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BM/E

BROADCAST MANAGEMENT/ENGINEERING

ELECTION '80

BROADCASTERS PLAN TO WIN

CONRAC

INNER VIEW:
A closer look at Conrac Monitors

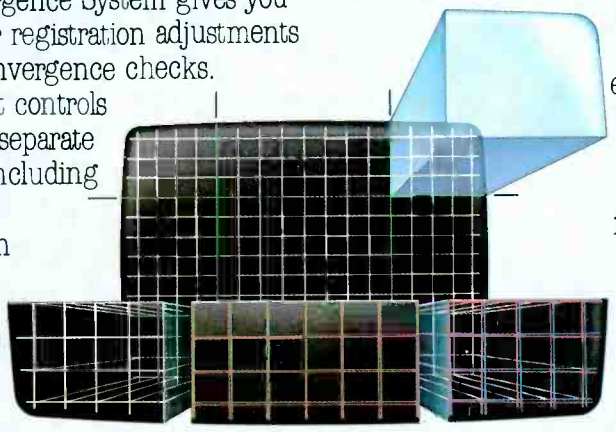
Active Convergence: Registration made simple.

Conrac's Active Convergence System gives you complete control over color registration adjustments and greatly streamlines convergence checks.

It uses 36 independent controls to individually adjust nine separate areas on the CRT screen–including corners!

You spend less time on convergence checks—and the adjustments you make will be much more accurate.

Conrac's system uses 24 operational amplifiers to independently control red, green, and blue in each screen area. Vertical and horizontal waveforms are referenced for shaping the signals that excite the convergence yoke assembly. Dynamic blue lateral convergence is achieved with operational amplifiers.



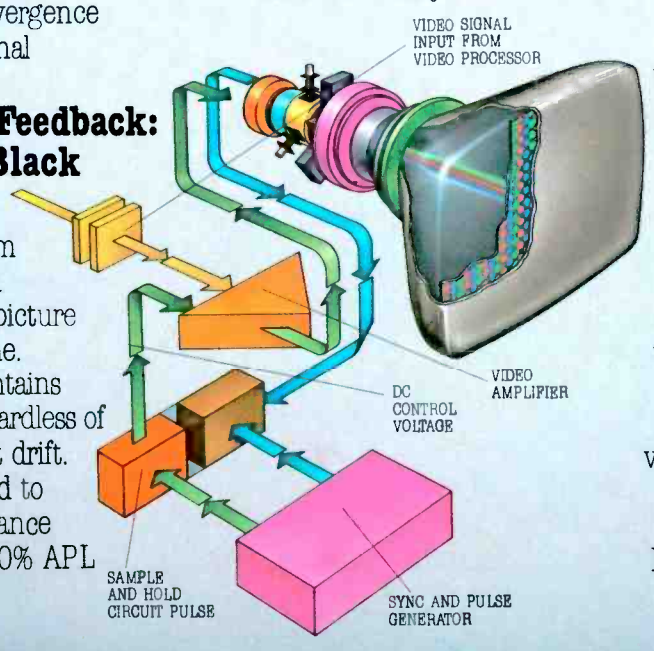
Conrac's Active Convergence system lets you adjust color registration on nine separate areas of the CRT.

Beam Current Feedback: The Ultimate in Black Level Stability.

Conrac's unique Beam Current Feedback system maintains a more stable picture for a longer period of time.

It automatically maintains black level stability—regardless of CRT aging or component drift. In fact, black level is held to within 1% of peak luminance level between 10% and 90% APL (Average Picture Level).

Conrac's exclusive Beam Current Feedback system automatically maintains black level stability.



Conrac's unique system uses a keyed back porch video amplifier and beam current sensing that occurs during the vertical interval. The video signal is ac coupled to the video amplifier, thus eliminating the dc component and retaining the level between black and white. It is then amplified and applied to G1 of the CRT. The feedback loop is completed when a sample cathode current (gated by the brightness pulse) is applied to a sample and hold circuit. If the cathode current changes for any reason, the video amplifier's dc level is automatically adjusted. Result: reference black level will remain constant.

Conrac Technology: 30 years of leadership.

Conrac's track record of technical innovation stretches back nearly three decades. And what we've learned since then goes into every monitor we make today. That's important to you. Because the more technology we pack into each monitor, the more performance you'll receive from it. Active Convergence and Beam Current Feedback are just two ways Conrac technology can save you time and money.

For the complete inner view of Conrac technology, call or write us today: Conrac Division, Conrac Corporation, 600 North Rimsdale Ave., Covina, CA 91722, Telephone: (213) 966-3511, Telex: 67-0437

Quality you can take for granted.

Circle 101 on Reader Service Card

Three more reasons for ADDA's leadership in digital image technology.

The VIP-2 . . . affordable video compression.

ADDA delivers low cost video compression, featuring one-hand joystick operation and pre-programmed picture sizing and positioning. The selectable "zoom" mode features fixed picture center or fixed picture edge.

The VW-2 . . . TBC/Frame Synchronizer for Type C VTR's.

The VW-2 is designed for Type C format VTR's with time base correction and digital dropout compensation. Other features of the VW-2 include velocity correction, heterodyne time base correction, freeze frame, and freeze field.

Computerized Library Control for ESP Systems.

ADDA's new computer-directed library control system records the description and location of as many as 64,000 stills stored in the ESP System. It provides the off-line capability to preview stills, assemble and edit sequences through the use of subject, time, and program source codes.

ADDA CORPORATION

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New from Hitachi

A Colossal One-Inch Step

One-inch is the VTR format of the future. It's too important a step forward for a scaled-up 3/4" or a scaled-down 2" system. It deserves to be totally original, with every advance designed in. That's how we approached the new Hitachi HR-200, after almost 20 years of experience making quad machines. The result: a one-inch Type C VTR destined to establish new broadcast standards everywhere. In every department, the Hitachi HR-200 is miles ahead of the one-inch competition!

Fast, sure, easy operation

Hitachi one-inch VTR's are loaded with features—many of them Hitachi exclusives. Like the brake release for easier threading. Both video and audio confidence. A "B-wrap" configuration, for reduced dropout. A *precision* moveable tape guide for easy loading, with an incredible 1-micron tolerance that's accurate for up to 2 million threadings! Plus a sloped design and easier-to-see top mounted drum for still easier threading.

Dazzling performance extras

Imagine shuttling a 1-hour tape end-to-end in just 80 seconds! It's possible, only on the Hitachi HR-200, because an internal air compressor injects a column of air into the tape guides to reduce friction and increase acceleration. The same air compressor provides air for the non-contact air drum, cushioning the tape when in the standby or fast shuttle modes. For fumble-free shuttling and jogging and fast editing, a single knob controls both. There is audio spot erase capability. And a Hall-Effect head on the third channel reads the time code more accurately, regardless of tape speed.

A microprocessor makes the built-in editor the most advanced you'll find today. And, just as important: it can be re-programmed to interface with editing systems of the future. Serial or parallel logic for remote control? Both have advantages, so Hitachi gives you both. Built-in cable compensation boosts the signal so you can use cable up to 300 feet.

Uniquely simple service

Serviceable components have been human-engineered for easy access and replacement. The PC modules are front-mounted and can be removed in an instant. The six heads come as a pre-aligned drum assembly that snaps out and snaps back in minutes.

HR-100 Portable Model

The HR-200 is available as a console, or for tabletop use or 19" rack mounting. Best of all, it costs no more than ordinary 1-inch VTR's!

Smallest Type C portable ever!

The HR-100 portable model has many of the HR-200 features, yet it's the smallest Type C portable in the world. And the most serviceable too, with plug-in PC modules. Die-cast uniblock construction makes the HR-100 durable yet extremely light. And like the HR-200, it has a non-dropout tape path. Plus an extended tape path for less edge wear, an auto back space assemble editor, and 3-way power with built-in battery pack, AC adapter or external DC.

Take a big one-inch step. See the New Hitachi 1" VTR's...today.

Hitachi...Tomorrow's technology today.

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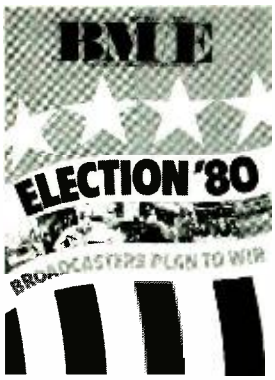
MAY 1980/VOLUME 16/NUMBER 5



The quadrennial elections provide radio and television stations with one of their greatest challenges. The goal is to get the information first and deliver it fast

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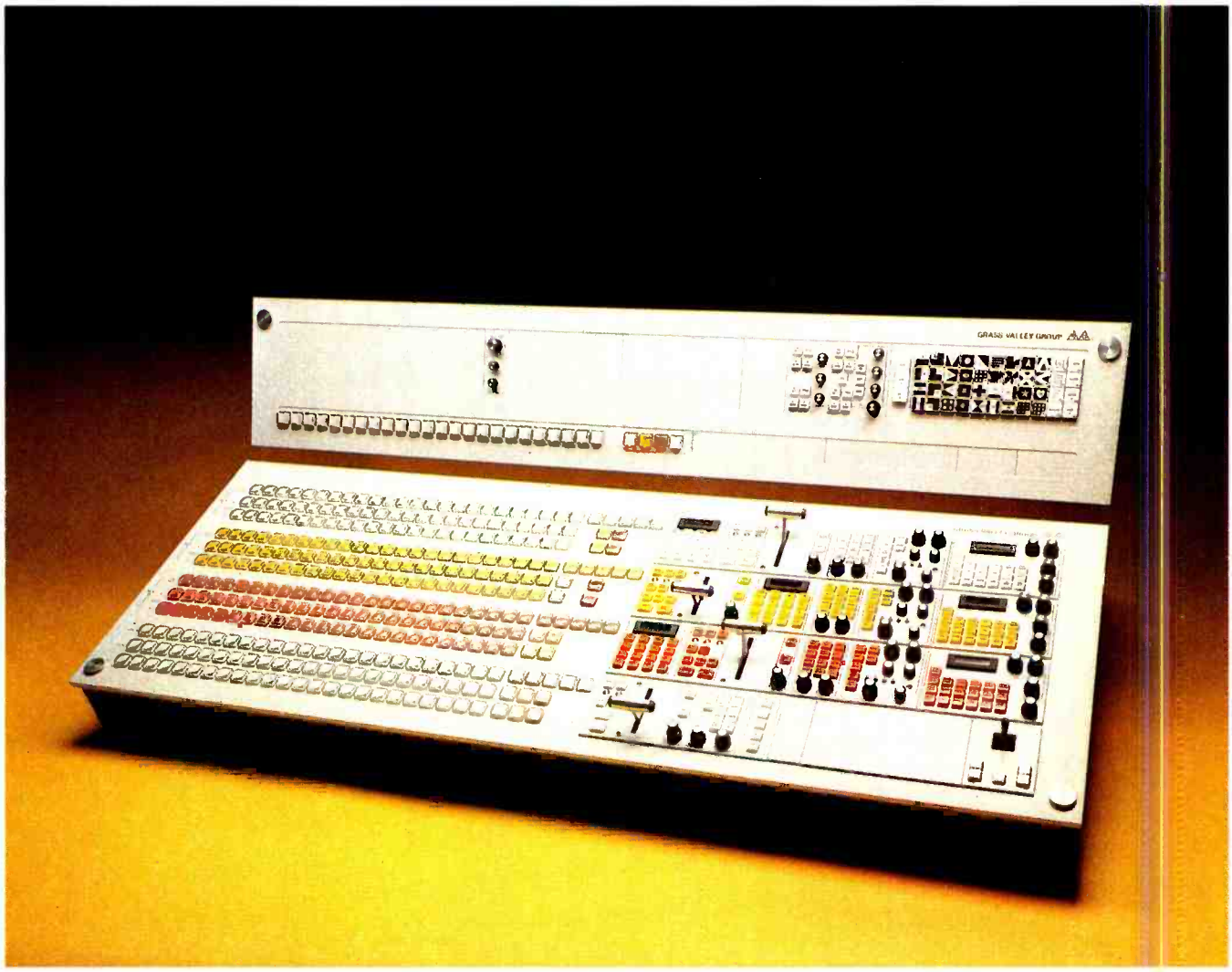
Unmatched Power!

The new GVG™ 300 Production Switcher and Four-Channel Mark II Digital Video Effects



New-from-the-ground-up designs

The 300 switcher and MkII DVE are completely new in concept and design—not merely revisions of previous models. The 300 is a no-compromise switcher designed to complement the popular 1600 Series for the ultimate in production flexibility and power. The four-channel MkII DVE is a second generation unit with unique features providing an almost unlimited variety of effects.

New features, new production power

The 300 is an advanced design with unique features such as unlimited re-entry of effects, fully integrated E-MEM™ Effects Memory system, four input buses per M/E, a quad split from each M/E, automatic key follow and Personality Programming.

Second generation Digital Video Effects

The MkII DVE combines the power of the new NEC DVP-16 multichannel Digital Video Processor and the GVG MkII control system. It operates like a production switcher, not a computer terminal. Selection of most common on-air effects is no more complicated than choosing a wipe pattern. For post-production flexibility, programming modes permit creation of highly complex effects which in turn can be memorized in the standard E-MEM system. Other standard features include continuous zoom from zero to infinity, digital noise reduction with motion detection, and Digital Strobe Action, a motion-dependent freeze.

See it all at NAB

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BROADCAST INDUSTRY NEWS

Boost In FM Slots Proposed By FCC

Changes in the FM frequency assignment rules, proposed late in February by the FCC, could lead to a "significant" increase in the number of available commercial FM channels. According to the Commission, it acted out of concern that while in many markets all FM assignments were filled "on paper," in actuality the demands for FM service had not been met. The major part of the proposal would allow Class A stations to be assigned to slots previously reserved for Class B or C stations if no Class A assignments were available.

Two new classes — B1 (between A and B) and C1 (between B and C) — will be added, and Class B stations (including B1), now restricted to the northeast and California, would be permitted anywhere in the country. In addition, all existing Class B and C stations would have to meet minimum requirements for power and antenna height or risk reclassification to a lower category. The final part of the proposal calls for adoption of a new separation table to reflect the updated propagation curves.

Comments on the FCC's proposals are due June 13; replies must be in by August 13.

Ascertainment List Modified; Handicapped, Gays Still Out

Handicapped and gay persons are still not included in the checklist for community ascertainment by broadcasters, recently modified by the FCC. The modification leaves the checklist intact but rewords the "other" category in a manner intended to encourage licensees to contact "all significant elements and institutions in any particular community."

The rephrasing leaves non-listed groups with the burden of contacting local broadcasters, who themselves will decide if the group is "significant." If the licensee deems the group to be of importance, it is then obligated to contact representatives of the group as part of its ascertainment surveys.

The action was initiated by a 1976 petition brought before the Commission by the National Gay Task Force and 142 other gay organizations. The petition asked that gay people, widely estimated to make up 10 percent of the national population, be included in the ascertainment checklist. According to the FCC, many gay groups and organizations of the handicapped filed in support of the proposals; even so, the Commission decided that adding the two categories was not "necessary or preferable," claiming "the evidence did not indicate that gay and handicapped persons are significant in all or most communities," and, in effect, leaving that decision to licensees.

NAB Asks Dismissal Of TV Code Suit

The Justice Department has produced no evidence that advertising time standards in the NAB's TV Code are unlawful or anticompetitive, the NAB asserted in February as it asked the U.S. District Court for the District of Columbia to dismiss the JD's suit against the TV Code. Filed in June of last year, the suit charged that the voluntary code drives up advertising costs and deprives advertisers of free competition by restricting advertising time on television stations.

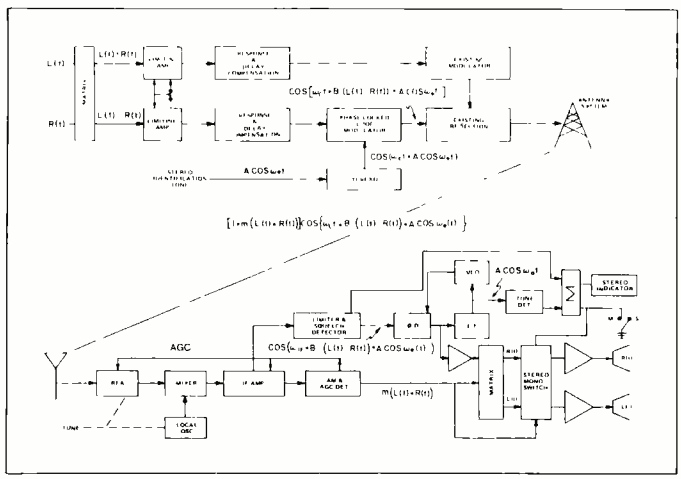
The NAB went on to say in its brief that the JD failed to address the purpose of the TV Code, the extent of official endorsement for the standards, and the policy reasons for the suit, as requested by the court. The association stood firm in its position that the time standards serve the public interest and are widely supported by Congress and the FCC. The JD also failed to make an effort to determine what actually affects prices for broadcast advertising, the NAB continued, stating, "it is the audience

Magnavox Wins Big In AM Stereo Race

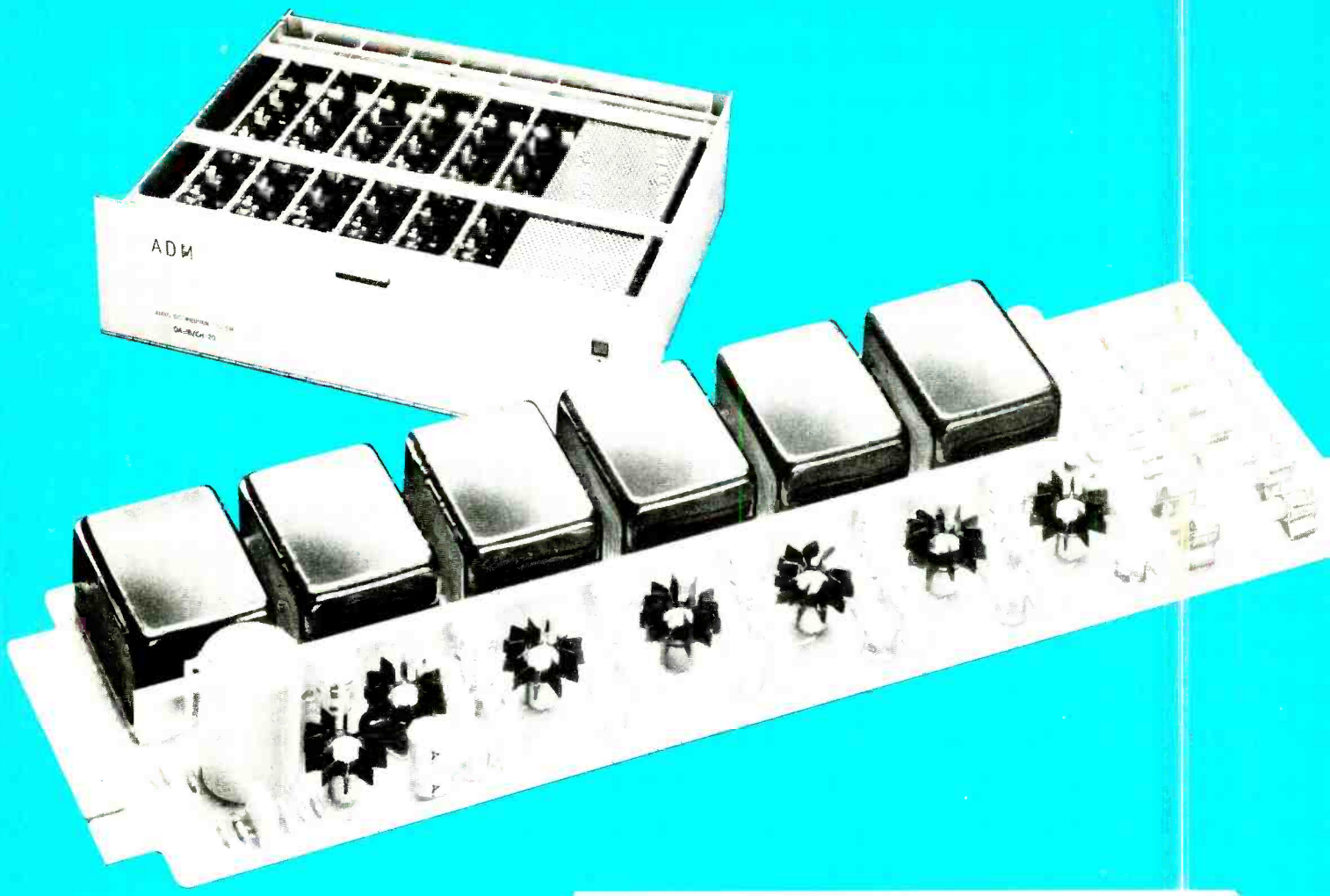
Magnavox's AM stereo system, one of five under consideration for years, received FCC approval April 9. The landmark decision paves the way for AM broadcasters and receiver manufacturers to offer AM stereo to the listening public.

Magnavox, of course, was reported pleased at the decision and is expected to be a major producer of AM stereo receivers. FCC engineers had found the Magnavox system outperformed the other competitors, although the edge was not great. The other systems were offered by Harris Corp., Belar Electronics Laboratories, Kahn Communications, and Motorola; all five were incompatible.

Debate at the Commission focused on whether it was appropriate for the FCC to make the decision or whether it would be better left to the industry. Commissioners Brown and Jones took the latter position; Quello, on the other hand, predicted "a lot of wasted motion and resources" if the FCC did not make a choice. One argument in favor of making a decision was that U.S. or Japanese auto manufacturers might try to influence the industry to choose a particular system; auto makers are especially interested since car radios are expected to be the major recipients of AM stereo.



The approved Magnavox system places L+R information on the AM channel and L−R information on a linearly phase-modulated channel. For purposes of stereo identification, a 5 Hz subaudible tone is frequency-modulated onto the carrier with a deviation of approximately 20 Hz. Existing AM transmitters may be used without modification, according to Magnavox. No multiplying or mixing techniques are needed, but the L+R and L−R paths must be equalized for transit time and amplitude to preserve stereo separation.



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- The DA16B/CH20B system is designed and built to meet ADM's highest quality and performance standards, and carries a five year unconditional warranty.

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exposure accompanying programming, not the Code time standards, which imparts value to advertising time."

New Communications Bill Proposed In Senate

The Senate Communications Subcommittee is expected to present a new proposal for communications legislation that may include radio deregulation and five-year television licenses and, perhaps, exclude a spectrum fee. So reported *Television Digest* shortly before press time for this issue. Staff proposals for the new bill will be presented to the senators, whose decisions will determine what the bill actually says.

Largely ignored by the proposed bill, apparently, is CATV, with only ownership restrictions mentioned. This could change during markup, though, with the addition of issues such as syndicated exclusivity, copyrights, and signal carriage. Although radio deregulation will be a large part of the bill, it is not expected to be as sweeping in this respect as its predecessor, S. 622.

Public Radio's Health Is Vital, Says Ferris

A healthy public radio system is an important aid to the FCC in its efforts to deregulate radio, chairman Charles Ferris told the 1980 Public Radio Conference held in Kansas City in mid-March. Public radio, by serving segments of the market usually overlooked by commercial broadcasting and by providing a full schedule of public affairs programming, protects the public's access to news, Ferris said. By doing so, it cuts down any possible risks in deregulation of commercial radio and "helps reduce the rationale for federal regulation of certain aspects of radio."

Noting that economic prospects for public radio were gloomy, Ferris pledged his support of public broadcasting's search for additional sources of funding. He described the FCC's recent attitude towards "innovative ideas" for fundraising as "pragmatic," in contrast to the traditional "narrow, moralistic" view held by the Commission. As an example, he cited the Commission's March 13 decision to allow PBS stations to use their satellite earth stations to carry private commercial messages and programs. Ferris asserted there was "no reason why this precedent should not logically apply to NPR stations as well."

MDS Subject Of Three New Rulemakings

Multipoint distribution services (MDS) are in the spotlight as the subject of three recent FCC rulemakings, focusing on licenses, technical standards, and frequency allocations. The licensing rulemaking proposes three alternatives to speed assignment of MDS channels, used primarily to carry STV signals. The first is a lottery system (apparently favored by the FCC); the other two ideas include "paper hearings," which limit contesting applicants to submitting written briefs and evidence, and auctions.

The proposed frequency allocations would create additional MDS channels in the 2500 to 2690 MHz band, currently reserved primarily for instructional television fixed service (ITFS). Two channels are now allocated for MDS: Channel 1 (2150 to 2156 MHz), available throughout the country, and Channel 2 (2156 to 2162 MHz), limited to the 50 large metropolitan areas. The technical rulemaking proposes the establishment of standards for acceptable interference and geographic spacing between MDS systems.

MDS, a common carrier service, in-

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Best In The Field

HITACHI SK-90

Outside the studio, the remarkable Hitachi SK-90 does it all. For EFP, it sports a studio style 5" viewfinder. All key functions can be controlled with your choice of Remote Operating Unit (ROU) or Digital Command Unit (DCU). For ENG, slip off the SK-90's studio viewfinder, slip on the 1.5" viewfinder and shoulder mount. Your SK-90 is now a compact, lightweight self-contained portable!

ENG with EFP image quality. And EFP with *total* remote control. SK-90 has the field covered!

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Hitachi SK-90: portable ENG mode

Digital Command Unit (with coax/triax option)

Remote Operating Unit features RGB cal

volves microwaving radio signals from the system operator's transmitter to various receive points specified by commercial subscribers. First proposed in 1971, the service was established by the Commission in 1974. At the present time there are 131 authorized MDS stations throughout the country, 86 of which are either actually offering service or are ready to do so. About 467 applications for new MDS systems are currently pending.

Earth Stations: Selling Like Hotcakes

Earth station manufacturers are being kept busy — and happy — by broadcasters' latest buying spree. According to a survey by *Satellite Week*, published in mid-March, 57 non-public television stations had installed dishes, and stations were continuing to install them at a rate of one a week. The figure compares with that of six months ago, when only 33 non-PBS TV stations had earth stations. Growth is expected to continue strongly since only 10 percent of non-PBS TVs owned dishes.

Other findings of the survey showed that TV stations in seven of the top 10 markets were dish-equipped and that 22 network affiliates had earth stations, compared to only three six months ago. The trend, *Satellite Week* noted, is for stations to follow the leader: if one station in a market gets a dish, the others get one too.

Nets Acted Unreasonably In Carter Case, Says Court

The U.S. Court of Appeals for the District of Columbia has agreed with the FCC that the three major TV networks were unreasonable in refusing to sell air time to the Carter-Mondale Presidential Committee.

Last November the Commission ordered the nets to comply with its "reasonable access" requirements after they refused to sell the Carter-Mondale group 30 minutes of air time. The nets gave reasons for their refusal, but the FCC deemed them inadequate.

The court agreed with the Commission that an affirmative right of access exists and said that the Commission should determine when the right of access arises in each campaign when it examines broadcasters' decisions to grant or deny access. Once right of access is determined to exist, each request for time must be treated individually; "across-the-board denials will not be tolerated," the court asserted.

Minority-Owned Stations Jumped In 1979

Figures released by the NAB in March showed 138 broadcast stations with minority owners, compared to 101 the previous March. The biggest gains were made by blacks, who gained 36 radio stations and three TV stations during the one-year period covered by the NAB survey.

Of the minority-owned radio stations, 105 are owned by blacks, 18 by Hispanics, and one by Native Americans. Eight TV stations, including five VHFs, are owned by blacks and six by Hispanics.

Women have also been making gains in broadcasting, but in another area. An RTNDA survey found over 30 women serving as news directors at commercial television stations; between 450 and 500 radio news operations were headed by women as of mid-1979. Of the total news broadcasting force, 26 percent were women, with 94 percent of all TV news staffs and half of radio news staffs employing at least one woman.

Minority employment has not fared as well, however. Only one-fifth of radio stations employ minority newspersons, 26 percent of whom are Hispanic and 63 percent black.

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Tektronix 1900 Digital Generator.

Introducing the first all-digital generator.

Plus These New Testing Capabilities.

With the new SMPTE Color Bars test signal, just three quick monitor adjustments take the aggravation out of matching color monitors. The 1900's SIN X/X signal provides an extremely flat, 4.5 MHz spectrum for fast and simple checking of the system frequency response and the multipulse signal capability greatly simplifies the testing of group delay characteristics.

With every 1900 Digital Signal Generator you not only get the standard FCC or NTC7 test signals, you also get the unexcelled accuracy and stability of all digital circuitry.

Changing industry standards will not obsolete your 1900 Digital Generator, because each test signal data is programmed in replaceable PROMS.

For details on the first, *all* Digital Generator, call toll free: 1-800-547-1512.
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News

SBS Authorization Upheld By Court

The FCC's 1977 authorization of Satellite Business Systems (SBS) was upheld late in February by the Washington, D.C., U.S. Court of Appeals. A federal appellate court had struck down the authorization 18 months earlier after legal challenges by the Justice Department, Western Union, and the American Satellite Corp. accused SBS's application of violating the Clayton Antitrust Act. Also opposing SBS at that time were AT&T and the FTC.

The latest decision permits SBS, a joint venture of IBM, Comsat, and Aetna Life and Casualty, to proceed with implementation of its system. Scheduled to begin service early next year, the system will handle voice, data, and facsimile satellite communications in a digital format. SBS's plans have recently been broadened to include service to medium-sized communications customers as well as the original market, large corporations with far-flung offices and massive communications needs. The original plan called for a system of private earth stations to bypass telco links; the new idea is to have dishes shared by more than one customer, located either on a customer's premises or on "strategically placed SBS premises," according to the firm.

WTC TV Tower Snagged By Microwave Hazard

The powerful television transmitting antennas atop one of the World Trade Center's twin towers in New York, scheduled to go into service this spring, will have to mark time because of a possible health hazard to workers and sightseers on the other tower's top floors. Tower 1, host for the antennas, is screened from the emissions by concrete.

Recent tests have shown that the top floors of Tower 2 would be subjected to emissions of 360 $\mu W/cm^2$. Opinions differ on what constitutes a "safe" level of microwave exposure and no federal or New York City standards have been set. The Port Authority of New York and New Jersey, owner/operator of the WTC, will attempt to cut radiation levels to below 100 $\mu W/cm^2$ so that the antennas can begin transmitting TV signals sometime later this year. Several ideas for screens or barriers are under consideration.

News Briefs

Region 2 nations have **tabled the U.S.'s proposal of 9 kHz AM spacing,** slating the question for consideration at the next session of their administrative conference, to be held in November, 1981. The U.S. delegation, although disappointed, expressed the feeling that new and better technical studies would serve to persuade other western hemisphere nations in the interim. Back in Washington, there was much indignation at the FCC about a letter sent to 22 attending countries by NAB shortly before the meet, urging further study of 9 kHz. The action was seen by some as a direct blow to U.S. efforts to pass the measure.

The **first 15 dishes** in Mutual Broadcasting's satellite network were installed late last year by California Microwave. The 15-foot receive-only earth station antennas went to stations in the eastern U.S . . . . The **AP plans to install 400 earth stations** this year at stations in its radio network. Fifty dishes had been installed by April . . . . Detroit common carrier Greater Star Link Corp. is **gearing up for Republican Convention** coverage by adding new uplink service to its present facil-

"FAST, FLEXIBLE, ACCURATE..." MACH ONE AT ASTIN/MOORE.

When Astin/Moore designed its modern post-production facility, they wanted a *software-oriented* computer-assisted video editing system to interface with their Bosch "B" format one-inch VTRs.

Director of engineering Dave Orr chose the Fernseh, Inc./ Mach One™ videotape editing system.

"We needed a system that was *fast, flexible* and *accurate*, and on which program changes could be made easily and quickly. Mach One fills the bill."

A/M's Emmy-award-winning chief editor Marco Zappia heartily agrees.

"The Mach One's dedicated keyboard with single-key functions makes editing fast and simple. I can edit as fast as my fingers can move, and this has helped my rapport with producers and directors. If someone says, 'Okay, I'll take that,' I still have time to say, 'Well, look at this, too!'

"Everything about the Mach One system is geared to speed, and that can be translated into creativity, making for an extremely cost-effective operation.

"The system takes best advantage of the rapid roll time of the VTRs, and it parks very accurately . . . right on frame."

If your editing system is bottlenecking your video post-production output, switch to Mach One. You'll discover more control-room flexibility and freedom than you've ever known.

For descriptive literature, please write or call Fernseh, Inc., P.O. Box 15068, Salt Lake City, Utah 84115, (801) 973-4619 or 972-8000; Telex: TM388352 SLC.

FERNSEH INC.

the Video Corporation of
Bell & Howell and Robert Bosch

News Briefs

ity. Two 10-meter antennas have been installed and a third will be set up sometime this summer, frequency-coordinated for all satellites and transponders. Scientific-Atlanta has the contract for transmitters and associated equipment.

Federal budget cuts have bypassed the FCC — so far. At press time the first round of cuts were reported to have missed the Commission, although NTIA seemed a likely target . . . . PTL Television Network's Rev. James O. Bakker was **ordered to comply with an FCC subpoena** by the Washington, D.C., U.S. District Court at the request of the Department of Justice. The case revolves around PTL's alleged violations of Commission rules by broadcasting misleading or deceptive statements about fundraising (see *BM/E*, March, 1980, p. 79).

The New York Section of the IEEE has approved a **Broadcast, Cable, and Consumer Electronics Chapter,** to be headed by George J. Lowe, assistant chief TV engineer for Pace University . . . . **Listeners in southern Florida are receiving Radio Moscow** on their AM dials. The English-language broadcasts are being relayed by a Cuban station that usually transmits in Spanish; the rebroadcasts make Radio Moscow available to listeners without shortwave equipment . . . . The third annual **Visual Communications Congress,** covering a wide range of film and video subjects, will convene at the New York Hilton May 28 through 30. FCC commissioner Anne Jones will be the featured luncheon speaker. Info from VCC, 500 Summer St., Stamford, Conn. 06901.

The Commission has **acted on several pending rulemaking petitions** in an effort to clear up a case backload. A petition to reverse the FCC's position giving preference to minority applicants for broadcast licenses was denied, as was a petition asking that commercial TV stations be required to have earth stations and one seeking that licensees be prohibited from giving recorded TV programs to foreign stations whose grade A contour includes the supplying station's service area. A petition to establish a screening process for petitions, sponsored by NAB with NRBA's support, was denied, but the FCC asked its staff to recommend ways in which the staff could handle certain petitions . . . . Six **revised broadcast forms** are now available from the FCC. They are 303-A, annual programming report; 314, application for consent to assignment of broadcast construction permit or license; 324, annual financial report; 324-A, annual financial report of networks; 340, application for authority to construct or make changes in a noncommercial education station; and 395, annual employment report and instructions.

Business Briefs

Rockwell International Corp. has acquired **Wescom, Inc.,** an Illinois-based telecommunications supplier producing voice frequency, pulse code modulation, and voice switching equipment. Kerry R. Fox, formerly of Rockwell-Collins, has been named president of Wescom . . . . **RTS Systems,** a subsidiary of Compact Video Systems, Inc., will have its professional intercommunication equipment distributed by **RCA's Broadcast Equipment Division** . . . . **Houston International TeleVideo, Inc.,** recently acquired a 20 percent interest in Tulsa-based **Video Communications, Inc.,** boosting VCI's worth well over the $15 million mark, according to the two firms. VCI is a leading distributor in home video.

Scientific-Atlanta has formed a new antenna products division to design, manufacture, and market satellite earth

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If you don't take too much time making your decision, you can get the TT-7000 in practically no time at all.

3M

Business Briefs

station antennas. The firm's Optima division, making cabinets, cases, consoles, and desks, has expanded its manufacturing capabilities to accommodate record increases in sales . . . . Professional audio equipment maker **Ashley Audio** has moved into its new 11,000 square foot manufacturing facility at 100 Fernwood Ave., Rochester, N.Y. 14621. New phone number is (716) 544-5191 . . . . **GTE's CATV Division** is expanding with a new 77,000 square foot building at its El Paso, Texas, headquarters . . . . **General Cable Co.** is relocating to a new facility in Pearl, Miss., about five miles from its present location. Its parent company, **GK Technologies, Inc.,** reported record earnings and sales for 1979, with sales exceeding $1 billion.

Belden Corp. has announced plans for a 220,000 square foot Electronic Division wire and cable manufacturing plant in Tompkinsville, Ky., to be completed in early 1981 . . . . **Anixter-Pruzan** has moved into new warehouse and sales offices in the Los Angeles and Chicago areas. The L.A. office is located in Irvine, Calif.; the Chicago base is in Elk Grove, Ill . . . . **Stag Systems, Inc.,** of Palo Alto, Calif., has been formed to market and distribute universal PROM and logic programmers manufactured in the U.K. by Stag Electronic Designs, Ltd. The new firm is located in the Palo Alto Industrial Park, 1120 San Antonio Road, Palo Alto 94303; telephone is (415) 967-0953.

Cable Atlanta, CATV operator in Atlanta, Ga., has purchased a 54-channel AML microwave local distribution system from **Hughes Aircraft Co.'s** microwave communications products . . . . **Alexander Manufacturing** has announced a new battery pack belt rebuilding program. For information, call (515) 423-8955 or write the company at 1511 S. Garfield Pl., Mason City, Iowa 50401 . . . . **Oak Industries, Inc.,** parent of **Oak Communications,** STV operator and supplier, reported a 130 percent increase in net income for 1979; sales for the period rose 46 percent.

Henry H. Klerx has been named managing director of **RCA Jersey Ltd.,** a U.K. branch producing equipment for European and African markets . . . . **Moseley Associates** has appointed Mark G. Fehlig marketing manager . . . . Thomas A. Michalski was appointed division VP and GM of avionics products and Louis Casalino was named division VP and GM of digital products by **California Microwave** . . . . Stanley Silverman has joined **Ampex Corp.** in the newly created position of director of market planning.

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It's got one of the best optical systems around. Prism optics (F/1.4) to help you make the best use of available light. Even at night.

