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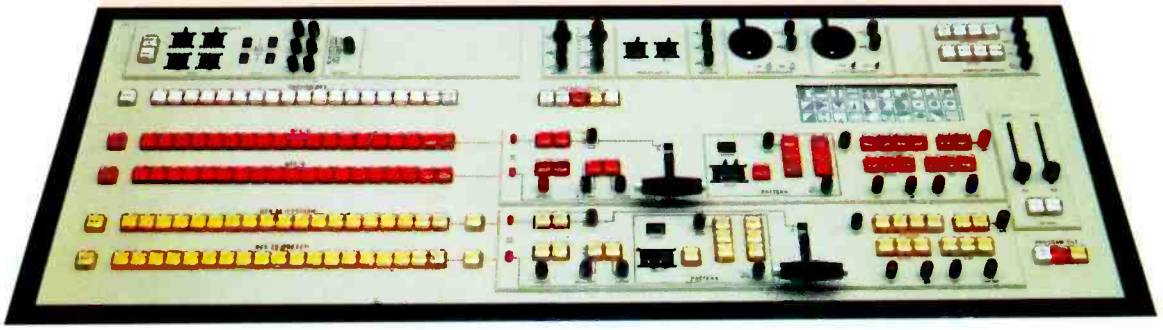

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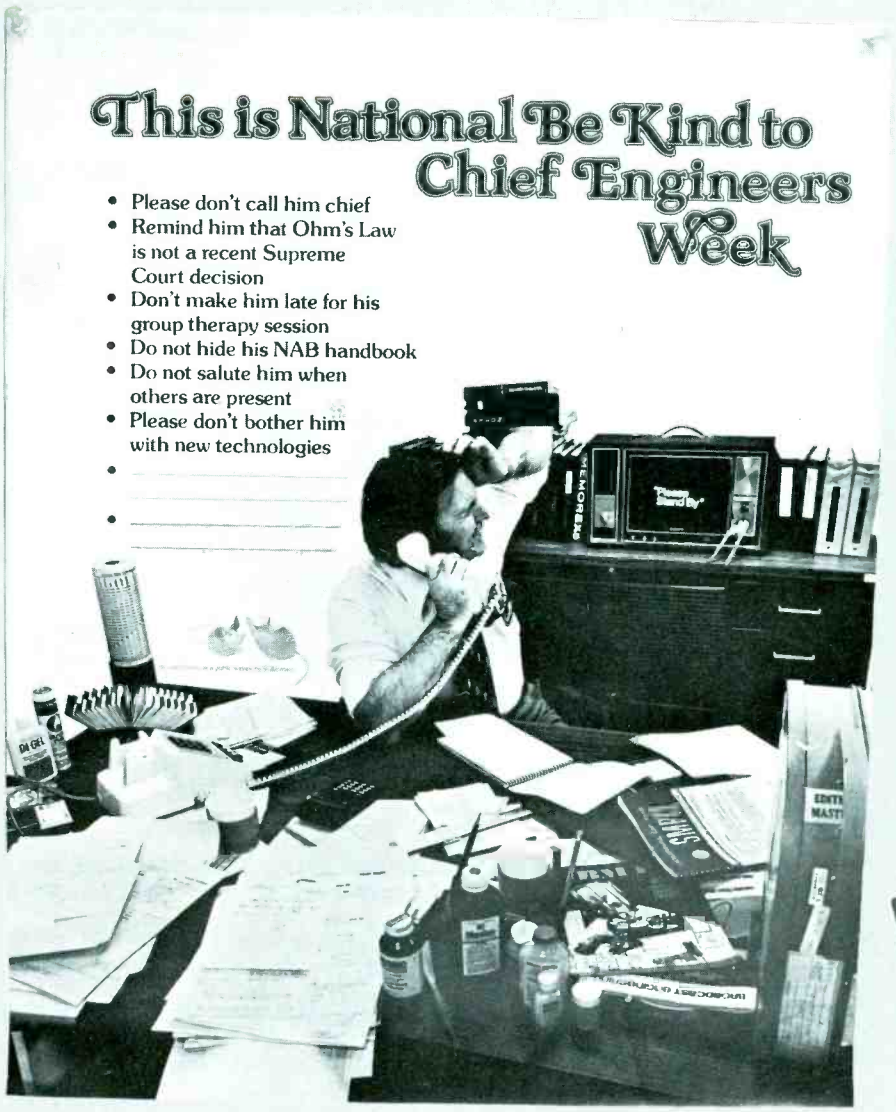

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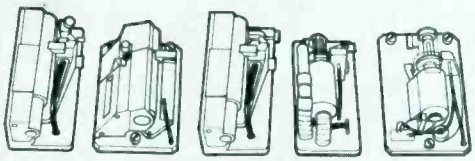

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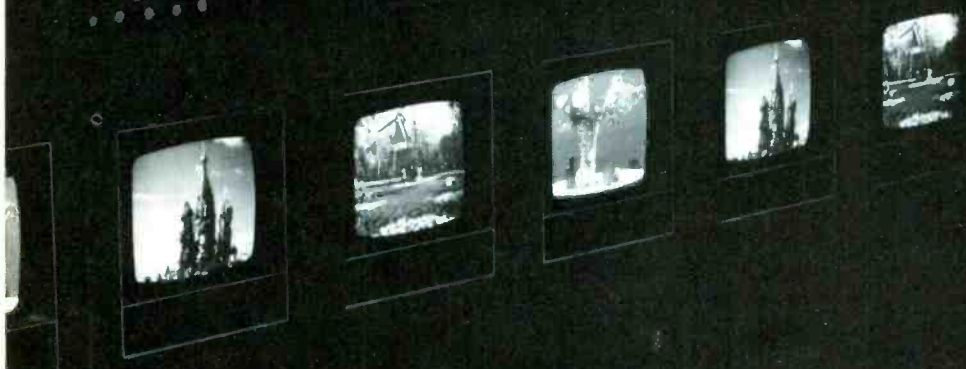

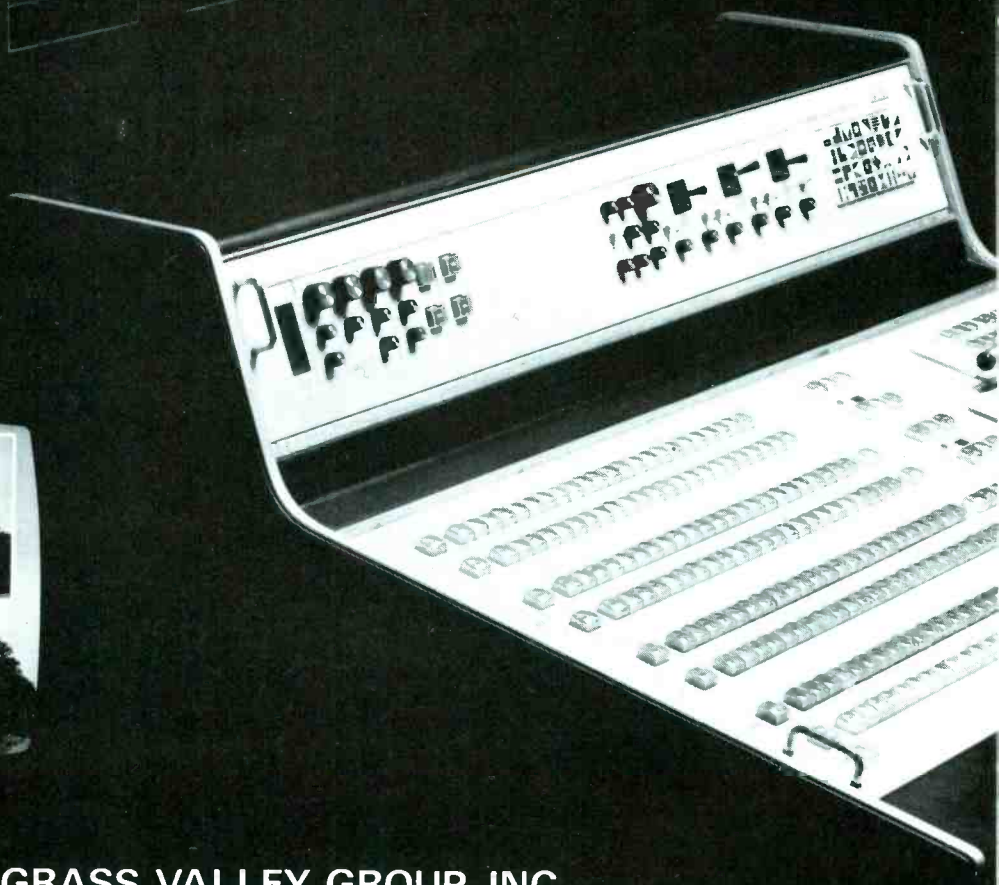

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BROADCAST INDUSTRY NEWS

NAB Seeks Supreme Court Reversal In Crossownership Case

The NAB has told the U.S. Supreme Court that the FCC exceeded its authority in imposing limitations on joint ownership of broadcast stations and newspapers in the same market.

The case reached the Supreme Court after the U.S. Court of Appeals ruled that not only did the FCC have the authority to break up 16 combinations, selected as the most "egregious" cases, but that it also should have required divestiture in all cases of broadcasting-newspaper crossownership unless the licensee could show that the public interest would be served.

The NAB brief filed with the Supreme Court argued that the FCC regulations on crossownership "exceed the agency's authority under the Communications Act to regulate 'communications by wire and radio.' They represent an unprecedented Commission attempt to regulate all forms of mass communication including not only the broadcast media, but the print media as well." Such regulations, the NAB added, conflict with the FCC's own interpretation of its authority and that of the Congress. The Congress has stated that "the Commission is not authorized to make or promulgate any rule or regulation the effect of which would be to discriminate against any person because such person has an interest in, or an association with, a newspaper."

The NAB also contended that divestiture has not increased the number of broadcast stations, but has barred broadcasters from local newspaper publishing and excludes newspaper publishers from owning stations simply because they are in the newspaper business. And, the NAB continued, the FCC itself concedes that its "regulations are not based on any finding that a broadcaster's affiliation with a local newspaper publisher detracts from its broadcast performance . . . the FCC's own staff study showed that broadcasters affiliated with newspapers have demonstrated 'statistically significant superiority' in the critical area of local programming" including local news and public affairs.

The NAB said that such regulations go beyond the constitutional authority of any governmental agency. "The FCC regulations, as expanded by the Court of Appeals, constitute a governmental effort to orchestrate the sounds of all major media instruments in this country" — an outright abuse of the First Amendment. In this case the "government has taken it upon itself to restrain broadcasters from *ever* publishing a local newspaper and to *permanently* 'bar' local newspaper publishers from consideration for broadcast licensees."

A technician operates the Mutual Broadcasting System's new computerized master control console that will enable Mutual to feed up to six network programs simultaneously when combined with the network's planned satellite distribution system. Mutual has entered into a seven year contract with Western Union for up to six 15 kHz channels on its Westar I satellite and has contracted with California Microwave, Inc. to manufacture more than 500 receiving terminals with 10 foot antennas. See separate story on page 87.

Rep. Van Deerlin Likes NRBA's Minority Ownership Aid Program

Rep. Lionel Van Deerlin, (D-Calif.), chairman of the House Subcommittee on Communications, reacted favorably to the Minority Ownership Aid Program presented by the National Radio Broadcasters Association in San Diego. Frank Washington, special assistant to FCC chairman Charles Ferris, also reacted favorably to the plan.

The NRBA's program will provide guidance and informational services to minority purchasers of broadcast properties. NRBA plans to maintain listings of stations known to be available for sale, of station brokers, attorneys, engineers and financial institutions best suited to assist minority groups purchasing broadcast facilities.

NRBA also proposes amendment of the Communications Act to provide longer license terms for radio as this should assure the financial community of government's interest in a stabilized communications industry. Given that assurance, financing for minority owners will be more easily obtained. In addition, NRBA advocates authorization of Small Business Administration loans to prospective buyers of broadcast properties.

AT&T Rate Increase Threatens Local Programs

The NAB asked the FCC to reject the American Telephone and Telegraph

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Minimum object distance from front vertex	0.7m (27.6")	0.7m (27.6")
Object dimension at minimum object distance: Wide:	103.2 x 77.4cm; 129.0cm diameter	
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Company's proposed revision of part-time or occasional use rates for TV stations. NAB also called for a rejection of certain regulations pertaining to these rates.

NAB said that "much of the programming of independent (non-network affiliated) TV stations currently operates near or at a break-even point. Substantial cost increases in these instances may force programs into the red and thereby thwart their continuance. The types of programs likely to be beleaguered by increased costs include many community affairs programs requiring broadcasts from remote locations, area charity telethons, certain news programs, and sports programs at all levels from high school athletic competitions through professional sports."

In a separate filing, NAB asked the FCC to suspend for the full 5-month statutory period the new tariff revision. NAB said the substantial cost increases "cannot be absorbed in bulk by many radio stations subscribing to newswire services." It added that in some cases, "the very survival of the newswire service may be in jeopardy."

No Waivers Of Multiple-Ownership Rules: FCC

The Commission has refused to consider requests for exceptions to the multiple-ownership rules, adopted April 22, 1977, as a bar to "undue" concentration of broadcast control. The rule prohibits common ownership, operation or control of three broadcast stations, if any two are within 100 miles of the third (measured city to city) and if there is a primary service contour overlap of any of the stations. Three broadcast operators, who had applied for right to acquire or construct stations prior to adoption of the rules, asked for exemptions, but were turned down. However, the FCC did clarify the rule on two counts: it said that UHF applications, because of the continuing need to foster this service, would be considered on a case by case basis; and that AM/FM combinations would be considered one station if both were licensed to one urbanized area, as defined by the U.S. Bureau of the Census.

FCC Tightens Power Measurement Rule

What amounted to a loophole in the regulations on maintenance of authorized power output by broadcasters has been plugged by the FCC. A U.S. District Court in Richmond, Virginia had ruled that the requirement in the regulation for "actual" power be as close as practicable to "authorized power" made it legal for a licensee to overpower by the amount of the "acceptable" margin of error. This, said the FCC, was counter to the intent of the law and the regulations. Accordingly, the FCC has amended the regulations to stipulate that the power delivered to the antenna must be the authorized power, as near as is practical according to specified methods of measurement, with measuring instruments of specified minimum accuracies. So broadcasters: don't put out 12,000 watts on a 10,000 watt license with the excuse that this is the "play" in measurement techniques.

NAB Opposed Rewrite of FM Antenna Rules

In a move designed to protect FM stations from costly and burdensome new technical requirements, the NAB has opposed an attempted rewrite of the FCC's FM antenna rules.

The NAB opposed changes which

continued on page 12

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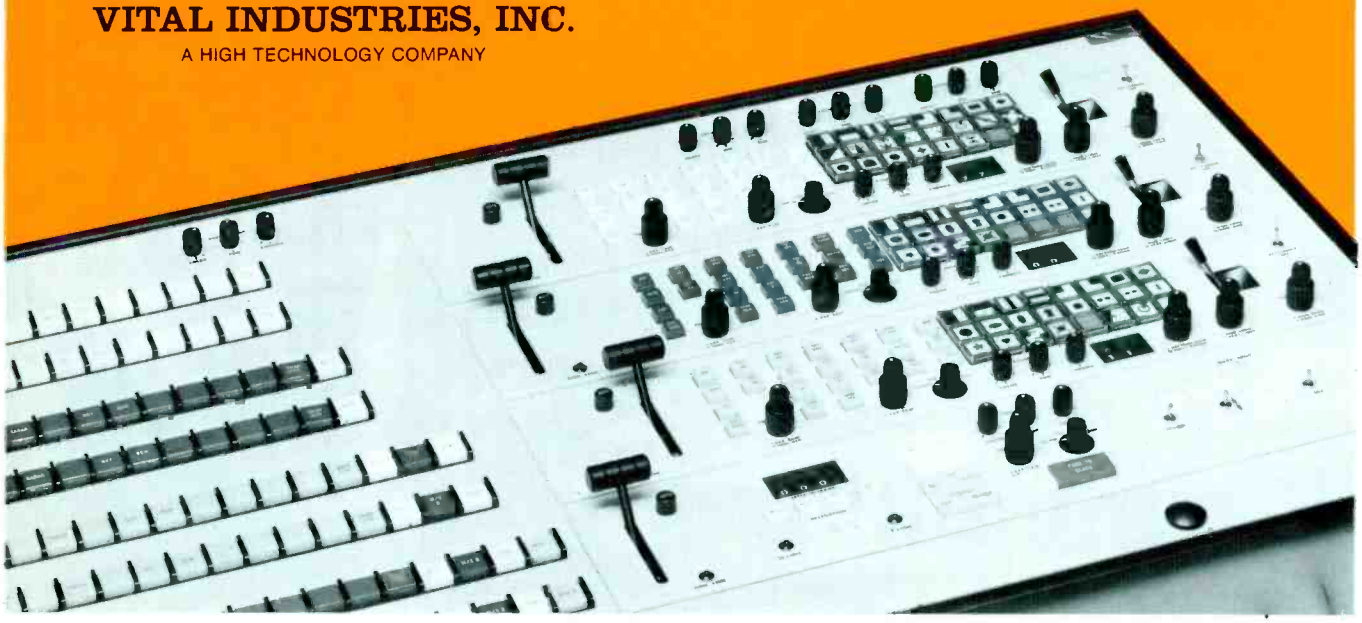

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would designate non-directional FM antennas as directional if their radiation pattern cannot conform to perfect circularity to within 4 dB, a very difficult standard to meet. Once an FM antenna is defined as directional, the station must make detailed and expensive measurements of its signal pattern before the FCC grants approval to operate.

Because the proposed rules would affect new FM applicants as well as present FM stations making changes in their antennas, the NAB noted that many stations might be dissuaded from upgrading their antennas.

Pre-Hearing Discovery Rights Opposed

The NAB has asked the Court of Appeals for the District of Columbia to affirm the refusal by the FCC to allow pre-hearing discovery rights to parties filing petitions to deny broadcast renewal applications.

Discovery rights are demands that stations answer questionnaires and produce documents and records. NAB's brief was submitted at the invitation of the Court.

In its filing, NAB said that forcing the FCC to afford private discovery to those who challenge broadcast license renewal applications with claims of employment discrimination deprives the agency of its lawful discretion to fashion its own method for conducting administrative inquiries. NAB said that if the Court compels the FCC to allow pre-hearing discovery in situations where employment discrimination is alleged in petitions to deny, this principle could be extended logically and mandate discovery to all challanges of the petitioners, including the sensitive First Amendment area of programming judgment.

FCC Proposes Freeing Pay TV On Sports And Films

The Commission has proposed a rule change to remove the restriction on over-the-air pay TV on certain sports events and on commercial advertising, as well as the limit of 90% of total programming for sports and movies combined. The proposal arises, says the FCC, from the Court of Appeals decision last March 25 which struck down similar restrictions on pay cable. The Commission afterwards asked the Supreme Court to review the case, specifically to decide the status of pay TV. However, the Supreme Court refused to review; so the FCC is proposing to bring pay TV to parity with pay cable, without further court direction.

NAB President Attacks Idea Of Performance Royalties

Vincent T. Wasilewski, president of the NAB, urged broadcasters to help convince Congress that to require broadcasters to pay for the right to broadcast recorded music would be "unwise, unnecessary and unfair."

He said that the concept of stations paying performers is expected to be raised in the next session of Congress and, if passed, would cost broadcasters $15 million.

Speaking before the Oregon Association of Broadcasters, Wasilewski said that payment of performance royalties of the magnitude suggested by existing legislative proposals "would lead to a reduction in the quality and quantity of radio broadcast service upon which the American public relies heavily each day for news, information and entertainment."

He added that if record companies receive performance royalties as well as promotional benefits from airplay, the incentive to resort to payola will be greater.

continued on page 14

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News

Wasilewski noted that the gross revenues of the record industry exceed those of the radio industry and that record industry revenues have grown faster than radio revenues in recent years.

NAB Warns Institutional Advertising Restrictions Violate First Amendment

The NAB has asked the Civil Aeronautics Board not to take any action which would prevent the airline industry from passing on institutional advertising costs to their customers.

The CAB is considering such action in response to a request by the Aviation Consumer Action Project (ACAP). ACAP alleges that institutional advertising costs are not business-related and should not be included in airline customer rates.

NAB contends that these restrictions would violate the free speech guarantees of the First Amendment and involve the CAB in censorship of advertising messages based on a vague definition of institutional advertising. NAB also contends that the CAB could not draft a definition of institutional advertising clear enough to prevent a "chilling" effect on the exercise of constitutionally protected rights.

Study Finds News Media Functions Need Special Protection

A new study of the First Amendment finds that certain activities of the news media are accorded a special role in the whole system of checks and balances envisioned by the framers of the U.S. Constitution and upheld by years of Supreme Court decisions.

In the Samuel Pool Weaver Constitutional Law Essay, in the fall edition of the *American Bar Foundation Research Journal*, Vincent Blasi, professor of law at the University of Michigan and affiliated scholar of the American Bar Foundation, examined the role of freedom or expression as a check on government misconduct, and points to specific implications of First Amendment theory for the news media and their relationships with the government and public.

What is at stake, Blasi points out, is not the symbolic participation of the powerless but the sharing of real power. Struggles over access to media channels of information and mass communication have forced the Supreme Court to make choices among powerful competing interests and to draw on new

continued on page 19

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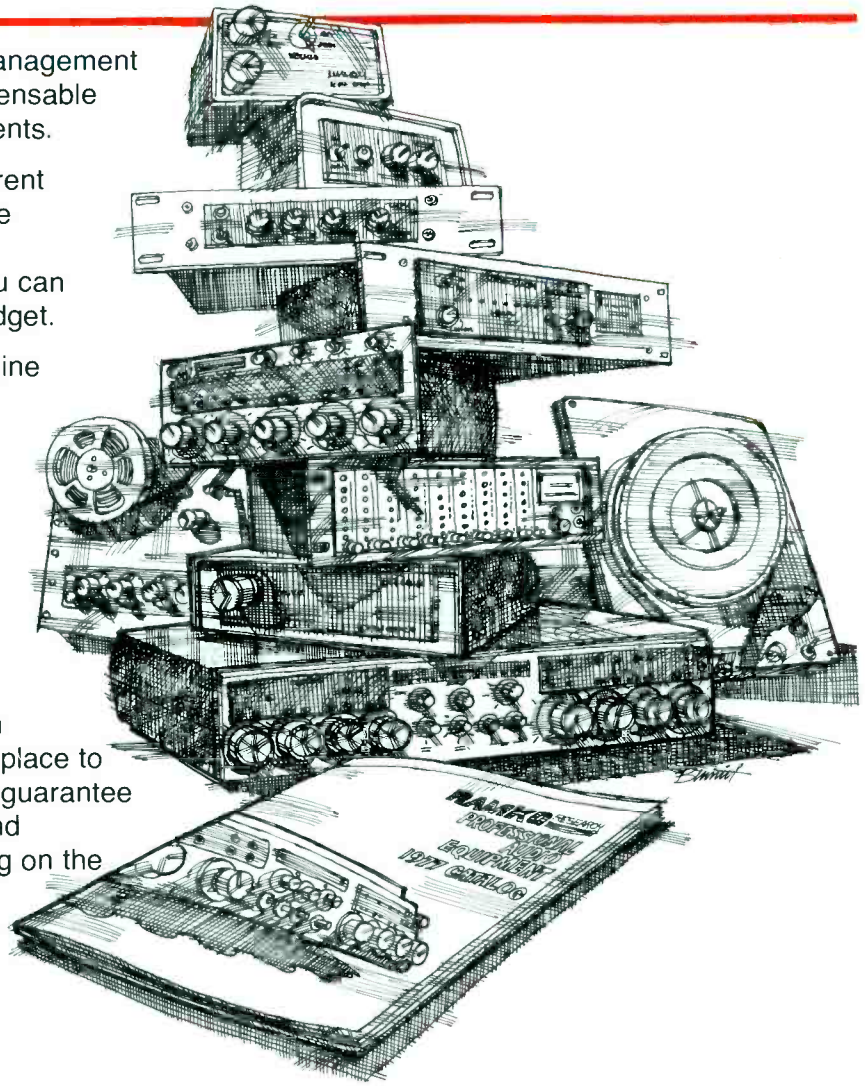

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values to explain their decisions.

Recently, Blasi observes, the Court has been moving toward freedom of expression for its function of exposing and checking abuse of governmental power. Blasi feels this "checking value" should be recognized more fully, particularly because it was so important to the framers of the Bill of Rights. In fact, he notes, James Madison, who wrote the First Amendment, "remains the best teacher we have on the subject of freedom of expression."

UHF Group Funds Study To Improve Antennas

The Georgia Institute of Technology, Atlanta, Ga., has been commissioned to conduct a study to measure the performance of UHF receiving antennas.

"The purpose of the study is to provide guidance and support to the industry in the establishment of technically sound uniform standards for the measurement of UHF receiving antennas," said David Sillman, manager, Engineering Planning, PBS. Currently, there are few, if any, guidelines for consumers as to the performance of UHF antennas under local conditions and with locally available channels.

The commission for the study is supported by the Council for UHF Broadcasting (CUB), and a coalition of public broadcast organizations. The group also represents NAB, the Association of Maximum Service Telecasters and other industry organizations.

NCTA Backs White House On Public Broadcasting

The board of directors of the NCTA, at its meeting in San Diego, strongly supported President Carter's goal to make publicly funded programming available to the widest audience. It also urged that both the Administration and Congress provide equality among media in establishing and administering all public broadcasting programs.

The board also endorsed live TV coverage of the proceedings of the U.S. Congress. NCTA said such live TV coverage should be provided by the appropriate bodies of the Congress rather than by any private interest.

Authorization of the NCTA staff to challenge the FCC's refusal to take action to break exclusive, long-term contracts obtained by networks and local broadcasters that deny motion picture product to pay cable subscribers, was made by the board.

NCTA said the FCC's decision to take no action ignored the anti-

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competitive effects of contractual exclusivity and left the cable industry no alternative than to seek relief through the courts.

Resurrection of IVC on Track

According to Jack Watts, executive vice president and chief operating officer of International Video Corp. (IVC), the company is on the road to recovery after its recent financial difficulties which forced IVC to close its doors briefly in July.

The California manufacturer of video recorders and cameras ceased operation early last summer and filed Chapter XI proceedings for voluntary reorganization. The management of Video Logic Corp., a major customer of IVC, obtained control of the firm through the courts. Though there is no ownership of IVC by Video Logic, its current management team including IVC president Roy Woodland, and Jack Watts held similar positions with Video Logic. Woodland has a reputation as a troubleshooter for financially shaky companies and has installed a management team that, in Watts' words, is more financially oriented. Financing is being handled by a group of investors organized under the name of VMC.

IVC has trimmed its administration and concentrated on sales manufacturing and services. Its sales force has been organized under a national sales manager and several field area managers.

Watts stated that IVC will continue to sell and deliver the video cameras, IVC-7000 and 7000P and the IVC-9000 VTR. The IVC-700 and 800 series of one-inch equipment will also be continued. Watts said that customers should examine the products "on their own merits" since the company intends to remain a major factor in the video products business.

Watts also said the IVC is looking at some new products in the area of less sophisticated cameras and is pleased with IVC 1070 editing one-inch VTR for the non-broadcast market.

Said Watts, "We've been in control just 3 months and we're pleased with the results. We see a lot of areas where we can develop successfully."

TV Must Reflect Changing Standards NAB Vice President Says

Jane Cohen, vp for television of NAB, said "television must reflect changing standards of taste." But "because television has a mass audience does not mean it must produce programs of so-called universal taste," she added.

Addressing a luncheon meeting of the NAB for Community Affairs, Ms. Cohen said that "the industry has a responsibility to go beyond giving its audience more and more of what it currently will accept."

The NAB vp said that while she does not believe television should lead the parade of changing standards, "it should not lag so far behind the march of an audience of millions that it can be chained to the past by a few hundred letters of complaint." She also said the medium should not be "frightened by organized pressure groups that do not reflect the independent views of the general public."

NAB Radio Board Of Directors Covers Variety Of Topics

NAB's Radio Board of Directors held a one day meeting and discussed topics ranging from the rewrite of the

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EASTMAN 7250 FILM

A NEW HIGH-SPEED FILM FOR "AVAILABLE DARKNESS."

If you've ever had to pass up a story for lack of light, we'd like you to know about new Eastman Ektachrome video news film high speed 7250 (tungsten).

It is a companion film to our Ektachrome video news film 7240 and uses the same Process VNF-1 procedures. It is, however, far faster (EI 400), and it can be pushed two stops and still provide you with an image of excellent broadcast quality.

It is an ideal solution for news assignments when additional lighting would be inappropriate or prohibitively expensive.

For available light, available twilight, or "available darkness," Kodak has a film to help you get the news. For literature or a call from one of our Sales and Engineering Representatives please write: Eastman Kodak Company, Dept. 640, Rochester, N.Y. 14650.

Film is good news.

Kodak

Circle 115 on Reader Service Card

News

Communications Act to standards for radio receivers.

The Board unanimously approved a change in the amount of commercial time allowed per hour as recommended by the Radio Code Board. It reads, "As a general rule, up to 18 minutes of advertising time within any clock hour are acceptable. However, for good cause and when in the public interest, broadcasters may depart from this standard in order to fulfill their responsibilities to the communities they serve." This language, effective immediately, places greater responsibility on individual subscribers for determining advertising schedules.

NAB's engineering department is to begin work on establishing technical standards for radio receivers for consideration at the boards's January meeting. NAB's assistant to the vice president for engineering, Chris Payne, said that if action at the FCC goes smoothly, AM stereo could be a reality in less than a year.

In another action, the Radio Board passed a resolution urging the FCC to adopt an overall radio allocation policy prior to the 1979 World Administrative Radio Conference (WARC). In the formulation of such policy, the resolution stated, the FCC should consider the proposals in the pending Clear Channel and WARC 1979 proceedings, and in petitions filed by the Community Broadcasters and Daytime Broadcasters Associations as well as any other proposals which may directly or indirectly impact on radio allocations.

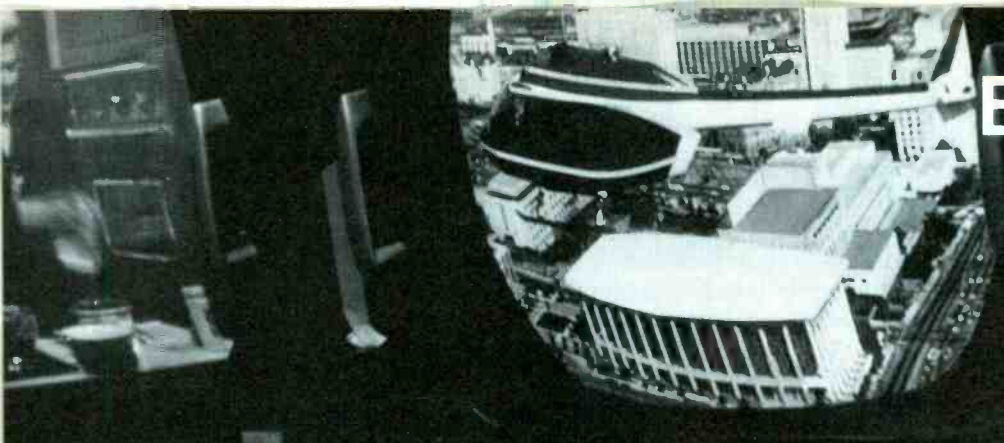
The sr. vp for government relations, Donald Zeifang, updated the Board on saccharin legislation, utility advertising, all channel radio legislation, performer's royalty, and the Communications rewrite.

John Dimling, NAB vp for research, said the results of a project co-sponsored by the Radio Advertising Bureau on alternative methodology in ratings will soon be available.

NAB's general counsel Erwin said that cassettes will be available sometime in November from the legal department to help member stations in filling out their license renewal applications. He also said the department is planning a series of seminars on gag orders and libel and slander suits in conjunction with the Radio Television News Directors Association and the Reporters Committee.

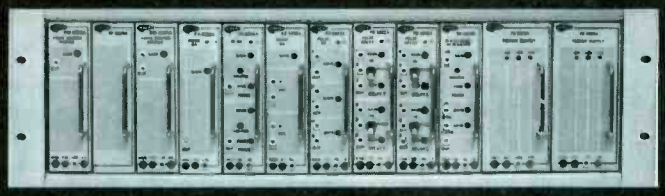
Charles Jones, NAB's vp for radio, said next year's May 24-26 Radio Programming College will be held at

continued on page 24



Experts agree, our 21 years of switcher knowhow is today's responsible state-of-the art design . . .

like our Series 5900.



