention paid to an issue by government officials, community leaders, and the media, should be able to determine whether an issue is "the subject of vigorous debate with substantial elements of the community in opposition to one another."

Third, the broadcaster should be on guard that "programs initiated with no thought on the part of the licensee of their possible controversial nature will subsequently arouse controversy in opposition of a substantial nature which will merit presentation of opposing views." Determination of whether or not the matter contained in such programs is controversial should be made by using the subjective or objective guideline approaches outlined above. Should the broadcaster determine the program matter to be of a controversial nature and of public importance, provision for opposing viewpoints should be made.

What Specific Issue Has Been Raised?

Determination of the issue actually raised by a particular program is a difficult problem.[2] The difficulty is exascerbated by the fact that the transcript or tape of the program giving rise to the complaint is often unavailable to aid in determining the specific issue raised. Recollections of station employees and listeners hindered by the passage of time, sometimes must be relied upon. Yet, an accurate transcript would not always facilitate a definitive formulation of the issue actually raised. People do not often talk in the form of questions and answers. Rather, it is the human tendency to discuss many aspects of an issue whether on point or peripheral. Indeed, a broadcast may consciously avoid explicit mention of the ultimate matter in controversy and focus instead on assertions or arguments which support one side or the other on the ultimate issue.

The Commission has illustrated this sometimes abstruse problem by reference to a hypothetical broadcast which takes place during the course of a heated community debate over a school bond issue. The hy-

[1] "Merely because a story is newsworthy does not mean that it contains a controversial issue of public importance." Healey v. *FCC*, 148 US. App. D.C. 409 (1972). Thus, a newsworthy but uncontroversial story is not subject to the F.D. requirement of presentation of opposing viewpoints.

[2] On September 27th, the U.S. Court of Appeals for the D.C. Circuit overturned an FCC decision that NBC News had been unfair in a 1972 documentary about the pension industry. The Court of Appeals disagreed with the FCC's judgment that the documentary was unbalanced on the *broad issue* of overall pension plan performance for workers. The Court further stated that the network was reasonable in asserting that the documentary was on the *less controversial issue* of "problems" with pensions.

pothetical program spokesman argues for the urgent need to construct new schools, as well as to increase teacher's salaries. Proponents of the bond issue also espouse both of these arguments. However, the broadcast licensee's problem is to determine whether the spokesman's issues relating to the adequacy of (1) present school facilities, and (2) teachers' salaries (both of which might not be at all controversial in that particular community) have actually raised the issue of whether the school bonds should be authorized (which well may be controversial). The broadcaster should note well how the Commission would have the licensee confront this problem:

> "We would expect the licensee to exercise his good faith judgment as to whether the spokesman had in an obvious and meaningful fashion presented a position on the ultimate controversial issue of whether the school bond issue should be approved. The licensee's inquiry should focus not on whether the statement bears some tangential relevance to the school bond issue, but rather on *whether that statement, in the context of the ongoing community debate, is so obviously and substantially related to the school bond issue as to amount to an advocacy of a position on that question.*"

Thus, the intent of the spokesman regarding presentation of a controversial issue of public importance is irrelevant. Problems resulting from the intentional camouflaging of controversial issues disappear. The standard becomes objective: Is the statement, as perceived within the parameters of current community debate, so "obviously and substantially related" to a controversial matter of public importance as to become an advocacy of one position on the issue? In the above-cited example, the broadcast spokesman may, in the licensee's determination, have addressed a controversial issue. The spokesman may or may not agree with this determination. Further, the Commission may or may not agree with this determination. *Yet, the Commission has clearly stated that the licensee's reasonable and good faith determination will not be disturbed.*

Again, the Commission emphasis is that "[a] policy of requiring fairness, statement by statement of inference by inference, with constant Government intervention to try to implement the policy would simply be inconsistent with the profound national commitment to the principle that debate on public issues should be 'uninhibited robust, and wide open.'" Here First Amendment freedoms and responsibilities collide. The Commission, in implementing the national commitment to stimulation of debate on public issues, will not dictate fairness responses as a result of "off-hand or insubstantial statements."

What Is A "Reasonable Opportunity" For A Contrasting Viewpoint?

Having determined that an issue raised in its programming is "controversial" and of "public importance," the broadcaster must decide "whether it has afforded a 'reasonable opportunity' in its overall programming for the presentation of contrasting points of view."

The licensee must consciously and actively encourage the presentation of opposing viewpoints. The broadcaster cannot take a *passive* role (i.e., merely

continued on page 26

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adopt a policy of not refusing to broadcast opposing points of view upon demand). Yet, the Commission has consistently refused to develop a formula for determining the proper spokesman to present the opposing viewpoints. In the Commission's words:[3]

> "The mechanics of achieving fairness will necessarily vary with the circumstances, and it is within discretion of each licensee, acting in good faith, to choose an appropriate method of implementing the policy to aid and encourage expression of contrasting viewpoints. Our experience indicates that licensees have choosen a variety of methods, and often combinations of various methods. Thus, some licensees, where they know or have reason to believe that a responsible individual or groups within the community holds a contrasting viewpoint with respect to a controversial issue presented or to be presented, communicate to such an individual or group a specific offer of the use of their facilities for the expression of contrasting opinion, and send a copy or summary of material broadcast on the issue. Other licensees consult with the community leaders as to who might be an appropriate individual or group for such a purpose. Still others announce at the beginning or ending (or both) of programs presenting opinions on controversial issues that opportunity will be made available for the expression of contrasting views upon request by responsible representatives of such views."

In increasingly rare situations, a licensee will be unable to find an appropriate spokesman for an opposing point of view. In such a case, the broadcaster must be prepared to show that he has made a good faith diligent effort to locate such an appropriate spokesman.

Oftentimes a controversial issue may give rise to multiple contrasting viewpoints. Here the broadcaster must determine (1) which viewpoints or shades of opinion are to be presented, and (2) which spokesmen are appropriate for each particular viewpoint. Thus, the licensee may deem necessary the presentation of a *major* contrasting viewpoint, but deem the presentation of a *minor* contrasting viewpoint unwarranted. Thus, he must "[m]ake a good faith judgment as to whether there can reasonably be said to be a need or interest in the community calling for some provision of announcement time to these other parties or candidates and, if so, to determine the extent of that interest or need in the appropriate way to meet it." This, of course, reflects the Commission's deference to the broadcaster's discretion. This discretion is not unbounded, as the Commission has indicating in speaking of deliberate selection of spokesmen for opposing points of view to favor one viewpoint at the expense of the other:

> "In the final analysis, fairness must be achieved, 'not by the exclusion of particular views because of . . . the forcefulness with which the view is expressed, but by making the microphone available, for the presentation of contrary views *without deliberate restrictions designed to impede equally forceful presentation.*"

The broadcaster may not adopt a "policy of excluding partisan voices and always itself presenting views in a bland, inoffensive manner . . ." Part of the effective presentation of opposing viewpoints involves viewer exposure to partisans of a particular viewpoint who truly believe in their position. Again, the Commission disavows any intention to decide the desirable or appropriate spokesman in any particular situation.

"Time" is often raised in discussing the reasonableness of contrasting viewpoint presentation. The licens-

[3] *Mid-Florida Television Corp.*, 40 FCC 620 (1964).

ee is *not* required to provide equal time for the various opposing points of view, aside from the area of political broadcasting. (See "Interpreting FCC Rules and Regulations," August 1974.) It is felt that an equal time requirement would prohibit rather than promote the discussion or presentation of controversial issues, and is simply not practical in view of the large number of issues arising daily in our contemporary society.

In light of the sometimes nebulous standards and requirements imposed upon the broadcaster, the Commission will ultimately limit its inquiry into Fairness Doctrine compliance to the following question: "Whether in the light of all of the facts and circumstances presented, it is apparent that the licensee has acted in an arbitrary or unreasonable fashion."[4] In view of the danger of (1) violating First Amendment rights, and (2) the somewhat broadly defined broadcaster responsibilities under the Fairness Doctrine, no sanction is opposed on the broadcaster for *isolated* fairness violations during the course of the license term. The licensee is requested to make additional provision for opposing viewpoints when the Commission determines a fairness violation.

The Complaint Procedure

The Commission has rejected suggestions that fairness complaints be considered in connection with license renewal applications, rather than at the time they are presented to the Commission. While consideration of fairness complaints at renewal time would reduce the Commission's administrative work load, the present procedure for reviewing complaints on an ongoing basis is considered an incentive to the filing of such complaints by interested citizens. Complaint procedures are summarized in the Commission's *Fairness Doctrine Primer*, as follows:

> "Where complaint is made to Commission, the Commission expects a complainant to submit specific information indicating (1) the particular station involved; (2) the particular issue of a controversial nature discussed over the years; (3) the date and time when the program was carried; (4) the basis for the claim that the station has presented only one side of the question; and (5) whether the station has afforded, or plans to afford, an opportunity for the presentation of contrasting viewpoints."

Complainants are urged to state the basis of their fairness complaint in view of the fact that the doctrine does not require *each* program to present contrasting views on an issue. Thus, the licensee need only provide "reasonable opportunity" for opposing viewpoints in its *overall programming*. A viewer need not watch the station 24 hours a day, seven days a week in order to make a valid fairness complaint. A complainant, for example, may be a "regular viewer" by viewing *routinely* major representative segments of the station's news and public affairs programming. Of course, such an assertion is not conclusive evidence of a fairness violation. A station need not research *everything* it has broadcast on a particular issue to refute the fairness complaint. In order to establish its

continued on page 61

[4]This standard has been reenforced by the abovementioned U.S. Court of Appeals decision regarding the "Pensions" documentary. The Court found that NBC was entitled to deference by the FCC in their disagreement over what the program was about. Thus, the FCC's finding of "arbitrary and unreasonable conduct" in licensees' failure to air opposing viewpoints was overturned.

A College FMer Tests Budget Four-Channel

By Arthur C. Matthews

The students at WVSS, Menomonie, Wisc., accustomed to broadcasting in mono, are producing four-channel programs now. They've learned to inegrate a semiprofessional quadraphonic recorder with existing facilities—and achieve surprisingly good results.

The collegiate broadcaster would like to be an audio gourmet as much as anyone else in this business. Our station, the voice of the University of Wisconsin—Stout State campus (in Menomonie), is at present, a flea-power 10W FM facility, one certainly not equipped like even a barebones stereo outlet. The student association has just authorized funds for stereo, but to even consider a multi-channel board, like heavy cream on a poor man's palate, would be an impossible financial burden.

Large, multi-channel boards with multi-channel recorders are too expensive for stations like ours. But, if you limit yourself, as we found, to four channel, relatively inexpensive experimentation in multi-channel production is possible, and you can salvage most of your present equipment, too.

I began investigating hi-fi tape recorders, and finally purchased a used Otari MX7000Q, a model which uses quarter-inch tape. I also looked for a suitable mixer, but found that nothing less-than-monstrous is available. It was decided to use my own mixer, a Sony MX16, for this one proved easiest to use by students: no equalization; no pan pots; no reverberation units. Just eight channels of input, and four of output.

Finding a place for the new studio was the next problem. A main control room/record library takes up most of the space at the campus facility. A training area, production studio, and news room/office/small production studio fills the rest.

Lacking studio space, we started WVSS four-channel productions in my home. The "control room" is part of a hallway. The recorder, covered with plastic to keep grease out of delicate parts, sits behind the meat cutting board in the kitchen. The studio area is variable; the engineer can see the dining room, behind him being the office and monitoring room. From his vantage point, the engineer operates the mixer, the recorder via remote control, and is within arm's reach of a turntable.

A Crown SX700SP has been converted to four-channel play for mixdown procedures. Completing our equipment roster are two pairs of speakers and four ribbon cardioid mikes.

One of the major purposes of teaching four-channel production now was to experiment with the medium: is quadraphonic recording really an advantage over stereo; can the idea be adapted to the small station without the need for a great deal of funds; can a college FMer like us use four-channel now?

Arthur C. Matthews, Coordinator of Radio at WVSS, has produced 74 four-channel programs with students over the past three years.

Author at the Otari MX7000Q having rewound the tape.

Students learn the three dimensions of four-channel.

While WVSS is mono, the four-channel production tool has proved very handy. The students are producing a 160-part, five year program called "Music Before Today." Object of the series is to enable the listeners to hear as much music as possible. So far, 32 portions of the series, these dealing with the music of the Middle Ages and Renaissance, are in the can. Admittedly, there is very little Renaissance four-channel material at present; conventional stereo recording techniques might have been enough. But these tapes could eventually be encoded to provide four-channel spread, when (and if) WVSS converts to stereo—and if the FCC gives the OK to discrete quadraphonic broadcasting.

The script for the series is recorded in segments, each using a different example of music, and recorded under voice-over narration. Between segments, music comes up or simply segues.

Originally, I considered first recording and editing the spoken material, then adding the music on both unused channels. But, that approach was too time consuming. The students switched to this method: voices are recorded on two channels, and two are reserved for the music. Both are recorded at the same time, and then edited and remixed.

continued on page 76

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Interactive Satellite ATS-6 Brings People Together

A full evaluation of the impact—or thud—of the Applied Technology Satellite ATS-6 now linking teacher with teacher, teacher with kids, kids with teachers, doctor with doctor, doctor with patient, patient with doctor, is over a year away, but it has already proved one thing: it has brought educators together in a gigantic cooperative undertaking.

The fact that brilliant color TV pictures could originate in the basement of a building at 2480 W. 26th St., Denver, travel 26,000 miles up and out to a satellite floating 22,300 miles above the Galapagos Islands and back again to 56 scattered corners of the Rocky Mountain states such as Dulce, New Mexico, and Fort Menton, Montana, boggles the mind of Art Branscome, education editor for the Denver Post. Teachers, of course knew it was coming. Walter Coyne told them as far back as November 1972 in the pages of *American Education* that the education satellite project could have an impact of learning analogous to that of Gutenberg's press.

Other experts associated with the program (described earlier in BM/E, April, 1974 p. 54–60) are not quite as sanguine. But the interactive capability, the two-way transmission via the satellite, is of vital importance in the demonstration. Dr. Gordon Law, STD project director for the Rocky Mountain Federation sees endless possibilities in two-way transmission. He adds "In this business you've got to have imagination, an intuitive feeling for what the system will do. And we think it will do a lot. When radio first came out, it was mainly used to broadcast weather forecasts to farmers. Who could have envisioned the tremendous extent of radio broadcasting today? The implications of direct broadcasting by satellite, particularly its low cost aspects are equally tremendous."

Although the satellite has been in use for only a few months, it is clear to teachers and doctors involved in actual transmission that the talkback feature really has people interacting. But do you really need a satellite for this? We talked to Dr. David Caldwell who is in charge of a Veterans Administration hospital information exchange. Theoretically, the answer is no, but teleconferencing techniques (audio only) never were able to get a dialogue going such as that now happening during the VA transmissions. A big factor, according the Caldwell is the rapport developed between the persons at remote sites and the personality on the TV camera. Another enthusiast about the live two-way feature is Stephanie Bennett, project director of the Chautauqua (Fredonia, N.Y.) Regional Educational Service Agency—part of the Appalachia experiment. She says the combination of direct talkback via satellite, feedback via teletype, and selected "tailored" messages received on the four channel audio track (as a result of the participant's response), all add up to provide "intense" learning experiences.

The interactive technology for feeding and receiving information via satellite with back up from hard lines and computer retrieval systems as used in the Appalachia demonstration is indeed impressive. But equally impressive was the interaction a year before the satellite became operational in designing the programs to be transmitted. More about this later. First a few details on the programs offered both in the Rocky Mountains and in Appalachia. (See box page 40 for overview of all programs involved.)

Appalachia Regional Commission

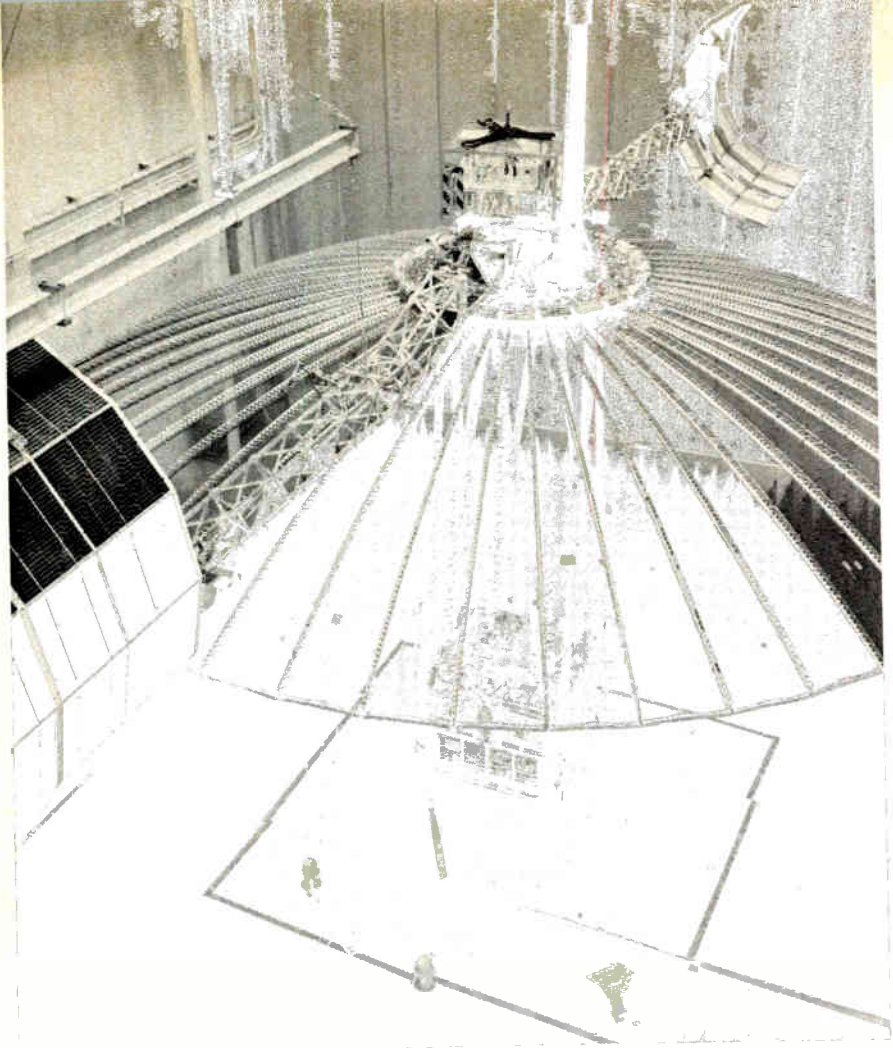
The Appalachian Educational Satellite Project (AESP) includes 15 Regional Educational Service Agencies (RESA) stretching from Guntersville, Alabama in the south to Fredonia, N.Y. in the north. Five serve as main RESA sites.

AESP decided at the outset to emphasize in-service teacher training as a result of a survey by ARC in 1971 of 32,000 Appalachia teachers.

AESP picked reading instruction and career counselling as the areas most needing attention. The target was 600 elementary school teachers this summer for reading and 600 junior and senior high teachers in the 1974–75 school year for courses in career counselling.

Upon its selection as the Resource Coordination Center (RCC) for Appalachia, the University of Kentucky organized itself into seven missions. **Career Education Components**—to develop 12 programs and four interactive seminars for grades 1–6, for summer transmission; to develop two levels of 16 live interactive seminars in career education for teachers (G 7–9 for fall broadcast; G 10–12 for spring broadcast). (Both of the above components also selected and developed supplementary material.) **Television component**—to produce all of the above reading and career video seminars (45 minutes each). **Four channel component**—to develop four channel one-way audio programs for the 12 courses. **Information Systems Component**—to develop a computer/manual system for storing, retrieving and delivery of instructional material to the 1200 teachers in four courses. **Evaluation component**—to design and implement evaluation. **Management component**—to coordinate and manage the project's activities.

There is also a 30-member national Advisory Board



ATS-6, rated at 200,000 watts ERP, is world's most powerful communications satellite. It's shown here in flight configuration while undergoing final tests at Fairchild Space and Electronic Co's Germantown, MD., facility. Antenna is 30-feet in diameter.

to review RCC policies and guidelines. To accomplish the above, the Univ. of Kentucky received $1,433,000 for the courses, the RESA received $500,000 to organize and monitor the operation of the courses. The ARC receives $200,000 to direct the project.

The reading course format is modeled on the New York State Department of Education In-service Reading Program. The course emphasizes practical techniques and shows Appalachian classroom teachers how to use the techniques. For each of the seminars, an audio link between the classroom sites in the RESAs and the studio is maintained for one-hour-and-forty-five minutes, for question asking.

The career-Education program development for K–6 focuses on ways K–6 grade teachers can structure curriculum around the world of work. How to help students acquire self-awareness, decision-making skills, occupational information, academic skills, and healthy attitudes toward work is covered.

The career-education seminars for Junior and Senior high school teachers consists entirely of live video from the RCC studio at the University of Kentucky. As a result of weekly feedback via audio connection, it is possible to alter subsequent presentations, thereby adapting the content of the on-going course more toward the expressed needs of the participants.

The initial seminars deal with career-education themes chosen after analyzing in-service career-education materials and career-development literature in the ERIC collection. The final half of the course focuses on implementation procedures. Since the participating teachers are to serve as career-development resource persons for students, administrators, parents, and other members of the community, they need to know how to deal with day to day situations that will come up. The programs, therefore, must have the flexibility and the potential to deal with their real problems.

Four-Channel Audio as an Instructional Activity

A 15-minute pre-programmed audio review of the video content follows each program that is not a seminar. This procedure demonstrates satellite capability for multiple-channel synchoronized transmission. Through headphones a participant hears a question, usually in the form of a problematical solution. He pushes one of four buttons on a touch pad to indicate the response he judges is most appropriate. He immediately hears a description of the factors he should have considered when making his response. The four channels are carried by satellite. The RCC automatically polls each student position and sends an appropriate signal corresponding to the buttons pressed. Coded two-tone bursts determine what gets passed to the students.

The incorporation of a response-accumulation device in the four-channel console makes possible the collection of data useful in program revision. This mechanism records student responses to questions related to desired outcomes. In this manner, it is possible to determine which behaviors the program does not adequately prepare the student to perform and the

program can be revised (before release of the program if a pilot group is tested).

The response-accumulation device in the four-channel audio console also provides a mechanism for in-house revision of video segments before they are released. This procedure entails having a group similar to the target audience view each completed video. They are told whenever the light over the television comes on they are to turn the dial to A if they understand what is being said or B if they do not understand. They can be asked to answer any yes-no type question. From the recorded responses, it is possible to chart effective and ineffective sections in the program. By charting these responses, areas in the program in need of reworking are revealed. In normal operation, the responses are recorded on a cassette which is mailed to the RCC for analysis.

Information-Retrieval systems backup

To supplement the limited depository of hard-copy or microfiche reference materials at each RESA site, the teachers in the courses have access to computer-based information retrieval systems: The Computer-Based Resource Unit (CBRU), the Texas Computer Retrieval System (CRS), the Select-Ed Prescriptive Materials Retrieval System (PMRS), as well as computerized index tapes to Educational Research Information Centers (ERIC), and Abstracts in Instructional Materials and Abstracts in Research Materials (AIM/ARM).

This is a view from the Rocky Mountain Federation Network Coordination Center, Diamond Hill, Denver, Colorado. NCC controls two-way communications here.

The CBRU data base consists of units of study on career-education topics. The computer matches the set of objectives supplied for a particular class or individual to potential resources and strategies and prints out a list of appropriate instructional activities, supplementary materials, and evaluative devices.

