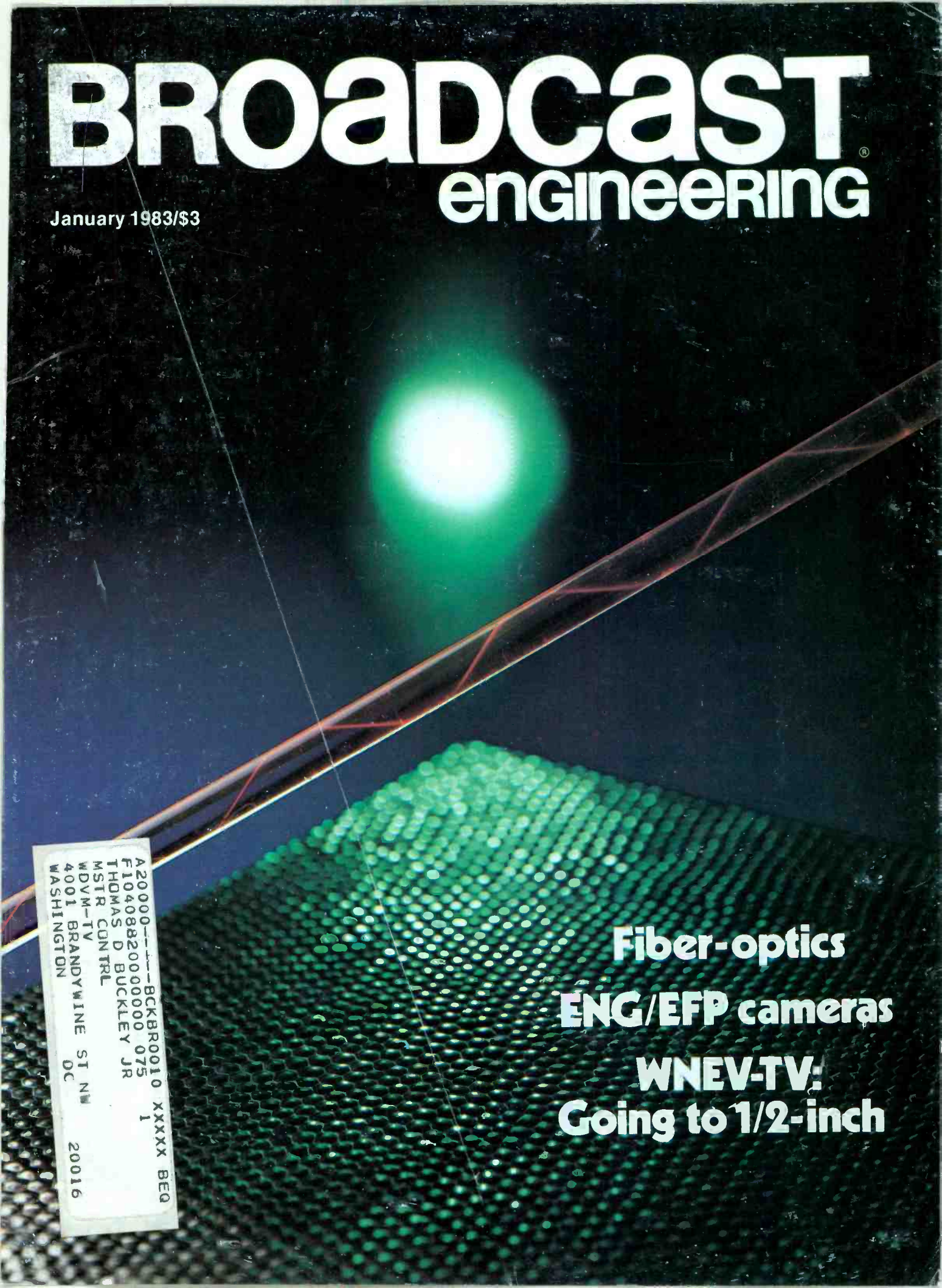
BROADCAST® engineering

January 1983/$3



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BROADCAST engineering

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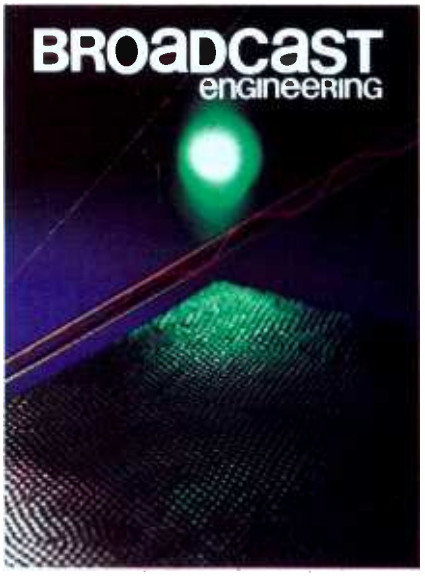