And an automatic beam optimization circuit. Because "comet tailing" is great for shooting comets.

A LOT OF CAMERAS. A LOT OF CAMERA.

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Now that's a lot of camera.

And if that's what you need to cover the elections this year or that sales meeting next month, see the Sharp XC-700.

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Fourteen transmitters are now in service and four more will follow shortly. This speaks well for Continental's transmitters design and for their choice of long life EIMAC power tubes.

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RADIO

PROGRAMMING & PRODUCTION FOR PROFIT

Public Affairs Mixes Public And Private

THE FCC HAS ISSUED for comment a proposal that would remove or relax the guidelines on radio programming, including the requirement for a certain attention in programming to public affairs. This is part of the deregulation push, and as such has been welcomed by important voices in the industry, including the NAB.

At the same time, a sizeable number of stations have in recent years put on greatly enlarged and serious public affairs programming, well beyond the requirements of the guidelines. This appears to support the FCC's position on many aspects of deregulation, which is that stations do "good" programming not because the FCC tells them to, but because they want to, or have to for market survival.

However we view the validity of this argument, and especially its application to the whole range of broadcast managements, it is true that the activities of stations especially committed to public affairs have in most cases been extremely useful to those stations. We can happily accept the existence of a genuine desire on the part of these managements to help their respective communities. In each case, though, there seems to be a greater or lesser proportion of image enhancement, promotional value, and in some cases money accruing to the station from the programming.

These facts, together with some extremely interesting approaches to public affairs program design, were evident at the NAB programming conference last September in a session titled, "The New Public Affairs: Listeners Love It." Moderator Charles Murdock, president of WLW in Cincinnati, told about a campaign of that station titled "Riverfest 1979," a benefit for the Cincinnati Symphony. Included were a variety of outdoor events including a concert on a barge in the river, and tickets sold at $2 each to benefit the orchestra (total take, over $15,000). Various local retailers sponsored individual sections of the campaign, all coordinated by WLW and ending with a grand fireworks display that brought 350,000 people to the river. The orchestra got the big boost that was needed; WLW got special attention over many weeks from a very large section of the Cincinnati audience.

Jerry Wishnow, president of Wishnow, Inc., of Marblehead, Mass., has designed a number of many-sided public affairs promotions for various stations. The general principle, he says, is for the station to hit hard and directly at a really serious problem in the community. Working with WBZ in Boston, for example, Wishnow got 15 or 20 of the principals in the bitter fight over school integration into a room that was locked, and on the air, for more than 20 hours. Food and other amenities were available, but the participants were not allowed to leave (per the original agreement with them) until some compromises had been reached.

In attendance also were trained social psychologists and people with fact sources. The scheme worked: important progress toward settlement of the controversy came out of "T-Group 15," the locked-room group. The progress of the group was followed by the community on WBZ, which sponsored the operation and won a basketful of local and national awards for it, with enthusiastic notice in the U.S. and foreign press.

Another campaign for WBZ was a multi-front attack on the drug problem that included putting troubled kids in a room with a family therapist; eight weeks of discussion on the air with

Radio Programming

definitions, examples, and warnings; programs directed to the schools; and development of a legislative package designed to bring sanity to the state's "Byzantine" and ineffective drug laws. The last item came through the state legislature as the "WBZ Drug Bill," and again the station won recognition and praise in tremendous volume.

Another Wishnow campaign that may stimulate thinking at other stations was an attack on the energy crisis, with Boston citizens (including the governor and the mayor) publicly joining car pools to save energy, and car stickers identifying those who joined the "WBZ energy fight." Another was for KABC in Los Angeles, a "Go To Health" campaign with weeks of information and exhortation on diet, exercise, and nutrition, with people joining up to be weight watchers, advice from experts on health problems, contests for weight loss, and much more. There was, for example, the "KABC Waistline," a call-in program with advice given to callers on various topics concerning diet and weight control. A pamphlet on health was offered free on the air.

A main Wishnow point is that the station staff must be directly and personally involved in the campaign. With their enthusiasm and commitment, the campaign can go; without those qualities on the part of the staff, it will be dead.

In the case of the "Go To Health" campaign in Los Angeles, there was a major sponsor, Sears, Inc., to carry a good part of the cost. Since the campaign included many forms of advertising and promotion on top of the on-air push, the cost was quite high. The return to KABC in recognition and community acceptance, however, was extremely high.

Mark Bragg, whose Public Affairs Broadcast Group has more than 200 clients for consultation service, produces a series of documentary programs on the "heavy issues" turned up in ascertainment, which he finds pretty much the same in most communities. These programs are built around talks by experts, questions and answers, and informational background. Bragg has produced more than 500 such programs for clients. He says the programs have to be fast-moving and expertly designed.

These half-hour documentaries, made to the station's order, can be fitted into the schedule at different times, but for many stations not at such packed times as 9:00 a.m. For that and other quick-action time slots, Bragg makes one-minute features drawn from the longer programs. These have been very

successful too: more than 150 stations are using them at the present time. Bragg said that the cost of his programs ranged from around $12 to about $40 a week, very small for programming of such weight.

Tim O'Donnell, director of editorials and community affairs for KNX, Los Angeles, has developed campaigns somewhat like those of Wishnow in Massachusetts. A prime example is the recent "KNX Assault On Rape," which was motivated by the sharp increase in crimes of rape in the Los Angeles area. This many-sided campaign was not designed, O'Donnell said, as a direct station promotion. KNX wanted to do something about this problem. A part of the campaign consisted of many short introductory PSAs with music, giving women some preliminary information, such as where to get self-defense training, where to report rapes (they were strongly urged to do so), where to find legal and health aid, and how to take precautions against rape.

There were longer documentaries on all these aspects of the problem and others. The station offered a free handbook listing all concerned agencies, and giving precautionary and self-defense information, with addresses of organizations offering courses. Thousands wrote in for it.

KNX also worked with legal experts in developing a revised law on rape that would make changes considered very desirable, such as eliminating the routine cross-questioning of rape victims on their sex habits and the requirement that they undergo psychiatric examination, not a regular requirement for victims of any other crime. The legislative package became the new law in the fall of 1979. KNX won a batch of awards for its six-month campaign.

Jerry Wishnow summed up the new public affairs as follows. The objective is to "make something happen in the community." In the process the station positions itself as the ally of the listener in a vital struggle, an excellent position for any radio station to have. **BM/E**

BM/E's Program Marketplace

Syndicators For Radio

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"CUSTOMIZED SYNDICATION" is a descriptive phrase frequently heard in the radio business. Bob Botik, founder and president of Botik Broadcast Services, Inc., may have carried the idea further than almost anyone else.

Botik works out programming specifically for each station that subscribes to his service. His format is Adult Contemporary, but each station gets an Adult Contemporary made just for that station. It comes to the station in the usual way, on reels of 7½-ips tape produced in Botik's own recording facilities. He aims for the highest technical quality; dubbing is at 1:1 and the gear includes studio Ampex recorders and other items of similar quality. The tape is 1½ mil mastering tape.

A number of the leading syndicators, as described in earlier columns here, are making similar efforts to get the highest possible technical quality into their tapes. Botik is most unusual in the individualized attention he gives to each station's programming problems, attention that results in a full-format program adjusted as closely as possible to that station's need.

In developing the programming, Botik sits down with the management to get a thorough understanding of their objectives and resources. He learns about the market from them, and also from any other local sources that are available. Then he develops a fully sequenced program schedule that takes over the station's main format time.

Botik is emphatic that he does not replace the program director. He says that he — and the station — needs the program director for knowledge of the market, assessment of the success of the programming, critical input, and general support. The program director must be a key member of the team.

The same applies in another sense to the sales department. Botik says that one of the essentials for success of a format is thorough understanding by the sales manager and his staff. They must know its character and strengths in detail, and sell those strengths to station clients.

His own contribution, in more specific terms, is the sequencing of the numbers to produce a consistent, sustained, pleasing effect. He calls Adult

Program Marketplace

Contemporary a "fragile" format because so many disparate elements can get into it. "Crossovers" tend to break the format, and artists for many reasons shift styles in a way that "scatters" the flow.

Botik says he wants close control of the sequencing to avoid this danger of a "mishmash" effect, which he believes has sharply reduced the effectiveness of Adult Contemporary music at a number of stations. Close control, however, does not mean rigidity, a failure to be on top of new hits and trends. He follows the new music as it appears, and incorporates new numbers whenever he thinks they will help keep the music flow alive and satisfy listeners' desires to hear the latest tunes.

If a new record by a "high image" artist seems especially timely and valuable, Botik gets it into a station's programming within a few days of its release on the market. In the majority of cases new music gets onto the refresher tapes that go out on a schedule worked out by Botik and the management.

Botik keeps on top of what he is doing, using his own market research, too. He uses telephone interviews to find out how his station is perceived in the market after a format change. This additional guidance is to be added to the station management's own expertise on the market.

Bob Botik started his operations in July, 1979, after more than 17 years as program director, later general manager, of such stations as KNOW and KMXX in Austin. His experience in making a success at these stations led him, as it has a number of other seasoned radio executives, to the decision to be his own boss, dealing with the program problems of a number of stations.

He disavows any intention to build his business to the point of serving scores of stations, however. His method of operation, in fact, precludes a large-volume syndication. He says he will take on only as many stations as he can handle himself personally, along the lines outlined here. But this is not a one-person direction: actively participating as an executive in the business is his wife Terri, also a veteran of radio sales and management.

Right now, Botik has three stations in active service and several prospects. He believes that when the next ratings appear (before this magazine is printed) he will have all the selling material he needs for the present. There will be no promotion campaign to reach dozens of stations; he wants word of mouth and proven records to carry his business. If it goes, Bob Botik will have proved that "few can be good" in a field mostly carried by the big numbers. **BM/E**

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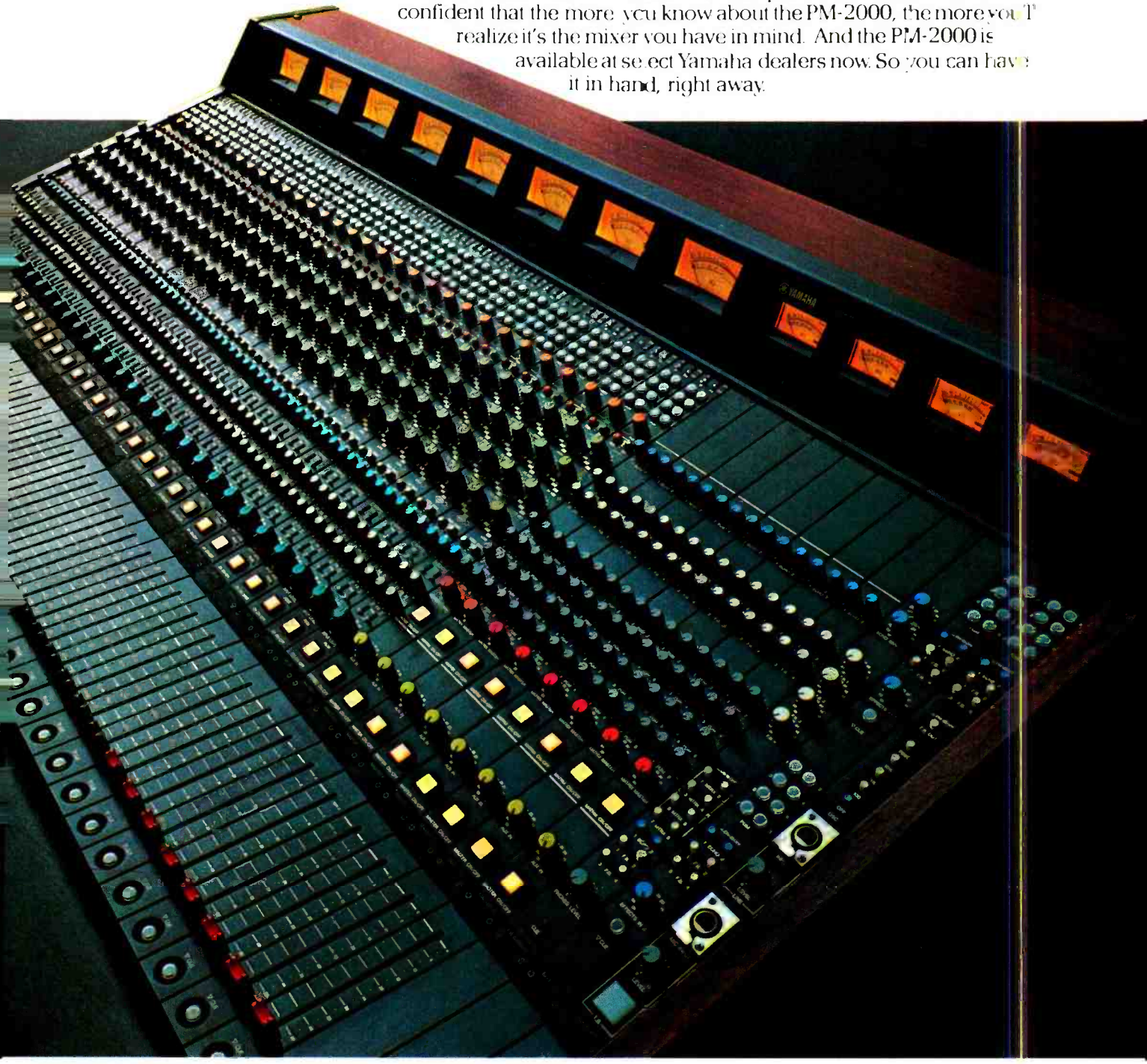
With 5-position, 4-band eq, and six independent sends on all 32 inputs (24 channels also available), plus a full-function 14 x 8 matrix, the PM-2000 has earned a reputation as the consummate console. Distortion and noise specs are as low as much more expensive studio consoles.

Write to P.O. Box 6600, Buena Park, CA 90622 for complete information. We're confident that the more you know about the PM-2000, the more you'll realize it's the mixer you have in mind. And the PM-2000 is available at select Yamaha dealers now. So you can have it in hand, right away.



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"IF YOU WANT TO COVER THE USE A CAMERA THAT'S ONLY GOOD

Shot with a Sony BVP-300 camera at f2.5 with approximately two footcandles' light.

DARK SIDE OF A CITY, YOU CAN'T WITH BRIGHT LIGHTS."

Henry Sheppard, WCCO-TV, MINNEAPOLIS

"There are news-gathering and documentary situations where the use of artificial light is just too intrusive or difficult to achieve," says Henry Sheppard, Chief Engineer of WCCO-TV, the CBS affiliate in Minneapolis.

"That's why our Sony portable BVP-300 cameras are such a big plus. With them, we can shoot in low-light conditions and get a lot of detail other cameras might not pick up. We even get good pictures with as little as two footcandles of light."

WCCO-TV owns seven Sony BVP-300's, which the station's photographers use together with Sony BVU-5C recorders. The cameras are used to shoot public-affairs programs and segments of PM Magazine, as well as for ENG and documentaries.

"We're very particular about picture quality," says Sheppard. "And before we committed ourselves to Sony, we evaluated just about every portable color camera available.

"Sony's colorimetry is excellent, its signal-to-noise ratio is high, and it always turns out pictures that meet our standards. Many of our engineers find its quality comparable to studio cameras. And our photographers like the way Sony handles. For example, in a helicopter, they can cradle the camera on one shoulder to reduce vibrations and get a very steady picture.

"And with the Sony system, each photographer can operate independently, without a second person along to monitor sound."

When asked about Sony durability, Sheppard replied: "We don't coddle our cameras here. Each one gets handled by about 15 or 20 different photographers. They come in in the morning, grab their equipment, throw it into the back of the car, and they're off. Sony takes that kind of treatment remarkably well, and it's a good thing, because we can't afford to have our cameras down."

Of course, Sony makes a full line of one-inch broadcast equipment, including cameras, recorders, editors and the BVT-2000 digital time base corrector.

For information, write Sony Broadcast, 9 W. 57th Street, New York, N.Y. 10019. Or call us in New York at (212) 371-5800; in Chicago at (312) 792-3600; or in Los Angeles at (213) 537-4300.

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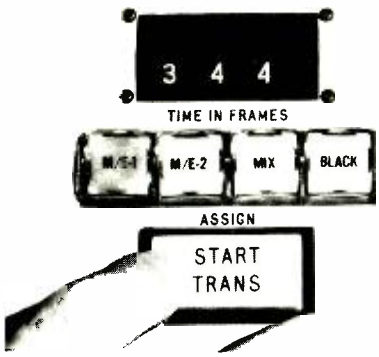

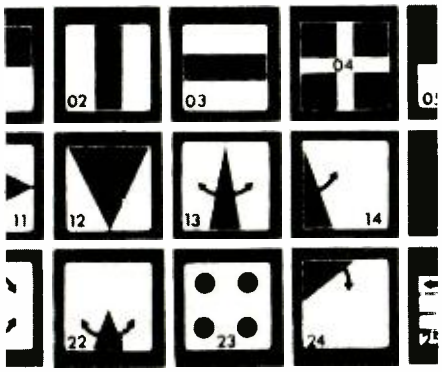

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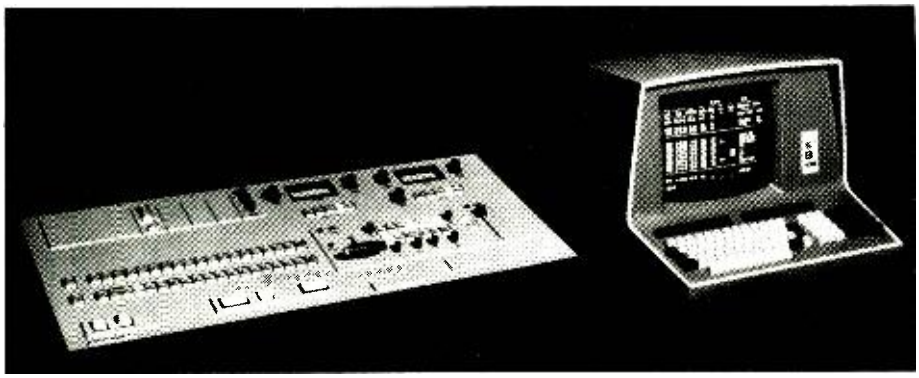

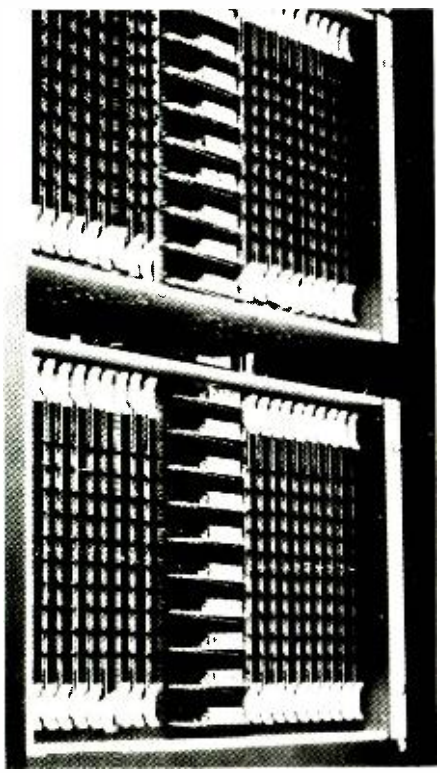

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TELEVISION

PROGRAMMING & PRODUCTION FOR PROFIT

KGUN: Off To A Good Start With Award-Winning Local Programs

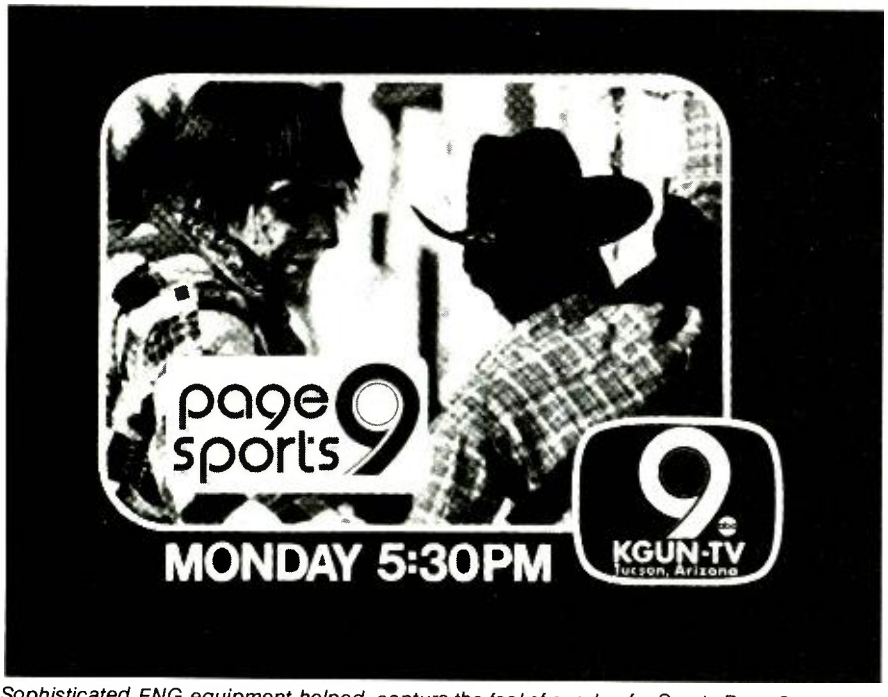
ALMOST EVERY STATION wants to do "good" local programs. Almost every station executive realizes that you cannot always do what you want to do. But the essence of this business is change and what seemed impossible yesterday seems practical today. When the NATPE handed out its Iris Awards for local programming last year, KGUN didn't win. It didn't even enter. But this year, entering for the first time, KGUN walked off the stage at San Francisco's Masonic Hall with two Iris Awards. Jack Paris, KGUN's programming director, acknowledged that his station had come a long way towards making the impossible practical.

The two programs that won, *Sports Page 9* (in the small market sports program category) and *The New Reporters* (in the small market, children's program category) are both examples of shows that depend on maximizing resources. The shows are the product of the adage, "what's worth doing is worth doing well."

The New Reporters results from a fairly traditional relationship between station and community, but the results are very untraditional. The program is produced in cooperation with the Tucson Unified School District and has as its executive producer Marie Fraesdorf, director of radio and television for this agency. Fraesdorf and photographer Bill Dahl, both employees of the district, provide the bulk of the writing and producing for the show.

Fraesdorf, a former broadcaster who spent five years anchoring a local network-affiliated news program before joining the school district, approached KGUN nearly five years ago with the idea for *The New Reporters*. Basically, Fraesdorf wanted to produce a half-hour monthly newscast consisting of stories dealing with the activities of the various schools in the Tucson area. In order to get the full potential out of the concept, Fraesdorf decided to use school children both as anchors and field reporters on the stories. With the program being for and about children, she felt it seemed natural to have children do it.

During the course of a month, Fraesdorf and Dahl film any of several ongoing programs in the school district —



Sophisticated ENG equipment helped capture the feel of a rodeo for Sports Page 9

◄Circle 122 on Reader Service Card

nutritional programs, musical shows, Mexican cultural activities, and so forth. Fraesdorf writes a script for the footage and goes over the script with one of the several children who work on the project. "We try to gear it (the script) to the child and make it sound as if the child were talking," said Fraesdorf. After it's written, the child who is to do the report is then asked to try the script. If the child prefers to substitute his own words, he does.

Fraesdorf shoots a stand-up with the reporter and then has the reporter do a voice over for the remainder of the story. She handles most of the audio herself. Dahl then edits the segments together, with the average report running between two and two and a half minutes in length.

KGUN's award-winning The New Reporters *uses school children as anchors and reporters*

On Tuesday evenings between 7:00 and 9:00 p.m., Fraesdorf and the three children who will be anchors for the program meet at KGUN studios.

The KGUN studio production unit, complete with full technical staff, then tapes the "network-style" newscast. Each program consists of several preproduced film stories as well as in-studio interviews and short reader items. The show is subsequently aired at 11:30 Saturday mornings. The intent of the program is to inform and entertain both children and adults. The station provides the half-hour free and includes three public service spots within it.

Fraesdorf reports that the children are the key to the program's success. "We have had reporters as young as third graders," says Fraesdorf. "Lauren Brown," a third grader, "is priceless," Fraesdorf notes with pride. "He reports with such authority and he's so darling — really, people just love these kids." Though it's hard to judge the success of the program along traditional broadcast standards, Fraesdorf says that mail to the program and the reactions of both children and parents indicate to her that the program is not only meeting its public service aims but is a source of genuine entertainment for its audience.

Weekends bring local entertainment back alive

The other Iris Award winner at KGUN was a masterpiece of station commitment and resource utilization. *Sports Page 9* is one edition of the regularly scheduled *KGUN Specials*. KGUN produces some four half-hour specials per month for a total of 36 original half-hours per year. The *Page 9* episodes are produced by the news department, and when the particular segment is about sports, it is designated *Sports Page 9*. The episode that took

the Iris Award was "Tucson Rodeo '79: A Reflection," produced by sports director Thom Boyd.

Boyd, who has been with KGUN for just 18 months, is a fine example of what this type of project can bring out in a station and its people. Boyd loves his work. He has worked as a sportscaster for many years and before coming to KGUN he worked in Washington, D.C., Baltimore, and Atlanta. Of those markets, says Boyd, " . . . all they really wanted was a sports anchor." The opportunity to do specials at KGUN has "taken what had become almost a staid and boring job and turned it around," he asserts.

Now, says Boyd, "I look forward to each night. I know my boss wants features, I want features, and I think the people want features." This attitude is what has made the five producer/directors at KGUN so productive. Ideas for specials keep flowing from these people to special projects director Steve Burns. Burns, news director John Posten, and Jack Paris all get into the act. And the specials are extra duty; as Paris points out, "We don't hire people to do just these shows — they all have their regular duties."

So for the 54th Annual Tucson Rodeo, Boyd began working on the project a week before the first bronco burst from the gate. By the time the four-day rodeo was ready to start, Boyd felt completely familiar with the grounds and surroundings. Boyd starts his day with a radio program from 5:30 a.m. to 8:30 a.m. at KTKT. For the rodeo he'd head out to the rodeo grounds, arriving at about 8:50. There he would meet his producer/photographer Charlie Beckner, and, as Boyd says, "just wade into it with a camera and microphone."

Boyd wanted to capture the lifestyles and personalities of the cowboys themselves. Other stations and KGUN provided daily coverage of the rodeo events so for his special that was to air the day after the close of the rodeo, he wanted to do more than just highlights. A rodeo cowboy today, according to Boyd, is quite different from the general conception. Many of the cowboys have attended rodeo colleges at the University of Arizona, and even Pima Community College in Tucson offers such a program. For the local cowboys, it's an opportunity to compete with the Roy Coopers and Furgesons, modern heros of the rodeo.

Contrary to popular belief, the rodeo life is very close-knit. Cowboys try hard to take their wives and families with them wherever they go. And often they go great distances in a single day in order to compete in different rodeos. The Tucson Rodeo parallels the Houston Rodeo, so many of the contestants flew into Tucson to make an eight-

second ride on a Brahma bull and took the next plane to Houston for another eight-second outing.

Much of the program that Boyd and Beckner wanted was outside the video medium. They had to intimate the smells, the quality of light, and work delicately with the sound. That they felt they succeeded was due largely to the ENG, according to Boyd. "Thanks to the technology of this business, shooting with our TK-76s and all the electronic editing, this program was really a lot more fun. We'll be sitting in one of our ENG editing booths and all of a sudden we'll say, 'you know, that looks better than live.'"

Executive producer Fraesdorf watches the monitors during taping of The New Reporters

But the technology played an important role in making the show practical as well as aesthetically successful. Boyd still had a commitment to do a 5:00 p.m. and 10:00 p.m. sportscast nightly in addition to developing his special. KGUN assigned two field cameras to the rodeo plus a microwave-equipped van. All day long the live cameras recorded events and microwaved them back to the station for recording on two-inch tape. Boyd would radio back editing instructions via two-way radio and at 5:00 p.m. he'd do a live 10-second intro into the highlights of the day's events, go to the edited package, come back for a live wrap-up, and then hand the "rest of the world of sports" back to his in-studio sports announcer, Jay Alvis. This set-up allowed Boyd to multiplex his time and provided him with video of the events themselves to edit into the personality essays he and Beckner recorded.

Boyd and Beckner recorded nearly 20 half-hour cassettes of cowboys and their lifestyles. Integrated with this was the action footage from the daily live feeds, music, and wild sound. Though Boyd admits that some station engineers grimace at the number of passes through the tape that he and Beckner made, he also reports that everything worked — it held up.

Jack Paris admits that these specials are not commercial bonanzas, but do very well when given adequate promotion. For a lot of local programming, promotion is a genuine sore spot. Time is valuable and often scarce. Nevertheless, these programs do represent a solid commitment on the part of the station and are of increasing importance, according to Paris, as his station contemplates the uncertain consequences of the introduction of cable TV in the market.

As Boyd put it, ". . . it just lets you know that it's pretty important to be a part of that community — and what better way to be a part of it than be out there covering it in human terms, getting it across to the folks." **BM/E**

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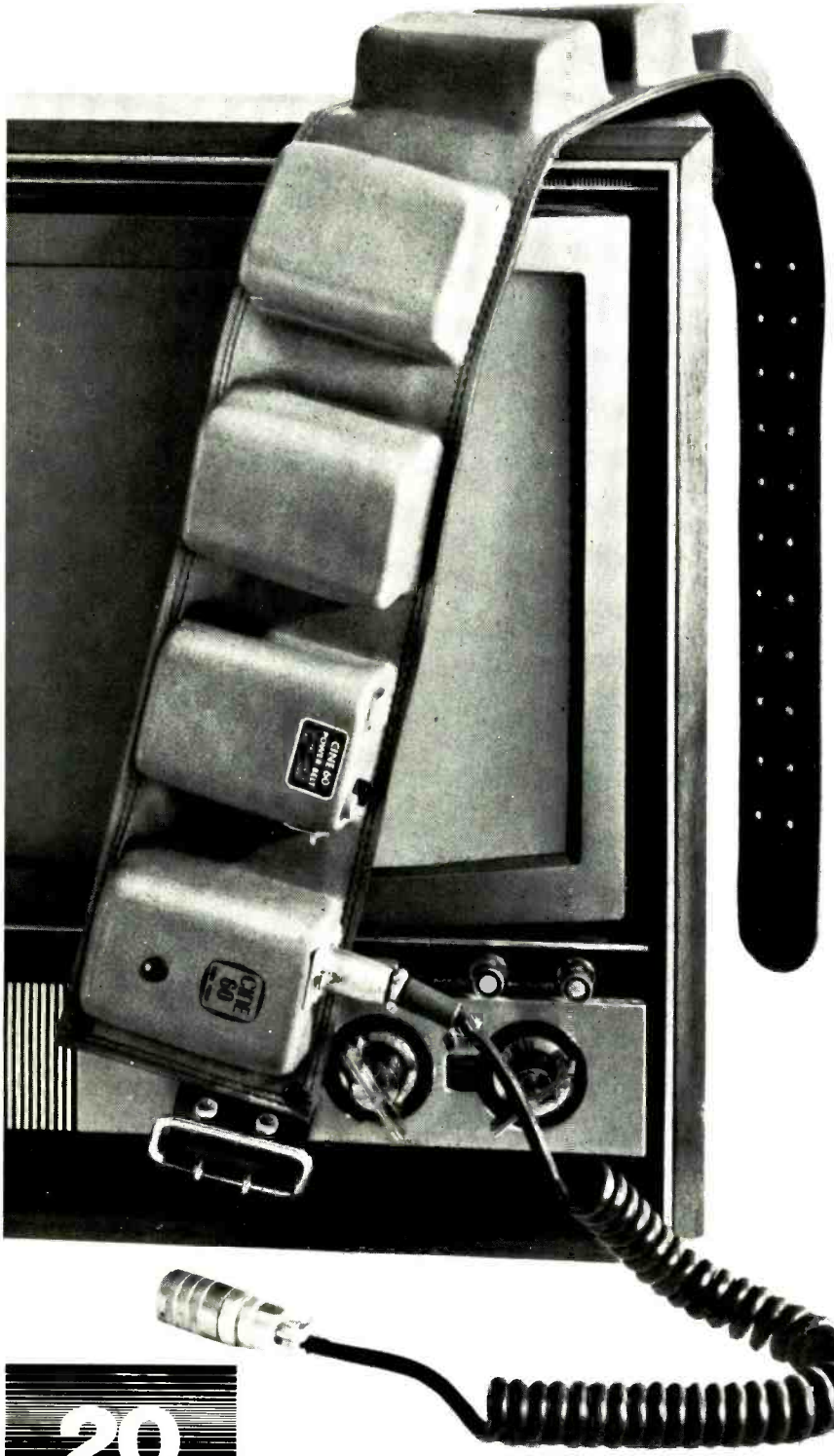

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ELECTRONIC ELECTION PRIMER

With the 1980 election drawing close, stations in all markets are formulating plans to provide high quality, rapid, accurate election reports. Computers are playing an ever-increasing role in this process both for "number crunching" and, when linked to character generators, for on-air display.

"ELECTION COVERAGE IS PROBABLY the most complex thing you ever attempt in news," says Joel Albert, manager of local news operations at NBC-owned WRC-TV in Washington, D.C. "If you're going to use a computer, you have to be in step with the thing all the way. You can't just plug it in a week beforehand and put a few names into the files; you have to develop an orderly plan for getting what you want out of it."

Albert's experiences are echoed in almost every market in the U.S. Five or six years ago it might have still been acceptable to write election results received from a local election headquarters on a blackboard or art cards. Today, with election night coverage one of the hottest areas of station competition, the only station that hasn't at least considered using a computer is probably one that has no competition.

The choices among computer systems for election reporting are manifold, and depend to some measure on what facilities the station already has. One method is offered by manufacturers that normally feed weather radar, meteorological reports, and other data to stations that dial up and ask for it. Generally the station captures the information on some type of disc or still storage device, then airs it at the appropriate time. The information supplied to the station during election night, however, consists mostly of the results reported by the News Election Service or other news wire. While providing a good overview of national races, these systems seldom provide the kind of in-depth analysis of local or statewide races needed by a station attempting to maintain a strong local presence with its news. Even in the cases where statewide elections are covered, the results on wire services usually lag far behind results that a station can gather itself. Wire services also generally report only major party candidates, making calculation of exact vote percentages impossible.

Stations with large in-house computers used for business automation may find themselves able to develop software programs to perform the local race number-crunching tasks, entering the election results into a character generator for on-air display. The problem here is that software development of any kind requires a massive time- and money-consuming effort; election reporting programs are not easy to prepare.

Another alternative is offered by business automation system manufacturers, who can spread the cost of software development among all their customers. Though more economically feasible, this method still leaves the station with the problem of getting the results on-air. Work is starting, of course, on taking the output of an in-house or time-shared computer system and feeding it through a translation program into a character generator. At this time it appears, however, that practical systems are still somewhere in the future.

In the meantime, therefore, stations are availing themselves of the various election reporting systems offered by the manufacturers of large-scale character generator systems. The idea here is that the character generator already has a computer which can be used to both "crunch" election return numbers and format them directly for on-air display. Specifically, the systems include: Thomson-CSF's Vidivote (used in conjunction with its Vidifont character generator and sometimes with its Viditext expanded software program for additional on-air display features); Fernseh, Inc.'s Compositor I (formerly the TeleMation unit) with its Television Events Display (TED) program; and the Election Reporting System (ERS) offered by Telesource in conjunction with Chyron. ERS differs from TED and Vidivote in that the character generator's systems are used only to display the information, whereas the number crunching is done on a large, time-shared computer fed directly by the station. ERS offers the advantage of being able to feed a participating station with any results, including national and other stations' local reports, stored in its memory.

Gathering returns

In all uses of the computer for elections, the first step is to carefully plan out which races will be covered and what the method of inputting the results will be. Since the computer must open a separate file to tabulate each race, ballot referenda have to be considered as separate files. Special analysis of returns also entails setting up separate files: to display as a single readout all the incumbent candidates who are leading, or to show the differences between rural and urban voting patterns in a statewide race, separate pages are necessary.

Inputting the results is more and more a function of computer terminals, and the speed with which results can be entered often makes a critical difference between one station's program and another's. While the less sophisticated operation is still waiting for an election headquarters result to come through, the sophisticated operation has

reporters at key precincts to show voting trends and enable the election producer or election analyst to predict a winner.

The most basic method for getting returns into the computer is to have reporters in the field calling in results from local election headquarters (or other reliable sources such as the League of Women Voters) using standard telephone lines. The reporters identify themselves to the operators at the station, sometimes using a special code to prevent unauthorized calls. The operators then log the precinct or county being reported, the race, and the vote totals. Sometimes the telephone operator is seated at a computer terminal and inputs the results directly; sometimes the results are first logged on a preprepared form, then given to a terminal operator for inputting.

In almost every case, the input terminals are standard leased data terminals with CRTs. These permit interaction between the operator and the computer program so that the computer can run a "check out" asking the operator whether the results have been checked, whether the votes are tallied, whether the race number is correct, and so on. This helps prevent inputting errors.

The number of input terminals varies with the needs of the station and the system capability. Up to eight terminals can be used with the TED and Vidivote systems and an unlimited number with the ERS program.

A typical terminal setup would be similar to that found at WSM-TV, NBC affiliate in Nashville, Tenn., where Lee Whitehurst sets up eight Texas Instruments Silent 700 terminals at the station to input data from a battery of 20 telephones. Reporters at polling stations call in results of local races, with the Compositor's TED program used in its additive mode to prepare an overall results page. Statewide and national results are taken off the UPI and News Election Service (NES) wires and also inputted by the terminal operators.