The Texas CRS with its 10,000-item data base identifies reading instructional materials. During satellite-televised programs, the teachers are shown how to fill in forms specifying the kinds of materials wanted. Requests are teletyped to the RCC for transmission to Texas. There the CDC 6600 Computer prints out microfilm numbers, shelf numbers, and program titles and teletypes the information back to the RCC. The Recordak Microfilm Reader-Printer retrieves the abstracts that correspond to the numbers, and either the abstract or the actual item is sent to the requester.

The PMRS, based on approximately 4000 instructional materials, is a manual retrieval system that permits the teacher personally to conduct searches for instructional materials, once certain variables are identified and translated into terms contained in the PMRS thesaurus. The teacher is taught how to use the system during one of the satellite-transmitted programs.

The ERIC tapes allow computerized retrieval of selected citations of educational reports and journal articles from worldwide sources. AIM/ARM citations supplement the ERIC file; these citations are in the same format and are assigned retrieval number by the same system.

RCC reports that the information retrieval system was used only in a limited way this summer since teachers are not accustomed to availing themselves of the service. RCC will step up the "educational" effort but as of this writing it is not likely that this effort can be judged as vital to the program.

Transmission of information requests

In order to determine the most efficient way to process information requests, three alternate and/or

The ATS Space to Group Operation

ATS-6 operations are ultimately controlled by the STS Operations Control Center (ATSOCC) located at the Goddard Space Flight Center and effected through the NASA ground stations at Rosman, North Carolina and Mojave, California. During periods when the Health and Education Telecommunications (HET) experiments are being conducted, control of the ground equipment is performed for NASA by the Federation of Rocky Mountain States at their Denver, Colorado Network Control Center (NCC).

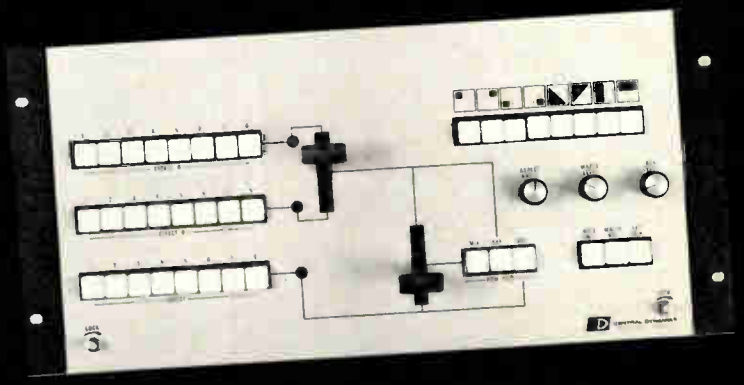
The satellite carries two high-powered (22 watt) transmitters (operating in the 2.5 GHz range). Each transmitter will bounce a signal off the parabolic reflector to produce a southern beam and a northern beam forming a giant "footprint" on the earth, each beam approximately 500 miles long and 300 miles wide. Another ATS-6 transmitter (in the S Band) enables STD engineers at the earth station near Morrison, Colorado (13 miles southwest of Denver) to monitor all transmissions. This unit produced a "global" beam capable of being received by Denver as well as NASA earth stations.

On command from the Goddard Space Flight Center the spacecraft is repointed to shift the footprint. Design work of Denver-based STD engineers has resulted in the development of antenna/receivers costing about $4,000 apiece, the lowest priced equipment of its type ever produced.

Many equipment suppliers are involved. The satellite was built by Fairchild Space and Electronics Co. It was launched by Titan III, build by Martin Marietta. The receiver was built by Hewlett-Packard, the antenna by Prodelin. The four channel response system was built by Audio Services Inc.; the A/V modulator by American Data. Westinghouse Defense and Electronics Systems provided field service.

small... is sometimes BIG ENOUGH!

Central Dynamics Introduces the New VS-10 TV Color Production Switcher for Mobile, CATV, Industrial and Educational Applications



Priced at Only $3350, we believe it represents a major value breakthrough for professional programming with true broadcast quality

You don't always have to be *big* and sophisticated to make it as a TV Color Production Switcher. The low cost VS-10 is an 8-input, 3-bus, compact, self contained, vertical interval, solid state switcher with ample sophistication for professional programming with *true broadcast quality*. Impressive special effects, mix amplifier, wipe/key amplifier, output selector and broad operational capabilities provide real production talent. A unique automatic special effects preview allows presetting keys and wipes for smooth, dramatic transitions to effects. The VS-10 lets you chroma key, matte key, wipe or dissolve to keys, dissolve or wipe between program sources, dissolve to special effects, or insert titles. Other standard features include a Cut Bus and true On-Air tally system. The VS-10 is compatible with NTSC, PAL-M and PAL color systems. All this . . . plus the proven reliability of the largest and most sophisticated Central Dynamics Production Switchers.

Sometimes . . .
SMALL *is* Big Enough!

Control Features

Wipe - Fader positions A & B signals. Aspect Ratio Control varies configuration of 4 corner patterns.

Keys - Wipe Keys on or off. Key Level Control adjusts slicing level of key signals. Matte Level Control adjusts luminance value

Mix - Fader proportionally controls output signals from the Direct Bus and the Key/Wipe Amplifier.

Switches - Crosspoint *and* Output Selection switched in vertical interval with illuminated momentary pushbuttons. Wipe, Key Mode & Pattern switches are mechanically interlocked pushbuttons. Tally lights on each input bus indicate "on-air" signal.

Specifications

Video - 8 loop through inputs (BNC) externally terminated.
1 V p-p composite or 0.7 V p-p non-composite synchronous signals.
1 External/Chroma Key input terminated internally. (CDL Chroma Keyer Module is optional)

Pulse - 1 Sync input (BNC) externally terminated, 2 to 6 V p-p.

Tally - Relay interface with 14-pin Amphenol connector with mating connector.

Power - 115 VAC ± 10% 60 Hz or 230 VAC ± 10% 50 Hz (switchable). 50 VA.

Mounting - Rack frame mountable with hinged front panel. 19" (483 mm) W x 8-¾" (22 mm) H x 7" (178 mm) D. All external connections are on rear of frame. 18 lbs. (8.5 Kg.)

Unit includes module extender, Operating & Maintenance Manual.

Central Dynamics has earned a reputation as one of the unquestioned leaders in TV Broadcast Equipment. Our standard line of production switchers are priced from $11,000 to $70,000.

The VS-10 is the first of a series to be *engineered* and *priced* to fill the gap between inexpensive, inadequate switchers and the more sophisticated, expensive ones.

Solid-state technology, and volume production techniques allow the VS-10 to be offered at this remarkable price.

However, you purchase the VS-10 with complete confidence that it is backed by the engineering experience, integrity and reputation of Central Dynamics.

We are convinced, as you will be, that the VS-10 *Broadcast Quality*, TV Color Production Switcher is the best value available on the market. We're delivering production units now.

Order yours today . . . at only $3350.

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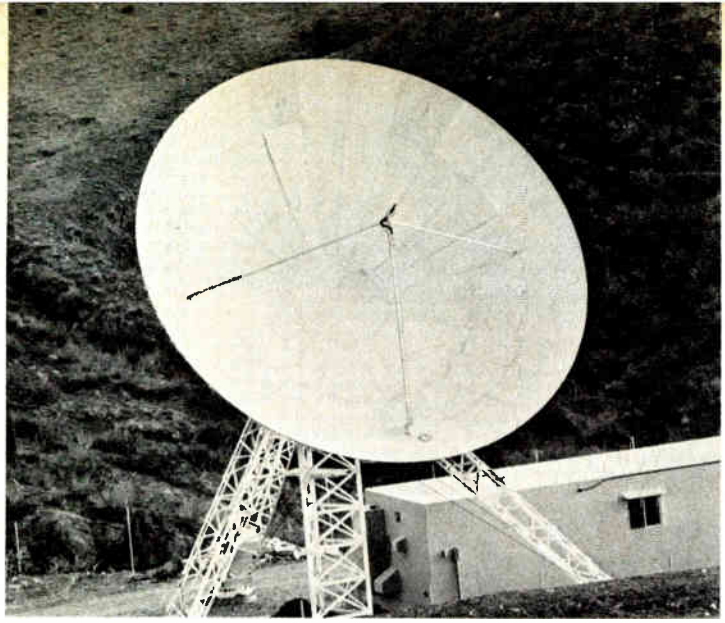
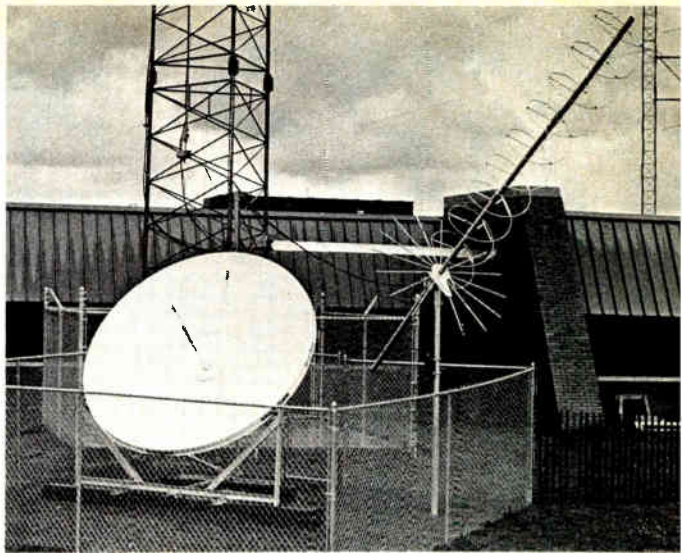
See the New VS-10 in operation at the NAEB Show, Booth 15

Circle 125 on Reader Service Card



This large antenna is the Denver Uplink Terminal located at Morrison, Colorado. Satellite position is controlled from Rosman, N.C. and Mojave, Calif.



Typical remote antenna installation (this one at Fredonia, N.Y.). Parabolic antenna picks up ATS-6, the helical antenna, the ATS-3. Local educational TV translator tower in background.

complementary communications systems are being tried out:

- Voice transmission, via the ATS-3 Satellite during the times it is available to project personnel, and simulated satellite transmission, via long-distance and lines at other times. (In some cases, the ATS-3 has not worked well and land lines were necessary.)
- Facsimile transmission via Xerox facsimile telecopiers installed at the RCC and each RESA (slow scan TV will also be tried this spring by the Veterans Administration)
- Teletype transmission via TWX installed at the RCC and each classroom site.

Transmission of the AESP courses

In transmitting RCC-produced materials, interfacing techniques include the telephone links necessary to transmit audio and video signals from the RCC in Lexington, Kentucky, to Rosman, North Carolina, for the uplink there and the downlink to ancillary and lead RESA sites.

Except for four-channel audio, all the RCC-produced programs are linked at Rosman, North Carolina to ATS-6. Since the North Carolina uplinks does not have the capability for transmitting multiple channels, the four-channel audio programs are uplinked at Denver, Colorado to ATS-6. Data, voice (questions the audience asked during the seminars), and information requests, are transmitted via ATS-3 from the six intensive sites (the five lead RESAs and the RCC).

The Rocky Mountain Federation Program

As mentioned earlier in this report (and in BM/E April, 1974), career education is the major thrust in the Rocky Mountain area which involves 56 sites. Unlike the Appalachia experiment, however, courses will be aimed at *students* as well as teachers.

Intensive in-service training of teachers and coordinators preparing them to work with students preceded the daily programming to students.

As in Appalachia audio talk back is a feature. In 24 of the 56 community sites, talk back is possible.

As part of a Rocky Mountain Materials Distribution Service, teachers at the 56 rural schools have received catalogues from which they can request 460 videotaped programs on subjects such as history, social studies, mathematics, career education and others.

When a teacher requests video material, it is taken from a "library" at the STD facility in Denver and the program is then transmitted to the school via ATS-6. The request can be made via ATS-3 or by conventional means of communication, i.e., telephone or postal service.

In all about 5,000 junior high school students will view the programs at the 56 "closed" sites but additional thousands of students will be able to view the programs on twelve of thirteen public television stations in the eight states.

The career education programming will emphasize three areas: self-assessment, to help students to measure their own needs, interests, aptitudes, and skills; career information, to provide data about the spectrum of career options open to a young person; and specific decision-making skills, to help students make sound choices based on their improved understanding of their own potentials and the realities of the job market.

Seven hours and 12 minutes per week has been assigned each of the two "footprints" Rocky Mountain East and Rocky Mountain West. About 121 hours of programming will be broadcast in each footprint between now and May 15, 1975.

The Rocky Mountain Federation is also going to the public via the satellite. The first evening program explored consumer and business interests in the mail order industry. It began on Thursday, September 26.

These programs are also being carried on twelve public television stations in eight western states. PBS covers 87 percent of the population. The addition of

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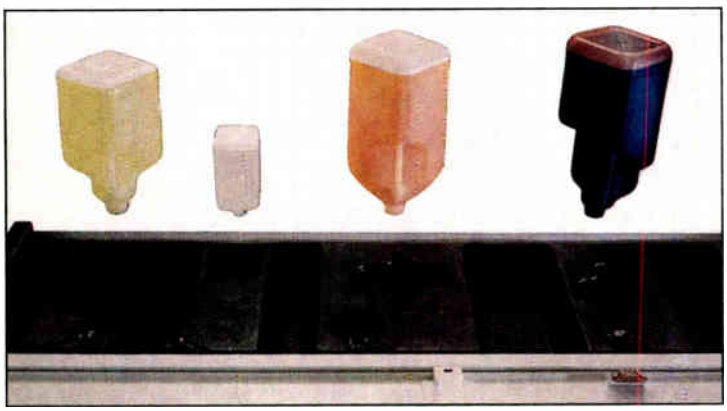
The new KODAK SUPERMATIC 8 Processor lets almost anyone on your staff get expert film processing results.

The SUPERMATIC 8 Processor is a complete film processing lab in a cabinet-size unit that virtually anyone can operate. It features a rapid-access operation that processes a 50-foot roll of the new KODAK EKTACHROME SM Film 7244 in just 13½ minutes.

And it's so easy to operate.



The chemicals come in color-coded bottles that fit only in the proper slots. It automatically flushes and cleans itself at the push of a button. And a little light goes on to tell you when it's time to push the button. Automatic threading and no special plumbing installation... just an ordinary tap and drain will do.

It all boils down to this: Super 8 film is economical. Our new KODAK SUPERMATIC 200 Sound Camera gives you the portability you need for local features, news and commercials. With quality thrown into the bargain. And our new SUPERMATIC 8 Processor develops your film fast.

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Please send me more information on all your new professional super 8 products, including the new KODAK SUPERMATIC 200 Sound Camera, pictured here.

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the 56 small town locations raises the coverage to about 96 percent.

Succeeding programs will be transmitted by satellite on Thursdays at three week intervals each month with the final program to be broadcast April 24, 1975.

Director Gordon Law said the most important aspect of the 10-program evening series will be *interaction* between moderators and guests in STD's Denver studio with viewers in communities involved.

Among topics to be explored besides the mail order business are (1) interpersonal communications; (2) ramifications of strip mining and oil shale development; and (3) cultural characteristics of the eight states in the STD project.

Other topics are: choosing and evaluating careers; the effect of cooperatives on agriculture; childhood development; health services; and issues of concern to the elderly.

In the concluding evening program, viewers will discuss issues affecting their states and region with governors of the eight states served by the STD.

Formats of all but one program are based on approximately 28 minutes of live and taped programming with the remaining 22 minutes devoted to interaction.

Veterans Administration Program for Exchange of Medical Information

Ten Veterans Administration hospitals located within the Appalachian footprint of the satellite are participating in a series of satellite broadcasts aimed at developing new methods of exchanging medical information.

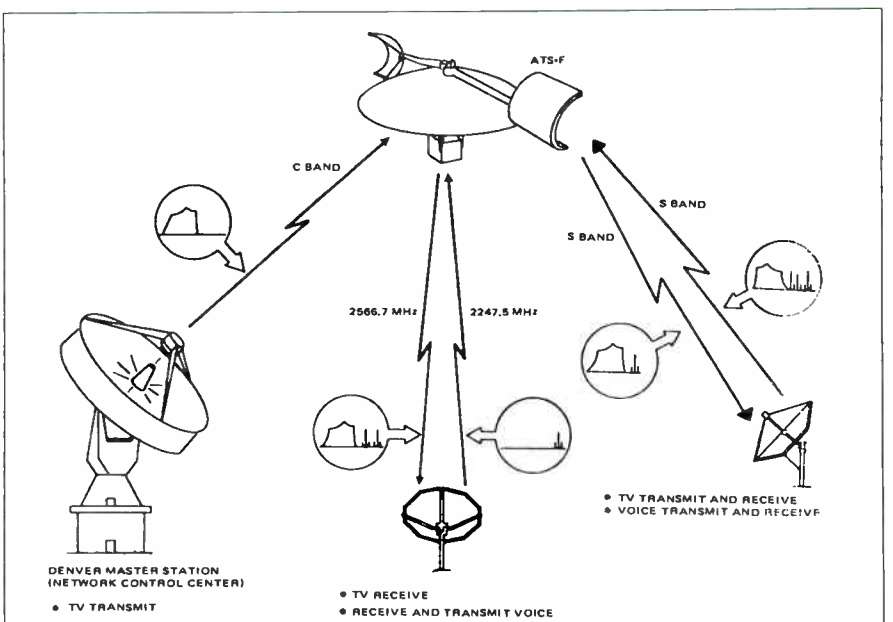
The topics of the broadcasts, which were selected by the hospitals as those they needed most and were most interested in, will be the subjects of films and videotapes developed in the National Medical Audiovisual center in Atlanta. Robert Shamaskin, a deputy director of the Veterans Administration, reports that over 90 medical subjects will be covered in the eleven month program: "Everything from dandruff to toe itch."

The broadcasts, scheduled to run about 2 ½ hours a week for a year, will also include live exchanges in the following formats:

- Video seminars, in which groups at the VA hospitals will ask questions of a physician moderator at the center in Atlanta and receive comments over a return audio channel.
- Televised presentation of patient cases from one hospital to participants at other hospitals.
- TV teleconsultation, in which doctors at VA hospitals will consult with specialists at teaching institutions. Patients and clinical material may be televised.
- Computer-assisted instruction, in which physicians and staff members will participate in programmed instruction, including history-taking, diagnosis and management of various clinical problems.

The participating hospitals are located at: Altoona, PA, Beckley, West VA., Clarksburg, West VA., Dublin, Georgia, Fayetteville, North Carolina, Johnson City, Tennessee, Oteen, North Carolina, Salem, Virginia, Salisbury, NC and Wilkes-Barre, PA.

Educational system capability is depicted here. At left is TV transmit, center is a typical school terminal, at right the capability in Alaska which includes remote TV transmit. Some talk back communications is via the ATS-1 and ATS-3. Table refers to capabilities for the HET experiment. (not Alaska).



TRANSMIT FREQUENCIES	Channel A - 2569.2 MHz Channel B - 2670.0 MHz
TRANSMIT POWER	EIRP, either channel ≥ 52.5 dBw
SIGNALING FORMAT	Video modulation on an FM carrier (FM-TV); 4 sound channels on subcarriers; telephony channels on separate RF carriers.
PERFORMANCE OBJECTIVE	TASO Grade 1 (TV picture) equivalent when received at minimum 3.7 dB figure of merit terminal.

A Stitch in Time...

Our *CP-16 Maintenance Training Seminars* are a vital aspect of our total product back-up and service philosophy.

We believe that knowing how to carry out some immediate repairs on your CP-16 camera in the field may well be the critical difference between "blowing" an assignment or carrying it out successfully.

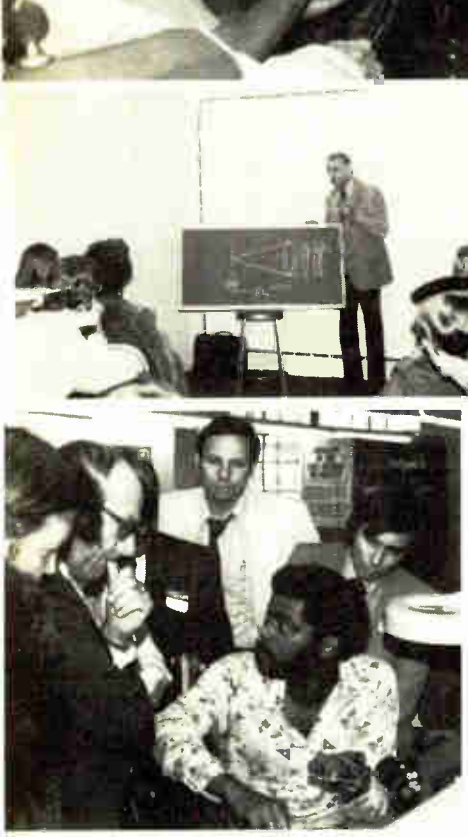
Designed for TV-newsfilm/documentary cameramen, TV station and dealer service technicians, our CP-16 workshop/seminars emphasize effective trouble-shooting, preventive care and simple repairs under field conditions.

Among those attending our first CP-16 training seminar was Charles Darling, Newsfilm Production Supervisor at KMGH-TV7 in Denver, Colorado. KMGH-TV recently won the 1974 National Press Photographers Association "News Station of the Year" Award. Darling's evaluation of the seminar follows:

"Any professional motion picture camera, subject to the abuse of news situations, will eventually develop problems. It is rare, however, that a working photographer can receive a factory 'crash' course in servicing his own reflex sound camera.

"The time spent in the mechanical and electronic phase of instruction will enable us to evaluate problems on the spot, without expensive and time-consuming guess work, and minimize downtime. Of special importance was the ready access to factory production and engineering personnel. The segment on optical components, conducted by Angenieux Corporation, was an added bonus that completed the program.

"Cinema Products is to be congratulated for demonstrating its leadership as a manufacturer of 16mm newsreel equipment and for its continuing response to the rapidly changing demands of TV communications."



We hope you will be able to join us at our next CP-16 Maintenance Training Seminar.