Today, thanks to discerning users in the TV industry and elsewhere, DYNAIR is a primary supplier of audio and video switching systems. One of these years-ahead family of products is the Series 5900 Broadcast Signal Distribution System . . . a cost-effective method of handling all your distribution needs with a single package. Available plug-in modules include: video, pulse, subcarrier, pulse delay, and audio distribution amplifiers; black-burst and color sync generators; and video and audio switchers. We'd like to call your attention to the latter two . . . our newest.

Video Switch Module

Configurations: 5 x 1, 10 x 1, 5 x 5
Switching: solid-state, vertical interval
Crosspoint Control: Remote momentary
Crosstalk: 60dB
Differential Gain: 0.1%
Differential Phase: 0.1°

Audio Switch Module

Configurations: 5 x 1, 10 x 1, 5 x 5
Switching: solid-state, air quality "pop-free"
Crosstalk: better than 70dB below output
Distortion: less than 0.15%

The Series 5900 is the most compact, competitively priced professional distribution package ava lable. Isn't it time you joined the rest of the experts and got the story on DYNAIR's capabilities? Write or call for additional information and for the name of the broadcast dealer in your area who handles this family of products.

DYNAIR ELECTRONICS INC.

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TELEPHONE: (714) 263-7711 TWX.: (910) 335-2040

Circle 117 on Reader Service Card

HOW TO CUT THE CLIMBING COSTS OF TRANSMITTER OPERATION

The entire line of CCA FM transmitters was designed to cut operating costs. Using proven, grounded-grid design. Neither Collins nor Harris have it. But every CCA FM transmitter does. Grounded-grid design. From 1kw to 80kw.

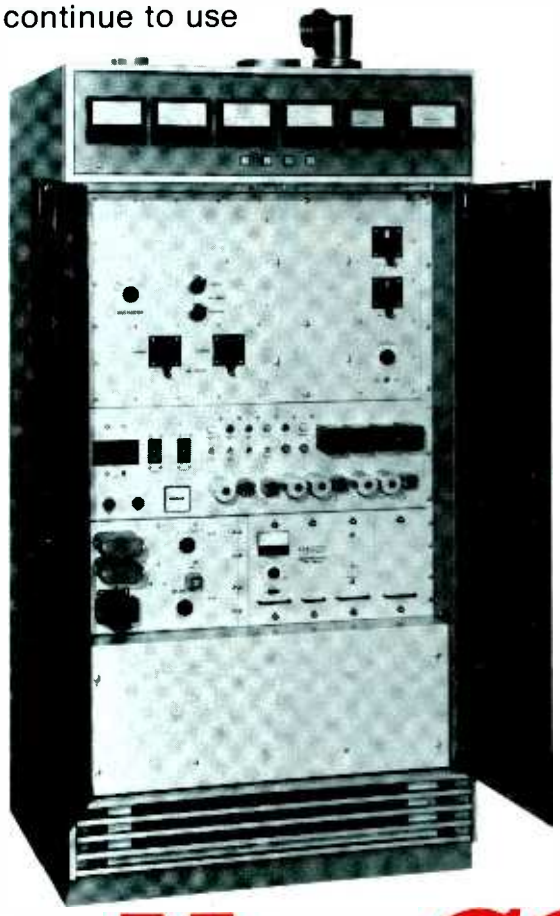
Conservative grounded-grid design cuts operating costs. Cuts the expense of replacing tubes with the short life cycle inherent in transmitter designs using high frequency tetrodes for FM. In a recent survey, the tube life at a typical station, WFPG-FM in Atlantic City, N.J. was 55,586 hours running continuously. Still, other transmitter manufacturers continue to use the tetrode approach requiring periodic neutralization. And — most important — the unnecessary expense and compromise of shorter tube life.

You'll hear a lot of talk about the cost of operation between different makes of transmitters. But one thing stands out:

The transmitter with the longer tube life costs less to operate. The grounded-grid CCA FM transmitter.

You won't empty your pocket buying or operating CCA equipment.

For further details, call our toll-free number, or write.



The New CCA

CCA Electronics Corporation • Broadcast Plaza • Box 5500 • Cherry Hill, N.J. 08034
Call toll-free: 800-257-8171. In N.J. call collect: (609) 424-1500 • Telex: 845200
In Canada call toll-free: 800-261-4088, or (416) 438-6230

Circle 120 on Reader Service Card

News Briefs

Appeals for the District of Columbia for permission to intervene in the Court's review of the FCC's decision to terminate its examination of exclusive contracts between program producers and pay TV cable interests . . . . Members of the **Task Force on Minority Ownership** were named by NAB. The committee is designed to foster an increase in minority ownership of broadcast facilities. NAB board chairman, Donald A. Thurston heads the Task Force. The group members are: Regan A. Henry, president, Broadcasting Enterprises Network, Philadelphia; Benjamin L. Hooks, exec. dir., NAACP, N.Y.C.; William A. Leonard, vice president, Washington, CBS, Inc.; Donald H. McGannon, chairman of the board and president, Westinghouse Broadcasting Co., N.Y.C.; Thomas S. Murphy, chairman of the board, Capital Cities Communications, N.Y.C.; and NAB president, Vincent T. Wasilewski.

A **$15,000 grant to stimulate and measure citizen interest** in the development of CATV in Pittsburgh was awarded to that city's NAACP Branch Labor and Industry Committee and the Univ. of Pittsburgh's Dept. of Speech & Theatre Arts. It's to be funded by the Public Committee for the Humanities in Pennsylvania . . . . **NCTA, in support of a broadcast** industry request to the FCC, called on the FCC to grant tax certificates routinely when CATV property is voluntarily transferred to a buyer owned or controlled by a minority group. Holders of tax certificates are not obligated to pay capital gains tax on the sale of property if the proceeds are reinvested within two years.

The FCC was asked by the NCTA to re-examine three key areas of its July franchise standards decision. It **urged the FCC to prohibit local authorities** from including ancillary revenues in the base on which they collect franchise fees, to immediately impose the franchise fee ceilings on pre-1972 cable systems, and to set reasonable renewal standards so that a CATV operator who has provided adequate service to a community will have a presumptive right to renewal . . . .NCTA's **board thanked Richard E. Wiley,** former FCC chairman for "his unparalleled leadership of the FCC" at its meeting in San Diego. It said the CATV industry had received very fair treatment from the FCC under Wiley . . . . Rewrite Committee chairman Ralph Baruch, of NCTA, called for an **"Era of New Principles"** for the CATV industry. Baruch outlined the new principles at NCTA's San Diego meeting. He said that all special interest groups should prove that their proposed regulation or legislation is in the "public's interest" — rather than self interest.

Business Briefs

Bosch-Fernseh announced that MetroMedia flagship station WNEW-TV, New York, is the **first U.S. purchaser for its new BCN Digital Store.** WNEW-TV engineering vice president Bill Kelly said, "We asked to be number one on the shipping list for these Digital Stores just like we were the number one broadcast station to receive the BCN studio and portable recorders." With this equipment, WNEW-TV expects to offer new broadcast operation and studio production services that no other studio or station can match except at substantially higher prices.

Hubbard Broadcasting has joined CBS and NBC as a **major purchase of Sony's new highband video recorder,** the BVH-1000. Hubbard ordered one BVH-1000 for WTOG, its Florida station earlier this year. Hubbard's five additional BVH-1000s will be installed at KOB-TV in Albuquerque and KSTP in St. Paul . . . . **Ampex began its delivery** of its VPR-1 helical videotape

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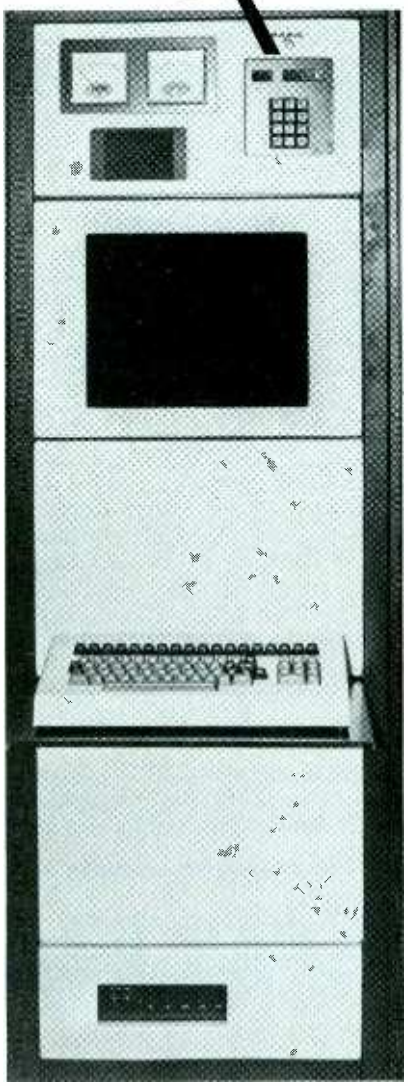
It's BASIC



BASIC A

BASIC B

We asked broadcasters all over the country what they wanted most in an audio control system. They told us and we built it. We call it BASIC.

Everybody wants a system that talks English... not computerese. BASIC will find the next station ID if you ask it to "find the next station ID." Just like that. You can insert your programming commands in broadcast language phrases.

Everybody wants a system that will perform all important functions (not everyone agreed on what was important and what wasn't). Nevertheless, BASIC performs all of the functions all IGM systems ever have... and more.

...the only audio control system that talks your language ...ENGLISH!

IGM

A Division of NTI
4041 Home Road
Bellingham, WA 98225
206-733-4567

Everybody wants a system that handles thousands of events. BASIC A employs RAM (Random Access Memory) to store 4000 events, expandable to 8000 in 2000 increments. BASIC B employs "floppy discs" to store eight days of up to 6000 events each day plus 8000 events common to all days.

Everybody said "those big systems cost too much. Produce one that we all can afford." So we did. We call it BASIC... and it's the finest thing IGM ever did.

Circle 122 on Reader Service Card

RADIO
PROGRAMMING & PRODUCTION FOR PROFIT

News Is Doing A Bigger Job For Radio Than Ever

IN 1978, SYNDICATED NEWS will be plentiful, and it will be accompanied by more and more well-produced, "people–oriented," feature and backup material that tends to keep listeners tuned in, to build up the quarter-hour rather that just the cume.

Quite a few stations will start during the year to get their syndicated news by direct satellite link, and the number of such stations will steadily increase through 1978, and the coming years. That will improve the audio quality, the efficiency, the speed of news delivery, and will allow a great expansion of the services the news syndicators can supply, with regular multiple programming at no great increase in costs.

Those are some of the main things that are happening to syndicated radio news a year after *BM/E* started this monthly report on the sources of programming for radio. The first column, in the January, 1977 issue, discussed the handling of news by many of the stations that were then NIS subscribers, due to be cast adrift that May when NBC closed the service down. Nearly all had decided to stay with all-news. That first programming report also listed syndicated news services that could help to fill the NIS gap.

A year later, as suggested above, all the old-news gatherers are doing more than ever in their history for radio, and a number of organizations, new and old, are turning out material, not hard news, that often supplements the straight news slots in a valuable way. So here is our update on syndicated news sources. The effort has been to uncover all important sources of more or less regular national and international news and broadly-based feature material. The ones we missed will be added in future columns. There are many organizations putting out very specialized material aimed at particular political, economic, or commercial interests. We did not include them; station managers and program directors develop a keen nose for such material and can decide quickly whether they want it or don't want it.

American Broadcasting Company, 7 West 76th St., NY, NY. Tel: 212-LT1-7777. Designed primarily for affiliates of the ABC network. A full array of news feeds throughout the program day.

Associated Broadcast News Service, 726 Nat'l Press Building, Wash., D.C. Tel: 202-628-6397. Produces a weekly package of 80 programs, each one to two minutes long, now distributed on cassettes, so that subscribing station can use an average of 16 each day. These come generally under the head of news interpretation, human interest, and consumer aid. They include interviews with leading news figures for comments on the news, produced by a team of 15 experienced correspondents, often as actualities with intro and outro explanations. Series have such titles as "Out of Your Pocket," "Where Your Money Goes," "The Opposite View" (opposing views by name figures on controversial issues). About 200 stations now use the service, which costs $27.50 a week. Also: develop special stories on order from individual stations. Syndicated programs can be given intros and outros with individual station identification.

Associated Press Radio, 1825 K St., Wash., D.C. Tel: 202-833-5300. Comprehensive — and familiar — array of audio news feeds via dedicated telco line throughout the program day, from one of the leading old-time news services. Also features, specials, documentaries, interpretive news comment. As related in the satellite story on another page, AP is planning to go to satellites for distribution, (as are UPI and Mutual).

Black Audio Network, 166 Madison Ave., NY, NY. Tel: 212-686-6850. Calling itself a "minority news service," this organization puts out a twice-daily 5 minute feed with news of Blacks, Hispanics, Indians, etc. Also 25 to 30 minute features and actualities in the same fields.

Barrett-Goren, 32 Freemont St., N. Tarrytown, NY. Tel: 914-631-2617. Cliff Barrett and Frank Goren, two former stars of the NIS, went on their own when that folded. They now put out a weekly tape with 50 news features, running 1-1/2 to 2 minutes each, most coming under the head of "backgrounders," comments on the news by authoritative figures, plus coverage of how-to-do-it, human interest, health, money, etc. They have recruited some of the leading names from NIS, plus others of equal note, to record the material—Dr. Lee Salk for health, Jane Quinn for house and home, a dozen others of similar weight. Other subjects covered are photography, outdoor life, sports, religion. A large proportion of the material is in actuality form. Subscriber gets with each tape a sheet with intros, backgrounds on the commentators, timing, etc.

Barrett-Goren say their material is heavily "people oriented," and tends to hold the listener beyond the newscasts it follows (this clearly applies to some of the other syndicated material described here also). This is an important trend noted already in the introduction above. Barrett-Goren charge from $50 to $225 a week, depending on market size, and at time of writing had about 30 stations signed up.

Capitol Broadcast News, 1337 22nd St., NW, Wash., D.C. Tel: 202-785-2889. Two to five feeds a week on Washington news of special interest to subscribing stations. Report given station identity. Also a daily general feed, 3 minutes to 25 minutes, in-depth stories looking into the how and why of news; developed by 7 reporters in Washington, 14 around the country. A third service will be a daily commentary series, 90 seconds each, with nationally known commentators and columnists, on social and political topics.

CBS Radio, 51 West 52nd St., NY, NY. Tel: 212-975-4321. Primarily for CBS affiliates and O & O's. Comprehensive news feeds throughout the day. Features, documentaries, multipart weekend specials.

Christian Science Monitor, Boston, Mass. Tel. 617-262-2300. This long-established "international" daily paper, generally rated one of the best in the world, puts out a weekly open-reel tape with 20 stories, from 45 seconds to about 2-1/2 minutes. Topics are consumer affairs, international news, "profiles" and interpretations of the big news. The news tape is bartered for Monitor spots, 6 to 10 per week, as negotiated with each station. Has been in operation about 9 months, now used by 155 stations in the U.S. and Canada. Call: David Dunbar.

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Radio Programming

Fairchild Broadcast News, Room 371, UN Bldg., NY, NY. Tel: 212-593-3294. Daily audio feed, UN actualities, interviews, reports; also a weekly 15-minute tape, world political news in depth. Also covers all political and cultural events in NY area as desired by clients.

Farm Radio News, P.O. Box 6053, Leewood, KS. Tel: 913-642-7373. In depth coverage of futures markets, grain and livestock; major terminal livestock; major terminal livestock markets; other news affecting farm interests including legislative news from Washington; weather, crop reports, etc; presently by Teletype, bulletins, 6 AM to 7 PM.

International Media, 724 Nat'l Press Building, Wash., D.C. Tel: 202-638-5071. Another source of "people oriented," "background" material on the news, this one with a strong religous, moral, ethical slant, taking up the important social issues. With frequent news-pegged comment on such topics as abortion, violence, family instability, etc. Puts out 25 minutes of material a day, 6 days a week via a 25-minute daily "live" feed on lines leased from United Press International. The 25 minute feed is recorded by the broadcaster, includes 12 to 15 news spots, most of them actualities with correspondent comment, which can be fitted into programming separately as wanted. Much of the actuality material is phoned in by stringers around the country. Principals are Cal Thomas, formerly at NBC TV news; and Forrest Boyd, who came from 15 years as a newsman at Mutual.

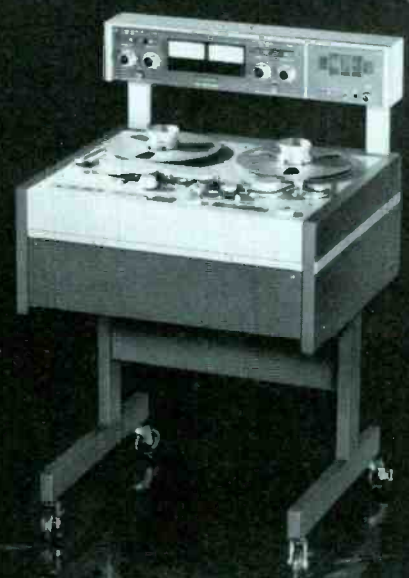
Mutual Broadcasting System, 1755 Thomas Jefferson Highway, Arlington, VA. Tel. 703-685-2000. This is by far the largest news network in radio, with more than 750 affiliates. Has for years supplied a top-of-the-hour newscast and features and documentaries; also has specialized in live coverage of major sports around the country. Mutual will greatly expand its services, beginning about the middle of this year for West Coast affiliates and working eastward, by going 100% to satellite distribution (see satellite story in this issue for details).

National Black Network, 1350 Ave. of the Americas, NY, NY. Tel: 212-586-0610. Feeds 19 newscasts a day, 5 minutes each, on the top of each hour, with "Black oriented" news. Also: two sports shows a day; a weekly 30-minute press conference-interview on an important political or social topic; "Martin Luther King Speaks," a 30-minute weekly show; the "Story Hour," one-hour program weekly,

continued on page 35

Studer introduces the A80/RC

the quality defies comparison...
the price invites it



From now on you don't have to pay more money to get Studer quality. The new Studer A80/RC two-channel recorder costs the same as or less than two of the other three popular names.

It sounds unbelievable. And it is the most perfect machine you can buy for any two-channel application you can think of.

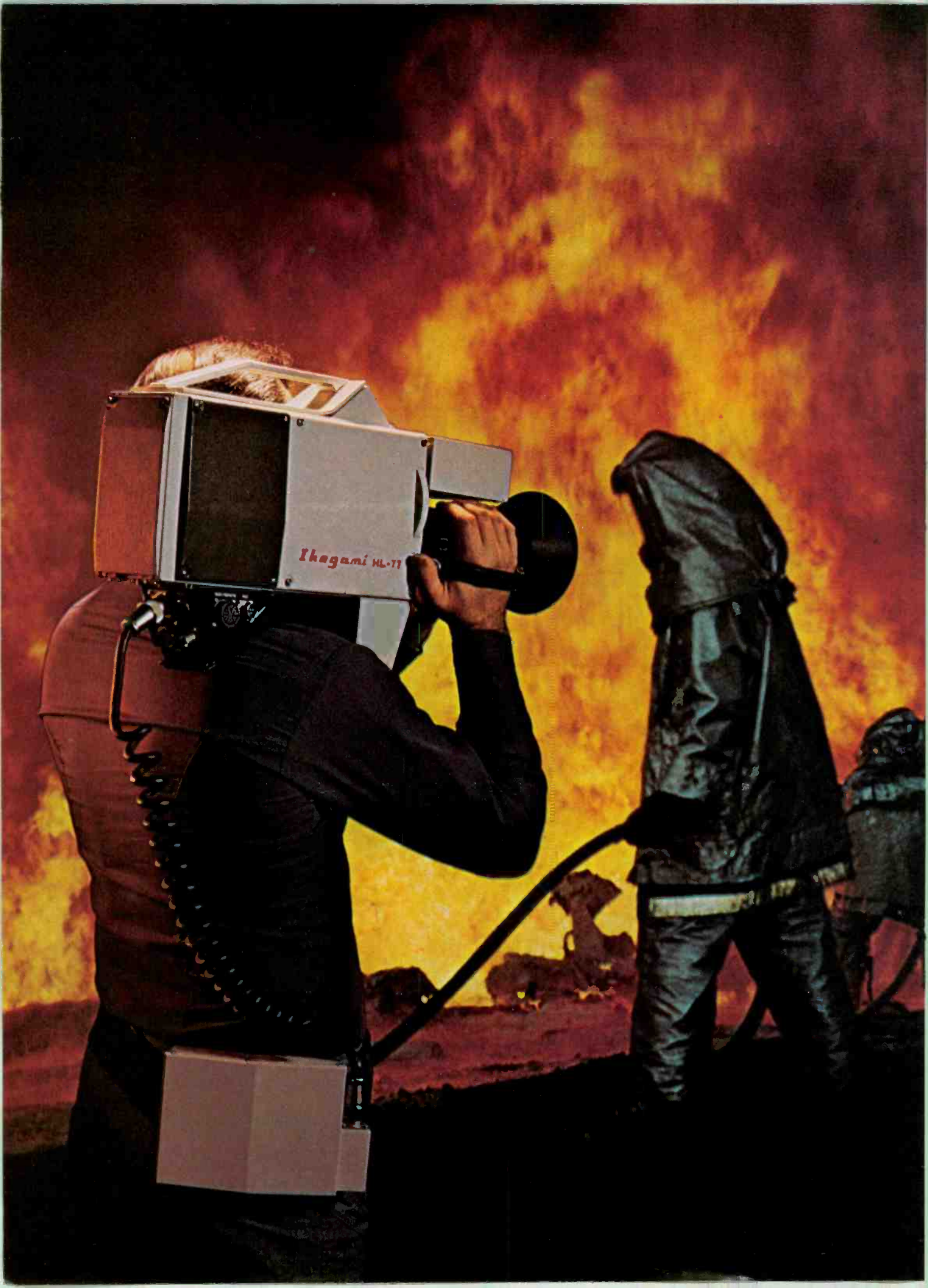
Because nothing but a machine created by Willi Studer records, plays, handles, and lasts like a machine created by Willi Studer.

Now you have a choice: you can pay less for an A80/RC and get more tape recorder, or pay more for another brand and get less tape recorder. The A80/RC sells for $6,500 as shown.

Visit Studer for a hands-on experience with the A80/RC or for full information, call:

STUDER REVOX

Studer Revox America, Inc., 1819 Broadway, Nashville, Tennessee 37203 / (615) 329-9576 • In Canada: Studer Revox Canada, Ltd. / (416) 423-2831


Ikegami HL-77

"The real disaster is when your ENG camera doesn't work."

Talk with a broadcast TV news cameraman and that's what he'll tell you. And that's why more TV news teams use Ikegami ENG cameras than all others combined. When you get only one chance to cover a news event, a dependable Ikegami is the one ENG camera to use.

The reason: The prime features built into Ikegami ENG cameras are dependability and colorimetry. Everything else is icing on the cake. And the Ikegami combination of dependability with ruggedness, light weight, image stability, and simplified controls, is why all three networks used the Ikegami HL-33 and HL-35 ENG cameras at the 1976 Democratic and Republican Conventions. And why they were used at the 1976 Summer Olympics.

Now we have two cameras that are even better: the Ikegami HL-77 and HL-37. In the HL-77 we've done away with the 26½-lb backpack and tucked its functions inside the camera body—and still reduced the HL-77's weight (less lens, but with viewfinder) to a pound less than the HL-35 head alone. The HL-77 weighs in at 13½ lb. In the HL-37 we've split the package so the head weight (without lens) is even less, and the shoulder-sling process pack comes to 6½ lb.

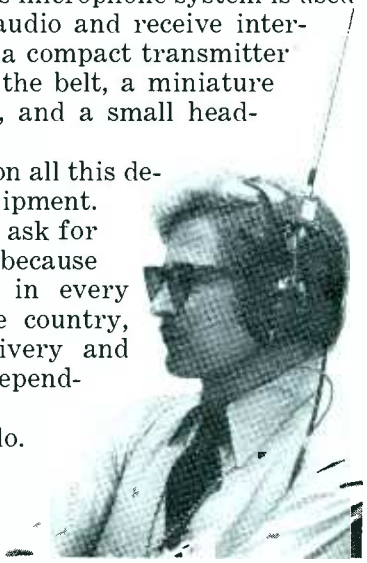
Both cameras use three ⅔-inch Plumbicon* pickup tubes, and f/1.4 prism optics. The viewfinder is 1½ inches. And everything else that made the HL-33 and HL-35 the real winners at the conventions is still there—just smaller and lighter.

Both the new HL-77 (the *Ike*) and the HL-37 (the *Mini-mate*) produce broadcast-quality coverage with good color, brightness, stability, high sensitivity even in low light, and reduced lag due to bias light. Both can feed video and audio to a local or remote video tape recorder, or via microwave transmitter receiver for remote pickup.

For microwave transmission from our HL-33 and HL-35 ENG cameras to a remote pickup point, we offer the Ikegami PF71 portable microwave relay system. This backpack unit transmits the video signal on the 13-GHz microwave band; audio and command signals on the 950-MHz uhf band. Maximum range is about 1800 feet with omni antenna, 3700 feet with 60-degree horn, two miles with a 20-degree horn.

For the sound portion of the program, the Ikegami PFM-091 wireless microphone system is used to transmit program audio and receive intercom audio. It includes a compact transmitter and receiver worn on the belt, a miniature condenser microphone, and a small headset/whip antenna.

We've got the specs on all this dependable portable equipment. Just write for them, or ask for a demonstration. And because we have distributors in every major area across the country, you can get fast delivery and service. If you want dependability, you get it from Ikegami. More people do.



Ikegami

Ikegami Electronics (USA) Inc., 29-19 39th Ave., Long Island City, N.Y. 11101 · (212) 932-2577

Circle 124 on Reader Service Card

INSTANTANEOUS Digital Command

30 Functions for only $1995

TFT Model 7601 represents a major breakthrough in remote control systems. Now, you can get 20 channels of digital command functions plus 10 channels of digital telemetry functions for less than $2000! And it's the same high quality, reliable design that has made TFT equipment a standard in the broadcast industry. Just check this line-up of features:

DATA SECURITY ASSURED

Full command-code redundancy, *plus* odd/even parity check, makes digital data errors virtually impossible. A TFT proprietary feature. Even lightning induced noise has no effect on integrity of command functions.

INSTANTANEOUS COMMAND

Less than 0.2 second marks the time for a complete command/execute function with the new TFT high speed data modem.

ONE MAN CALIBRATION

The front panel of the Model 7601R (Remote Terminal) has a DVM and scaling potentiometers so that just one man, on-site, can perform the FCC required weekly calibration. A studio lock-out switch provides complete operator safety for on-site work.

CHOICE OF TRANSMISSION METHODS

Model 7601 interconnection can be either telephone lines or radio links which include STL, TLS or SCA.

MINIMAL SERVICE DOWNTIME

Quick-disconnect rear barrier strips allow fast removal of the 7601 from the rack without disconnecting any of the interface wiring between the remote terminal and the transmitter or alarm sampling points.

TEN OPTIONAL STATUS CHANNELS

In addition, 10 status indicator functions may be factory or field installed to provide instant status display and alarm.

The Model 7601 is just one of a full line of field-proven, reliable, fail-safe remote control systems offered by TFT. Other remote control systems designed for AM, FM and TV include the Model 7610, 120-channel digital telemetry/status/control system, the TELESCAN* auto-logging multi-channel CRT display and tolerance alarm system, and a complete line of remote control accessories. They're all available now from TFT. Call or write:

*Trademark pending

TFT *TIME & FREQUENCY TECHNOLOGY INC.*

3000 OLCOTT STREET, SANTA CLARA, CA 95051 (408) 246-6365 TWX No. 910-338-0584

Circle 125 on Reader Service Card

Radio Programming

with Ossie Davis and Ruby Dee — poetry, story-telling, interviews with cultural and entertainment leaders. Goes to about 85 stations.

National Broadcasting Co., 30 Rockefeller Plaza, NY, NY. Tel: 212-664-4444. News feeds on the hour throughout the program day; documentaries, specials, major sports, etc. Designed primarily for NBC affiliates.

Reuters, 1700 Broadway, NY, NY. Tel. 212-582-4030. World-wide news gatherer, offices in every city, every country, long established for news from the whole world. Audio feeds throughout program day; subscriber's choice of foreign or domestic news or combination.

U PI Audio Network, 220 E. 42nd St., NY, NY. Tel: 212-682-0400. The other great American news service (along with the Associated Press). Has a most comprehensive series of audio news feeds throughout the program day; also specials, documentaries, news interpretation, sports, etc. Discussing joint satellite distribution with Associated Press (see satellite story in this issue).

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BM/E's Program Marketplace

Syndicators For Radio

Burkhart-Abrams and Associates

6500 River Chase Circle, Atlanta, GA 30328. Tel. 404-955-1550

STORIES IN THIS SERIES during its first year, 1977, frequently made the point that format names are no more than useful shorthand; the station management has to listen to a large sample of any syndicator's product to know what it is all about.

Everybody has a good general idea of what "rock" means, but calling a syndicator's output "rock" is not enough. The influence of specific choice of music is paramount in the character of the programs.

Burkhart-Abrams, a fairly young syndication operation, applies not only personal taste, but also the results of fairly elaborate original research, in their choices for "Super Stars," now on nearly 40 stations around the country. This is "album-oriented rock," a description accurate as far as it goes. The choices have been aided by a very careful research program, involving buyers in record stores and ad hoc panels assembled in many parts of the country.

Burkhart-Abrams gets permission from the record retailer to put cards on the counter, which buyers fill in and leave. Some of the questions are: "What did you buy?", "Can we call you?" Kent Burkhart, founder and president, says that the simple sale of an album is not specific enough: they want to know which cuts the customer really likes.

This information can be elicited in the telephone call later made to the buyer by Burkhart-Abrams personnel. The likes and dislikes are carefully tabulated to help in programming choices.

Another part of the research effort consists of panels of listeners who are recruited in each area via newspaper ads. They come to some central location to hear a batch of upcoming recordings and record their likes and dislikes. Burkhart says many college students working in statistics answer the ads in order to work in a statistics-oriented project and get paid for doing it.

The results of the listening tests also aid Burkhart-Abrams in their choices. But the experience and taste of Burkhart, Abrams and their helpers remain dominant.

The programs put together, like those of most other syndicators described here, are scaled to give a radio station complete coverage of its "entertainment" requirements. Burkhart-Abrams work closely with each subscriber on the total station image, taking careful account of the market, competition, etc. They like to bill themselves as "media consultants," which means recommendations on all aspects of a station's programming including major changes of format.

A recent example cited by Kent Burkhart is their agreement to set up programming for both the AM and the FM operations of KNOK, in Fort Worth, Texas, for new ownership: the Earl Graves publishing firm in New York. The two stations will be differ-

continued on page 36

Radio Programming

entiated, with the AM following a regular "Black" style of programming, and the FM concentrating more on "disco" music. The program plans for both stations will be laid out in detail.

Burkhart says the decision to use disco music heavily was stimulated in part by their recent research results, and by the growing availability of the music. He says a frequent "route" for disco hits in recent months has been, first, to be heard and liked in the discotheques themselves; then to get onto New York's WBLS-FM, which has the largest Black audience in the U.S.; then onto New York's big "mass appeal" station, WABC.

A majority of the Burkhart-Abrams stations are "live" (non-automated), on the firm's recommendation. They like "live" operation for its speed in getting current hits on the air and its quick flexibility for meeting challenges in very competitive markets. They frequently call clients and recommend certain current hits for immediate insertion in the programming. In most cases the material will later be incorporated into the update tapes that Burkhart-Abrams send out to the client. Burkhart told *BM/E* he believes that in coming years syndicators will distribute their material to subscribers via satellite or fiber optics, giving the process more immediacy and efficiency so that current hits, for example, could go out on an "instant" schedule. But that is still some years away.

Kent Burkhart started in radio as a school reporter and disc jockey while he was still in high school in Texas. While at TCU in Fort Worth he was No. 1 disc jockey at KXOL. Later he worked for a long series of stations, including Gordon McLendon's early "beautiful music" stands, and later Todd Starrs at KOWH and the beginnings of "Top 40."

He was general manager of WQXI in Atlanta, and later was an executive in Pacific and Southern Broadcasting Company, with stations in half a dozen cities.