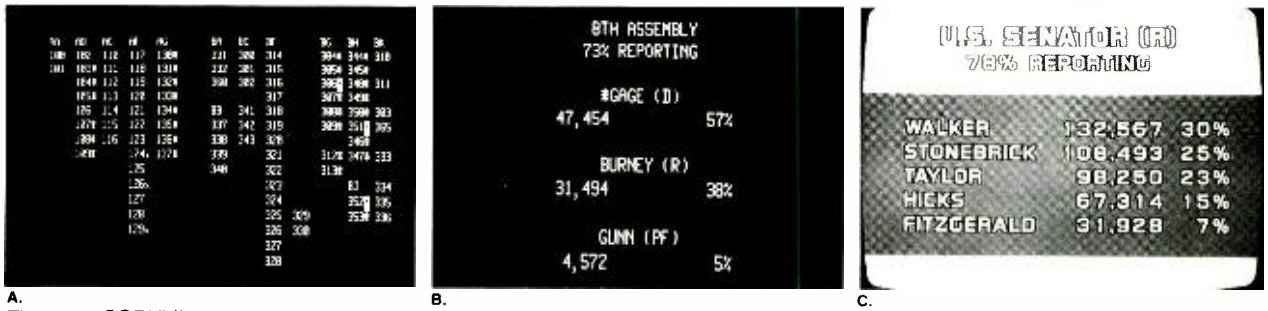
Deployment of the terminals can make a significant difference in the speed with which results are inputted. If all the input terminals are locked back at the station, for instance, then all incoming results must pass through the telephone system, be logged, and then entered. If, on the other hand, data terminals are situated at local election headquarters or at election pools coordinated by local newspapers or wire services, the results can be fed into the computer as soon as they are made available. The data terminals can interface directly with the computers, of course, over standard telco lines using ASCII code and the RS-232 interface.

At WWL-TV, New Orleans, news director Phil Johnson remoted five data terminals at the clerk's office in each of five surrounding parishes (counties). As soon as the votes came into these centers, they were made available to the terminal operators, who fed the results to the TED system back at the station. Over 100 races were covered in the last election, with dozens of sub-race pages set up to display results from each parish. In the last election, Johnson also located a terminal at the local wire service pool in case the tabulated results coming through there were faster than his individual parish reporting system; they weren't!

Generally, a combination of local reporters and direct input is necessary to provide coverage of both statewide races and local races in a station's coverage area. At KSTP, Minneapolis, for instance, executive producer of news Ken Green was confronted (in 1978) with statewide races for governor, two U.S. senate seats, seven House of Representatives posts, much of the state legislature, and a number of local offices. Five terminals were used to input the Telesource system — two located at the statewide pool coordinated by the AP for statewide results, and three located back at the station where results put out by the local League of Women Voters were called into the station.

The most complicated returns-gathering setups are those in which a combination of remoted data terminals and studio-located terminals for phoned-in results are used. At KAKE-TV in Wichita, Kans., Ron Loewen uses a combination of seven remotely located and in-studio Texas Instruments 700s to feed the Compositor TED. Two terminals are located at the station to input call-in data from 100 of the state's 105 counties for statewide races. At the same time, remoted terminals located in the three counties surrounding the station's own — those that vote by machine — input data as soon as it is received at local headquarters. Within the city itself, volunteers are assigned to each polling place. As soon as results are made available, volunteers rush the results to one of the station's three strategically located tallying centers; after some manual number crunching, data is immediately inputted through a terminal.

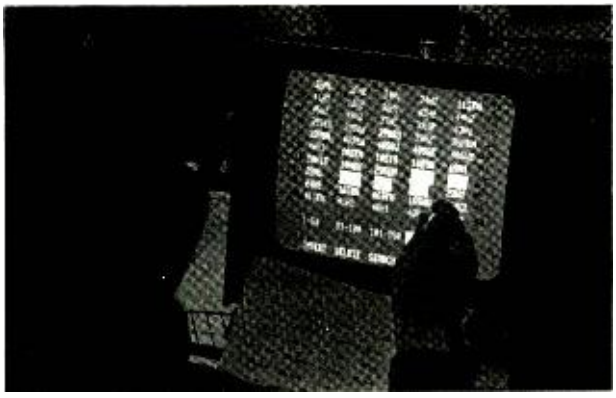
Certainly one of the most complex setups in the country must be that at KTVY, Oklahoma City, where information and public affairs manager Ernie Schultz covered some 110 races in the '78 election with an ERS system. Three separate input programs were tied into the time-shared computer: for statewide results from all 77 statewide counties, Schultz relied on an election pool, entering the votes as replacement totals; from the Tulsa/

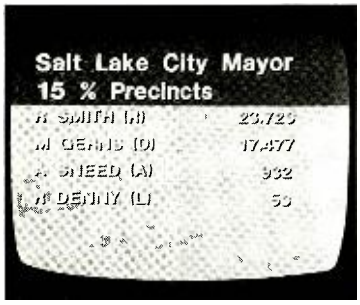


A. B. C.

Thomson-CSF Vidivote system. Producer's status monitor (A) lists races by number in pre-arranged sequences; asterisk indicates new vote total since race was last aired, reverse asterisk indicates new votes and new leader, "x" indicates no votes received yet. Newsroom monitor (B) provides quick tabulation of individual races for producer and/or director; asterisk indicates a winner has been declared in the race and that a check-mark or similar symbol will appear when the page is aired. On-air display (C) is automatically formatted with candidates ranked in descending order

Electronic Election Primer





KAKE-TV used Compositor TED program during last election. Light pen permits assembly of race sequences and also calls up races on status display monitor for producer or director to examine

Muskogie county area (comprising, together with Oklahoma City, 1.6 million of the state's 2.8 million residents), Schultz was able to receive precinct-by-precinct and countywide total results from another station participating in the ERS system; from his own Oklahoma County precincts, Schultz relied on local civics club volunteers located at each precinct to call in results. The latter were used to compute vote totals for both local races and also Oklahoma County voting patterns in statewide races.

The tricky part in coordinating the coverage was that duplicate vote totals were being received for statewide elections — Oklahoma County returns reported both in the statewide pool coverage and in local precinct returns called in by the volunteers. To avoid misleading viewers, Schultz had to be careful to stick with only one set of figures when showing the Oklahoma County contribution to statewide returns.

Number crunching

The ability of the Vidivote, TED, and ERS systems to manage vast amounts of information and format it in a way suitable for use in television broadcasts is primarily a function of their computer systems. In the case of Vidivote and TED, the same computers and microprocessors used for character generator formatting are simply reprogrammed with software to handle the election mode. In both systems, the number of races that can be handled by the standard memory packages is 200 races and sub-races. In the ERS system, because of its large, time-shared computer, the number of races can be unlimited; but there are additional costs to program the system as the number of races rises.

In all three systems, races and sub-races to be covered in each particular election are carefully mapped out in advance, and a code number or mnemonic device assigned to each race.

Actual entry programs differ somewhat from system to system. In Vidivote, for instance, the terminal operator punches in the mnemonic for the race to be entered. The CRT display shows the names of the candidates in the race one by one in ballot order, and the operator inserts the new vote totals. After the last candidate vote has been entered, the system again displays the candidates one by one while the operator verifies the totals and makes corrections. If rapid entry and display are required, the verification program can be bypassed, although some kind of verification is always required before new vote totals will update and replace old totals. With an RS-232 interface, of course, the process is automatic.

Once the numbers have been entered, the computer systems go to work. The candidates can be re-ranked in descending order of votes received or left in ballot order. The computer calculates the number of total votes received in the race or sub-race, the number and percentage of precincts reporting, the vote total received by each candidate, and the percentage this represents of the vote count. The entire calculation process is performed in milliseconds once the data has been inputted, and is then ready for immediate on-air display.

Another important function is the ability to discern among multiple sources reporting on the same race. In the Vidivote system, for instance, data from wire services, county clerks' offices, reporters at polling stations, and other sources can all be inputted simultaneously. The Vidivote retains all the data in its memory, but only displays on air the vote total which is highest for any given race. It can also add together individual precinct or district reports and use that total if it is higher than, say, the wire service or Secretary of State returns. In the TED system, individual races are preset to select either "grand total votes" when the results come in from an already computed source such as a wire service, or "new votes" when the source is individual precincts or districts. In the former case, the new vote total automatically replaces the number in the file; in the latter case, incoming votes are added to the existing total. Similar programs are available on the ERS system.

The other significant ability of these number-crunching systems is to arrange data in sub-races or special breakouts. In a statewide election, for instance, the station will want to show its viewers not only the overall candidate standing throughout the state, but how the candidate did in its own particular coverage area. In a citywide election, the station might want to show how the candidate did in a particular precinct, or a group of precincts with special interests or common ethnic backgrounds. Another frequently used breakout is to show how all incumbent candidates are doing against newcomers, or how many Democrats versus Republicans are ahead in state legislature races, etc.

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In each case, sub-races of the main race are set up as special pages, each with its own computer file. A single entry is made into the computer listing the race, precinct reporting, and the candidate vote totals. The preprogrammed computer simultaneously adds the information to the master display of the race, adding the new vote totals from the precinct just reporting. At the same time the information is stored as a separate page which can be aired to show how the individual precinct voted.

Similar programs can be used to display special information. To create the incumbent versus newcomer file, for example, the computer simply checks its memory to see whether the leader in each race is incumbent or not (based on material stored when the election program was determined), then adds to the "incumbent" or "newcomer" total as appropriate.

All three systems also have programs that will let the director or producer, watching a special status display monitor, know when fresh results have arrived for a particular race, and/or when the leader has changed.

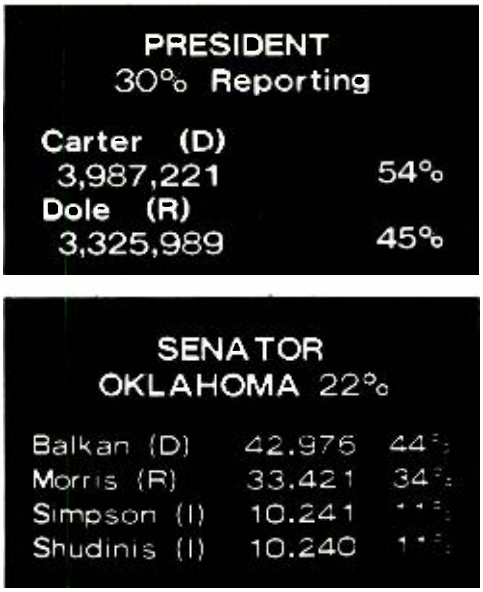
It must be realized that the more analysis that is done by the computer, the more costly it becomes. In the case of the Vidivote and TED systems, the cost is one of memory storage. Each breakout requires tying up one of the standard 200 race files available. When covering over 100 actual races, which is not at all uncommon, the number of files left open for analysis or special page displays becomes somewhat limited. Extra memory can be added to both systems, but not inexpensively. In the ERS system, of course, the amount of memory capacity is unlimited; however, the cost of using the system is charged directly according to the amount of programming and storage required, and a hefty tab can be run up quickly if dozens of special call-outs are used.

One way around this may be the use of an auxiliary computer to perform many of the mathematical calculations normally required by the character generator-based systems. A station will sometimes lease time on a local time-shared computer system; this has the advantage of being far less costly than actually purchasing an in-house computer, but is subject to all the problems of time-sharing systems such as lags in getting information out when the computer is in heavy use by other time sharers, and the perhaps psychological problem of realizing that if the system crashes, there is nothing the station can do about it.

At KTBS in Shreveport, La., head of special projects Brend Hodge did experiment with an outside-supplied computer service for last fall's primaries. All results, including telephone call-ins and input from a data terminal at a wire service headquarters, were input at the computer house. The results were sent to the station over data lines and the hard copy was reentered through a Vidivote keyboard.

By the time of the general election two months later, however, Hodge was able to use the station's own IBM System 34 (normally set up for a Columbine business automation program) to handle election night number crunching. It took computer systems supervisor Dale Beasley and a local computer expert 103 hours to program the system. Part of the task was to match the output format of the System 34 to the input program of the Vidivote; although the two were not electronically interfaced, the program from the computer could be rapidly and easily reentered in the Vidivote.

According to Hodge, there were two reasons for going with the in-house computer in conjunction with the Vidivote. In the first place, the in-house system offered much greater control than the computer service company system; in the event of failure of any part of the system, her own engineers were standing by ready to correct the problem.



Sample page displays from Chyron/Telesource Election Reporting System. Full-page displays permit insertion of station logo or call letters at top of screen. Half-page displays, listing leaders only, permit insertion of other programming at top of screen

She was also looking for far larger memory capacity from the computer than the Vidivote system could offer. Votes were coming in from three sources: the AP wire service, headquartered in New Orleans, where a reporter called in statewide totals; precinct-by-precinct call-ins from the station's own and several outlying parishes; and precinct-by-precinct returns from a station in New Orleans (to cover the southern half of the state) with which KTBS had an election night ad hoc pooling arrangement. Statewide races, such as that for governor, were set up as a set of sub-races; each of the sources was first input into the System 34, tallied, then entered into the Vidivote. The Vidivote would select which of the three sources represented the highest total, then display it whenever the governor's race was called up. If individual page displays had been entered into the Vidivote, of course, the memory capacity would have been very quickly filled up with over 100 local and statewide races to be covered, and parish-by-parish reports required for many.

Some stations also used their vote-gathering systems to assist election analysts in forecasting winners or in providing data on poll interviews. At KSTP, for instance, news director Stan Turner during the last primary race relied on his 12 years of reporting statewide politics to determine that certain well-populated counties in northern Minnesota would carry the vote one way or the other. These were broken out as separate sub-races in the ERS program, and once a significant sample of voting from the northern counties had been received, Turner was able to declare a winner. O&O stations particularly have access to public opinion polls and interviews conducted with voters after they leave the polls; both sets of information can be entered into the computer system, then displayed to help explain voting patterns.

Electronic Election Primer

Electronic election production

If everything has been preplanned properly, the first results from an election will begin appearing ready for on-air display within minutes after the polls close. Displaying data to election producers and directors and permitting rapid display of the material on-air are integral features of all the computer-assisted systems.

TED's light pen system is certainly one of the most elaborate. The election status monitor displays the seven-digit alphanumeric mnemonic for each of the 200 races, flashing those that have received new vote totals since last called up for on-air display. The terminal operator, acting under direction of the election producer and/or director, simply touches a light pen to the screen to display the actual race with the candidate rankings.

The same light pen system is used to assemble sequences of races. When the director is ready to air the pages, the Compositor operator (usually in the control room) selects the Compositor's TED mode; a single button on the keyboard airs the next page in the sequence and presents the following page on preview so that on-air talent is alerted as to what's next. At any point during the program, the sequence can be broken and a page with fast-breaking news inserted.

In the Vidivote system, a similar status display monitor shows the election producer/director the entire slate of races at a glance, grouped by a three-digit number under the race sequence to which it has been assigned (AA, AB, CA, CB, etc.). In the Vidivote system, race page sequencing is determined by the Vidivote entry terminal by first selecting the two-letter code for the sequence and then the number code for the particular race. Like the TED status display, the director/producer knows at a glance which races have received new vote totals: an asterisk next to the race number shows new votes received since the page was last aired and a reverse asterisk in a box indicates new votes and change of leaders; an "x" next to a race indicates that no votes have been posted yet, allowing the director to skip over that race when presenting the pages on-air.

To examine a particular race, the terminal operator simply types in the number code for the race, which is instantly displayed with candidate rankings and vote totals. An asterisk next to a candidate's name in this preview display indicates that the candidate has been declared a winner and that a check-mark, flashing, or other device programmed by the station will appear next to the name when it is aired. Both TED and ERS offer similar winner declaration capability, though with candidates ranked in order this feature is not always used.

An important difference in the Vidivote system is that the Television Data Reporting System (TDRS) computer is separate from the Vidifont computer. Though both the TED and Vidifont systems will continue to receive and process data while pages are being displayed, use of the TED program to air displays results in the loss of the use of the Compositor character generator for titling. In the Vidifont system, full Vidifont capabilities are maintained at all times.

The ERS system works in much the same way. The time-shared computer not only performs number-crunching functions, but also formats the information

ready for on-air display. At the station, a data terminal is assigned to call up the pages from the computer, either singly or in preprogrammed sequences. The TD simply punches up the terminal display on the switcher, and the terminal operator, under direction of the producer or director, controls what goes on the air. By entering the race number and instructing the system to "go" with the carriage return, single races are put on the air. To activate a sequence, the letter code for the sequence is entered and, following carriage return, the pages begin flipping by.

The system works with a Chyron-designed and manufactured Television Titler Controller (TTC-400), a microprocessor that allows the time-shared computer to control and feed data to the Chyron character generator through an RS-232 interface. Incoming data (at the rate of 60 characters per second) is stored by the "black box's" buffer memory, then transferred to the Chyron's character generator for colorizing, font selection, and so forth. Interruption of the Chyron functions is only momentary, and full control of the character generator is maintained.

On-air display

The ultimate payoff of all these systems comes in their immediate formatting of the data for on-air display. Typically, each race is displayed as a single page, although primary races with a large field of candidates may require the leaders to appear on the first page and those trailing the field on subsequent pages (which can be skipped over in the sequencing if desired). Simple ballot questions requiring tabulation of only "yes" and "no" votes can often be grouped on a single page, as can groups of races if the producer and director are willing to list only the leading candidate(s). In the ERS program, the producer has the option of creating an automatic "roll by" in which the races will come up fairly rapidly in a predetermined sequence, listing only the name of the race and the leading candidate. In the other systems, prearranged pages must be created for this special kind of display.

Full-page displays in the three systems are fairly similar. At the top of the page, the producer has the option of using a station logo or the legend "CALL LETTERS Election Results," or the like. Affiliates often use their network's election logo to keep the local program consis-

3M Unveils Election System

A new election reporting and display system which combines 3M's D-8800 character generator with a Station Business Systems computer and software package was introduced and demonstrated at the NAB.

The combination, called "8800/VOTES," gives the television station complete vote information input capability, automatically formatted election races, automatic vote totalizing and percentage calculations. The final presentation is through the D-8800 on a random demand or predetermined sequence basis.

The D-8800 is microprocessor-based and offers a fully independent dual-channel operation with built-in dual-channel mixed capability. It features 10 speeds of roll/crawl, six speeds of animation, eight masks for roll/crawl and a multi-font library with custom logo and font design.

The Station Business Systems Division of Control Data Corporation offers a complete "VOTES" election reporting program, running on a compact, in-house minicomputer. This part of the 8800/VOTES system can be rented for just 1980 election coverage if desired.

tent with the network feed. When the ERS system is hooked up to older Chyron models, the page is supered over a slide to provide colored backgrounds as well as the station logo or text; otherwise, the graphics and text are inserted electronically by the character generator.

Against a background color of the station's choosing, the actual page display next lists the name of the race and the percentage or number of precincts reporting. This is followed immediately by a listing of the candidates with their party affiliations (if programmed) and vote totals and/or percentages (again depending on the wishes of the producer) in a separate background color. Candidates can be ranked either in ballot order, or, as is most common, in descending order of vote totals with the winner on top. In some systems, updating of new vote totals can be held back until the display is on-air to add dramatic impact. In the ERS system, the results can either be popped onto the screen or written out when the page is called up — again adding dramatic impact.

All three systems also have the ability, with the simple push of a button, to reduce the full-page display to a lower half, permitting the insertion of other programming in the top half of the screen. The lower half display, which generally lists only the name of the race and the two leading candidates with their totals, can be supered, or used over an internally generated color background.

Perhaps the most advanced page-display options are available on the Thomson-CSF system when used in conjuntion with the Viditext software package. This permits, for instance, repositioning blocks of data on the display screen or individually coloring sections of the display.

While these options afford greater graphics flexibility, some broadcasters raise a note of caution about overly busy on-air displays. The caution comes particularly from seasoned elections producers, who note that the function of the displays is to present information as succinctly as possible, not to look so busy that viewers lose track of what they are supposed to be watching.

This point is further emphasized by Roy Trumbull, engineering supervisor at KRON-TV in San Francisco. Testing the readability of character generator displays,he established as minimum criteria that the display had to be readable on a 21-inch set at least 10 feet away. With these criteria, he found the absolute maximum display has 10 lines of copy with 25 characters per line. "That's the maximum capacity," he warns. "If you've got that much text, the screen is already too busy. 'Keep it simple' is the dictum we must all operate with."

The same holds true for special effects used in conjunction with the on-air page displays. Since the outputs of all systems appear at the production switchers as single inputs, they are capable of being manipulated as if they were video sources. They can, for instance, be frame-compressed by a digital effects generator, then inserted over the shoulder of the on-air talent. Or they can be used with digital effects systems' chroma key tracking features and inserted into chroma key bands or special windows. Again, the caveat "keep it simple" applies. With as much as three or four hours of programming to fill on election nights, production people will want to resort to every trick in the book to keep viewers interested; keeping the display of election data readable and uncluttered, however, should be the foremost concern.

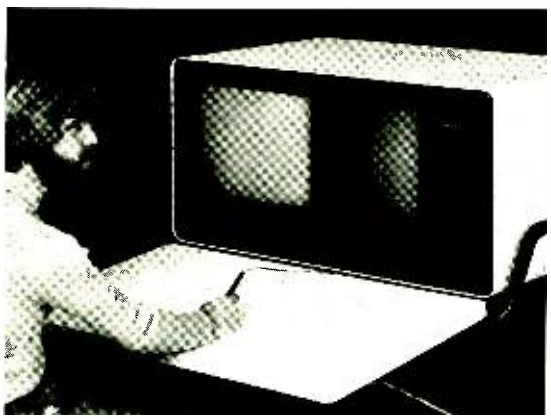
In conclusion, it must be pointed out that though the choice of computer and on-air display system must mirror the station's own particular dedication to news and elections programming, few stations can afford to be without them for the first election of the decade. One thing is for certain: writing on blackboards for elections coverage is a rapidly vanishing art! **BM/E**

New Graphics System Could Find Election Reporting Applications

Just introduced at the NAB show, the Ampex Video Art (AVA) system may see some action this fall for innovative graphics during election reporting. A prototype of the system was used by artist LeRoy Neiman during the broadcast of the Super Bowl from New Orleans in 1978 (see *BM/E*, February, 1978). Many new features have been added since then.

The system permits graphic artists to create original art or modify existing pictures, charts, or diagrams with a broad selection of colors, hues, saturation, line weights, shapes, and intensities. There are no keyboards or dials to contend with; instead the artist uses an electronic stylus and palette to direct the computer and paint or draw the art.

A good deal of highly sophisticated digital software has gone into creating a system that can be mastered by even the most non-sophisticated artist.



The designer sits at a tiltable flat surface, called an "electronic tablet," that is divided into two working areas. Two video monitors face the artist. On the left, the color monitor displays the artist's work. The right hand "menu" monitor lists a large number of different verbal commands that allow the artist to select a variety of painting and sketching styles, colors, and special effects. Holding the electronic stylus, the artist draws and communicates with the AVA system on the two halves of the palette.

The artist need only be concerned with the electronic stylus, which is used to select various operating modes from the menu monitor. Selection of modes is in plain English commands. Touching the stylus to the palette causes a video cursor to be shown in the corresponding area on either the picture display or the menu monitor. Slight additional pressure activates whatever command has been given to AVA, and artistic work on the palette's drawing area can proceed.

The electronics for this new turnkey graphics system can be remoted up to 1000 feet from the artist's palette and monitor console. AVA's components include a DEC PDP-11/34 minicomputer with 256K of RAM memory and an Ampex DM-980 or DM-9160 disc drive. Additional electronics include the special AVA video processor and memory and their power supplies, all held in a standard 19-inch electronics rack.

The basic AVA graphics system offers 256 colors and nine type fonts. An optional scanner copy stand for inputting existing art into the AVA memory is available, as is a photocopy printer to produce hardcopy samples of the art work generated by a designer/artist on the AVA system.

Beyond ENG

Born into ENG, the HL-79A adapts beautifully to EFP. The accepted leader in ENG, the HL-79A, reinforced its position as the preeminent portable camera at the 1980 Winter Olympics. Scores of HL-79A's covered the ski slopes, the bobsled and luge runs and the skating rinks for the ABC Network. Their performance brilliantly etched into the world's visual memory, is history. But the industry already knows about the HL-79A's capability.

Today, more and more broadcasters are learning that the HL-79A is a superior EFP color camera. Options such as 4½-inch electronic viewfinder with return video, program and intercom audio plus genlock — among other features — transform it into the ideal camera for sports and special events, commercials and high quality production. Triax equipped, it ranges nearly a mile from its base station. Near-darkness is its frequent habitat; but it has knee control for brilliantly lit scenes too.

Of course, you may need some of its ENG flexibility for EFP too —like its shoulder action shape, 11.2 pound weight, 6-hour clip-on battery.

The specs and automatic features of the HL-79A are equally outstanding. They're yours, along with an eye-opening demonstration, at your Ikegami distributor. Or contact Ikegami Electronics (USA) Inc., 37 Brook Avenue, Maywood, N.J. 07607, (201) 368-9171. West Coast: 19164 Van Ness Ave., Torrance, CA 90501 (213) 328-2814; Southwest: 330 North Belt East, Suite 228, Houston, TX 77060 (713) 445-0100; Southeast: 552 So. Lee St., Americus, GA 31709 (912) 924-0061.

Ikegami HL-79A

PUTTING THE ELECTION TO WORK FOR A RADIO STATION

A radio station has a responsibility to its listeners for election reporting. But management should not overlook the benefits that flow the other way – from the election coverage to the station. Here is how several stations, each with a different general news style, plan to make the most of this fall's elections for their listeners and themselves.

THE AMERICAN PUBLIC DEPENDS on both radio and television for prompt election news, with the proportion of the load carried by each varying greatly from small to large community and, of course, from individual to individual. In some places, radio is the main carrier; but it is essential everywhere because everyone, in some situations and times of day, will use radio rather than television.

So radio has a prime responsibility for election reporting. Many radio stations meet this simply through their regular news programs, which may occupy a relatively small part of their on-air time. For many of those stations the remarkable election jobs done by the large wire services will have tremendous value. The various radio nets, too, are putting election coverage for their affiliates on a high level.

However, there is a range of radio station characters and community positions that make some local effort, large or small, appropriate and valuable. From the examples given here, other radio managements may get suggestions for changes or enlargements they want to make in their own election plans.

WFTW puts it together

In Fort Walton Beach, Fla., WFTW-AM and FM have established a position as prime news sources for a large surrounding area, with four counties included; Ocalusa, Santa Rosa, Escambia, and Walton. The management for a number of years has used a very large local news program to attract a considerable fraction of the audience and to help establish the character of the station for local businessmen.

WFTW has five mobile pickup cars with Marti and Motorola two-way radio. There is also a complement of handheld Marti transmitters that can use the mobile units as relays to get signals back to the studio. The news department has CB equipment to keep in touch with the charter boat fleet in nearby Destin, Fla., that helps cue the station in on emergencies at sea. There are, of course, scanners for local police communications.

The station is also well positioned with respect to the local ham radio community. The station manager is himself a ham and has a rig right in his office. As noted before in *BM/E*, the ham nets have often supplied instant communications to points regular newsgatherers could not get to in time, or at all.

This array of news gathering facilities is used for at least 11 daily newscasts on events throughout the Gulf Coast area. For national and international news, WFTW has the AP wire and audio services.

Carl Shelenberger, technical director, told *BM/E* how the facilities will be used in this fall's elections. The station's mobiles will be out touring every precinct polling place for spot checks, to radio in latest totals. There will be a permanent crew at the county court house, where county-wide returns are put together. Since there are 32 precincts in the county, this will be a major part of the operation. It is vital to the station because WFTW has established itself as "the" source of local news, and there are many races this fall for county offices.

As the information comes in, it is entered on a master sheet at the station. The station's bookkeepers, armed with calculators, will get instant totals for the station's unofficial, but eagerly followed, election projections.

There are also a number of state-wide offices to be filled in the fall election, and WFTW will be able to announce how the surrounding counties are going on those candidates. For the state-wide results, WFTW will have a telco line to a contact in Tallahassee who can follow official tabulations there.

The local and state figures will also, of course, show how the counties and the state are doing in the national election. For other states, the AP wire and audio services will bring national returns. All the information will flow

Computer set-up and triax too

Today, broadcasters are classing computer setup and triax as necessities. Ikegami offers you a choice of two such cameras. Both are proven in the studio and field.

- The HK-312, with 1¼-inch pickup tubes, is the only proven computer setup camera today. More than 100 are in service throughout the ABC Network, at WGBH, and at other major stations.
- The HK-357A with 1" diode gun pickup tubes offers the same high standard of performance along with the convenience of field capability.

Both are extremely stable cameras that can be operated manually. And both accept computer control for automatic setup for on-air readiness in 45 seconds.

Both cameras can be used with multi-core cable. With triax the cameras can be a mile from their base station.

Of course, in colorimetry, automatics, circuitry excellence, and range of options, both are incomparable. But seeing is believing. Experience a demonstration soon at Ikegami Electronics (USA) Inc., 37 Brook Avenue, Maywood, N.J. 07607; (201) 368-9171. West Coast: 19164 Van Ness Ave., Torrance, CA 90501 (213) 328-2814; Southwest: 330 North Belt East, Suite 228, Houston, TX 77060 (713) 445-0100; Southeast: 552 South Lee St., Americus, GA 31709 (912) 924-0061.

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PORTABLE VIDEOTAPE RECORDING WITH THE AMPEX VPR-20:

Bringing Back Tape You're Sure You Can Use Calls for a Tough, "Smart" Portable Recorder.

Finally, you can videotape remotely without compromising the considerations that apply to studio work. Because Ampex engineers went far beyond the usual definitions of portable acquisition when they designed the VPR-20 one-inch helical.

Confidence Is Paramount.

On location, you have to know that you're capturing good material. So Ampex built a confidence feature into the VPR-20 that actually plays back the picture from the tape into the camera viewfinder during recording. When you see it in the viewfinder, you know it's on the tape. And you can have color playback in the field, thanks to the color stabilizer option, which mounts inside the VPR-20.

Production Flexibility for All Situations.

When the assignment is commercial production in the field, your VPR-20 can backspace itself for a flawless assemble edit. And color framing is standard. The advanced cueing system allows you to go back and look at the last shot, and either go on from there or retake the shot and eliminate unwanted material. Right in the field. As simply as pushing the appropriate button.

The Front End of a Special Effects Production.

Tapes recorded on a VPR-20 are fully compatible with every trick in the VPR-2 special effects book. Once you bring your material back to the studio, you can slow it down, speed it up or stop it on a selected frame with a VPR-2. And if you haven't seen the quality of VPR-2 special effects yet, you're in for a surprise.

If You Can Take It, Your VPR-20 Can, Too.

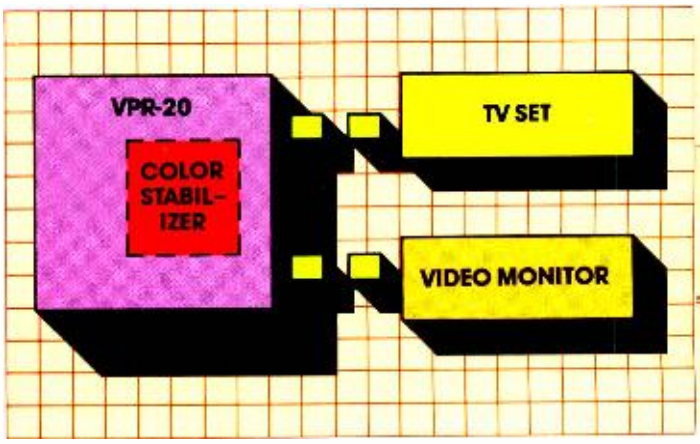
Environmentally, your VPR-20 can take nearly anything that your operator can. It shrugs off dust and sand in the air, tolerates a cloudburst, and stands up to heat and cold. Oblivious to the way it's held or positioned, the VPR-20 has an amazing resistance to the kind of gyroscopic conditions that go along with field recording. So you can take the VPR-20 for granted.

Enough Power to Finish What You Start.

The VPR-20 battery pack has more than enough capacity to record and rewind a full hour of tape. Then, when you're ready for more shooting, the quick-change battery pack gives you quick-change power. There's even a battery/charger system that brings you up to full power again in less than an hour. You'll really value the VPR-20's power-down memory. It keeps the tape timer operational during battery or power changes for up to two days if need be. This is portability with a punch.

If The Specs Don't Convince You, A Demo Will.

Somewhere within reach of your station, the tough, "smart" VPR-20 is turning the impossible into an everyday affair. Call us for the technical information, and then get your hands on a VPR-20. You won't want to let go.



AMPEX MAKES IT EXCITING

Ampex Corporation, Audio-Video Systems Division, 401 Broadway, Redwood City, CA 94063 (415) 367-2011

to a crew of anchormen and analysts in the station, who will collaborate with a news editor in getting material on the air.

Shelenberger points out that the entire staff, including most of the salesmen, will be drafted into news service for election night. There will be fast food and coffee on hand at all times. The anchor crew gets relief from time to time, because the pressure on that job is tremendous for speed and accuracy. Shelenberger himself joins in the anchor job when he is needed.

The effort is keyed to the management's ambition to be first with the election results and with comprehensive, accurate, intelligible news. It is an elaborate effort for a radio station in a medium-sized community, but it is an essential part of the station's stance. Small-community stations could adopt most of the operation without great expense: getting people out to the local precincts regularly, for example, is available to almost any station. A permanent contact at the official counting house is also an easy operation. Just how much or how little of such a plan a station adopts will depend, as already suggested, on the role that news plays in the management's objectives.

The election job at the nation's news center

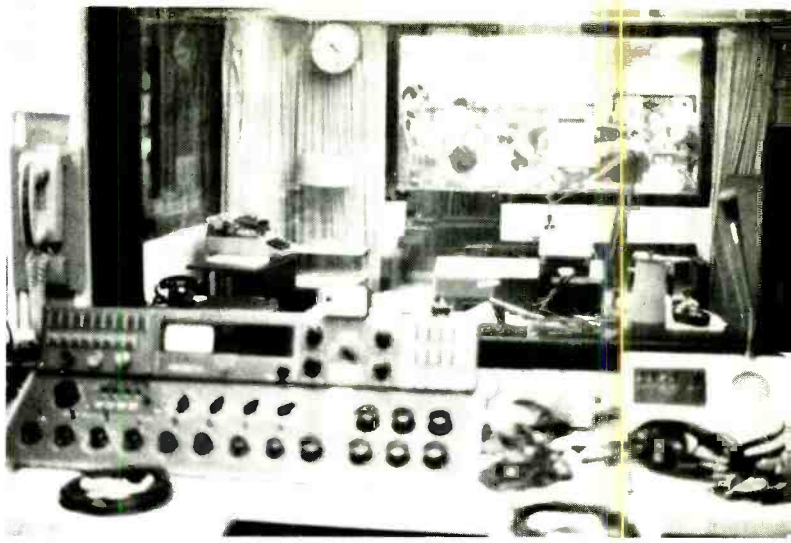
The job of covering the election at WTOP-AM in Washington, D.C., is complicated by the fact that this is an all-news station, and by the fact that Washington is the most important and complex news center in the country. But WTOP faces additional complexity: the station must cover local elections in surrounding areas of Maryland and Virginia where a good proportion of Washington's workers live. WTOP gives strong attention to local news in the Maryland and Virginia communities and sells the audiences there as parts of its prime market. The station therefore feels an obligation to cover the elections there in detail.

Ed Tobias, news director, sketched for *BM/E* the general plan for meeting these complex obligations. For getting the Washington national news, WTOP will combine the AP wire and audio services, plus the dedicated lines to various news sources in the city set up for the station's regular operation. Important figures can be interviewed for actualities when the news director decides on that. For the local election in the District of Columbia, there is a reporter at the county headquarters in Washington with one of the station's VHF two-way radio systems. He can get constantly up-to-date totals to the studio in a hurry.

The same VHF system will be the main link to the polling centers in the Maryland and Virginia counties. WTOP has established receiver stations at two high points in the Washington area. With the help of those stations, signals from hand-held VHF transmitters can reach the studio from the main spots to be covered in Maryland and Virginia.

The suburbanites will be vitally interested not only in their local candidates, but also in state-wide elections. For those, WTOP must have reporters at official countdowns in Richmond, Va., and Baltimore, Md. These reporters will have dedicated telco lines to the Washington studios.

The local coverage will show how each county or region is going in the national election; the AP information and remote pickup data gathered within Washington will fill in with the national results. Reporters will be



CBS Radio Network puts many newscasts on the air from this control room in the New York headquarters. Editing of newscasts is carried out in large room beyond window

Incoming news information is fed to several recording rooms like this one, for recording and editing. Editors have complete record of material in, can call it up as wanted

stationed at a number of WTOP's Washington remote spots for comment and interviews as well as data. They can use the telco lines permanently set up to many of those spots, or the VHF radio at spots away from the regular pickups.

WTOP has elaborate staff and facilities for preparing news for broadcast (see *BM/E*, December, 1979, for a story on this station). The news staff totals about 40 people, and they have not only the remote gathering facilities described, but also a number of editing positions with complete facilities for calling in data from any remote or from other sources and assembling data into a recorded newscast.

During the election coverage a news editor (one of whom is always in command during the station's regular operation) will be joined by election analysts and statisticians to help get the results in perspective for the great number of races the station must follow. The anchor crew will go on the air from time to time with background information. The whole complicated operation requires expert orchestration, and WTOP will depend not only on its own highly expert news staff and political commen-

tators, but on ad hoc experts hired for the job.

In Minneapolis, the job is somewhat easier

WCCO in Minneapolis is one of the most successful AM stations in the country with its mix of something for nearly everyone — the farmer, the high-culture city dweller, the young, the old. Local news is an important part of the mix. The station has established a tradition of live remote coverage on election nights, according to Curtis Beckman, news director.

WCCO covers surrounding suburban communities as well as the twin cities themselves. In the past the station has successfully used the following method for following the county races: the clerk at each local polling center sends the station a copy of the local ballot. Then during the election night the clerks call in the results regularly for entry on the ballots. The WCCO staff can easily get the necessary totals on county races from this tabulation.

Within the city, the station's remote operation gets heavy use. There is a crew at legislative headquarters to follow the races for the state legislature and get the results to the studio as fast as they come in. In the past the local League of Women Voters has also aided the operation by collecting returns from some county districts.