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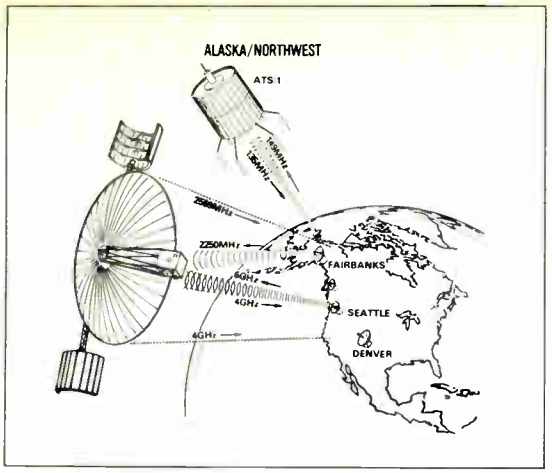
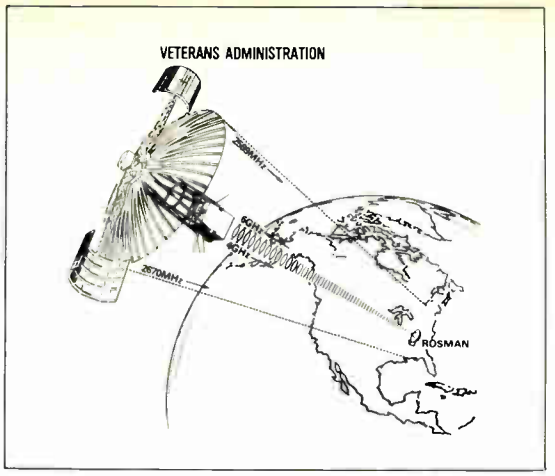
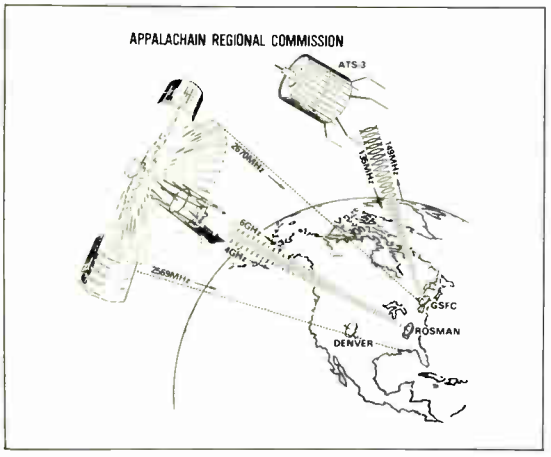
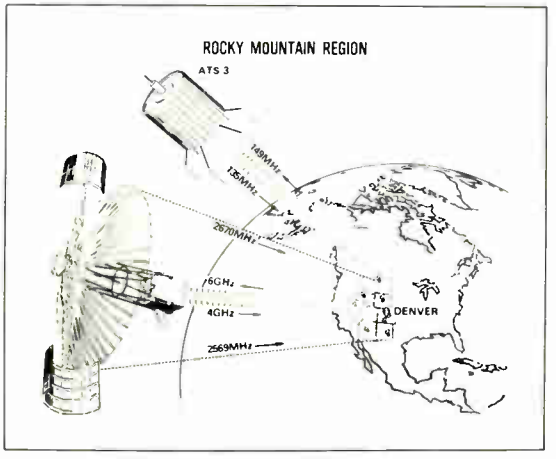
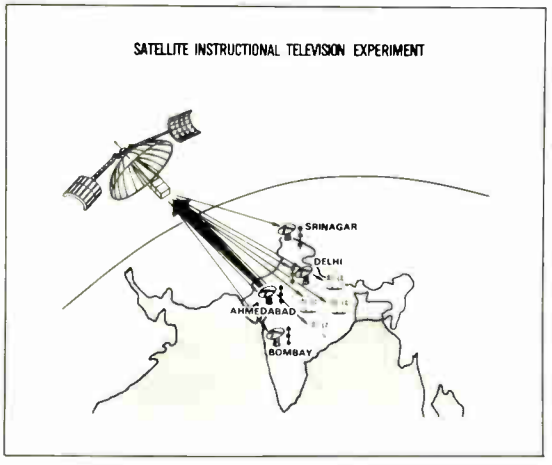










These diagrams quite graphically illustrate how satellites are being used and their area of coverage. The India experiment will not begin until next year.

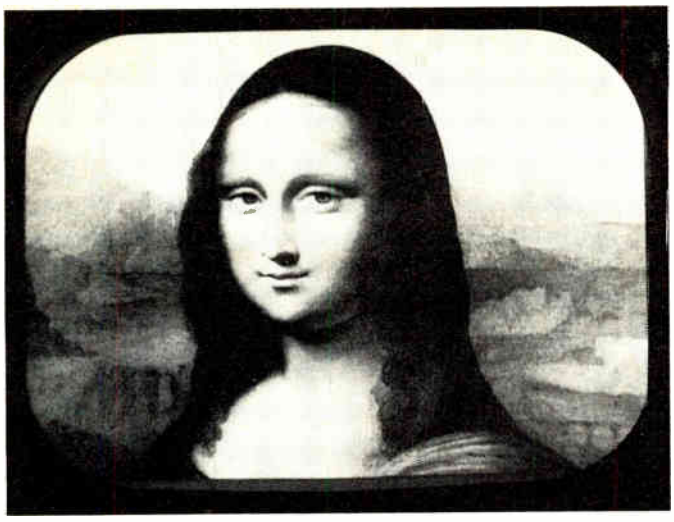
Cooperative Program Development

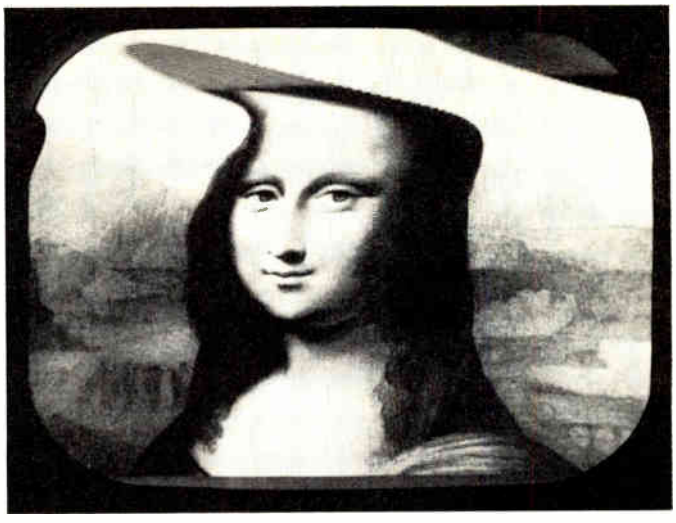
If the video/seminar courses distributed by satellite are indeed as outstanding as the initial feedback indicates, their creation must be chalked up as a major accomplishment. How could something really so high quality and effective be put out in such short order? The answer is cooperation and participation.

RESA directors of the Appalachian experiment that BM/E talked to were enthusiastic. We asked one director in the north if her teachers could fully relate and identify with programs produced in the south (Kentucky). Her reply was that this was no problem whatsoever. RESA directors participated in the setting of course objective and Univ. of Kentucky film crews actually came into the various sites to film techniques used by successful teachers. We asked Dr. Norfleet Williams, deputy program director at Kentucky, the secret to this cooperation. His reply: "We gave them a piece of the rock."

Dr. Harold Morse, AESP project director says the satellite was the catalyst in getting a high quality course developed for region-wide use. If it were not for the satellite, such region wide acceptance might have been unlikely.

He continues, "RESAs are being tied together across state lines and are learning to rely on each other's expertise in certain areas. They are exchanging materials and equipment. Some RESAs have extensive libraries, others have great facilities in computer facilities. All are discovering the advantages of coop-





The TBC-800 can keep your masterpiece from becoming a mess

For a long time, now, a good many videotape production managers have overlooked one of the most important differences between quad and helical VTR equipment: most of the quad machines have time base correctors; most of the helical recorders don't.

Nowadays, high quality helical recorders have servoed capstan motors, which is a step in the right direction. Now, the Ampex TBC-800 is a further step toward insuring good playback performance including insert edits.

The only way to arrive at a completely stable playback signal is to run everything through a time base corrector. That's what happens inside every broadcast station quad VTR, and that's what you have to add to your capstan servoed helical VTR output before you'll have a masterpiece of a production.

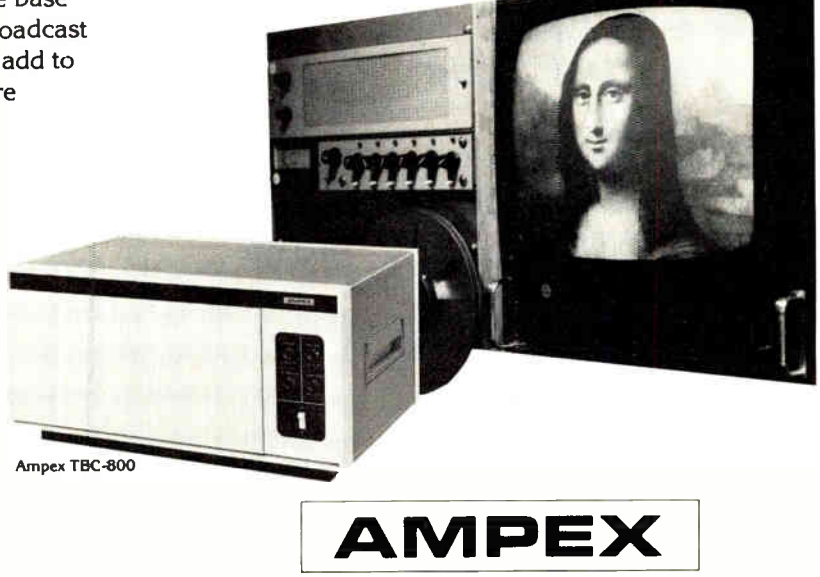
Time base correction is every bit as difficult to achieve as you might imagine. The incoming signal is converted from analog to digital format, reshaped, retimed, and then reconstituted. The circuitry is complex, and the engineering effort involved years of laboratory work at Ampex.

Toughest of all was our own requirement that the TBC must be reliable enough to stick in a corner and forget.

When you buy an Ampex TBC-800, you add the final link in your helical production process. You'll be able to show your production the way you visualized it, without tearing, without flag-waving, without color errors, and without jitters. And if your program is good enough for broadcast use, your videotape will meet all FCC requirements for picture stability.

To use an Ampex TBC-800 digital time base corrector, your helical VTR must be a non-segmented model, and the capstan motor must be a servo type. If you're that far along, we'll take you the rest of the way.

Your local Ampex distributor has information about the TBC-800, and can arrange for a demonstration. Or you can contact us directly for a free brochure. Either way, you'll be a lot closer to taping a masterpiece.



Ampex TBC-800

AMPEX

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Audio-Video Systems Division
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(415) 367-2011

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eration. These linkages are likely to remain long after the satellite project is over."

Alaska's Health/Education Telecommunication Experiment

Alaska's objective in conducting experiments with the ATS-6 satellite is to develop information needed to improve the quality of planning to meet specific telecommunications needs in the State. Demonstrations will serve as models for services which might be made available on an economically feasible basis in the future.

Eighteen small earth stations, which will receive high-quality television and provide two-way voice communications to other stations in the system, will be situated within the portion of Alaska covered by the ATS-6 beam. Four of these earth stations will have the additional capability of transmitting television. The Alaska education experiment has been allotted four hours and forty minutes per week by NASA.

The selection of the instructional topics is based upon an assessment of needs conducted by the Alaska State Department of Education in January, 1973. The programs will cover:

1. Instructional Programming (elementary grade level). The following components will be involved: Early Childhood Education; Basic Oral Language Development; Health Education; Teacher In-Service Training. Consumer committees comprised of par-

The Scope of ATS-6 Health/Education Telecommunications Demonstration

Satellite Technology Demonstration—The STD is funded by the National Institute of Education, U.S. Department of Health, Education, and Welfare (the National Aeronautics and Space Administration is providing the satellite, advisors, and some of the supporting technology) and is being developed and managed by the Federation of Rocky Mountain States. Many other entities are also harnessed to the effort: HEW's Office of Telecommunications; the offices of the governors and chief state school officers of the participating states; the Rocky Mountain Corporation for Public Broadcasting; local school superintendents and boards, community leaders—a vast network of national, regional, state and local participants.

The Federation of Rocky Mountain States, headquartered in Denver, was established in 1966, as a partnership of six mountain states—Idaho, Montana, Wyoming, Utah, Colorado, and New Mexico. (Nevada and Arizona, while not members of the Federation, are also participating in the STD.) Its aim is to involve state governments and private sectors, as well as their resources, in an cooperative effort to solve regional problems and to promote and plan for the orderly development of the region. (Its councils and committees are involved in numerous studies and activities ranging from transportation to natural resources, from market development to human resources, from arts and humanities to telecommunications.)

The STD is one part of NASA's overall Health/Education Telecommunications Experiment on the ATS-6. The two other regions participating are Alaska/Pacific Northwest and Appalachia. Sixteen sites in thirteen states in the Appalachia region—including a production center at the University of Kentucky at Lexington—are participating in an experiment utilizing the ATS-6 and the ATS-3 to program remedial reading and career education to teachers. In the same region ten Veterans Administration hospitals are linked by the satellite system in a patient-oriented experiment.

Alaska and the Pacific Northwest Programs—Nineteen sites in Alaska and two in the Pacific Northwest are also participating in health and educational programming, including teacher training in remote areas. WAMI, standing for Washington, Alaska, Montana, and Idaho, is conducting experiments in medical education and diagnostic services involving universities in the states. Further, the Indian Health Service will experiment with the satellite system to study its potential in alleviating an acute shortage of medical practitioners among Indian populations in the northwest.

Network discipline for all the HET transmissions is being maintained through a Network Control Center at the STD facilities in Denver.

The Appalachian Education Satellite Project—The Appalachian Education Satellite Project (AESP) is a joint venture of ARC under the auspices of the National Institute of Education (NIE) and the Applications Technology Satellite (ATS) experiment (with support from the National Aeronautics and Space Administration). The Appalachian Regional Commission (ARC), established by the Appalachian Regional Development Act of 1965, is the federal-state agency Congress delegated to promote the over-all development of the Appalachian Region. ARC brings professional expertise and federal monies to bear on pressing regional problems, ranging from highways to health and education services. Local and state governments implement objectives established by ARC by developing relevant programs and contributing to their funding.

ARC has initiated and served as coordinator of various Appalachian educational programs. Consequently when it was known that satellite time could be obtained for NASA-approved projects, ARC helped HEW, NCET (National Council for Educational Technology), and NIE conceive an education technology demonstration that eventually became known as the Appalachian Education Satellite Project (AESP). AESP is a communications experiment demonstrating the feasibility of delivering via satellite (in-service education courses and supporting information services in career-education and elementary reading) to teachers in the Appalachian region.

The immediate educational objective of the AESP is to improve the effectiveness of the classroom teacher, thereby upgrading the quality of reading and career-education instruction available to Appalachian students. AESP hopes to determine if the linking together of existing organizations, like the Regional Educational Service Agencies (RESAs), and communications satellites can result in more effective and significant in-service teacher training.

AESP will also examine the effectiveness of the instructional sequence of televised lecture, audio questions with immediate feedback, ancillary practice activities, and review testing. It will further demonstrate the feasibility of developing central computerized information systems for delivery via satellite.

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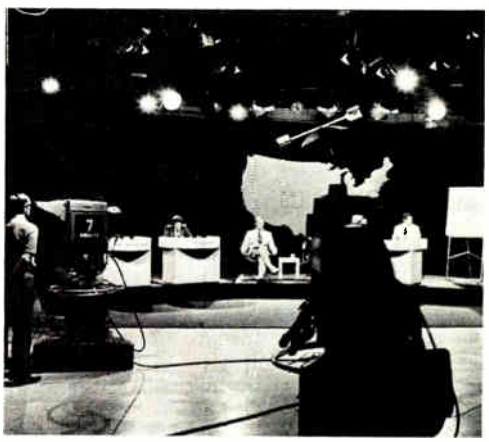
Class of teachers at Fredonia, N.Y. watches program broadcast from the Univ. of Kentucky via ATS-6.

Close-up of students participating in four channel audio lessons. Audio from ATS-6 depends on which of four buttons is pushed.

Installation at Fredonia uses teletype with VHF interface to communicate via ATS-3.



Veterans Administration uses studios of KMGH-TV, Denver, to initiate broadcasts.

ents, Native leaders, teachers and administrators have been organized to oversee program design and development within the Early Childhood Education, Basic Oral Language Development and Health Education components. There are three committees, one for each of the broad topic areas.

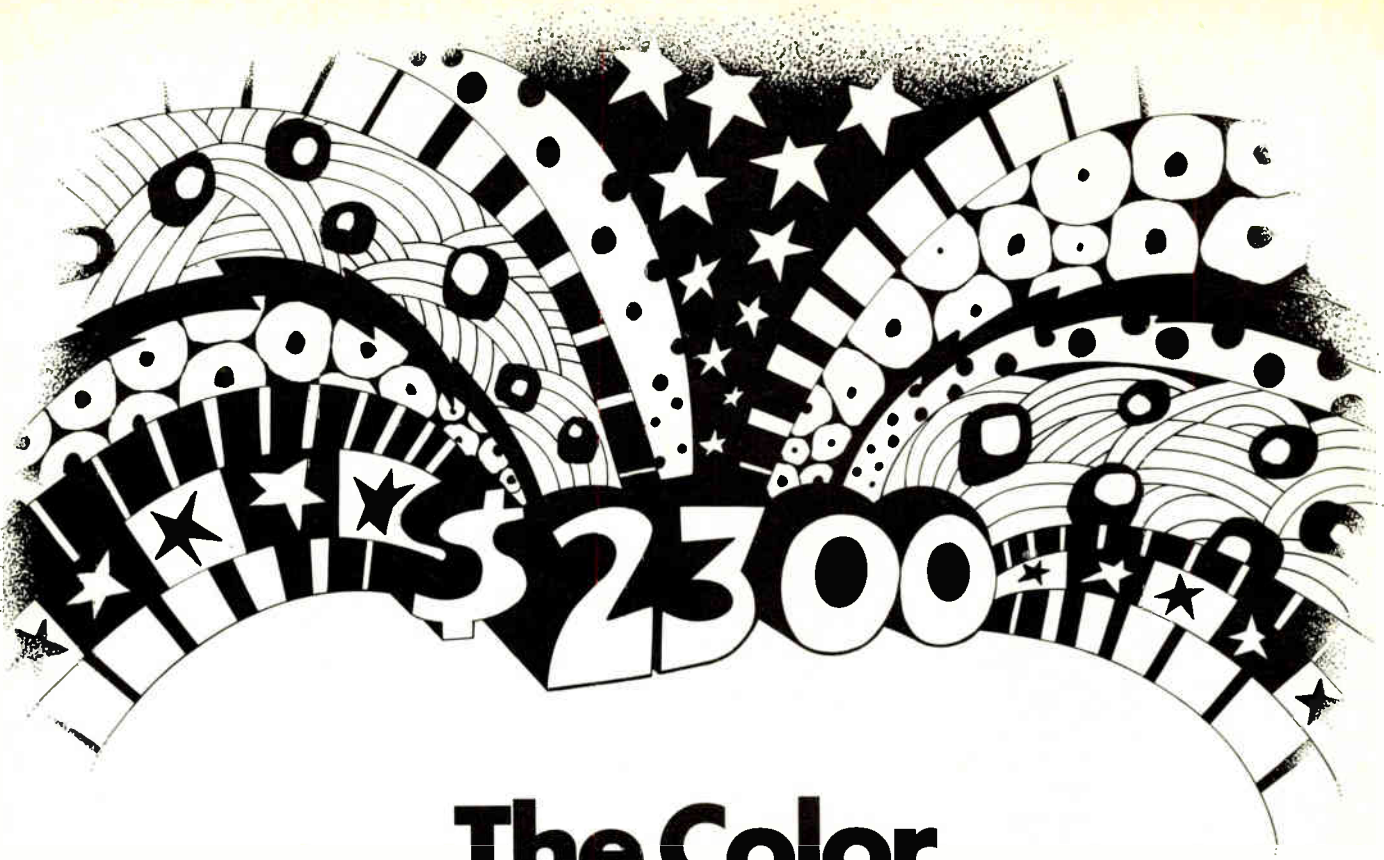
In all of the instructional programming components the capability for audio (and in some cases, video) interraction is a keystone of the over-all program. Most programs will have built-in pause points for response. Circuits for the audio interaction will be provided by the ATS-1 satellite, which is currently being used for educational and medical experiments in Alaska. Four of the ATS-6 terminals will have video transmit as well as receive capability.

2. Public Broadcasting (general population). Two elements are involved, Viewer Defined Programming and PBS/NPR Interconnection. The Viewer Defined Programming experiment will be centered around a program entitled "Alaska Native Magazine." It will be presented in several Native languages, and English, simultaneously, by employing ATS-6's four audio channels.

This experiment will be designed and managed by Alaska Natives. A committee will serve as the initial content-determining body for the "Alaska Native Magazine." Each week, 30 minutes of film, video tape, and in-studio production featuring Natives and Native concerns such as Native Land Claims, Pipeline Impact and Native Arts and Culture, will be produced and be broadcast to all earth stations in the field. This will be followed by 30 minutes of panel discussion, question and answer, suggestions for further programs and any other interaction desired for this. In localities where it is possible, the program will be rebroadcast by a local public TV outlet, including some mini-transmitters (0.5 to 10 watt output). When broadcast, the program will have built-in pause points, where audio (and perhaps video) feedback from the viewing locations can be accommodated. These pause points will also allow viewers to express opinions and ask questions. This project will use the satellite to allow the consumer to determine the content of future programs and could well lead to future systems of consumer-controlled communications.

The PBS/NPR interconnect element will demonstrate the use of low-cost earth stations for receiving radio and television network programming. It is intended to determine, by audience measurement, the urban Alaska reaction to live programming as contrasted to that received after delays of 12 hours to one month.

Specific responsibility for the ATS-6 program is assigned to Dr. Charles Northrup, Satellite Experiment Coordinator, Office of Telecommunications. He will have overall responsibility for continued planning and



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conduct of the experiments in Alaska, and for liaison with federal agencies and other participants in the demonstration. He will coordinate and guide the educational experiment, operations, and utilization functions.

In addition to the educational experiments which are described in great detail in the program plan and in the summary, there will be in Alaska as is indicated by the schedule, experiments in medical education by the Washington, Alaska, Montana, Idaho Medical Program and experiments in health care delivery the Indian Health Service. The Indian Health Service will utilize full video interaction among the villages of Tanana, Galena, and Ft. Yukon and will use full video interconnection with the city of Fairbanks and will have video receive capability in the city of Anchorage. The W.A.M.I. program will utilize two earth stations in Washington State and the inter-activity earth stations in Fairbanks.

Next, India

The ATS-6 is currently in geosynchronous orbit 22,300 miles over the Galapagos Islands for experiments in the United States. After its first year in orbit, the 3,080-pound satellite will be repositioned to a new orbit over Kenya in Africa. From this position, over 2,500 villages in India, where television and motion pictures have never been seen before, will witness educational programs on modern agriculture and health—including family planning—through a broadcast directly from space.

The Future—From AESP Overview—Technical Report No. 2

The AESP project demonstrates ways to use "satellite power" to make quality education accessible to all, regardless of where they live. What the AESP and other satellite communications experiments eventually could lead to staggers the imagination:

- a University-via-Satellite, broadcasting on 25–40 channels, in-service training courses for teachers, doctors, lawyers, engineers, and other professionals, the courses being prepared continually by RCCs at universities across the country;
- national or international multiple-channel satellites that make possible: (1) interlibrary sharing of resource materials, (2) the bringing to the classroom of famous people from all parts of the world, (3) the broadcasting to schools of subjects requiring competencies not available locally, (4) the transfer of instructional information from a large central computer to local request centers, and (5) the connection of students to groups at other locations for discussion.

Designing such a system requires the consideration of many educational, social, political, administrative, and economic factors, such as how to develop quality software, how to establish a national network without sacrificing heterogeneous interests of regions, and how to secure finding for the building of satellites. In *Nation's Schools* (October, 1973) it is estimated that it will cost 50–100 million dollars to build, launch, and operate a 12-channel satellite with a maximum life expectancy of seven years.* If the benefits justify the creation of a national network of communications satellites, it is likely that effective implementation procedures can be developed.

There are several things that schools can do now to prepare for education-by-satellite. They can consider installing a cable system that can be connected to an inexpensive satellite receiving antenna or a cable TV network that is tied to a remote satellite receiving station; familiarize school personnel with audio-equipment; plan and write proposals for the use of satellite facilities.

If the Appalachian Education Satellite Project ends in the fall of 1975, these things remain:

- 15 sites in Appalachia equipped with TV receivers, 4-channel audio, teletype intercommunicators, libraries, and specialized instructional materials;
- 1200 Appalachian teachers who have completed in-service training courses;
- 4 graduate-level courses available for use on closed-circuit or educational television systems;
- a staff at the University of Kentucky experienced in the development of software and the management of education-by-satellite projects;
- a nucleus of trained teachers to work with RESAs to provide similar experiences for their colleagues;
- a mass of data analyzed and interpreted to guide the designing of similar projects.

In 1975 when the ATS-6 satellite is repositioned over India, the AESP experiment formally comes to an end. What happens after 1975 depends on whether local school systems, State Departments of Education, the ARC and NIE want to support continued educational programs via satellite. Perhaps, ETV stations, universities, and school systems across the region will re-use the taped portions of the AESP courses for in-service teacher training; or the RCC at the University of Kentucky will become a training center for personnel from other universities or groups who plan to produce satellite education programs; or the RCC at the University of Kentucky will continue to produce software for an expanding number of courses and RESAs.