THE COVER is a general, photographic interpretation of an optical fiber. It was provided courtesy of Standard Telephon und Radio AG, Zurich, Switzerland. This company has developed an optical TV transmission system called OVID. A brochure on the system is available by circling (365) on our Reply Card.

Coming events

Jan. 21-24
COMMTEX '83, New Orleans, LA

Jan. 24-26
LPTV West, Disneyland Hotel, Anaheim, CA

Feb. 4-5
SMPTE 17th Winter TV Conference, St. Francis Hotel, San Francisco, CA

Feb. 6-9
Association of Independent Television Stations (INTV) 10th Annual Convention, Galleria Plaza Hotel, Houston, TX

March 17-22
National Association of Television Programming Executives (NATPE) 20th Annual Conference, Las Vegas Hilton, Las Vegas, NV

April 10-13
NAB 61st Annual Convention, Las Vegas Convention Center, Las Vegas, NV

April 17-21
NPR Annual Conference, Hyatt Regency, Minneapolis, MN

May 28-June 2
13th Int'l TV Symposium and Technical Exposition, Montreux, Switzerland

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BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other station management personnel at commercial and educational radio and TV stations, teleproduction studios, recording studios, CATV and CCTV facilities and government agencies. Qualified persons also include consulting engineers and dealer/distributors of broadcast equipment.

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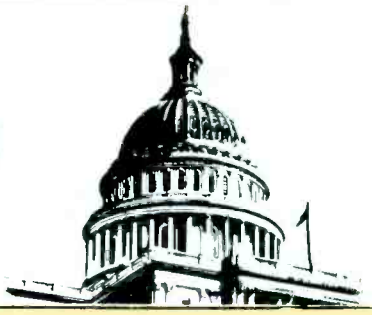
FCC update

January 1983



By Harry C. Martin, partner
Reddy, Begley & Martin
Washington, DC

3-year rule repealed

In another major deregulatory move, the commission has repealed its 3-year rule, which restricted the transfer of broadcast stations owned less than three years. The effect of the rule has been to prevent the sale of controlling interests in radio and TV stations during the three years after their acquisition except in circumstances in which the seller demonstrates that he is making no profit from the transfer, that the sale is necessary and that it would otherwise serve the public interest.

At the same time, the commission eliminated its *anti-trafficking* policy under which it would not permit the sale of a broadcast property in circumstances indicating that the owner had been holding the license for resale rather than serving the public interest.

The commission said it was eliminating these restrictions because changes in the broadcast industry have ended the need for them. During the 20 years since the 3-year rule and anti-trafficking policy were adopted, the number of radio stations has increased from 3712 to 9125 and the number of TV stations from 603 to 1059. At the present time, the commission said, 65% of all TV households receive seven or more TV signals and 87% receive four or more. Based on the competitive environment that has developed from this increase and from the advent of newer video technologies, the commission said that the public interest would best be served by allowing station sales to be regulated by marketplace forces rather than FCC rules. Elimination of these sale restrictions will allow stations to go to their *highest valued use* and will thereby facilitate the provision of the most desired services, the commission said.

Some restrictions on the sale of broadcast interests will remain, however. In cases in which a permit has been granted as the result of a comparative hearing, the initial permittee will have to operate the facility for at least one year. Also, the commission will retain restrictions that prohibit a permittee from obtaining a profit on the transfer or assignment of a construction permit for an unbuilt station and that require a seller who retains an equity interest in such a permit to provide his proportionate share of the capital or guarantees necessary for financing station construction.

Section 307(b) deliberations

Section 307(b) of the Communications Act requires "a fair, efficient and equitable distribution of radio service." Over the years, commission interpretation of this provision has resulted in decisions preferring applicants in comparative broadcast proceedings who propose to operate from communities without other outlets—even where competitors specifying a different community would serve substantially the same area and population.