The remote operation, of course, will reach to local election headquarters and to campaign headquarters for both official returns and political comment. For national figures, WCCO relies on the CBS network and on the wire services.

All the data brought in is fed through a crew of anchors and political commentators who can go on the air with it directly or prepare recorded newscasts for later use. This part of the operation is clearly the key to the success of an elaborate election effort (as it is at all the other stations interviewed for this story). The figures alone can create confusion and then boredom. The listener needs to know what they mean, how they affect standings, how they compare with earlier elections and with expectations, and what they say about the outlook.

Election-night newscasts on the CBS Radio net will be distributed to various sections of the net at this control position in New York. Operator selects portion of net to receive broadcast by simply pushing a button on panel. Emergency "net alert" panel is on the right

CBS: a national net's election plan

Close to 300 radio stations will get their news of the national elections this fall from the Columbia Broadcasting System's radio net coverage. The CBS planning for this is virtually complete, and was described for *BM/E* by Morton Goldberg, manager of technical services. It puts to use facilities of the CBS net for its regular news coverage, a round-the-year setup that has been in place for several years. Added will be a special command center at the New York headquarters and a radio position in the TV control center. Except for shared use of a computer for election totals, the equipment and personnel of the radio net are entirely separate from those of the TV operation.

At the command center will be the CBS anchors for the operation, Charles Osgood and Reid Collins, with George Herman as political analyst. Incoming data from all over the country arrives at the command center and is routed to a series of recording rooms controlled from the radio command center. A producer and editor for each region of the country at "regional desks" coordinate the data from each respective region.

The anchors will know at all times what information has come in and what disposition has been made of it by the producers and editors. They can take incoming information for immediate airing or wait for an edited news script that may include background information.

The information will reach the New York offices by telco line from each region and state headquarters. For the purposes of the radio net, CBS will be following only the national election figures. But the results in each state will of course be presented separately, and if a state develops a particularly close race it will be followed closely by the CBS team on the spot.

The vote data will come into the New York headquarters by what is in effect a separate telco network. A crew there will enter the vote figures in the computer used jointly by the television and radio nets. Various totals, ratios, and comparisons with earlier elections will be instantly available in the computer output.

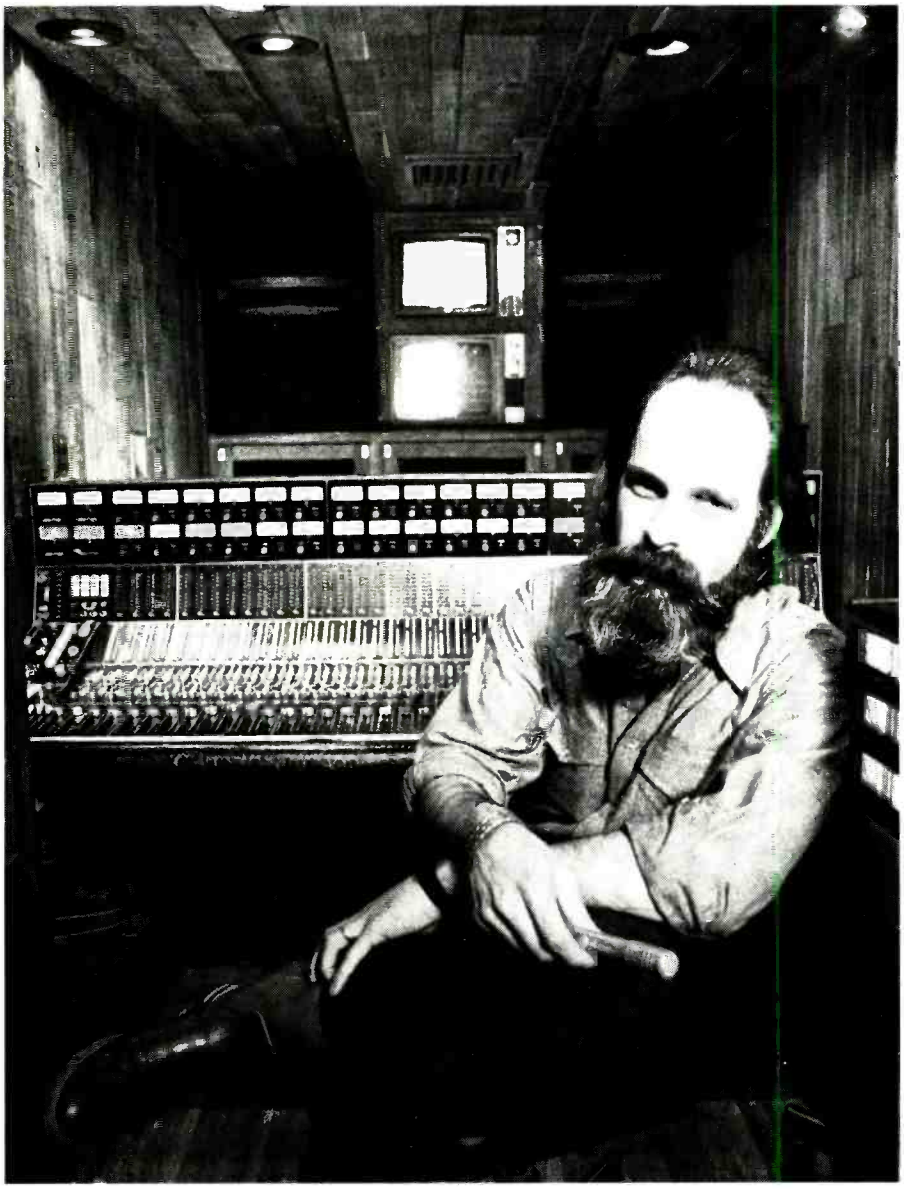
Each editing position, plus each on-air position, will have a call-up system connected to the computer. This system can display any total, ratio, or comparison at any time with a pushbutton system right at the position. There will be more than a dozen such positions, and the system makes sure that the operation has up-to-the-second vote totals in front of every person concerned.

A CBS crew at each state capitol location will pick up vote tallies as they come in and get them to New York headquarters. These remotes have two-way communication with New York via the incoming and outgoing telco nets, using a telephone hybrid interface developed by CBS especially for the operation.

This system allows instant cuing from New York to the remotes, and also allows the remotes to originate interviews with key people for comment or analysis. These actualities can be aired from New York as they come in or recorded for later use. The editors and producers at the positions in New York decide on the use of actualities in consultation with the news director on duty.

During the key period of the election, starting about

fact: "I never thought such a rugged microphone could sound this great"!



Record Plant Studios, N.Y.C.

David Hewitt
Director of Remote Recording

"When we record a live concert, we have just *one* chance to get every bit of music on tape... perfectly. That's why it's essential that every piece of equipment give *outstanding* performance, even in unpredictable situations that result in equipment being called upon to serve above and beyond the call of duty.

"Our mobile units follow a string of one-nighters from New York to California, with set-up and take-downs every step of the way. There isn't a microphone in the world that's too rugged for that kind of assignment. The Shure SM81 has proven itself time and time again as an incredibly reliable condenser microphone. In fact, we once accidentally dragged an SM81 over 400 feet on a wire catwalk... and it still performed perfectly!

"But, what really blew me away was the SM81's superb sound. Its exceptionally flat frequency response makes it our first choice for uncompromising acoustical guitar applications; and, the wide dynamic range and ultra-low distortion make it perfect for brass and percussion instruments as well.

"We count on Shure to make certain our remote facilities give dependably high performance. With the kind of custom-designed, state-of-the-art equipment we've got in our vans, we wouldn't settle for less-than-the-best microphone on stage!"

SM81 Cardioid
Condenser Microphone

SM81 Cardioid Condenser Microphone

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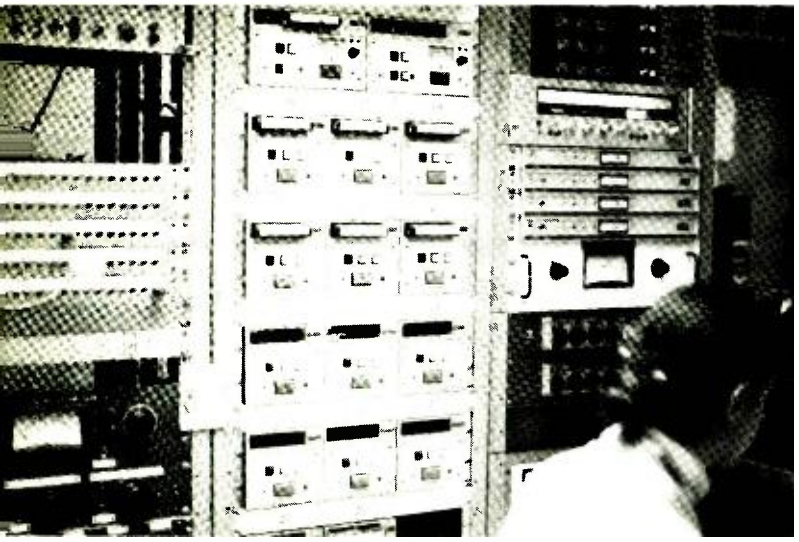
Election To Work For Radio



Sections of election newscast can be put on carts, and played from bank of cart machines in control center. Material on carts can be supplemented or revised at any time, as the news director elects. Entire CBS news system is being fine-tuned for coverage of election

8:15 p.m. Eastern time, CBS will send out regular election reports for about 24 minutes each hour, in two segments about 12 minutes each at 15 minutes after the hour and 45 minutes after. This is tied to the 9:00 p.m. closing of the polls in the east, and will cover nationwide figures as fast as they come in from that time onward. The coverage, as in earlier elections, will include not only the reports of vote totals but also comments on the trends by analysts in New York and Washington, interviews with key figures as noted above, and other editorial material of various kinds developed by the CBS Radio news team. It is important to note again that the radio operation will be entirely separate from the television operation; CBS Radio has its own large newscasting and editorial team.

The system is also set up for fast distribution of break-in special bulletins at any time. This uses the "net alert" system developed by CBS, described in an earlier article on CBS news gathering *(BM/E,* March, 1977). In brief, each affiliate has a receiving system that produces a warning signal and a number on a display panel. The numbers are connected by an established code to the nature and urgency of the bulletin. At the New York headquarters a pushbutton system sends out the alert signal. The on-air crew at the receiving station hears the signal and sees the bulletin code and can switch into the incoming CBS telco line to get the bulletin, airing or recording it as the case demands.

Washington, of course, is a key remote in the operation and CBS will use its elaborate news-gathering facilities there. The pickup operation in Washington has two main kinds of input system: dedicated telco lines to many key spots in the city, such as Congressional meeting rooms and the White House newsroom, and a two-way UHF radio system which uses mobile and hand-held transceivers, plus several relay stations in high spots around the city. This elaborate net, in use for several years, allows CBS to get instant news from almost any important point in news-intensive Washington. Interviews of any nature can be fed to New York for nationwide distribution.

To get the newscasts to radio affiliates across the country, CBS will use its regular networks, which combine telco lines and satellite hops. The satellite hops now in use are from New York to Chicago, and thence by telco line throughout the midwest; and from New York to Los Angeles, thence by telco throughout the west coast states. But CBS, like every other organization distributing programming over wide areas, is looking forward to steadily expanding use of satellites. Morton Goldberg confirms that CBS expects large gains in economy, quality, and convenience as the satellites take over more and more of the job. The receiving radio stations will share in the gains; nationally distributed news is one of the many kinds of programming that will get a large boost from the birds.

WWPA: good coverage in a medium-sized city

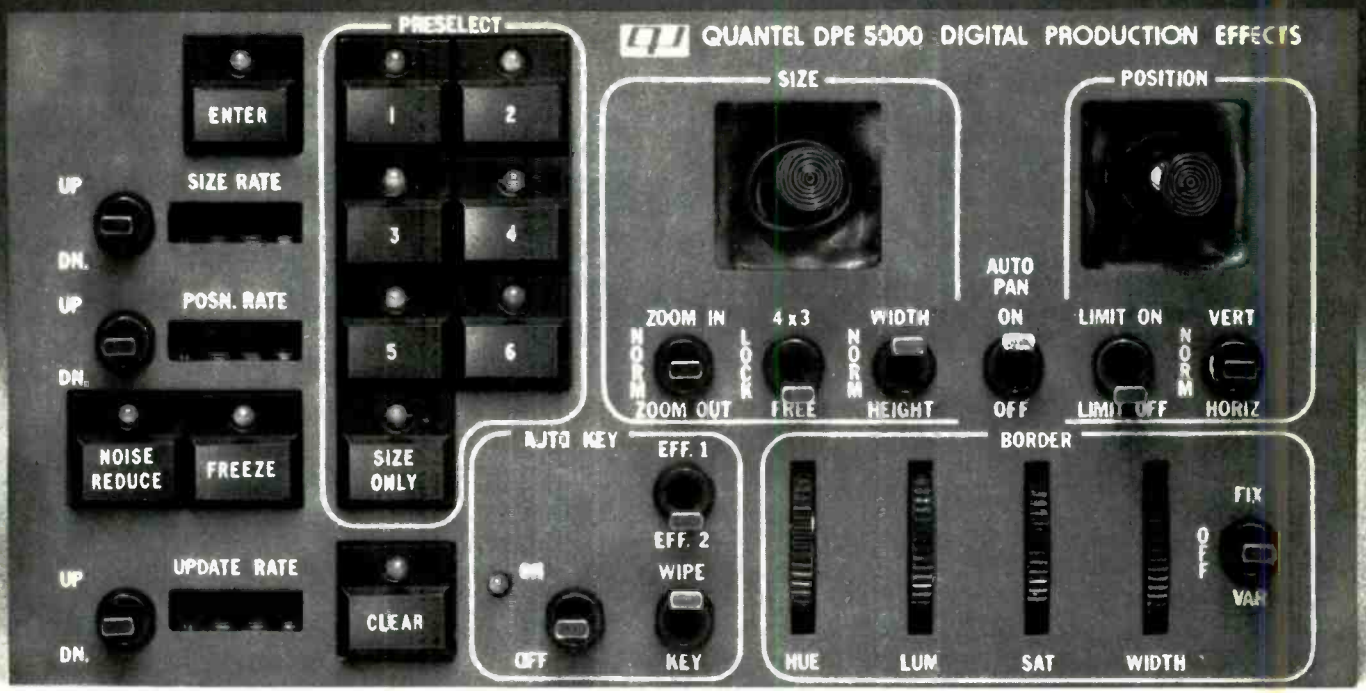
The CBS national radio net will cover the national election figures only, including, of course, state-by-state totals. Each affiliate will choose how much or how little to do about strictly state and local elections. A plan that promises to serve a medium-sized city well and keep the station in the forefront as the minute-by-minute source of authoritative news is that of WWPA, in Williamsport, Penn.

Program director Ken Sawyer told *BM/E* that the surrounding counties within the station's coverage area include 87 precincts. His plan for keeping on top of each precinct includes getting from each a supply of official ballots on which vote totals can be tabulated. WWPA will have a crew of four or five people at the county courthouse in Williamsport, to which vote totals are periodically telephoned from the precincts. Two of the crew will act as statisticians, using desk calculators to get totals and percentages on the votes from each precinct. From past experience, Sawyer believes that the station's own workers will get the totals faster than the official tabulators. In fact, the county tabulators often check their figures with the WWPA crew.

Two crew members at the courthouse will make a running on-air commentary on the vote trends. They can be put on the air directly through the station's two-way radio system, a Marti using 40 watt transmitters on 161 MHz, plus hand-held transceivers on 450 MHz. The Marti remote system is based on a mobile van used for WWPA's regular news coverage throughout the county. The van can be parked right outside the courthouse to put the crew there on the air whenever wanted throughout election night.

At the WWPA studios there will be an anchor crew who will supplement and analyze the reports from the county courthouse. They will also air incoming results on the national election, which WWPA will get from the CBS net. The station will also air, from the courthouse, interviews with local politicians and other important figures who tend to congregate there on election night. The remote crew can communicate with the studios via the Marti system to confirm the choice of interviews; they can also get and give cues so that the interviews are put on the air efficiently.

This WWPA plan is consonant with the management's placement of the station as a leading news source for the community. The entertainment format is Adult Contemporary, but the extensive news coverage is also a weighty part of the station's operation. The election plan, of a kind available to many stations in small and medium-sized cities, seems well calculated to enhance the station's leading role in the community's news. **BM/E**



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NEWSROOM COMPUTERS ORGANIZE ELECTION COVERAGE

ELECTION '80

By Phillip O. Keirstead

At local stations as well as major networks, organization of news staffs, equipment, and information is one key to successful election coverage. Computers are bringing their speed and accuracy to the aid of national and local operations.

IN THE EARLY 1970s the national elections provided the incentive and dollars needed to develop broadcast-quality portable videotape recorders. Today, the presidential election is demonstrating practical uses for computers, minicomputers, and word processors in newsrooms.

The newspaper, magazine, and printing fields have been using word processors and computers for several years. The reasons are largely economic. When a reporter types a story on a terminal, the edited version of that story reaches the consumer virtually untouched by expensive, frequently unionized, human hands. The bottom line for computers is to reduce the cost of production.

Broadcasters have been quick to adopt computers where an economic benefit could be readily shown — for example, quicker, more accurate billing and record-keeping simplicity and accuracy for logging functions. In broadcast newsrooms, however, it has been difficult to show dollars and cents savings from the installation of computers. Even if words are typed on terminals, they are spoken by humans. Therefore, why not just keep using the trusty old Royals and Underwoods?

Competition is the answer. Speed and immediacy have always been primary concerns of broadcast journalists in the United States. One area in which the race goes to the swift is in reporting election returns.

Kenneth L. Brookhart, systems analyst for KLAS-TV in Las Vegas, explains how his station wins the election results race. KLAS is wired directly into the county election board computers in Clark County (Las Vegas) and Washoe County (Reno). "If we know votes are in, we can bring that information out and have it processed and on the air before it is printed out," says Brookhart. The competitive media are left holding the printouts, as they see the information they just received being flashed directly onto viewer screens by KLAS. Brookhart explains: "We have someone at the election board so that each time they run a box or tray of punch cards through the computer, we can access it and get the data out of it."

Computers are being tied into character generators to produce instantaneous vote tabulation updates and displays by both local stations and the networks. WBTV in Charlotte, N.C., uses a somewhat more cumbersome system to display returns tabulated on Mecklenburg County's computer. All local media have pooled their resources and established METS — Mecklenburg Election Tabulation Service. Results from the county's 111 precincts are phoned to the Civic Center, where they are entered into the computer and then displayed by overhead projectors.

WBTV's assistant news manager, Ron Harrington, described the process as follows: each news outlet gets a copy of results as they come in, precinct by precinct. A WBTV employee at the election site telephones the totals to a data entry operator who enters them directly into the computer. Meanwhile, back at the station, the staff can call up the information on a preview terminal and decide if they want to air it. The preview terminal displays candidates' names, party affiliations, and percentages as well as precinct subtotals; all information can be called up via the keyboard on the station's character generator.

In many cases stations are making the move towards computerizing the newsroom by using existing facilities. For example, KLAS built its own in-house computer to assist in videotape editing; the same equipment becomes part of the computer package used to process election returns. One in-house computer communicates with election board computers by dedicated phone lines, translating the computer language from the outside computer. A second in-house computer does the processing, storing, and recall for air.

Phillip O. Keirstead is an associate professor of broadcast journalism at Florida A&M University in Tallahassee. Previously, he was an editor/producer for CBS News and a television news director. He is the author of three books on broadcasting.

ABC News's computer terminal features detachable keyboard

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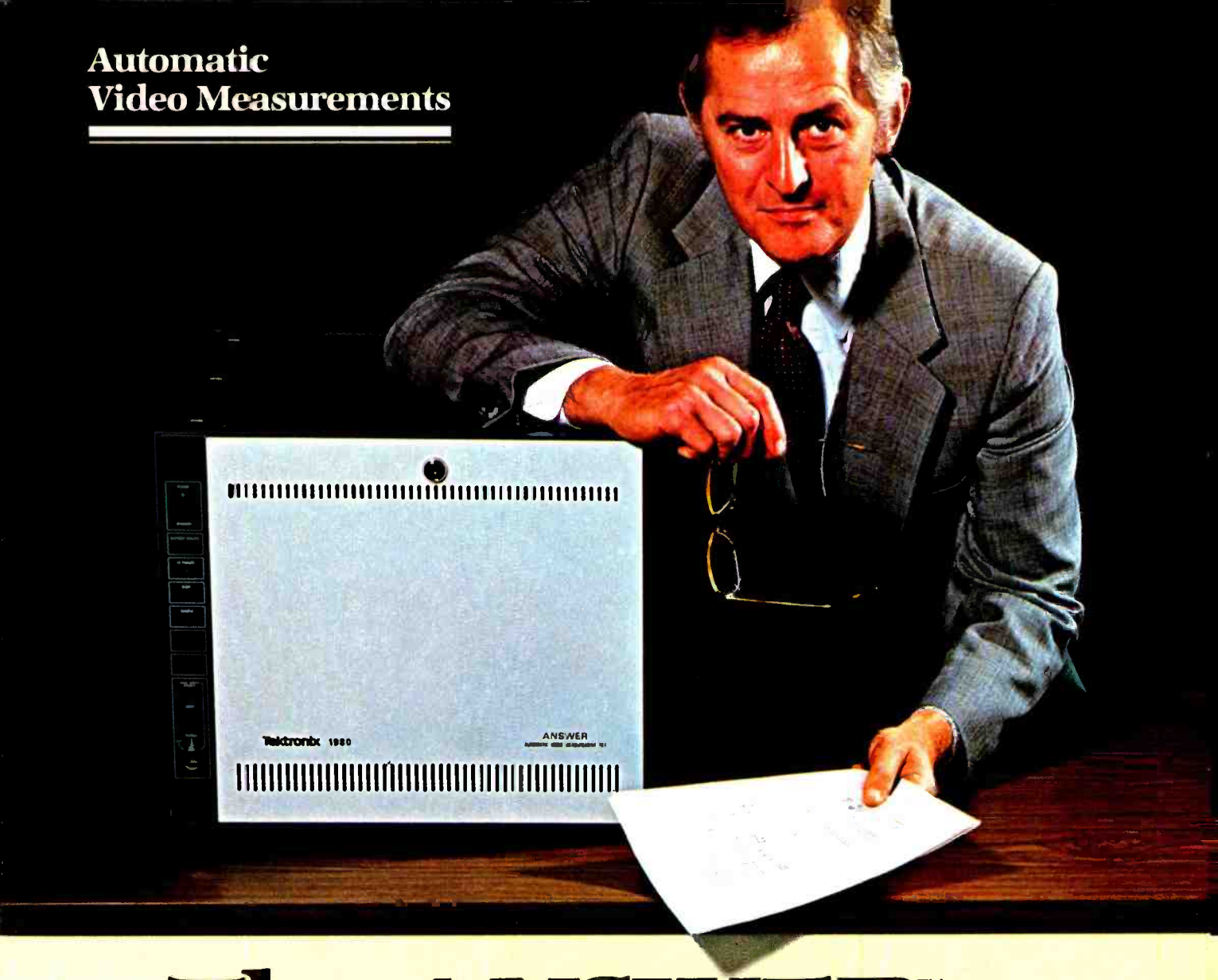

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Newsroom Computers

Brookhart says KLAS has pretty well shaken down the system and plans to make only minor changes. "We will be using a larger character generator which gives a little faster recall," explains Brookhart. The TeleMation Compositor unit (now Fernseh) also gives the station more control of formatting.

WBTV expects to be installing the Jefferson Data Systems electronic news processing system this summer, but right now the station relies heavily on leased terminals and computer time. Harrington says the only thing WBTV has in-house is the interface to tie the computer to the character generator. The station has leased time and terminals from Data Center Management in Charlotte during the past three elections.

The input terminals are located at Data Center Management. Two of the input terminals are designed to handle phoned-in results from 15 additional counties in the station's ADI while six are used to handle Mecklenburg County results. Two of the four call-up terminals are assigned to television, and two to WBT radio. Results from previous elections are included in the program so that the call-up terminals can provide data for election-night analysis. WBT radio, with more available airtime, makes greater use of the analytic data.

Networks are pushing

CBS News also takes advantage of existing equipment to handle some of the record-keeping functions involved in the network's complicated primary and election coverage. CBS News political coordinator Adam Powell III uses a word processing terminal located in the newsroom to compose a political "who's where," listing correspondents and crews, their locations, and what they're working on.

Another use of the word processor is production of a daily two-page political newsletter that reports trends, anecdotes, and information correspondents wish to share but can't squeeze into their stories. Powell also produces a candidates' "who's where" and charts competitive coverage by ABC and NBC. He also routes scripts of the major TV newscasts and selected radio broadcasts into the system to flesh out the political reference bank. The Wang terminals in the CBS News newsroom are tied to an existing system in the archives department. One part of the system is used for creating transcripts of all broadcasts, reference books, and election reports. The other part of the system stores scripts and reference materials separately. This system can be used for key word retrieval. For example, a radio editor can request all scripts containing the word "Reagan."

Currently, the newsroom at CBS News has three terminals and a hard copy printer. Part of the system is used for the transmission of show and story scripts back and forth between the radio desks in New York and Washington. This system is also used for transmission of scripts for the *Evening News*. The CBS News Special Events Unit uses Wang terminals — line printers, character printers, and photo printers — to compile the briefing books that are a

"And In That Very Tight County Sheriff's Race . . ."

MSI/66 portable data terminal

While national and state elections often feature large organizations such as NES gathering and distributing election returns, those smaller races in outlying districts often get neglected. But it won't always be that way. System Concepts, Inc., has developed the MSI/66 portable data terminal for those special circumstances where a television station wants the information firsthand, and above all, first.

The MSI/66 portable data terminal permits a stringer or reporter at a remote election site to directly dump data into the preformatted computerized election system back at the station, thus eliminating the middleman data entry operator. The unit, about the size of a walkie-talkie, consists of a calculator-type keyboard and a phone coupler in addition to memory.

This is the way it will work. All races of interest to the station will be assigned a number. Where the race is one covered by NES the station will use the NES identifier, but if the station is covering the race independent of NES it will assign an identifier using the NES format. Before being dispatched to the polling place, the MSI/66 unit will have the identifier recorded into it.

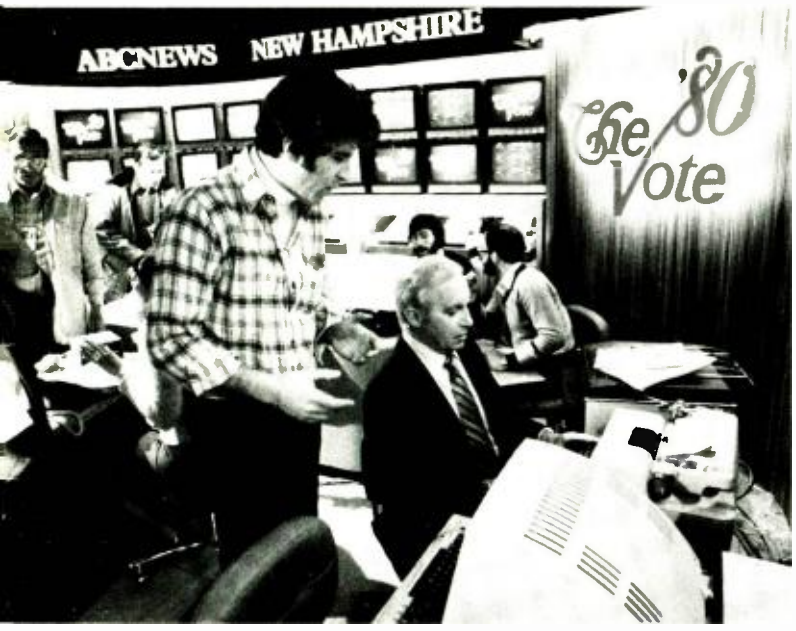
Once at the polling place, the stringer awaits the vote tally, and enters the data onto the portable terminal following a cue sheet prepared specifically for that race or precinct. After completing the data entry the stringer dials up the station computer on a telephone, attaches the MSI/66 phone coupler to the speaker, and presses "transmit." The stored digital data flows directly to the station computer's preformatted page where it is registered in its proper location on the display page through a system of tabs.

Other uses for the portable data terminal might be reporting from key precincts or, in non-election periods, reporting sports results, developing comparison shopping data for consumer reports, and any other situation requiring entry, manipulation, and display of data gathered at multiple remote sites.

The MSI/66 (or similar hand-held unit) is just part of System Concepts' plans for its Electronic Newsroom system. The host computer for the MSI unit is a specially programmed TRS-80 (Radio Shack) computer, hardcopy output is through a Radio Shack printer, and the electronic on-air display is via a System Concepts graphics system. Bulk data storage will be on a Corvus, or similar, disc drive with the preformatted pages stored on floppy disc. A special-purpose interface developed by System Concepts ties the system together and permits the use of other graphics systems.

At WTLV, Jacksonville, Fla., chief engineer Howard Kelley has been experimenting with the TRS-80 as a newsroom computer for news, weather, equipment allocation, and other housekeeping functions. Currently, the TRS-80 is interfaced with the station's Chyron III graphics system.

According to Gene Leonard of System Concepts, the full computerized newsroom system with text editing, story files, housekeeping programs, and script and timing preparation should be ready sometime later this year. Attendees of NAB, Las Vegas, will have seen elements of the system functioning. More details on the development time frame for this system will be known after the convention. Details will be available in *BM/E*'s June issue, the NAB Show-In-Print.



Jeff Gralnick (left) confers with Frank Reynolds on the ABC "Vote 80" set for the New Hampshire primary. Computer terminal is in foreground

Ron Harrington (left), assistant news manager for WBTV, works with Chuck Poole (right) on the Data Center Management system

necessity during political season. CBS News subscribes to the political data bank supplied jointly by the Associated Press and the *New York Times*. Election producers and correspondents are supplied with portable Texas Instruments terminals that can call up background information from AP/NYT or research data developed by Warren Mitofsky's Election Survey Unit. All three networks do post-vote surveys at polling places; correspondents use the portable Texas Instruments terminals to spot trends that can become leads for their field reports during the primaries. Direct character generator feeds of election results are common to all three networks, and some additional visuals are being developed, such as on-screen bar graphs.

CBS News relies on in-house capability — most of which has been in place as part of the research and archives departments. A company-wide project, however, is underway to develop news department word processing and computer systems for all owned and operated radio and television stations and for CBS News. KCBS News-Radio in San Francisco has been the pilot station for this effort (see *BM/E*, November, 1977) and is in the process of installing a second-generation word processing system for handling locally originated and wire service copy.

ABC News is also using computers to handle logistical problems involved in convention coverage. John E. Congedo, manager of data processing and election facilities for news, says: "The first time we ran into the problem was in the conventions four years ago. We couldn't keep track of people, equipment, hotel rooms, flights, or car rentals. We wanted to know how many people were working tonight and how much it was going to cost to feed them. So we wrote a program that can do almost anything. It can save stories and it can save data about the candidates — all available through our terminals. As a matter of fact, we move our terminals all over the country."

ABC does not use its terminals to keep track of people, crews, and candidates, but the network does use its computer capability to print the photo masters for the briefing books. The books are produced far enough ahead to be available to all personnel needing them, and update material is put on call-up terminals.

Congedo says using computers in conjunction with election coverage has its own set of human problems. "The problem is getting people to understand and use the terminals," he notes. "First they wanted a terminal with a detachable keyboard. Then they said, 'That's fine, but how do I get block transmit instead of character transmit?' Next came, 'Well, gee, that's fine, but now we need an intelligent terminal.' Then they wanted a portable terminal . . . they really didn't know what they wanted. Now we feel what we want is a portable terminal that not only has a printer, but also has a CRT display."

ABC News uses some text-editing equipment for transmission of scripts but leaves polling to an outside organization, which runs its own program on ABC's leased computer. The net has a separate system for graphics. Congedo points out that computerization of graphics lowers the cost of visual processing. ABC also uses an internal wire that permits key individuals to dump stored memoranda and so forth at convenient times. It relies heavily on leased equipment, including terminals from Texas Instruments, ADDS, Beehive, and Lear-Siegler.

NBC News Election Unit general manager Roy Wetzel reports a somewhat lower use of terminals and computers. The news division does, however, have 50 terminals tied to RCA's data processing facility in Cherry Hill, N.J. The net's major effort has been directed towards election surveys and on-air graphics. Sources inside and outside NBC say the corporation has abandoned its previously announced wholesale switchover to computerization, with budget cuts cited as the reason.

Discussions with sources in all three network news divisions reveal some degree of internal difficulty in dealing with corporate data processing executives, who tend to feel their toes are being stepped on as the news divisions expand their computer usage. News division people often feel their needs are so specific they cannot get the information or cooperation they desire from corporate data systems.

The 1980 elections are giving developmental people a chance to demonstrate how computers can be used in the context of news coverage. The major approaches have concentrated on surveys and tabulation and display of election returns.

A number of individuals and firms are looking at word processing as a useful adjunct to news department technology. It seems inevitable that the CRT switchover, now in its second and third generation among newspapers, is about to move into broadcast newsrooms. **BM/E**

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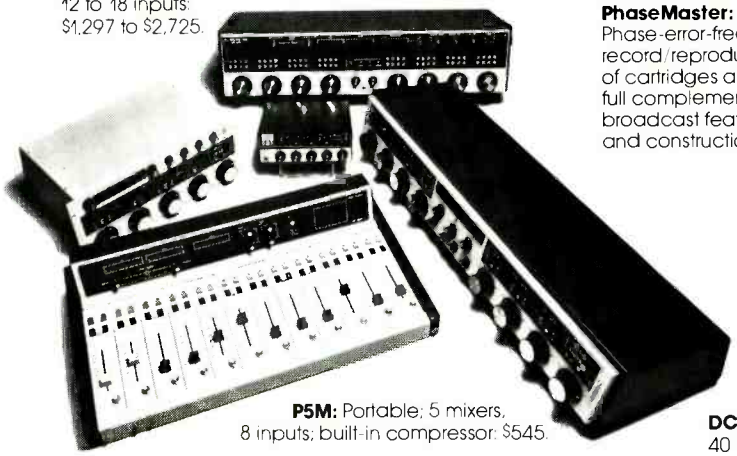

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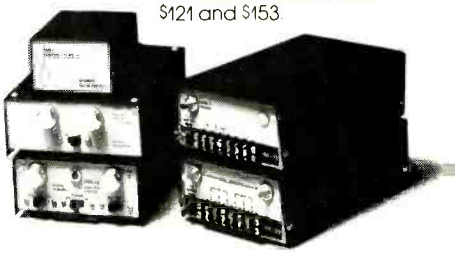

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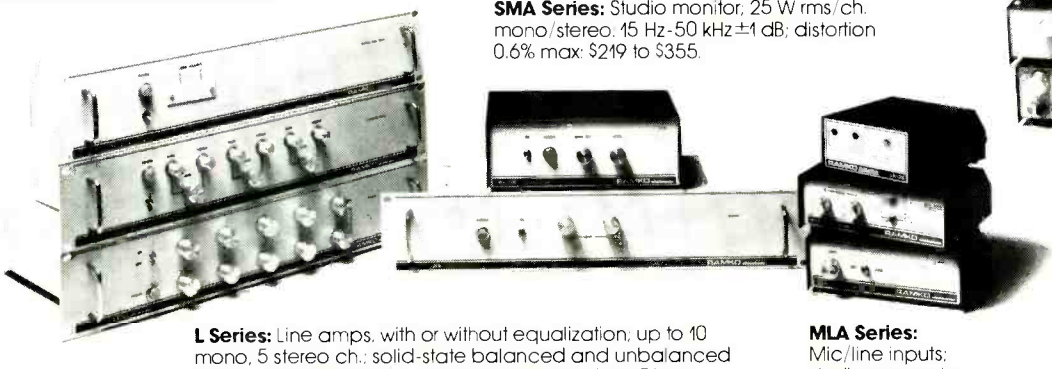

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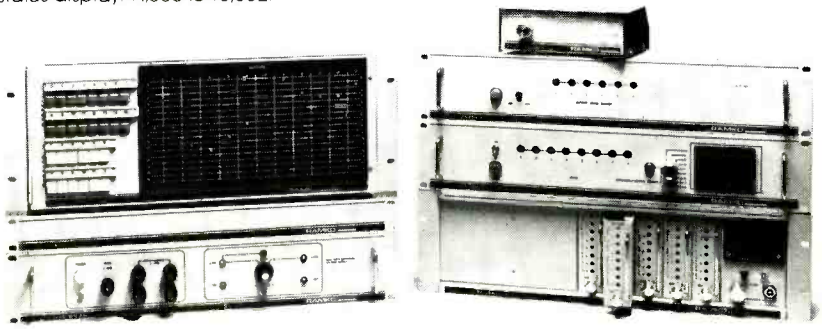

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Circle 137 on Reader Service Card

NBC MOBILE CONTROL ROOM BRINGS NEW APPROACH TO ELECTION COVERAGE

At NBC the big van is out in favor of a modular control room. The new approach offers greater flexibility and incorporates a more rational approach to engineering and cuing communications for multiple remote sites.

ONE THING THAT DISTINGUISHES election coverage from most other types of remotes, according to Jeff Meadows, managing director of NBC's news operations, is that EJ crews spend most of the day functioning as traditional news gathering teams and then, at an appointed time, switch over to an on-air studio/field configuration. Most of the day, as they follow candidates along the campaign trail, EJ crews work independently on individual stories, selecting their shots, doing standups, filing reports. Suddenly they move into an election headquarters or take up positions at a polling place and plug into an on-air network for live coverage. Instead of working independently, they now need to take directions from a central control room, frame shots for split screens, and maintain two-way communications between their correspondent and an anchor in the newsroom.