The problems and mistakes as well as the accomplishments of the Appalachian Education Satellite Project contribute to the information base necessary for the use of satellites as educational and communications media. "The age of inordinately expensive, fractional effort, typified by 'n' teachers (of 'x' capability) individually preparing 'n' lessons for 'n' topics in 'n' classrooms in 'n' schools (*Educational Technology,* August 1972, p. 10) may one day be as outmoded as the one-room schoolhouse.

** Another approach to economics was provided by Howard H. Hupe, of HEW at the National Conference on Open Learning in Higher Education, Lincoln, Nebraska, Jan. 16–18, 1974. Hupe estimates on a leased basis that one satellite channel costs $600 an hour and the programming costs $10,000 per hour. These are fixed costs based on 24 hour a day satellite service. If the average learner uses the service 2 hours a day, it takes at least 12 learners to fully use a day's service—on the basis of one learner per course. To reduce the cost per learner, bigger audiences are needed. If there were 120,000 learners altogether and there are 12 segments in the learning day (2 hrs. each per day) that works out to 10,000 students per course. Thus the satellite cost per student is $.06 and the program cost is $1.00. To this must be added the local receiver station cost which is estimated to be $15,000 per year (including a technician operator). Based on 3000 sites and 40 total learners per site, the distribution cost is about $.56 for a total cost of $1.62 per learner. By increasing the total learners to 1,200,000 and learners per site to 400, costs (satellite, program reception) drop to $.156 per learner per hour.*

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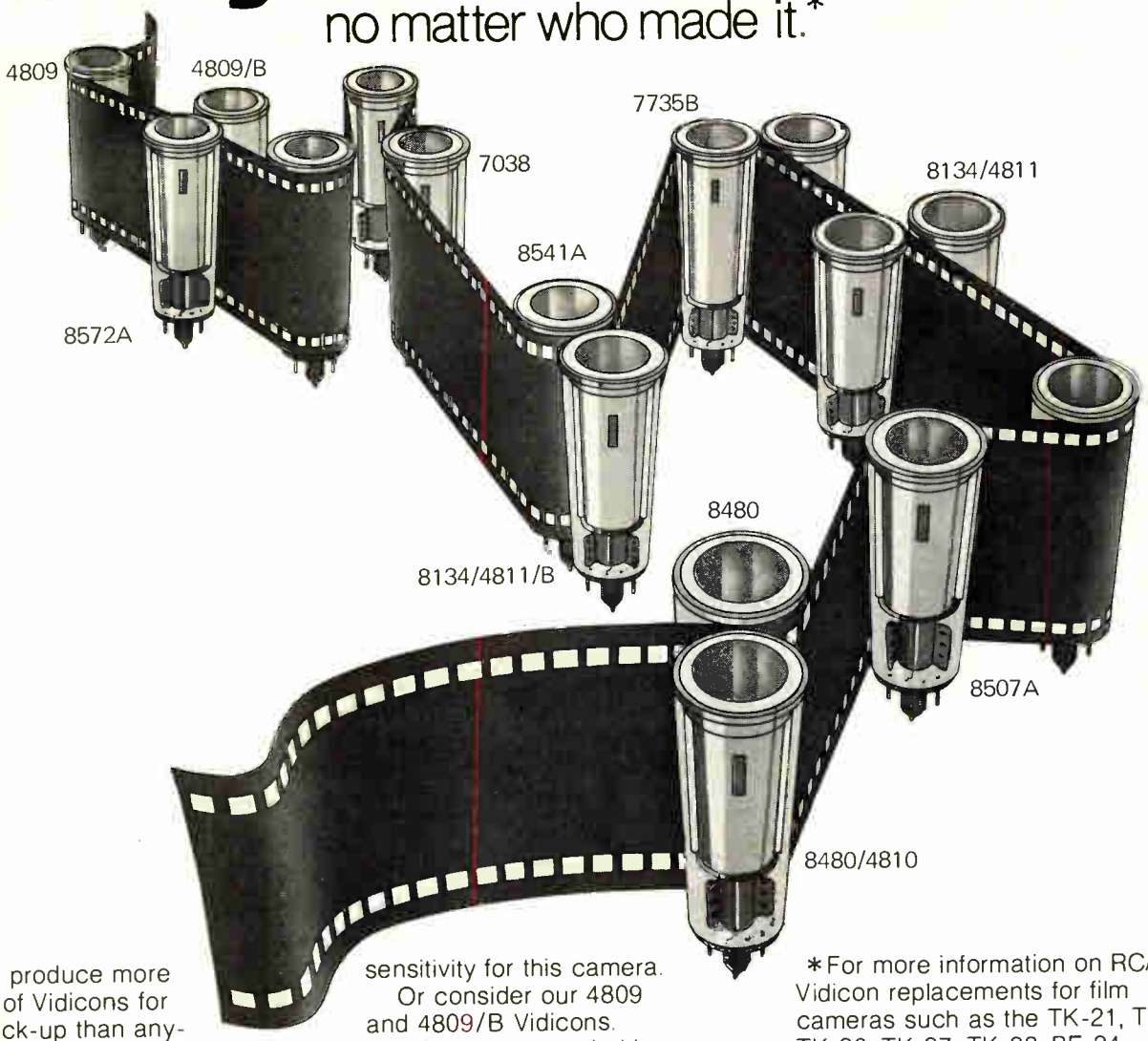

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RCA Electro Optics

Dial Access is Alive and Well at Ann Arbor

The Univ. of Michigan's computerized language lab is successful and expanding. Some two hundred programs can be switched to a host of student carrels. Secret of reasonable cost and simple design is a time division multiplex scheme as a substitute for crossbar switching.

Students can dial-in requests for a specific tape which would then be loaded on a cart player. Computer, below, assigns tape player to student carrel.

Request stations in student carrel

View of the pdp-11 computer which handles all traffic.

Photos courtesy of Jim Bixler.

When Erwin M. Hamson, Director of the Language Lab at the Univ. of Michigan wrote the guiding rules to a new facility five years ago, he said "Equipment ought not be installed which precludes the use by students and teachers of any present or foreseeable technique." This goal has pretty much been achieved with a random access "Instructomatic" system installed by Visual Electronics Inc.

The equipment poses no real constraint on how the academic staff can use the lab and the system can be adapted to experimental modes or new uses. In 1974, the university decided to add a remote cassette recorder facility. This, along with other innovations proved to be quite easy as will be described in a moment.

The system is dubbed RAMP for Random Access Multiple Program system. It can switch 200 different programs to 168 student dial-in stations. This number could be expanded. The whole system is under computer control—the computer is a Digital Equipment Corp. pdp-11.

The computer provides a number of operating features. Following are a few examples:

Computer assigns a player to the student—The student is given a program catalogue which includes a number to dial for each program. The computer will connect the student to a player and start it if that program happens to be already loaded on a player. This is not likely. If this is the case, the computer will signal the operator to obtain that program cartridge from the library and tell him which player to load it on. The computer will then connect that player to the student and start the player.

Instructor control—Any instructor in the Language Dept. can enter any student carrel, identify himself to the computer by ID number and be connected with any of his own students in attendance (using their ID number) to listen or talk with them. He can do this in an automatic mode whereby he continues to press only one button and he is successively connected to each of his own students. The switching system uses the time division multiplex technique whereby all 200

Continued on page 48

program audio channels are encoded onto busses. Recorders are located at each student listening station.

The objective of the time division multiplex design was to reduce the high cost of a switch matrix necessary to enable several hundred students dial access to hundreds of audio program sources. For example, for 200 students to reach 400 programs, not unreasonable numbers, a matrix of 80,000 crosspoints is required.

Time division multiplexing serves the basic purpose nicely and has several unique benefits. Many formats are possible but in Visual's System ES Electronic Switching equipment the method is built around 100 audio signals each amplitude modulating one of 100 pulses. Each pulse is about 200 nsec wide and the complete series of 100 pulses is fed on a distribution bus with a repetition rate many times higher than the highest audio frequency. This multiplex bus (about 5 Mhz in bandwidth) and synchronous clock pulses are connected to as many as 1000 student dial decoder circuits. A student, for example, then dials 032 and his decoder selects the 32nd pulse in the series of 100 and detects the audio with which it has been modulated.

As many as 10 mulitplex busses, each with 100 audio signals, can be fed to each student decoder and the desired bus is then selected by the first of the three digits dialed. Thus the system has a capacity of 1000 students receiving any of 1000 audio programs simultaneously (100% trunkage in other words) without the enormous cost and complexity of a 1,000,000 crosspoint matrix.

An added requirement of such a system is that the audio source, normally a tape machine, must automatically start when dialed. In a standard switch matrix system, the load of the student headset when switched through the matrix to a tape machine, is sensed and used to start the tape machine. Since a multiplex system isolates this load and does not permit it to be sensed, another scheme is required.

To provide this "demand" start, the System ES includes a return bus to which only those pulses which have been dialed are added. This bus is connected back through all the program audio encoder circuits. Wherever these pulses find coincidence in an encoder, they start the associated tape machine.

Furthermore the pulses on this "demand" return bus, serve several additional purposes. Since they also are at the previously mentioned high repetition rate they are gated on and off by dial pulses to convey deck control information such as stop, fast-forward, reverse, record, etc., from the student's dial to his own particular deck.

Even more important, these "demand" pulses are then audio modulated by the student's microphone. Through detection circuitry associated with each encoder circuit and a connection to each tape machine, this audio is detected and recorded on the student-record track of the student's tape machine. Thus two way audio is established using a multiplex switcher normally considered to be a one way system. This two way audio also permits intercom between an instructor at the central switcher with any student in his carrel.

Although VTRs are not used at the language lab, video tape machines could be accessible for student

Continued on page 48

DIAL ACCESS

dialing.* Therefore there is a long list of other features such as convenient dial code cubes to easily change dial numbers when a tape machine breaks down, lights on the decoders to show system activity at a glance. The University of Michigan has just ordered from Visual a significant expansion. Some 30 RMCR-3 Remote Cassette Recorders will be added in the central control facility and a software program provided to integrate them with the computer.

Thus, by dial control alone, the following features are provided:

- A student can obtain control of a cassette recorder if his ID number indicates it is authorized.
- The student can select a program to be inserted in a cartridge player, which is then automatically connected to his carrel speaker and to his cassette recorder's program channel and both machines are started.
- While the program is being recorded on the student's cassette program channel the student can record on the cassette's student channel.
- When the program cartridge ends, the cartridge unit recues and is released for other students and this is detected by the computer.
- The student retains dial control of all functions of his cassette recorder including replay of the program and student channels and re-recording on the student channel.
- The system includes a printer which provides both the operating and the teaching staffs with duration and date-of-usage information by number of student, carrel, machine and program, important for service and maintenance of the system and for studies of the teaching program.

The Ann Arbor facility is also adding 50 Radio Q Cartridge Units, dual channel, for additional program source decks. These broadcast quality players are warranted by the constant use a language lab gives such equipment and the high quality audio required for language studies. The original 168 position system cost about $300,000.

The University of Michigans Language lab is heavily used. The Language Department has some 800–900 French students at any time and about 600 German and 600 Spanish students. Russian is taken by 200–300. Chinese by a fewer amount. Altogether there are 27 languages taught. The lab is not used for self-taught courses. All work is auxiliary and supplemental to classroom work. Nonetheless the regular use of the lab means classroom time is reduced since time spent in the class is more effective when students do drill or other assignments in the lab.

Hamson reports the lab is full from mid morning into the afternoon. The lab is open from 8–12 on Saturday and at 2 pm on Sunday afternoons. **BM/E**

** Video frequencies are too high for inexpensive multiplexing. Therefore Visual's System VS Video Switching equipment "bridges" the student's dial line for the audio system and a solid state video matrix with a dial decoder switches the video associated with the audio. There are normally fewer video tape machines and fewer video monitor equipped carrels; so the higher cost video matrix is not so great a price penalty.*

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Simplified Audio/Video Routing Requires Fewer Operators

By Joseph A. Maggio

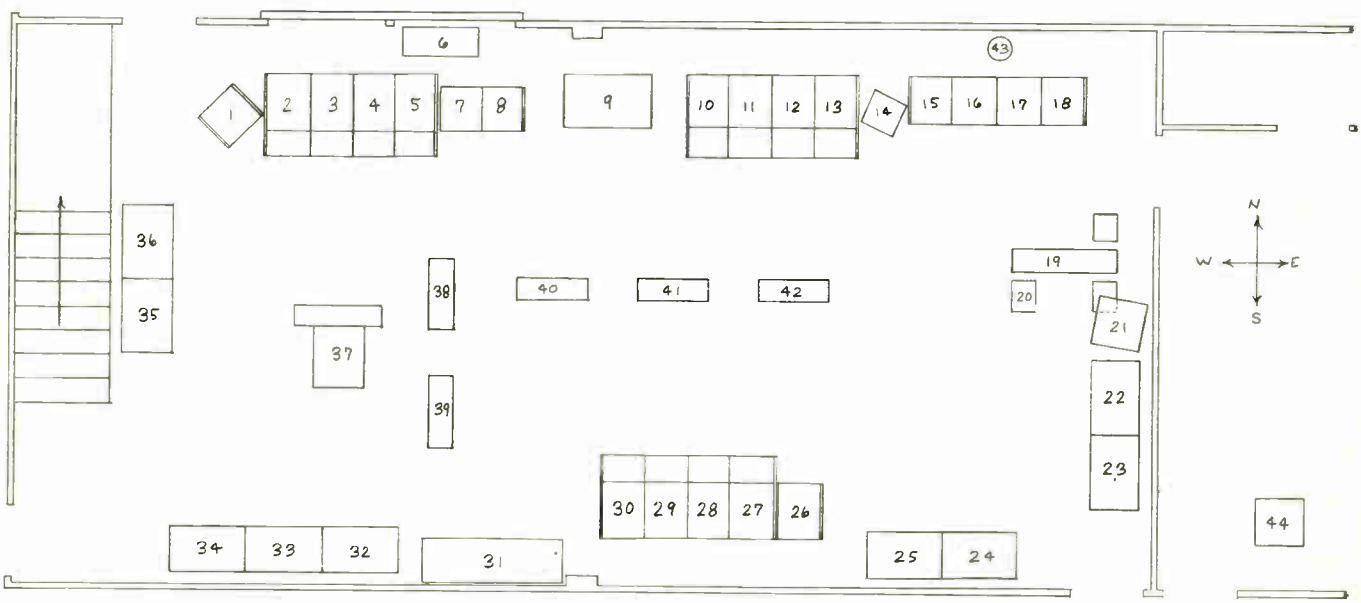
When programming increases, initial solutions to production control fall short. Here's a new signal routing system which can handle a number of inputs/outputs with very few operators.

An instructional television system often expands its facility to accommodate the demand for more and better programming. The upgrading process usually means greater flexibility is incorporated and quality improved. The catch is, parameters of the newer system are extensions of the older. Problems that occurred with the original facility either have to be eliminated or they are likely to be compounded.

Mr. Maggio is Chief Engineer at the Dept. of Televised Instruction for the Spring Branch Independent School District, Houston, Texas.

Spring Branch Independent School District, located in the suburbs of Houston, Texas, has been operating a two-channel 2500 MHz ITFS system since 1965. At first, a small room served as the Master Control area, and a modified conference room as the television studio. But the system's success soon was apparent, and the television department requested that the school district expand the facilities to an updated four-channel 2500 MHz ITFS system.

While the building housing the TV facilities was under

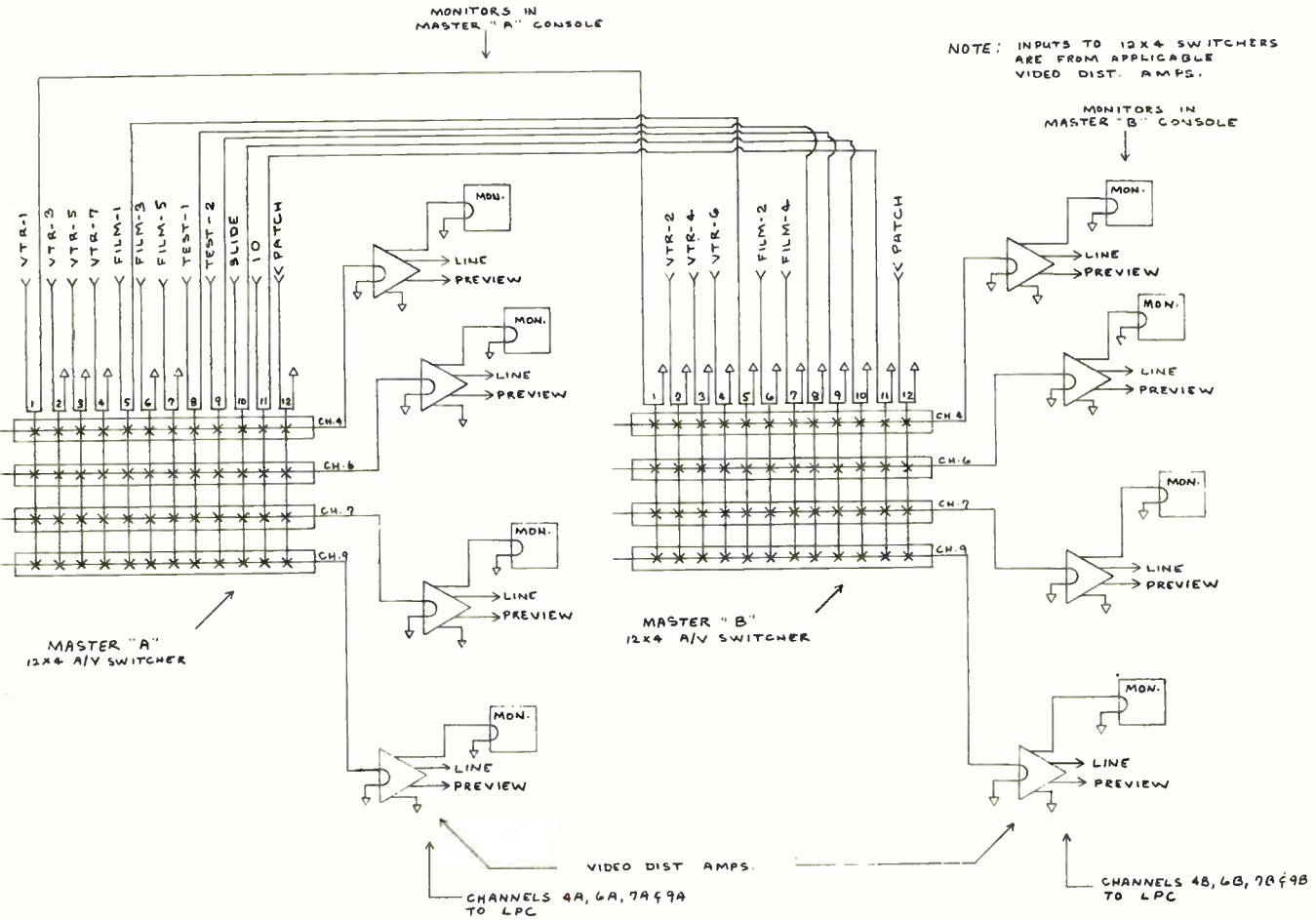


1 - prod. monitoring & A/V patch panel
2 - video prod.
3 - video prod.
4 - video prod.
5 - audio prod.
6 - prod. speaker
7 - audio turntable
8 - audio prod. & dist.
9 - station ID
10 - Channel 9 LPC
11 - Channel 7 LPC
12 - Channel 6 LPC
13 - Channel 4 LPC
14 - Channel 4 preview monitor
15 - transmitter equip.
16 - transmitter channels 7 & 9
17 - transmitter channels 4 & 6
18 - building R.F. dist.
19 - color film multiplexer
20 - color film controls
21 - hanging color monitor
22 - VTR 7 - color
23 - VTR 6 - color
24 - VTR 5 - b & w
25 - film rewind
26 - color prev., video dist. & A/V patch panel
27 - master prev. & audio dist.
28 - master "A" console
29 - remote controls
30 - master "B" console
31 - film-edit workbench
32 - VTR 4 b & w
33 - VTR 3 b & w
34 - VTR 2 b & w
35 - film rewind
36 - VTR 1 - color
37 - slide chain
38 - film 1
39 - film 2
40 - film 3
41 - film 4
42 - film 5
43 - transmission line
44 - master clock & engineering equip.

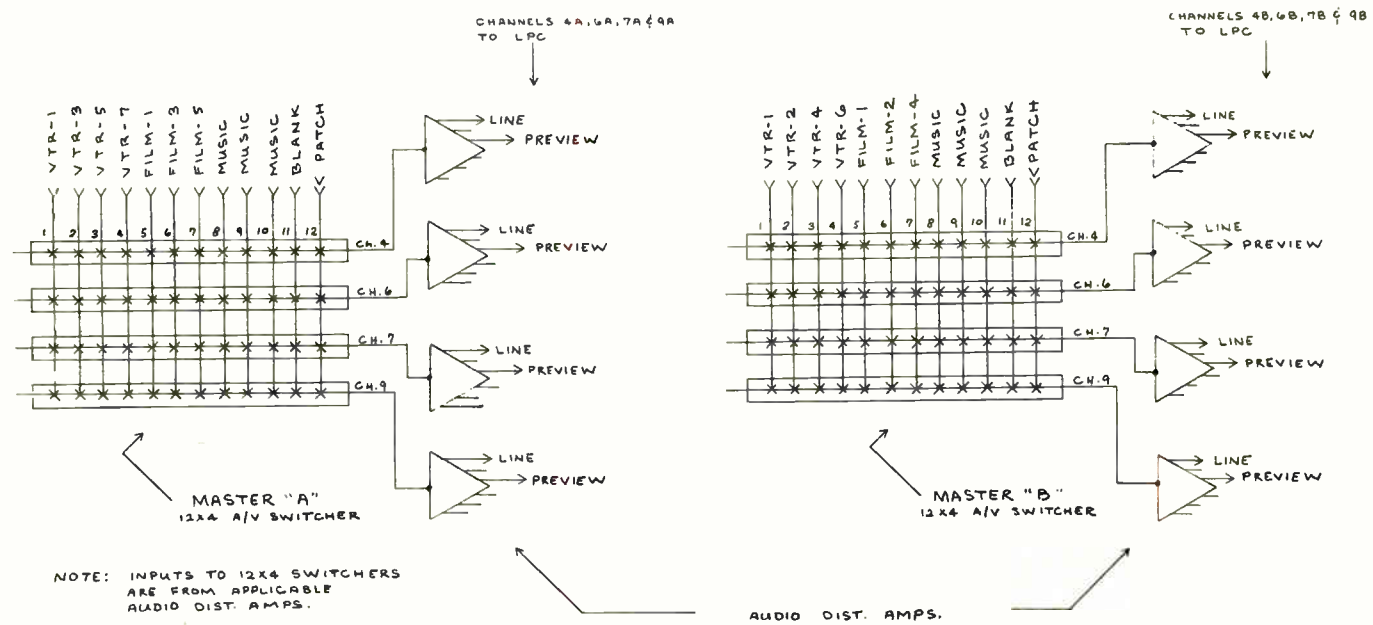
Master control room at Spring Branch

construction, the new system started taking shape—at least on paper. Written specifications indicated three channels would be broadcasing in black and white, and one channel in color. Funds were limited, so existing equipment was used, though primarily in the production area. But while money was spent updating equipment, a great deal of attention was focused on redesigning the signal routing system for the broadcast area.