In 1972 he went on his own as a consultant to stations wanting guidance on programming formats, and that, as might be expected, led to his own program syndication. In the course of his travels to stations he encountered repeatedly a young program director named Lew Abrams; these meetings finally brought Burkhart's invitation to Abrams to join the operation.

With the AOR "Super Stars" a healthy project, Burkhart and Abrams are working hard on their second format: a "soft rock," still unnamed. Obviously, it will be as carefully and tastefully produced as the "Super Stars" — a good bet for success. **BM/E**

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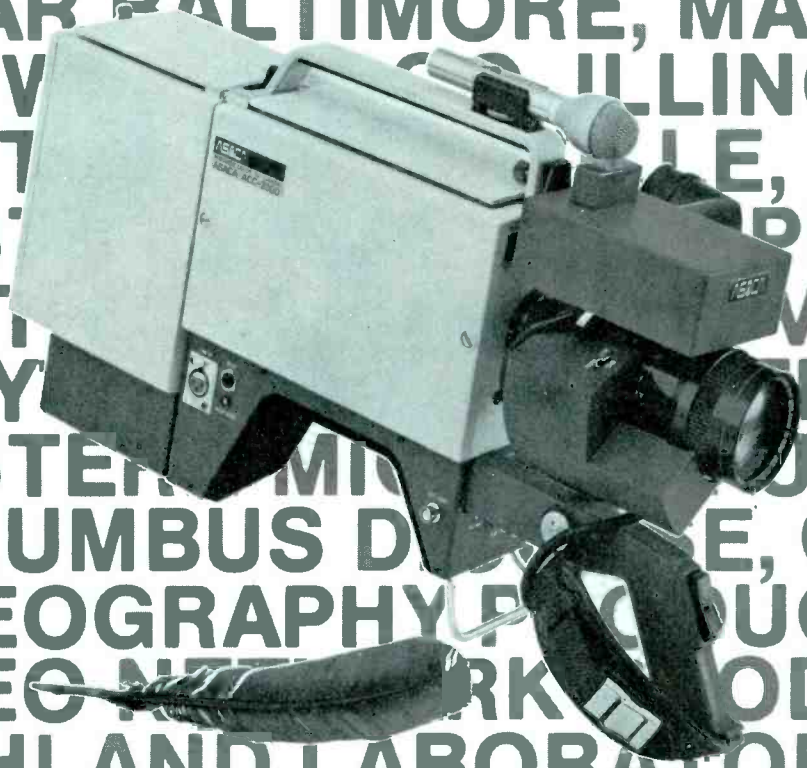

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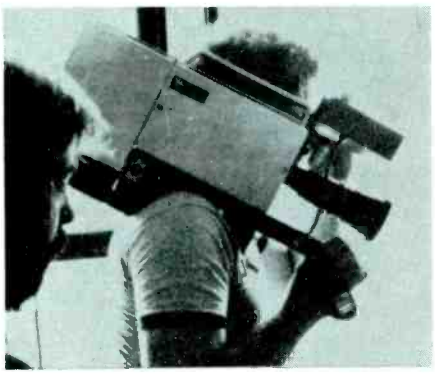

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Circle 129 on Reader Service Card

ENG Is Making Freelance News A Reality

ALMOST EVERY STATION'S news department, at one time or another, has purchased exclusive news film from either a freelancer or an amateur filmmaker who just happened to be on the scene of a major story when it broke. The best known case is probably the famous Zappruder films taken of the John F. Kennedy assasination in Dallas. Many of the famous front page photographs have been supplied to newspapers by freelancers or propitious amateurs. Even in the stiffest of union contracts, news directors are given the right to buy outside produced news footage under certain circumstances.

Until now, the freelance news photographer/filmmaker has been a relatively unorganized, hit-or-miss, marginally profitable and rare specie. That is beginning to change. ENG equipment, two-way radio, police and fire radio scanners, mobile vans and the news wire services are making freelance news gathering a viable proposition. Action Movie News, in New York, is in the forefront of this newly developing field. Last year, AMN sold in excess of $140,000 worth of exclusive news footage to New York City television stations. On one evening, according to Sheldon Levy, AMN president, WCBS-TV used AMN footage in each of its first six news cuts. AMN's all-time record was a total of 30 stories carried by local stations in a single night. Levy now counts each of New York's six commercial stations on his active client list.

AMN crew at Bronx fire. Not putting police and firemen "on the spot" has led to good relations with the departments.

Last July when AWOL sailor hijacked a Vermont bound bus to New York's JFK Airport, AMN was among first news crew on the scene.

The growth of AMN is nothing short of spectucular. Levy had been working as a dispatcher for the New York City Fire Department since 1968 and had been going to fires with a still camera trying to make a little extra money by selling his fire pictures to New York newspapers. In 1973, a friend suggested that there might be more than the $50 or $80 a picture he got from newspapers if he had film footage for TV stations. Levy arbitrarily called WCBS-TV to find out if they would use such material and if so, what were their requirements and how much would they pay. What he found out was not all that encouraging. He was told that they would use the material if it was exclusive (that is, if they hadn't assigned one of their own crews to it) but that the price would be limited to the daily wage of a single union cameraman, about $100. He was also told that whatever he shot would have to be on pure speculation. He could get no assignments and could not cover anything that any station personnel were assigned to. Levy was not greatly encouraged but he went ahead and purchased a 16mm film camera. Fortunately for Levy, the New York City firemen went on strike and his first night's labors resulted in four fire stories purchased for $400. Levy figured that he was really onto something here. He quit his dispatcher job and founded AMN.

Shortly afterward, one of the people he dealt with at WCBS-TV moved over to WNEW-TV and began seeking AMN stories for use by this station. Working in film presented a problem for Levy when it came to serving multiple clients. Both stations wanted the same footage and he had just one print. He then got a partner and a second 16mm camera. Soon, however, other stations wanted his material and he began to see that adding additional film cameras and operators could, in the long run, be counterproductive.

Fortunately, technology had changed and videotape recorders and electronic cameras meant that he could easily record a scene and make dubs for each client station. In fact, with film, he had the problem that if the story didn't sell, he was out of the cost of the film and processing; with tape he could just use it over again. The whole electronic news gathering structure made great sense for a freelancer.

continued on page 41

New! For heterodyne VTRs

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It's the CVS 516, first digital TBC made and priced to give users of non-segmented, heterodyne VTRs all the proven advantages of modern digital video processing.

The CVS 516 is ideal for ENG, teleproduction, studio VTR backup and much more because it comes with features that, before, you'd find only in TBCs costing up to twice as much.

For example, correction of chroma/luminance delay problems, a 3 dB chroma noise reduction, velocity compensation and color dropout compensation are standard.

So is "Gyrocomp," an exclusive, use-proven CVS memory design that easily handles severe gyroscopic distortions—without breakup.

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Simple operation is another plus for the CVS 516. Front panel controls give you total mastery of your video signal. Each control also has a preset unity position to give you a consistent starting point for all your tapes.

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So, to give your heterodyne productions the quality they deserve, get the one digital TBC made and priced to do the job—the CVS 516. For full details and/or a demonstration, contact your authorized CVS Distributor or CVS. And ask for our new booklet about the basics of digital time base correction. It's free.

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Circle 130 on Reader Service Card

TV Programming

AMN now includes all New York City commercial stations on its client list. To cover the news, AMN uses an Ikegami HL-33 and HL-37 with Sony BVU-100 recorders. The company has also added two vans equipped with 6.5 kW generators, 500 W inverter, shooting platforms on the roof, lights, audio mixing and Tektronix monitoring equipment. The vans are also equipped with Motorola two-way radios and mobile telephone. The vans were custom built to AMN specifications by Wolf Coach of Connecticut and include 13,500 BTU air conditioning systems and heating systems.

What really makes AMN work, however, is its 24-hour a day, seven day a week schedule and its elaborate collection of radio scanners; UPI Greater New York wire and police dept. teletype. AMN is often on the scene of a breaking story simultaneously with the arrival of police or fire teams. In addition, Levy says that AMN enjoys a special relationship with New York City's police and fire departments and often receives tips on important raids and arrests. One tip received on August 12, 1977 resulted in AMN having the only pictures of accused "Son of Sam" killer, David Berkowitz, as he was brought into police headquarters. This particular story was done on film and Levy found himself in the awkward position of having all six client stations bidding for the same film. Though for once he was in a position to get more than his usual $100, he was also faced with the problem of alienating five of his clients.

Finally Levy arranged with ABC to transfer the film to five video cassettes and he was able to satisfy each of his clients. Levy said, "Of course each station would like to have 'exclusives' but they are more afraid of not having the story at all."

Though the strict union rules in force at New York City television stations place restraints on the use of outside produced news footage, they also help Levy. For one thing, the wages and work rules limit the stations' abilities to keep crews on the streets at all hours. As a result, New York's nights from midnight to 7 a.m. belong to Action Movie News. It is estimated that an all night news operation on the level of Levy's would cost each station about $150,000 each year. Instead, all six stations got the late coverage last year for a cumulative expenditure of just a little more than $140,000. Levy's team consists of five cameramen and two assignment editors. Action Movie News footage is just what the name implies — action. If it looks good, AMN shoots it.

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The Action Movie News team (left to right): Vito Maggillo, Harry Rittenberg, Kevin Dougherty, Sheldon Levy (kneeling), Joseph Scurto, and Sal Mazza.

There is no pretense of journalism in most AMN footage and most of it is supplied with wild sound only. On rare occasions, an AMN operator will pose an open-ended question to a newsmaker such as a case in which a fireman who had just rescued two children from a blaze was asked, "What went on in there?" The question never reached the air but the answer was moving and dramatic and made a very strong news story.

The crews at AMN work 60-hour weeks and make a little over $200 per week. Nevertheless, the lure of the street excitement and the potential for commissions on successful coverage makes finding and keeping employees no great problem. But Levy feels that AMN is begining to reach the saturation point with New York City TV stations. AMN averages 3.5 stories aired per day and beyond that the growth potential in the New York market is small. A study of the stories sold by AMN revealed that 85 percent were shot during the midnight to seven a.m. time period so Levy has rearranged the work schedule so that he is strongest during that period. A much smaller staff is kept on alert the remainder of the time. The answer for Levy, however, as it is for most other entrepreneurs, is to expand the market.

The expansion has taken two forms. First, Levy has gone into partnership with Larry VanderVeen to form Mobile Video Services, Inc. This company, equipped with additional gear and its own van, specializes in remote productions of commercials, screen tests, and does some exterior shooting for ABC's soap operas. This type of work, unlike the news operation, can be scheduled and therefore introduces some stability into the AMN/MVS operation. In addition, Levy has established some relationships with stations outside the New York market. AMN shoots a lot of sports footage for WTTG-TV of Washington teams when they're in town. For stations outside the market, AMN can, and does, take assignments. Recently, WRAL, in Raleigh, N.C., assigned AMN to cover a demonstration by supporters of the so-called "Wilmington 10" who were protesting the prosecution of these men on the occasion of a visit by the North Carolina Symphony Orchestra to New York's Lincoln Center. In another instance, AMN shot the New York end of a telephone interview between a recording company executive and a WWJ-TV reporter in Detroit. The recording was air freighted to WWJ and intercut with the recording of the reporter's side of the interview.

The cost of such services is surprisingly reasonable in the light of normal New York prices. A full crew will do all work for $125 an hour with a two-hour minimum. The same price sticks for any type of assignment and AMN crews have frequently gone on aerial jobs for the same price. Of course the assigning stations pick up the cost of the helicopter but no special premium is paid for the type of job.

Another aspect of AMN is its extensive library of dramatic action footage. Hundreds of fire, crime and disaster scenes are on record. Clients for such footage have run the gamut from local stations to the BBC. Part of the reason for keeping the recorded material on hand is that the news value of a particular piece is not always immediately apparent. There have been a number of occasions when fire footage was turned down on that basis but sold later when it was discovered that the fire was arson committed to cover evidence of a murder. In other cases, a murder victim that appears to be just another of the nameless homicides in New York later is identified with organized crime or discovered to be a victim of some crime spree.

Levy expects that AMN and its sister company, MVS, will continue to grow. In fact, other such groups are springing up in places like San Francisco. All in all, it appears that a news director who wants footage of a local dignitary visiting a distant city or a local sports team at away games is soon going to have more options open to him as the idea of freelance ENG grows. **BM/E**

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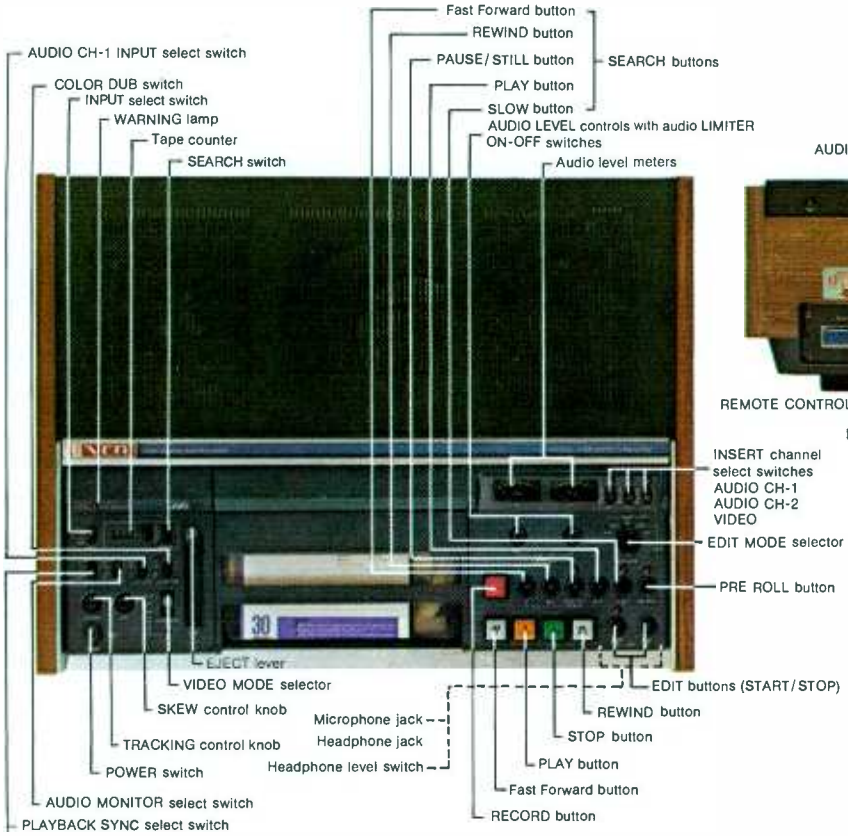

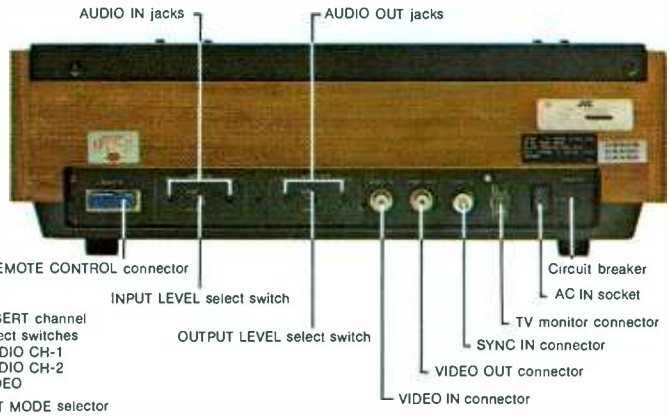

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Radio News Remotes: Reliable, Studio-Quality, Distance-Defying

With today's equipment any radio broadcaster can bring his news in live from all around the town and from 50 or more miles away.

JUST A YEAR AGO, in the January, 1977 issue, *BM/E* presented the evidence that radio's ENG, as old as radio itself, was becoming a new, state-of-the-art technology, capable of bringing in "live" news from anywhere in a station's market, and with studio quality.

In the March issue, *BM/E* described what is probably the most elaborate system of this kind put up so far, the CBS Radio Network pickup system in Washington, D.C. Four permanent automatic repeater stations, at high points around the city, allow the newsmen to reach the studios directly with hand-held portable transmitters ("bricks") from just about anywhere. Well-designed cueing, back-up and automatic diversity make the system flexible, efficient to run from the studios, nearly fail-proof.

But extremely few broadcasters need as much ENG capability as that. In the year since our first report the makers of the equipment have improved their systems and consolidated the ENG advance. The general result is that now *any* broadcaster can have an up-to-date ENG operation on a scale that fits his needs and resources.

For most jobs there are two main elements: one or more of the new breed of hand-held or shoulder-hung portables, 1 to 3 watts output, with the new audio quality and range of 1 to 5 miles; some means for relaying the signal to the studio, when the hand-held unit is beyond its range; or alternatively, a "mobile" for reaching the studio directly. Mobile transmitters (10 to 40 watts output), car mountable or quickly installable at remote locations, can act as such originating equipment, or (with proper receivers added) as repeaters for hand-held equipment. Permanent automatic repeater stations (one at a high point will often give city-wide coverage) fit into the needs of some broadcasters. Or it may be worthwhile (one example is given below) to put up one or two fixed repeaters just for a particular job: the equipment is ready for this.

The foregoing points to one caveat for seekers of radio's new ENG: in many cases the station must supply some system engineering. The variations in distances, terrain, market geography, available frequencies, and news practices make it impossible to meet all needs with a single system. This point is also made by the variety of systems in the station stories that follow.

Giving the whole technology more scope is the new set of frequency assignments for remotes in the 450-455 MHz band established by the FCC in November, 1976 (described in detail in *BM/E*, March 1977). This new division of the frequencies in the band added 38 new channels, a highly welcome addition for broadcasters in large cities where the UHF remote band is badly crowded.

For the equipment, several manufacturers have been particularly active. Marti, McMartin, Moseley, Motorola and General Electric make mobile transmitters in the band with RF output up to about 50 watts. Marti, McMartin and Mossley all have new transmitters that have been type approved under the new rules for broadcast remotes and take advantage of the new frequency and bandwidth assignments. Power levels can be chosen for each application.

For the hand-held operation, Marti has the RPT-1 series of transmitters and McMartin brought out the new RPU-1103 in 1977, as did Comrex with their new HHT-1KA. All are in wide use for news gathering by broadcasters. Some examples are cited below.

Moseley's RPL series of higher-powered mobiles is available on both 150 and 450 MHz with bandwidths corresponding to the new FCC regulations. Marti introduced late in 1977 a unit which can simplify system construction: the RR mobile repeater receiver. Tuned to the hand-carried transmitter, this receiver also has a tone decoder which responds to a subaudible tone sent out by the hand-carried transmitter. When cued by the tone, the receiver will turn on an associated mobile transmitter automatically, to form a repeater system that relays the signal to the studio. This system can be in a car, driven to an advantageous relay spot.

For fixed repeater service, any of the large mobile transmitters can be installed, along with an appropriate receiver, the combination to be cued on by a signal from the studio or (automatically) by the receipt of the remote signal. By getting the right combination of hand-carried, mobile, and fixed equipment, the broadcaster can today easily cover just about any requirement in local news gathering. And the larger mobile transmitters, with well

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designed antennas and favorable air paths, can often bring the news from 50, 60 or more miles away.

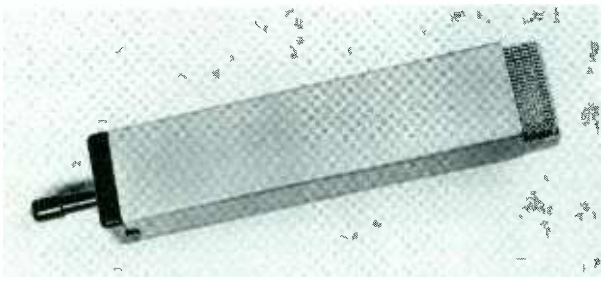
How does equipment of the kind described here, the basis for the new radio ENG, differ from the two-way radio equipment we have had for 30 years and more (in business, taxis, truck dispatching, etc., etc.)? M.E. McClanahan of Marti summarized the main differences as follows:

Broadcast equipment must be able to operate continuously, rather than just intermittently;

Overall audio quality must meet broadcast levels, rather than voice-communication, sub-telephonic levels;

The transmitter needs a broadcast-type compressor/limiter to keep modulation steady through a range of conditions;

The transmitter should run on DC as well as AC power.



Comrex hand-held transmitter, HHT-1KA, 1 watt output, 450-456 MHz, built-in electret condenser microphone.

Marti's new "repeat receiver," RR-50/450, has tone decoder to turn on relay transmitter (see story).

McMartin mobile transmitter, RPU-1150, output 50 watts, for either 150 MHz or 450 MHz band.

Broadcasters' recognition of the need for studio-level audio quality, or something near it, has been a strong motivating force in the spread of the new ENG for radio. The trend noted last January is continuing: the old idea that remotes should sound like a very poor telephone circuit is steadily disappearing from the broadcast consciousness. Listeners do not get a sense of "being right there" from very low audio quality, but from quality that makes the voice and background sounds seem as real as possible.

Some new approaches have begun to spread during the year, promising to extend ENG capability in certain directions. One is the use of audio cassettes for pickup, with new equipment for fast editing of the cassettes at the studio. This abandons instant on-air capability; and the quality will also be lower than that postulated in the foregoing, unless cassette equipment of special design — and high price — is used. The ordinary hand-held cassette recorder obviously cannot match broadcast studio quality.

However, some stations, by using excellent cassette equipment, are getting quality that satisfies their news listeners. The trend is evident in the demand for a new cassette recorder with a number of editing features, shown by Edco at the recent NRBA convention (see *BM/E*'s December report). Deliveries of the machine were due to start about the time this magazine is distributed. An Edco spokesman told *BM/E* that they have a sizeable backlog of orders from radio stations who want the machines specifically for the news-editing function.

Another new technique (also introduced at the NRBA) is the "Low-frequency extender" developed by Comrex. This is an encode-decode system, intended for use with telco lines. It shifts the program material up by 250 Hz at the sending end, shifts it back down again at the receiving end. This enchances quality by: (1) side-stepping the standard 200-300 Hz low-frequency cut-off of telco systems — the low end of the decoded material goes effectively to about 50 Hz; (2) greatly improving the signal/noise ratio.

Westinghouse station WBZ in Boston has been using the low-frequency extender on an experimental basis. A Westinghouse spokesman told *BM/E* the quality enhancement was so definite that Westinghouse was contemplating using the system, not only for fast delivery of local news remotes via telephone lines but also for program distribution among the "Group W" stations in various cities in some circumstances.

Finally, here is a small sampling of station stories that show the resourcefulness of the new ENG. There could have been many more; but these tell the story well.

WEAN, Providence, R.I. Joseph Drury, chief engineer, faced the problem last September of getting live coverage of the America's Cup Races, held at sea from 10 to 20 miles off Newport. His highly successful solution started with a Moseley mobile transmitter, on 450 MHz, carried to the scene on the press boat, a 65-foot catamaran allowed to follow the racing yachts fairly closely. To pick up the mobile, Drury set up two temporary, "fixed" repeater stations on shore, one at the FM transmitter site of WEAN, on a hill near Providence, the other in the Shamrock Hill Hotel, on the bluff in Newport overlooking the ocean. These pick-up points used Motorola repeater equipment and were connected to the WEAN studios by high grade land lines.

WEAN's news department was thus able to put the start

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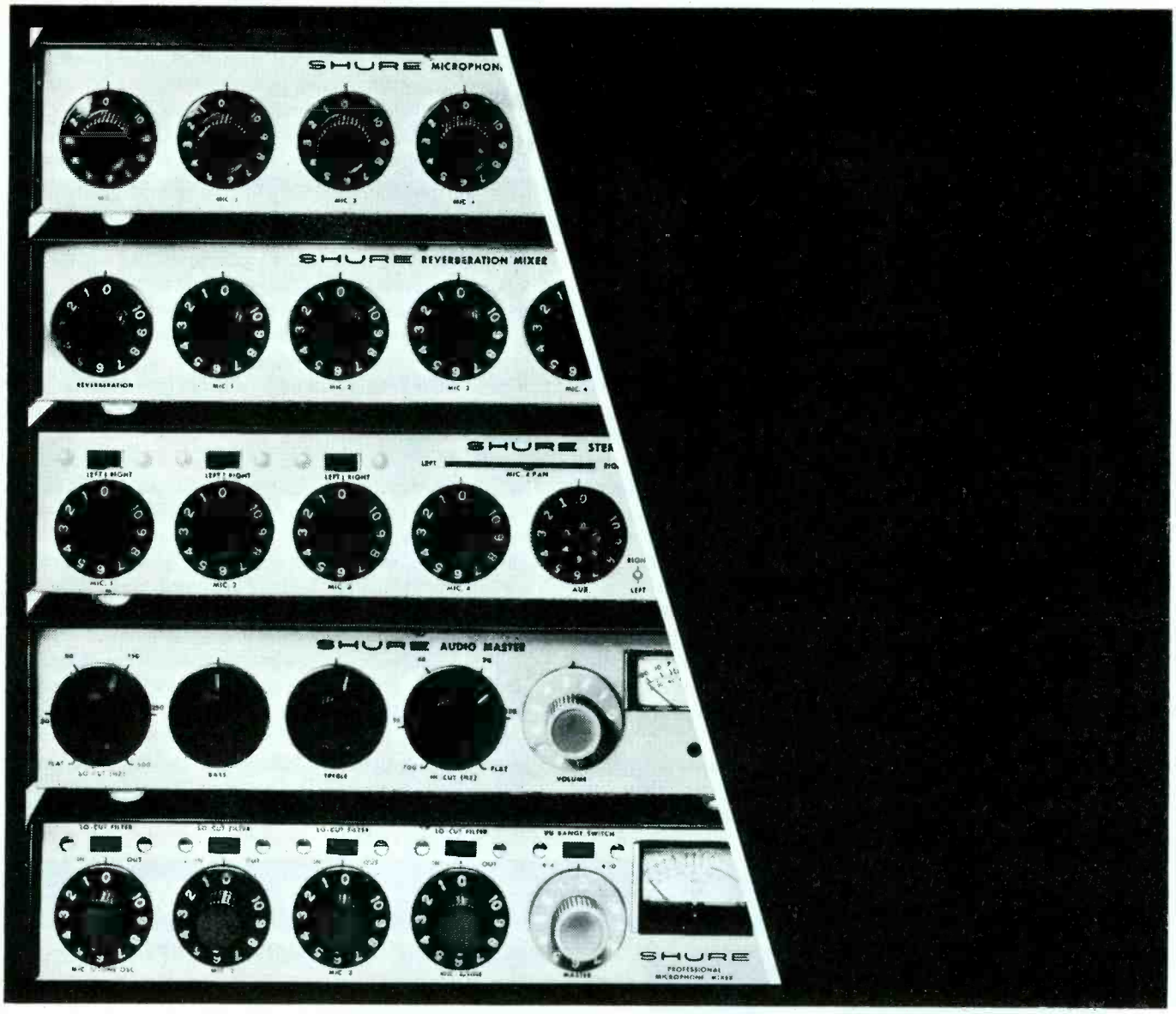
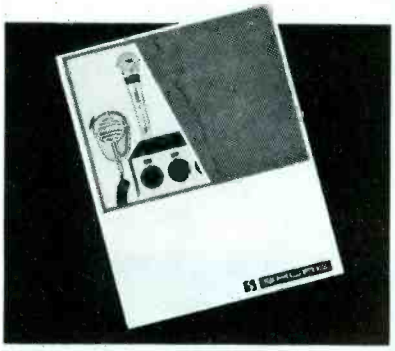


Rack 'em up.



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and the finish of each race on the air "live" in real time; to update the status of the two yachts directly from the scene twice an hour; and to break in with any instant news of importance during the race. The newsman at sea got his studio cues with a small Motorola pocket receiver tuned to WEAN's AM frequency; the anchorman simply told him over the air when to come in. Talk-back cues from the newsman to the studio could go in over the pick-up route: it all worked perfectly, Drury says.

The system was made legal by a temporary authorization from the FCC, effective for the duration of the races.

KMOX AM and FM, St. Louis, Mo. The day before Thanksgiving every year, the St. Louis Globe Democrat and many charity organizations run "Old News Boys Day." Former newsboys, now prominent citizens, sell papers on the street to aid needy children. Sales are for any amount the buyer wants to pay, with the understanding that the money is headed for the needy ones. A part of the operation is a congregation of celebrities on Celebrity Corner for interviews, speeches, etc.

Ed Karl, director of technical operations for KMOX, turned up on Celebrity Corner at 6:30 AM with a McMartin RPU-1103 hand-carried transmitter, and the KMOX news crew was able, for about three hours, to describe the scene, putting very numerous interviews and statements on the air live.

The street pickup area was about one mile from the KMOX studios, and signal strength was more than satisfactory: Ed Karl says they have found the RPU-1103 gets the news directly back from up to about 5 miles away. Studio cues to the newsmen were, as at WEAN, over the station's regular air signal to hip-pocket transistor radios. Everything worked perfectly.

WSNW, Seneca, S. Carolina. For this small-market AM station, general manager Wayne Gallimore has instituted another approach to ENG: he uses a Comrex wireless mic system to get to a Marti mobile transmitter, in a car or installed near a news operation. The range of up to about 100 yards from mic to mobile service for the live news operations that Gallimore wants to carry out. This mode of operation has been used for years by some broadcasters: it has increased relevance now because of the new breed of wireless microphones now appearing, with higher audio quality, not only from Comrex but from such firms as Schaffer-Vega and HME (see December's NRBA report on this).

KRLD, Dallas, Texas. Rick Neace, chief engineer, has equipped the station for an elaborate local news operation. He has four of the Marti hand-held RPT-1s and six of the Marti mobiles, RPT, 25 watt transmitters. The station has two airplanes for traffic and wide area coverage. For pickup throughout the Dallas-Fort Worth area, Neace has installed a permanent repeater station on the tallest building in Dallas.

This complement of equipment makes it easy to get the live news back and on the air from anywhere around the two cities. KRLD not only serves its own very comprehensive news programming, but feeds sections of the news to more than 100 stations around the state via the Texas State Network. The quality and immediacy of the material are important to all the receiving stations. **BM/E**

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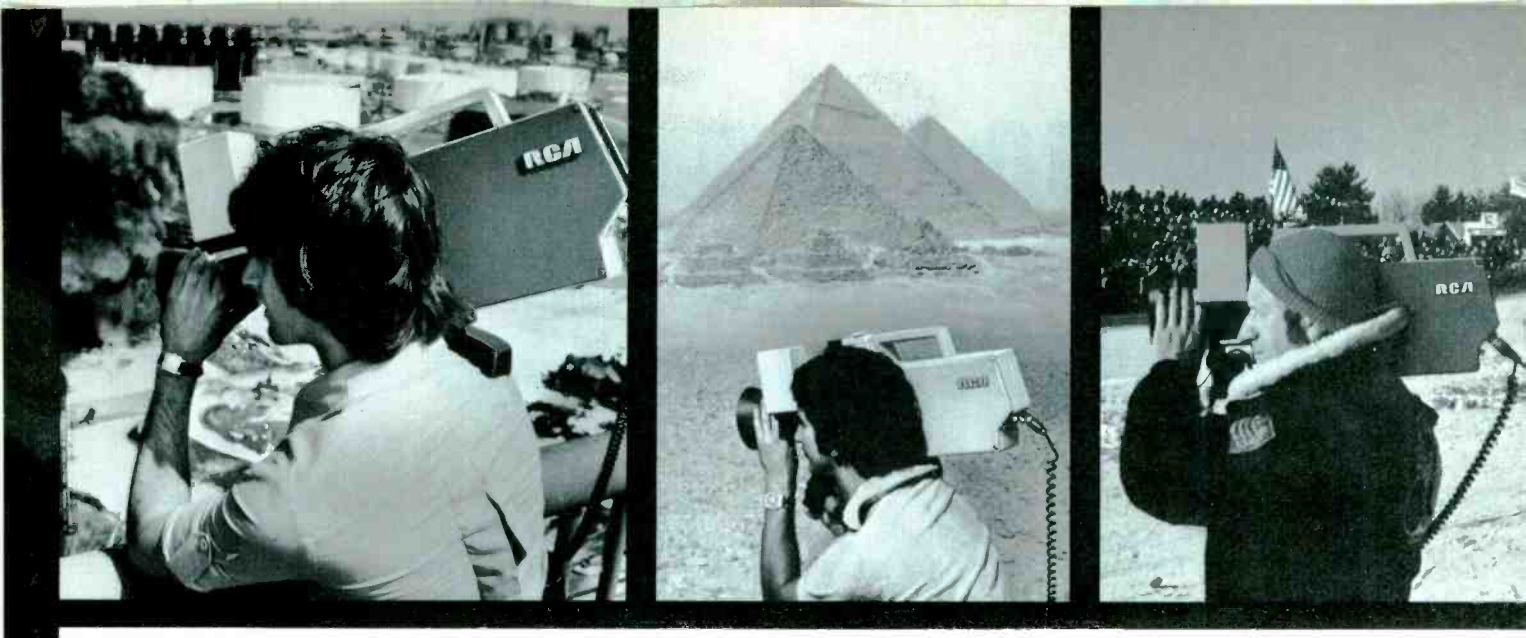

TK-76. Part of the new video freedom.