NBC's Nightly News *report on the Wisconsin primary was delivered by John Chancellor through the network's unique mobile switching center*

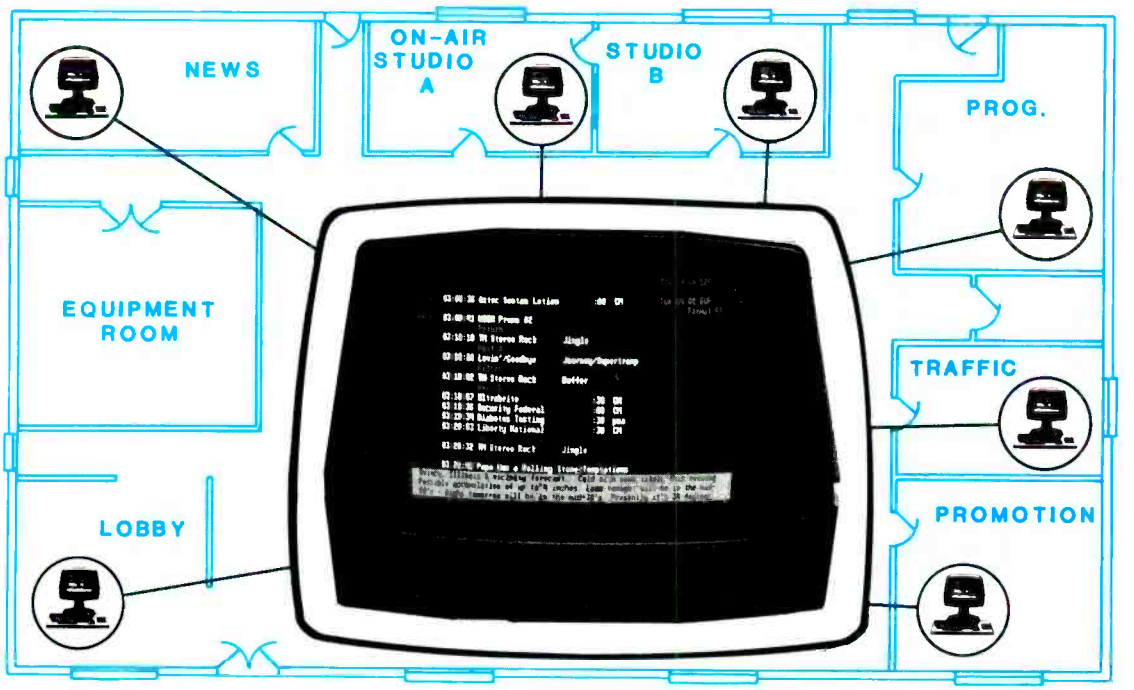
For networks, unlike local stations, this involves setting up a finely integrated control center in city after city. One thing that is common to both local stations and networks, however, is the need for a highly refined system of communications for engineering, cuing, and program signals.

NBC has attempted to handle both of these problems with an innovative approach. About a year ago, Tom Wolzein, then NBC's manager of news operations, decided that the upcoming primary season would require something different from the traditional 40-foot production van approach. Wolzein felt that all the necessary equipment associated with a control center could be configured into easily portable modules in shipping crates that could be set up and wrapped quickly, stored economically between engagements, and moved quickly to a new location. By getting out of the vans, NBC would be able to take advantage of available space in different cities, giving its crews more commodious accommodations and avoiding those problems associated with trying to find a good location for the trailer.

Jeff Meadows, NBC's current managing director of news operations (Wolzein has moved on to become producer, *Nightly News* special segment), added to the project a view of engineering and cuing communications born of his experience in Europe as part of NBC's London operation. "What is important in my mind, and in the European view of things," said Meadows, "is that the cue-program be a mix/minus; that it not include the program from the remote source but rather everything minus the remote source audio." What surprises Meadows is that the "concept of the mix/minus is not very well developed in America . . . that no manufacturer of audio consoles has developed an audio board that provides an output for each input that carries everything but the audio from its associated input." Meadows suggests that the mix/minus circuit is particularly important in satellite transmissions since it "is rather difficult for a correspondent to talk

One for all...

Harris' 9003 Program Automation System



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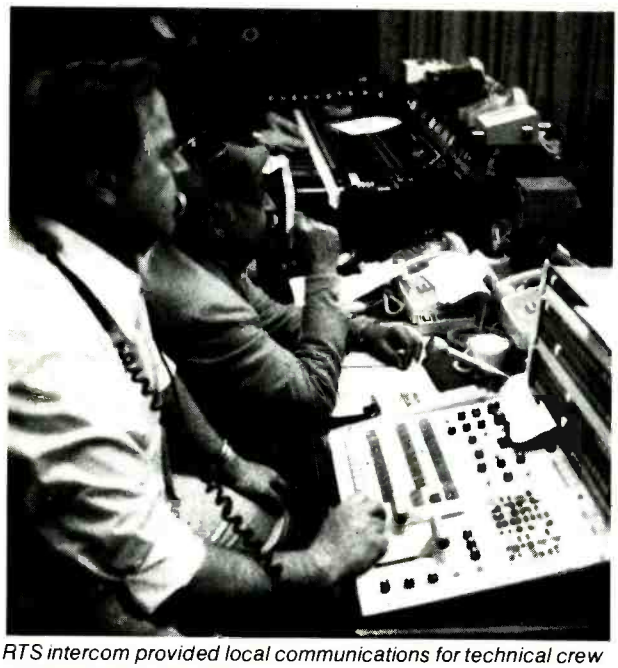
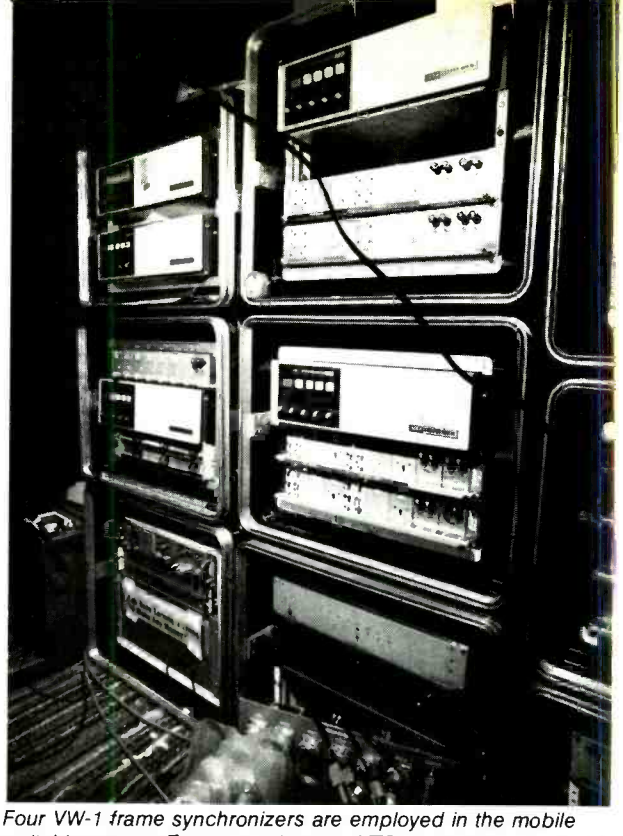
NBC Mobile Control Room



RTS intercom provided local communications for technical crew at Milwaukee's City Hall



Four VW-1 frame synchronizers are employed in the mobile switching center. Two are assigned to VTR playback and two are selectable for the remote sites. TD can assign remotes at his panel

The overall mobile switching center stacks up and goes into operation within five hours

Audio for program, cuing, and engineering is handled by the audio operator using both a Yamaha 32 by 4 by 4 board and a Richmond 8 by 2 by 2

against the echo of his own voice in his ear."

The result of both Wolzein's and Meadows' views is the "Rack Pack Mobile Switching Center" that NBC has been shuttling around the country for its primary election coverage.

The "Rack Pack"

The heart of the "Rack Pack" is a series of 18 or more specially designed shipping containers built by Thermodyne. Each case contains shock mounted 19-inch racks. Both the lids of the cases and the backs are removable. The equipment is permanently rack-mounted inside the case. When the cases arrive at their destination, they are set up in two bays, a front bay of nine rack packs containing the electronics associated with the GVG-1600L switcher, monitors, audio boards, RTS-intercom, etc. and the back bay of nine cases containing the technical monitoring equipment and associated hardware.

The lids and back panels of the containers are removed and the cabling is installed. In four to six hours the mobile switching center is set up and operating.

For the Wisconsin primary, the mobile switching center was set up in a room of Milwaukee's City Hall. John Chancellor's anchor position was established in the city council chambers and two cameras were assigned to cover his position. Three remote locations were established, one at Carter headquarters in the Cafe Rouge of the Hotel Pfister, another in the Grand Ballroom of the Sheraton Hotel, which served as Rep. John Anderson's headquarters, and a third location, an interview room also at the Sheraton.

According to Steve Bonica, news technical planning manager, who has been monitoring the progress of the mobile switching center, microwave facilities were employed to carry program video and audio from the remote sites to the mobile switching center. Said Bonica of the mobile center, "The concept seems strong for a news-type situation in which you need to quickly coordinate the activities of many crews and producers."

The product of the mobile switching center, it must be

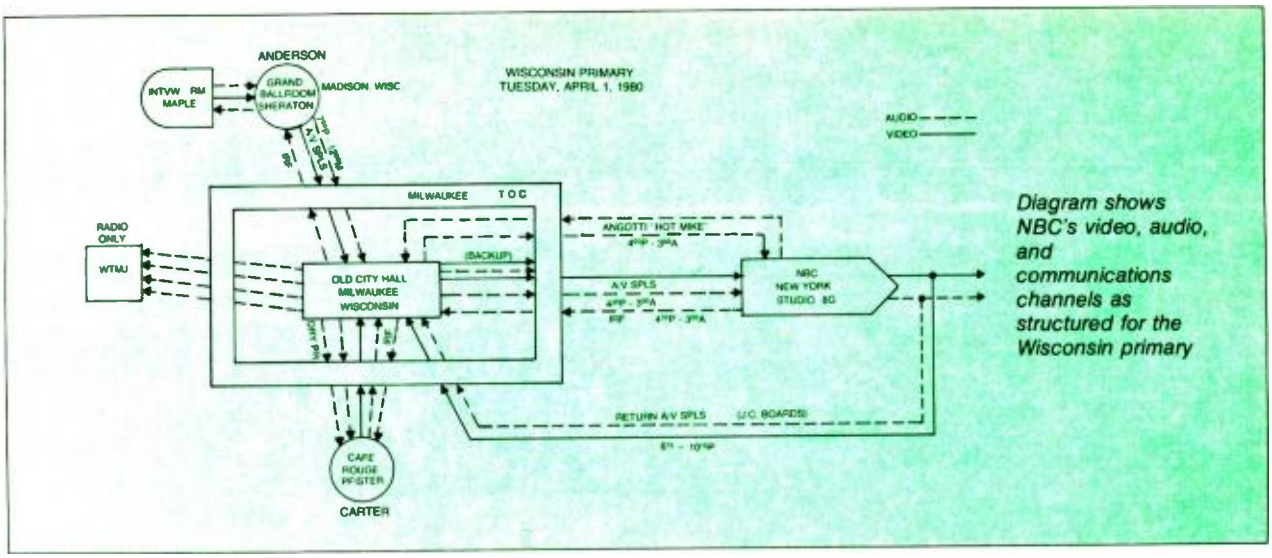


Diagram shows NBC's video, audio, and communications channels as structured for the Wisconsin primary

remembered, is integrated with NBC *Nightly News*, headquartered in New York. The election unit is part of the news and not all of it, so communications between Milwaukee and New York needed to be fully articulated as well. Executive producer, *Nightly News* special events, Joseph Angotti is still in charge of the overall program, so his communications channel in New York had to place him in the center of things in Milwaukee.

Video coming into the Milwaukee center came from the three remote locations and the council chambers; there was also return video from New York. The video going out to the network was presented to New York as a single package and included edited stories rolled in from local VTRs. In addition to the mobile switching center, NBC also had four edit packages operating consisting of Sony BVU VCRs, BVE edit controllers, and two color monitors each.

Of the four ADDA VW-1 frame synchronizers used in the mobile switching center, one each was assigned to the two Sony BVU playback VCRs as TBCs and the other two were assigned to the incoming remotes. A Dytek 15 by 7 routing switcher handled the basic distribution of signals. A panel available to the TD permitted him to assign video to any of seven destinations, either of the two VW-1s, VTR 1 or 2, monitors, the video test and measurement equipment, or to the editing setup.

Program audio and communications channels

The three remote sites provided program audio via diplexed channels on the microwave transmitters. In addition, program audio originated with Chancellor's microphone in the council chambers and from the New York studio. The New York audio coming into Milwaukee was provided only as feedback. As is normal, program audio was fed as a solid output to New York and as interruptible feedback to the talent at the various locations.

Engineering channels were handled over telco lines provided to the remote sites and an RTS system employed at the mobile switching center. A dry pair brought two-way engineering communications to the Carter headquarters and the crew at the Sheraton got its communications via a dial-up line. The third remote site was merely an extension of the facilities at the Sheraton.

At the heart of the audio section of the mobile switching system is a Yamaha 32 by 4 by 4 audio console and a Richmond 8 by 2 mixer with two echo buses. Of the four output buses on the Yamaha, one carried program audio plus Chancellor, another carried program audio minus Chancellor, a third carried IRF, and the fourth carried all the Milwaukee feeds minus New York.

The Richmond mixer is used to drive the IRF system and is seen by the Yamaha mixer as another input. The four monitor buses on the Yamaha each have four post faders, one for each of the outputs. By adjusting the knobs on the monitor outputs, the console operator can create the mix/minus channels desired for the IRF.

This rather complicated system is in the process of being superceded. As part of the mobile switching center, NBC engaged McCurdy Radio to build a special audio panel that would provide the mix/minus capability without the complicated business of going in and out of the Yamaha.

The McCurdy panel, due to be operational in time for the Pennsylvania primary in late April, will be essentially a PL matrix. The panel will present a series of three-position pushbuttons, each labeled according to the destination of the output it represents. In each case it will be carrying audio to the destination minus the audio from that location. In order for the director to interrupt this feed, he will depress the appropriate button (or series of buttons if he wishes to create a conference), and will then speak to the desired destination(s). In the middle position, the key introduces the audio into the communications channel. In the full-up position, the audio from that location is locked out of the communications channel. This function is provided since it is assumed that the director may at times wish to reduce the amount of chatter on the line by eliminating certain nonessential nodes from the system.

Meadows describes the advantages of the "Rack Pack" mobile switching center in terms of its speed, smaller crew, greater flexibility, and, ultimately, its simpler communications system. "This is the first time, I think," said Meadows, "that I have seen the traditional electronic news gathering team integrated with the classical studio/field live special event machine. There are problems obviously, but by and large it's quite an exciting notion, I think. We are rewriting the book on how to do remotes." **BM/E**

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There's also the EPA-500 tonearm system consisting of the EPA-501H, a titanium nitride tubular arm unit with dynamic damping for today's high-compliance cartridges. The EPA-B500 tonearm base with four-point gimbal suspension. And the SH-50P1 stylus pressure gauge, fully electronic and accurate to 1/10 of a gram. Also available are four other titanium nitride arm units with dynamic damping to match the mass and compliance of any cartridge.

RAMSA For remote broadcasts there's the Ramsa WR-130, an 8x2 portable mixer. It includes −70 dB attenuation for each input, high and low equalizers and a pre/post sub mixer. Plus pan pot, peak-overload indicators, and balanced mike inputs. While inputs 1-4 will accept turntables. There are also two auxiliary inputs. Outputs include high and low equalizers, a headphone output, echo send and receive, and record send.

To complement the WR-130 mixer, use the Ramsa WP-9210 power amplifier. When you do, you'll get a clean 200 watts RMS per channel into 8 ohms from 20 Hz to 20 kHz with no more than 0.05% THD. You'll also get electronically balanced XLR inputs with continuous level adjustments, phone-jack inputs, as well as overload and short circuit protection.

To meet high performance standards there are three Ramsa hand-calibrated microphones. The WM-8000 and WM-8050 are designed for vocal use and include floating microphone capsules and triple wind screens to suppress shock and pop noise. For instrument miking there's the back electret condenser WM-8150 for improved high frequency and transient characteristics. It operates on batteries (not included) or connects to a phantom power source.

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Circle 141 on Reader Service Card

CHARACTER GENERATOR SURVEY

For eye-appealing, informative election reporting, stations may want to take a hard look at their character generator systems and evaluate their capability for on-air display of election returns.

IF ONE HAD TO PICK the single most significant difference between election coverage today and ten years ago, it would undoubtedly be the presence of the character generator to display election returns.

Character generators with enough resolution and graphics capabilities to offer a real alternative to art cards first began appearing on the market some six years ago. Keeping pace with the steadily increasing complexity of microprocessors, PROMs, RAMs, and so forth, they have now become as sophisticated as the most elaborate production switcher or special effects unit.

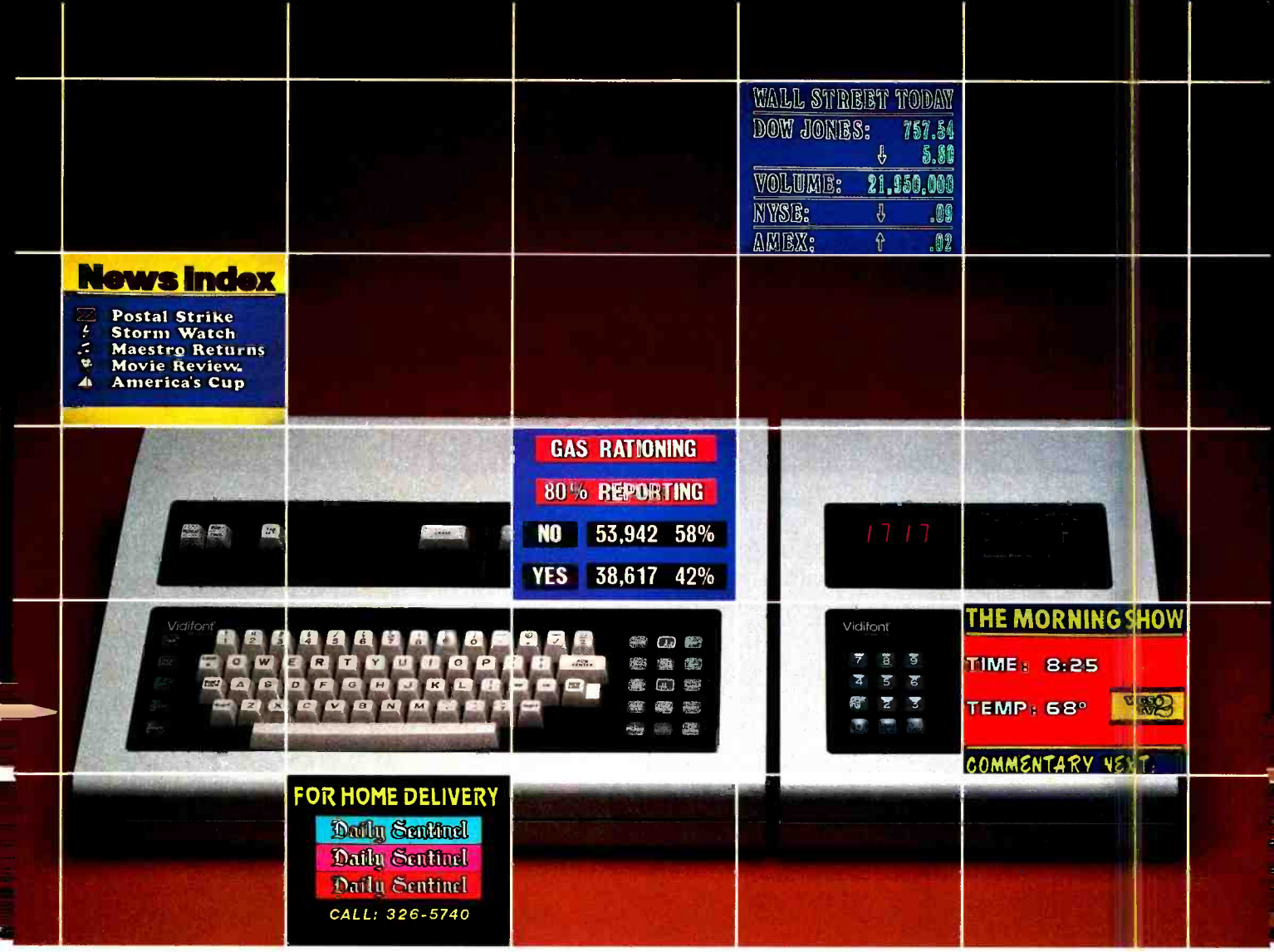
Listed here, in tabular form based on information supplied by the manufacturers, are the specifications on some 20 character generators. They are arranged in three groups based on price: Group I includes models under $6000, Group II models from $6000 to $20,000, and Group III models over $20,000.

It must be pointed out, however, that price is not always an indication of complexity. Of course, a simple titler for $5000 will probably have characters composed in a 7 x 9 or 9 x 14 dot matrix, an internal memory of around four pages, and composition of eight lines per page with 16 characters per line, whereas the most expensive systems have character resolution approaching 30 ns, many pages of internal memory, and some 20 rows per page with some 50 characters per row. Features in software-based sys-

Group I: Under $6000

Manufacturer	Model No. Price Code (PC) in 100s*	Character Generation						Features				Expansion	
		No. of fonts stored internally	Characters per font (upper, lower case)	Character resolution (nanosec or elements)	Character height (lines)	Page format (rows/characters per row)	No. of fonts available	Dynamic display modes (roll, crawl, etc)	Edit/ position features	Effects (border, color, etc)	Other	External memory	Options
Knox Video Products	K50 PC: 10-16	1	64 (upper case)	7x9 matrix	36	8/16 (4 pg mem)	1	Flash and crawl		Shadow edge	Internal mix, independent edit		Title, crawl, sync., timed pages
	K60 PC: 14-19	1	64 (upper case)	7x9 matrix	18	16/32 (4 pg mem)	1	same as above		same as above	same as above		same as above
	K128 PC: 35-76	2 5(MF246)	64 (u/l case)	768 elements	16 to 32	8/24 (8/16 pg mem)	2	3 speed roll/crawl, flash	Auto center	same as above	Half and double size letters, italics, 3 position window, internal mixing		Independent edit channel, MF246 multi font (5), 8-16 internal page, 32 external page (s/s), 400 page disc
Laird Telemedia	1200 PC: 13		65 ASCII standard	9x14 dot matrix (upper case)	14,28 & 56 selectable	10/25 (12 to 32 characters per row adjustable)		Character flash and character on/off	Semi-automatic centering (horizontal)			32 char. solid state memory	Circuit boards for 15 additional lines, fixed title line plug-in cards
	3600A PC: 33		64	9x14	28 x 15 pix elements (adjustable width)	10/25		Underline, overline, crawl, roll, box, flash		Horizontal edging	Word length selection of black or white characters	1,000 char. memory (4 pages) roll/crawl	5 additional solid state memories, pulse interface, color sync generator, color billboard generator
3M	D2000 PC: 35-50	1	62 (upper case)	38 nsec	20 or 28	10/24 (4 pg mem)	3	Underline, word flash		Broadcast mixer, word by word underline	Built in audio coupler	400 page disc store	Lower case, char. edge, auto center
	D2500 PC:56	1	124 (u/l case)	40 nsec	20 or 28	10/22 (4 pg mem)	3	3 roll & crawl speeds, 3 crawl position, word flash	Auto center	Broadcast mixer		400 page disc store	
System Concepts	Q-V PC: 50	1 9 sizes large & small caps by row	90	32 hor. pixels	12-48 (4 hts)	3 widths from 24 to 32 characters per row	3	Roll/crawl, crawl through static display, flash	Title any raster position, erase row & page, crawl any raster position, absolute centering		192 row resident memory, self diagnostic maintenance program	Optional	Digital minicassette extended memory

*Price codes reflect a range between the basic model (first number) and the model with all options (second number)



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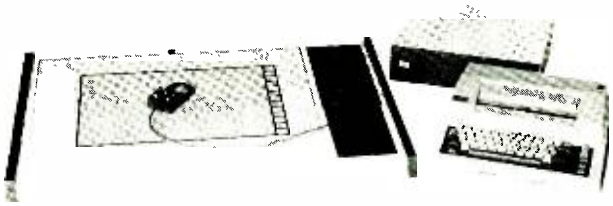
tems, however, are a function of the size of the microprocessor, the number of PROMs, RAMs, and so forth, and systems can frequently be expanded by the addition of outboard floppy discs or other memory systems to expand their capabilities considerably, particularly in the area of page memory.

The character generator as graphics system

A versatile character generator offers more than the basic roll, crawl, and flashing features found on most of the lower-cost systems. More advanced — but still moderately priced — types offer some kind of letter size variation, with letters that can be slanted to represent italics. Colorizers are added to provide chrominance backgrounds. At additional cost, color can be added row by row, or on an individual letter basis. Character edging is often desirable and border edging or drop shadow is offered by many manufacturers. The features that come as standard or as add-on modules vary from maker to maker. Late model designs incorporating microprocessors tend to offer more at little or no extra cost since instructions are in software and not hardwired in IC logic.

The extensive use of microprocessors has led to systems that can no longer be called titlers or character generators; "graphics system" is a more appropriate name. Several companies stand out as suppliers of graphics systems. Falling in this category are the Thomson-CSF Vidifont IVA, the Chyron IV, the Fernseh, Inc., (formerly TeleMation) Compositor I, and the 3M D-8800. MPB Technologies' Vista 80 graphics system offers weather overlays on maps, pie charts, and bar charts.

Chyron IV graphics system



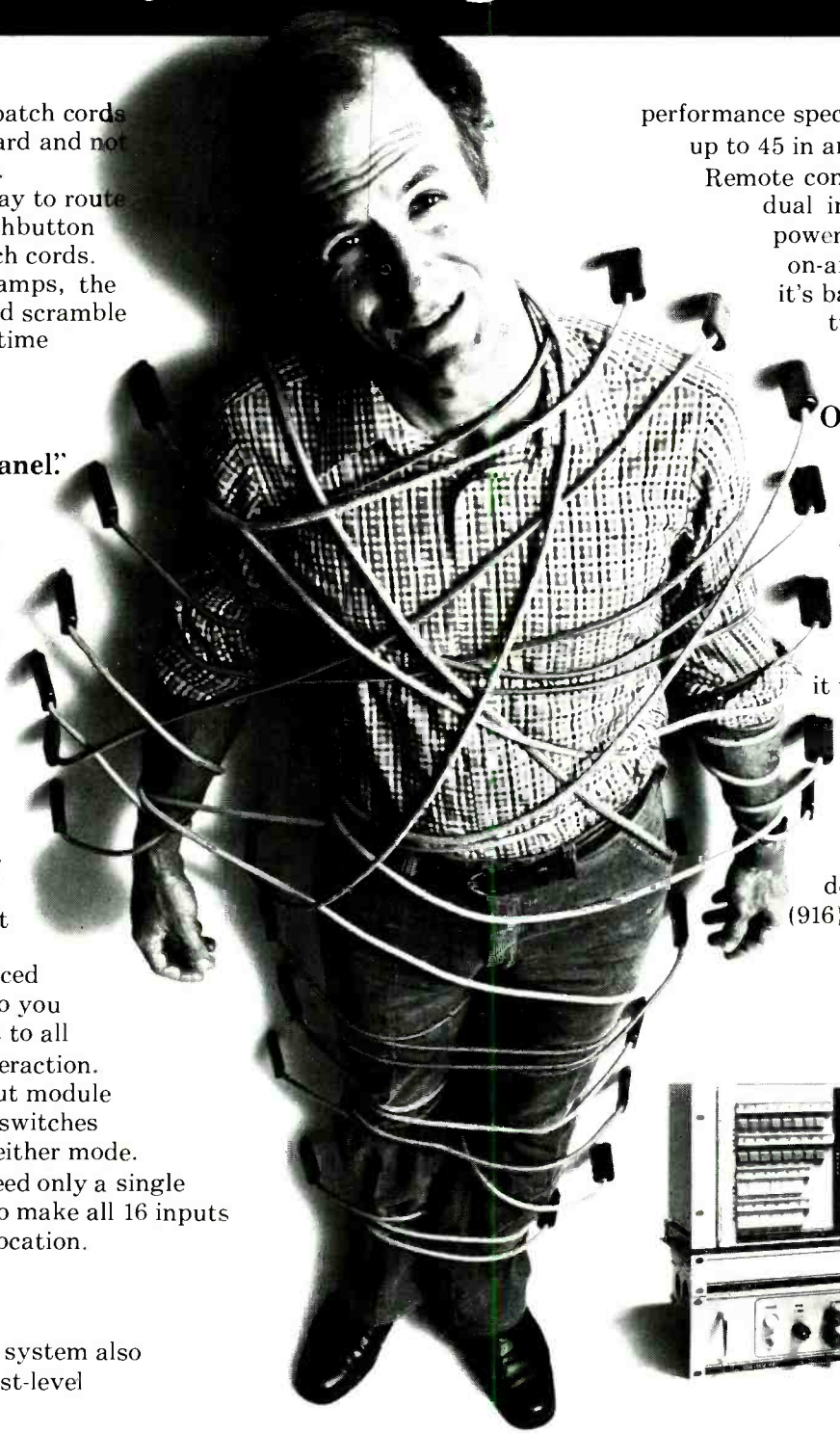
Fernseh Compositor I graphics compose option

Graphics systems offer font compose capability, which means creative video designers can add special characters or graphics of their own design. New fonts, including foreign languages, can be added by the user from artwork

Group II: $6000 to $20,000

Manufacturer	Model No. Price Code	Character Generation						Features				Expansion	
		No. of fonts stored internally	Characters per font (upper, lower case)	Character resolution (nanosec or elements)	Character height (lines)	Page format (rows/characters per row)	No. of fonts available	Dynamic display modes (roll, crawl, etc)	Edit/ position features	Effects (border, color, etc)	Other	External memory	Options
Dynasciences	—048 PC:200	3(u/l case)	91 (u/l case)	70 nsec	14 to 24	10/20	Multiple	3 roll & crawl speeds, flash title 1 & 2 line	Auto center line & page	Edging, colorizer	Operator prompting, digitizer (creates custom fonts & logos)	128 page disc	Zoom, "panic" button, "ace" program, diagnostic program
Knox Video Products	KSD246 PC: 115	5	246 (u/l case)	1536 elements	16 to 32	8/24	5	3 roll and crawl speeds, flash	Auto center	Shadow edge	Independent edit, half and double size letters, italics, 3-position title window, internal mixing	400 page floppy disc	Remote control, programmable disc
3M	D3016 PC:75	1	124 (u/l case)	40 nsec	20 or 28	10/22 16 int. pg of memory	2 plus selected intl	3 roll/crawl speeds, 3 crawl positions, word flash			Edit plus program channels	400 page disc store	
System Concepts	Q-VII PC: 100	3 (20 sizes of each font by row)	90	32 horizontal pixels; with Nanolog character refinement less than 20 nsec	8 to 64 (5 heights)	12/32 (selectable 1-22 rows)	3	2 roll, crawl, flash speeds, 2 roll & crawl modes, simultaneous modes line & block graphics, multiple roll texts & crawl texts	Title any raster position, erase row, page, insert/delete, open/close, save or exchange page, crawl any raster pos. & roll up to any raster position, 32 tabs, absolute centering, horizontal increment position	Borderline fine or bold, shadow, 4 quadrant selection, color char. by row, color backgrd by row, color graphic separators, 7 hues selection, page fade adjustable 0 to 2 seconds	192 row resident memory, memory protect battery, self diagnostic maintenance program	Avail. as option	Digital cassette external memory, single floppy disc, dual floppy disc memory, custom logo
	Q-VI PC:80	1 (24 sizes by row)	90	same as above	8 to 64 (6 heights)	same as above	3	same as above	same as above	Horizontal edge, color background by row, 7 hue selection, color graphic separator, edging adjustable white to black	same as above	same as above	same as above Q-VI/A monochrome only Q-VI/M automatic mass memory

All those in favor of patch panels, raise your right hand.



Wrestling with those patch cords is cumbersome, awkward and not very good engineering.

But now there's a way to route audio signals with pushbutton ease. Without the patch cords. Without the separate amps, the noisy pots and the mad scramble to adjust levels every time you switch inputs.

Introducing the "electronic patch panel."

Meet the incredible new Ramko ARA-1612 Audio Router/ Amplifier.

It lets you use front panel and/or remote control pushbuttons to route 16 inputs to any of 12 outputs, simultaneously or individually, with an instant LED display of what signal is going where.

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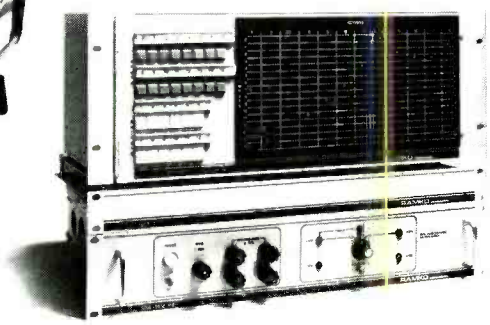


RAMKO

via a camera or electronically with a joystick or light pen (Vidifont) or through an X-Y-Z coordinate system (Compositor).

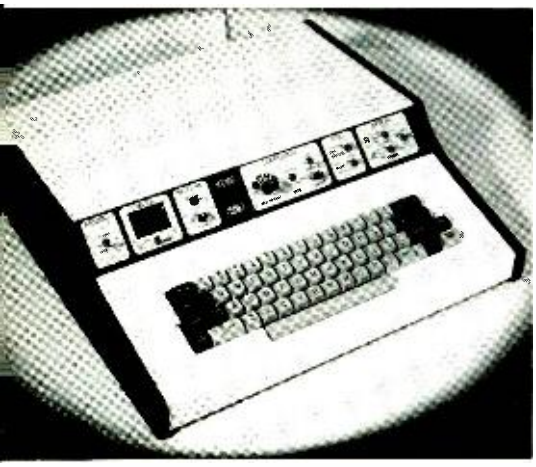
Some graphics systems go so far as to offer animated graphics. In these modes, instructions can be prerecorded to establish appearance, sequence, and dwell time. Chyron calls the effect "action graphics," and cites as an example two boxers silhouetted against a brilliant background. They move towards each other, exchange blows, and one man falls. The other raises his arms in victory and the words "the winner" then flash on the screen. All action graphics can be first rehearsed, then entered in the Program Sequence Controller for display at high speed. The 3M D-8800 offers 10 animation rates (one to 20 pages/sec), and a separately designed animation "line segment font."

The Fernseh system offers a convincing animation display in which a letter, selected from the font library, is stored as a series of 10 successive stages in a zig-zag move across the screen, at the same time rotating about itself in three-dimensional space. The computer then automatically fills in the in-between movements between the operator's preselected positions; the move is created by the computer in real time. The Viditext option for the Vidifont system offers much the same possibilities.

Although even simple character generators can be expanded to include extra fonts, the top-of-the-line machines permit typographer-designed proportional structured alphabets to be used. In most systems, extra fonts are added as internal memory via separate module cards. In the more flexible systems, fonts are stored on discs and entered as needed into the internal memory of the system. The internal memory capacity varies: the standard RAM memory has space for six average size (32-line Helvetica) fonts. The exact number depends on the size and complexity of the font. The expanded RAM CM-3002 used in the Compositor I accommodates eight fonts.

It is worth noting that some Group II systems offer a variety of type styles other than the two sizes of a fixed font typical of Group I systems. Dynasciences offers three separate fonts: News Gothic Bold, Times Roman Bold, and Helvetica Bold, with upper and lower case letters each for a total of six. A unique feature of the 9048 is a zoom feature that permits a continuous plus or minus 50 percent increase or decrease in character size (at any one of three rates).