The objective of the new design was to help eliminate operational problems resulting from mass programming, and to ease the burden of growing pains. The new signal routing system can handle a number of inputs/outputs with the minimum number of operators, yet affords a superior on-air signal quality. This switching system also



Two master switchers A & B are used; VTR-1, Film 1, Test-1,2 and ID can be switched from either position



Audio input to the two master switchers

allows for future expansion with minimal costs.

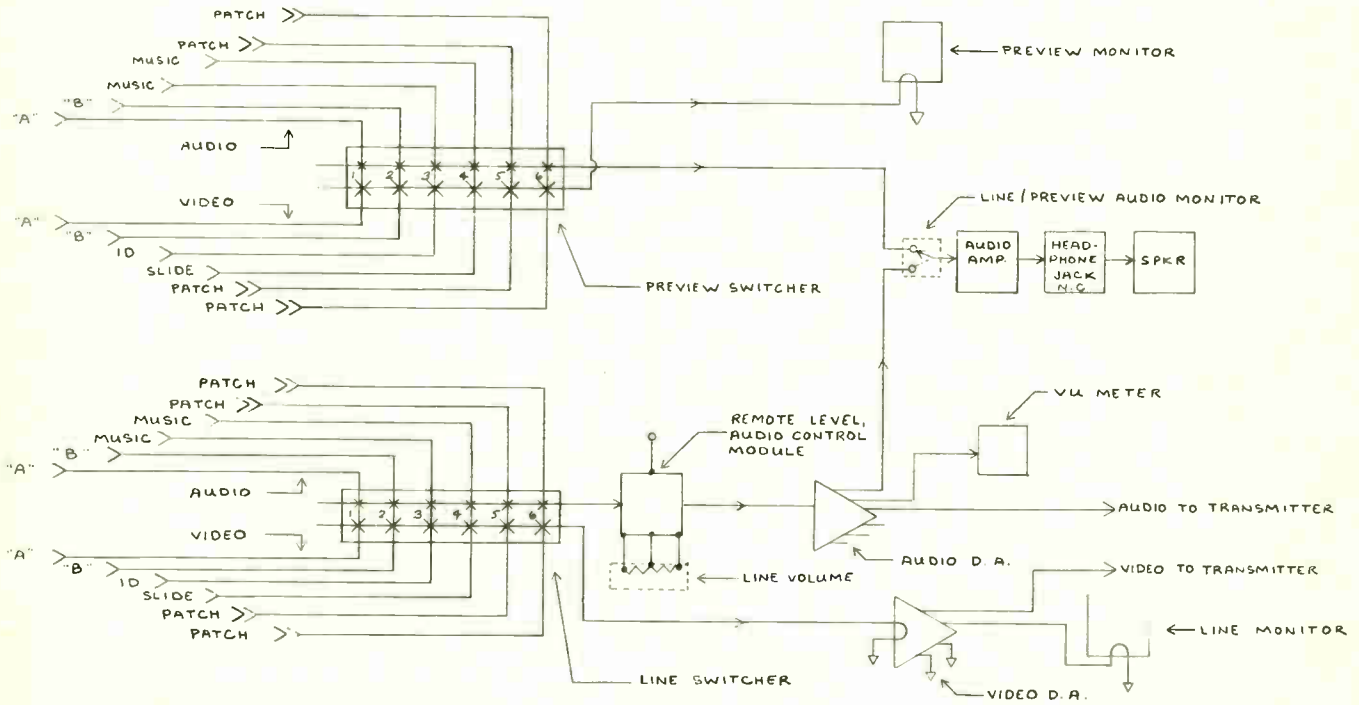
Fig. 1 illustrates the location of the equipment in the Master Control Room. Seven videotape recorder/players (four black-and-white, three color) are located along three walls of the room. Five black and white film chains are located down the middle of the room with the threading side facing the Master Control Boards. There is one color film multiplexer. The production area is located in the northwest portion of the Master Control Room and is theoretically isolated from the broadcast area. Seven VTR's, six film chains, three test signals, one slide chain and the station ID comprise the eighteen inputs which can feed just one, or all four channels simultaneously. A 20 x 4 audio-follow-video switching matrix can easily do the job in this control room with as many as four operators routing input sources to outputs; however, a new approach to signal routing is currently in use, using only two operators at the Master Control Board.

During the infant design stage of this signal routing system, the station manager was doubtful that operations would be easier, despite the anticipated programming schedule of airing some thirty-two programs during an eight-hour school day. Mr. Henry L. Thomas, director of Televised Instruction, said:

> "As the station manager of a four-channel public school ITFS operation, one of the first concerns in basic design is making a large operation work professionally with a very small staff. When my engineer first mentioned our present design, I found it confusing. At first glance, it seemed too much to be done by too few people. The idea of only two people feeding four channels of programming frightened me."

Two Dynair 12x4 audio/video switchers are used, designated as Master "A" and Master "B" (Fig. 2 and 3). Master "A" switcher inputs are: VTR-1, VTR-3, VTR-5, VTR-7, Film-1, Film-3, Film-5, Test-1, Test-2, Slide, ID, and the 12th input is patchable from the patch panel. Master "B" switcher inputs are VTR-1, VTR-2, VTR-4, VTR-6, Film-1, Film-2, Film-4, Test-1, Test-2, Slide, ID, and the 12th input also patchable. Both Master Switchers have VTR-1 and Film-1 in common which are used primarily for production; however, they can be used to back up the other sources by either Master "A" or Master "B" in the event of equipment tie-up, failure, etc. Both Master Switchers also have Test-1 (stairstep), Test-2 (multiburst), Slide and ID in common; a limited amount of built-in redundancy is necessary, since these four input sources can be switched on-the-air from either Master "A" or Master "B", if needed, when operating personnel is limited. Each Master Switcher has four outputs each: 4A,6A, 7A, 9A, and 4B, 6B, 7B, 9B—a total of eight sources that may be fed to four channels.

There are four Line/Preview Consoles (LPC)—one for each of four channels. Since all are operated identically, explanation of one LPC is sufficient. The LPC is semi-passive; that is, an operator can route the program selected from either Master "A" or Master "B" to the transmitter via the LPC. One can associate this console to a small compact production unit where audio and video can be previewed independently of program (Line) audio and video. The LPC (Figure 4) has two 6x1 video terminating switchers with contacts wired for unbalanced audio: one switcher for the preview circuits, and one switcher for the line circuits. The inputs to the LPC 6x1 switchers are alike; they are: "A", "B", ID, Slide, Aux. 1, and Aux. 2. Aux. 1 and Aux. 2 are spare inputs which can be patched from the patch panel or, if needed, the system can be expanded to accommodate a Master "C" and a Master "D" switcher. The preview circuit of the LPC is used to preview programs before sending them to the line circuit. The line circuit of the LPC feeds the transmitter input for airing. The color film chain signal and a color bar test signal are switched at the LPC which handles the color channel; these two signals are used in lieu of Aux. 1 and Aux. 2 at this LPC. Audio volume is monitored and adjusted at the LPC with a volume control, VU meter,



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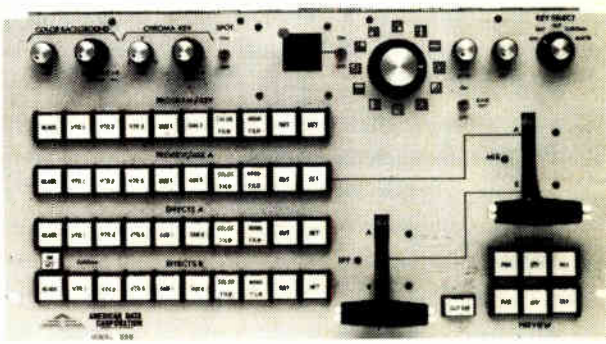

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James Tate and Fred Carter operating Master "A" and Master "B" boards as Joseph Maggio, chief engineer, looks on.

Line/Preview console (LPC) operators, Barbara Bromley (left) and Judy Deal, monitoring on-air programs of four channels.

Overall production area view of the Master Control Room. Master Boards to the right, LPC across the room on the left, and the production consoles in lower left.

amplifier and speaker or, if need be, headsets.

More than six dozen video, pulse and audio distribution amplifiers are used in this system to help isolate load resulting from operator error, or from adding noise to or, in any way, disturbing the original signal. They also permit signal routing to various sources including patch panels. Normally, this system will operate efficiently without the aid or use of any audio or video patch. The patch panels can be used (1) to back up a switcher by re-routing the signal in the event of equipment failure; (2) to enhance the signal routing system during crowded broadcast scheduling; (3) to expand the operating capabilities of the Master Control Room in either the production or the broadcast areas.

Reviewing the signal routing: The signal path is from the source (tape or film), through Master "A" or Master "B", through the LPC to the transmitter. This system can be operated with four operators at the Master Boards. However, at the Spring Branch Independent School District ITFS, only two operators are used at the Master Boards and two operators at the LPC. Results: Traffic congestion in the Master Control Room area has been eliminated; flexibility is increased when maintenance problems occur; and double-checking procedure has been added when airing programs. Dissemination of audio/video signals in this manner also results in a higher efficiency of broadcasting on four simultaneous channels with few "on-air" problems. **BM/E**

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Unique "Offset" Method Introduced

With the new Tektronix Model 1480 waveform monitor, a calibrated one volt is applied to lift alternate H-lines vertically, leaving the remainder at "base" level. Adjusting amplitude to put the bottom of "upper" cycles on the same level as "top" of lower cycles gives signal amplitude exactly equal to one volt. The new instrument also has other novel operation modes for more efficiency in TV and VTR testing.

The pressure for more accuracy and speed in checking the performance of TV systems has been growing sharply in recent years. The new Tektronix Model 1480 Waveform Monitor, which recently superseded that company's popular Model 529 monitor, gives TV measurement precision a large boost with a new way of adjusting a TV signal to match a calibrated voltage level,

Called by Tektronix the "offset method,"* this new testing mode can be illustrated by its use in adjusting level of line 17 of the vertical-interval test-signal system (VITS). As shown in the photo, line 17 includes, among other elements, a luminance bar at the "top" of the signal, a sine-squared pulse, the standard staircase signal, and a sync pulse showing the sync tip or "bottom."

When the calibration mode is switched on, a 1-volt square wave accurate to ±0.2%, with a period of 4H, is added to the signal. This lifts two complete lines of the signal vertically by exactly one volt. The following two lines stay at the "base" level.

Another new operation mode of the monitor, a "sweepback" or "foldback" system that can bring later cycles of a signal back into sweep coincidence with earlier ones, is now brought into play. The two cycles at "base" level are brought back so they are under the two lifted, or "offset" cycles. (See p. 58) The luminance bars of the upper lines are exactly one volt vertically above the luminance bars of the lower cycles.

Then the signal amplitude is adjusted so the sync bottom of the upper cycles is in vertical coincidence with the luminance bars of the lower cycles, the amplitude will be exactly one volt.

This method avoids several sources of inaccuracy inherent in the long-time standard method: adjusting a calibrating voltage to fit closely into convenient graticule markings, and then adjusting the signal to the same markings. There is the uncertainty in fitting the calibrating voltage to the lines, and the uncertainty in adjusting the signal voltage to the lines. Then there is any change that occurs in vertical gain between the two adjustments (which are sometimes separated in time by a considerable period). And in many cases there is graticule parallax to add to the error. Even worse is the old "shop" method of marking the CRT with a grease pencil.

Tektronix claims that, with the calibrating voltage accurate to ±0.2% and a general setting accuracy of ±0.2%, the basic accuracy is ±0.4%. Differences in level come out to about 0.8 dB per graticule line (an internal graticule on the Model 1480 eliminates parallax), which allows good estimations for a basic resolution to about 0.1 dB. But the instrument has a calibrated 5× vertical multiplier; with this applied, the resolution of the amplitude adjustment process is of the order 0.02 dB! Older methods had no comparable magnification of the adjustment resolution.

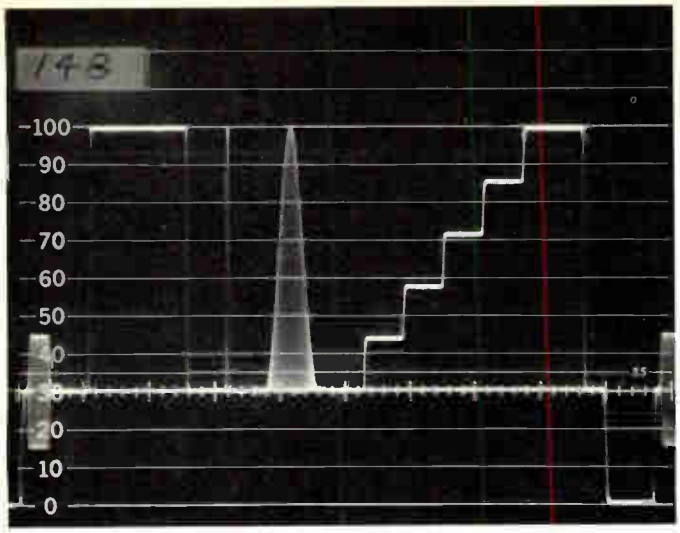
The accompanying photographs illustrate a number of phases of the operation as applied to the VITS line-17 display. They also illustrate the use of another feature of the monitor, the built-in noise filters, that improve adjustment accuracy with very noisy signals, at two levels. With controls set "flat," no filter is applied; with the "IRE" setting, highs are attenuated without appreciable distortion of the signal. This effects a significant reduction of the noise (not illustrated by photo). If the signal is very noisy, further reduction is available with the "Low Pass" setting (upper right hand photo p. 58).

The offset method can be used to measure amplitude of the picture alone by setting the DC restorer to "back porch" rather than to "sync tip" (a switchable choice). Then the back porch is the "bottom" of the display, and the picture amplitude can be adjusted or measured, with luminance bar and black level brought into coincidence. The sync amplitude cannot be measured directly with the offset method, but it is easily calculated as the difference between the overall level and the picture level.

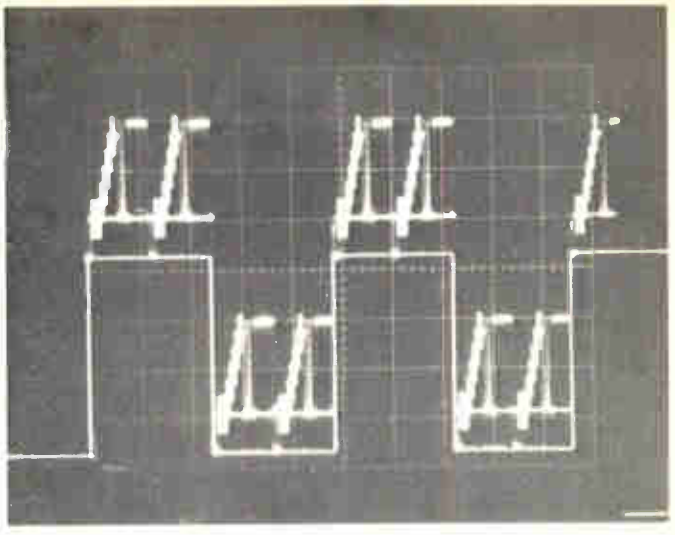
It is obvious that the offset method described can be used to measure a great variety of signal voltage levels with comparable accuracy. The usefulness of the mode extends well beyond the analysis of VITS and of TV signal waveforms in general.

continued on page 58

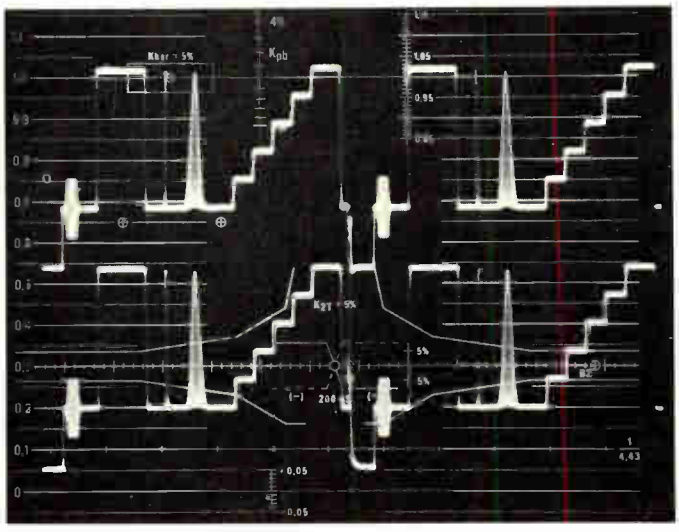
** The offset amplitude adjustment method was developed by Dr. L. G. Weaver, Tektronix European Engineering Consultant.*



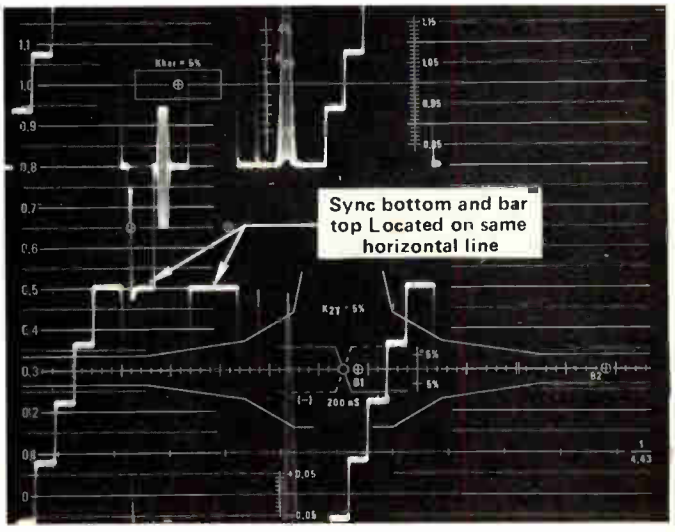
Line 17 of VITS. Key elements for offset method are luminous bar at top, and sync "bottom."



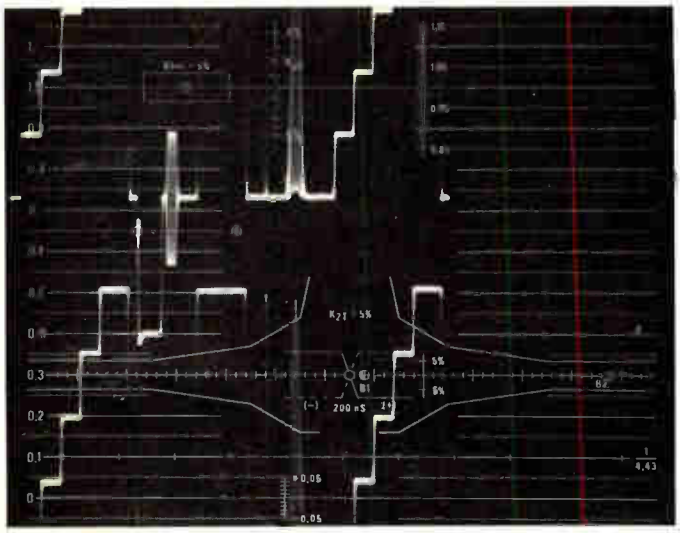
This photo shows how display is locked to the calibrating square wave.



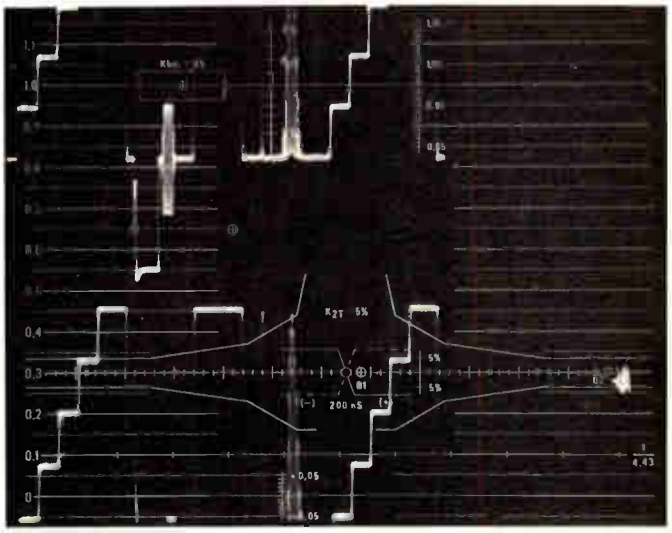
This is normal display on waveform monitor 1480 at reduced amplitude.



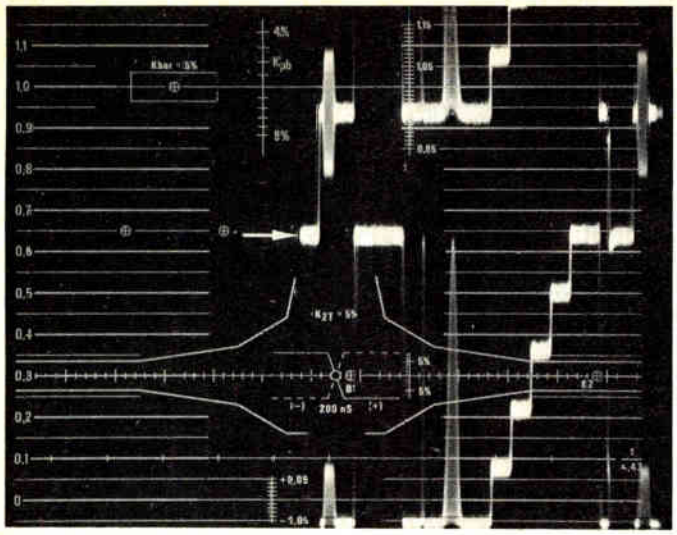
With correct setting of gain control sync bottom and bar top are on same horizontal line.



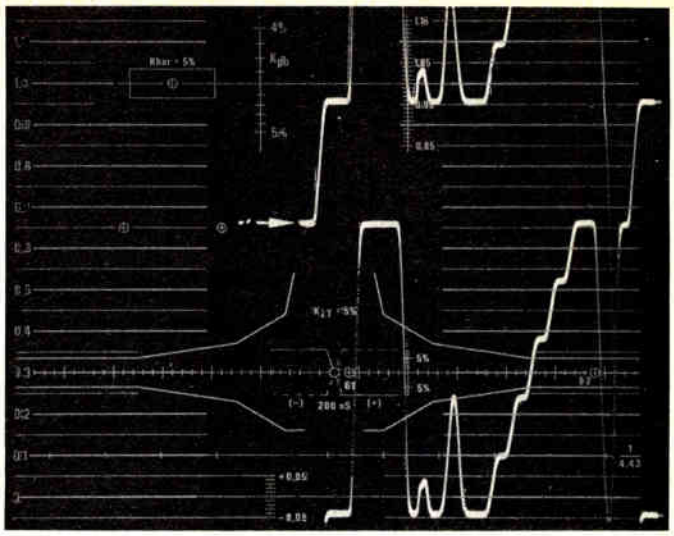
This shows how display would look with gain 10% too high.



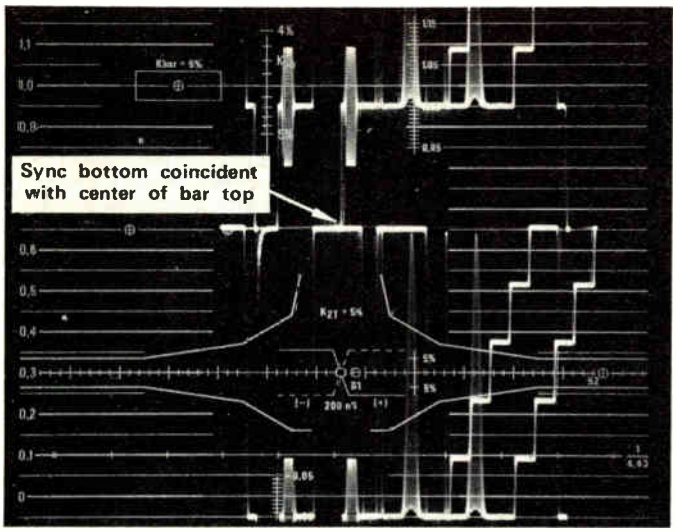
Display here is with level 10% low.