In a recent decision by the FCC's Review Board, the preference gained in this fashion has been eliminated in TV proceedings. The case involved competing applications for a channel assigned to Cleveland. One applicant specified Cleveland and the other Shaker Heights, a community with no broadcast outlets of its own. The Review Board ruled that both applicants were seeking authority to serve the same large *community*, namely metropolitan Cleveland. Because TV stations typically serve much larger areas than radio stations, the board said that no 307(b) preference should be awarded.

There is a good chance that the policy considerations underlying the Cleveland decision will be applied to AM and FM within the near future. The commission proposed new rules in June that would eliminate its Suburban Community, Berwick and De Facto Reallocation policies. These policies have required hearings in situations in which, due to proposed station location and power, a question is raised as to whether a party intends to serve the smaller community specified in its application or some larger nearby community. In reexamining these policies, the commission is considering the same redefinition of *community* under Section 307(b) of the Communications Act as was used in the Cleveland case. If the new standards are adopted, an applicant proposing technical coverage of an entire metropolitan area would receive no credit for serving any particular municipality within it. This will not only eliminate the 307(b) advantage enjoyed by applicants for smaller, unserved communities, it also will obviate the need for special hearing issues to determine the true intentions of such applicants. At press time, the commission's staff expected that action on these policy changes would be taken during December 1982 or sometime this month.

Relaxation of restrictions on AM broadcast operations

Last summer the FCC instituted a rulemaking proceeding looking toward significant relaxation of restrictions on daytime AM stations. (See **BE** October 1982, page 6.) At the request of the Clear Channel Broadcasting Service (CCBS), the FCC has extended the time for filing comments in that proceeding to Jan. 14, 1983. The extension was needed to allow CCBS to complete an engineering study to determine the service gains and losses that would result from extending daytimers' hours of operation.

The FCC said that it is highly unlikely that the proceeding will be concluded before the summer of 1983.

In a related development, dialogue continues between Canadian and US officials looking toward a new AM allocations agreement. At a meeting in late October, items afforded top priority were efforts to resolve clear channel assignments, the extension of operating hours of daytime-only stations (pre-sunrise and post-sunset) and increased nighttime power to 1kW for Class IV stations.

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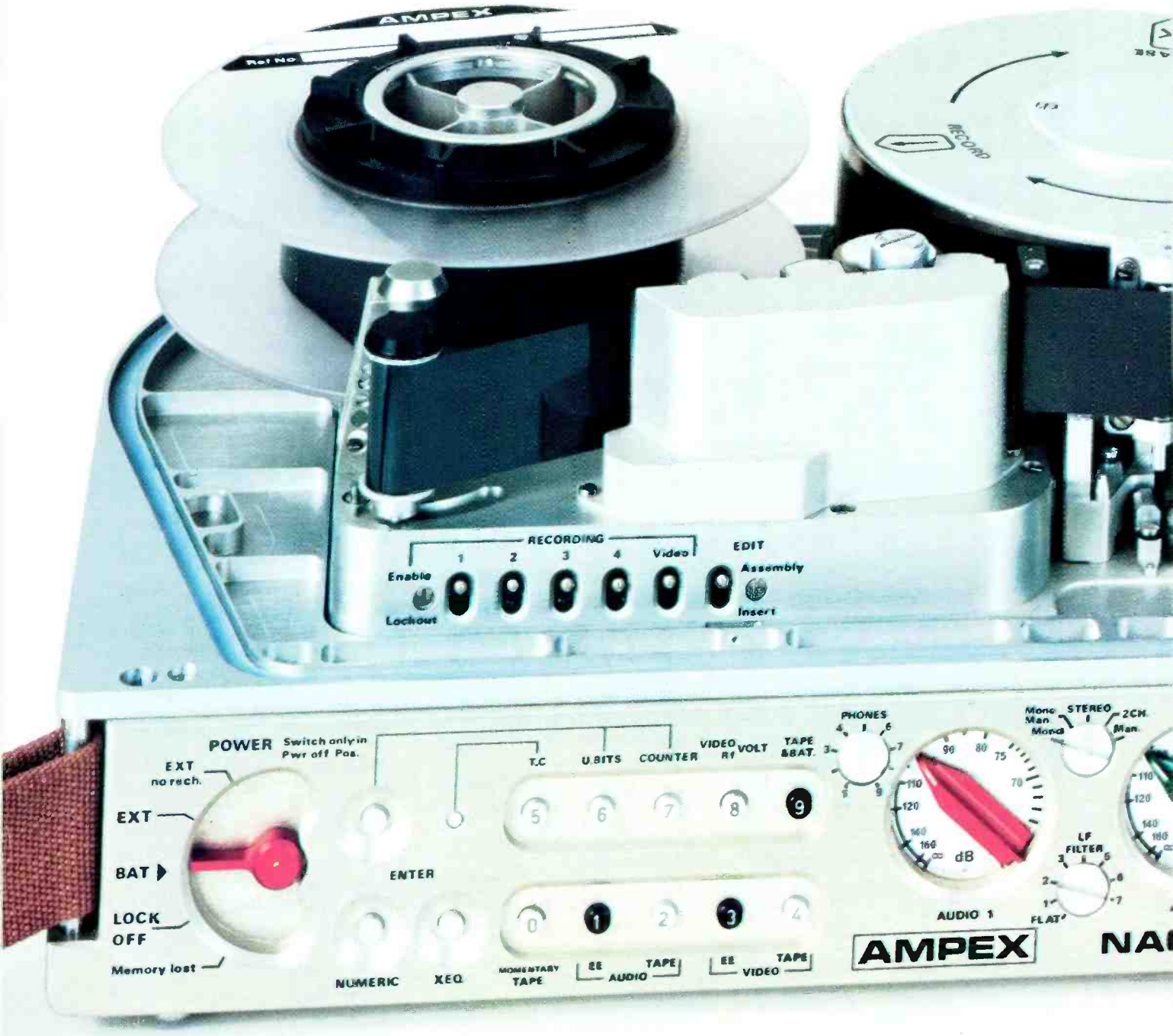