Going All Out For News: ENG Is Being Used To Dramatically Improve News Coverage

Worried at one time that ENG would create journalistic problems, stations are finding that they are doing a better job of covering the news, a task which is the key to a competitive edge in some markets.

KEN TIVEN, PHILADELPHIA's KYW-TV news director, writes in *The RTNDA Communicator,* "Electronic News Gathering (ENG) compresses time and distance to the absolute of 'Live' everyday for many local stations. But the substitution of tape for film and the addition of live capability are only technological developments. By themselves they do not improve the quality of television journalism."

What is improving local television journalism, however, is an unprecedented combination of farsighted management, good engineering, new technology, and some innovative rethinking about what constitutes responsive local news coverage. Where once the new technology led some television stations to hype their new capabilities, most have settled down now to the point where new capabilities are being systematically applied to legitimate news gathering opportunities.

For one thing, newsmakers have caught on to television's "live" capability and are scheduling press conferences and major announcements later in the day in hopes of being carried live. Judicious news directors, on the other hand, are learning that they do not necessarily have to "go live" with a live report. If the announcement does not measure up to the required news value, that live feed is recorded and edited at the station and placed in perspective. When live capability became a reality, many news directors asked: "What good is it? How much happens during the average half-hour or hour newscast?" The answer is a great deal happens, especially when one considers that the deadline for filmed news might be as much as an hour prior to air and that the time during the program itself is effectively shut off from anything more informative than a phoned-in report with a promise of "film at eleven."

KYW-TV's Instant Eye van being loaded aboard 747 for flight to Europe. Three week assignment overseas was to cover canonization of Bishop Neuman. Satellite was used to file final report.

The new tools of television news, like microwave, portable electronic cameras and recorders, news vans, and efficient video editing equipment, are changing television journalism in a number of ways. Stories that were once considered only suitable to print for in-depth coverage are being treated successfully by television stations using electronic means, stories that might have been considered suitable for only rugged film cameras are now being routinely covered by ENG equipment, enlarged coverage areas dictated by population shifts are only now beginning to get attention, the absence of which has been a sore point to many outlying districts nominally within a station's ADI.

At KYW-TV "Instant Eye" leads to 'better' news

One longtime criticism of television news has been that it only goes after the visually interesting stories in any depth. Critics say that a warehouse fire may be spectacular, but how many people's lives are actually effected by it whereas a state budget crisis affects every state citizen's life but because it is complex and visually dull, such topics are often given short shrift by television journalists. Such criticism is often earned but one of the effects of ENG in the hands of TV journalists has been the ability to apply it to a story in the specialized way a doctor applies a variety of surgical instruments to a complicated operation.

In this particular example Pennsylvania was in the midst of a serious legislative impasse on the Commonwealth's budget. State employees had not been paid for weeks. Threats of strike were growing increasingly shrill. Welfare recipients had gone without many services and many were faced with threats of eviction, food shortages, cut-off of routine medical services and other essentials. The state's political apparatus was deadlocked. The situation was extraordinary and KYW-TV, with its sister Westinghouse station in Pittsburgh, KDKA, decided to take extraordinary measures to report the story.

All in all, the story was dramatic and significant but of the type that would normally be difficult to present comprehensively on television. KYW-TV sent a reporter to

News director Kenneth Tiven (right) discusses script with video producer John Terenzio.

Eye Control: the heart of the ENG newsroom. Microwave controls are on left, patching and test gear in center rack. Two Microtime 2020s, one with Image Plus, are in righthand rack.

Harrisburg, the capitol, and bought telco lines from Harrisburg to Philadelphia. KDKA bought telco lines from Pittsburgh to Philadelphia. Soon the structure for reporting a statewide story was present. The news teams in Philadelphia and Pittsburgh identified and located people in each of those cities who were being seriously affected by the budget crisis: state employees, welfare clients, and local officials. Via a live hook-up between the three cities, citizens, legislators, and the Governor were brought "face-to-face" to voice complaints, explain actions and inactions, and trade accusations and counter-accusations. One particularly dramatic sequence included an exchange between a Philadelphia constituent and her representative in Harrisburg. A taped segment had shown a representative appearing to "footdrag" during a legislative conference through the use of procedural delays. Immediately afterward his constituent complained about his obstructionist role but he denied it and passed the blame on to the Governor who was also on camera live from another section of the Capitol. The resulting exchange was like a gust of fresh air that left the legislator politically naked before the audience. Tiven feels that such an application of new technology to reporting the news, though powerful, does require some careful judgment to avoid becoming more than journalists.

Throughout the budget crisis, live reports incorporating elements from Pittsburgh, Philadelphia, and Harrisburg were carried live by both KDKA and KYW-TV during their newscasts. Switching of feeds was done at KYW-TV. The existence of the live hook-up also was used to do a sports segment when the Phillies and Pirates were scheduled to play. On another occasion, the entire news programs were co-anchored from Harrisburg. The set-up was expensive but the story provided comprehensive treatment of one of the most serious problems confronting Pennsylvania in recent history.

Things such as this, though, are legitimate news gathering opportunities. To take advantage of such opportunities, KYW has built its operation around its "Instant Eye" unit. Instant Eye consists of 3 vans equipped with Microwave Associates transmitting equipment, two with dishes and one with "Goldenrod" antenna. Transmissions have been achieved from distances as great as thirty miles. The camera-to-van link is in the 13GHz range and the van-to-relay point is on the 2GHz band. The relay point uses one antenna for each of four quadrants and is located atop Penn Center in downtown center city Philadelphia. The signal is relayed from there to a receiving antenna on top of the KYW-TV building on Independence Mall. There have been some problems, according to chief engineer Robert Fields, due to overcrowding of the 2 GHz band. (Other stations around the country also report crowding in their local ENG bands.) All of the Philadelphia stations have installed filters in their microwave equipment and this has reduced interference to some degree.

The only other major problem reported by KYW for its Instant Eye operation is a small blind spot from its relay point to the southeast into southern New Jersey. Philadelphia is basically a city of two story buildings so the 35 ft. extender on the van antenna is adequate for almost any location in the city. The city, however, has an interesting local ordinance that forbids the construction of any building higher than the top of William Penn's hat, whose statue adorns the top of city hall. As might be expected, the city fathers have shown no interest in decorating Penn's hatbrim with microwave antennas so to solve some transmission problems, KYW will soon construct another relay point in South Jersey pointed at their current relay antenna. KYW is also discussing the establishment of a permanent South Jersey news bureau. Coverage of news from this area is currently provided by the stationing of an Instant Eye van in the area.

KYW uses five ENG crews equipped with 3 RCA TK-76 cameras and 2 Ikegami HL-37s with an HL-35 for backup. ENG crews are available 18 hours a day. News is gathered in a number of ways. Stories gathered during the day are shuttled back to the station by any one of KYW's 14 reporters for editing on the station's Sony BVU-500 editors. (The station also has a Convergence editing system and one Datatron 7600 used by its Evening MTWTF program.) Another method, which is being used increasingly around the country, involves transmitting stories via microwave back to the station for editing. The third method is, of course, a live feed for immediate broadcast during one of the station's news broadcasts.

At the station an Instant Eye control center has been established which serves to record incoming microwaved

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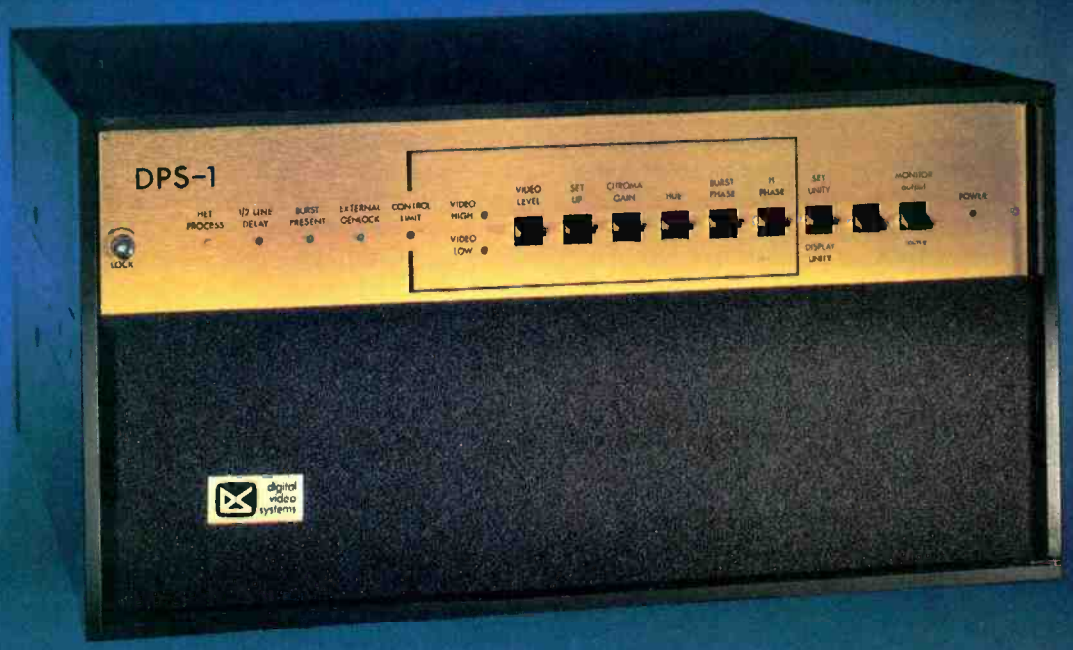

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stories and as an on-air machine room for rolling prerecorded material during the program. KYW believes in delivering a complete package to master control so each piece consists of a fully edited segment, both video and audio. This has completely eliminated the need for awkward A & B rolls involving multiple sources and audio carts. As a result, on-air errors such as missed cues have been virtually eliminated. Another KYW feature consists of what they call "Sony sandwiches." A "Sony sandwich" is essentially a live intro and outro given by a reporter around a prerecorded segment that makes up part of a continuing story which the reporter is still covering on location. Equipment in the Instant Eye control room includes 4 BVU-200 video cassette machines, a push-button ENG assignment switcher for assigning the recorders to one of two Microtime 2020 time base correctors. One of the 2020's is currently equipped with Image X enhancement and the other is scheduled to get Image Plus shortly. Also in the Instant Eye control room are the necessary remote control units for the relay antennas, required monitoring equipment and communications equipment tieing in the room with both the field and master control.

Communications with field reporters while on air are accomplished by the use of small FM receivers which carry program audio. KYW has asked the FCC to approve its use of an SCA to carry interruptible program audio so that the control room can also communicate with the field reporters. Other operational communications are handled by two-way radio.

Despite all the time, energy and money that KYW has invested in Instant Eye, the concept would probably not have worked if management and labor had not reached a reasonable agreement on how to staff and manage Instant Eye. When KYW first launched Instant Eye on the initiative of news director Tiven, the station was still dealing with the classic jurisdictional problems. The film local was worried that its men would lose work, the engineers and techinians were looking at expanded responsibilities, and management was concerned about labor problems experienced at other stations that went all-ENG.

Tiven sat down with the various locals and with other members of the management team and hammered out one of the more reasonable arrangements for operating an all-ENG operation. According to Tiven, "Labor is too frequently blamed for things when management hasn't got its act together." With management's act together, Tiven wound up with a 23 person Instant Eye staff made up of 7 former cameramen, 7 former sound and lighting men, and hired another 6 people. All members of the crews are cross-trained. They all shoot, edit, and perform first echelon maintenance. More complicated maintenance is handled by two engineers assigned to caring for the ENG equipment.

The people are organized into five crews. One crew begins at seven AM and two more are added later in the afternoon. The evening shift is covered by another two crews.

Management of the 14 reporters and crews is handled by a number of assignment editors. The assignment editors function normally in relation to the field crews but between the field crews and the executive producer of the news, a new position, video producer, has been created. The responsibility of the video producer is both technical and journalistic. The current video producer at KYW is Ed Hersh, a Columbia Graduate School of Journalism alumnus, who is a self declared "technical maven." Hersh has been so successful at his current job that he is now moving into more of the producing responsibility and will need to be replaced. Nevertheless, as a video producer, Hersh makes decisions related to the quality and progress of incoming stories. Some may be assigned to editing, others may be judged suitable to air live and others may need more work or redirection. The video producer keeps the executive producer, Cliff Abromats, informed about the status of the various stories and when a news program like KYW's Eyewitness News is frequently 25 to 30 percent live, the need for a video producer is apparent.

The next link in the management chain will be an Instant Eye manager to ride herd on the various equipment employed in the Instant Eye operation. Though performance of the field crews is continuously improving, Tiven notes that about 40 percent of the errors in the field are "errors of assumption," that is, people assuming that things will work without having had the common sense to make sure that they do. A typical example is when a bogus cable gets left in a van and subsequent crews attempt to use the same cable over and over again before removing it for repair. Most such errors can only be corrected with common sense and good management, thus the Instant Eye manager.

WFAA explodes the myth of fragile ENG equipment

A constant worry among managers considering taking their stations down the ENG path has been the reliability of expensive ENG equipment. David Goldberg, chief photographer for WFAA, asks rhetorically, "How much more reliable than absolutely no problems can you get?" WFAA, Dallas, began experimenting with ENG about two years ago. They started with two Sony DXC-1600 cameras and were favorably disposed. They now have eleven Ikegami HL-77s which they have been operating constantly since last May. In that time WFAA photographers have, according to Goldberg, "jumped on board: helicopters, the hood and trunks of cars, the bumper of a fire engine; we went canoeing, skateboarding, motorcycling, and jogging; we took them out with us in the rain, the snow, the blistering Texas sun, and even for a brief dip in the pool."

The foregoing quote is from a script that Goldberg wrote to tell WFAA viewers about the switch to ENG. The quoted section covered actual clips from WFAA news footage shot since the station switched to an all ENG operation. The pool sequence was accomplished by putting the Ikegami in a 35 gallon aquarium which floated a few inches below the water's surface in order to get sub-surface shots of kids in a "Learn to Swim" program.

According to news director, Marty Haag, much of the credit for the smooth operation of WFAA's ENG program belongs to Goldberg. Some two years ago, WFAA realized that sooner or later they would probably make a partial or complete changeover to ENG just to keep up with technology. Goldberg was put in charge of researching equipment and systems since he and his crews would have to be the users. Goldberg visited numerous stations to see how they were doing with ENG operations and examined the products of numerous manufacturers.

Goldberg settled on Ikegami cameras for two major

continued on page 61

ENG microwave: the next generation.

Farinon announces the lightest 20 watts you can buy.

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How many times have you wished for more microwave power in a system you could send almost anywhere?

Farinon's new ENG package is the answer. Now you can upgrade with a complete three-element package from a single supplier:

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- A 20-watt, 2GHz video transmitter, the FV-2MF, that can operate from two 12V batteries.
- A new high-gain, low-noise preamp, the 60576 for the receiver end.

The beauty of the transmitter/amplifier combination is that it lets you take 20 watts almost anywhere. It's not as light as our mini-portable, of course, but then it has twenty times the output. And you could use the new package as a *relay station* for the mini-portable. (The 60515 amplifier requires only one to two watts drive.)

The two units take up only five mounting spaces in a standard ENG rack (that's just 8¾ inches). And because they need only 24 volts, they'll go anywhere you can bring or find two regular 12V batteries. An important point: the combination accepts either negative or positive ground power, making it adaptable to a wider range of vehicular power systems. (Consider the other way to get 20 watts of power: a big remote unit, interconnecting cable, a big RF head, a big motor generator.) You can also use 110VAC if you have it.

The FV-2MF has other advantages. Like our mini-portable, it's frequency-agile. And when you're transmitting a signal through a tricky downtown path challenged by high-rises, you can move the aural subcarrier from the top of the baseband to 4.83 MHz, assuring that your audio will arrive at the other end. It's a remote-controlled function.

With the audio in the normal position, you get the higher-quality video you need for studio transmission.

The 60515 amplifier, despite its high-power output, needs only low drive power. It's a high-quality bipolar device, with gold-to-gold transistor bonding to prevent metal migration and softening over years of use.

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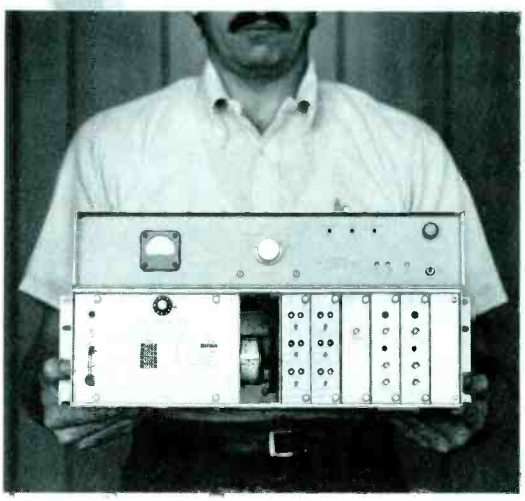

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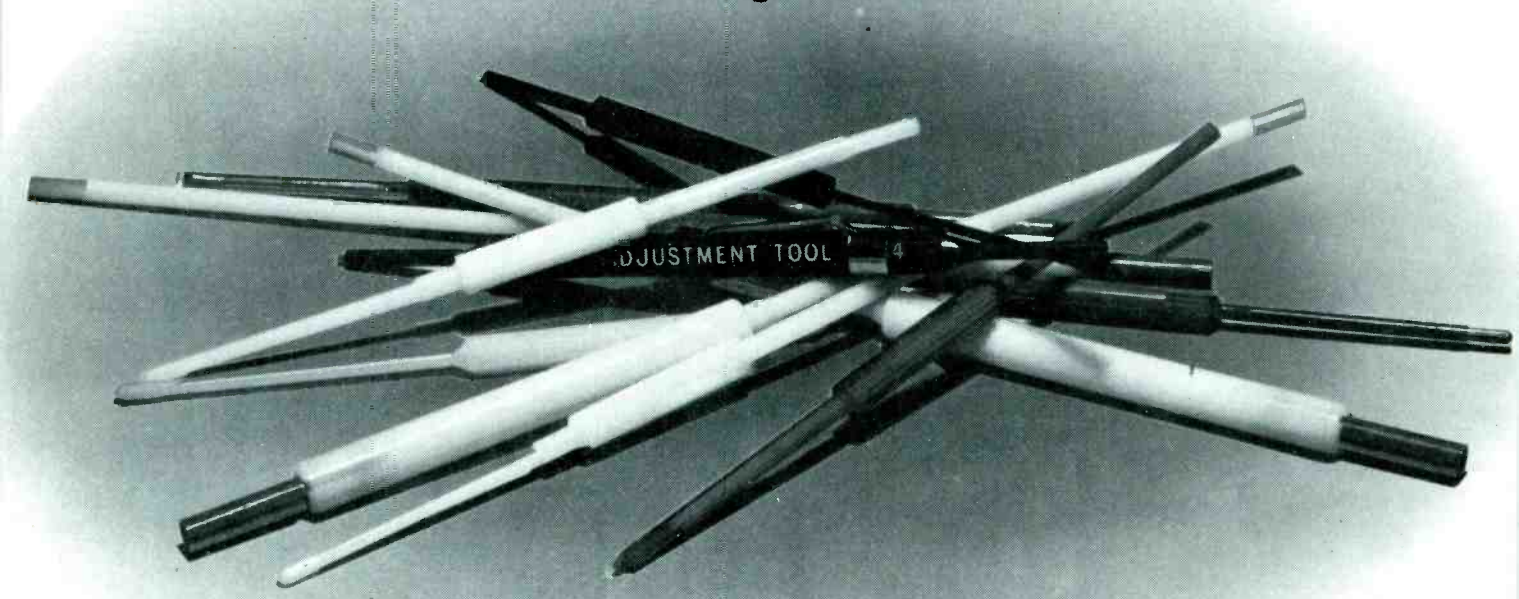

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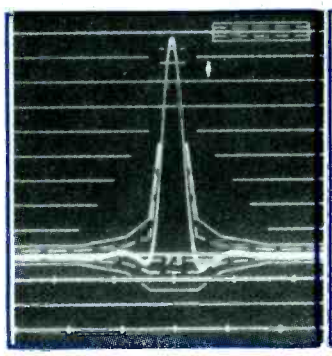

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reasons: first, he felt that their quality was as good as any of the cameras he examined but more importantly, as a photographer, he felt the balance of the HL-77 was superior to others he had tested. Goldberg said, "We decided that there would be no change of attitude towards news gathering. We would go in and get the news with no special accomodation for the equipment."

WFAA has been able to live up to the rigors of news gathering with electronic equipment for a number of reasons, among them, a thorough training program under Goldberg, an emphasis on responsible care of the equipment, and the belief that their personnel can be relied upon. Some stations have been reluctant to permit their cameramen to take home electronic equipment the way film equipment was traditionally taken home. But Marty Haag, news director, points out that "When I first came here, we found that all the equipment was kept here at the station. Photographers would come in on an assignment and find that somebody had canabalized their equipment — battery packs hadn't been charged or a cable was missing. So I figured, what the hell. If you give the guy enough responsibility to send him out of town on a major breaking news story, he knows how to handle himself and he is adult enough to handle the equipment."

Haag states that WFAA is saving money though financial considerations have never figured into editorial decisions. "Where we had budgeted $12,000 a month for film stock and processing," said Haag, "we are now budgeting about $1000 a month for videotape replacement." By the time the equipment costs are amortized over "six or seven years," Haag continued, "we began to see that the switch would also be a good fiscal decision."

The switch to ENG has caused some changes in the WFAA news broadcast. Haag said that "it has changed the broadcast in some subtle ways and some dramatic ways." Since Goldberg insisted that news tape would be edited in the same style that was used for film, there has been no major change in the way a particular piece is

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New Device Helps Troubleshoot ENG Equipment

By Steven A. Smith, dir. of Television Engineering, Meredith Broadcasting

In KCMO's new plant, a new device, the Studio Tape Exchange Drop Out Monitor (DOM) will play an important quality control role in the ENG operation. The unit has been under test for the last several months with a quad machine and has provided vital information about the VTR system with which it works. Applied to the ENG operation, it will allow 100% checking of our field equipment, tapes and editing playback units.

Basically the DOM is connected to the Drop Out Compensator and servo system of a VTR. It monitors instantaneous rate of RF signal loss, overall totals of RF signal loss and loss of servo-lock. (There is an option which allows it to monitor the RF output from the tape head directly to allow its use with older systems which may not have drop out compensators.) The results are available by means of numeric displays, printouts or specific signals to external equipment.

The DOM is available at a low enough cost to allow us to provide one for each playback 2850 or BVU. As each tape is played, the different counts and signals will provide information regarding each microsecond of performance. By analyzing the data we will be able to pinpoint whether the fault is in the tape quality or whether there has been tape stretching due to the editing stop-starts. We will be able to track back through our records to isolate field recorders which are creating problems.

Most importantly, we will be protected against damaging a valuable taped sequence during editing since we will have instant warning of dirt pickup at the playback unit head.

The DOM is available in formats suitable for a number of applications ranging fromt he simplest use in a hotel/motel pay TV movie installation to operations monitoring quad cart machines. We will use a model which allows monitoring and printouts including the SMPTE time code on the tape being played. The printer is optional and can be plugged into the appropriate DOM when required for creating a detailed historic record.

The displays on the DOM as observed by the operator or the printout when checked later by maintainence serve to reveal a number of possibilities. For example:

A. An increase in overall dropout count associated with the playback unit and independent of the tapes will point to the necessities for preventive maintenance on that machine.

B. Exessive loss of servo lock without build-up of dropouts counts (the DOM can be set to ignore dropouts while lock is lost) may point to tape stress.

C. Occurance of burst of dropout count can indicate bad spots on the tape, or a growing dropout count for the tape may be noted, which calls for the tape to be evaluated or retired to less critical duties.

D. Built-up of dropout count during still frame operation warns that the limit for that section of tape is being approached.

E. The excessive instantaneous rate of dropout alarm (the DOM) continuously checks for permissable dropout accumulation every ¼ of a second and sounds an alarm so long as the limit is exceeded, points to possible dirt pickup and resulting tape damage. The operator can take immediate action to protect the original field tape.

We expect to see a number of other quality control advantages because the DOM units are on line full time using the simplest of record keeping. The data provided by these units will allow us to analyze and stay ahead of problems as the ENG programming load increases.

New dropout monitor (DOM) being used at KCMO.

handled. The TRI EA-3 editing systems used at WFAA have been adopted comfortably by the station's personnel (reporters, cameramen, field producers, and editors all perform editing work). Visually, Haag and Goldberg feel that the look is cleaner and both claim that the low light level they can now work under is superior to the light levels they were able to use effectively with film.

WFAA, like KYW, believes in delivering a complete "package" for each news piece. When film was still the mainstay of the WFAA news broadcast, "simul-rolls" were frequently used. The director, who punches his own show, would call for an "A roll," a "B roll," a cart roll and audio fades for original sound which led to a high state of excitement in the control room. Added to this, the station was using Mylar splices which were getting jammed in the claw transport of the station's telecine. Now nearly 90 percent of the material is fully edited and audio mixed prior to air time. The ¾ inch cassettes are then dubbed up to ACR-25 carts and rolled from the Ampex automation.

According to Haag, "These are subtle changes. The use of carts alone has added ten years to the lives of about three or four people around here . . . sometimes, now, the director is even able to stand up and have a cigarette during the broadcast."

The dramatic changes, according to Haag, are associated with their new "Minicam" van. The live segments are, of course, something that simply weren't available before. But in addition to live feeds, the van is also used to beam in stories for editing at the station. The van has also permitted the station to gather news closer to air time. With the verdict due any minute in a recent Amarillo, Texas murder trial, Haag chartered a Lear jet to fly the taped footage to Dallas' Love Field the moment the verdict was in. The Minicam van was positioned at the airport and in communication with the station. The plane landed and the taped material was immediately transmitted to the station, just making the top of the 6 o'clock broadcast. "I don't think we could have made it any other way," said Haag.

The van is designed to handle complex multiple camera assignments as well as routine news tasks. It is a Ford

Eight of the Ikegami HL-77s in use at WFAA.

The WFAA Minicam Live van. Van is used both for live remotes and beaming back pre-recorded stories.

E-350 with additional payload capacity to accommodate the extra weight of the on-board Onan generator and extra batteries required for electrical service. Outside power outlets provide up to 25 amps of lighting power when the generator is operating. The microwave antenna mounted on the roof can be controlled from a panel on the inside. A speaker is mounted at the rear of the dish antenna to provide program audio when trying to establish a path to the downtown receiving point. The van also is able to tap either a standard 120 volt AC service on location or a 240 volt service, if available. Patch connector panels for power, video and audio are also mounted on the exterior.

The interior of the van is fully carpeted for insulation and sound proofing. A swivel type captain's chair is positioned at the control point to permit easy movement by the control operator. The Microwave Associates microwave equipment is diplexed so that cueing and other studio communications can be accommodated. The van also includes an Ampex VCR for recording and playback.

The station's other "news cruisers" frequently rendezvous with the van to transmit stories they have recorded back to home base. Eventually these cruisers will be equipped with portable microwave equipment.

Signals are received at WFAA by a Nurad antenna located at the top of the Southland Life Center in downtown Dallas. Antenna selection and routing is handled at the station's Transmission Center. The incoming signal is processed and switched into a Micro Consultants DFS 3001 frame synchronizer with joystick positioner. The frame synchronizer was chosen in order to avoid chancy gen-lock switches, a circumstance that has also prompted KYW-TV to order a frame synchronizer.

One of the most important parts of the WFAA Live operation is the EDR (ENG Decision Room). In this room, incoming signals are previewed and decisions to "break-in," go live, or route to one of the station's five editing rooms are made. The EDR is also equipped with an intercom system that permits the ordering of in-house material to be placed on other machines throughout the plant. These internal sources are then routed to the proper location for inclusion in edited tapes.

One of the fringe benefits derived from ENG is the solution to the problem of file footage. Each day's news broadcast, of which there are three, is recorded off-air onto a ¾ inch cassette and filed by date. This has made the relocating of file footage easy and economical.

Dallas is one of the many so-called "hyphenated markets," Dallas-Ft. Worth. Ft. Worth is currently covered

continued on page 67

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Video Cassette System.

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by a WFAA news bureau that consists of reporters and an ENG crew. Stories done by the Ft. Worth bureau are routinely picked up by a courier at 2:30 PM and run the 30 miles into Dallas via the turnpike. Obviously, this system creates certain time restrictions for Ft. Worth coverage. Soon Ft. Worth will get its own microwave installation and WFAA will be able to go live from that city as well as being able to beam completed stories to WFAA during other parts of the day.

Steerable microwave makes news bureau concept possible

A great deal has changed in the audience make-up for many stations since they went on the air. Demographics have changed, populations have shifted, and, fortunately, technology has developed. San Francisco, according to KRON-TV news director Mitch Farris, is one of those cities whose population has undergone enormous shifts since the post-war years. A recent study of the five counties in the San Francisco ADI was conducted to determine why the HUT (Households Utilizing Television) was unusually low in this ADI. One of the reasons cited was that viewers felt that San Francisco stations were unresponsive to the localities in which they reside. Said Farris, "This is a most unusual market in that whereas most people identify it as San Francisco, the fact of the matter is that, in terms of population, the two largest counties are Santa Clara County, with large cities like San Jose, and Alemeda County, with cities like Oakland." Both of these counties are much larger in population that the next largest counties, San Francisco and San Mateo, which are of comparable size. The fifth county in the ADI is Contra Costa, which, though slightly smaller than San Francisco County, is closing in on San Francisco since it is growing while San Francisco's population is declining.

Not only is the population of the ADI shifting to surrounding counties but industry is also moving. So, not only do the people reside outside of San Francisco, most also work outside the city. Farris points out that as a result of these trends, many of the ADI's viewers never even come to San Francisco.

KRON, which has been last in news ratings, has now decided that one way to solve this problem is to change the geographical focus of their news program. To accomplish this, KRON has established permanent news bureaus in Alemeda, San Mateo, Contra Costa, and Santa Clara counties. These bureaus will be staffed by reporters, engineers and technicians. Each bureau will be equipped with a full compliment of ENG equipment including microwave equipped vans. Microwave relay sites have already been identified and eventually these will have steerable microwave dishes to retransmit live reports and other news material to the KRON station for inclusion in the news broadcast. When completed, said Mitch Farris, "We will have the largest news coverage area in the country."