System Concepts' Quantafont devices, using a microprocessor, share many shapes to achieve the effect of multiple fonts. Essentially three fonts are stored — Sans Serif, large and small caps; Serif, large and small caps; and Serif, upper and lower case. Through a choice of four



Knox K128B

3M D-3016

3M D-8800

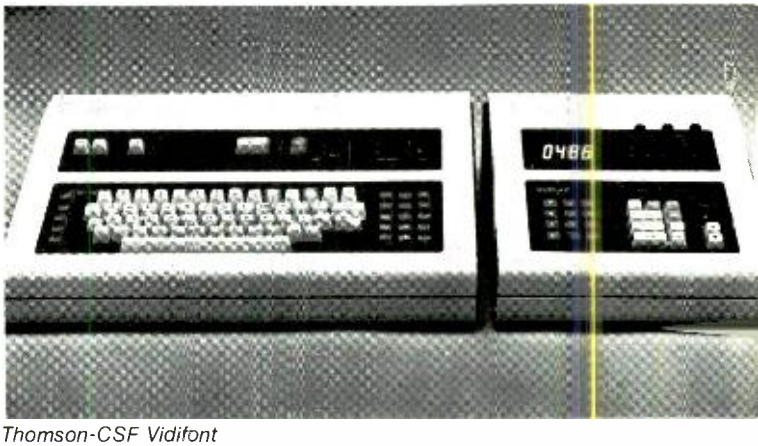
Group III: Over $20,000

Manufacturer	Model No. Price Code	Character Generation: No. of fonts stored internally	Characters per font (upper, lower case)	Character resolution (nanoseconds)	Character height (lines)	Page format (rows/characters per row)	No. of fonts available
Chyron Telesystems	RGU-I PC. 280-370	4	94 (u/l case)	27 nsec	4 to 420	24/62	25 + logos
	Chyron IV PC. 440-650	6	94 (u/l case)	27 nsec	4 to 420	24/62	25 + logos
Fernseh Inc. (TeleMation)	Compositor I PC: 460-800	8	96 (u/l case)	30 nsec	10 to 127 graphics up to 384 scan lines built using multiple characters	12/31	104
MPB Technologies (Vista 80)	116 PC: 200-240	2	94 (u/l case) underlines are special	40 nsec	16 to 48 specials up to 384 lines	16/31	20 + maps, logos
	116/3FX	6					
	116/6FX	12					
	216 PC: 275-320	4					
	216/3FX	6					
	216/6FX	12					
3M	D-8800 PC. 280-400	4 (up to 40 fonts may be stored on a single floppy disc drive) four fonts loaded at one time	96 (u/l case) plus symbols & punctuation	35 nsec	16-64 standard (larger or smaller on request)	Variable (determined by text — proportional spacing) & font height	42
Thomson-CSF	Vidifont IVA PC: 260-440	2 per channel	92	45 nsec	18-128	16/57	112

System Concepts Quantafont Q-VI/M

Dynasciences 9048 graphics system

Fernseh Compositor I Keyboard



Thomson-CSF Vidifont

Features				Expansion	
Dynamic display modes (roll, crawl, etc)	**Edit/ position features**	**Effects (border, color, etc)**	**Other**	**External memory**	**Options**
5 roll/crawl speeds, char. flash, underline, programmed pause during roll and crawl, 9 speeds char. & char. reveal, auto. lower third	Row shift, char. shift (H&V), 256 tabs, row insert and delete, char. insert and delete, char. manipulation (H&V)	7 colors, background or individual characters, multiple edge (drop shadow, etc.), background color on 8 TV line increments	Maintenance diagnostic panel, multiple keyboards and disc drives	2,000 rows of titling per interchangeable floppy disc	2nd channel B/W or color, multiple keyboards, disc drives
same as above plus instant italics, animation	same as above but unlimited character manipulation including vertical & horizontal character overlap	64 color selection for char. or backgrd. in 4 TV line increments, 15 edge/border formats, multicolor logos	same as above	same as above	2nd channel as above + camera font compose for in-house creation of special fonts & logos
6 roll/crawl speeds, flash, underline, preset roll speeds with manual override, fixed title + roll/crawl window on one page, auto title and speed change while roll/ crawl in progress, roll/ crawl of any list of pages	row/character shift, H & V centering, 4 tabs per page (4000 total), lower third tab, auto reset of font, edge, color, spacing, flash	32 character/background colors on each page, character-by-character colorizing/font, selectable edge width & luminance, 3 edge styles: shadow, border, outline	High-speed (7 pages/sec) page change rate, diagnostic programs, 7 keyboards with assignable priorities, one button sequencing of pages, manual or automatic dwell time sequences, two letter protection code assignable to each page, auto aesthetic spacing plus auto proportional spacing, auto inner-row spacing	999 pages plus programs plus 8 fonts plus 100 animation sequences plus 200 election races per disc	On-line 104-font library disc, digital graphics compose, character zoom, plus X,Y,Z axis rotation in animation mode, election reporting with local vote entry or external computer vote entry
4 roll/crawl speeds with increment (+ or −) and pause, flash, programmed sequencer	Block shift up/down, row shift, auto center line/page, char. insert/delete, char. style selection, color editing, up to 3000 tab locations	8 colors: full or limited background color, edge color, character color, 3 edging styles: symmetrical, shadow up, shadow down	4 presets for rapid preselect sequences, display pages and fonts stored on diskette by operator assigned number rather than addresses which must be looked up, index of titles used prepared automatically	985 pages of 180 char/page	All models upgradable to dual channel 216 models, font compose
10 roll/crawl speeds, 10 crawl positions, 8 roll masks, 8 crawl masks, 10 animation speeds (1-20 pgs per sec), record instruction mode, char. and word flash & underline	Delete/insert char. & row, center row & page, right/left justify line, right/left justify page, row shift/scan line by scan line, 10 tabs, row interchange, inter-char. & word spacing	8 character by character color (RGB), 8 register by register background color, full edging plus 4 position drop shadow	Interactive keyboard/console	One double sided floppy drive standard, can add up to 4 drives (up to 2,000 pgs stored on each drive)	Second channel, extra keyboards, interfaces
8 speeds or roll/crawl, 3 speeds of flash, multiple char. ripple rates and timed replace, underline, outline	Auto char. overlap, auto center, justify left-right, 57 tab locations	6 color background on page, row or partial row, 9 edge positions	Blanking to blanking roll/ crawl, microprocessor font compose	500 pg floppy disc store (0.3 sec. access time)	Full resolution preview channel, full color second channel, Vidivote, Viditext, RS 232 interface time display, 3rd 500-page disc storage, font compose

Character Generator Survey

different character widths and six character heights (8 to 64 lines), 24 character sizes of each font can be created and intermixed.

Even though some systems have less internal memory than others, this need not be a limitation, particularly if new fonts can be dumped into the internal memory easily. Or it may be possible to mix fonts in the internal memory.

Usually with the higher-priced systems three or more font styles can be intermixed. In the Chyron IV, for example, which stores six fonts simultaneously, character style or size can be intermixed in any word, row, or full page.

All of the Group III systems offer roughly comparable font characteristics, but some offer more than others. Thomson-CSF leads in the number of fonts available with 112; Fernseh, Inc., lists 104.

Character height specs vary, with 64 lines average. Vidifont, for example, lists character height as 18 to 128 lines. 3M, with doubling, goes to 256. Fernseh, using triple characters, says it can go from 10 to 384; Chyron boasts four to 420.

Generally speaking, Group III systems offer more features in terms of positioning and dynamic display modes, although again, some of the microprocessor-controlled Group II units offer quite an impressive array of features.

While it may seem that all systems offer crawl and roll, it is worth noting that the specs do differ. 3M reports 10 rates of vertical roll and horizontal crawl. Other specs read eight rates, five rates, three, and so forth. A programmable window in which roll and crawl take place is offered by 3M and Chyron.

Character resolution for the newest Group III systems exceeds the 40 nanoseconds typical for Group II systems (and earlier Group III models). 3M says 35 ns increments produce characters with excellent smoothness (model D-8800). In the medium-priced systems, System Concepts refers to its basic resolution as 32 horizontal pixels, but reports that its Nanolog character refinement approach produces an effective start point resolution of less than 20 ns.

Most systems offer an RS-232C ASCII interface, which means that weather data, sports scores, and other information coming in over wire services can be converted to high resolution characters from the 125 ns resolution offered by ASCII.

The message memory facilities of systems vary. Most all Group III systems incorporate flexible disc storage (which stores both messages and fonts). More memory can be added. The Vidifont IV system provides random access to 192,000 characters, equivalent to 6000 rows of information (or 2000 three-line subtitles) at an average of 32 characters per row. The average access time to any message is 0.3 seconds. Chyron IV stores 128,000 16-bit words and claims 2000 rows of standard subtitling. 3M says each diskette in its system handles 254,000 characters with a read-back time of 0.4 seconds.

The Fernseh Compositor I uses a rigid cartridge disc drive system that stores 999 full pages. This system also stores the eight fonts, all operating programs and test (diagnostic) programs. The MPB system uses a diskette that will store 985 pages of about 180 characters per page. Memory is considered continuous, so the number of pages

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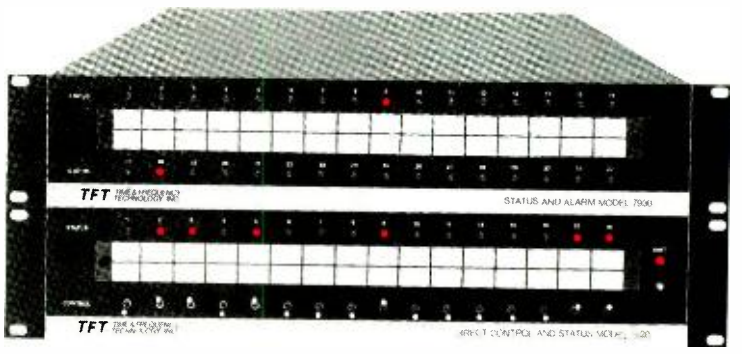

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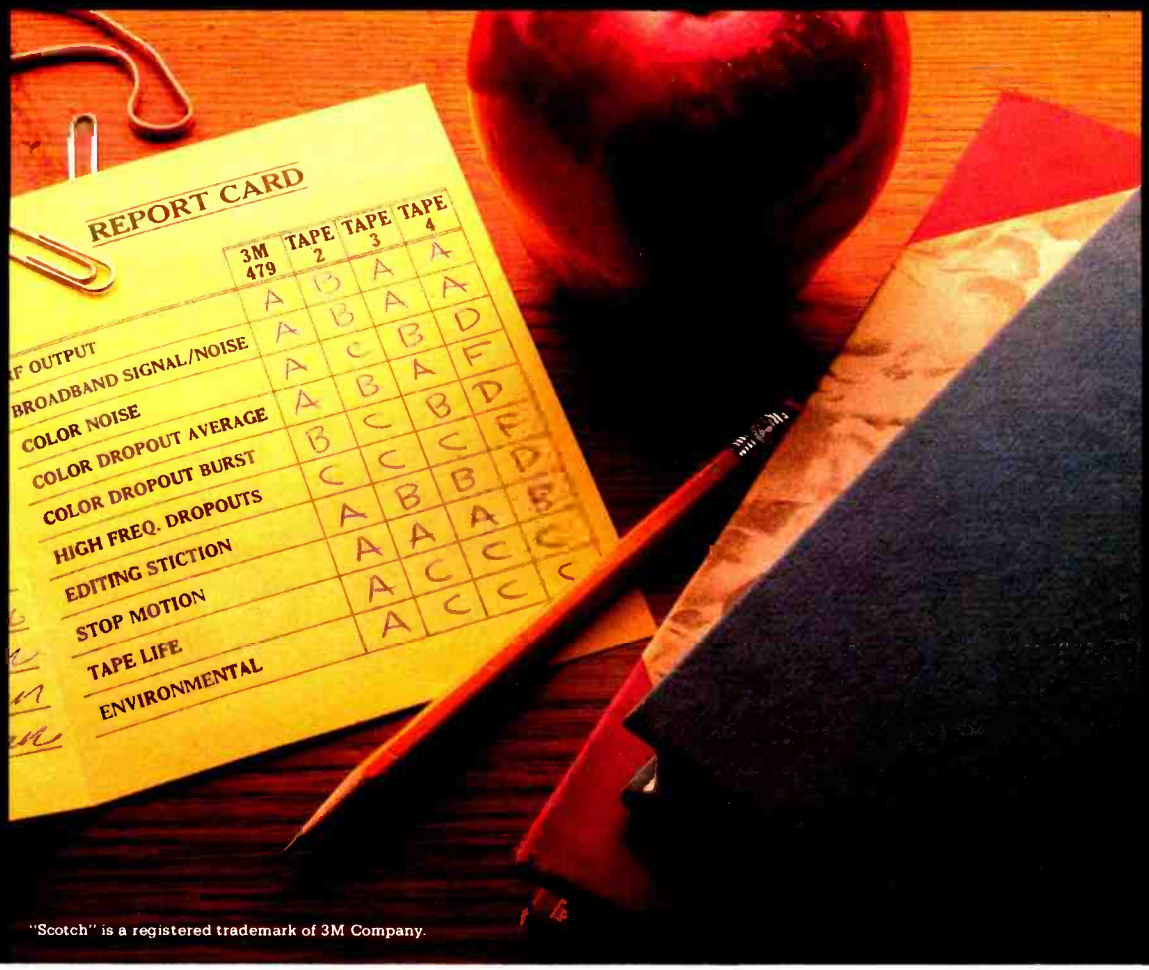

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3M

decreases if pages are crowded.

Some of the Group II machines also use floppy disc store. The Dynasciences 9048 system has a 128-page external memory. The 3M D-3016 has an internal 16-page memory, but options allow transferring a page of memory to an audio cassette. Time to record and play one page is about 7.5 seconds (each minute of audio tape is equal to eight pages of information). A floppy disc memory can be added as an option. System Concepts' Quantafont units are built around a 192-row internal memory which holds 6000 characters. This can be extended by use of a dual mini-disc (1600 rows) or computer-grade digital cassettes. A cassette can load 192 lines into the internal resident memory in 10 seconds.

There is one system design for cable TV that reports use of a bubble memory of 500 pages of eight lines each — the Computer Video System CDD-8M. On the other hand, simpler Group I units typically include only eight pages of internal memory.

Features beyond comparison

The different features found on character generators are simply too many to comment on in a single article. Most of the more important items are incorporated in the accompanying charts. No chart, however, is able to convey the operating ease of a system. Can a single keystroke enter an instruction or are several strokes necessary? Some of the new microprocessor-based systems incorporate software programs that make operation quite simple. Many manufacturers (Chyron, Fernseh, and 3M, for example) boast an interactive display to coach the inexperienced operator through a sequence properly.

Ease of editing is important, and manufacturers' literature should be consulted on this point. It is not easy to compare one product with another by reading since the industry does not follow any standardized format in describing systems.

Many character generators/graphics systems are being purchased today with dual channel capability, which permits broadcasters to have a picture preview output and an on-air broadcast output at the same time. The literature should be read closely on this point — does the equipment under consideration offer two channels of high resolution quality or is one limited? To save costs, the edit/composition channel of some systems consists of low resolution characters.

Finally, it should be noted that this survey does not include the wide range of data display systems/character generators offered by Video Data Systems, Laird Telemedia, BEI, Computer Video Systems, and QSI Systems among many others, designed primarily to provide constant readouts of time and weather information or simple subtitling. Nor does it include a host of systems for generating SMPTE time code displays or systems for low-resolution teletext or viewdata applications.

Also, it must be pointed out that this listing was compiled before the 1980 NAB show, for which several manufacturers have announced plans for new character generator introductions. For an update on what's newest in character generators, make sure to check out *BM/E's* June NAB Show-In-Print issue. **BM/E**

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THE RADIO EARTH TERMINAL: ENTRY TO THE SATELLITE AGE

The programming the satellites will bring to radio broadcasters will be rich, varied, high in quality, and low in cost. This article describes the fundamentals of the satellite earth terminal, the device that connects the broadcaster with this great new storehouse of radio programming.

FOR THE NEXT COUPLE of years the radio broadcaster may feel even more pressure than the television broadcaster from the question: shall I buy an earth terminal? As noted in many accounts of video earth terminals, the video satellite program nets are beginning to take shape with a lot more just off stage, and more than fifty television broadcasters already have terminals.

But the radio satellite nets are coming even faster. Before 1980 is over there will be several nationwide nets in full operation. They will demonstrate powerfully the high technical quality, low cost, and great flexibility of satellite distribution for radio.

The Mutual Broadcasting System is furnishing more than 600 MBS affiliates with earth terminals to receive the Mutual mix of news, sports, talk, and entertainment, including live music in stereo. The Mutual terminals are being built by California Microwave, Inc., and are now going in at the rate of 50 a month, with the whole net scheduled to be finished by the end of the year.

Another nationwide net in construction is for National Public Radio. By the end of 1980 NPR will have furnished about 200 public radio stations across the country with earth terminals that tie them into the net for fast, high-quality program distribution. Included will be NPR's news, talk, and discussion programs, and much music, also including live concerts in stereo. NPR will eventually have uplinks in several locations for a strong localism in the program mix. The NPR terminals are coming from Rockwell-Collins.

The Associated Press is also going to have a countrywide net by the end of the year, with more than 400 earth terminals furnished to AP subscribers. The AP net will deliver news, talk, backgrounders, and audio services faster and with much higher technical quality than wire distribution could manage. AP will share the satellite net with RKO for distribution of RKO's outstanding music and other entertainment. The AP terminals are also coming from California Microwave.

Another organization turning to satellite distribution is Muzak, which has contracted for 200 earth stations from California Microwave and looks ahead eventually to using many thousands. The nets mentioned here are just the beginning. Software producers of many kinds are alert to the advantages of satellite distribution. A number are now in active negotiation with the satellite organizations and there are likely to be announcements on the topic in coming months from syndicators of music formats, producers of specialized information (financial, business), talk-show producers, and others.

Radio broadcasters will also find it useful to know that the satellites can be readily set up for data services with a wide range of bandwidths, from low-speed teletypewriter (60 to 120 bits/second) all the way up to high-speed data (56,000 to 256,000 bits/second). In addition, high-speed, high-resolution facsimile is easily transmitted and received.

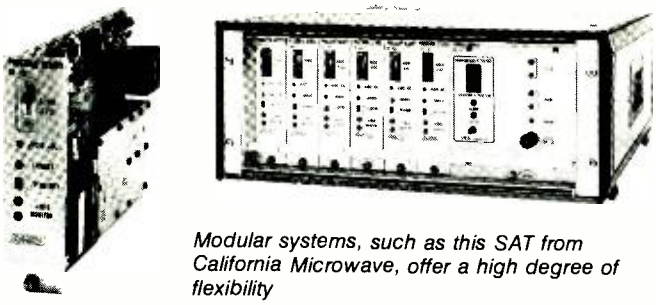
Thus, even if broadcasters see no immediate reason for buying an earth terminal, they will probably want before too long answers to the questions: What goes into an earth terminal? How do I choose one? What will it cost? How do I get it installed? This article aims to answer these questions in broadcaster terms.

The signals that come down to the terminal from the satellite occupy the 3700 to 4200 MHz band. The 500 MHz bandwidth can be divided in a number of different ways. The Western Union Westar satellites, which will be used by Mutual, AP, and some others, have 12 or 24 transponders, complete receive-retransmit circuits each nominally 40 MHz wide. To get 24 transponder circuits, the satellite has a frequency re-use scheme with two different antenna polarizations on each transponder.

Because the uplink signals, in the 6 GHz band, and the 4 GHz downlink signals both share spectrum with terrestrial microwave and with adjacent satellites, the FCC has in the past required detailed frequency coordination for an earth terminal before authorizing construction. The prospective user had to study all possible sources of interfer-

The FCC's deregulation of receive-only satellite terminals has led to a proliferation of small-aperture dishes such as this one

Prepared by *BM/E* with the collaboration of Herbert C. Granger, director of East Coast Satellite Operations for California Microwave, Inc.



Modular systems, such as this SAT from California Microwave, offer a high degree of flexibility

ence at the proposed site and reach a determination that the service would be satisfactory. Once the FCC accepted the plan, future users of microwaves in the area would be required to avoid interference with the earth terminal service.

However, within the past year the FCC has instituted an alternative (see *BM/E*, November 1979, p.14). The prospective user of an earth terminal can put it up without prior frequency coordination and without FCC authorization of any kind if he forfeits FCC protection from sources of interference that come in later. The earth terminal user can still go through the complete frequency study if he wants the protection. Most of the organizations now putting in large numbers of earth terminals have elected to take the protection risk, on the ground that, so far, there has been no trouble at the great majority of earth terminal sites.

One effect of the FCC frequency-coordination requirement has been a strong emphasis on the 10-foot antenna for radio terminals. Within the constraints of existing satellite output power, reasonable earth terminal cost, and various technical trade-offs, the 10-foot antenna has been roughly the smallest size that could provide the reception pattern required by the FCC. Leading builders of earth terminals for radio, therefore, concentrated on the 10-foot antenna, and economies of scale brought the cost down to attractive levels.

Thus, even those earth terminal buyers forfeiting FCC frequency protection in favor of rapid net building are using 10-foot antennas (in some cases, even larger ones). Smaller antennas, six-foot and even four-foot, may become important in the future because there are a number of proposals for increasing transmitter power in the satellites and for other changes in technology that will help make the smaller antennas viable. Prospective buyers should make up-to-date checks with suppliers on the status of the proposals in this area and the standing of the smaller antennas.

The elements of an earth terminal

The antenna, the first element in the earth terminal, is a critical component because the signal arriving over the 22,000-mile path from the satellite is extremely weak at the terminal. The antenna must provide a large amount of gain, typically 40 dB or more. Each site will present some variation in signal conditions, and these must be taken into account in the design of the terminal.

The signal goes from the antenna to the low-noise amplifier (LNA), which is attached directly to the antenna. The LNA boosts the 4 GHz signal another 50 dB. There are several grades of LNA, with noise figures lowest at highest cost. The LNA can be chosen to match the signal conditions at the site.

A significant aspect of satellite terminal operation is that one antenna and one LNA will usually cover all the services from a satellite. Choice of services resides in the downstream, and less expensive, electronic components, and these can be added to or changed at any time, as detailed below. Since the antenna and its base are the largest elements of cost, an earth terminal has a low potential demand for reinvestment because of obsolescence (there is more detail on costs below).

Program slots in the satellite

In principle the 40 MHz of bandwidth in a transponder could be divided into scores of multiplexed carriers. The satellite is in effect not bandwidth limited. Each additional carrier, however, will take a certain fraction of the available downlink power. Since the power in a carrier signal is a crucial characteristic that cannot be allowed to fall below a certain level if the system is to perform as planned, the satellite is power-limited. A careful trade-off must be made between the number of program channels and the power available for each channel. This trade-off can be made in a number of different ways, depending on the bandwidth, distortion, and noise characteristics needed for the particular program service, the subscriber's earth terminals, and other factors.

One carrier assignment plan now in active use, that of the Westar satellites, is shown in Figure 3. Sixteen carriers, each 20 kHz wide, are disposed in the transponder band. Each carrier can be assigned to actual program channels in a variety of ways, some of which are described in detail below.

How a program is selected

The program selection begins with the downconverter, which is mounted no more than a few feet from the LNA at the antenna installation. The downconverter filters out of the 4 GHz signal the frequency band of a particular carrier, and sends it along at the carrier frequency, over standard coaxial cable, to the demultiplexers and demodulators in the studio, which can be as much as 300 feet from the antenna. The demultiplexer filters select the desired program channel and the demodulators recover the baseband signal.

It is central to the remarkable flexibility of satellite distribution that changes in the services received depend in the majority of cases only on changing the comparatively inexpensive electronics units. The demultiplexer units and the demodulators are small, plug-in assemblies. To bring in another program service, the user simply adds two additional plug-ins. If he wants another whole carrier, he adds another downconverter, which makes available a second array of programs. He can have at the output of his satellite electronics any two, five, or 10 of those programs, using small, easily installed electronics units.

Program channel specifics

The frequency plan shown in Figure 3 has been optimized for audio service. It is configured to avoid interference from terrestrial microwave signals and from adjacent satellites. Because of the potential interference from TD-2 microwave systems, the 60 ± 2.2 MHz band and the 80 ± 2.2 MHz band are not used.

The frequency plan also minimizes interference from intermodulation products which are generated in the satel-

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Switch to Panasonic. Because Panasonic gives you your choice of four versatile switchers/special effects generators (SEG's). So, depending on the size of your studio and your budget, you only have to buy as much switcher as you need.

For broadcast studios and production control centers, there's the AS Series. The AS-6000, with seven program inputs, 14 wipe patterns and a fully adjustable colorizer, lets you add color to your supers or fade to a solid color. And it has many other features that you have to see to believe, especially at such a low price—only $6,000.*

You have to see the AS-6100 to believe it. It's the most advanced Panasonic SEG. It features 10 program inputs, two external key inputs, two downstream key inputs and three auxiliary inputs for film chains and VTR's. 17 inputs in all. Plus a "spotlight," downstream mixing for up to three cameras, and a fully adjustable colorizer. Yet the price is only $7,500.*

For creative color production in smaller studios, the Panasonic WJ-4600A at $2,095* is an excellent choice. And for more versatile special effects, the WJ-5500A at $3,950* is even better. Both units offer important features: An internal E.A.R.S.-170A sync generator with genlock, color bar generator and vertical interval switching. Plus internal and external keying. And burst for fades to black.

The WJ-4600A has six program inputs, six wipe patterns in the normal/reverse mode, two effects buses with a fade-wipe lever, and a preview/program bus.

The WJ-5500A has even more. Eight program inputs. Downstream mixing for three video signals. Nine wipe patterns, a wipe positioner and your choice of sharp or soft edges. Plus normal, normal/reverse, and reverse modes.

All four switchers are compact, self-contained and have illuminated pushbuttons.

Take a close look at them. And you'll get switched on to Panasonic.

For more information, write: Panasonic Company, Video Systems Division, One Panasonic Way, Secaucus, N.J. 07094. In Canada, Panasonic Video Systems Department, Mississauga, Ontario.

*Panasonic recommended price, but actual price will be set by dealers.

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just slightly ahead of our time.

lite transmitter. Operation levels and amplifier backoff margins are also optimized for the performance objectives.

There are two principal systems for assigning program channels to carriers — multiple channel per carrier (MCPC) and single channel per carrier (SCPC). Each has its own advantages.

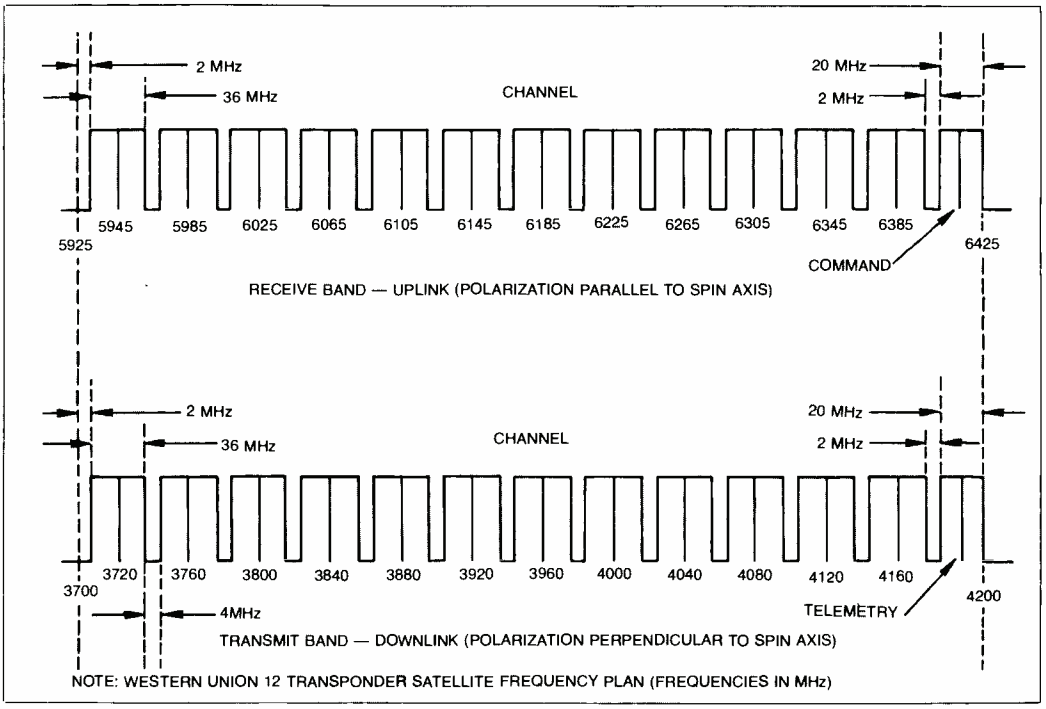
Multiple channel per carrier

MCPC allows the subdivision of each carrier into a number of different program services without affecting the number of carriers per transponder or per satellite or increasing the intermodulation products within the transponder. The demodulator equipment for this service is fully developed (CMI, for example, has a family of FM demodulators with extended threshold and multiplex ports).

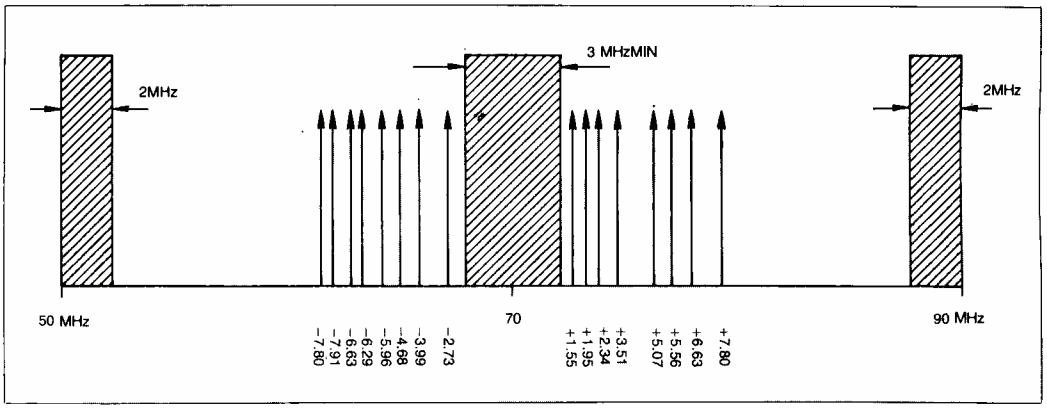
Figure 4 shows a number of MCPC baseband configurations now in use. Configuration D, for example, provides two voice channels and a high-quality 7.5 kHz program channel on one carrier. The program channel will exceed the quality of typical AM radio broadcasts of news and of commercials containing music. The two voice frequency (VF) channels multiplexed above the program channel have frequency response and group delay better than those of C-2 conditioning.

The transmission of 9600 baud data on such MCPC voice channels has been thoroughly tested over working satellite links. Each of the two voice channels may also be used to transmit 25 TTY (teletypewriter) tone channels. For example, 50 separate state wires from a wire service organization can be multiplexed into the two VF channels that are placed above the 7.5 kHz program channel. Other combinations can be seen in the other illustrated configurations.

The great adaptability of satellite service is well illustrated by the following example: by changing the plug-in crystal in the VF channel demultiplexer, the carrier frequency may be offset so as to center any one of the 25 state wire frequencies at 1140 Hz, the tone frequency currently used on many state wire printers. This makes it easy to shift from terrestrial to satellite transmission without obsoleting or modifying printers currently in the field. The printer is simply disconnected from the telco line and reconnected to the earth terminal output. By maintaining this universal tone channel interface, restoration of any satellite circuit depends on a dial-up network interconnect. No microprocessor or expensive TD interface is needed to provide the 50 state wire services to any broadcaster. This is especially important when a wire service



Spectrum assignments of transponders in Western Union satellite, for uplink (top) and downlink (bottom)



Placement of carriers in transponder for single-channel-per-carrier service

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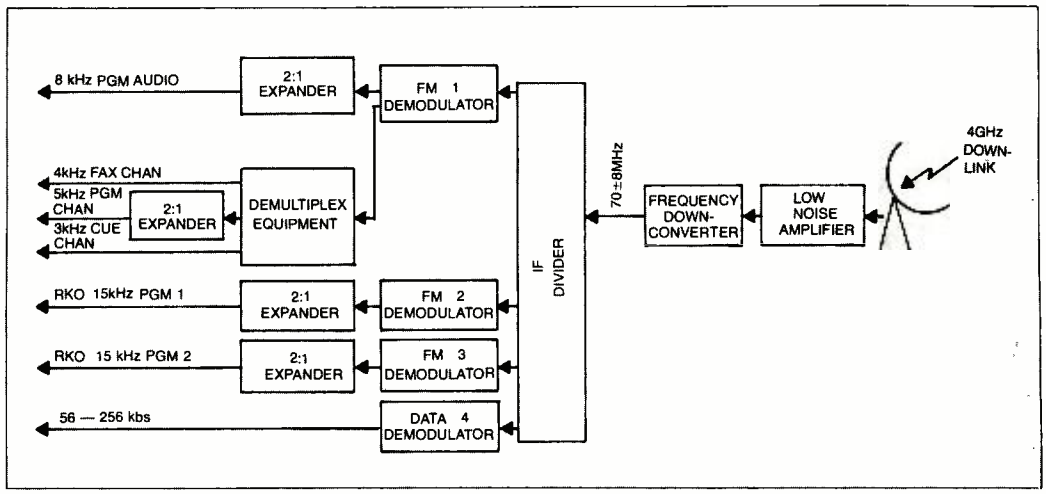
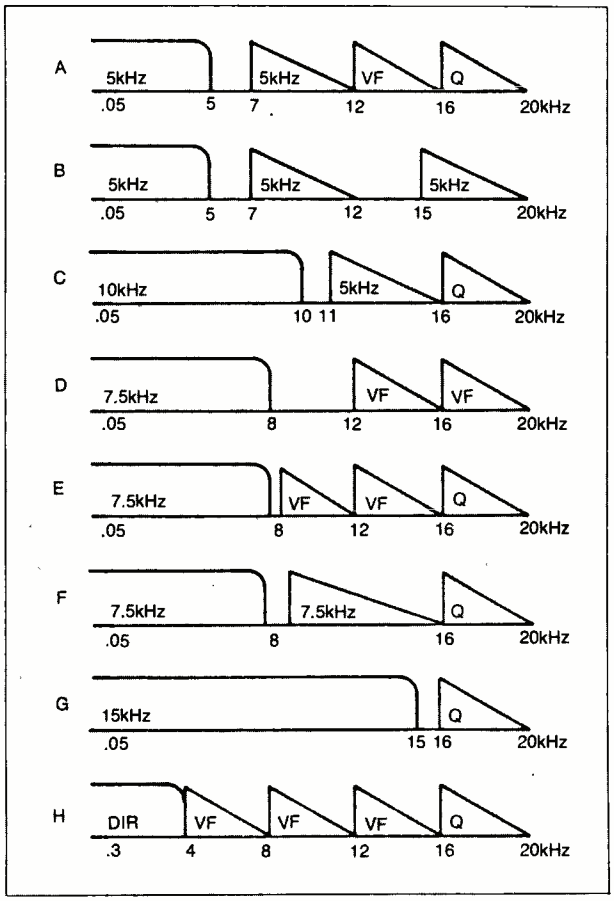


Typical system plan of receive-only earth station (developed for RKO-AP shared system)

organization evaluates the economics of serving, say, 3000 broadcast affiliates across the country that do not subscribe to audio news. The radio broadcaster should be aware that the builders of earth terminals have developed this and many other system designs that fit satellite service into the existing requirements of radio broadcasting.

Configuration B puts three 5 kHz regional networks on one carrier. Configuration C will put, on two carriers, AM stereo plus two 5 kHz regional news channels and two cue channels for switching information and access control. The 10 kHz program channel is directly modulated onto the FM carrier and is therefore inherently phase coherent.



Some of the configurations that can be used in a multiple-channel-per-carrier system, putting several program channels on each carrier

Careful phase matching in directly modulated channels of FM demodulators assures excellent stereo service. (CMI, for example, provides phase match typically less than one degree mid-band and three degrees at band edge, for 5, 7.5, 10, and 15 kHz channels.)

Configuration F carries two 7.5 kHz program links plus a channel for slow-scan video news slides, with the cue channel allowing remote switching. Mutual Broadcasting uses Configuration G, which puts switching and automation tones, news, and schedules on the cue channel above the 15 kHz stereo direct channel. Configuration H can handle five commentary or data channels or any combination. A frequency extender on the VF channel, plus a 2:1 compandor, will provide a rich-sounding commentary channel. This configuration meets the needs of specialized networks that want to share existing satellite nets at low space cost.

The advantages of SCPC

A single channel per carrier system maximizes power in the program channel. It can include a cue channel multiplexed above the program channel in the space from 16 kHz to 20 kHz. Each plug-in demodulator receives a single carrier and demodulates a single channel.

The electronics for a single channel per carrier system are obviously simpler and less expensive than the equipment needed for multiple channel demultiplexing and demodulation. The technology is less demanding in important respects. Single channel per carrier will cost a little more per program for the space segment, but turns out to be economical for many users.

Compandors: the noise problem

The economics of small aperture terminals (10 feet and smaller) and the presently allowed satellite power levels will not produce program audio signal-to-noise ratios much above 50 dB. For that reason, some form of digital or analog compandoring is incorporated in most satellite audio service. CMI has designed and subjectively tested a number of compandor systems over the past several years. With the system chosen, highly experienced listeners could not distinguish the original source material from satellite-transmitted programs in 70 percent of the tests made. The compandor system thus allows a subjective S/N ratio of 60 to 90 dB to be reached in a transmission facility with a bare channel ratio of 30 to 40 dB.

The multiple-satellite problem

It is clear that as satellite programming grows in quantity, with more and more program sources going to the birds, there will be increasing value for the broadcaster in being able to bring in more than one satellite. Antenna mounts are basically adjustable, since each antenna must be pointed exactly for the specific site location. Repointing is available on a number of plans. A handcrank system is the least expensive, and the slowest. At the other extreme are motor drives which can reposition the antenna in 20 seconds or less to any orientation within the range. In many cases motor drives can be added at a later time, but the total cost of the motorized antenna will be higher if the construction personnel return for a second visit.

Analog and digital modulation

CMI has made comprehensive analysis of the financial and technical trade-offs between analog and digital modulation. For the present, CMI is using analog, which is cheaper and simpler and also meets quality requirements (it is noteworthy that National Public Radio, with very rigid quality requirements, came to the same conclusion). Analog modulation allows for a cue channel per time zone in multiple channel per carrier operation, plus a second special program channel, with no increase in space costs. It also has the capability for fixed point, remote, or mobile access points for more flexible program origination, and another level of backup if the primary uplink or originating studio should suffer a catastrophic failure.

However, the great flexibility and comparatively low cost of changing the electronic receive systems, pointed out in the foregoing, also means that a later change to receiving digital modulation can be readily accommodated. The technology for this is in hand; no large changes in overall system architecture would be needed. CMI is keeping a close watch on developments to determine if and when digital modulation becomes important to users of satellite programming.

The cost of an earth terminal

The cost of an SAT, installed, depends to large extent on the difficulty of preparing the site, with the large base for the antenna the major cost element. On the average, with no special site difficulties, a complete terminal can be put in for around $10,000. CMI has worked out a variety of options, from turnkey installations to assisting the buyer to a do-it-yourself kit with complete plans that the buyer can use to build the antenna base himself and install the antenna. The do-it-yourself plan will be attractive in many cases if the buyer is able to get local construction of the antenna base at reasonable cost. CMI's travelling construction crew naturally will often cost more than a local contractor because of travel and living costs.

Installing the electronics presents no difficulties for experienced radio engineering personnel. Another advantage of analog modulation is that the electronics units all have widely understood functions and design. Once the signal has travelled the 22,000 miles from the satellite to the receiving antenna and has come down to familiar frequency territory in the downconverter, the technology holds nothing strange for the radio engineer.