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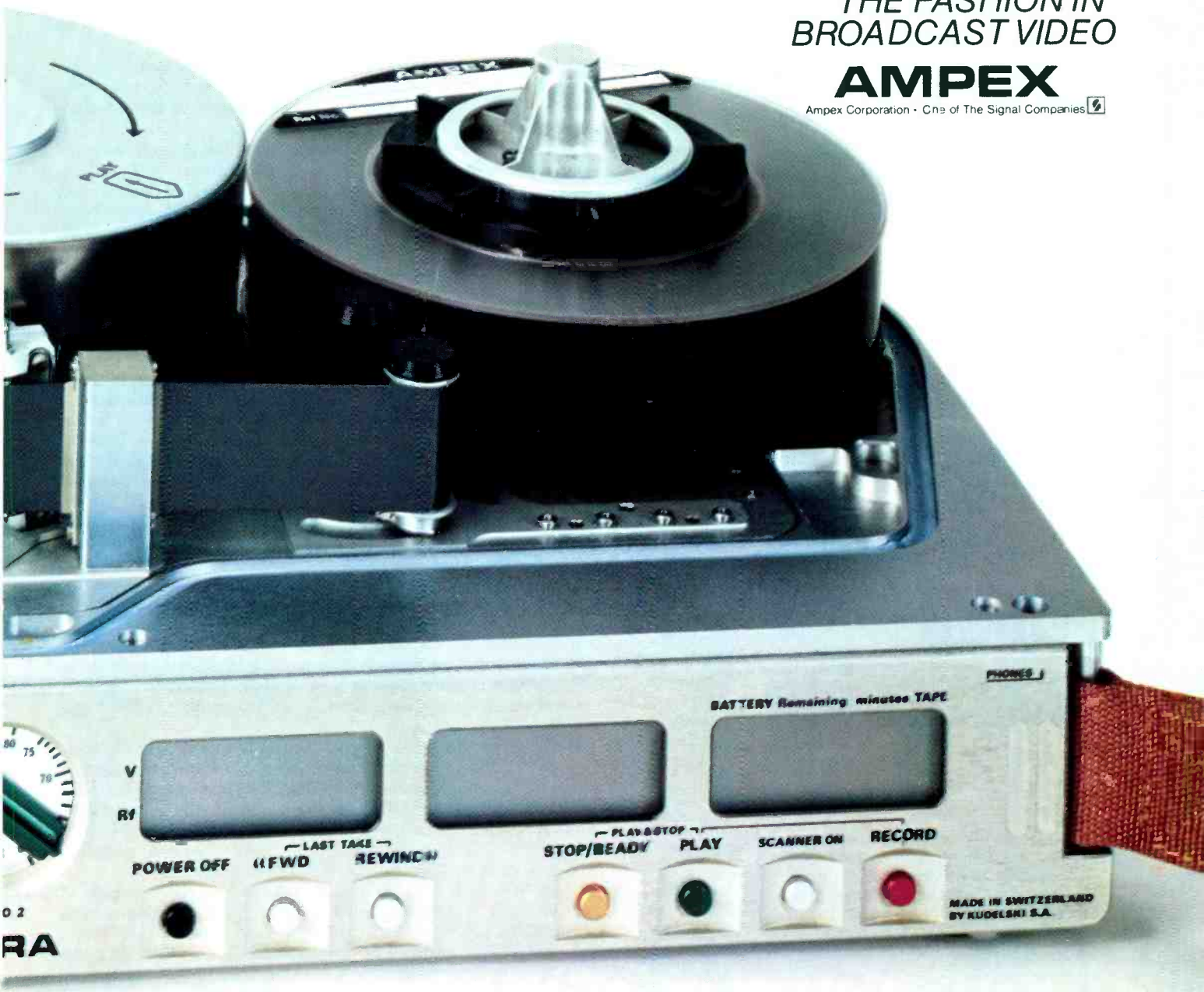