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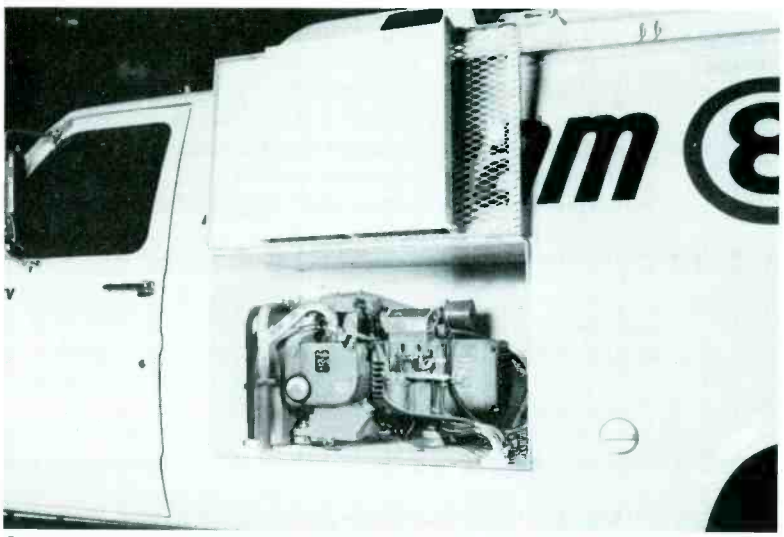
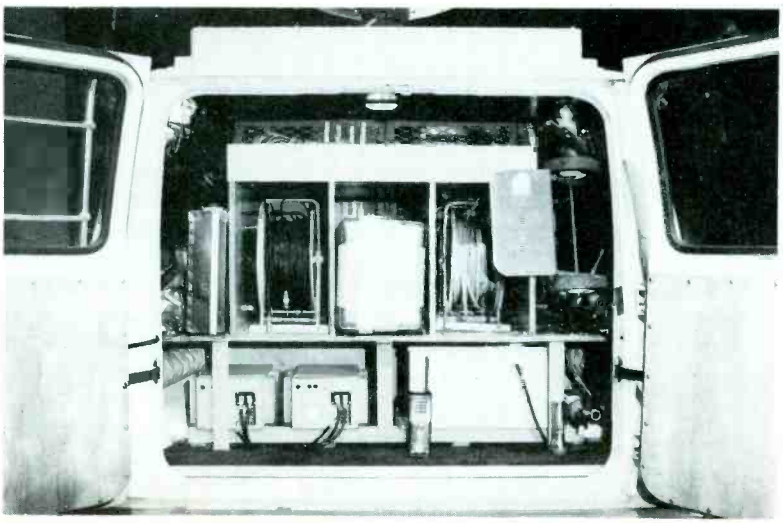
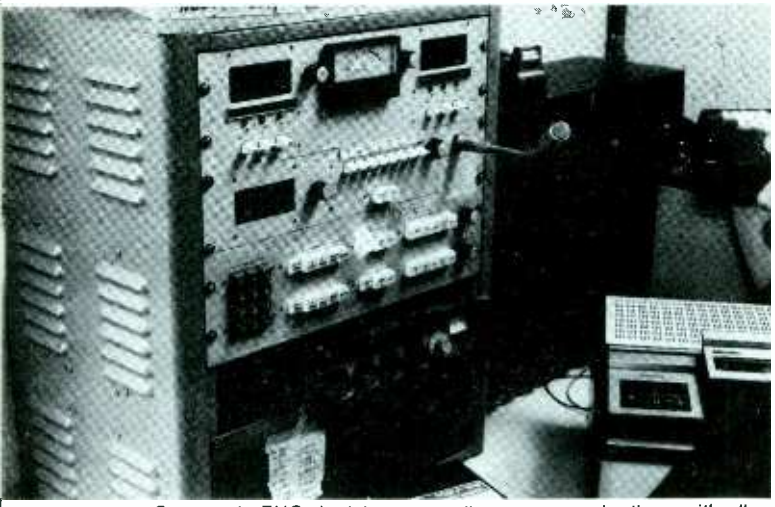


Onan generator provides auxiliary power for van's equipment. External AC power is used when available.

Swivel type captain's chair provides easy reach to all control equipment.



Easy access is provided to field equipment through rear doors. Van was designed at the station.



Console in ENG decision room allows communications with all areas of WFAA operation through intercom system. Any in-house source can be routed to station's editors.

WFAA uses TRI-EA3 editing system. Plans call for additional editing stations.

Presently, the Santa Clara bureau based in San Jose is the most fully developed of the bureaus. Already a Santa Clara report, anchored live at the bureau's small "newsroom set," is a regular part of the KRON newscast. The bureau is staffed by five people, a reporter, an anchorman, two photographers, and one engineer. The van consists of a microwave transmitter and antenna, and the recording is accomplished with an RCA TK-76 and Sony BVU cassette machines.

The unique element in this setup is the presence of a steerable microwave antenna on Mt. Sutro which is capable of panning to nearly any transmitting point in Santa Clara county. The panning of the dish is controlled from KRON in San Francisco. The dish itself is designed by Taburn Electronics of San Diego and is a Cosigan square type antenna which generates a pattern such that the need for tilting maneuvers is eliminated. With the Mt. Sutro installation, KRON can now reach as far as San Jose. A second steerable dish is soon to be installed at Mt. Loyola Parreta which will serve areas as far south as Monterey and a third will be installed on Mt. Diablo which will permit the station to reach as far north as Sacramento on a routine basis.

When Mitch Farris first proposed his bureau concept, KRON's chief engineer Larry Posey was confronted by a number of problems. First, local microwave bands for ENG were crowded and increasing gain at the transmitters was impractical. "We talked to a number of manufacturers," said Posey, "and finally we had to go back to the old microwave dish theory that the gain of the receiving antenna could be increased. Once we determined that we could get decent antenna gain, the next thing was to use steerable dishes."

Once the additional antennas are installed, they will relay signals from their respective areas to Mt. Sutro. There standard Nurad horn type antennas will relay the signals to KRON. Two Nurad horns are already mounted on the Sutro Tower and one of them is diplexed so that KRON will be able to go live with any one or all three of the microwave signals simultaneously. At the station, a microwave control center is being developed. Currently the center handles one feed at a time and routes it either to the production switcher for air or to one of KRON's three Datatron 76 controlled editing positions. One of the three Datatron editing positions is equipped with a CMX mix amp and associated keyer so that editing can be done with A & B rolls and programmed dissolves.

Material microwaved in for editing is time coded at KRON before .outing to one of the Sony BVU-200 recorders for editing. Scripts with editing cues are prepared at the bureaus on telecopiers and transmitted to the station. Cues are still content related but KRON is planning on adding an aural subcarrier to the microwave channel to carry time code generated in the field. When that happens, edit cues will be given according to time code.

KRON has on order a Grass Valley switcher with an NEC frame synchronizer. When this equipment is installed all three (and possibly four) microwave feeds will be available to the production switcher. This will be an important part of making the "regional newscast" work. In addition to the nightly reports from Santa Clara County, KRON is already relying heavily on live and microwaved stories for its news. A content analysis of the station's stories over the last few months showed that two-thirds of its items were already being generated from outside San Francisco. On one recent broadcast, seven live segments were used in the one program.

Though the success of this "regional news" concept will take some time to develop, early indications are that audience reaction is very positive. On one live segment recently broadcast from Oakland, the television station's telephones rang constantly with calls from viewers for hours after the segment. During recent rain storms, KRON was able to give regional reports of damage and conditions from several locations and was able to trace traffic problems caused by a strike of the bus line serving Santa Clara County. Said Mitch Farris, "The technology that we are employing now has allowed us to go much further in covering the news than any other station. If this works, it is a giant leap forward for broadcast news."

The problems once forecast for ENG have not materialized. The live capability which was thought by many to run the risk of manipulation and gratuitous use, has instead become a powerful tool in the hands of journalists and engineers. Much of what is being covered today by ENG was always newsworthy but restrictive technology often did not permit timely coverage of these stories. So if news has changed, it's been a change for the better. **BM/E**

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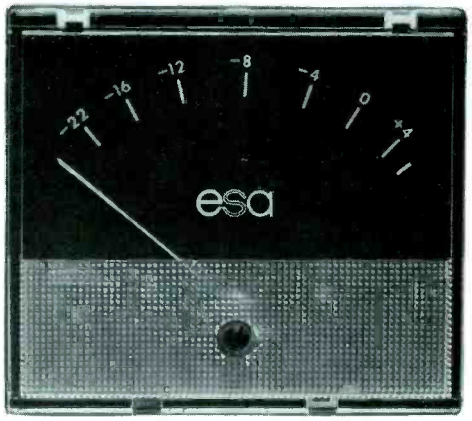

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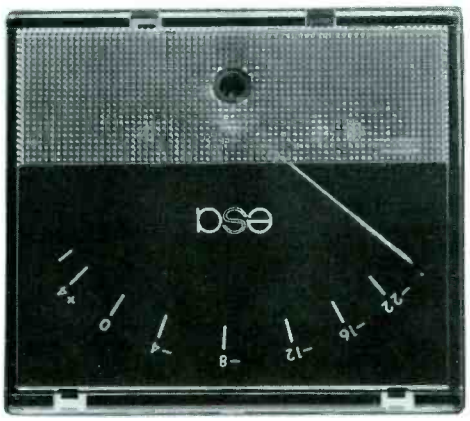

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Equipment Replacement— The Financial Considerations

By David E. Schutz

As the business of broadcasting becomes more complex and sophisticated everyone involved needs to know more about the world of finance. Below are some concise guidelines on how to justify capital expenditures for technical improvement of your facilities.

THE REPLACEMENT OF TECHNICAL equipment and related capital budgeting matters are some of the most important operating decisions made by any station. The chief engineer normally must shoulder the responsibility for justifying to management why a specific piece of equipment should be replaced and/or the benefits that will arise from the addition of a new item. There often is difficulty in quantifying many of the factors that are present in any equipment replacement decision. Thus there is a strong temptation to simply provide a long list of alternative projects along with their associated costs and allow management to select those projects which it can "afford" during the coming year. Any engineer that falls victim to using this technique does both his station and himself a disservice and may further widen the schism that often exists between management and engineering.

The engineering department has a unique and valuable store of information that, when properly applied, can greatly aid the station's overall capital budgeting strategy and hence its overall operations. This article will provide an overview of some of the fundamental financial considerations that should be made when examining any capital budgeting decision.

Before proceeding further it is important to isolate and identify the prime operating objective of any broadcast station. If the facility is commercial the objective is to maximize its profitability, subject to meeting its obligations to the public and its employees. If the station is noncommercial, maximization of operating efficiency is most important. The concepts of profitability and efficiency as they apply to both types of stations are closely interrelated. We exist in a world with finite resources, time, money, and materials are but a few of these. The commercial station that provides a given level of programming and public service in the most efficient manner possible will maximize its profitability. In a similar fashion the noncommercial station can provide expanded services on a fixed budget if it improves its operating efficiency.

David E. Schutz is an independent management consultant specializing in the economic and marketing aspects of the broadcast industry.

What are the factors that should be considered when making capital budgeting decisions?

There are three basic types of information that are required when making any type of capital budgeting decision. To illustrate, it will be assumed that a station is considering a major modernization of its transmitting plant that will cost $300,000. Other pertinent data concerning this example is contained in Fig. A.

Initial Expenditure—This is the immediate cash cost of the new equipment for the project to be undertaken. When compiling this figure it is important that the costs of labor for insallation be realistically estimated. Many engineers neglect this point, they rationalize that the station's regular technical staff can perform the installation as part of their regular work. While this may be true for small projects it rarely is the case for larger ones. If a technician is diverted from maintenance for any length of time the reliability and useful life of the equipment that he would otherwise be servicing will decrease. This results in a hidden cost to the station, but a cost just the same.

In many instances the old equipment that is being retired can be sold on the used equipment market rather than simply being junked. If resale is possible *do not* deduct the proceeds from the sale of the old equipment from the cost of the new item(s) until you have checked

continued on page 73

Don't settle for ENG-Only!

LDK-11 is an ENG and EFP Camera.

It's the unique Philips camera that started everyone thinking ENG *and* Field Production. The one camera that does *both* without compromising quality or operational features. One of the many innovations that has earned Philips its reputation as "the INNOVISION company."*

With *exclusive* Philips design and performance, the LDK-11 outperforms those "mini" and "micro" ENG-Only cameras. It is lightweight, battery or AC powered, totally portable and easy-to-operate for ENG; with full production control either remotely or at the backpack. Yet the LDK-11 incorporates the Philips picture-determining features that go *into our most advanced studio cameras.*

Plus...the LDK-11 includes many additional unique features for difficult field production and ENG applications. Here are just a few:

- Outstanding low-light performance; 6 to 12 dB additional gain to match specific requirements down to 8 ft. candles.
- Bias-lit Plumbicon™ tubes for lowest lag.
- Lowest Delta T permits high ambient temperature operation.
- Ultra stable gamma circuitry for true color rendition down to black.
- Switchable gamma to .35 provides contrast compression.
- Production gen-lock capability up to *3000 feet.*
- New ⅔" Plumbicon tubes with studio camera resolution.
- Up to 300' of ½" cable between camera head and backpack.
- Carry head only. Ideal operator's weight (14 lbs. with 10:1 lens).
- Change head-to-backpack cable length without adjusting registration or set up.
- True broadcast quality (27 MHz) 2-line contours with coring and combing for maximum sharpness and minimum noise.
- Magnetic shielding as in studio cameras.
- Optional 5" viewfinder.

The broad application of the LDK-11 in studios, documentaries, sports, local spots *and* ENG confirms that broadcasters need—and want—more than just an ENG camera. Prove it for yourself. For more information or a demonstration of the LDK-11 call your local Philips representative or contact Philips Broadcast Equipment Corp., 91 McKee Drive, Mahwah, N.J. 07430 (201) 529-3800.

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Circle 143 on Reader Service Card for a demonstration

America is ready for CP-TV Antennas!

The FCC has authorized the use of circularly polarized antennas for television!

Jampro is ready to supply you with an already patented CP production line of TV antennas made for *any specific channel!* The Jampro time-tested spiral antenna is mechanically symmetrical. Its comparatively modest windloading permits replacement of existing top mounted antennas without tower changes in many cases.

Antenna power gains vary from 1.2 to 4.8 for lowband VHF, and 4 to 10 for highband VHF, with safe power inputs of up to 100kW. Gains of 16 and 24 are offered for any UHF channel, with 10kW inputs.

The advantages of signal penetration and ghost reduction with CP Antennas are measurable. So why not improve your station's signal with the latest innovation in TV antennas? Write to us for a complete proposal, stating your desired ERP, and available transmitter power.

The first CP omnidirectional TV broadcast antenna in the world - - - created by Jampro - - - was installed in May 1975 under FCC authority at KLOC-TV Channel 19, Modesto, California.

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Fig. A

Expenses and benefits for proposed new transmitter

Initial cost of new transmitter:	$300,000
Less: Salvage value of old equipment: (after consideration of taxes)	$ 10,000
Investment Tax Credit (10%[1]):	$ 30,000
Immediate Cash Outlay For Project	$260,000
Annual Operating Expense Savings and Value of Increased Operating Capabilities	
Reduction in labor costs:	$ 45,000
Reduction in maintenance & electricity:	$ 7,000
Value of increased operating capabilities: (ie, reduction in outages, etc.)	$13,000
Total Annual Savings and Benefits:	65,000

[1]It is assumed that station has sufficient income to fully utilize the potential tax credit.

with the station's accountant. If the depreciated value of the old equipment is substantially less than is salvage value the station will be liable for additional income taxes because of the "profit" that will arise from the transaction. If you encounter this type of situation deduct only the "net" or "after tax" benefit of the sale from the cost of the new equipment. This figure will vary depending on the station's unique tax posture and can be obtained from the accountant.

Future savings and increased operating capabilities—The motivation for purchasing any piece of equipment normally is twofold. First, new equipment is generally more efficient and therefore less costly to operate than the items it replaces. Second, the new component may provide operating capabilities that were not previously available. Referring to the example of the transmitter replacement in Fig. A, one of the largest savings will result from the introduction of remote control operation and the subsequent reduction in labor costs. Other savings will result from reduced maintenance requirements and electrical consumption. Estimates of these are also included in the figure.

The process for determining the amount of operating savings resulting from new equipment is relatively straight forward when compared with valuing increased reliability and capabilities. To illustrate, suppose you are currently losing three hours of broadcast time per year due to avoidable transmitter outages, what is the value of this time? This is not an easy question to answer, but as a starting point try using a figure that is twice your station's hourly program rate. This will make some allowance for negative audience reactions that extend beyond the value of the missed commercials. Stations in more competitive markets might choose a higher multiple to reflect the increased difficulty they face in regaining the confidence of their audience. In respect to enhanced technical quality you must attempt to make a realistic evaluation of the improvement in your station's performance versus the competition. A slight reduction in your transmitter's noise level will likely go unnoticed while the increased operating flexibility available through the use of Electronic News Gathering could have a substantial effect on the ratings of your news programs. When program quality can be enhanced management will likely obtain estimates of the improvement directly from the sales and programming departments.

Tax considerations—Taxes and the various rules concerning them are an ever present factor for commercial businesses. One positive result of a capital expenditure for new equipment is the Investment Tax Credit that applies to Federal income taxes. At the present time the investment tax credit is equal to 10% of the investment made in new equipment or facilities[1]. It is important to realize that, unlike a tax deduction, a tax credit results in a corresponding reduction of a station's tax liability. In the example of the transmitter costing $300,000 there would be an immediate $30,000 reduction in tax obligations. This is not an insignificant amount. If a station is already in the 48% marginal tax bracket, which is the case for all incorporated businesses making more than $25,000, this is the equivalent of $57,692 in gross income.[2] The tax credit should be deducted from the initial cost of the project since it produces an immediate cash savings.

Fig. B

Present value discount factors

	Discount Factors				
Year	8%	10%	12%	14%	16%
1	.926	.909	.893	.877	.862
2	.857	.826	.797	.769	.743
3	.794	.751	.712	.675	.641
4	.735	.683	.636	.592	.552
5	.681	.621	.567	.519	.476
6	.630	.564	.507	.456	.410
7	.583	.513	.452	.400	.354
8	.540	.467	.404	.351	.305
9	.500	.424	.361	.308	.263
10	.463	.386	.322	.270	.227
11	.429	.350	.287	.237	.195
12	.397	.319	.257	.208	.168
13	.368	.290	.229	.182	.145
14	.340	.263	.205	.160	.125
15	.315	.239	.183	.140	.108

Analysis of data

After you have collected the data already discussed you can proceed to analyze the overall capital investment project. One of the simplest and most commonly used methods is to determine the simple payback period for the project. To accomplish this the cash expenditure for the project (after deduction of the net value of any old equipment sold and the investment tax credit) is divided by the annual savings and benefits expected to result from it. The quotient, which is expressed in years, shows how long it will take to recover the cost of the project. Unfortunately, while this is a simple method for evaluating projects it fails to note the "time value of money". A cornerstone of financial theory states that "a dollar received today is worth more than one received tomorrow". Referring to the example of the new transmitter, the simple payback period equals $260.000/$65,000 = 4 years. However,

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[1]The tax credit can be used to offset tax obligations up to $25,000. Beyond this amount it can be used to offset up to 50% of the tax liability.
[2]The formula for determining the gross income equivalent of a tax credit is: Tax Credit x [1/1 − Tax Rate].

suppose that the $260,000 that would have been invested in the transmitter were placed in a savings account earning 5% interest per year. At the end of the four year payback period the value of the account would have risen to $316,160. Applying the payback formula to this amount the payback period has increased to five years, an increase of 25%!

Fig. C

Application of discount factors to future benefits[1]

Year	Annual Savings & Benefits	Discount Factor (8%)	Present Value
1	$65,000	.926	$60,190
2	"	.857	55,705
3	"	.794	51,610
4	"	.735	47,775
5	"	.681	44,265
6	"	.630	40,950
7	"	.583	37,895
8	"	.540	35,100
9	"	.500	32,500
10	"	.463	30,095
Total	$650,000		$436,085

[1]Hypothetical transmitter replacement referred to in Fig. A. The new unit is expected to provide savings & benefits beyond the current transmitter for a period of 10 years.

In order to adjust for the time value of money future savings must be discounted to determine their present value. In essence this answers the question of how much would the station have to invest today to have a given sum of money in the future, where there is a known interest rate and time period. Selection of an appropriate discount rate is a complicated process on which several books have been written. However, a good starting point can be found by using the return available on high grade commercial bonds. At the present time this averages 8%. Fig. B lists the discount factors for various interest rates and time periods. Other rates can be found in most accounting manuals. Utilizing the data in the figure, each year's future operating benefits are multiplied by the appropriate discount factor. Fig. C shows how this is done with the hypothetical transmitter replacement. The products obtained from the multiplications are then totaled for the period that corresponds to the estimated useful life of the equipment. This sum can then be used to calculate a time adjusted payback period for the capital investment. It you have some uncertainty as to the size and duration of the future benefits of a project, increase the discount factor. It is not uncommon to find stations that use an 18% discount factor for evaluating risky capital investments.

Closing thoughts

An understanding of the fundamental concepts and inputs required for evaluating capital budgeting decisions provides both the engineer and station management with a common approach for objectively considering the alternatives available to them. Thus the accuracy of the decision making process is improved. In such an environment the station's overall operations can only be improved!**BM/E**

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NEC is the *only* manufacturer of ENG cameras to use large scale integrated (LSI) circuits, dramatically reducing the number of individual circuit components in the camera. As a result, the MNC-71/CP is significantly more stable in performance, as well as 7 to 14 times (!) more reliable in circuit operation.

With the introduction of this remarkable new ENG camera, Cinema Products and NEC provide the perfect combination for the electronic side of a *balanced* TV-news operation.

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As our track record with the CP-16 shows, no one understands better than we do how vital it is for the TV-news cameraman to have a reliable camera to work with.

Remember, you can't go "live" with a *dead* ENG camera! So, make the most of your ENG dollar with the MNC-71/CP, the *reliable* ENG camera with *reliable* CP backup!

Cinema Products is the exclusive distributor of the MNC-71/CP throughout North America. For further information, please write to:

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Why you should continue Plumbicon® TV tubes in

The future for ENG grows brighter and more exciting with each passing day. The same can be said about the ⅔-inch Plumbicon, the TV camera tube that made Electronic News Gathering possible and practical at the same time.

Reflecting our continuing commitment to provide the broadcast community with state-of-the-art Plumbicon tubes—(it was a Plumbicon tube that revolutionized color TV broadcasting in 1964)—we invested almost four million dollars in the development of the ⅔-inch Plumbicon tube, most of it before the first ENG cameras were even introduced. Very early in the game, we felt that electronic journalism, with the support of modern tube and camera technology could surely add a new dimension to television broadcasting.

Even with that confidence, the phenomenal acceptance of Plumbicon-equipped portable cameras nearly overwhelmed us, as it did everyone else. In just 18 months we have supplied almost 4000 of these tubes to U.S. broadcasters!

In a market of such magnitude, it was not unexpected that other ⅔-inch camera tubes would arrive on the scene, sooner or later, with the usual "ours is better than theirs" claims. We feel that much conflicting and contradictory information has been given to the broadcast industry, regarding these new tubes. In the final analysis, only you, the broadcaster, can judge the *system performance* of these tubes and compare their performance *in the camera* with the Plumbicon tube.

In the meantime, we offer some of our own experience on the system performance of the Plumbicon tube compared to the Saticon (Registered trademark NHK/Japanese Broadcasting Corporation), one of these recently arrived new products.

Sensitivity Sensitivity is the critical parameter in ENG. In the field, where you have no control over lighting, you need the Plumbicon tube's greater sensitivity to maintain an acceptable signal-to-noise ratio in your final edited news story. Even in those next-to-impossible lighting situations, you are more assured of producing a useable picture with a Plumbicon-equipped ENG camera than with the same camera equipped with the Saticon.

Resolution Your final, edited tape is the criterion by which you must evaluate ENG system performance, and your pick-up tube should always be selected with that fact in mind.

Resolution specifications are a good example of this principle. Plumbicon tube sensitivity gives you enough latitude for aperture correction with very little loss in S/N ratio, to achieve the required 100% modulation depth at 5 MHz, but the resolution of most ENG *systems* is limited by the video tape equipment used. From the systems performance point of view, therefore, a pick-up tube chosen solely for its resolution specifications may have no positive effect at all on picture quality!

Lag The Plumbicon tube has lag characteristics that are so favorable that it can be used entirely without bias light. If your camera provides bias light, it simply improves the Plumbicon's lag characteristics. The Saticon *must* use bias light or its pictures will be seriously degraded. In the middle of a news event, should a bias light lamp burn out . . . . . !

to specify ⅔-inch your ENG cameras.

Temperature Stability

Since the Plumbicon's photoconductive layer is processed at temperatures in excess of 175°F, your Plumbicon tube can tolerate temperature excursions that may take the photoconductor to 160°F. The Plumbicon tube tolerates 160°F ambient without damage of any kind. The Saticon, however, will experience partial or complete layer destruction at these temperature levels after a few hours. It is totally conceivable that your ENG camera will experience temperatures which will cause the Saticon tube in your camera to approach a critical life condition.

Life

Based upon actual operating experience with the Plumbicon, rather than on statistics of accelerated life testing, you can expect from 2 to 5 years of service, depending upon operating practice.

Burn-in

The Plumbicon exhibits no, or very little perceptible picture sticking (burn-in) especially in highlights. The Saticon, on the other hand, has been observed to have a noticeable characteristic of "hanging-up" on bright highlights and also tends to exhibit picture sticking after a camera has been focussed on a scene for any length of time.

Registration

The Plumbicon tube incorporates a precision gun assembly for controlled geometry and registration. Our final testing includes a computerized registration check which matches each tube's performance with a data base which includes readings on previously tested tubes. Should any tube fail to match up to this data base, it is rejected. This is added insurance that your camera will maintain precise registration even after you replace your original Plumbicon tubes. Needless to say, you *do not* have to replace the Plumbicon tubes in "sets."

Storage

The Plumbicon can, of course, be stored for many months without deterioration. But why store TV camera tubes? Storage means money. Amperex service to the broadcast industry is justly famous. Delivery of replacement tubes anywhere in the USA within 24 hours is routine. In extreme emergency situations, we have shipped tubes clear across the country in as little as eight hours.

We expect you to make your own comparisons and we are sure your findings will agree with ours. One of the things that may not be apparent from your comparisons is the fact that Plumbicon TV camera tubes continue to stay abreast of the needs of the broadcast industry after more than ten years of production which has put almost 150,000 Plumbicon tubes into broadcast stations around the world.

When you specify Plumbicon tubes in your ENG cameras, we deliver a lot of experience.

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Network Solving With The Programmable Calculator

By George W. Ing

L, T, and Pi networks can be solved quickly, saving wear and tear on the engineer's nerves.

THE FIRST ARTICLE IN THIS SERIES dealt with using a modestly priced, pocket size Texas Instruments SR-56 programmable calculator to solve simple broadcast engineering problems where repetitious calculations are involved.

Now we will undertake more complex calculations for the purpose of designing L, T and Pi networks. A multielement directional antenna system, with different day and night patterns, may use a score or more of such networks, especially the T variety. Often, revised calculations must be done in the field.

Since the calculator instruction book gives detailed instructions on how to program, we will touch only briefly on the method. The illustrations for this article are taken from the writer's notebook. The programs shown may be used, of course, without studying the method. If you have an SR-56, merely press the keys shown under "Program Keystrokes" reading from left to right. Execution keystrokes are shown for typical examples. A large number of keystrokes are used in setting up these formidable appearing programs, but each program only takes a minute or two to set up, and thereafter you may solve any L, T or Pi network which is to be used for matching between resistive terminations. In keeping with the usual practice in designing phasing and coupling networks, the coil resistances are ignored.

The programs are set up by telling the calculator to "Learn" the sequence of keystrokes that you would use to manually solve the problem. Pressing the "LRN" key places the calculator in the "learn" mode. (Then, in effect, a slot is left open for later insertion of the variable when the program is executed). After "LRN" is pressed the calculator learns a sequence of keystrokes relating to the variable. If there are several variables, the run/stop key (R/S) is pressed to indicate that another slot is to be left open for later insertion of a variable upon execution. If the problem solution requires several steps, the R/S key is pressed before entering the keystrokes for the next step.

Most of the keys have dual functions. The "2nd" key must be pressed before using the second function. The "STO" and "RCL" keys will be used often to store and recall numbers. For instance, pressing "STO 1" after an entry, indicates that the number is to be stored in memory register 1. Pressing "RCL 1" indicates the number is to be recalled from memory register 1. There are ten memory registers, but we will use a maximum of four in the program instructions.

Mr. Ing is director of engineering for Mission Broadcasting, Co., San Antonio, Texas.

Fig. 1 shows L network equations along with program and execution keystrokes and two examples. The program execution will give the value of the two reactive arms and also the phase shift through the network in degrees. The phase shift depends on the transformation ratio and cannot be independently specified. The theoretical maximum is plus or minus 90 degrees. The L network will work equally well in either direction. For instance, an L may be used to match 50 ohms to 100 ohms, or 100 ohms to 50 ohms, depending on which way it is turned. X_P parallels the higher resistance.

In the program sequence of Fig. 1, arrowheads mark where the variables will be entered at the time of program execution. R_1 is entered first and then R_2. Keystrokes "STO 1" and "STO 2" indicate that R_1 and R_2 will be stored in memory registers 1 and 2, respectively, for further use. The keystrokes "RCL 1" and "RCL 2" indicate when R_1 and R_2 are recalled. When you set up the program, ignore the arrowheads and press only the keystrokes indicated.

The first 13 keystrokes, after LRN is pressed, tell the calculator how to solve the first equation and thereby determine the series arm X_S. This value is stored in memory register 3. The run/stop key (R/S) is pressed before entering the keystrokes for solving the second equation. The keystrokes that follow tell the calculator to recall all three stored items and perform the calculations to obtain X_P. Then, the run/stop key is pressed again before entering the keystrokes for the third equation. These keystrokes tell the calculator that to obtain the phase angle, R_1 and R_2 are to be recalled from memory in order to determine the angle whose cosine is the square root of the quotient of R_1 divided by R_2. After all the instructions are entered, the run/stop (R/S), reset (RST) and LRN keys are pressed to take the calculator out of the learn mode and prepare for program execution.

Next, we will set up a program for solving or checking T networks. Fig. 2 shows equations, program and execution keystrokes, and two examples. T networks are more flexible than L networks because the phase shift may be specified. The theoretical limit is plus or minus 180 degrees, but the practical limit is less. The network design is for resistive terminations. If the load has a reactive component, as would be the case with most antenna loads, the antenna reactance must be taken into account. By adding one or more reactances in series with the antenna reactance, the algebraic sum may be made the correct value for the output arm.

In the program sequence of Fig. 2, arrowheads mark where the variables will be entered later at the time of

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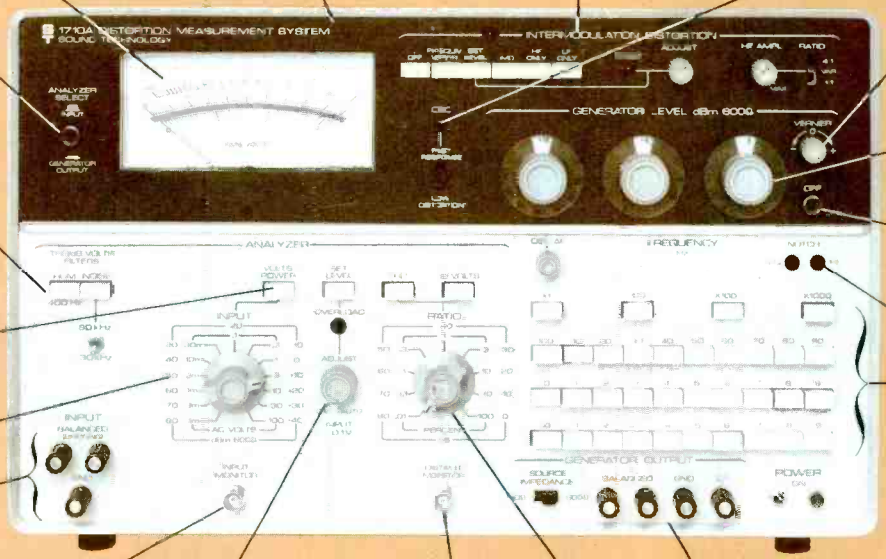
Here's how useful a distortion analyzer can be



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program execution. R_1, R_2 and the phase angle "θ" will be entered in that order. The "STO" keystrokes indicate that these items are stored in memory registers so that they may be recalled and used again.

After LRN is pressed, the first 16 keystrokes tell the calculator how to solve the first equation and thereby determine the shunt arm X_3. This value is stored in memory register 4. The run/stop key (R/S) is pressed before entering the keystrokes for solving the second equation. These keystrokes tell the calculator to recall two of the stored items and perform the calculations to obtain X_1. Then, the R/S key is pressed again before entering the third equation keystrokes, which tell the calculator to recall two of the stored items and perform the calculations to solve X_2. After all the instructions are entered, the RST and LRN keys are pressed to take the calculator out of the learn mode and prepare for program execution. On execution, if the phase angle is negative, press the change sign key after entering the angle. When the answers are displayed, a minus sign in front of the reactance indicates, of course, that the reactance is capacitive.

The T network program may also be used to solve Pi networks. To accomplish this, we deal with conductances (G), and susceptances (B). Conductance, of course, is the reciprocal of resistance, and susceptance is the reciprocal of reactance. The solutions are in susceptances, but the calculator is instructed to invert, change sign, and then display the answers in reactances.

To execute the program in the manner suitable for solving for Pi networks, press CLR and RST and enter the reciprocal of R_1. Press R/S and enter the reciprocal of R_2. Press R/S and enter the desired phase angle, followed by change sign if phase delay is desired. Then to obtain the answers press R/S, invert and change sign to obtain X_3. Press R/S, invert and change sign to obtain X_1. Press R/S once more, invert and change sign to obtain X_2. Execution steps to solve a Pi network for the same match as the first T example are shown in Fig. 3.