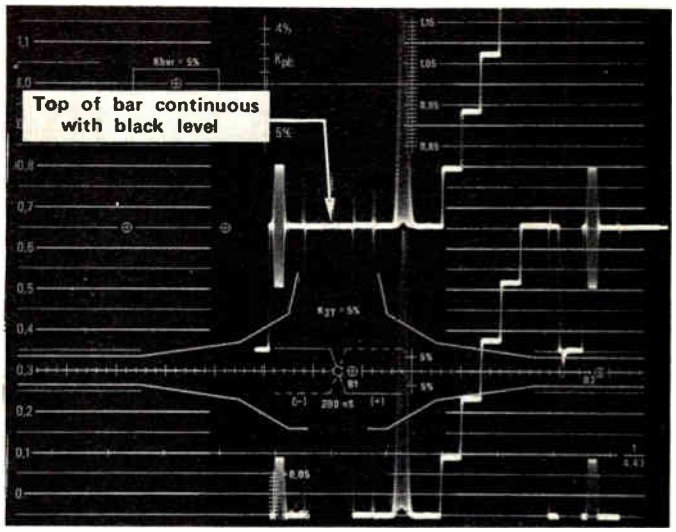
Signal with random noise FLAT response.



Noise is reduced with LOW PASS response setting.



This photo shows how the OVERLAY function makes signals coincident for accurate measurement.



Measurement of picture component amplitude can be measured as well, as this photo shows.

Some of the other new operation modes that add to the flexibility and accuracy of the waveform monitor are: a digital system for selection of line and field, which is positive (errorless); automatic adjustment of focus and brightness for optimum display at each writing speed; maximum sweep rate of 0.1 microseconds/division (three times faster than that of the Model 529), which allows examination of T pulses even in the vertical interval; a considerably brighter CRT display, clearly readable at all normal lit room levels.

Another mode designed specifically to enhance VITS analysis is called "All Fields," It allows superimposition of all or any part of alternate fields. With this mode the engineer can view all four International test signals at once, or any other combination of VITS; he can view simultaneously but separately test signals inserted at two or more different points in the system; and he can make determinations of field time distortions.

An auxiliary video facility consists of input and output buffer amplifiers, and switching, so that additional filters, signal processing equipment, equalizers, measuring equipment, or other units can be switched at will into the path of the signal through the waveform monitor. External BNC connectors, and 75-ohm terminations, allow the auxiliary units to be added without any disturbance to operation along the main path. The "extra" units can be switched in or out as needed. One useful application is for noise filters that reduce the bandwidth to just the level needed for optimum signal to noise ratio. Another is the insertion of auxiliary measuring equipment, when it is desired that the signal will not be affected in any way by the measurement.

Highly useful outside the TV transmission field, is a 15-line display capability: it is particularly appropriate for analysing performance of quadruplex VTRs, since each head passage comprises a little over 15 lines. In a later article BM/E will discuss in detail the principles and method of using this new analysis mode.

The general electrical characteristics of the Model 1480 are all at state-of-the-art levels, as might be expected in an instrument with advanced operation capabilities. **BM/E**

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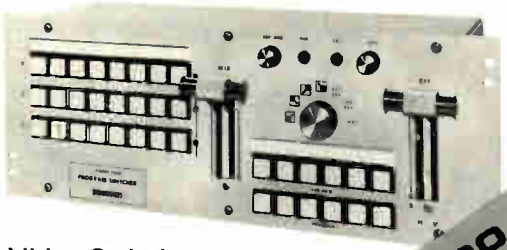

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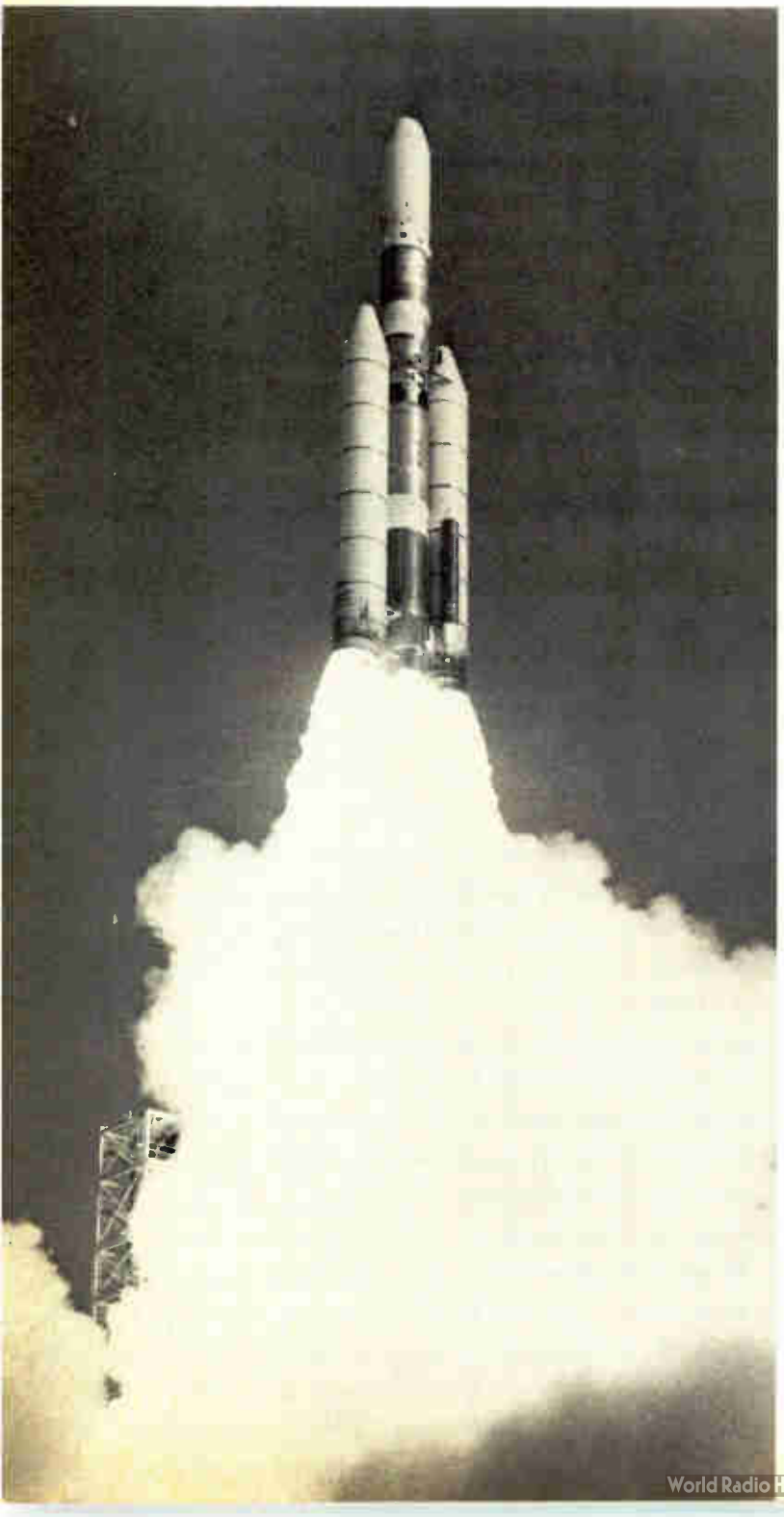
Top-of-the-Art Engineering To Get Full Play At NAEB Convention



The emerging evidence of satellite viability for domestic networking, the most recent advances in the digital handling of audio signals, and a new, highly efficient video time compression system that has worked well in educational television, will be among the topics to give cogency and timeliness to the engineering sessions of the 50th Anniversary Convention of the National Association of Educational Broadcasters.

The Convention will run November 17 through 21st at the Hilton Convention Center, in Las Vegas, Nevada. It will also include an equipment exhibit, with more than 60 manufacturers signed up at the time this issue went to press. (See list below.)

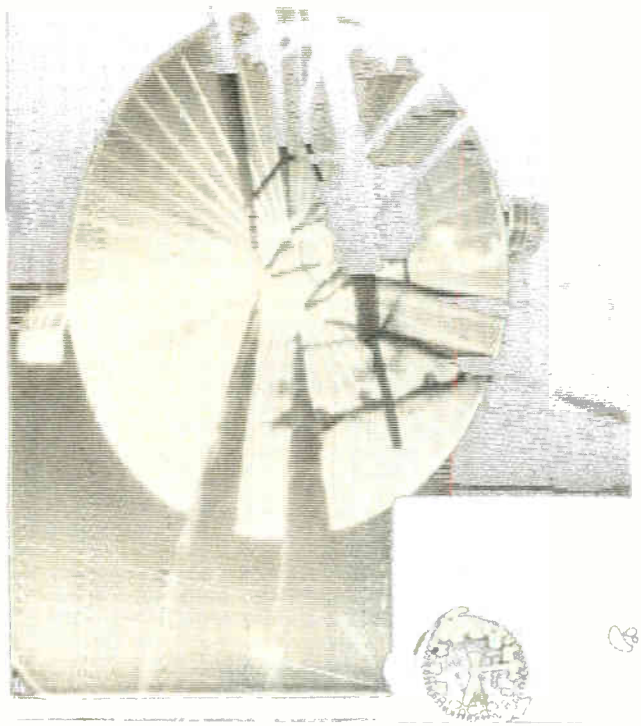
Some of the other engineering topics will be: a report on a quantitative comparison of videotape recorders; two papers reporting new uses of vertical interval reference signals; a new approach to computer-managed graphics; and a new super-accurate VU meter.

There will also be a report on FCC actions and trends, by Harold Kassens, Assistant Chief of the Broadcast Bureau; a round-up on the progress and outlook for public broadcasting, with a distinguished panel from public broadcasting engineering and management; and a panel discussion, "Quality Audio—Where Do We Go From Here?"

The session on satellites will include a demonstration of transmission via the Applications Technology Satellite 6, which is being used for dissemination of educational programs in Alaska, Appalachia, and the Rocky Mountain area. Philip A. Rubin, director of engineering for the Corporation for Public Broadcasting, will present an "overview" of satellite technology, and John Ball, manager of transmission for the Public Broadcasting Service, will report on the experiments of that organization in the use of mobile satellite receivers for networking.

The report on digital audio will be from R. Evans Wetmore, assistant manager of transmission, PBS, and the super-accurate VU meter will be reported by its developer, Wayne Hetrick of National Public Radio.

The time compression system called VIDAC, is a joint project of the Georgia Educational Television Network and the Westinghouse Corporation. The use of VIDAC will be described by O. Max Wilson, Director of ITV for the Georgia Network, and the technical description will be by Henry Diambra, vice president, engineering, of Westinghouse. **BM/E**



Discussion of ATS-6 satellite is a big topic at NAEB. The unusual photo of the ATS-6 in flight (on page 60) was taken by the onboard TV camera. You are looking at the deployed 30-foot antenna which produces a high effective radiation power. The spacecrafts two solar panels can be seen projecting from behind the antenna. The satellite was put into orbit by Titan IIIC. (For more on the ATS-6 Health Education Technology program see article beginning on page 30.)

FCC RULES AND REGS

cont. from page 27

compliance with the Fairness Doctrine, the broadcaster need only specify the date and time of the *particular* program which presented a contrasting view of the relevant issue. The Commission suggests that broadcasters, for their own convenience, might want to maintain a record of their public issue broadcasting throughout the period of its license in order to facilitate its responses to fairness doctrine complaints. Finally, potential complainants are urged to first air their complaint with the station involved.

Application Of Fairness Doctrine To Broadcast Of Paid Announcements

Editorial advertising, defined by the Commission as comprised of "commercials actually consisting of direct and substantial commentary on important public issues," is fully subject to the fairness doctrine in the same manner that it applies to the commentary of a station announcer. Problems relating to editorial advertisements arise (1) when they are sponsored by groups which are not generally considered to be engaged in debate on controversial issues, and (2) when they do not *explicitly* address the ultimate matter in controversy. The Commission expects licensees to deal with these difficult problems by doing nothing more than making "a reasonable, common sense judgment as to whether the 'advertisement' presents a meaningful statement which obviously addresses, and advocates the point of view on, a controversial issue of public importance." The licensee's determination must include, in addition to review of the text of the ad, "his general knowledge of the issues and arguments in the ongoing public debate." If the advertisement bears only a distended relationship to the debate, the Fairness Doctrine would not be applicable.

The Commission's Fairness Report rejects the use of the "cigarette case" [5] as Fairness Doctrine precedent for advertisement of commercial products or services. The "cigarette case" resulted in a mechanical procedure to "trigger" the Fairness Doctrine and treat all cigarette advertisements—regardless of what they actually said—as discussions of one side of a controversial issue. Thus, all cigarette advertisements were deemed subject to the Fairness Doctrine requirement of opposing viewpoint presentation. The Commission, in the future, will apply the Fairness Doctrine only to those commercials which are devoted in an "obvious and meaningful way to the discussion of public issues." In the absence of meaningful and substantive discussion, such as found in editorial type advertisements, the Commission will not deem the usual commercial product advertisement as presentation to the public of one side of a controversial issue.

Conclusion

The Commission's recent "Fairness Report" clarified several issues relating to broadcaster compliance with the Fairness Doctrine. Problem areas have included licensee determination of (1) what is a controversial issue of public importance"; (2) what is the specific issue raised; and (3) what is a "reasonable opportunity" for contrasting viewpoints.

Broadcasters retain broad discretion in dealing with Fairness Doctrine problems, although such discretion is *not* unbounded, and is subject to FCC determination of "arbitrary and unreasonable" licensee action.

The recent Court of Appeals "Pensions" program decision (while pertaining specifically to broadcast journalists and news programs) indicates that broadcasters are to be given "the widest latitude [by the FCC] to determine for themselves" whether programs are fair. **BM/E**

[5] *Bandzhaf vs. FCC*, 405 F. 2d 1082, (D.C. Cir. 1968).

GREAT IDEA CONTEST

This winds up the Great Idea entries for 1974. In December, finalists in the contest will be represented for reader votes on Windjammer Cruise Winners. So tell us your preferences for this month at once. Fill in the ballot which appears on the Reader Service Card.

78 Phone System Is Tied Through the Control Board.

John E. Shepler, WROK, Rockford, Ill.

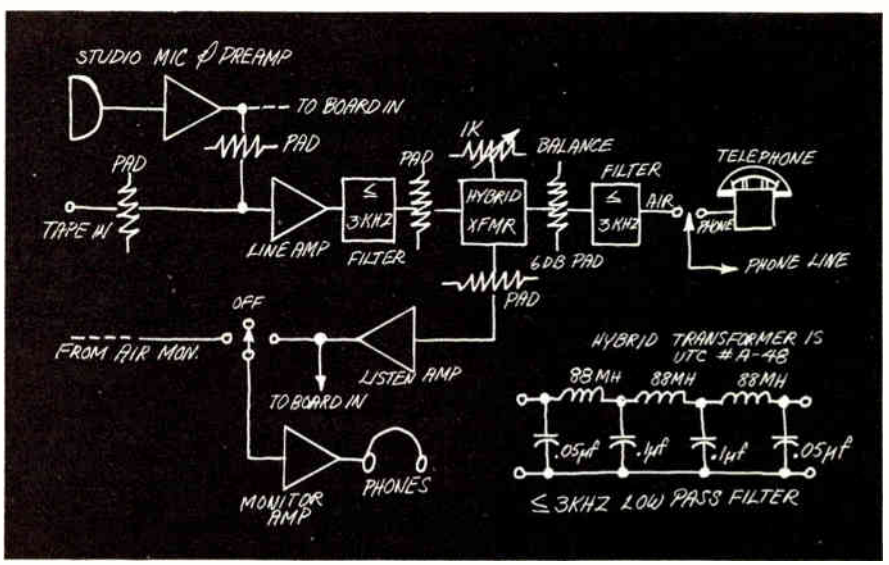
Problem: To provide a phone system that lets you talk and listen through the control board, even off the air.

Solution: I designed the circuit shown in the figure around a commercially packaged hybrid transformer. Other hybrid arrangements should also work. The two filters help reduce line noise and keep cross-talk through the transformer to a minimum.

The pads are designed for 600 ohms and should be as large as possible to avoid mismatches that would upset the balance of the hybrid. Six DB's is the minimum value for each.

The amplifiers should also be designed to work into 600-ohm loads and need only amplify enough to compensate for the pads and varying line levels. A preamp or booster with at least 20 to 40 DB gain should do.

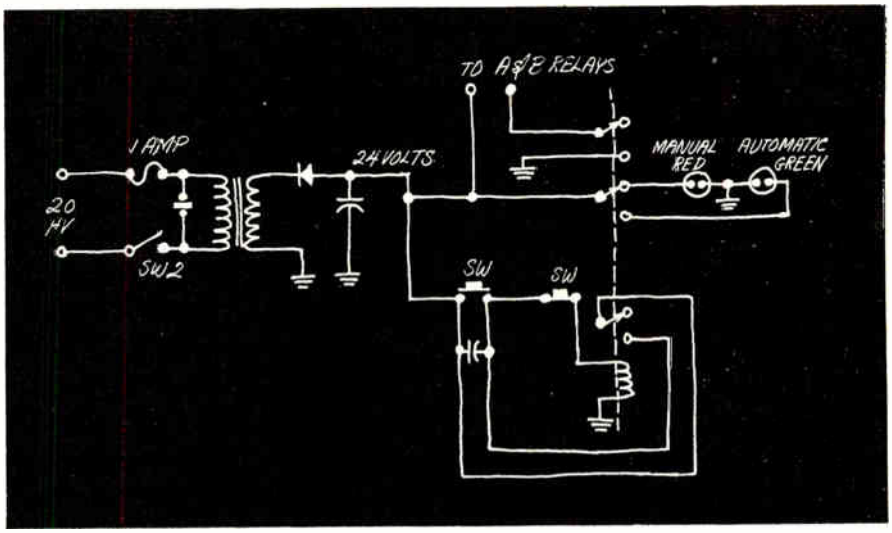
The input is bridged across the main microphone preamp. If this is done before the mic key, you will be able to talk down the phone line without being on the air. However, if a call is placed on the air, the studio speakers must be muted to avoid feedback. Note that another input is provided for a cartridge machine or recorder. This could also be used as a second bridging connection for a guest microphone.



Shepler's phone circuit that goes through control board

1975 Great Ideas

BM/E will repeat the popular Great Ideas contest in 1975 beginning in February. Rules will be simpler and published next month. If you are ready to submit your idea now, write for a copy. Fill in the ballot which appears on the Reader Service Card



Schematic of Hosington's audio switcher

The output of the listen amplifier goes directly to an available channel on the control board. The headphone monitor may be used as a telephone receiver, an air monitor, or turned off completely.

To set up circuit, speak directly into the microphone and adjust the line amp gain for about 0 VU on the telephone line. Then balance the hybrid transformer by turning the balance pot until the output to the board and phones is minimum. Adjust the listen amp gain to provide enough level on incoming calls.

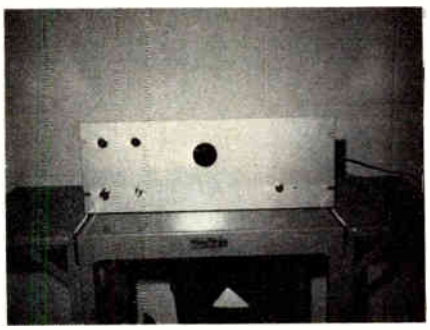
The regular telephone set is still used for dialing, and will function as usual until switched out of the circuit. The pad and filter have a DC path that holds the line after the switch is thrown. The switch may be omitted if a phone company coupler is used.

79 Automation to Main Console Audio Switcher is Flexible.

W. K. Hoisington, General Manager, WKYV-FM, Vicksburg, Miss.

Problem: To switch both right and left channels from automation to main console.

After installing a SMC 3060 automation system, we wanted a way to use the main console for standby production. Also, our goal was to switch the 3060 directly into the transmitter and switch the output of the console directly into our production equipment.



Hoisington's switchers

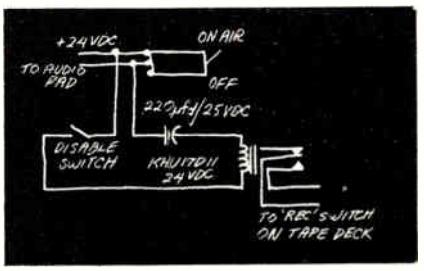
Solution: We didn't want to use jack panels or a bunch of switches. The switcher shown in the schematic has worked very well for us with no problems. You can't tell when the automation is switched from the console to the transmitter; there is no change in level or popping from relay contacts. Back-up operation is assured; Cannon connectors were installed on the back of the switcher if the switcher broke down. Now the announcers can, if need be, unplug the cables leading to the console and transmitter and connect what needs to be connected to the transmitter.

80 Recorder Monitors Announcer At Automated Station.

Duane L. DeSalvo, Ass't. Engineer, KETO, Issaquah, Wash.

Problem: To automatically record whatever goes out on the air when the board is "on the air."

When our automated station changed formats, management wanted to record every commercial break and newscast originating from the control room board that was aired.



De Salvo's on-air monitoring recorder

Solution: To go "on the air," the operator on duty must flip the board switch from "off" to "on the air," and by doing so connects it to the audio pads connected to the limiters.

The on-air switch has +25 volts on its terminals. By connecting a ca-

continued on page 64

pacitor and relay to this switch (see diagram), a circuit was made which, when the switch was in the "off" position, would charge the capacitor. When switched to on-air, the circuit terminals are shorted, allowing the capacitor to discharge through the relay and, in turn, energize the record relay in the tape recorder hooked up for monitoring. An extra switch was placed in series with the circuit allowing it to be disabled to prevent the tape machine from going into the record mode while playing back a program on the air. In order to keep costs down, provisions for shutting off the recorder were not included.

81 Modified Cart Player Delays Audio.

Elden DuRand III, Engineer, WAVE AM/TV, Louisville, Ky.

Problem: To modify one of the older types of tape cartridge record playback units for audio delay use.

The machine used is in a studio where a live telephone call-in show is aired. It incorporates a 5 sec. delay in case a caller uses profane language or says something libelous.

When we started doing call-in shows, we used an Ampex AG-350 with a modified outrigger playback head. This machine used an open tape loop which invited disaster if someone accidentally touched it while being used.

Solution: The remains of an RCA RT-7A audio cart record/playback unit were brought out of retirement, and modified for use on the call-in show. My reason for selecting a cart machine for program delay is that the modified tape cart, while nothing more than a tape loop inside a nice package, exactly substitutes in function for the reel tape recorder, while avoiding its problems.

The reader has probably already wondered where to hang the third head when there are only two head positions in a standard spot-size cart. The Nortronics magnetic head catalog has just what I was looking for: their "Combo" (No. AlHC-47K) series. The RT-74 was rebuilt in the following sequence.

1. The original heads were removed along with trip cue relays
2. The Nortronics erase/record head was installed in the mount next to the capstan.
3. Nortronics playback head was installed in the place occupied by the cue head.
4. Necessary circuit changes were made
5. Heads were aligned.

Full details may be obtained from BM/E.

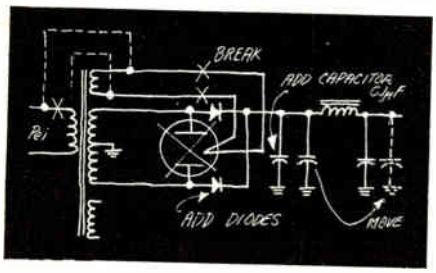
82 Buck Out Leaping Line Voltage.

James Feasel, Chief Engineer, WHTH/WKNO, Newark, Ohio.

Problem: To counteract the effects of abnormally high line voltage.