Finally, if the radio broadcaster has caught a case of satellite fever, he is right on track for the future. **BM/E**

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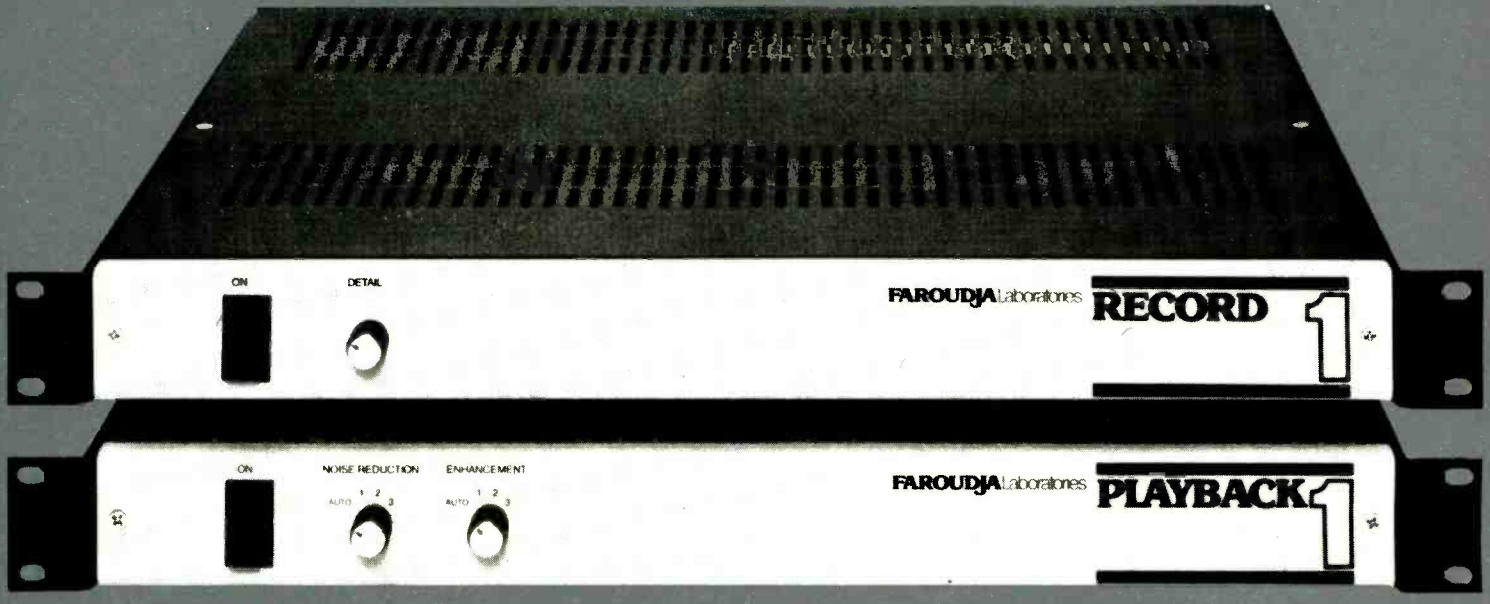
The Image System is different. It consists of a pre-processor called Record 1™ and post-processor called Playback 1.™

Record 1 boosts small details which will be predictably degraded or lost in all color under VTR formats. Further, Record 1 encodes the original video signal with a non visible, fully compatible pilot signal which will later control Playback 1 to set detail levels *automatically* without operator error based upon monitor performance.

Portable RECORD 1

Playback 1, the second part of the Image System, is utilized just before time base correction for broadcast. It reduces noise and ringing, eliminates chroma/luminance delay and sharpens details; *automatically*. The resulting picture does not have the cartoon effect or plastic appearance of color under formats – it looks as if it comes from a more expensive VTR.



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EARTH TERMINALS FOR VIDEO: READY TO TAKE OFF

Video program distribution via satellite is on the verge of tremendous expansion. Earth terminal technology has reached a high level, and the industry appears to be ready to supply television broadcasters with high-quality receive-only terminals in quantity. This article is a primer of such terminals: what goes into them and what to watch out for when you buy one.

THIS COULD BE A TAKEOFF YEAR for satellite distribution of video programming. The industry has been watching it build for a number of years: at this time in 1979 there were about 20 stations with earth terminals, outside the government-built, centrally planned network of the Public Broadcasting System. As this is written there are close to 60 non-PBS stations with earth terminals, and by the end of the year the total will almost surely pass 100. The rate of increase is predicted to rise sharply in 1981.

This upturn, this rush for the satellite bandwagon, is a response, first, to the virtually universal realization that satellite distribution is much cheaper and better than terrestrial distribution. It is also a response to the appearance of a number of satellite video program sources, with many more visible on the horizon. (The accompanying box lists the main satellite program operations at the time of writing and some that are due for early appearance.) In some cases television stations are taking their places in special nets that are adopting satellites for getting programs to affiliates.

Additionally, some firms building satellite terminals are now in their second or third generation of equipment and the technology is highly advanced, with fairly stable prices. Broadcasters know who the reliable suppliers of satellite equipment are: track records are on the books.

It is a good time to set forth, for the great majority of television broadcasters who have had no contact yet with earth terminals, what a video earth terminal is, how to get it installed, and what it costs. The signal an earth terminal brings in covers the band 3700 to 4200 MHz, the standard downlink frequency for both radio and video satellite service. The signal is extremely weak at the antenna because the total output power in the satellite is limited by the device's weight and size limits and by its source in solar power, and because the signal has to travel the 22,000 miles from satellite to earth.

Thus high antenna gain is the first necessity of an earth terminal. The antennas supplied with video terminals, with diameters from 4.5 to 30 meters, supply gains of 50 dB and more. Antennas now used for video service range from the 4.5 and five-meter sizes that many cable television systems use up to the 30-meter antennas of international service. Television broadcasters are installing mostly the 10-meter antennas, with a minority of five-meter types. The larger the antenna the higher the gain, but the choice will be determined by trade-offs among cost, signal conditions at the site, and the characteristics of the desired service. An expert in the field has to work with the broadcaster in analyzing the weights and interactions of the various factors.

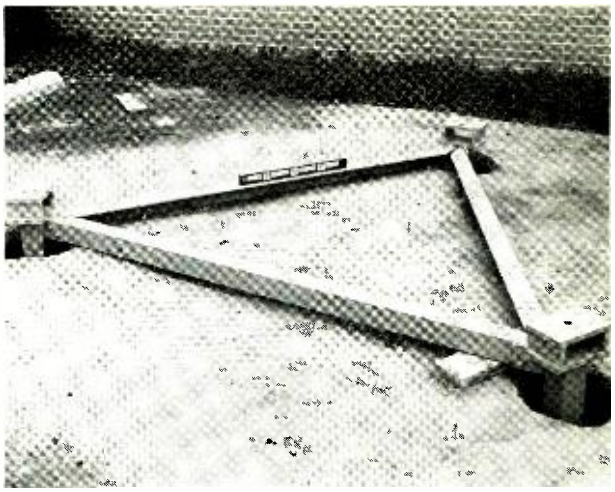
Attached to the antenna is the low noise amplifier (LNA), which is depended upon for another 50 dB of gain. LNAs come with a range of noise figures, from the parametric with 0.8 dB to the GaAs FET with figures in the 1.5 to 2.6 dB range. The parametric can now supply noise performance close to that of a cryogenically cooled amplifier, which was used in some of the early earth stations. Cryogenic cooling requires, of course, a refrigerator, compressor, and vacuum chamber. Broadcasters can now generally avoid the cost of this equipment by using a parametric LNA, or if the site signal conditions are favorable, the less expensive GaAs LNA, used by many broadcasters and cable television systems. Other advantages of the GaAs amplifier are freedom from periodic maintenance requirements and better mean time between failure rates than parametric amplifiers.

The video receiver

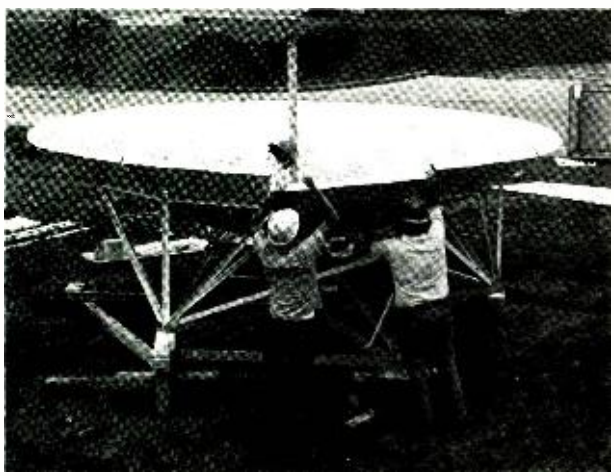
The 4 GHz signal goes by coaxial cable to the video receiver, which can be up to about 300 feet away without serious loss problems. The receiver selects the program wanted, which usually means selecting the output of one transponder. Generally speaking each transponder covers

Prepared by *BM/E* with the help of **Kenneth Liddick** and **Thomas Kelly** of Scientific-Atlanta, Inc., and several broadcasters who now have earth terminals. All photos and drawings from Scientific-Atlanta.

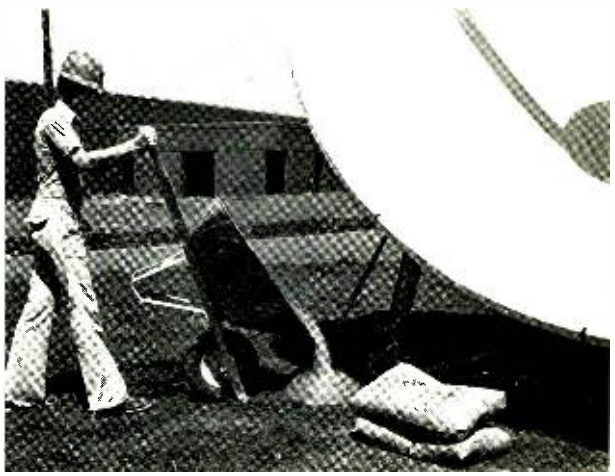
Stages in antenna installation. Hand-held drill prepares the holes



. . . into which the base is set



The dish is constructed atop the base



Holes are filled in with concrete for stability

a 36 MHz band and carries one video program. There is bandwidth in one transponder for two, or perhaps even three, video programs, but that means dividing the available power among those programs — the satellite has plenty of bandwidth but is severely power-limited. As the power available in a program channel goes down, the cost of the electronics in the earth terminal goes up and the difficulty of solving the design problems intensifies. System designers have so far found the best balance of tradeoffs in putting one video channel on a transponder.

The program audio plus cue channels and other audio or data information are usually put on subcarriers in the video band. Two, three, or even four such subcarriers are being used for the subsidiary narrow-band information. The video receiver downconverts the 4 GHz signal to the proper transponder, demultiplexes the signals on subcarriers, demodulates each of the signals to recover the baseband information, and clamps the baseband output.

Other transponders on the same satellite can be brought in by putting a power divider in the coaxial line just ahead of the video receiver and adding one or more additional video receivers. No changes in the antenna and LNA are needed; adding program capability to the earth terminal means only adding to the comparatively inexpensive downstream electronics units, which gives the satellite distribution system great flexibility for the receiving station. (As noted in the companion article on radio earth terminals, they have similar flexibility for the same reasons.)

Doubling transponder use

There is a way of doubling the number of transponders from the standard 12 to 24. This "frequency reuse" technique is based on having two antenna polarizations, one on the even-numbered transponders and the opposite one on the odd-numbered transponders. The earth station antenna must have a dual polarized feed plus a second LNA and coaxial cable run if programs are to be brought in at the same time on both polarizations.

Redundancy for reliability

A strong trend in the installation of video earth terminals has been the provision of some form of redundancy in the electronics to improve the reliability of the service. The makers of video earth terminals have a well developed redundancy technology, and the user has a choice of methods and costs.

One method, for example, is shown on page 94. It is based on a standby LNA and video receiver. An automatic protection switch monitors the main LNA and receiver for adequate signal levels. If any problem develops, the switch transfers operation to the standby units. Threshold

The Satellite Video Nets Are Coming On Strong

Broadcasters' interest in earth terminals for video programs is certain to spread over the next few years because the programming available in the sky will grow strongly. As this is written the main satellite programmers are Spanish International Network; Hughes TV Network, with a very large sports program; Robert Wold, with a variety of material; the Independent TV News Association; Viacom (with the RCA SMARTS package); Group W (the Westinghouse broadcasting network); and Blair TV.

Two or three of the large religious nets, especially the Christian Broadcasting Network and the Praise The Lord TV Network, which have been mainly reaching cable TV systems with their satellite operations, are actively promoting the installation of earth terminals by television broadcasters who want the religious programs. Many such terminals are in various stages of planning. A little further ahead both ABC and CBS will gradually shift to the satellites for their program distribution. In fact, every established supplier of video software for a multiplicity of broadcasters is planning to use the satellites at some time in the early future. In addition, a number of software producers not now actively reaching broadcasters have been stimulated by the attractive economics of the satellites to start getting ready for satellite operation. The sky will be full of video programming, a lot of it first-class and most of it enticingly priced for the broadcaster.

conditions, switching time, and other parameters are selectable by the user.

This configuration can be extended to the "1-N" mode if the user is bringing in more than one channel at a time. A single standby LNA, plus one frequency-agile receiver, can be switched in to replace any of several LNAs and video receivers (typically up to seven).

The user also gets options to operate the redundant circuitry in several different ways, as desired: in a fully-protected mode, as described above, or with the redundant channel used as a secondary program channel along with the primary channel. If protection of the primary channel is needed, the system preempts the secondary channel and switches it into primary service. A third method involves setting the automatic switching into an override mode, so that the redundant circuits can be used for occasional simultaneous program service.

Maximum protection with more than one program channel in simultaneous service results, of course, with a standby LNA and receiver for each of the channels in service. The user has to decide whether or not the need for reliability justifies the additional cost of such total protection.

Antenna repositioning

It is becoming clear that as satellite networking spreads, a great many earth terminal owners will want access to more than one satellite. Most of the broadcasters with terminals interviewed by *BM/E* were definite in wanting the capability to reach a variety of satellites, if not now, then within the near future.

Most antenna mounts are basically adjustable; the original installation must allow for accurate positioning at the user's site. The differences come in the ease with which the antenna can be "repointed." Maximum flexibility comes with motor drive systems that allow antenna reorientation in as little as 20 seconds to any position

within the antenna's range. These fast-drive systems are naturally also the most expensive.

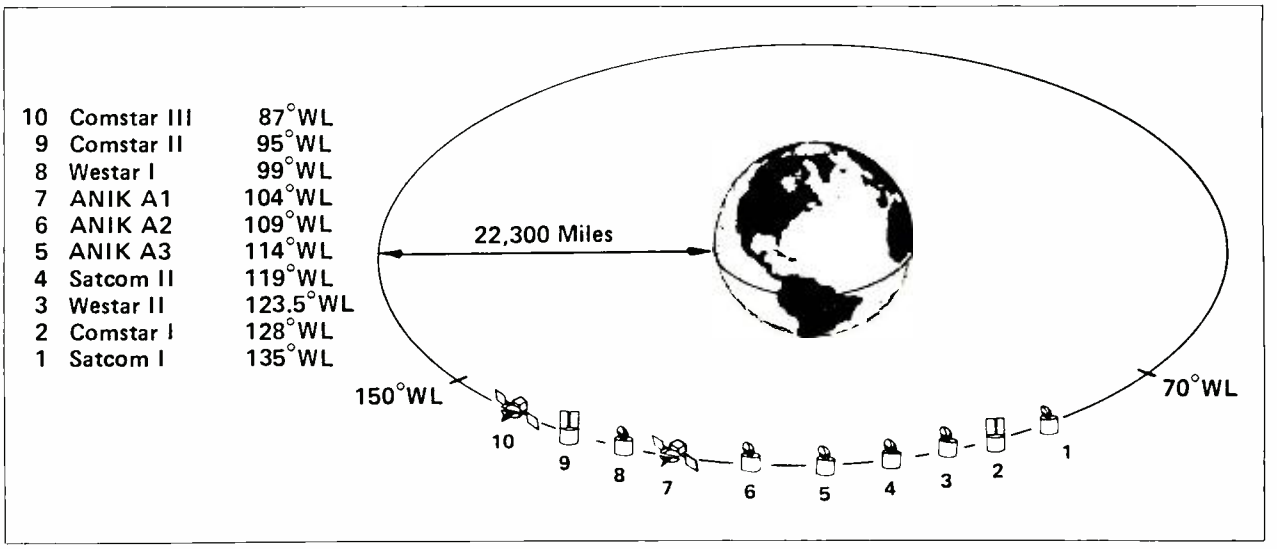
Slower drives are available at lower cost, and one may be good enough for the user's application. Slowest of all, with manpower time counted in, are hand-crank systems. When the cost of antenna repositioning is put in the trade-off balance, the cost of sending one, or more likely, two people out to the antenna for hand-cranking must be added in.

The two-dish connection

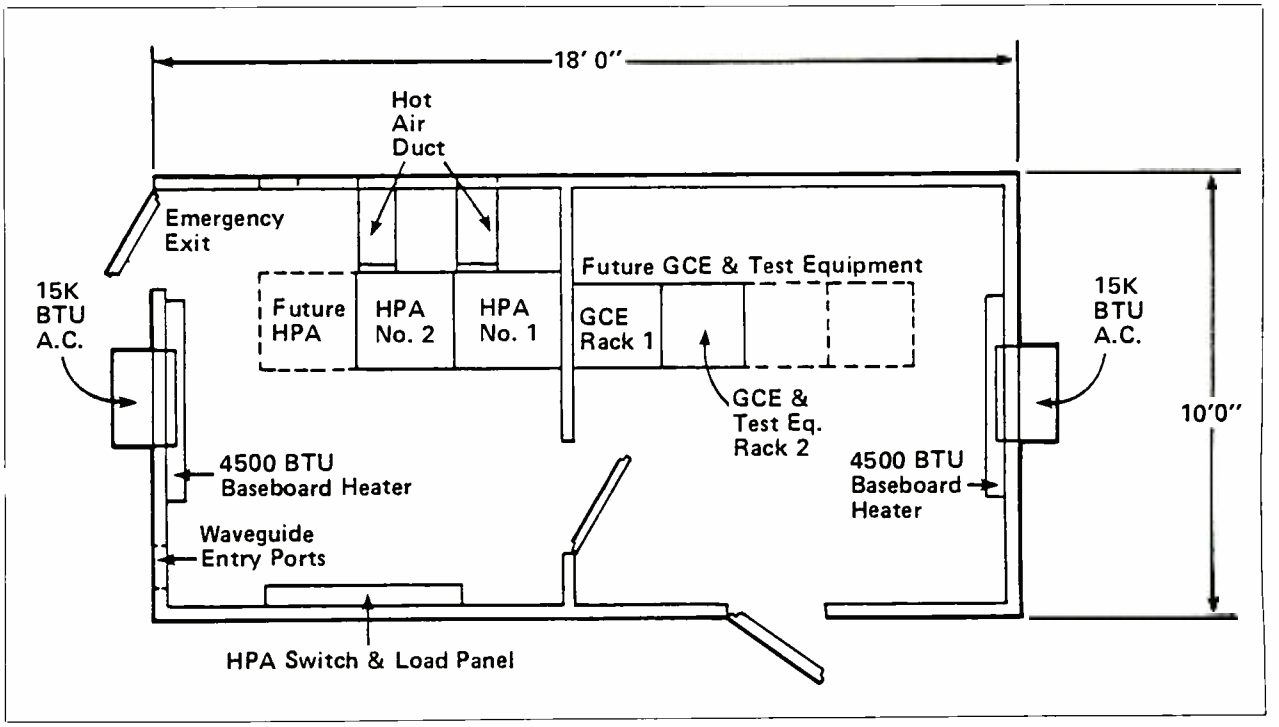
Another way to multiply access capability that is getting a lot of attention and some use now is simply putting in two antennas. It is a strong tribute to the importance earth terminal users foresee in satellite program distribution. Many cable television systems are particularly interested in having a second antenna, and there are discussions among programmers, carriers, cable system suppliers, and equipment makers on how second antennas could be supplied to cable systems on a mass scale. This development highlights the fact that the installation of earth terminals has primary interest not just for the terminal user, but also for the programmer and the carrier. On the radio side, Mutual, for example, is furnishing earth terminals free to all affiliates. The industry discussion on the second-dish approach for video terminals includes proposals for sharing the cost among programmers, carriers, and users. The RCA SMARTS system, too, now in an experimental stage, has envisioned supplying the earth terminal to the user as part of an agreement by the user to take the programming service involved.

A two-dish station

The logic of two-dish operation can be seen in one example, that of KDNL in St. Louis. Chief engineer

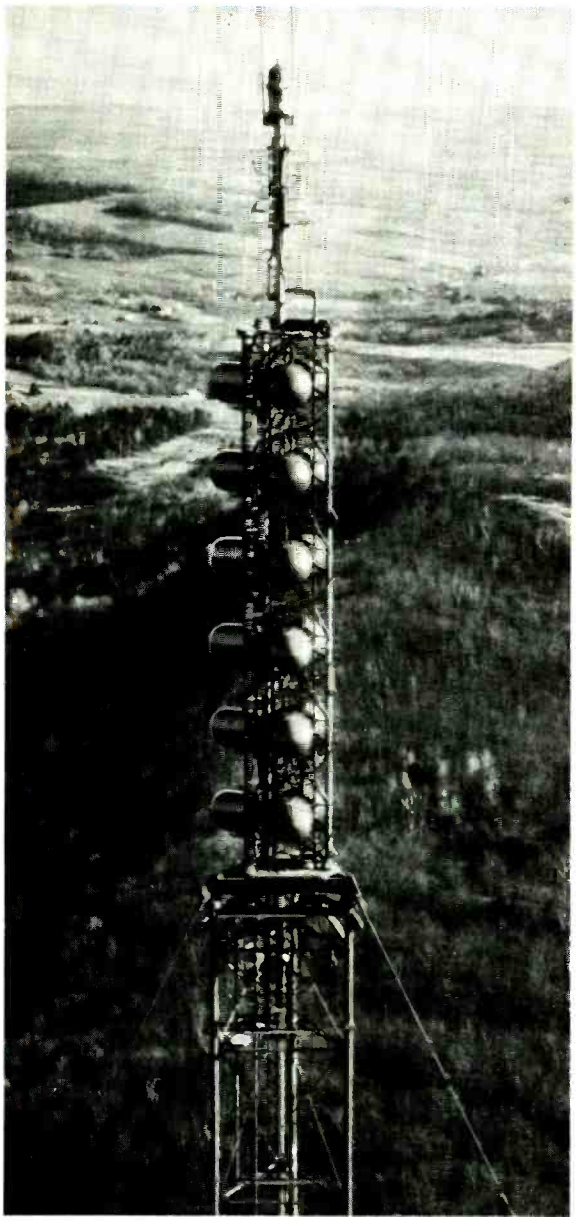


Western hemisphere Domsats

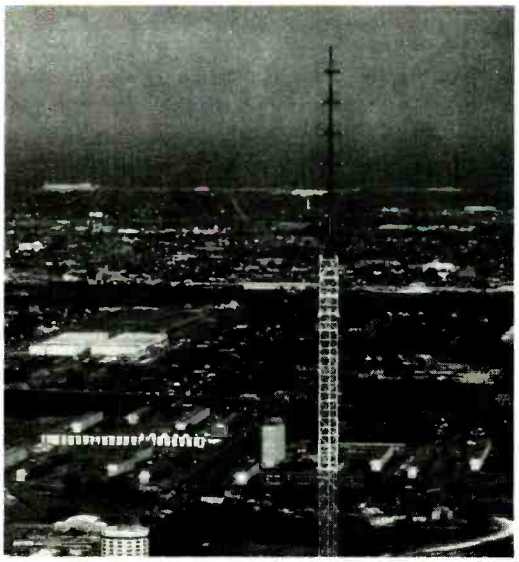


Typical transmitting/receiving earth station equipment layout

Harris' CP* antennas lead the way to vastly improved coverage and signal strength.



WAST-TV, Albany, New York, CBR directional antenna. No tower change required.



WW_-TV, New Orleans, Louisiana, CPV omni-directional antenna. No tower change required.

With the Harris CPV antenna, there's no need to replace your present tower when switching to CP — because it has windloading specifications comparable to Batwing and traveling wave antennas. The Harris CBR (Cavity Backed Radiator) is designed for a wide variety of directional patterns. Both antennas allow multiple stations to operate from the same antenna.

Harris CP antennas deliver excellent circularity, low axial ratio and low VSWR. And each may be tailored to your specific coverage requirements.

Learn more about the Harris CP antennas. Contact Harris Corporation, Broadcast Products Division, P.O. Box 4290, Quincy, Illinois 62301, (217) 222-8200.

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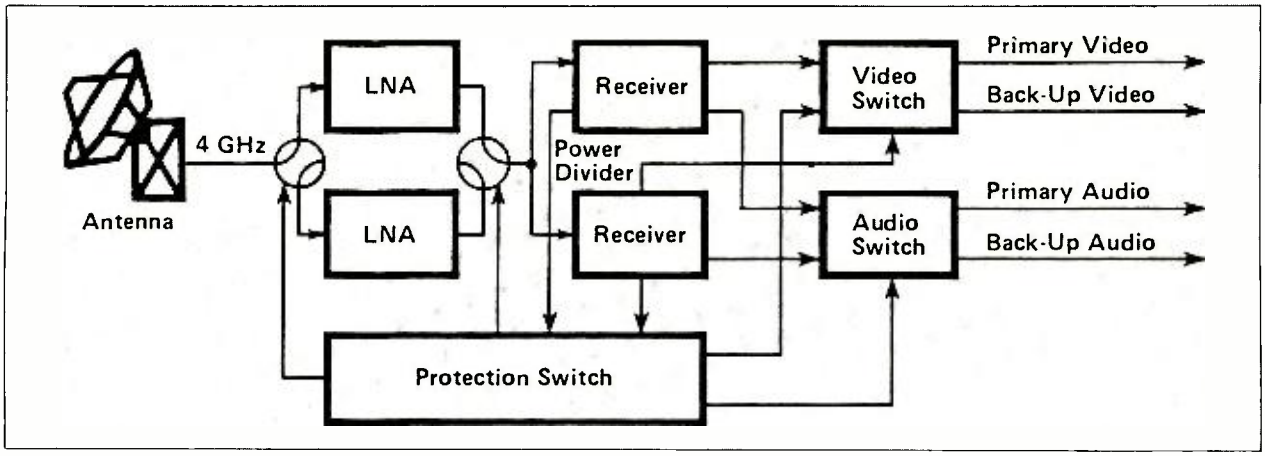
Earth Terminals For Video



Block diagram of redundant receive-only earth station

Wayne Anderson, interviewed by *BM/E*, pointed out that one of his Scientific-Atlanta five-meter antennas is for receipt of the Christian Broadcasting Network programs that are primary material for the station. The other is used for a variety of programs, including many sports pickups, which the station gets often through contracts with the Robert Wold organization. The second antenna gives the programming flexibility the station wants, and clearly this is going to build up in the future: it will make available many kinds of programming. The cost of the second system will be comfortably amortized by the station's investment in programming.

The cost of video earth terminals

The cost of video earth terminals covers a wider range than that of radio earth terminals. With a 4.5 or five-meter antenna, the smallest now in general use, the installation can cost in the $10,000 to $20,000 range.

There are many variables, however, particularly in the cost of preparing the site and building the base for the antenna. A difficult site can easily raise the cost to $30,000 or more. Every broadcaster with earth terminal experience interviewed by *BM/E* emphasized the necessity of doing the base properly in the beginning. Two or three stations are known in the industry to have miscalculated the base construction for one reason or another, requiring very expensive rebuilding after the original was finished. The general rule is, avoid like the plague dependence on soft ground for support. If the ground at the site is soft for any reason, support must be taken down to a firm layer with concrete or steel pillars under the pad.

Watch the add-ons

The rule for any complex system, when counting the cost, is to watch out for add-ons, the extras that are needed for the intended application but are not in the standard price first quoted. Earth terminals certainly come under this rule: earth terminal users interviewed by *BM/E* noted that a careful survey of *all* costs is a necessity.

The attractive economics of satellites

Overall, the cost of getting into satellite program reception is substantially less in most cases than getting similar programs by terrestrial nets. This fact is one of the most powerful forces in the satellite upswing. An instructive example was given by Walter Bundy, chief engineer of WPHL in Philadelphia. This station has been getting many sports programs via satellite for a number of years. Through the Robert Wold organization the WPHL pickup would go from the sports site to the nearest uplink, then from the satellite to an earth terminal in the New York area, then by terrestrial circuits to the station.

WPHL has now completed construction of its own earth terminal, however, and the final terrestrial link is no longer necessary. The management expects the saving in wire costs to pay for the earth terminal in no more than three years. Chief engineer Bundy says cost was not skimped in the installation: there is no way to get a good earth terminal at bargain prices. His own antenna pad needed pillars going down to rock about 27 feet. The antenna has a motorized drive for high-speed repositioning. The Andrew 4.5-meter dish and the electronics were figured for best quality.

This approach to earth terminal design is general among broadcasters who are getting in. Fast drives, very solid bases, and redundant electronics are common. The leverage on overall cost that the terminal brings makes it economically feasible to be generous in the quality of the terminal. Most broadcasters are taking advantage of this equation, responding not only to economics but also to the general push toward top quality in program technology.

An example of risky cost saving for video terminals is the fiberglass antenna. Although very attractive because of low cost and light weight, the plastic antenna carries a large hazard of deformation from heat unevenly distributed over its surface. Since the allowable antenna deformation is measured in thousandths of an inch, metal, with its ability to distribute heat quickly over the surface, comes out much better than the plastic.

Getting a clear site

In the March issue, Dan Yost described the general procedures for frequency coordination ("Satellite Earth Station Site Selection," p. 97). It is widely agreed that getting an interference-free site in a large city is the most troublesome aspect of joining the satellite revolution. There are useful methods to follow on this, and *BM/E* will return to the subject in detail in an upcoming issue. There are a number of firms that specialize in site finding and frequency coordination; hiring a competent firm in this highly specialized technology is an excellent investment for most broadcasters getting into satellites. **BM/E**

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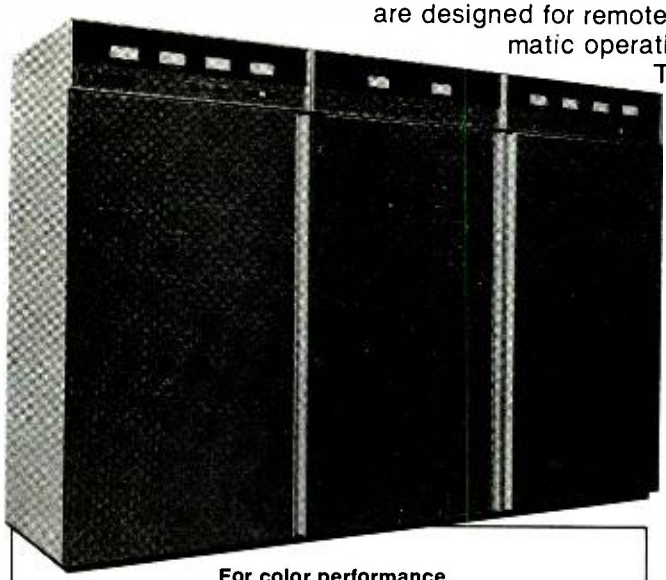

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RESEARCH TECHNIQUES CAN MAKE YOUR NUMBERS BETTER

By Keith Greiner

Because ratings are so little understood, stations may accept them abjectly. Some statistical techniques exist that can turn your standing into an advantage.

WHEN "THE BOOK" COMES OUT, just about every station that didn't finish on top gets the feeling that they are really better than the numbers indicate. In many cases, they're right. In fact, there is information right in the back of "the book" that can help you develop those numbers into exploitable data that can improve your sales efforts. One of the most important skills is the ability to use the most profitable kind of marketing research. This article will show you some of the research techniques that can be used to generate greater sales for your station, even if you are already the station in your market with the greatest billings.

If you are in one of the Arbitron survey areas, there is no doubt that the results of the most recent survey can have a tremendous effect on your billings. If you made the top rating in your audience category — congratulations! But if you didn't get the rating you would really like to have, some creative use of the data can show that you may actually have the top rating in spite of that number they published.

The key to your success lies in the fact that *every* survey relies on a sample of listeners, and never reports the actual listening of the entire population. Because of this, the number reported is only one of many rating figures that might be reported if you were able to duplicate the survey several times. These variations are the result of variations in diary placement, response, editing, data entry, sample weighting, and other processing.

By using some simple statistical probability, you can determine the confidence interval (CI), an estimate of the maximum and minimum values your rating or share could be if the survey were repeated. The most typical confidence interval is at the 95.5 percent level of confidence. This means that if the survey were repeated under identical conditions for 100 separate surveys, you could expect your rating or share to fall within the confidence interval in at least 95 of those surveys.

If you don't have the top rating, you should be able to recover some customers who might be inclined to use a

Keith Greiner has been a researcher with one of the top audience research companies and is currently marketing research director for Iowa's largest savings and loan association.

Table 1: Plus Or Minus Confidence Intervals At The 95.5% Level Of Confidence

P	100%–P	Number of Persons in the Sample or Subsample										
		10	20	30	40	50	60	70	100	200	300	400
1.00%	99.00%	6.29	4.45	3.63	3.15	2.81	2.57	2.38	1.99	1.41	1.15	.99
5.00	95.00	13.04	9.22	7.53	6.52	5.83	5.32	4.93	4.12	2.92	2.38	2.06
10.00	90.00	18.97	13.42	10.95	9.49	8.49	7.75	7.17	6.00	4.25	3.46	3.00
15.00	85.00	22.58	15.97	13.04	11.29	10.10	9.22	8.54	7.14	5.05	4.12	3.57
20.00	80.00	25.30	17.89	14.61	12.65	11.13	10.33	9.57	8.00	5.66	4.62	4.00
25.00	75.00	27.39	19.36	15.81	13.69	12.25	11.18	10.35	8.66	6.12	5.00	4.33
30.00	70.00	28.98	20.49	16.73	14.49	12.96	11.83	10.95	9.17	6.48	5.29	4.58
35.00	65.00	30.17	21.33	17.42	15.08	13.49	12.32	11.40	9.54	6.75	5.51	4.77
40.00	60.00	30.98	21.91	17.89	15.49	13.86	12.65	11.71	9.80	6.93	5.66	4.90
45.00	55.00	31.46	22.25	18.17	15.73	14.07	12.84	11.89	9.95	7.03	5.74	4.97
50.00	50.00	31.62	22.36	18.26	15.81	14.14	12.91	11.95	10.00	7.07	5.78	5.00

Based on the formula $CI = \pm 2\sqrt{\frac{P(1-P)}{n}}$

*Formula from George W. Snedecor and William G. Cochran, *Statistical Methods*, Sixth Edition, Iowa State University Press, 1967, p. 210.

Where: CI is the plus or minus confidence interval in percentage points
P is the percent of respondents giving a specific response
n the number of respondents in the sample or subsample being studied

competitor by graphing your confidence interval alongside theirs. A hypothetical case involving three stations is shown in Figure 1. The reported ratings are six, five, and two for stations A, B, and C respectively.

To the untrained media buyer, the six rating of station A is substantially greater than the four rating of station B. By graphing the confidence interval, however, we see that there is a three percentage point area where, with repeated surveys, the published ratings could show station B with a higher rating than station A.

All you need to do is educate your customer to understand the confidence interval. Be careful if your position is that of station C. Here, there is some overlap between B and C, but station C's confidence interval is right at the location where it becomes significantly lower than station A.

Keep in mind that statistically as the rating or share percentage increases, so does the confidence interval. Likewise, as the sample size of the survey decreases, the confidence interval increases. As a result, the choice of the sample size is extremely important. If your audience is made up of all persons in the survey (as few audiences are), you should use the sample of in-tab diaries shown in the front of the survey report book. (I feel this is more representative than the effective sample base figure.) If, however, your audience is made of a portion of the total people (i.e., persons 35 to 49), add up the percent of total *diaries* in the sample returned by persons in the age group you are most likely to reach. Remember that the smaller the sample, the greater your chance of having a confidence interval that overlaps with someone else's.

For calculating your confidence intervals, use either the formula or nomograph at the back of the ratings report book. For smaller samples, you may also estimate by using Figure 2 and Table 1, which were designed to be used with the other surveys discussed here, but are very applicable to the ratings as well.

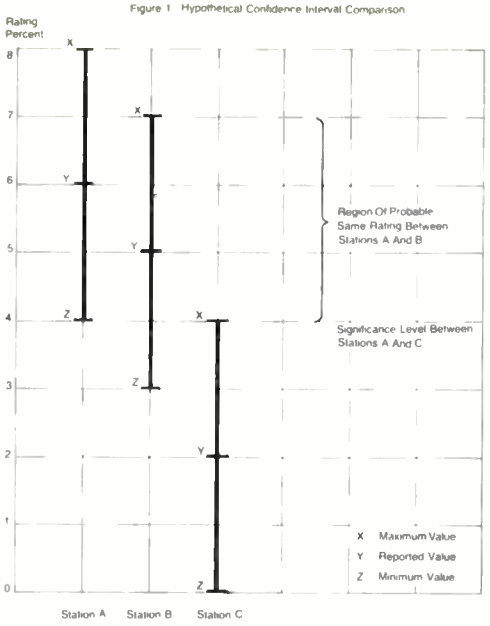
A further, very interesting analysis you can do is to calculate the confidence interval of your station's CPM compared to the others. By using various combinations of demographic categories and media buys, you can come up with some very excellent CPMs.

A second useful sales tool is your own telephone survey of the broadcast audience in your community. Here you can develop some tools the ratings people can't provide in the survey. For example, when you are marketing to financial institutions, you may wish to show how many savers with high incomes listen to your radio station or watch your news. For auto dealers, you can show the percentage of listeners who plan to buy a new car in the next few months. Many surveys of this nature find some surprising results. For example, you may find that your country station has more professional listeners than you expected. That is something you'll want to tell your customers. Again, it is important to note that the survey can have variability that works in your favor. Figure 1 and Table 1 show the variability of responses for various sample sizes and percentages of response.