In the case of 90 degree T and Pi networks, solve for X_3 only. This will give all three reactances, except that the signs of X_1 and X_2 will be opposite to that of X_3. If you attempt to use the calculator to find X_1 and X_2, an error signal will be flashed because the calculator cannot work with the tangent of 90 degrees, or infinity.

Actually, unless you encounter a 90 degree network while calculating or checking a number of networks, there is no need to use a program just for 90 degree networks. Each reactance is equal to the square root of the product of R_1 and R_2. For phase delay, the series arms are inductive and the shunt capacitive. For phase advance, the reverse is true.

If the explanation for the two programs seems complicated, remember that you may use the programs without studying the manner in which they were set up. Merely press the key sequences as shown.

The ability to perform repetitious calculations facilitates the study of some network peculiarities. For instance, if you attempt to design a T network to match a 50 ohm transmission line to a 200 ohm load, and select a phase shift of −60 degrees, you will find that the output arm reactance disappears and you have an L network. If you change the phase shift to −65 degrees, the output arm will be inductive. If you change to −55 degrees, it will be capacitive. If you attempt to design a Pi network

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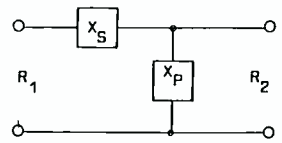
FIGURE 1

"L" NETWORK DESIGN BASED ON FOLLOWING EQUATIONS:

$$X_S = \pm\sqrt{R_1 R_2 - R_1^2}$$

$$X_P = \pm\frac{R_1 R_2}{X_S}$$

$$\theta = \cos^{-1}\sqrt{\frac{R_1}{R_2}}$$



R_2 MUST BE GREATER THAN R_1,
X_S POSITIVE FOR PHASE DELAY,
X_S NEGATIVE FOR PHASE ADVANCE.
X_S AND X_P MUST BE OF OPPOSITE SIGN.

PROGRAM KEYSTROKES:

LRN	STO	1	X	R/S	STO	2	−	RCL	1
X^2	=	2nd	$\sqrt{x}$	STO	3	R/S	RCL	1	X
RCL	2	÷	RCL	3	=	R/S	RCL	1	÷
RCL	2	=	2nd	$\sqrt{x}$	INV	COS	R/S	RST	LRN

EXECUTION KEYSTROKES:

KEY	DISPLAY
RST	0
50 (R_1)	50
R/S	50
200 (R_2)	200
R/S	86.6 (X_S)
R/S	115.47 (X_P)
R/S	60 (θ)

EXAMPLE 2:

KEY	DISPLAY
CLR	0
RST	0
10 (R_1)	10
R/S	10
100 (R_2)	100
R/S	30 (X_S)
R/S	33.33 (X_P)
R/S	71.56 (θ)

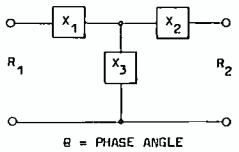
"T" NETWORK DESIGN BASED ON FOLLOWING EQUATIONS:

FIGURE 2

$$X_3 = \frac{\sqrt{R_1}\sqrt{R_2}}{\sin\theta}$$

$$X_1 = \frac{R_1}{\tan\theta} - X_3$$

$$X_2 = \frac{R_2}{\tan\theta} - X_3$$



θ = PHASE ANGLE

PROGRAM KEYSTROKES:

LRN	STO	1	2nd	$\sqrt{x}$	X	R/S	STO	2	2nd
$\sqrt{x}$	÷	R/S	STO	3	SIN	=	STO	4	R/S
RCL	1	÷	RCL	3	TAN	−	RCL	4	=
R/S	RCL	2	÷	RCL	3	TAN	−	RCL	4
=	R/S	RST	LRN						

EXECUTION KEYSTROKES:

KEY	DISPLAY
RST	0
50 (R_1)	50
R/S	7.071
100 (R_2)	100
R/S	70.71
-60 (θ)	-60
R/S	-81.6496 (X_3)
R/S	52.782 (X_1)
R/S	23.915 (X_2)

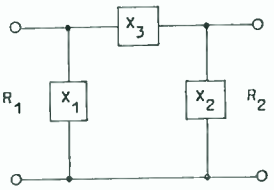
EXAMPLE 2:

KEY	DISPLAY	
CLR	0	
RST	0	
125 (R_1)	125	
R/S	11.18	
75 (R_2)	75	
R/S	96.825	
105 (θ)	105	
R/S	100.24	(X_3)
R/S	-133.73	(X_1)
R/S	-120.34	(X_2)

for the same match and select −60 degrees for the phase shift, the result will be the same L network as was obtained in attempting to solve for a T. There are many other combinations of transformation ratios and phase shifts which result in an L instead of a T or Pi.

It is also interesting to examine the change in shunt arm reactance of a T network in the vicinity of 90 degrees phase shift. Take, for example, a 50 ohm to 50 ohm network. If you enter various phase shifts from 70 degrees through 90 degrees to 110 degrees, you will notice that although the series arms change considerably, there is very little change in the shunt arm. This fact has led to the widespread use of this type of network as a phase shifter in directional antenna systems. The shunt arm is fixed while the series arms are varied. Variable inductors are often ganged together mechanically for single knob control, but more recent practice is to use a tapped coil for one series arm and a continuously variable for the other. The variable inductors are placed in series with fixed capacitors in the series arms of phase advance networks.

FIGURE 3 PI NETWORK DESIGN



EXECUTION KEYSTROKES

KEY	DISPLAY	
RST	0	
.02 (G_1)	.02	
R/S	.02	
.01 (G_2)	.01	
R/S	.01414	
-60 (θ)	- 60	
R/S	-.01633	
*1/x	- 61.237	
+/-	61.237	(X_3)
R/S	.004783	
*1/x	209.08	
+/-	- 209.08	(X_1)
R/S	.01056	
*1/x	94.729	
+/-	- 94.729	(X_2)

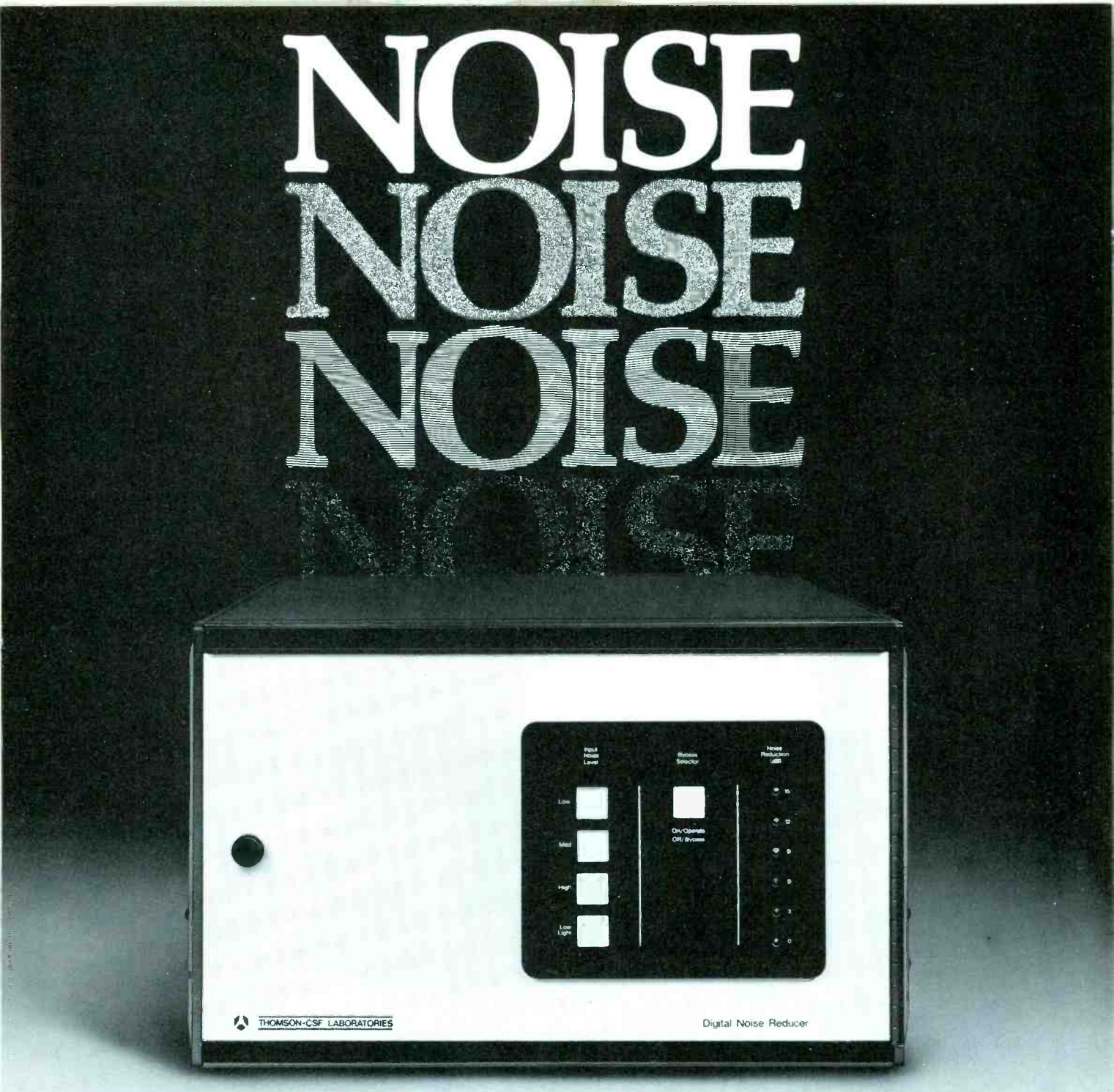
* Indicates second function of key.

If you have been encouraged to purchase a programmable calculator, there are many models to choose from. The Texas Instrument's SR-56 is that firm's lowest priced model. It has 100 program memory locations. The lowest priced Hewlett-Packard model is the HP-25. It has 49 program memory locations and has the reverse Polish notation (RPN) preferred by many. RPN often will save program steps. The programs shown in this article are easily adapted to the HP-25. Higher priced models offered by both companies have the magnetic card feature which enables you to make up and preserve your own programs.

The T network equations shown in Fig. 2, were obtained from "Antenna Engineering Handbook" by Jasik.

A future article will show how to program to obtain the horizontal plane pattern and also the pattern at various elevation angles for a two tower directional antenna system. **BM/E**

NOISE NOISE NOISE NOISE



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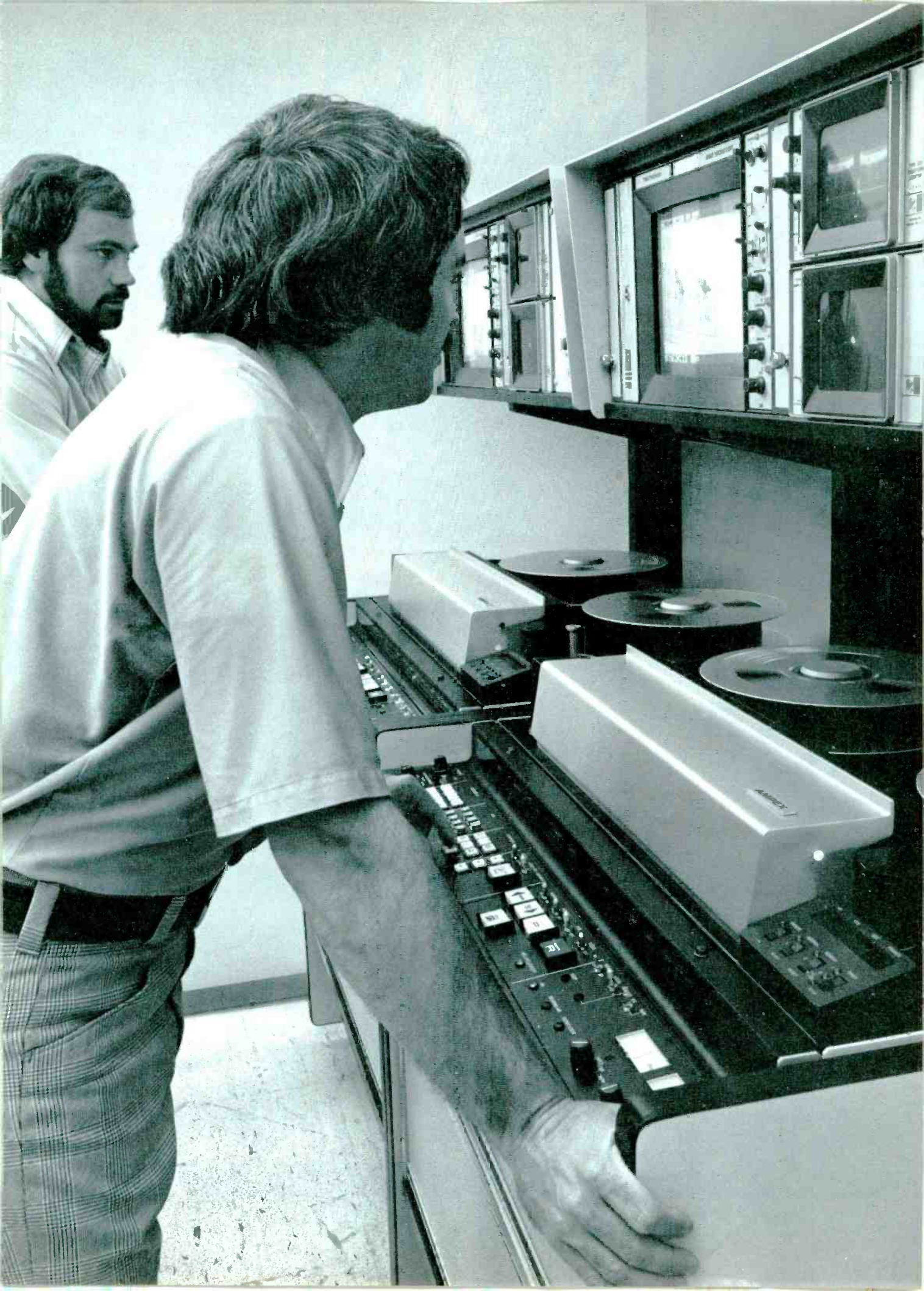

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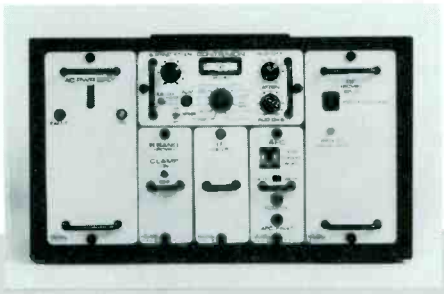

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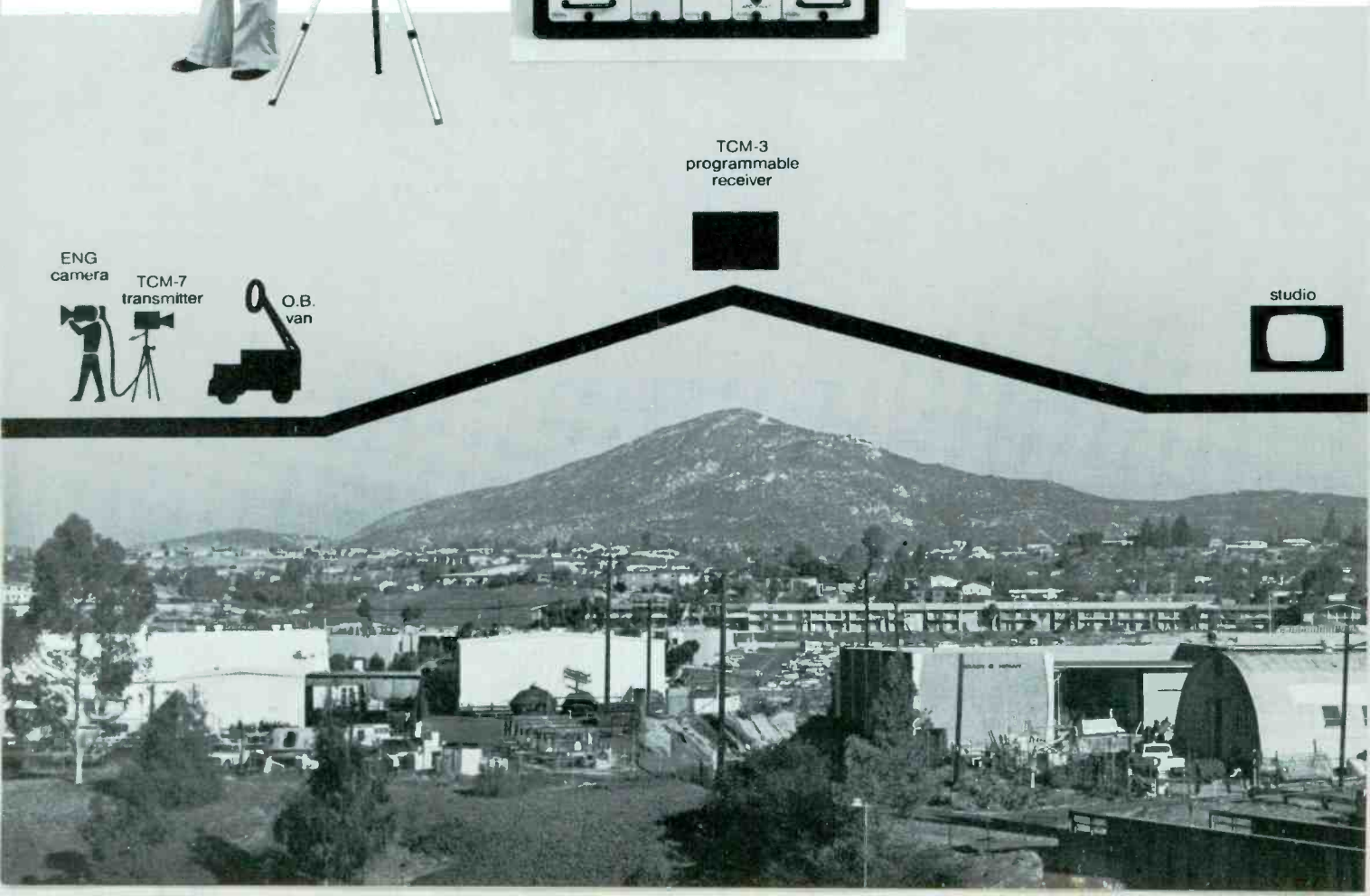
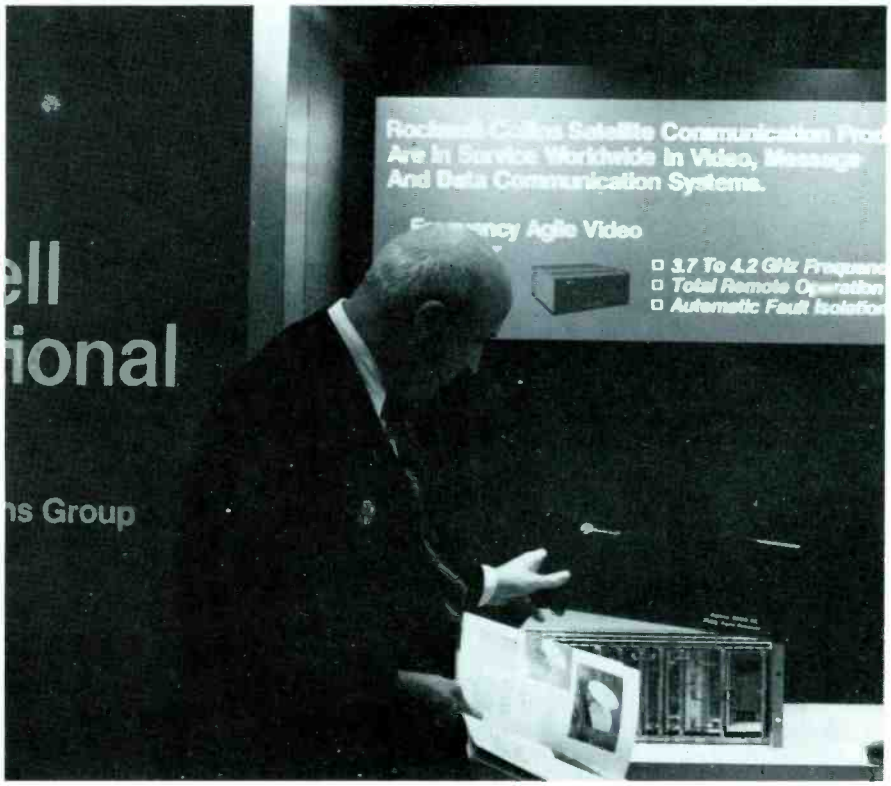


Big Year For Broadcast Satellites In '78; New Generation Devices Coming For '80's

In 1978, PBS system will go operational. Mutual announces 750 affiliates blueprint. AP-UPI envision 6000 earth stations in future plan. And Japan will test direct broadcast in '78. But 5 to 10 times more powerful systems will be ready for space shuttle launching in early '80's.



The Public Broadcast satellite distribution system about to go operational was a big topic at the recent NAEB Convention. The Collins (Rockwell International) exhibit was well attended as visitors dropped in to increase their understanding of this latest technological advance.

This earth receive only station is typical of those being set up by Collins for the PBS network.

THERE HAS BEEN SO much news about satellite carriage of sports and special TV programming this past year that one tends to become a little blasé about recent announcements. Broadcasters accept the fact that satellites are coming; the question simply is "How do I go about getting mine (i.e., an earth station)?"

But *BM/E* suspects the full impact of what satellite distribution means has yet to fully dawn on broadcasters. Imagine yourself a commercial TV station living a comfortable life as an affiliate. You go to a state broadcasters association meeting and hear a plan that says "Why tie yourself to the network and take only what they offer on their terms. If we broadcasters work together, we can put six different programs up in the sky at the same time and choose what we want."

Sound far-fetched? That's just about the situation that public broadcast stations face right now as the PBS TV satellite interconnection system gets ready to go operational. There will be only three choices initially, but a fourth will be available within a year, on top of which is an inexpensive option of two more choices on an occasional basis. (True, some of the channel time will be used meeting time zone differences but there's plenty of available time for additional programs.) PBS talks about flexibility in program selection. Commercial stations, in this situation, could talk about the right to freedom of choice in programming. Indeed, one of the hallmarks of the Mutual plan for radio broadcasters (see separate box), is the choice of three programs given to its subscribers — sports, music or news. The key word becomes access — not some activist's access to your transmitter but *your* access to a wide range of programming possibilities.

Access is a subject that PBS members have recently been thrashing out now that the first public transponder is only two months away from being operational.* Before the year is out, the system will have three transponders. Earth stations, under contract to the Collins Commercial Telecommunications Div. of Rockwell International,

continued on page 88

are going up at a rate of well over 20 per month, with 173 planned in all. Right now the big talk is about disconnect from the AT&T system.

Progress being made on the PBS distribution system was a major theme at the 53rd NAEB Convention held in Washington, D.C. last November. Regional representatives described results being made on five transmit sites: Columbia, S.C., for the Southern Educational Council Assn.; Hartford, Conn. (Univ. of Hartford) for the Eastern Educational Network; Lincoln, Neb., for the Central Educational Network; and Denver, for the Rocky Mountain region. Only the Western Educational Net has yet to select its site.

An extra uplink is under construction in Talahassee, Fla., not as part of PBS, but as a State of Florida project. Florida has a forward-looking plan for considerable intra-state exchange, and is the first state to build its own uplink for feeding into state earth terminals. PBS can also use Western Union's own transmit cities: New York, Chicago, Los Angeles, San Francisco, Dallas now, more in 1978 as other cities are added.

There will be other uplink possibilities since PBS plans a series of portable R-T terminals built on trailers for such purposes as "restoring" lost service. John Ball of PBS announced these portable units in the offing as he described the maintenance and remote control provisions developed by Collins for the PBS.

Following on the heels of the PBS system will be the National Public Radio Satellite system of 189 participating stations. Fifteen uplink sites are planned. Some 31 receive stations will be co-located with PBS earth stations.

Satellite programming now impressive

Although the PBS system will increase, significantly, the amount of TV programming delivered by satellite, usage has been growing in other quarters. Jim Ragan, president of Western Union, told the NAEB gathering that on one weekend last fall, 11 transponders were being used simultaneously for football. Last August the sports count was 70 baseball-, 11 football-, one hockey-; one tennis- and three soccer games carried by satellite. All three

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*After taking care of the national program service (two transponders), the five regional groups of the PBS system should be able to select transmission times they desire. Guidelines for determining other programs carried would depend on number of stations agreeing to carry the program, etc.

Mutual, California Microwave, Western Union In Biggest Satellite Deal So Far

All 750-plus affiliates of the Mutual Broadcasting System will be linked to Mutual headquarters by satellite, under a plan jointly announced November 21 by Mutual, California Microwave, and Western Union.

The contracts signed among the three companies will thus lead to construction of the largest satellite radio network now in active development, with Mutual originating the programs, Western Union distributing them nationwide via Westar satellite, and California Microwave building the earth terminals that allow the affiliated stations to bring in the programs.

The project breaks new ground on several fronts. Mutual will buy and keep ownership of all the earth terminals, supplying them to affiliates at no cost: this suggests that earth terminal costs can be handled in such a way that receiving broadcasters face no financial burden. Western Union will install and maintain the terminals.

Mutual's president, C.E. Little, and executive vice president, Gary Worth, said at the announcement that the cost of each earth terminal, installed, would be a little less than $10,000. The whole start up cost for the project, including contract with Western Union for satellite service, is about $10 million. Mr. Worth said that Mutual did not expect distribution by satellite to be substantially less expensive than the present service by AT&T, so that it would take perhaps eight years or more to recover start-up costs.

However, both executives emphasized the far more varied service Mutual could supply with the satellite net in place. Initially the satellite system will carry three simultaneous programs, and eventually this will be raised to six. Using more than one channel via AT&T lines makes service prohibitively expensive, Mr. Worth said. Satellite transmission will be on a "single channel per carrier basis," with each channel having 15 kHz bandwidth, less than 1% distortion, and at least 65 dB signal/noise ratio, quality far above that of standard telephone lines.

With this transmission capability, Mutual will be able to service different groups of affiliates who want different sports programs at a given time, for example. Mutual is planning a great variety of other kinds of programs, including music in stereo. Affiliates will get a rich choice of different program packages.

In the great majority of cases, the station will have the earth terminal antenna on the studio roof or nearby, eliminating land lines and microwave links completely. A small percentage of affiliates will be linked to earth terminals in adjoining areas. The earth terminals are built around 10-foot antennas; this size was judged to allow the best combination of cost, performance, transponder power, and other factors. The downlink transmissions will be in the 3.7 to 4.2 GHz range. Satellite EIRP per channel is +22 dBw and receiver G/T is 15 dB.

Mutual is studying the feasibility of putting the uplink transmitter on the roof of their headquarters building in Arlington, Va. Alternatively the programs would go from there to Western Union's transmitter, nearby in Virginia.

Mutual planned to apply early in December (before this issue is distributed) for FCC authorization for the first 25 earth terminals. Getting the FCC authorization, with scores or hundreds of earth terminals coming up at one time, is one of the major unsolved problems for satellite net builders. Under present procedures the FCC requires a complete frequency coordination study for each terminal; doing 50 to 100 at once looks just about impossible. Mutual as well as AP and UPI, as described in the accompanying article, look toward some "block booking" procedure, or waiver of parts of the rules, to make the organization of their networks reasonable operations. A spokesman at the FCC told *BM/E* that no plan would be advanced in the matter until the problem was actually presented and the facts in each particular case could be studied. For the present, the frequency coordination rules are being strictly enforced.

In any case, Mutual wants to begin installing earth terminals for West Coast affiliates in June of this year, and will gradually "shrink" AT&T service eastward. The hope is for the whole net to be in operation by June, 1979.

Standing in front of the Mutual Radio Network's new 10-foot satellite receiving antenna are, left to right: F.L. Pendleton, Calif. Microwave, Inc.; James T. Ragan, Western Union; Dr. David B. Leeson, Calif. Microwave; C. Edward Little, Mutual Broadcasting System; Jay Van Andel, Amway Corp.; and Gary J. Worth, Mutual Broadcasting System.

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networks use satellites on an occasional basis. Hughes Sports Network (Paramount) and Robert Wold each contract for 5000 hours a year.

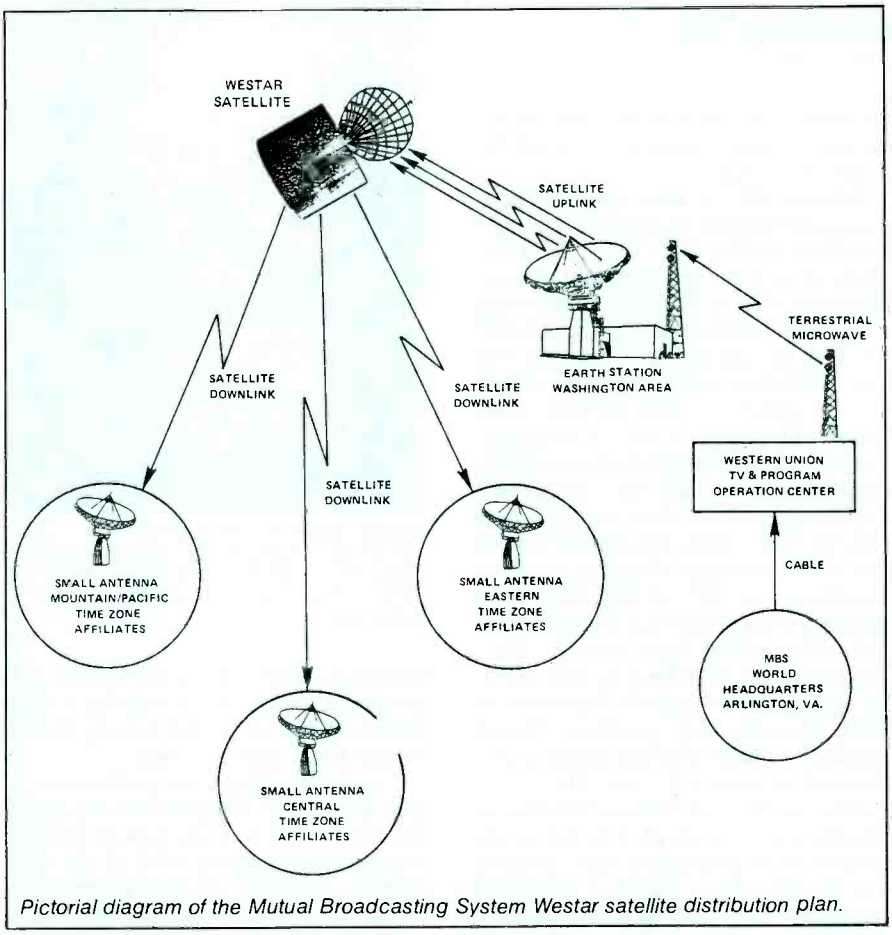
In terms of earth stations, Ragan provided the following approximate broadcast count: 173 PBS (another 45 or so for NPR); 200 cable companies; 300-500 Mutual broadcast subscribers; several thousand AP-UPI customers; 30 special networks; 10 or so independent stations and at least one affiliate station. (Scientific-Atlanta reports WBEN's earth station will be operational this spring.)

Last month RCA Americom and Viacom announced plans for the distribution of the latter's pay cable programming, *Showtime*.

The biggest satellite news, however, since the PBS system was announced, is the $10 million commitment made by Mutual Broadcasting as detailed in the accompanying box. Shortly there should be another significant filing to the FCC made by AP-UPI. The wire services will be seeking an experimental license to deliver news via satellite to eight Florida newspapers. While it is newspapers that are in the forefront here, broadcasters will be added. Like Mutual, AP-UPI expects to ask the FCC for class approval for this application foregoing the usual frequency interference coordination check. The AP-UPI plan differs from Mutual in that the data services want to use six-foot antennas (such as demonstrated last March, see *BM/E*, May, p. 6).

The Florida experiment will be a good test for the smaller dish since the state generally is on the fringe area. If the six foot antennas are no obstacle in Florida, they should be perfectly satisfactory elsewhere. It appears that the newspaper experiment will be via the RCA Satcom with antennas set up by Harris.

There is an urgent need for the news services to move to satellite as quickly as possible, says Jim Darr of UPI, because of the 48% increase in tariff for news service lines and 34% increase overall in the cost of land lines that will go into effect Jan. 23.