Are your studio lamps burning brighter and your equipment transformers hot enough to fry eggs on?

In some areas of the country, power line voltages have been creeping up higher and higher over the past ten or 15 years. Now the nominal line voltage in your area could be 125/250 volts, where it once was 110/220, 115/230, or 120/240 volts.



Feasel's substituting solid state devices for rectifiers

According to the Ohio Public Utilities Commission, this normal line voltage could creep even higher when loads are light. Some power companies are not yet operating at this 125 VAC level, but are expected to meet this national standard as soon as possible. The explanation for increasing line voltage is an economic one; it is more efficient for the utilities to transmit higher voltage, and also to use the difference to make up for losses in wiring instalations. For instance, most pole and distribution transformers recently installed do not have taps on them. So, in many cases, one must live with this high line voltage.

This means older 115 VAC tube-type equipment may be operating near the design maximum voltage limit, resulting in much greater heat output, shorter filament life, and some strain on other components such as transformers and chokes. Incandescent lamps last only a few weeks at this high voltage.

Lamps, however, can be replaced with less readily available 130 volt-rated units. But the smaller wattage lamps, on the other hand, usually come in only one voltage, and can cost a dollar or more each.

Solution: We place low-ohm resistors in series with incandescent lamps to help extend lamp life.

One method of overcoming so-called overvoltage, especially in older, vacuum tube equipment, is to replace the tube rectifier with silicon rectifiers and rewiring the transformer so the now-free filament winding bucks the series-wired primary voltage. Additionally, other unused secondary windings can be series connected to the filament to further reduce the voltage to the silicon rectifiers.

Most filter systems utilize a capacitor input pi network. If a choke is also used, move the input capacitor to the output side of the choke to change the configuration to choke input. This offsets the higher DC voltage resulting from the solid state components, and the high primary voltage. Also install a small-value capacitor in place of the input capacitor to damp out the inductive kick of the choke. Now wire the unused rectifier filament winding (plus any others mentioned before) to the primary as shown in the schematic; a 5% voltage drop at the rectifier terminals is the result.

If the resulting DC voltage is too low, reinstall a filter capacitor at the input of the choke filter network. Try different values since the output

continued on page 66

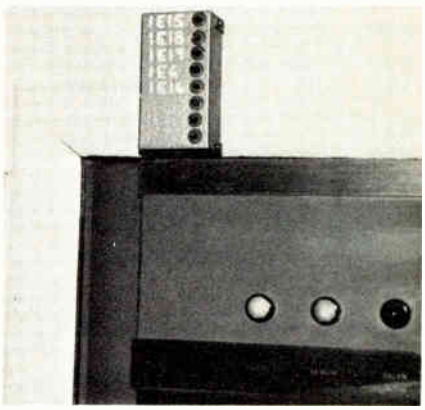
voltage is dependent on small values of the input capacitor.

83 Transmitter Interlock Indicator Protects Personnel.

John Maxwell, Transmitter Supervisor, WTVM, Columbus, Ga.

Problem: To assure safety and speed fault diagnosis when a TV transmitter malfunctions.

This interlock circuit has been used with our TT25CH transmitter for the past 14 years. Its use came about since the only indication of an open in the plate interlock circuit is the inability to apply plate voltage. This circuit was designed to protect personnel troubleshooting an open in the plate interlock circuit with schematic and vom inside the cage, with the door closed, and the plate voltage applied.

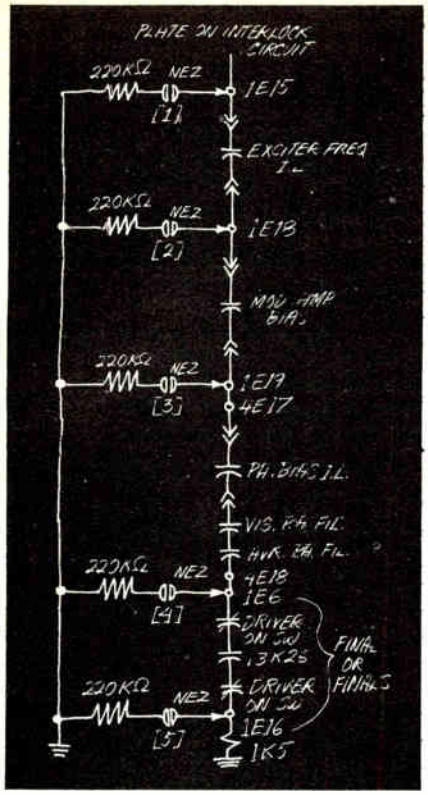


Maxwell's transmitter interlock indicator

Solution: Other than actually being in the cage, the other alternative is to hook up the meter, close the door, apply plate voltage and then read the meter through the window and repeat the process until the open is found. Essentially, this circuit is an external voltage indicator, monitoring the plate interlock circuit continuously.

The NE-2 neon lamps glow up to the open circuit. For example, consider what occurs when the visual p.a. filament switch trips. Neon lamps number 4 and 5 will be extinguished. Lamps number 1, 2 and 3 will remain on, indicating at a glance that the interlocks are closed up to this point.

Other than the benefits of locating an open interlock, this design also lo-



Circuit for transmitter interlock

calizes any other open in the plate interlock circuit. On one occasion, when plate voltage was applied, nothing happened. All the neons were out. Looking at the schematic, we found that the transmitter start switch was located ahead of the plate interlock circuit, 1E15. Turning off the transmitter start switch, then back on, cleared the open.

On two other occasions, an open aural p.a. filament interlock relay holding coil was located, and an intermittent surge relay, 13K26, located in the visual final.

An identical circuit is also incorporated in the transmitter drive to indicate an open interlock in the door, safety switch, modulator, reject load, dummy load, or unplugged Jones plugs in the exciter or modulator.

84 Talk Show Monitoring System.

James Cate, Chief Engineer, KOKX, Keokuk, Ia.

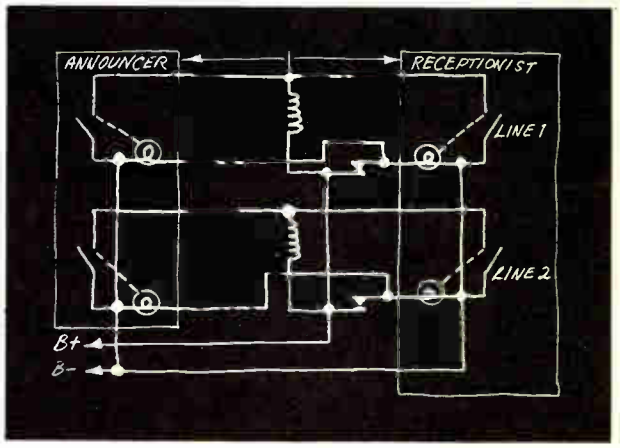
Problem: To relieve overloading of the phone system during talk shows.

After initiating a talk show, we found that the receptionist was devoting her full time to keeping track

continued on page 68

of which incoming calls had, and had not, been answered by the announcer. If the receptionist became involved in a long distance phone call or some other distraction, a person relieving her of the incoming call was completely lost as to which calls were for what purpose. We also found that our only intercom line (part of the phone system) was being used constantly for the talk show.

Solution: The system consists of two identical boxes; one for the receptionist, the other for the announcer. These boxes (shown as a two-line circuit in the figure) have one push button switch for each incoming line and are thus marked. These switches also have a translucent button that allows an indicator lamp to be seen. The two boxes are connected together by pulse type relays (momentarily energized) and are energized whenever a button is pushed.



Cates system for monitoring talk show

Now when a call is for the talk show, the receptionist pushes the appropriate button for the proper line. Her indicator lights, as does the announcer's. The announcer, upon seeing this, answers the proper line and pushes his button. This turns off both the announcer's and the receptionist's indicators, and the receptionist knows that call has been answered.

With this monitor system, she can spend more time attending to her normal duties. If she leaves her desk during a show, the replacement can tell immediately who the incoming calls are for, and which have not been answered. The intercom line is not used at all for the talk show, and interoffice calls can proceed as usual. **BM/E**

BROADCAST EQUIPMENT

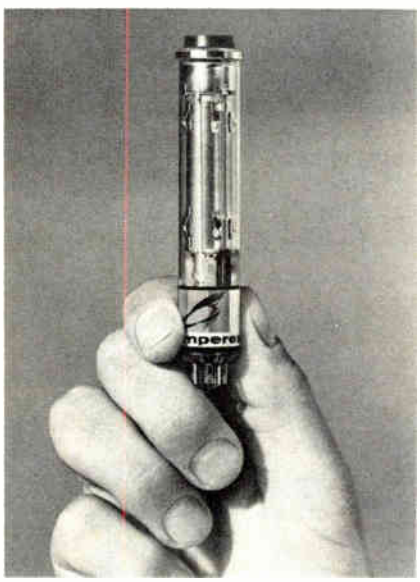
Low-cost image enhancer provides horizontal contour enhancement. Model 888 has single-knob control, was specifically designed for educational, industrial, and other similar TV applications. DYNASCIENCES. **300**

Routing switcher has both local and remote operation. Model 15X is available with 12 or 15 inputs, uses solid-state crosspoints for remotes, interlocked buttons and relays for local switching. $910 for 12 X frame, additional plug-in channels $325 each. 15 X frame slightly higher. COMMUNICATIONS TECHNOLOGY. **303**

Panel digital instrument uses 5 volts, has 4½ digits. Model AN 2545 has auto zeroing, floating true differential inputs, dual slope integrating A/D converter. $199. ANALOGIC. **304**

Compact audio tape recorder has synchronous reproduce, front panel edit control, IC digital control system with motion sensing. Model MX-5050 MIMI-PRO has switchable audible monitoring in fast forward and rewind, optional DC capstan servo, front adjustable bias, built-in test oscillator, standard reference level calibrate poition. Speeds can be 15 and 7½ ips, easily convertible to 7½ and 3¾ ips. There are two-channel and four-channel versions. $1345 OTARI **301**

New ⅔-inch version of Plumbicon color TV pickup tube claims higher resolution than any other comparably sized pickup tube. New tube, aimed particularly at portable cameras for "electronic journalism," can be used in poor light and has high stability over a wide range of temperatures, with lag (picture smear) near zero. Manufacturer's retrofit for existing portable cameras is under consideration. AMPEREX. **302**



Electronic synchronizer interlocks any two tape machines, video, audio, sprocketed or unsprocketed. "MINIMAG" has a capture range of ± 50 seconds, can be installed in 15 minutes, keeps the video-video, video-audio, or audio-audio pair together for any length of time regardless of tape stretch or shrink. Under $2000. AUTOMATED PROCESSES. **305**

High frequency spectrum analyzer has 100 dB displayed range, resolution of 0.1 dB and 5 Hz. Model 2370 has built-in 9 digit frequency counter and tracking generator RF/if gain ratio sweep rate and filter bandwidth are automatically optimized. MARCONI INSTRUMENTS **306**

Function generator provides sine, square and triangle waveforms. Model 5800 has distortion less than 0.5%, range 0.2 Hz to 2 mHz; 50 ohm output of 15 volts p-p. $245. KROHN-HITE. **307**

Trencher accommodates socket-mounted modules that convert it for a range of functions. Model R30 can be a trencher, vibratory plow, utility back hoe, reel carrier, hydraulic boring unit, Combo, and others. It is available with 30-hp gasoline drive or 36-hp diesel. DITCH WITCH (CHARLES MACHINE WORKS) **308**

Printed circuit and tubular miniature delay lines have 100 to 3000 nanosecond delays, impedance 500 to 2000 ohms. MINILINES are available in tubular and printed circuit form. COMPUTER INSTRUMENTS CORP. **309**

Digital audio delay system has 90 dB dynamic range, 320 ms of delay in 5 ms increments. Model 102 provides up to 5 delay outputs, LED headroom indicator, can be cascaded for longer delay with virtually no audio degradation; noise and harmonic dis-

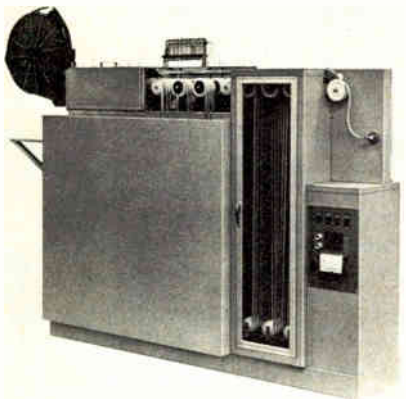
continued on page 70

PRODUCTS

tortion total 0.2% at limit reference level. Delay accuracy is 0.01% of setting. LEXICON **310**

Digital aurmeter ammeter has 3½ digit display, is 9/16-inch thick for front-of-panel mounting. Slimline ammeter is available with a variety of ranges, with accuracy of 0.05% of full scale. It has BCD data output. $208. NATIONWIDE ELECTRONIC SYSTEMS **311**

Processor for Super 8 160 color film operates at 34 fpm. "Houston Fearless" has advanced demand drive system. Under $15,000. TECHNOLOGY INC. **314**



Portable 10 mHz oscilloscope has dual true beam operation and "half tone" storage. Model PM 3234 has two independent beams, storage adjustable 0.3 seconds to 10 minutes. Sensitivity is 2 mV/cm. $1945.00. PHILIPS TEST AND MEASURING INSTRUMENTS **312**

New single-system and double system sound camera for super 8 film accepts the new Kodak "Ektasound" super 8 sound cartridge as well as standard Super 8 cartridge. Model 5008S has existing light capability, a new Angenieux 6-80 mm zoom lens with variable speed motor drive, mirrored shutter system auto exposure

with manual override, built-in sound amplifier, macrocinematorgraphy capability. $1448.00. CINEMA BEAULIEU, DIV. HERVIC CORP. **316**

Rewinder for ½", 1" and 2" tape for any size reel up to 12 ½" saves head and tape damage from fast tape on

playing machine. AUTO-WINDER also allows spooling off pre-set lengths of tape. It operates in both directions. $995. ULTRA AUDIO PRODUCTS **317**

Program limiter has adjustable

continued on page 72

PRODUCTS

"knee," 20:1 limiting ratio. It has 40 dB limiting dynamic range, a "ducking" circuit for dropping level a preset amount with an external voltage. DYMA ENGINEERING **313**

Integral-cavity Klystrons cover UHF TV band, 470–860 mHz, in three models. TH 205D Series have output of 20–25 Kw; TH 2060 Series have 10–15 Kw output. Gains are 45 dB and 42 dB respectively. THOMSON-CSF **315**

FM station monitor is a stereo tuner allowing most broadcast measurements to be made on signal. Model 1 BR-FM claims 70 dB stereo quieting for 50 microvolt input, harmonic distortion not greater than 0.15% in stereo, frequency response ± 0.2 dB from 75 microsecond curve, stereo flutter for even or odd integers of 38 KHz under 0.2%, buffered horizontal and vertical scope outputs, panoramic adaptor. SEQUERRA COMPANY **318**

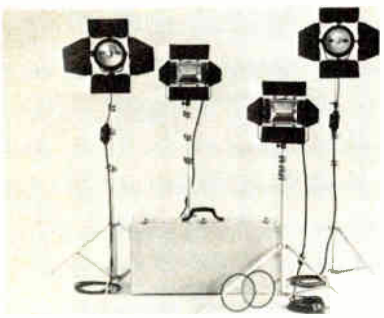
Preamplifier adds condenser microphone input to sound system of CP-16 camera series. Model CM-1 also has inputs for two low impedance mikes and one line, runs on power from battery pack of camera sound system. It can be mounted directly on camera with dovetail accessory. Preamp, $175.00; dovetail support, $22.00. CINEMA PRODUCTS. **319**

Limiter has independent average and peak limiting functions that operate simultaneously. Model 201 has front panel controls for variable attack and release times and response action. $480.00 INOVONICS **320**

Magazines for single-system recording on Eclair ACL cameras are now

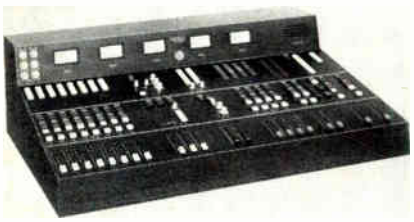
available. Units contain recording and monitoring heads, integrated circuit amplifier. The 200-foot and 400-foot sound-system magazines include dual microphone inputs, master gain control, AGC with fast attack, slow release. Attachment and removal are five-second operations. ECLAIR CORP. OF AMERICA **321**

Portable location lighting kits include lanebeam open-face Ianiro lights, among them a new 650-watt



lanebeam spotlight with fiberglass housing, which cools quickly and is every light and strong. The five Porta-Kits come in compartmented cases and are complete with stands. STRAND-CENTURY, INC. **322**

New 16-input audio console has three submaster mixing channels and two



program/mising output channels. Model 1632, designed as a TV production or on-air audio control, or for FM or AM radio, can be expanded readily with plug-in modules for more inputs; remote control (Lumiten) attenuators; limiters, compressors, equalizers on mike channels. Base price, $9,995, (which includes full monitoring, cueing, talkback, reverb send, other facilities). ROBINS/FAIRCHILD **323**

Turntable preamplifier provides complete mono, stereo and dual channel operation. Spotmaster Model BE-TMS has a phase reversal switch allowing fice modes of operation: mono in/mono out, stereo in/mono out, stereo in/stereo out, dual mono in/dual mono out, and single mono in/dual mono out. Output level is switchable to −10, 0, and +8 dBm. BROADCAST ELECTRONICS. **324**

continued on page 74

← Circle 150 on Reader Service Card

PRODUCTS

TV cameras are designed for use with intensified silicon intensifier target vidicon tubes, will resolve all ten shades of gray even on cloudy moonless nights, with 10,000 times the sensitivity of standard vidicons. The series 2856 cameras are weather-proof, in environment-resistant cylindrical housings, and provide automatic and remote control capability. COHU, INC. **325**

Tunable microwave handpass filters cover 1 to 20 GHz, and 4 to 18 GHz respectively. TYG-100 and TYG-400 have bandwidths of 10 to 30 MHz, have resolution of setting dial to 10 MHz, handle 100 mw maximum average rf power. TELONIC ALTAIR. **326**

Process eliminates cropping of titles and credits in the transfer of widescreen film to videotape. "Panamorphic scanning" uses a special variable anamorphic lens, and a digitally-controlled scanning technique, which "squeezes" the filmed image instantaneously when necessary. GOLDMARK COMMUNICATIONS. **327**

New meter combines analog and digital reading features with LED scale continuously displayed and line of lighted dots indicating reading. Without moving parts, "AnaLed" meter is sensitive down to 1 microampere full scale, can read linear and non-linear signals, as a linear function without conversion circuitry. Meter is available with vertical or horizontal indication, is 200 mM by 50 mM (proposed IEC standard). SIMPSON ELECTRIC CO. **328**

Low cost FM signal generator has digital frequency readout, 8 frequency ranges, low-frequency output for if alignment, internal/external modulation. Model 1012 has electronic fine tuning, less than 100 Hz residual FM. GAW CO. **329**

Parametric equalizers have four cascaded sections, each handling one part of frequency spectrum with 20:1 range giving broad overlap, and with boost to 16 dB and cut to minus infinity. Models 621A/621B have adjustable bandwidth, ¼ octave to 3 octaves, overload warning light, distortion 0.06% at +20 dBm out, noise −80 dBm in 26 KHz band. 621A (single channel), $419.00; 621B (two channels), $598.00. PARASOUND, INC. **330**

NEW LIT

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

Six-page short-form catalog lists **FM/AM signal generators, HF spectrum analyzers,** FM deviation meters, television test equipment, and other test gear for radio, television, microwaves, digital equipment. Marconi Instruments. **250**

Commercial products catalog for 1974–75 shows Japanese "original equipment" **transistors; electrolytic capacitors,** 12 to 50-volt ratings; new matched pair transistors; lighted rocker switches. International Rectifier. **251**

Application note shows technique of using a **"boxcar integrator"** to reconstruct a repetitive signal buried in noise, using sampling oscilloscope circuits. Tektronix. **252**

A 200-page **Analog and Digital Special Function** Catalog shows design

and applications data on amplifiers, buffers, sample and hold circuits, comparators, analog switches, MOS clock and digital drivers, power supplies. National Semiconductors. **253**

Manual on design and core selection for **toroidal and laminated power inductors and transformers,** "Transformer and Inductor Design," shows toroid O.D. calculations, permeability and air gap, weight and temperature rise parameters, other design data. Available for $1.00 from Magnetics, Box 391, Butler PA 16001.

Catalog of **CATV equipment,** 45 pages, shows trunk equipment, plug-ins, power modules, passives and accessories. GTE Sylvania. **254**

Full line of **test equipment** is covered in 16-page catalog, including VOM's laboratory units, G/P portables, others. Triplett Corporation. **255**

Portable chart recorders are subject of catalog, showing full line of instruments for 1 to 8 channels, with plug-in preamps. Gulton Industries, Inc. **256**

TCM-6 Series **microwave radio system** is covered in technical brochure; unit operates in any band 1.7 to 15.25 GHz, for voice, tv, radar video or data transmission. TerraCom. **257**

A manual, "Executive's No-Nonsense Guide to Computing Calculators," gives comprehensive applications and **selection data for calculators** in the range between electronic adding machines and large computers, to meet requirement of specific research, design, and manufacturing operations. Hewlett-Packard. **258**

Catalog lists **marketing manuals** for electronics industry and others, consisting of self-teaching guides to improvement of marketing efforts, Mainly Marketing. 3,000 radio station histories are shown in "Broadcast Profile"; catalog, samples and ordering details available. Broadcast Profile. **259**

"Surge Protection" is a new brochure describing the various sources of surge voltage, and detailing the use of 2-electrode and 3-electrode gas tube surge arresters. Telecommunications Industries, Inc. **260**

Digital thermocouple indicators, covering dozens of temperature ranges, are listed in manual, "Quick Look Selection Guide," giving all technical, mechanical and ordering information. Doric Scientific. **261**

COLLEGE FMer

continued from page 28

Four-channel techniques saved a recent program of the series. In the middle of the session, the stylus of the turntable cartridge was damaged, with no replacement available. The program was completed—with bent stylus—but had poor music quality. First step to save the tape began with short pieces of leader inserted between segments. The music was re-recorded on two unused channels with the replacement stylus fitted, using the leader as a signal to indicate when to fade up or out.

Four channel opens up other production techniques, too. Beginning collegiate actors are often poor script readers. Improvisation provides a technique that allows them to sound more spontaneous, rather than like wooden dummies. One improvisation session focussed on a traditional aspect of campus life—the Queen contest. The improvisation centered around counting the ballots; actors counting up bogus ballots frequently talked at once, then not at all. A normal two-channel setup with several actors on different mikes, and recorded on one channel, would have turned this into absolute confusion. The problem was solved in the mixdown, by fading back and forth between the counters and the forgers. Four performers were used, each occupying a separate channel. During the mixdown, musical background was added.

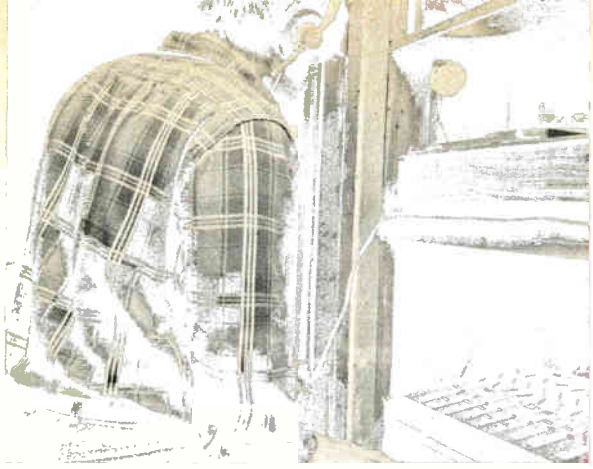
Several of the tape dramas combine editing and mixdown techniques. Both the stretches of slow-paced material, and inevitable quips of the actors are saved; they can be used in other portions of the tape, and on other channels, further heightening dimensionality. Having a choice

The cast assembled around the "Glass Table" The rugs cut down noise; water glasses for live sound effects. This group has chosen the scripted method.

of channel makes it easier to place actors within the sound field to meet the needs of the scene. Some other programs are produced somewhat differently: leader is spliced between sections that require sound beds. Then this sound is recorded at a higher level than the previously recorded voice-overs on unused channels. In the final mixdown, voices, effects, and music are balanced out.