The listenership measured in one of these surveys is not a rating, but in my experience it often tracks close to a cume share. If the same survey is taken quarterly, you can easily spot areas where your programming and promotion are resulting in better sales opportunities.

When you are designing one of these surveys, be sure to avoid asking leading questions and suggesting your station as an alternative. Don't even mention your station in the introduction. This can be done by having an outside

Figure 1 Hypothetical Confidence Interval Comparison



Extended along the confidence interval, a station coming in second may be, on any one day or at any one time, the number one station

Figure 2 Plus Or Minus Confidence Intervals At The 95.5% Level Of Confidence

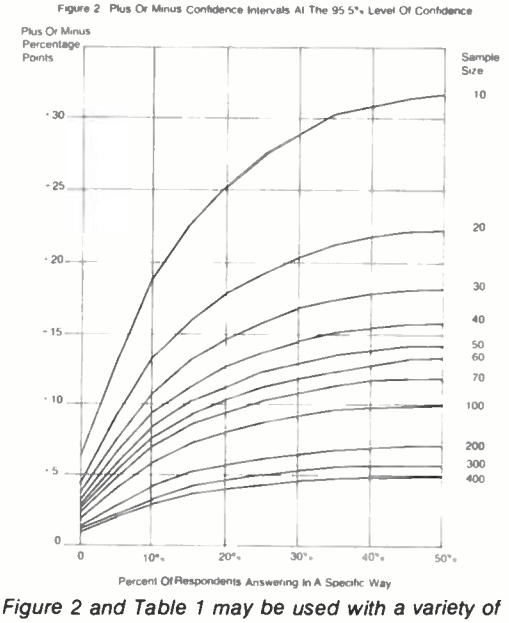


Figure 2 and Table 1 may be used with a variety of surveys as well as with ratings

interviewing service make the calls for you or by having the calls made under the name of a subsidiary. Be sure the sample for the survey is selected at random from the telephone book or another city directory.

Service corporations can also tabulate the survey for you. By first sorting the completed questionnaires in categories you wish to cross-tabulate, you can easily break out tabulations of groups which could help your sales team. Of course, the best tabulation method is by computer, but skillful hand tabulations by a reliable clerk can also be extremely useful.

When you prepare your follow-up survey, be sure to keep the same questions in roughly the same order. That approach will minimize variations due to changes in the survey. **BM/E**

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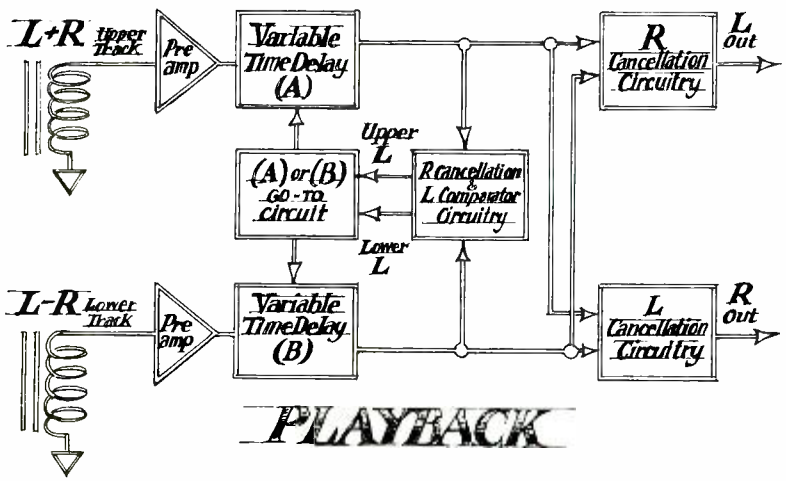

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INTERPRETING THE FCC RULES & REGULATIONS

More Competition For FM Broadcasters

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

NEW RULES JUST PROPOSED by the FCC could result in the entry of hundreds of new FM broadcasters into the industry. Will this mean a healthy increase in competition or a disastrous glut in the FM market? As of January, 1980, a total of 3155 FMs were already on the air, with applications pending for some 200 more. The new docket proceeding[1], announced February 28, 1980, proposes a new classification scheme for FM frequencies, modified mileage separations, and new power and antenna height requirements. This article will briefly discuss these possible changes and their consequences, as well as the background of the proceeding.

Background

The present table of FM assignments dates back to 1963[2]. Currently, the FM broadcast band is divided into 100 channels between 88 and 108 MHz. The Commission has reserved the first 20 of these channels for noncommercial educational stations. These are assigned all over the country and are not a part of the table of allocations.

The 80 commercial channels are divided by geographical region and technical categories. Stations that operate on Class A channels are designed to provide service to smaller communities. They are assigned throughout the country. Twenty channels are presently designated as Class A channels.

The remaining 60 channels are classified as Class B or Class C, depending on their geographical location. The Commission intended Class B stations to serve larger communities in the more densely populated areas of the northeast (Zone I), most of California, Puerto Rico, and the Virgin Islands (Zone I-A). The FCC has limited Class B stations authorized since 1962 to a maximum power of 50 kW.

Class C stations operate in Zone II, which consists of the remainder of the country outside Zones I and I-A. These Class C stations were designed to provide service not only to larger communities but also simultaneously to the more sparsely settled areas of the nation. Class C stations are authorized to operate at power levels up to 100 kW in order to achieve their dual objectives.

In issuing the notice, the Commission acted in response to petitions for rulemaking filed by George Philips of Laurinburg Broadcasting, Serge Bergen, an engineer, and the National Telecommunications and Information Administration of the Department of Commerce.

Bergen had specifically petitioned to allow the use of vacant Class B or C facilities by Class A operators. Bergen noted in his petition that the present system leads to "inefficiencies [that] arise from what may be characterized as geographic 'pockets' which lie too close to existing Class B/C allocations to permit operation of another B/C facility without interference, but far enough away for a full Class A facility to operate without objectionable interference." Bergen "conservatively estimated" that as many as 350 more Class A assignments could result from the rule change.

NTIA proposed far more extensive changes.[3] Included was a proposal for changes in the classification scheme for FMs. NTIA noted that the current allocations and accompanying separations are disincentives to maximum utility. For example, since current minimum mileage separations are based upon maximum power outputs, a Class C station

[1] *Notice of Proposed Rule Making*, BC Docket No. 80-90, Modification of FM Broadcast Station Rules to Increase the Availability of Commercial FM Broadcast Assignments, 45 FR 17602, FCC 80-108.

[2] *Third Report, Memorandum, Opinion and Order*, 40 FCC 747 (1963).

[3] NTIA also proposed changes in the FM rules to allow use of directional antennas and terrain shielding, reduced channel width below 200 kHz, etc. The Commission said it would consider these other matters in a future proceeding.

broadcasting at 25 kW gets the complete protective radius of a 100 kW station, even if the broadcaster in question could not afford to increase power and antenna height and would not serve the additional population. "[T]he minimum spacings are larger than they need be, to where stations do not operate (or, in the case of new assignments, do not propose to operate) with the maximum facilities allowed in their class."

Proposed changes

The Commission has proposed five rule changes:

- To allow stations with Class A facilities to operate on Class B or C channels when a Class A channel is not available;
- To add two new classes of stations — Class B1 (an intermediate class between Classes A and B) with maximum facilities of 20 kW effective radiated power (ERP) and antenna height of 92 meters above average terrain, and Class C1 (an intermediate class between Classes B and C) with maximum facilities of 100 kW ERP and 305 meters antenna height;
- To permit Class B (including B1) facilities in Zone II (the whole country excluding the northeast and most of California);
- To require that all existing Class B and C stations meet certain operating minimums for power and antenna height or be subject to reclassification to a lower class of channel. A similar requirement is also proposed for new Class C authorizations that would allow a new Class C assignment to start initially with Class C1 facilities; and
- To adopt a new separation table to reflect the updated propagation curves.

Under the Commission's plan, all stations that do not conform to the new specifications would be reclassified. Existing Class B and Class C stations now operating substantially below maximum facilities would have up to three years to meet new minimum power and antenna height requirements. At the end of that three-year period, all the existing stations would be classified B1, B, C1, or C, according to their operating facilities. However, newly granted Class C stations would have a grace period of six years to complete their changes. This exemption would be granted because of the greater costs involved in building the towers and installing equipment to operate at 100 kW. Only Class C stations would receive the six-year exemption.

Changes in mileage separations that accompany such proposals would involve only Class B stations. Under the present separations requirements, co-channel B stations may be no closer than 150 miles. The Commission noted that failure to change separation afforded Class B stations would obviate the reasons to create Class C1. So the Commission proposed a new separation that would decrease Class B protection from interference by approximately seven miles.

It should be noted that the FCC proposal would *not* eliminate the current zone divisions. However, although Class B stations could be assigned in Zone II, no Class C stations would be assigned to Zones I and I-A.

Discussion

The Commission reasoned from its own computer studies and research that these policy changes would bring FM service to parts of the country that otherwise would be excluded by the present rules, increase service to those areas presently underrepresented, and make broadcasters derive the maximum utility from their frequencies. It conducted computer studies to examine the Laurinburg and Bergen Class A proposals. The studies confirmed that FM assignments have become scarce in many areas. They also showed that the problem could be alleviated by allowing Class A stations to operate on Class B and C channels. Moreover, in the course of other studies, the Commission had found that certain areas of the country were entirely shut off from obtaining additional FM assignments. For example, although only five percent of the land area of Ohio and Illinois was eligible for new FM assignments under the existing system, that percentage would increase to 81 percent if the Class A proposal were granted.[4]

The question of more classes of stations was approached from the premise that a disproportionately large number of existing stations currently operate with less than maximum facilities, and therefore operate with protection in excess of that originally intended.

> "It was the intention of the creators of the Table [of assignments] to provide stations with adequate protection until their financial viability permitted expansion to maximum or near maximum [power]. Although FM broadcasting has developed to become a competitive and, in some cases, dominant force in today's marketplace, many FM stations continue to operate with less than desired facilities . . . [O]nly 20 percent of the stations occupying Class C assignments operate with facilities that warrant a Class C classification."[5]

Thus, the Commission proposed the two new FM designations, Class B1 and Class C1.

Both Chairman Ferris and Commissioner Brown, in separate statements, indicated these new proposals tied in with the structural approach the Commission would like to take to future regulation of broadcasting. By increasing competition and the number of broadcast outlets for otherwise underrepresented minorities of all kinds, the Commission could insure maximum service of the public interest on the one hand and reduced government interference to achieve that goal on the other.

In particular, this proposal might serve as a means of increasing minority ownership of broadcast facilities without many of the structural impediments to be found in other alternatives.[6] The changes in FM allocations discussed above would probably be preferable, for example, to an expanded AM band to prospective minority broadcasters. In contrast to the AM expansion, no major changes in radio receivers would be required to make the additional FM stations financially viable.

Conclusion

FM broadcasters should take special note of this rulemaking involving changes in the structure of FM assignments. Adoption of the FCC's proposal could mean major changes in the industry. Comments are due on June 13, 1980, and replies on August 18, 1980. Broadcasters should review the notice carefully, as well as relevant parts of the FM radio rules[7], to determine how this might affect their own operations. **BM/E**

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[4] *Notice*, 45 FR at 17604.

[5] *Ibid.* at 17605.

[6] See this column in the December, 1979 issue, "Minority Ownership and the FCC: Are the Changing Rules Meeting Real Needs?"

[7] §73.201-214.

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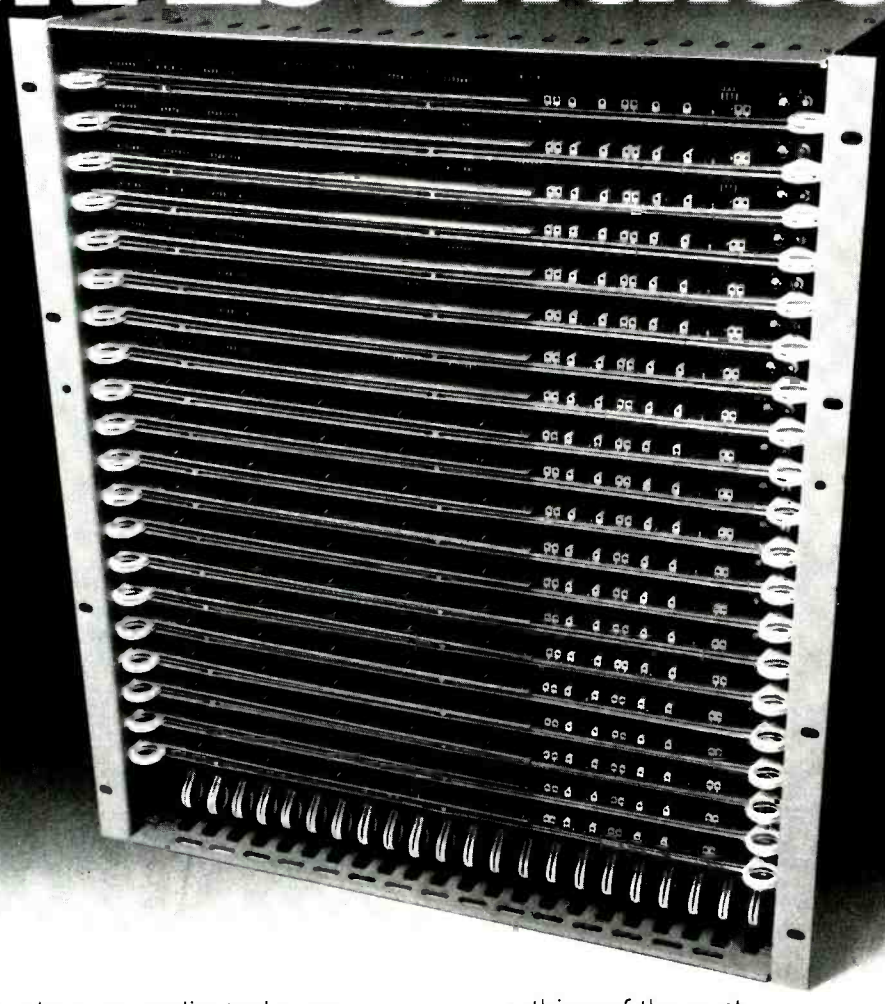

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Myles Marks, Engineer,
WIIC, Pittsburgh, Penn.

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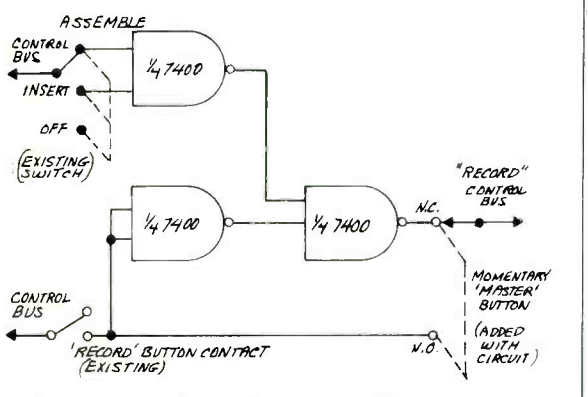

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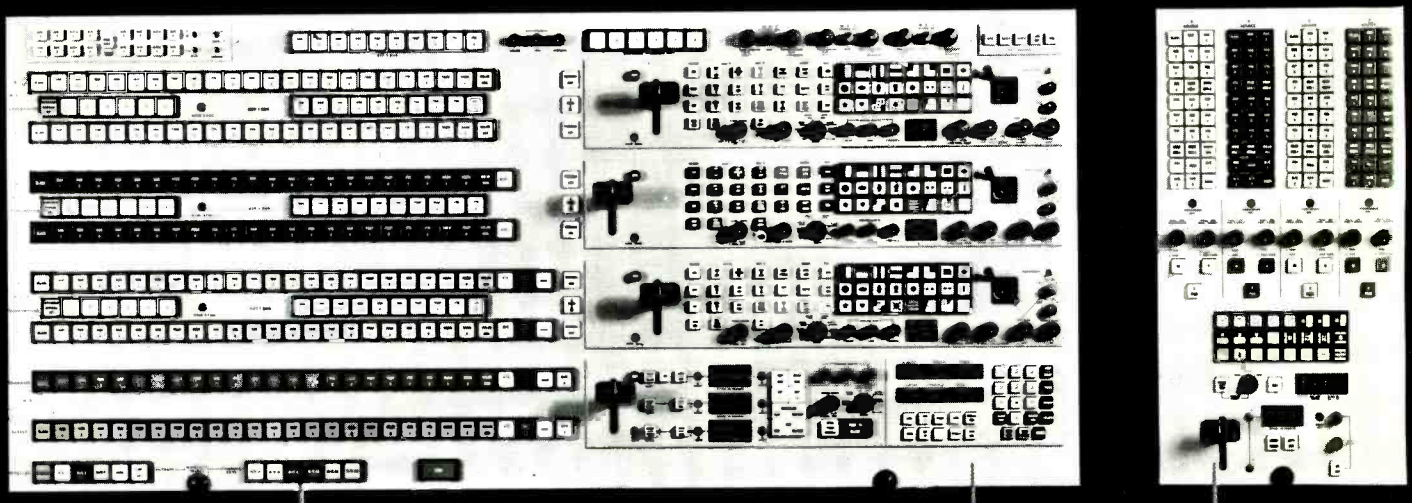

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Phone 904/378-1581 . TWX 810-825-2370 . TLX 80-8572-Vital-A-Gain

1980-the year Vital doubled its sales-personnel-plant facilities.

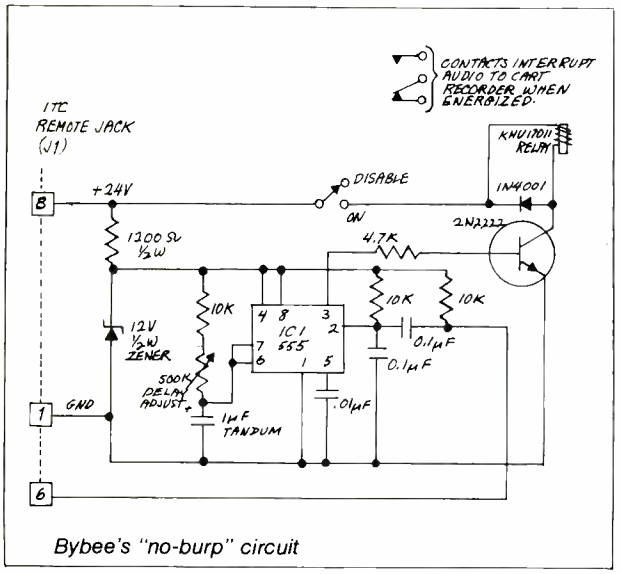
The accompanying circuit shows a simple method of inhibiting the record mode of the VPR-2 unless the machine is in either insert or assemble mode. If the machine is not in either of these modes, the only way it can enter record is for the operator to simultaneously press the RECORD button and the MASTER button that is installed with this circuit.

The circuit can be constructed with only one integrated circuit chip (7400 quad NAND) and one SPDT momentary pushbutton switch. The only modification to the machine is separating the record control bus from the record pushbutton after the bus leaves the pushbutton. All other connections are bridged across the existing contacts where shown.

12. "De-Burp" For Cart Machines

Robert Bybee, Chief Engineer, WLTA-FM, Atlanta, Ga.

Problem: Carts recorded on ITC machines may "burp" when they re-cue unless operators take great care not to record the material too "tight."



Bybee's "no-burp" circuit

Solution: This circuit mutes the audio when the recorder is started, allowing the tape to come up to speed before audio is recorded. The audio is then reconnected after a delay (adjustable). It is now absolutely impossible to record a cart that "burps," no matter how tight the cart was recorded. I prefer this method to the method used by BE cart recorders, which "fade on" the audio after the cart is started.

13. Auto Phone Feeder For Program Audio

Ken Anderson, Chief Engineer, KARR/KOPR, Great Falls, Mont.

Problem: To design a circuit for automatic feeding of program material to other stations, or for receiving program material from remotes.

Solution: An automatic feed device for remote lines has been needed in the broadcast industry for some time.

The 110B on-air mixer gives you up to 18-inputs in either stereo or mono with these standard features • Control room monitor • Headphone control • Seven mono line output amps • Three stereo bridging line amps • Five VU meters • Stereo program and audition output channels with meters • Mono output with meter • Cue on all mic and line inputs.

Auditronics modular design lets you start now with a basic main-frame and add modules for greater operational flexibility later when you need them. And, all Auditronics input modules and faders are interchangeable and obsolescence-proof. If you'd like to air a signal that is truly state-of-the-art, the place to start is with an Auditronics 110B console. For complete information and the name of your nearest dealer, circle reader service number or call us.

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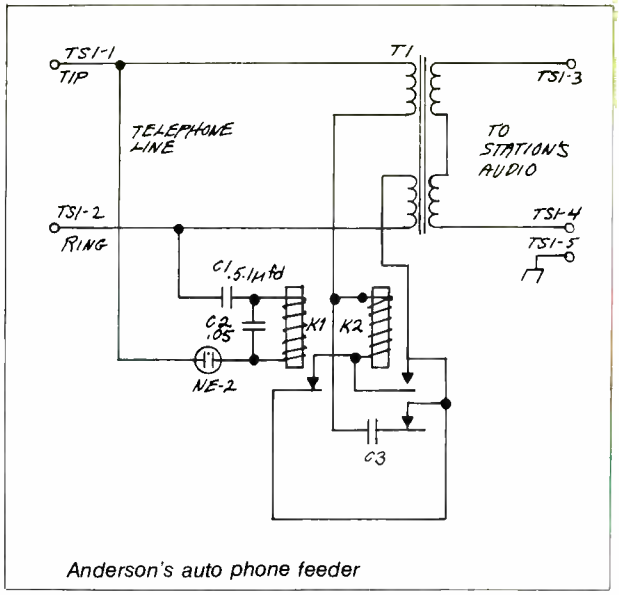
Great Ideas

The best thing about this unit is that it needs no assistance from any station personnel and is automatically restored to normal following termination of the telephone call.

The telephone feeder is basically a ringdown relay and dc coupling from the telephone company to the station's equipment and audio coupling from telco to the station. When the telephone number connected to the feeder is called, a ringing voltage of 90 V is received at the station. The ringdown relay, consisting of C1, C2, NE2, and K1, causes the normally open set of contacts on K1 to close during the ringing cycle. The telephone line is also connected to the primary of T1, a repeat coil. The center tap of the primary is connected in series with the normally open set of contacts on both K1 and K2. If a ring is present, K1's normally open set of contacts closes a dc path for the coil of K2 across the telephone line. When this happens, K2 operates via the dc potential on the telephone line, causing the ring to cease and connecting the coupler to the telephone line. The other set of normally open contacts on K2 are connected in series with a 2 ufd nonpolarized capacitor. This capacitor provides the audio path in the primary of T1. The secondary of T1 is either connected to a program output or program input, depending on the desired use of the telephone feeder.

Upon completion of the feed, the calling party hangs up. This provides the feeder with either an immediate dc break or a dc break in 20 seconds, depending on the telephone system. When this dc break is received, K2 will drop out and the telephone feeder will be restored to normal without operator assistance.



Anderson's auto phone feeder

Parts for the circuit are as follows: a repeat coil (111-C, 93-F, etc.); C1, 0.5 – 1.0 ufd nonpolarized 200 V; C2, 0.05 200 V; C3, 2 ufd 200 V nonpolarized; NE2, neon bulb; K1, 2500 – 5000 ohm plate relay SPST; K2, dc relay 400 – 500 ohm DPST; terminal strip, five-lug. **BM/E**

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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.

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

1980 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* _____

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 and 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, 1981, and announced in the March, 1981, issue of *BM/E*.

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, on 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).

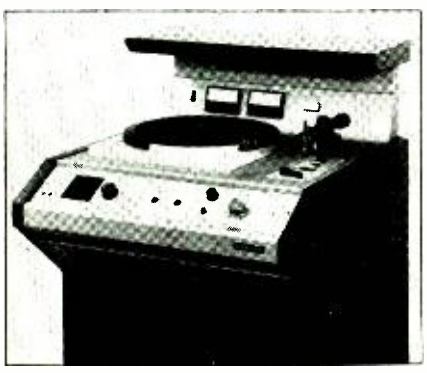
BROADCAST EQUIPMENT

Pressure Zone Microphone 250

PZM™ microphones are designed with a pressure-calibrated electret capsule facing a rigid boundary at a distance of a few millimeters, causing incoming sound to be received indirectly as no signal can arrive on-axis. Sound can only enter at the sides of the opening between the diaphragm and the metal plate. Operation is based on the principle that within a few mm of a rigid surface, incident and reflected sound waves from a pair of equal level signals add coherently. The plate creates a "pressure zone" where instantaneous pressure is uniform throughout and response is not a function of the angle of incidence. Thus, the mic maintains a flat response for all angles of incidence in the surrounding hemisphere. According to the manufacturer, the system offers several advantages: superior performance, elimination of directional discrimination characteristics, reduced microphonics, simplified miking techniques, and increased subject visibility. Because the mics can handle sound levels up to 150 dB they can be placed inside a drum or directly in front of an amplifier. Available in four models, including general purpose, low profile, flush mount, and lavaliere. Under $350. CROWN INTERNATIONAL, INC.

Turntable Console 251

The SL-9560 professional turntable console features a quartz-phase-locked direct-drive motor with claimed high rotational precision and torque, an advanced tonearm with dynamic damping and anti-skating, and control facilities for reliability and flexibility. Also included are PLAY and STOP pushbuttons, a LINE OUT switch, output level adjustment, a monitor button, volume control, and remote control for remote PLAY and STOP. The console is divided into two sections: the turntable and tonearm/cartridge "deck" section and the control and illumination "main" section. Four insulators between the main section and the floor attenuate external vibrations; another insulator is located between the main section and the deck. For additional protection against low frequency vibrations, the reproducer amp also employs a high-pass filter. TECHNICS BY PANASONIC.



Underwater Camera System 252

The OR/50 environmental system is an underwater single-camera system based on the Sony BVP-300 camera with an aluminum housing. The Fujinon f/1.4 wide angle lens provides a depth of field from lens contact to infinity. A quick-release feature on the housing allows underwater or topside conversions within minutes. The system maintains warm color tones underwater with available light, according to the maker, giving true reds at 80 feet. The complete package consists of the camera, lens, housing, 300 feet of cable, a Sony PVM-8000 color monitor, Sony CCU-300 control pack, a ¾- or one-inch Sony VTR, and shock/water-resistant Thermodyne plastic cases. OCEAN REALM SYSTEMS.

Solid State FM Transmitter 253

This all-solid state 3 kW FM transmitter is constructed from modules connected

in parallel for complete redundancy, with each stage containing four amplifier modules. If one module fails, the transmitter continues to operate with reduced power but unchanged quality. A second drive unit acts as a passive reserve. The solid state construction makes the unit suitable for unmanned operation. Tuning of the amplifier stages is not necessary when the frequency is changed. AEG-TELEFUNKEN.

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

Business Automation 254

The NIDUS System of business automation for small- to medium-sized radio and TV stations handles detailed spot and program orders, rotation schedules, sales analyses, billing, and

reports on accounts payable and receivable. It is flexible enough to allow the operator to change schedules instantaneously and prints an updated log after each change. After spots are aired, discrepancies are listed on the printout for billing purposes. Available in two versions: the NIDUS 100, incorporating a minicomputer with keyboard and display terminal for data entry, a printer, and four floppy diskette drives; and the NIDUS 130, with 32 million bytes of high-speed disc storage and a 300-line-per-minute printer. NIDUS BROADCAST SYSTEMS.

Auto Focus Device 255

Model 25 Sportsfocuser is designed to automatically focus tops-down stadium cameras during sports events. It is

compatible with Canon one- and 1¼-inch format lenses. The focuser mounts as two parts: a controller rides on the camera's handle and a servo module

slides in under the lens in place of the normal angle-drive focusing module. Before use the system is calibrated by using the left knob to focus on one person down on the playing field; after that, all focusing is automatic. Manual override is possible during use if desired. The system operates under any lighting conditions, according to the maker. E.N.G. PRODUCTIONS, INC.

Wheeled VTR Console 256

Model 3100 is a compact roll-around console for one-inch VTRs that occupies a minimum of floor space and offers complete machine access. The VTR turntable rotates 360 degrees for

servicing and flexible operation. Base cabinet has 19¼ inches of rack height for a TBC or other controls plus a pull-out shelf for equipment or tapes. The extended monitor shelf adjusts up or down in one-inch increments. Additional rack space or separate side control console may be added. WINSTED CORP.

Audio Mixer 257

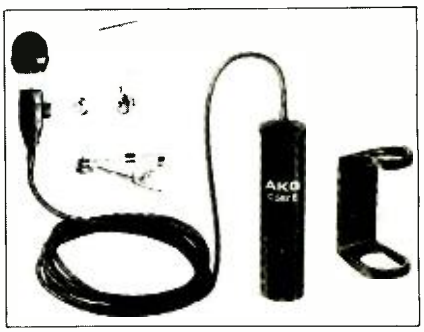
The Studer 169 audio mixer features completely modular construction with a wide variety of available configurations from 11 in/one out to eight in/four out. Appropriate pan pots for each output setup are included, as are metered, variable recovery-rate limiters, switchable cue tones, and muting, solo, and prefader monitoring facilities. Each input unit contains ±16 dB bass and treble equalizers plus a midrange equalizer (±11 dB) with a center frequency continuously tunable from 150 Hz to 7

Broadcast Equipment

kHz. Also featured are full reverb send and foldback controls and toggle-selected low end and/or external filters. Either PPM or standard ASA VU meters may be selected. Input sensitivity is adjustable at each input from −61 to +4 dBu; maximum output level is +23 dBu. $9210 to $10,988. STUDER REVOX AMERICA, INC.

Lavaliere Mic 258

The C-567 is the smallest available lavaliere of its quality and durability, according to the manufacturer, and features a field-replaceable transducer system. The mic head and output module feature all-metal zinc construction, chrome-black plated for a non-reflective appearance. The unit has no battery compartment. It may be phantom powered from a mixer or recorder, or by external ac or battery-operated phantom power supplies. Accessories include tie bars for one or two mics, a single-mic tie tac, belt clip, and wire-mesh windscreen. The mic is omnidirectional with a frequency range of 20 to 20,000 Hz. $195. AKG ACOUSTICS.



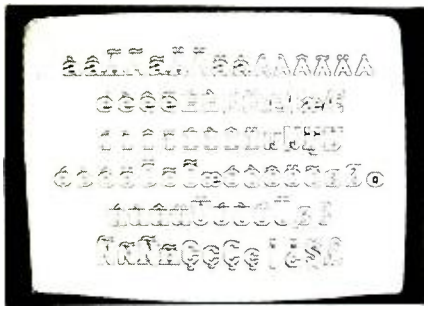
Audio Gain Rider 259

Model TGR-340 audio gain rider is designed to automatically ride gain on a program line, providing maximum modulation on a long-term basis with a minimum of audible or measurable by-products. The unit has a switch-defeatable multi-stage allpass network to increase signal symmetry and a recovery-enabling gate that freezes the gain-riding activity during program pauses to prevent background noise from being pumped up or fading down. Time delay can be added to the AGC recovery via a continuously variable

front-panel control for maintenance of short-term dynamic range. Switchable low-distortion treble AGC prevents overdrive in satellite, STL, tape, or other systems using treble preemphasis. Multi-channel operation is accommodated with single line strapping between units. The unit accommodates line voltages of 120 and 240 V ac at 50 or 60 Hz and occupies one rack unit (4.5 cm). MOSELEY ASSOCIATES, INC.

Titler Language Software 260

A new optional single-PROM set supplies language accents for 11 international tongues for the Q-VII teleproduction graphic titler. The set calls up 79 characters and provides true lower case accents, accents for reduced-size upper case, and the few required upper case accents to support



Dutch, Danish, English, Finnish, French, German, Italian, Norwegian, Portuguese, Spanish, and Swedish. All characters are called from keyboard and aided by a special keyboard key set. They have the same 20-character size selection by row and integrate with all standard display features of the Q-VII. SYSTEM CONCEPTS, INC.

Framestore Synchronizer 261

The DFS 1750 is a full framestore unit including heterodyne TBC and freeze in a rack-mount package only 1.75 inches high. The synchronizer has full remote control, automatic phased/non-phased switching, built-in test equipment and reference signals, and a digital I/O interface conforming to SMPTE recommendations on sampling. It accepts any NTSC signal and provides an output locked to station color black under all input circumstances. The non-phased facility allows it to operate with heavily degraded signals, including non-time base corrected heterodyne signals. The unit incorporates a framestore comprising two full fields, giving about 3.2 Mbits of storage. Fast hot cut operation is provided by special circuitry in the framestore. Other features include low packing density, low power consumption, and quiet operation. All components are front-accessible. MCI/QUANTEL.

Microphone Mixer 262

Model 7510 automatic microphone mixer, designed for broadcast and other applications, combines digital and analog circuitry and features automatic mic ON/OFF and output level correction for considerable gain without feedback, according to the manufacturer. Advanced level sensing provides fast attack of 10 ms to 10 μs. Each individual four-input (expandable to 24) module is equipped with front-panel controls for level, threshold, and release time settings. An additional switch allows each channel to be set for manual, automatic, or priority modes. A digital attenuator reduces output gain by 3 dB for each doubling of activated mics in all three modes. The unit has a built-in 40 V phantom power supply and direct outputs for each input channel. Overall system frequency response is 20 Hz to 20 kHz, ±3 dB. JBL.

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

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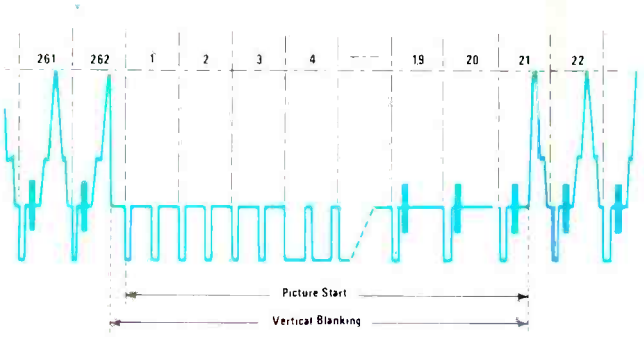
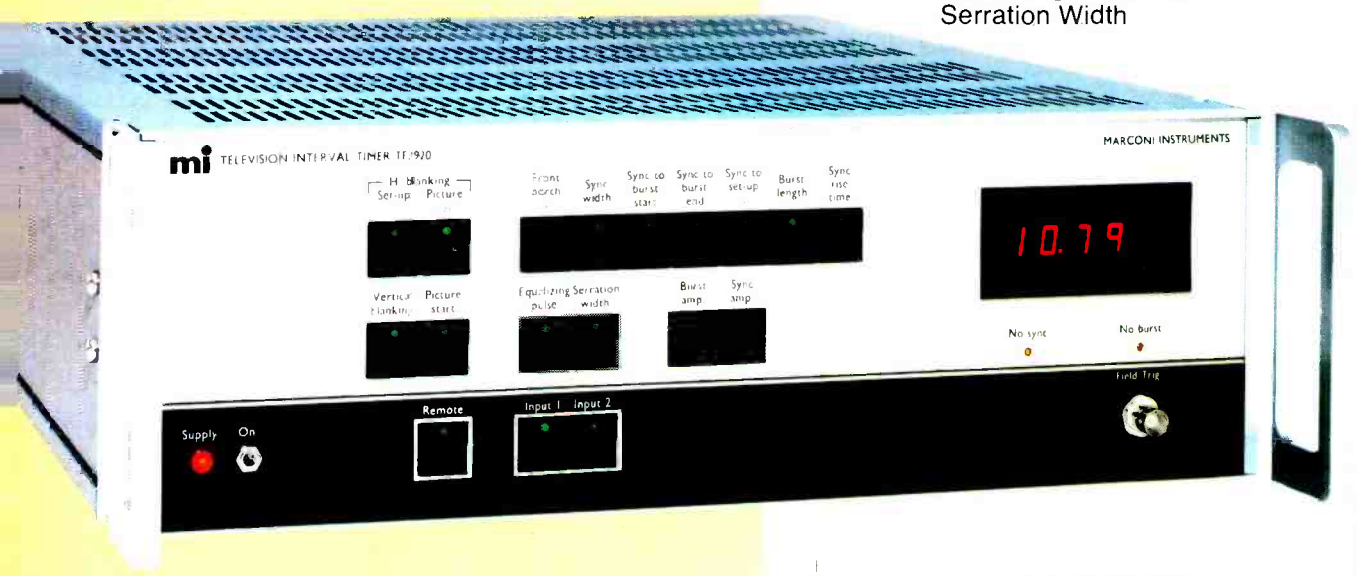


VERTICAL BLANKING MEASUREMENTS

Total Vertical Blanking Interval
Picture Start
Equalizing Pulse Width
Serration Width



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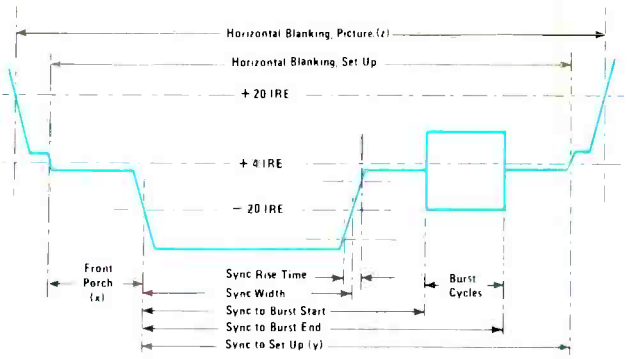

HORIZONTAL BLANKING MEASUREMENTS

Set Up Blanking (+4 IRE)
Picture Blanking (+20 IRE), (z)
Front Porch, (x)
Sync Width
Sync to Burst Start
Sync to Burst End
Sync to Set-Up, (y)
Burst Length in cycles
Sync Rise Time

REFERENCE MEASUREMENTS

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Sync Amplitude in IRE

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