Pictorial diagram of the Mutual Broadcasting System Westar satellite distribution plan.

The future

The NAEB engineering session on satellites moderated by Daniel Wells of PBS, provided a good forum for the future. Participating in a panel discussion were the Public Service Satellite Consortium (PSSC) as a user, satellite manufacturers, Hughes, General Electric and RCA, and carrier Western Union. Manufacturers focused on communications satellites that will be launched in the early 80's via the new NASA space shuttle.

Western Union has a second generation bird ready for launching in October of 1980 but it will be lifted via the conventional Thor Delta rocket. The new Westar will be a shared service satellite patterned after the NASA TDRSS (Tracking Data Relay Satellite Service) bird. Both analog and digital transponders are planned.

Goals for the next RCA manufactured satellite*, which have not yet been firmed up, are twice the transponders (current RCA Satcom has 24), twice the power and half the cost. Ed Walpole of RCA said he expects the satellite will provide for 6-4 and 14-12 GHz service as well as some capability in the 18-30 GHz band for mobile radio and other purposes. The next satellite will also have longer life.

Several transponders will put out 100 watts. More power would come about as a result of advanced nickel hydrogen batteries and larger solar arrays. Tens of kilowatts total power may be possible but RCA will shoot for 1-3 kW total output. The structure itself will dissipate internal heat better. RCA expects

continued on page 92

*RCA is also building a new hybrid satellite for Telesat and the Dept. of Communications of Canada for launch in Nov. of 1978. It will provide 12 channels of 6-4 GHz service with a 3 dB EIRP improvement, 6 channels at 14-12 GHz with 20-watt TWTs. There are four spot beams for spot coverage across Canada's seven sections.

CTS Switchboard In The Sky

Last month the performance (very successful) of the Communication Technology Satellite was the subject of a three day meeting at Ottowa, Canada. At the recent International Telecommunication Conference (INTELCOM '77) speakers and audience at the National Library of Medicine in Bethesda, Maryland, were connected with INTELCOM via the CTS. The South Carolina Educational Television Network rebroadcast the seminar on vaccines live to the public and another portion to physicians and hospitals. Later at INTELCOM, a live teleconference via CTS connected speakers from Atlanta to Goddard and Ottowa.

Microwave receiver portion of Mutual earth terminal built by California Microwave Inc.

this future satellite will be launched by the space shuttle but its payload will be in the Delta class.

Syncom IV, a new satellite now under construction by Hughes Aircraft, was described by Dick Jones as an optimum design for space shuttle launch. The space shuttle, which is 60 feet long and 15 feet in diameter, can lift 65,000 lbs. But no one needs a satellite this size, said Jones, and it would be expensive to launch — $20 million. Thus Syncom IV measures 14 feet in diameter and 10 feet in length and constitutes a partial shuttle load. Its "tuna can" shape is ejected out of the shuttle with a "frisbee-like" spin. Syncom IV has its own built-in perigee motor to get itself transferred to the 19,300 mile final orbit (necessary since the shuttle orbit is only 160 miles from earth). This perigee motor (800 lbs.) is later shed. An apogee motor gets the bird into its final geostationary position. When "parked" a large antenna unfolds. It's designed to have a 10 year life.

Syncom IV is of extreme interest to educators since part of it is being offered to users practically free. Hughes was so anxious to build an advanced communication satellite that it decided to go ahead without any immediate customers once it learned it could get a free launch in one of NASA's early shuttle orbital flight test missions.

Andrew Inglis (l), president of RCA Americom, shows Jeff Reiss, president of Showtime, a model of the RCA satellite which will distribute Showtime's pay TV programs.

For the benefit of non-profit users, if they can use it, Hughes has equipped the bird with a high power S-band transmitter complete with a six foot Syncom antenna which is comparable to the old ATS-6 30-ft. dish. With an 8 foot solar panel, Syncom IV can deliver 1.5 kW for ten years. Since Syncom IV has a five degree beam it is capable of illuminating 48 states. (Alternately, it could be moved to hit any part of the earth's surface.) Jones said if the PSSC or one of its members is not ready to take over operation of the S-band, it will simply be shut down.

This is only part of the story. The ATS-6 replacement takes up only 80 lbs. and 300 watts. This leaves 420 lbs. and 800 watts for other purposes. Thus Hughes is looking for several co-investors to get full usage from Syncom IV.

Both Jones and Bob Mott of the Public Satellite Service Consortium said the PSSC hopes to find users who can take advantage of Syncom IV and the Hughes offer.

The economics are intriguing. Compared to Thor Delta which had launch costs of $13.5 million in 1975, Syncom IV can be placed in orbit by the space shuttle for about $5.3 million. The current charge for a Westar transponder is about $800,000 annually but if one-third to one-half of this rental is to recover launch cost, future satellite operating costs will be reduced drastically. Jones said a four-to six-channel Syncom VI three times bigger and twice the diameter of Westar should cost about the same as a single Westar

channel.

Some of the huge advances that can take place as a result of the space shuttle were put into further focus by Harold Braham, manager of Advance Communications Satellite for General Electric. Braham projected future possibilities by "scaling-up" the two most recent GE satellites, the direct broadcast satellite built for Japan (that will be launched in March of 1978) and the multiple-beam military defense communications satellite, the DSCS-3, now under contract.

The Japanese direct broadcast satellite operating in the Ku band with 100 watts of RF power incorporates a high gain antenna producing an effective power about 100 times greater than that of Westar. Because of the higher power, receiving stations costing only $500 are possible. With the space shuttle these figures can be improved.

Braham said the launch cost for the 720 lb. Japanese direct broadcast satellite is in the $20 million range. With the space shuttle, a 2500 lb. satellite can be put up for less than $10 million. In broad terms an improvement of eight in weight/cost is available. Further, because of the larger diameter of the shuttle (14 ft. compared to 7 ft. for Thor) much greater power dissipations are possible.

Thus Braham envisions two kinds of future satellites — high power types that can feed directly to 1 meter antenna receivers, costing $300 in quantity, or multiple-beam types for restricted coverage. With 500 watts of RF power, all of the U.S. could be covered. With 250 watts, half of the U.S. (two time zones) could be blanketed. With 3000 watts total, twelve 250-watt transponders could be energized. A DC power capability of 9000 watts is practical, said Braham.

How About 300 Or More Multi-Spot Beams?

The 70 transponder system described by Braham may not be the ultimate. In a working paper prepared by the Public Interest Satellite Association, "The Unexplored Option . . .", authors Horowitz and Thomas feel 200 multipoint beams are possible serving, in addition to TV, 250,000 UHF handheld voice transceivers. At UHF frequencies, costs are lower yet. But for this mass communication eventuality to come about, NASA would have to develop a large deployable antenna shuttle experiment. New frequency allocations would be required. Result: much broader satellite access. PISI is looking for opinion. Send $1 for a 30 page booklet to PISI, 55 West 44th St., New York, N.Y. 10036.

With narrow beam antennas (0.6 degrees) covering 1/50th of the U.S. (areas equal to individual states), costs go way down — transmitter costs by a factor of eight and earth station costs by a factor of 5 to 10. Complete receiver costs for individual schools would be under $1000.

If such spot coverage is sufficient, it is possible to build a Transmit-Receive two-way TV station for only $15,000. This is because the receiver antenna gain can be increased to a point that the uplink ground transmitter need be only an inexpensive 5 watt solid-state module.

At 20 watts per transponder, 70 transponders could be located on the satellite (compared to the ten now planned for the commercial SBS satellite). In short, Braham said, the new satellites have a dramatic impact on driving costs down. An educational program reaching one region such as Boston, N.Y. and Washington could serve a potential of 40 million people extremely inexpensively.

Will users be ready? Mott of PSSC feels practical needs will be identified shortly and he expects there will be takers for the Syncom IV. But the PSSC has it's eye on all of the future satellites. Lowest possible operating cost will be a key factor, Moss said.

BM/E

INTERPRETING THE FCC RULES & REGULATIONS

By Frederick W. Ford and Lee G. Lovett;
Pittman, Lovett, Ford and Hennessey, Washington, D.C.

FCC Hits Sponsorship Identification Announcement Shortcomings

A BROADCAST SPOT APPEARS on your television screen. A woman dressed in a white pantsuit sits in a light colored chair and describes why a City bond issue should be voted down in the upcoming referendum. Briefly, white letters flash on the bottom of the screen stating that the announcement was paid for by the Ad Hoc Committee Against Deficit Spending. The only trouble is that nobody can read the words because they are superimposed over the woman's white pantsuit and the light colored chair. No verbal announcement is made. This is a violation of the Commission's sponsorship identification rules.[1]

This scenario may sound familiar because it has occurred often in a variety of ways. Sometimes, the sponsorship identification words are so small, or are flashed so quickly, that most viewers cannot read them.

This type of rule violation by television stations is only the tip of the iceberg. Many more violations occur on radio stations because, in part, operating radio stations substantially outnumber operating television stations. Familiarity with these sponsorship identification rules is crucial.

Federal Statute

Whenever a station receives money, a service or any valuable consideration to broadcast an announcement, the station must, at the same time, (1) make a statement that the announcement is being paid for or furnished and (2) identify the person providing the money or other consideration. This sponsorship identification announcement need *not* be made when a service (or property furnished without charge) is supplied for use on a broadcast *unless* the party supplying the service or property does so specifically "for an identification in a broadcast of any person, product, service, trademark or brand name beyond an identification which is reasonably related to the use of such service or property on the broadcast." For example, a sponsorship identification announcement need not be broadcast if a car dealer supplies a car to be used by actors in a television show *unless,* for instance, the television station agreed to specifically identify the make and model of the car as well as the car dealer's name and address. In short, if there is "promotional" intent on the part of the person supplying services or property, it is a fairly clear indication that a sponsorship identification announcement must be made.

The Commission Rule

Section 73.1212 implements by regulation the requirement of the Federal statute. But, in the case of political broadcasts matters, it goes further. Such matter, or a discussion of a controversial issue of public importance, must contain an announcement (1) at the *beginning* and (2) at the *conclusion,* if money, services or other valuable consideration is submitted to the station as an *inducement* for the broadcast of the announcement. Broadcasts of less than five minutes' duration need only contain one announcement.

A station has a duty to exercise "reasonable diligence" to determine the true sponsor of an announcement. Often, an agent will make arrangements with a station to broadcast paid political or other announcements. Identification of the agent's name is inadequate where the station is aware that the agent is acting for a principal.

Where an announcement concerns a political matter, or matter involving a controversial issue of public importance, the station has an additional duty. A list of the chief executive officers or members of the Executive Committee or of the Board of Directors of the sponsoring corporation, committee, association, or other entity must be maintained by the station for public inspection as required in Section 1.526 of the Commission's Rules.[2] Networks may maintain this list at its headquarters office. The list must be maintained in the public file for two years.

"Want Ad" Exception

Broadcast of a "want ad" or classified advertisement by a radio station or television station is exempted from the sponsorship identification announcement requirement. Despite this exemption, a station still has a responsibility with regard to such sponsorship announcement. The station must: "(1) Maintain a list showing name, address and (where available) the telephone number of each advertiser; (2) Attach the list to the program log for the day when such broadcast was made; (3) Make this list available to members of the public who has a legitimate interest in obtaining the information contained in the list."[3]

Policy Statement and Recent Cases

There is no substitute for a careful review of the Commission's sponsorship identification rule. After that, station personnel should review the Commission's Public Notice on the Applicability of Sponsorship Identification Rules that was published in the Federal Register on September 9, 1975. It contains Commission interpretations of numerous fact situations which commonly arise.

Review of recent FCC cases is also helpful. Problems and questions which arise for one broadcaster will very often arise for another broadcaster in a nearly identical situtation.

A Tampa, Florida licensee was admonished by the FCC for failing to identify a program as being produced and furnished by the American Security Council.[4] The program dealt with the military balance between the United States and the USSR. The station argued that the program was made available to it free of charge, and that there was no "special understanding" with the American Security Council concerning broadcast of the program. The Commission did not buy the licensee's argument, finding that

continued on page 96

[1] Section 73.1212.
[2] Organizations such as the American Cancer Society and the March of Dimes are exempted from this requirement.
[3] Section 73.1212(g) of the Rules.
[4] *Gaylord Broadcasting Co.*, 40 RR 2d 830 (Broadcast Bur., 1977).

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Microwave Associates

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FCC Rules & Regs

making the program available free of charge was an *inducement* to the station to present the program.

In contrast, the Commission ruled just the opposite in another case.[5] The National Association of Broadcasters supplied spot announcements to broadcast stations. A station broadcast these announcements without identifying their origin or maintaining a list of NAB officers for public inspection. The Commission found that there was no evidence that the licensee paid, directly or indirectly, for making the announcement. Further, the Commission found no evidence that the licensee had any obligation to broadcast them, or that the licensee as an NAB member would have been effected by refusing to broadcast the announcements. Thus, there was no showing that any consideration had been received for broadcast of the announcements. Neither did the complainant establish that the material broadcast (the merits of cable television versus over-the-air television) was controversial.

These two cases amply demonstrate that the decision a broadcaster must make — whether or not to broadcast a sponsorship announcement — is not black and white. Good faith judgments must be made. However, the Commission will *not* substitute its own judgment for that of the licensee. Rather, the Commission will look to see whether the licensee made a "reasonable determination" that issues contained in an announcement were or were not discussed in any meaningful and obvious way.

The Commission recently denied requests for waiver of the sponsorship identification rule by the United States Postal Service[6] and the Department of Defense.[7]

The Postal Service sought a ruling that it would satisfy Section 73.1212(f) (which waives the need for a separate, specific announcement concerning sponsorship) *if* (1) the sponsor's name is *stated* during the announcement (even if part of the "sales pitch") and (2) it is *clear* that mention of the sponsor's name constitutes a sponsorship identification. This is why commercial advertisers generally do not have to make a separate, distinct sponsorship announcement. For instance, it is clear that a 30 second spot for Ivory Soap is a paid commercial announcement.

The Commission denied the Postal Service's request, stating that many stations also broadcast Postal Service announcements as PSA's. Viewers or listeners would be unable to distinguish Postal Service commercial announcements from PSA's. The Commission went on to explain that it had little discretion in this matter in light of Section 317 of the Communications Act.

The Department of Defense sought a Commission ruling that it could omit the "paid for" or "sponsored by" announcement from its broadcast spots utilized for the old-volunteer army recruitment campaign. Again, the Commission denied the request saying that the public would not be able to distinguish between paid and free announcement. As with Postal Service, many broadcasters air free PSA's for the Defense Department. The Commission reiterated that it will continue to rigidly enforce the principle that the public has the right to know whether broadcast material has been paid for and by whom.

Conclusion

Station personnel should consult with their communications counsel whenever they are unsure about a sponsorship identification question. Remember, failure to properly identify a sponsor may leave a station vulnerable to a charge of taking payola. **BM/E**

[5] *Barry G. Silverman*, 39 RR 2d 1713 (1977).
[6] *United States Postal Service*, 41 RR 2d 877 (1977).
[7] *Department of Justice*, 41 RR 2d 881 (1977).

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Form-fitting compartments—cells cannot shift or move regardless of Powerbelt position; minimizes undesirable flexing of belt wiring.

Automatic circuit breaker—helps protect camera, lights, etc., as well as batteries in case of external shorts. Resets automatically.

Vacuum-formed seamless compartments—deep-molded with rounded corners and uniform wall thickness to reduce stress on material.

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SPEAK OUT:

"Discrete Quad Being Strangled By FCC Inaction," Says Richard C. Dean

In the technical session on FM quad at the NRBA convention in New Orleans in October, strong support emerged for FM quad on the part of a number of FM broadcasters in the audience, along with strong distress at what the broadcasters saw as "foot dragging" by the FCC on the subject. The point was made that the great effort of the multi-million-dollar EIA tests of two years ago seemed to have dropped in the FCC's lap without leaving a trace.

Richard C. Dean, president of WFMZ-FM and WFMZ-TV in Allentown, Pa., was among those who spoke strongly in favor of FM quad. BM/E asked him to expand his remarks into a "Speak Out" for this issue of the magazine, and the result follows below. Mr. Dean, 42 years old, started with radio in his boyhood days. He holds an Amateur Radio Advanced Class License, a first-class commercial license, is a senior broadcast engineer of the SBE. He is president of the "Music-Aire" background music system, of United Educational Broadcasting, Inc. of the Lehigh Valley Mobile Telephone Co., and of the Eastern Chapter, National Religious Broadcasters. He also describes himself as a "floor inspector and keeper of the cookie jar, and a career FCC agitator."

Because of the great importance of this topic, BM/E hopes that others in the industry – even in the FCC, perhaps – will send us their views for follow-up publication.

I HAVE YET TO MEET a person in or out of government who does not share a measure of despair and discouragement at bureaucratic bunglings among both elected and appointed regulators. Waste, inefficiency and confusion result when well-meaning government people try to second-guess the will and desires of the public they serve.

A case in point is discrete quadraphonic FM broadcasting. Some commission people, understandably caught up in the new excitement of AM stereo, are hinting that maybe discrete FM quad has lost the support of FM broadcasters. Or worse, that the public has lost interest in true FM quad. Nothing could be further from the truth. As a fact, over this past decade many FM broadcasters who have pioneered technical improvements and innovations in their markets like SCA, stereo, circular polarization and Dolby have lost confidence in the FCC's commitment to move ahead in this quadraphonic area.

Scores of seasoned stereophonic broadcasters in major cities across the land have patiently waited for years to make the necessary investment and committment to discrete quad. Certainly it costs money for equipment and programming — but FM broadcasters have come up the hard way and they aren't easily intimidated about pioneering new services for their burgeoning audiences.

As a further evidence of station intent and determination and in the absence of affirmative commission action on discrete quad over these many long years — certain broadcasters at one time or another in nearly every major city have ventured forth into "pseudo-quad" commonly known as "matrix, SQ or QS." What a bust! I'm not especially proud that our station pioneered Pennsylvania's first regularly scheduled "pseudo-quad" broadcasts back in 1970, which, incidently, have continued week after week to this very day. Being the only independent FM in our area, we've had to be first and innovative in new technology to simply survive. Now celebrating 30 years of service as a good music outlet — this station and its hundreds of FM sisters with every conceivable format need decisive FCC action to speedily approve a discrete quad system. As for us — we don't want another seven years of "imitation quad" . . . . we've had quite enough! And we've made serious efforts with Sansui's QS and CBS's SQ with and without decoder logic. This is not to say we have found matrix all bad or without redeeming value — for in certain applications it can sound beautiful and probably has a future with the record industry by providing a relatively inexpensive quad-enhancement over conventional stereo. But it is restrictive and severely limited in many applications important to the audio connoisseur. As the prime technical method used to actually transmit four audio channels via FM with its wide variety of formats and application requirements, the matrix phase differential system to achieve "four channel audio effects" simply does not cut the mustard with listeners . . . . or broadcasters.

Yet the same public wants quad in the worst way and they're putting it in their cars and homes in record numbers. There was a "flash in the pan" interest by consumers when some manufacturers brought out their matrix receivers — some with logic . . . . but the audio equipment consumers were far better educated than was first thought. They had already been into discrete quad tape for years and weren't about to move backwards. Who can honestly blame them or the manufacturers who were saddled with this lack-luster technical compromise.

Quadraphonic broadcasting today has some interesting similarities with the very early stereo broadcasts using an AM and FM station. Those broadcasts (preceeding FM multiplex stereo) attracted only a limited amount of attention but helped set the stage for "the real thing." The new stereo technology was good, the FCC took action, the broadcasters bit the bullet and made the investment and the public reacted with such enthusiasm that now it's hard to find a manufacturer that will even promote a hi-fi "mono" receiver. What if the FCC had dragged its feet for say ten more years? Couldn't the public satisfy itself with the old AM plus FM binaural sound?

Now what about that "taboo" concerning discrete quad broadcasting like possible loss of coverage? Hogwash! This rumor won't amount to a hill 'o beans. Sure . . . we all know you don't get something for nothing, but we learned to live with a tiny mite less coverage to have SCA which enabled many of us to survive in those earlier days. Then we sacrificed just a little for a 19kc pilot and gained a whole new world of stereo. And before very long, the circular antennas came along and more than made up for anything thought lost in coverage.

And HERE WE STAND at the threshold of discrete quad broadcasting, and it's been lab tested, and it's been field tested, and it's compatible, and it works, and it works well! And we've been STANDING HERE FOR YEARS, hat in hand, waiting along with our listeners and the manufacturers. All of us have been intimidated by a handful of guardians whom we all pay and commission to serve the "public interest" even as we broadcasters are commissioned.

I think IT'S TIME we trust this to the market place like multiplex stereo and color TV. I realize the whole idea might sound a little corny to some and perhaps old fashioned — but years ago they had a name for it . . . . free enterprise.

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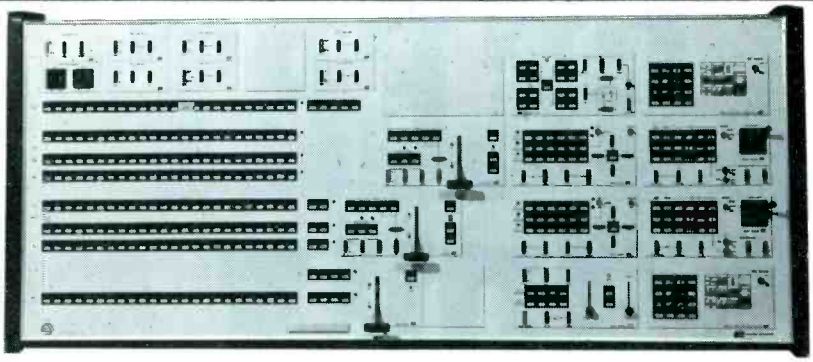

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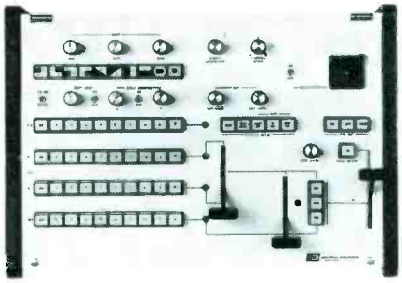

Sophisticated enough for large studio production, yet compact and inexpensive enough for small mobiles. Soft wipes and keys—even a Downstreamer keyer are standard. Self-contained and remote versions available.

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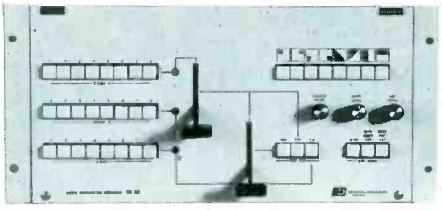

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COMMENCING THE 1978 GREAT IDEA CONTEST

The Great Idea Contest continues to be a "great idea" as more of you send in original solutions to everyday engineering problems. BM/E is delighted to continue this feature to convey to the industry the ingenuity of individual broadcast engineers. We hope you will participate again this year. Rules for entry are on the next page. Remember to vote on all published ideas. It's your contest. 1977 winners will be announced in the March issue.

1. Variable Equalizer For Telephone Lines.

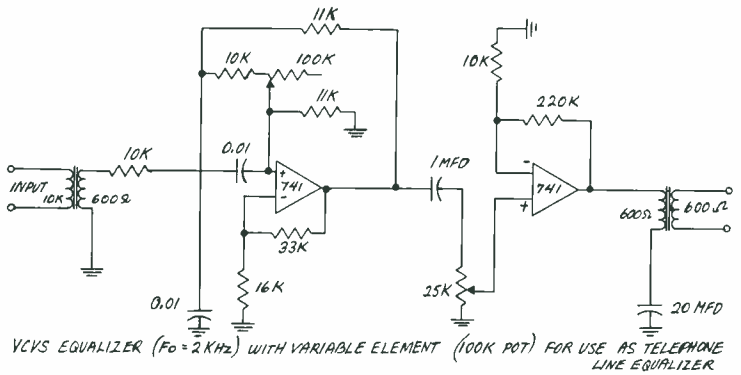
Allan S. Joffee, WCAU Radio, Philadelphia, PA

Problem: To improve quality on telephone line inputs.

Solution: This equalizer is designed to handle the class D line problem or the telephone call equalization problem. The bridging transformer feeds into the equalizer proper which is basically a VCVS band pass configuration with an adjustable slope control. The output of the filter is amplfied by the output Op amp which feeds a 600 ohm to 600 ohm transformer supplying a standard balanced output. The power requirements are a conventional plus and minus split supply of twelve to fifteen volts at minimal current.

When the 100 K pot is at minimum resistance, the filter exhibits a modestly flat curve between 100 Hz and 4 KHz. The upper limit then drops off fairly sharply. When this pot is at its maximum resistance then there is a tailored slope which places 100 Hz about 30 dB below the 4 kHz upper frequency point. The range of slope variation has proven very effective in handling the situations it was designed for. It very effectively dehums and brightens incoming audio from marginal lines.

If somewhat more gain is needed, then the 10 K resistor at the inverting input of the output op amp may be reduced to 4.7K.



VCVS equalizer (Fo = 2 KHz) with variable element (100K Pot) for use as telephone line equalizer.

2. Determining Direction Of Receiving Antenna.

Jack Vinson, Chief Engineer, WACO Radio, Waco, TX

Problem: For stations that do a lot of remote broadcasts using a Marti or similar transmitter unit, it is sometimes difficult to determine the direction of your receiving antenna.

Solution: If your station's antenna is located at the receiving antenna site, it is possible to use a small battery portable radio with a whip antenna to sense direction. Tune the radio to your station and, if it is an FM station, hold the radio so the whip is horizontal and point it in the direction of your station. The point of minimum signal will be directly toward your transmitting antenna. To

continued on page 102

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From Otari for uncompromising recordists. MX5050-2SHD designed for peerless two-track quarter-inch masters.

It's an exception of compact recorders. Specially designed for critical professional applications from the ground up. It leaves nothing to be desired. 68dB signal-to-noise and greater-than-60dB crosstalk. Variable speed DC-servo capstan motor for less than 0.05% wow/flutter and ±7% pitch control. +19dBm headroom before clipping. Motion sensing control logic. Front panel edit and cue; stepless bias adjustability; built-in test and cue oscillator; all front accessible. 600 ohm, +4dBm or -10dBm fixed-level output and XLR connectors. Remote controllability for all transport functions. In short, it's a sheer professional masterpiece to produce desired 15 or 7-1/2 ips masters.

The performance and reliability have been fully proven since its original version was introduced in 1973, in more than one thousand practical applications by broadcasters, studio recordists, audio-visual professionals and musicians all over the world. For the full story of this unique and compact professional machine, ask anyone who uses it or get in contact with your nearest Otari distributor.

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U.S.A.: Otari Corporation, 981 Industrial Road, San Carlos, California 94070

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control sensitivity in case of a strong signal, push the antenna downward into the radio.

3. A "Stick-On" Alternative.

Gregg Wilson, Operations Manager, WZLD-FM, Cayce, SC

Problem: Getting rid of a disorganized "gadget bag."

Solution: Instead of worrying about shoulder straps on a gadget bag, or if the snap holding those cables to the recorder strap is going to come unsnapped, etc., I've put 1 in. by ½ in. strips of adhesive backed Velcro on as many flat surfaces of my Sony portable as possible without interfering with controls or speaker. I also put Velcro on an assortment of cassette boxes, small gadget bags, loops for audio cables, external power leads, even the side of the mic. Whatever accessories I think I'll need I simply stick onto the side of the deck and take off. I have yet to lose anything because of the Velcro not holding, and I've found I've got a much more convenient package to carry than the gadget bag hung monstrosity I used to wrestle with. I can also see at a glance what I have with me and no longer waste time sorting through a bag to make sure 'x' is there before I leave.

Velcro strips are not hard to find and are quite inexpensive. (Mine come from Radio Shack for another purpose and I appropriated the remainder.) Believe me, an afternoon spent on applying Velcro to your equipment (and I'm assuming you're a slow worker when I say an afternoon) will more than pay off in quick order; in time saved when a newsman has to 'grab and go,' in frustration, and in ease of preparation at a news site.

4. Inexpensive Non-Composite Black Burst Generator.

Francis E. Hertel, Manager of Transmission, WNIN TV, Evansville, IN

Problem: I received a request from a closed circuit TV facility to come up with an inexpensive, non-composite, black bursh generator.

Solution: There are certain precautions to observe when constructing this generator. These include:

Use a good and heavy ground buss. Poor grounds will cause overshoots and noisy base line during non-burst periods.

FET source leads should connect directly to the ground buss. Make source leads as short as possible.

Keep the circuit layout physically small and all interconnecting wiring short.

Use a well shielded metal case for housing the circuit.

If you decide to make a P.C. board for the project, a 1.5 in. x 3 in. copper clad board will allow more than enough room for the circuit and yield enough excess copper for the good heavy ground buss.

Timing of the black burst is accomplished by cutting input and/or output cables to length or via adjustable delay lines.

For those who might want to take another approach to black burst timing: 1. A variable 3-30 Pf. cap. from the drain of Q1 to ground will effectively delay the start of the burst (delete the 6.8 pf. cap. if you use the above

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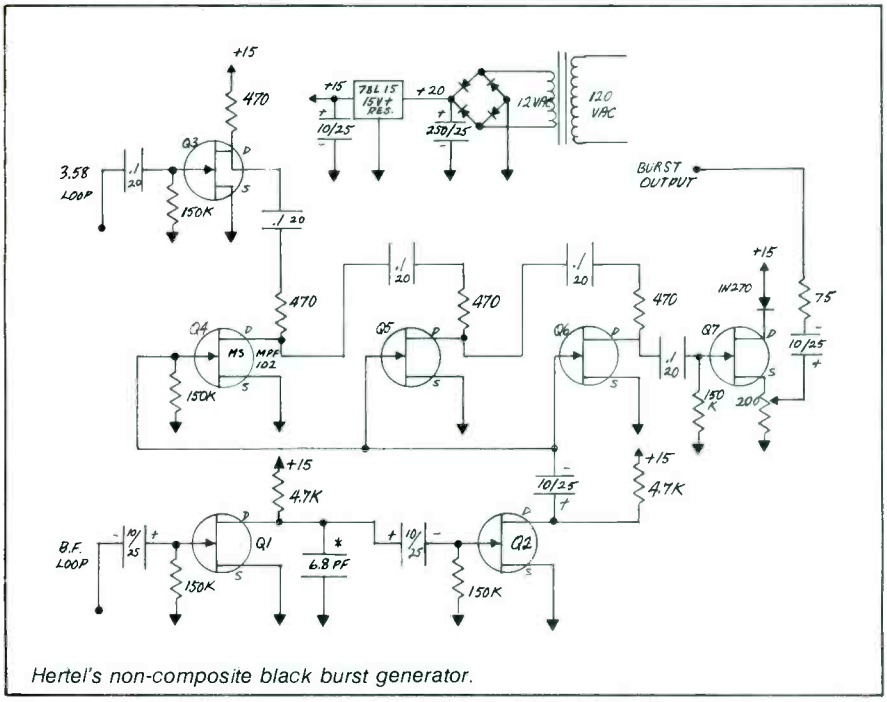
option). 2. A variable 3-30 Pf. cap. from the drain of Q2 to ground will additionally delay burst a small amount, but will primarily widen the burst duration and allow the user to trim burst width as their system might require.

3.58 phasing is a function of an external adjustable delay line, or by butting of an appropriate length of cable that supplies the C.W. 3.58 into the black burst generator.

If you watch where you purchase your parts and settle for surplus dealer parts, the black burst generator can easily be constructed for under $20.



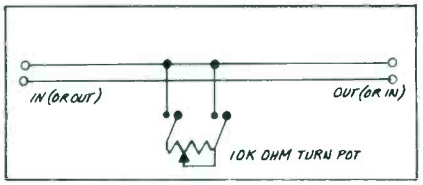
Hertel's non-composite black burst generator.

5. Simple Device For Matching Impedance.

David C. Williams, Director of Engineering, KGMS/KSFM, Sacramento, CA

Problem: One man's 600 ohms might be another man's mismatch.

Solution: The original idea for this gizmo came from Lauderdale Electronics Labs, whose information led me to question some manufacturers' claimed input and output impedances on audio gear. Lauderdale claimed that many alleged 600 ohm (or whatever) impendances are not exactly what they're supposed to be (outputs would be lower, and inputs would be higher). They suggested a simple little device, which I've expanded upon, to insure that the frequency response of your system is as flat as possible.