As part of WVSS public service programming, concerts by the Stout Symphonic Singers and the Concert Band are recorded. These groups, spread out across a large fieldhouse, often perform together. The recordings are made with four mikes covering each group. Usually there's little chance for a practice take; balances are corrected later if we run into problems.

Remote sessions, once interrupted by broken ground connections, can easily be saved when you mix down to stereo, or mono. At least we found, you have a usable recording.



Student operating the controls of the Otari MX7000Q. The Sony M16 Mixer is above his hand, the turntable above that.

What we've learned since going quadraphonic

Multi-channel audio experimentation is not difficult, or expensive, if a few rules are followed:

Buy a four-channel recorder equipped with four line inputs and four mike inputs. The recorder should have the capability of listening to a previous recording without time delay (self sync) as you lay down other channels.

Buy a playback-only deck for remix and adding 4 to 4.

Bypass the turntable inputs in your current production board and feed the turntables directly into the line inputs of the four-channel recorder. Microphones can be fed directly into the recorder, or through the board and mike inputs on the tape recorder (two mikes feed the board and two go to the recorder). Check for phase reversal if you use the latter method.

Build a mixdown box so you can route signals to a stereo (or mono) final mix recorder. **BM/E**

Non Broadcast Television Grows

Last month Video Expo V took place at Madison Square Garden, New York City. It wasn't a main arena event although it did manage to fill the rotunda on the Eighth Ave. side. Some 73 exhibitors displayed either hardware, software or the ability to produce software. Fourteen exhibitors collaborated to show 100 different video tape programs available for purchase or rent.

Knowledge Industry Publications Inc., which organized Video Expo V called it the largest non-broadcast TV show ever produced. Attendance was over 4000. Many attendees signed up for three simultaneous video workshops organized by three other magazine groups: *Training* and *PhotoMethods*, *In-Service Training*, and *Media & Methods*. These workshops catered to the interests of business industry, health care and education attendees, respectively.

Future File was the title of one of the seven alternative workshops conducted by *Training* and *PhotoMethods* and a high point was the Oct. 2 session on video discs. This was the first public event to occur following the announcement in September that MCA Inc., and Philips NV would merge their video disc efforts. Although there was speculation that MCA, Inc.'s Discovision system would be dropped and that MCA would become the software arm and Philips the hardware arm of the partnership, R. T. Cavanagh of North American Philips said the next phase is an engineering optimization effort to come up with a machine design that reflects the best of the two companies' separate efforts. But by repeatedly stressing, when asked about market entry timing, that Philips had a production version designed, Cavanagh left the impression that Philips would be making the engineering decisions and that the past Philip's effort would not be scrapped lightly.

The planned merger of these two companies, coupled with the recent takeover of Magnavox by Philips gave this team a psychological edge in the pre-trial warm-ups for the great video disc race. But the event itself appeared to delay any official crossing of the starting line. Cavanagh kept referring to a timing after 1975–76.

Another panelist, Leo Hofbert, spokesman for TED (Teldec) said TED was ready to cross the starting line and that there are no unresolved production problems in mass producing the TED mechanical system (the purported reason TED did not hit the European market last year as earlier announced). However, Hofberg implied overall economic conditions in Europe and the U.S. might delay further a marketing effort which would run in to millions of dollars.

Zenith, according to George Hrbek, manager of video disc development, is still exploring various optical approaches and has not settled on any system. Disc players in the

range of $500 and discs selling for $2–10 is still an attainable objective and the goal for optical systems, according to Jack Findlater of MCA.

While panelists averred two or more non-compatible video disc systems could co-exist, it was also clear that the more manufacturers line up behind one approach and the fewer total contending systems in the market, the better. But if someone doesn't soon try to prempt the field, other technical breakthroughs may occur.

It is not likely that many attendees at Video Expo now into (or planning to go into) video communications would sit by doing nothing until the video disc millennium arrives. Video communications production including private distribution networks, will continue to grow. The immediate decisions that have to be made by many of the non-broadcast telecasters is how to best stay apace with the state of the art. This means considering which of the many avenues to take in improving quality. There were many routes to improving quality discussed in workshops and shown in the exhibit area including switching to color from black and white, using time base correctors and doing more post-production work now possible as a result of new low-cost editing equipment.

As far as Sony is concerned this means switching to the U-matic cassette system from reel-to-reel one-inch systems. David MacDonald, Sony's video products manager, declared new cassette technology has obsoleted one-inch techniques. The 2850 U-Matic has a better signal-to-noise ratio than does older reel units and with the new RM 400 system cassette editor, assembly and insert editing is easy. Recording in the field can be done with the portable companion cassette unit, the 3800. With the availability (soon from Sony) of color cameras in the $2500 range, MacDonald also sees the phasing out of EIAJ half-inch black and white systems in about three years.

systems in about three years.

MacDonald predicted that Panasonic and JVC would soon have cassette edit capability to further push the penetration of U-Matics. Indeed a new company showing such a system was Avonix. But a fuller investigation of the exhibit floor revealed the future direction of the industry to be less clear. IVC showed the VCR-100C cartridge recorder with a superior bandwidth capability attractive to many users and Television Research International showed an editing system with considerably more capability than the Sony unit. While it was in the $4000 range compared to $1000 for cassette editors, the TRI unit offered frame by frame editing (for precise audio or video cuts) preview capability and fool-proof operation. The TRI system works with helical scan reel-to-reel units only. Nonetheless as a system that seems to be as precise as a more expensive SMPTE time code unit, and extremely fast to operate, it illustrates how program producers can exercise uncompromised creativity at budget prices.

The 3M exhibit at Video Expo V revealed that high-speed duplicators for helical VTR tape may finally be here. 3M has shown the principle before; now it is ready for production. Other new items: VCAP unveiled a video cassette changer system; Videodetcis showed an automatic random access video cassette system; Hitachi Shibaden exhibited a color camera with "extremely low lag" tubes called Chanicon Tubes.

PEOPLE

cont. from page 18

McCabe to special markets manager, both at Shure Brothers Inc .... **Gene Bidun** joined the Fidelipac Division of Telepro as sales manager .... **W. Dale Costello** became director of new product development for all subsidiaries and divisions of Oak Industries.

Joseph E. Blake joined WTAE-TV, Pittsburg, as assistant chief engineer .... **Phil Phillips,** general manager of the Donrey Media station, KBRS-AM, Springdale, Arkansas, was elected vice president of the Arkansas Broadcaster's Association .... New district manager, radio sales, for Gates Broadcast Equipment Division of Harris Corp. is Curtis A. Lutz, with responsibility for Oklahoma, Kansas, Arkansas and part of Missouri.

Joseph M. Engle Jr. became director, domestic sales for Gates Broadcast Equipment Division of Harris Corp .... **Benjamin B. Bauer,** vice president for acoustics and magnetics of CBS Laboratories, was awarded U.S. Patent #3,835,255 on the SQ matrix decoder, for quadraphonic disc playback .... Director of community development for Teleprompter Cable TV is **David W. Pardonner.**

Stanford R. Cook was named director of manufacturing for C-Cor Electronics .... **Gerald G. Heitel** became vice president, marketing, for International Video Corporation .... **Ray Klotz** joined KCSJ in Pueblo, CO, as chief engineer (he will direct building of new studio and transmitter facilities, and a new 100-kw FM facility).

Kenneth L. Ingram is vice president and director of sales and marketing for all consumer products of the Magnavox Company .... **Stephen A. Grayson** was named marketing and sales manager for IGM/NTI, automation equipment maker of Bellingham, Wash.

James A. Lowenber was named manager of the Mario Messina Company, Dallas radio and tv rep firm .... **George P. Dixon** became vice president and chief operating officer of C-Cor Electronics .... **Carl Smithburg** is a new CATV sales representative for Anixter-Pruzan, initially with responsibility for northern California and Nevada.

New local sales manager for WHCT-TV, Hartford CT, is **James R. Parker .... Bert H. Dann** became vice president and technical advisor to the president for International Video Corp .... **Dan Hartman** was appointed executive vice president in charge of the audio/video division of

Benson Paul Associates, Irvine, CA, providing executive placement, merger, and acquisition services.

Jack B. Hanks was promoted to market operations manager of the 3M Company's magnetic audio/video products division .... **Cal Arnold** joined KARN radio, Little Rock, Arkansas, as account executive .... **Michael McGowan** became chief engineer of KWMU, 100-kw FM station of the University of Missouri, St. Louis.

Tom Athans is the new product manager for Cerro CATV Devices .... Three professional educators added to the staff of Great Plains National are **Dr. Allen, R. Miller,** as counselor for college and university programming; **Patrick Drake,** as programming counselor; and **G. L. Grenier** as development specialist.

New midwest regional sales manager for AKAI is **M. S. Gritchen,** with headquarters in Skokie, Ill .... **John M. Boatman** assumes position as manager, field sales, RCA broadcast systems, covering Europe, the middle East, and Africa .... New national sales manager for Nikko Electric Corp. of America is **Allan Novick.**

NEWS BRIEFS

California Community Television Association will hold a Western Cable Television Show and Convention at the Disneyland Hotel, Anaheim CA, December 4–7, with management and technical discussion sessions, plus golf and tennis tournaments, fishing, and other entertainment .... **Television Bureau of Advertising** reports second-quarter spot tv investments at $412 million, up 1.5% from 1973 .... **WSNL-TV,** Central Islip, Long Island, claims a first for its projected total coverage of the fall elections, comprising more than 70 local and statewide contests that affect the station's audience in the two Long Island counties.

Scientific-Atlanta has bought the manufacturing firm of McKettrick-Agnew in East Lothian, Scotland, maker of precision mechanical products, and will use it as a base for expansion into UK and European markets .... **International Video Corporation** has a $3 million contract with the U.S. Navy for closed-circuit tv systems, initially to equip 39 ships for distribution of information, training and entertainment programs to shipboard receivers .... **Spzrta Electronic Corporation** will deliver the first FM broadcasting

continued on page 82

NEWS BRIEFS

equipment to be used in Malaysia, consisting of two 10-kw FM transmitters, which will go atop a mountain about 20 miles from Kuala Lumpur.

American Cablevision Corporation bought the cable system serving Madisonville, Texas, from Irving Mermel . . . . **Continental Electronics** will build a 100-kw AM station for the Pakistan Broadcast Corporation . . . . **The St. Louis Educational Television Commission,** which already operates Channel 9 in that city, is asking the FCC to assign to it Channel 40, not now in use, to expand its educational and public service broadcasting . . . . **Koenick Electronics** is building a new cable system for Great Lakes Cable Co., in Mancelona, Michigan, using **Ameco** trunk and line extender units.

Suburban Propane, New Jersey based distributor of bottled gas, has sold cable systems with over 12,000 subscribers to **Madison Communications, Inc.,** of New York City . . . . **AEL Communications Corp.** has appointed **Multilek, Inc,** Ottawa, as Canadian sales representative . . . . **Ampex Corp** announced in mid-September the sale of the 225th MM-1100 multichannel audio recorder.

RKO General Radio will sell a videotaped course, "The Breakthrough Course of Radio Selling," through **Concerned Marketing Company,** broadcast consultants with headquarter in Dallas . . . . **Kodak** announced in September the beginning of deliveries of the Model VP-1, Supermatic film-video player which allows viewing of Super 8 film on video screens . . . . **University of Wisconsin** will sponsor in June, 1975, along with the University of Minnesota and the Midwest Universities Consortium for International Activities, an international conference on satellite and broadband cable systems for higher education and public service purposes; for info, Dr. L. A. Parker, University of Wisconsin, Old Radio Hall, Madison, WI.

Armstrong Awards Committee announced eight prizes, totalling $4,000, for excellence in FM programming, in four categories, news, community service, education and music; entries are due by or before February 24th, 1975, with entry forms available from Armstrong Awards, 510 Mudd Building, Columbia University, NY 10027 . . . .

continued on page 84

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Position open for technician. Must be skilled in maintenance, TV Broadcast Equipment mostly RCA—including VTR's. First ticket. No age limits. Good climate. Growing community. University of Arizona and Community Colleges. Send brief resume to R. H. Holsclaw, C. E., Channel 4 TV, Box 5188, Tucson, AZ 85705.

New media program at 4-year liberal arts college desperately needs audio production facilities, including cart machines, turntables, reel-to-reel recorders, and production console. Also looking for TV studio lights. Please contact Al Lifton, Dept. of Mass Communications, Buena Vista College, Storm Lake, Iowa, 50588, or (712) 749-2180.

Radio Broadcast Technician to maintain professional audio and tape equipment. Good solid state ability essential. Digital logic background and FCC First Phone preferred. Contact Paul Martin, Radio-Television Centre, Naples, Fla., 33940, (813) 774-1270.

POSITION WANTED

Are things really changing? I am an experienced black newscaster-announcer-D.J. with some college. Third phone; will relocate. Tape and resume available. Box 1174-1, c/o BME, Blue Ridge Summit, PA. 17214.

EQUIPMENT FOR SALE

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East coast headquarters for broadcast and recording equipment. Gates Broadcast Equipment Division, Harris Corporation, 130 E. 34 St., N.Y., N.Y. 10016 (212) 889-0790.

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FM TRANSMITTERS (used): Selection of equipment in 10 KW, 5 , 3 KW and 1 KW range. Selection of used FM exciters. Terms available. COMMUNICATIONS SYSTEMS, INC., Drawer C, Cape Girardeau, Mo. 63701. (314) 334-6097.

FOR SALE: ABSOLUTELY BRAND NEW 93 months) McMartin Model TBM-2500C FM RF amplifier (ser. 34-0035). Tuned to 90.9 MHz. Never used, original packing. $500 G.A. Gilbreath and Associates, 4908 Lunar Dr. Columbus, Ohio 43214.

STODDART NM-30A radio interference-field intensity meter. 20-400 MHz. Like New condition—1966 Manufacture. Complete with AC PS, Dipole antennas, cables, tripod, and inst. book. Calibrated prior to shipment. $1,595. Surcom Associates. (213) 382-6985.

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Solid-state audio modules-console kits, power amplifier kits, power supplies. Octal plug-ins—mic. eq. line, disc. tape play, tape record, amplifiers. Audio & tape bias oscillators. Over 50 audio products. Send for free catalog and applications, Opamp Labs. Inc., 1033 N. Sycamore Ave. Los Angeles, Calif. 90036. (213) 934-3566.

FM TRANSLATORS: New Low cost solid-state FM translator can mean extra revenue for FM Broadcasters. Contact us for money-making facts. Terms available. COMMUNICATIONS SYSTEMS, INC. Drawer C, Cape Girardeau, Mo. 63701. (314) 334-6097.

EDUCATIONAL FM TRANSMITTERS: New low-cost solid-state, compact, reliable educational FM Transmitter line. Stereo and SCA available. Check out our education FM package. Terms available. COMMUNICATIONS SYSTEMS, INC. Drawer C, Cape Girardeau, Mo. 63701.

TIME BASE CORRECTOR Delta 44-388. Only used 6 months. Discontinuing local origination. A-1 condition. $8,500. Rich Steck, Semit Corporation, Box 1121, St. Petersburg, Fla. 33731.

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WE NEED USED 250, 500, 1KW, 5KW AM Transmitters, 250, 1000 Watt FM transmitters. No junk. Guarantee Radio Supply Corp., 1314 Iturbide St., Laredo, TX. 78040.

WANT TO BUY: Late model, 5 KW FM transmitter. Prefer Collins or equivalent quality. State condition, spare parts, price in first letter. Reply to Box 1174-2, c/o BME, Blue Ridge Summit, PA. 17214.

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NEWS BRIEFS

WPSX-TV, Pennsylvania State University, received a grant from CPB and the National Endowment for the Arts to produce six programs on Super 8 Film, each a study of the life of a woman, the films to be made by two young women photographers, Lisa Marshall and Ermetra Black.

PROGRAMMING

Great Plains National, Lincoln, Nebraska, in association with the National Council for Geographic Education, has made available sets of 35mm color slides of views in many areas of the world, including Scandinavia, Brazil, Australia, Great Lakes Shipping, Mining in Canada, South Africa, and many others. Slides are in sets of 60 ($40), 40, ($28) and 20 ($15).

"Moral Values in Contemporary Society," a series of 39 half-hour discussion-form programs, has been produced by the American Humanist Association, with many eminent writers, philosophers, and scientists as panellists, and Dr. Paul Kurtz, editor of the **Humanist Magazine,** as moderator. A few of the panellists are Dr. Jonas Salk, Dr. B. F. Skinner, Sir John Eccles, Dr. Mary Calderone, Helen Colton, Dr. Clem Martin. Series has been arranged for optional classroom credit, with study guides, etc., for colleges and universities. Series was produced by Jim Schoonover, 923 Kensington Avenue, Buffalo, NY 14215; inquiries should go to him. Ten sound beds for spot radio ads, with optional lyric introductions are offered by **William B. Tanner Company,** Memphis. Each is cut for 30 seconds; they are available on a single disc for mixing onto tape.

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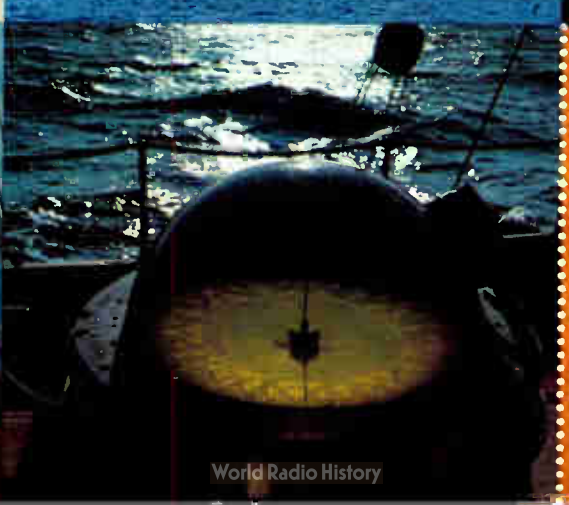

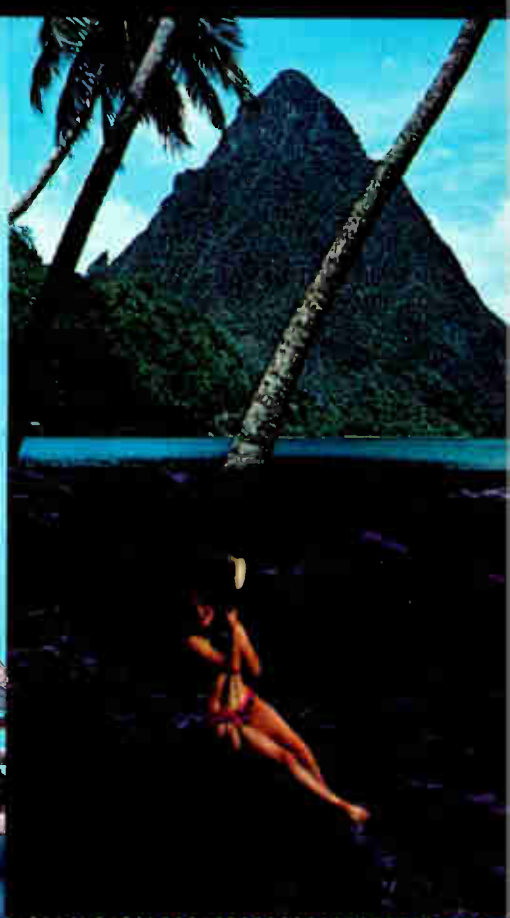

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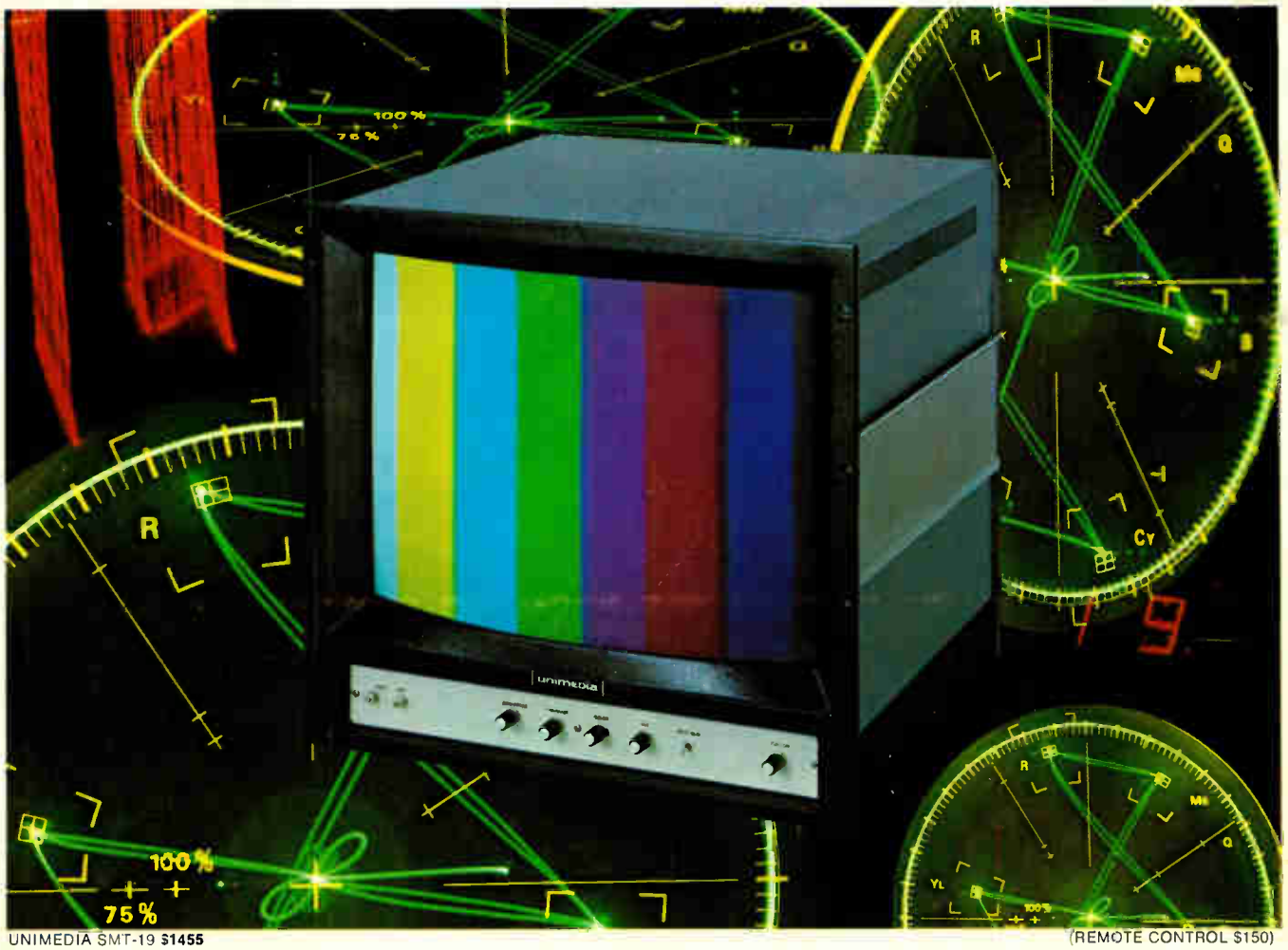

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