It works on the principle that two resistances will share the load across them; if the two are equal, they will

continued on page 104

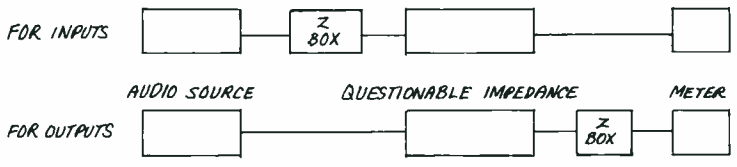
share the load equally by placing a pot across the impedance (in parallel with it) and adjusting it to assume exactly one half the load, you will have adjusted it to exactly the same impedance as that which you have placed it across. The way I did it (in a minibox, if you can top that . . .) is in Fig. 1.

The original design called for a multiposition switch with many pots as well as an ohmmeter (as a necessity) for each measurement. This could prove to be a hassle at times, so I visited the local surplus store and picked up a good ten turn linear precision potentiometer (10 k ohms) and a brand new vernier control for it for the absurd sum of $5.00. After wiring it up, a quick calibration with some 2% and 5% resistors I had around was all that was necessary. Now . . . it will tell me the true value of input or output impendance as in Fig. 2.

Connect everything as shown; switch the 10 turn pot out of the circuit; set the source (audio generator, or whatever) to provide a handy reference voltage on your meter; switch the pot back into the circuit and adjust it to reduce that handy reference voltage to exactly one half of its former value (or reduce it 6 dB). Now, either measure the resistance of the pot (which is the same value as the impedance in question), or simply read the value of the unknown from the calibrated vernier control (and this is the beauty of the whole thing). A 10K pot is super because, with a 10 turn control, you simply read the dial (3 decimal places), and multiply by 10. A 10 turn 1K pot would be just as convenient, but would lack sufficient range (it would be a trifle more exact on the lower ranges, though). Of course, any value would work with the appropriate multiplicative correction factor.

Two important points: 1) Get a pot with good linearity, otherwise the calibration (which, by the way, is as simple as setting the vernier to read what you want it to at some previously determined value) will be right on at one value and way off at another. Also, leave a set of binding posts across the pot anyway for calibration (also, you might get so particular about the whole thing you'll want to use a Wheatstone Bridge to measure the pot's value); and

2) use a high input impendance meter to prevent it from distorting your measurements, especially with outputs. A 20 K distortion analyzer will work, but be careful . . . 20K paralleled with 600 is 583 ohms. A 10 meg VTVM or DVM would be preferable. Also, don't load down the output of the source; as you vary the pot, you might check to see that the output hasn't changed.



Williams' device for matching impedance.

Rules for BM/E's Great Idea Contest

1. Eligibility: All station personnel are eligible. Consultants to the industry may enter if the entry indicates the specific station or stations using the idea or concept. Manufacturers of equipment or their representatives are not eligible.

2. How to Enter: Use the Official Entry Form on this page or simply send *BM/E* a description of your work. State the objective or problem and your solution. Include diagrams, drawings, or glossy photos, as appropriate. Artwork must be legible but need not be directly reproducible but not exceeding three in number. Camera reproducible material is preferred. Length can vary, but should not exceed 500 words. *BM/E* reserves the right to edit material. Entry should include: Name, title, station affiliation, and the class of station—TV, FM, AM. Indicate if idea is completely original with you.

3. Material Accepted for Publication: *BM/E* editors will make all decisions regarding acceptability for publication. If duplicative or similar ideas are received, *BM/E* editors will judge which entry or entries to accept. A $10 honorarium will be paid for each item published.

4. Voting: Every reader of *BM/E* is entitled to rank the ideas published. This can be done on the Reader Service Card in the magazine or by letters or cards sent to the *BM/E* office. To vote, readers should select the three ideas they like best and rank them 1, 2, or 3.

5. Winners: Top rated entries in the year long tally will become winners in each of the three major categories (AM, FM, TV). Final winners will be picked in February 1979 and announced in the March 1979 issue of BM/E

Mail to: Editors, BM/E
295 Madison Avenue
New York, New York 10017

1977 Entry Form

Name_____ **Title** _____

Station Call Letters_____

City _____

State _____ **Zip** _____

Telephone No. _____

Licensee_____

Class of Station at which idea is used (check one) TV_____ **FM**_____ **AM**_____

Category: Audio _____ **RF**_____ **Video**_____ **Control**_____

Objective or Problem: *(in few words; use separate sheet for details* _____

_____

_____

Solution: *(Use separate sheet—500 words max)*

I assert that, to the best of my knowledge, the idea submitted is original with this station; and I hereby give BM/E permission to publish the material.

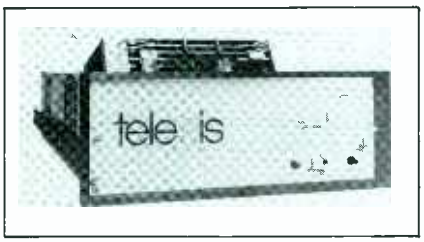
*Signed*_____ *Date* _____

6. Prizes and Awards: Three top prizes will be awarded: a programmable electronic calculator will be awarded for the highest rated entry in the respective categories of AM, FM, and TV. Ten engineering slide rule calculators will be awarded as secondary prizes for the highest rated entries in the following additional categories (top three winners are not eligible for these prizes): audio (three prizes, one each in the AM, FM and TV categories); RF (three prizes, one each in the categories of AM, FM, TV); Control (three prizes, one each in the AM, FM and TV categories); Video (one prize in TV).

BROADCAST EQUIPMENT

Remote Control System 300

Transmitter plant remote control is now provided by a system using a DEC LSI-11 minicomputer, as an auto-logging, remote control, and tolerance alarming system, with hundreds of con-



trol, metering and status channels available. TELESIS system is designed for use in multi-transmitter plants, either AM, FM or TV. The system minimizes the need for costly accessories which are dedicated to single operations. ERIC SMALL & ASSOC.

Studio/Transmitter Link 301

The TFT Model 770/771 STL provides an audio channel in the 950 MHz band between the broadcast studio and transmitter. It can also be used for studio-to-studio, intercity, network and similar radio feeds. A fully redundant receiver/transmitter system with automatic changeover when signal failure is detected, assures continuous reliable transmission. Capable of both single and dual composite as well as dual monaural operation, the link permits the operation of two monaural channels within a single 500 kHz bandwidth, with no crosstalk between channels. Transmission of a composite signal including stereo and two subcarriers for the SCA and remote control is another capability of the STL. TIME & FREQUENCY TECHNOLOGY, INC.

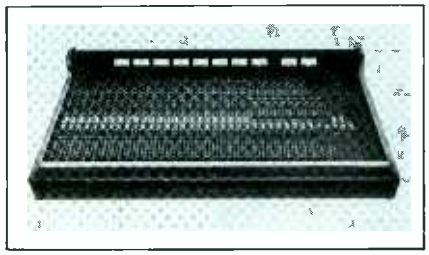
Tape Cartridge Machines 302

New Criterion 90 series tape cartridge machines features include extensive magnetic shielding for improved signal-to-noise performance, typically -58 dB mono and -55 dB stereo. This new shielding permits stacking without inducing measurable hum into adjacent decks. Also included are low noise pro-

gram amplifiers with +18 dBm output for greater headroom and high reliability PLL cue detectors that meet NAB specs. HARRIS CORP.

Audio Mixer 303

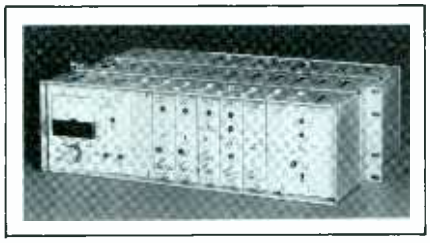
A 24 in-eight out audio mixer featuring new electronics, more head room and improved sonic quality is now available. The Model 15 used in the TEAC Tascam Series, features include: switchable six-band equalizer; new knob controls that allow pre- and post-



fading for cue and echo mix; and two 8x2 submixes for separate or cascade operation, and from which either bus or tape can be monitored. TEAC CORP. OF AMERICA.

Satellite TV Receiver 304

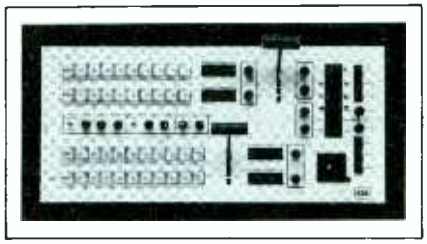
A single channel microwave receiver for use in 4 GHz satellite TV receive-only earth terminals is now available. The FST-4 Series receiver converts in-



coming RF signals into video/audio outputs and is fully compatible with 525/625 line NTSC, PAL, PAL-M and SECAM system requirements. FARINON ELECTRIC.

Video Production Switcher 305

The 902 Video Production Switcher is designed with two mix/effects systems which enable the producer/director to create wipe transitions on either mix/effects by sharing a pattern generator. The unit utilizes digital control logic to perform many functions previously



possible only on larger switchers. The 902 is rack-mountable and uses 8¾ inches of rack space. INDUSTRIAL SCIENCES, INC.

Tape Timing Accessory 306

A new multi-point search-to-cue and tape timing accessory that provides up to 20-cue storage capability for a variety of mixdown and over-dubbing operation. The unit features a 10-button keyboard panel and a cue store control allows access to a digital memory array. The keyboard is used to store up to 20 cues in memory and to recall them as desired. It is compatible with all Ampex ATR-100 and MM-1200 series recorders. AMPEX CORP.

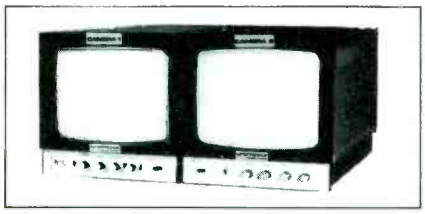
Video Distribution Amplifiers 307

The Model 72D is a differential input VDA intended for use with signals having large amounts of hum. Hum rejection of this model is better than 55 dB. Model 72C compensates for poor high frequency response caused by long cable runs. The unit provides adjustable compensation for up to 600 ft. of RG59/U cable. Model 72DC incorporates both the hum rejection and cable compensation features in a single amplifier. All units are completely self-contained and provide 4 outputs from a single loop-through input. DYNASCIENCES.

For more information circle bold face numbers on reader service card.

9-In. Color Monitors 308

The PMT-9 series utilizes an in-line gun and a self-converging picture tube with rare earth phosphors. Other features include pulse cross, A or B video



selection, A plus B video selection, switchable sync and a professional blue set-up switch. PTM-9 monitors can be rack mounted in a 8¾ inch vertical rack space and side by side with a waveform monitor, audio amplifier, wide band monochrome monitor, or another PMT-9 color monitor. UNIMEDIA.

Recording Head Cleaner 309

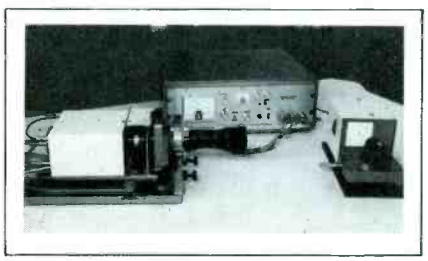
A new head cleaning solution, designed for removal of tough residue and impacted dirt on recording heads is now available. The Pentagon Head Cleaner effectively removes wet shed and reconditions rubber parts. Wet shed, the manufacturer explains, occurs where the binder (adhesive) does not adhere to the tape backing and the binder and oxide is deposited on the head. The friction of the tape moving at high speed across the head glues the binder oxide to the head. PENTAGON INDUSTRIES.

Stand By Slide Sets 310

New sets of four stand by slides compatible with broadcast and non-broadcast telecine chains are now included in the Porta-Pattern catalog. Each set includes vivid color photos of two flower arrangements, a bird in flight and a young lad fishing, with "Please Stand By" superimposed. TELECOMMUNICATIONS INDUSTRIES, LTD.

Optical Lens Gauge 311

An optical gauge for photo and TV lenses that may be used without special



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Broadcast Equipment

optics training and under normal studio conditions for routine acceptance testing of still, cine and TV lenses is now available. The system consists of three units: an image analyser, object generator and electronic control unit with meter display. The units are portable designed for use in normal filming operations. SIRA.

Electronic Enclosures 312

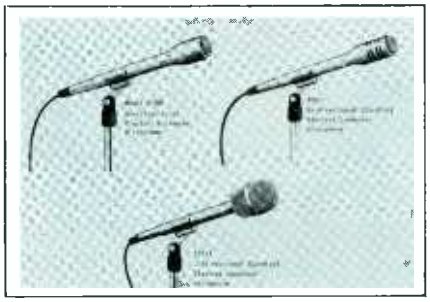
New Instant Optima/PAK's in 19 inch widths, a 28 inch high vertical cabinet and Optima Accent Cases in 5 inch, 7 inch, and 8 inch heights are now available. Optima Accent cases are shipped knocked down to reduce freight costs. All Instant Optima products are painted in a soft beige with bronze trim. SCIENTIFIC-ATLANTA, INC.

Rollable Tape/Film Cabinets 313

New ball bearing mounted cabinets for tape and film storage maximize use of available storage space. The rolling cabinets move easily, gliding on a low-profile steel track. When lined up in rands of up to five deep, the units roll easily left or right to provide fast access to cabinets at the rear. Both stock systems and custom designs are available. Free design service is available from the manufacturer. THE WINSTED CORP.

Lines of Microphones 324

Audio-Technica's line of microphones has been introduced to the U.S. for the first time. The company's first microphones are available in three electret

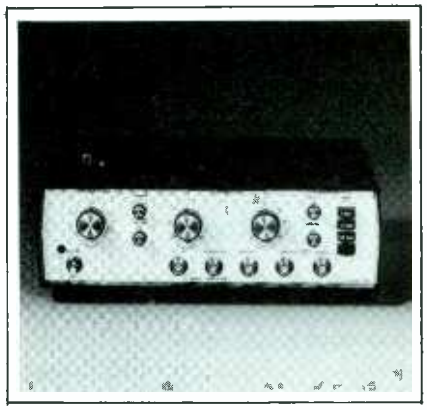


condensor and two dynamic "moving coil" models. Each type is available with cardiod (unidirectional) and omnidirectional acceptance patterns. All electret models have permanently polarized diaphragms and need no external power source. Prices range from $50 to $80. AUDIO-TECHNICA.

For more information circle bold face numbers on reader service card.

Broadband Sweep Generator 325

New broadband sweep generator priced at $625 is approximately half the cost of comparable units on the market according to the manufacturer. The Model 1061 has a frequency range of 1 to 400 MHz and features PIN diode leveling to provide an output flatness of ±0.25 dB. Harmonic and non-harmonic spurious signals are 30 dB below the output. The



unit has provision for up to six crystal-controlled, birdy by-pass markers with amplitude adjustment of mV to 2 V peak-to-peak, and width adjustment of approximately 100 to 400 kHz. The markers are accurate to 0.005%. It is available in 50 or 75 ohms. Remotely programmable center frequency, sweep width and amplitude over the 20 dB vernier range is standard. $625. WAVETEK ELECTRONICS GMBH.

Heavy Duty Wire Tie 326

Heavy duty 17-inch wire tie for bundling cables, wires and hoses. Nytye NT-425 has a minimum tensile strength of 120 lbs. and a maximum bundle diameter of 5⅛ in. It fills a previously existing void between ties for 4⅛ in. and 6⅛ in. bundle diameters. The all nylon NT-425 is available in natural white nylon. It is also available on special order in other colors or in ultraviolet resistant material. The Heyco Nytye is easily assembled by hand or tool and is available for regular or mounted applications. A triple-tooth rachet in its head engages with matching teeth on its body to assure a positive non-grip slip. Samples available. HEYMAN MANUFACTURING CO.

Microprocessor Calibrators 327

Calibrators with microprocessor control, devoid of any mechanical switch

controls, using a simple keyboard entry for functions, amplitude, frequency, etc. Storage and calculating capability provides separate upper and lower error limits entered in choice of volts, current, resistance, percentile or dB. Any arithmetical fraction may be keyed for downscale linearity checking, with error readout in percent of full-scale. No output ranges need be entered, only output magnitude—the microprocessor provides optimum resolution. The microprocessor also compensates for lead resistance when calibrating ohm scales. Models 5100A and 5101A accept RS232 and IEEE 488 system options and both are available with a 10 MHz option for RF voltmeter. The 5100A, without cassette reader, is $6995. The Model 5101A, at $8995, includes a mini-tape cassette reader for storing up to 58 calibration steps. JOHN FLUKE MFG. CO., INC.

Cleaner/Evaluator 328

Cleaner/evaluator for automatically cleaning and evaluating ¾-in. video cassettes operates ten times faster than real time without altering the recorded signal. The CCE Model U-1 removes dirt and embedded particles from tape surfaces and detects surface and edge damage causing VTR clogging and video dropout. A one hour cassette is processed safely and easily in less than six minutes. Two LED indicators and eight messages displayed on the front panel show tape and system status at each stage of operation. The system requires little or no operator training. CHYRON TELESYSTEMS.

1600 Line Resolution Camera Tube 329

The new tube, designated type 45XQ, is an extension of Plumbicon™ camera tube technology. Limiting resolution of the 45 XQ is greater than 1600 TV lines with 400 TV line response typically 95 percent and 1000 TV line response between 35 and 40 percent. Decay lag after 50 msec is typically 5 percent, even without using the tube's integral bias light system. The 45 XQ is a 30mm tube with effective target diameter of 26mm. Its design and construction are markedly advanced. Its evaporated G_3 electrode reduces the requirement for deflection power and improves geometry and registration, and its rugged mesh construction reduces microphonics. The manufacturer expects the tube to find application in motion picture production and other specialized broadcast uses. Pre-production sample tubes are now available for evaluation. AMPEREX.

Business Briefs

continued from page 27

recorders to the American Broadcasting Co. They will be used in ABC's network production. VPR-1 orders are coming from a broad spectrum of the international marketplace officials reported.

Scientific-Atlanta, Inc. and Spectral Dynamics Corp. reached an agreement in principle for S-A to acquire Spectral Dynamics, a test instrument firm . . . . Peter K. Onnigian, president of Cetec **Jampro Antenna Co.,** will devote full time to world-wide marketing of Jampro's CPTV antenna. Broadcast industry analysts have estimated a global market of $50 million for circularly polarized antennas.

Forward Communications, in Wausau, Wisc., has ordered $2.5 million of **RCA** TV transmitting, studio and ENG cameras, and associated equipment for its group stations . . . . **KTVT,** Ft. Worth/Dallas, signed an order for **RCA** transmitting and film originating equipment . . . . **PTL** (Praise the Lord) Television Network is expanding its Charlotte, N.C. center with **$500,000** of RCA color TV gear. It will be used in a new programming facility to feed PTL telecasts via satellite to affiliate TV stations . . . . **LeSea Broadcasting Corp.,** Indianapolis, Ind., placed a **$1 million** order with RCA for studio and portable cameras, VTRs, and film systems equipment. The gear is slated for: WHMB-TV, Indianapolis; WHFT-TV, Miami; and WHME-TV, South Bend, Ind.

Trinity Broadcasting Network (TBN) has placed an order with **Scientific-Atlanta, Inc.,** for a transmitting and receiving video satellite earth station to be installed in Tustin, Calif., and a satellite video receiving earth station for the TBN Phoenix broadcast station . . . . **Angenieux Corp. of America** has announced the sale of 100 42X studio and outside broadcast lenses to the **Soviet Union** for use at the 1980 Olympic games . . . . **Canadian Broadcasting Corp.** has ordered 100 W and 300 W solid state VHF FM transmitters from **Bayly Engineering,** a unit of the AEG-Telefunken group.

Data Communication Corp. signed up WGNO-TV, New Orleans; WWWE-AM, Cleveland; WTAJ-TV, Altoona, Penn.; and WPGH-TV, Pittsburgh for its "BIAS" (Broadcast Automated System) . . . . **Ampex Corp.**'s magnetic tape division has announced price increases averaging 5 to 10 percent for certain of its professional audio and industrial tape products, and for its complete line of blank consumer tape products.

Robert Wold Co. has wrapped up its biggest-ever schedule of professional basketball and hockey TV and radio. Wold's TV traffic for local clubs in the National Basketball Assn. (NBA) and National Hockey League (NHL) will total 362 games, an increase of 31% from a year ago . . . . **Bozak,** the hi-fi audio equipment manufacturer, was sold to a group headed by **Joseph Schlig** . . . . A newly formed company, **Electro-Optic Devices Corp.,** will design and manufacture ancillary components to support a fiber optics system. Its investors include Irving B. Kahn and Times Fiber Communications, Inc., a fiber optics systems manufacturer. EOD will provide Times Fiber with connectors, splitters, couplers and terminating devices needed for Times optical fiber systems for the CATV, data link, and other non-CATV markets.

The yearly syndicated **OPUS 77** radio special has surpassed the one hundred station sales mark, said producer Dick Starr. Recent sales include Drake's K-100 in Los Angeles; KXKX, Denver; KCMO, Kansas City; WFBR, Baltimore; KLIF, Dallas; and WFIL, Philadelphia . . . . **KAFE Radio** Santa Fe, N.M. became an affiliate of the CBS Radio Network . . . . **Warner Cable Corp.,** a subsidiary of Warner Communications Inc., announced that it will begin a new pay TV series called "Cafe Manhattan" on its two-way QUBE system in Columbus, Ohio. Cafe Manhattan provides the viewer with the intimate, informal theatrical atmosphere of top N.Y.C. clubs and is the first of its kind for pay TV.

C-Cor Electronics, Inc. has begun delivery to Warner Cable on a $252,000 order for replacement and drop-in of trunk amplifiers for their CATV system in Kingsport, Tenn. . . . . An earth station leasing company is being formed by **Alron Communications, Inc.,** Melville, N.Y. According to J.H. Scheinman, president of Alron, "Smaller (CATV) systems, and even larger ones that do not want to drain cash by building their own earth stations, will be able to provide major entertainment from Las Vegas and elsewhere, just as the big systems do now."

Teleprompter Corp. reported continued profit improvement in the third quarter of 1977. Net income for the 3 months ended Sept. 30, 1977 was $2,866,000 (4.17 per share) . . . . **Gulf + Western Industries, Inc.** reported a decline in net earnings for the year ended July 31, 1977. Net earnings were $150.3 million compared with last year's $190.1 million . . . . **Zenith Radio Corp.** announced the election of Revone W. Kluckman as president and chief operating officer . . . . **James Craig Ziegler,** one of the founders of Data Communications Corp., Mem-

phis, Tenn., has been named senior vice president for the parent company.

Remote camel racing in Bahrain will be a TV coverage possibility with **Pye TVT Ltd.**'s rugged outside broadcast vehicle being built for the Ministry of Information, Bahrain. The vehicle will be built on a Bedford four-wheel drive chassis and will have two LDK 11 portable color cameras and a CDL VS-10 production switcher . . . . **Dielectric Communications** announced that all RF wattmeters, loads and accessories shipped after September 1, 1977 are warranted for two full years from the date of shipment . . . . **VIZ Test Instruments Group** of VIZ Mgr. Co., Philadelphia, Penn., has announced a price cut on its WD-752A frequency counter and WD-751A digital VOM.

John E. Leonard, Jr., was named vice president/general manager of **Moseley Assoc., Inc.** . . . . William Cox and Robert Molley have announced the formation of a new mobile TV production company, **Video Image Production,** in Norfolk, Va. . . . . **Elmer Ellsworth Smalling III** set up shop in N.Y.C. as a consulting engineer. He was formerly with American Broadcasting Co. in engineering management . . . . **Martin Jackson,** formerly vice president of Broadcast Communications, Inc. has set up his own broadcast equipment rep firm in Scotts Valley, Calif.

Leasemetric, division of Metric Resources Corp., Burlingame, Calif., has announced the move of its Houston Rental Inventory Center into larger quarters at 5855 Sovereign Drive., Suite 100, Houston, TX 77036; tel: (713) 988-1000 . . . . **KOAX-FM** has announced its plans to relocate in early 1978 to new studios in the 50 story Reunion Tower under construction in downtown Dallas . . . . The **Council on International Nontheatrical Events** (CINE) is celebrating its 20th anniversary as the country's only voluntary, non-profit organization which coordinates U.S. entries in international film festivals abroad.

University Sound has announced the appointment of **Ron Means** to national sales manager . . . . **Larry LaKashman** has rejoined **Electro-Voice** as vice president for marketing . . . . IGM, a division of Northwestern Technology, Inc., of Bellingham, Wash., named **Peter P. Ruese** general manager . . . . **Sidney B. McCollum** has joined **Recortec** as national sales manager for video products . . . . **William T. Yasueda, of Recortec, Inc.,** has been appointed video product manager . . . . **Dynasciences,** a unit of Whittaker Corp., has announced the appointment of **John Samony** as national sales manager for video products . . . . **Herb Winawer** has been named vice president—sales at **S/T Videocassette Duplicating Corp.**

John S. Auld, president of EEV, Inc., announced the **acquisition of the assets of Microwave Associates,** Watsonville, Inc. from Microwave Associates, Burlington, MA . . . . Auld also announced the establishment of **corporate headquarters,** warehousing and service facilities at 7 Westchester Plaza in Elmsford, NY 10523 . . . . WSPA-TV, Spartanburg, SC, announced that construction of a new $1.5 million building would get under way immediately. Its president Walter J. Brown said the FCC approved the relocation of its studios at the intersection of I-85 and I-26 . . . . The **sale of KGVO-TV,** Missoula, KCFW-TV, Kalispell and KTVM, Butte, MT to Eagle Communications, Inc., a Montana corporation organized by Advance Corp. and Sullivan Productions Inc., was announced by Dale Western Broadcasting Co. Sale of the stations is contingent on approval by the FCC.

Corning Glass Works will begin **full-scale production of optical waveguides** at its Wilmington, NC electronics plant in 1978. The company said that conversion of about one-half of its 77,000 square feet of production and office space will begin im-

continued on page 112

mediately. Full production is expected by September . . . . **Warner Cable Corp. has announced consumer fees** for its new two-way QUBE communications service that premiered December 1 in Columbus, OH. The new monthly subscription fee is $10.95 compared to the standard CATV rate of $7.50. Installation costs for the home terminal that makes it possible to receive 30 channels of video and other information will be $9.95 for present subscribers. New subscribers installation fees will be $19.95.

TV stations in 111 markets representing 77% of U.S. households have cleared for the Robert Wold Company's live telecast of the **53rd annual Shrine East-West Football Game & Pageant** on Saturday, December 31 at 4 pm . . . . CBS's **"On Our Own,"** the only prime time network TV series being shot on videotape in New York City this year, is being edited at the studios of United Production Services . . . . **WCPO-TV,** Cincinnati, OH, has expanded its production department to include a new service called "Hotel-casting." The service will provide a permanent closed-circuit TV connection between the Cincinnati Convention and Exposition Center and Stouffer's Cincinnati Towers and the Netherland and Terrace Hilton Hotels. The service will provide live and taped coverage of events in the Convention Center as well as highlighting local attractions.

Park Broadcasting Inc., headquartered in Ithaca, NY, has **ordered RCA** color television broadcast systems valued at approximately $1 million for five of its group stations . . . . WTTV, an independent VHF station serving Bloomington and Indianapolis, IN, will **begin broadcasting a circularly-polarized TV signal** late this year with a new RCA transmitter and broadcast antenna . . . . WGAN-TV of Portland, ME, equipped their new television studios with **Marconi Mark V11B cameras.** The move to the new facilities is part of a continuing expansion of WGAN's operations.

All silicon target camera tubes offered by **RCA Electro-Optics and Devices,** Lancaster, PA, will be supplied as low-bloom tubes at standard prices. according to Thomas T. Lewis, director, Electro-Optic Products . . . . **Harris Corporation,** Broadcast Products Div., **reports new orders:** radio station WCAW, Charleston, WV, a 50 kW MW-50A, 1 kW MW-1A, and a 20 kW FM transmitter; a 5 kW MW-5 and a 20 kW FM-20K ordered by King Broadcasting for KREM, Spokane, WA; and the third 220 kW TV transmitter sold in the U.S., representing 100% market share for this power transmitter, has been purchased from Harris by WPTF-TV, Raleigh, NC . . . . **Teleprompter** announced an agreement in principle with its banking group to enter into a $136,500,000 term loan maturing in installments through June 30, 1985. The interest rate will be ½ percent over prime. This loan would replace a loan for the same amount.

Modular Audio Products, a unit of Modular Devices, Inc., Bohemia, NY, has appointed the Professional Systems Products Div. of Adelman-Pinz Sales Corp. sales representative for the northern New Jersey, metropolitan New York area, including Long Island. Professional Systems Products offices are located at 570 Yonkers Ave., Yonkers, NY, 10704. Phone (914) 423-4747 . . . . **Video Components, Inc.,** headquartered in Spring Valley, NY, has been appointed as the national sales representative for the Matsushita line of vidicon, silicon and newvicon camera tubes . . . . A new West Coast sales and spare parts facility has been opened by **Ikegami Electronics (USA) Inc.** The new facility is located at 19164 Van Ness, Torrance, CA, 90550 . . . . Cameras, videotape recording equipment and a mini-mobile unit are part of the rental package now being offered by **Image Transform, Inc.,** N. Hollywood, CA. Present equipment includes two RCA TK-76 cameras with Canon 10:1 lenses, two JVC portable ¾-in. cassette VTRs, and one 2-in. Ampex AVR-2. The air conditioned mobile unit is optional and is designed to carry the AVR-2 and assorted audio gear.

Scientific-Atlanta, Inc. received an order from AT&T Long Lines for a 10-meter diameter satellite earth terminal. The $300,000 plus order utilizes the Scientific-Atlanta Model 8002 10-meter earth station antenna with a special reuse feed to operate with the satellite . . . . **Multronics, Inc.** of Columbia, MD, has received an award of approximately $50,000 from T-CAS, Inc., of Falls Church, VA, for the manufacture of a dual antenna tuner filter to couple a pair of 20 kW AM transmitters to a common tower . . . . **Ampex** received a $1.3 million contract from TV Boliviana to supply a variety of audio and video equipment to the national television network . . . . **RCA** television viedotape and film systems, valued at approximately $3.3 million, will be used in televising the 1978 world championship soccer matches in Argentina, RCA Broadcast Systems announced.

Rockwell International Corp. realigned its electronic businesses into three major groups and an international operation. Its new Commercial Tele-

communications Group will include the Electronic Devices Div. and the divisions of the former **Collins Commercial Telecommunications Group** . . . . **Racal Electronics Ltd.** announced that it has agreed to acquire the assets and the business of **Dana Laboratories, Inc.** of Irvine, CA, a designer and manufacturer of digital voltmeters and systems counter and a wholly-owned subsidiary of Dana Electronics Inc. of Newport Beach, CA. Also included in the acquisition are the assets and business of Dana's U.K. and French sales affiliates.

Varian Associates received a Citation of Outstanding Achievement in Engineering Development at the Television Academy of Arts and Sciences' Third Annual Awards Luncheon. The award cites Varian for improving the efficiency of UHF klystron tubes so that they use about 10% less power . . . . **FCC granted advance approval** of the long anticipated FFS-2000 **over-the-air pay TV system,** designed by Feature Film Services, Inc. of Skokie, Ill. System features include: subscription and/or per-program operation, controlled by the broadcasters; two-way communication, allowing subscribers to request up to seven different program services at the touch of a button via interface with the telephone network; continuous control whereby receiving units are "on" only when activated by the broadcaster's control signals and turned "off" automatically in the absence of such individually addressed signals.

Scientific-Atlanta, Inc. promoted **Mickey L. Hudspeth** to sales manager of its Satellite Communications Div. and hired Dr. Guy W. Beakley as manager of engineering for that division . . . . **Herman Schkolnick** was appointed vice president-sales of broadcast television products by Ikegami Electronics (USA) Inc.

Michale J. Plumstead has been appointed general manager of WRCP and WRCP-FM in Philadelphia . . . . **Terrell Metheny** has been appointed president and gm of radio stations WRIT and WBCS, Milwaukee, by Great Trails Broadcasting Corp . . . . **Dean Sorenson,** president, Sorenson Broadcasting Corp., has been elected president of South Dakota Associated Press Broadcasters.

Don Long has assumed the position of TV manager for KRDO-TV, Channel 13 . . . . **Kathy Wold** has been named as news director of KRNA radio, Iowa City, Iowa . . . . **Ward E. Bledsoe** has been appointed director of engineering of the Donrey Media Group's broadcast division.

George R. Gardner, chief executive officer of TV Cable of Carlisle, was elected president of the Pennsylvania Cable Television Association.

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