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ENG landmarks

The year 1982 may well stand out as a landmark period for ENG coverage. The reason is not because broadcasters are waving their flags or patting themselves on the back, but rather that 1982 closed with some of the most remarkable achievements in man's history, and the tools of ENG were there to provide the most outstanding reporting ever witnessed. Let us take a quick look at a few of these events.

•On Dec. 2, 1982, Dr. Barney B. Clark, a 61-year-old retired dentist, became the first human recipient of a mechanical heart, the Jarvik-7 device developed by Dr. Robert Jarvik of the University of Utah's Artificial Organs Division. In the medical science field, this event ranks as a "giant step for mankind." Because of its medical significance, all the radio and TV networks devoted extensive coverage to the transplant. Hourly updates on the patient's progress were commonplace. But the top credit goes to the TV coverage that explained to the public how the device worked, how it was developed, and what medical professionals thought about the significance of the operation.

The power of ENG technology was brought out by this historical landmark, as dramatically as it did for man's first walk on the moon. No other medium even came close in comparison to ENG for its coverage of Dr. Clark's entry into history. No other medium could give the live demonstrations of how the mechanical heart functioned as did ENG; no other medium could convey the balance of optimism and caution of the heart inventor, and of the doctors who performed the operation, as did the ENG reports; and no other medium could explain the significance of the event to the public as thoroughly and quickly as did ENG.

The mechanical heart transplant will stand forever as a medical achievement. The importance of ENG in covering the event went without fanfare, but it gets our vote for the best coverage of 1982. Our congratulations to all broadcasters who brought the details to their listeners and viewers.

•Also on Dec. 2, the nation's atomic scientists celebrated the 40th anniversary of the first sustained nuclear chain reaction. For this celebration, leading scientists gathered at the University of Chicago, near the site of the first reactor, and commented on that historic scientific achievement. Again, the ENG crews were there and reported the event—live, as no other medium could have done so well. In our area, the *Kansas City Star/Times* covered this event on Dec. 9, reprinting from the *New York Times*. Once more ENG was first and had the best coverage.

•On Dec. 8, Norman D. Mayer, a 66-year-old anti-nuclear protester, parked his truck, reportedly containing heavy explosives, next to the Washington Monument and held the police at bay for 10 hours. The act was a bluff, but authorities did not know this until after Mayer had been killed. The printed news covered this event in depth, but ENG crews did it better, in color, with action, as the event occurred. Again ENG came through with flying colors.

But these are just some of the recent highlights of 1982. On other major world events, the ENG crews were there. As the ravages of winter set in and brought blizzards and floods to sections of the country, ENG was there. As economic stress affected the world, ENG teams continually brought realities and perspectives to broadcast audiences.

So, as 1983 begins, we wish to acknowledge the engineers, producers and crews who have been bringing exceptional ENG results to broadcasting. Keep up the good work.

Local captioning

We applaud KCMO/TV-5, Kansas City, for its recent institution of closed captioning for the hearing impaired on all of its local newscasts. Involved with KCMO in this venture is Beston Electronics, Olathe, KS, which provided the character generator-based talent prompting system to feed the Line 21 encoding equipment. The technology is generally the same as that introduced by PBS, ABC and NBC several years ago on selected network programs. At that time, KCMO, the local CBS affiliate, did not take part.

Although the captioned program has not been accepted as widely as many had hoped, the Kansas City area is particularly pleased to see this new effort. A number of families with hearing-impaired members have moved into the area, or at least have spent some portion of the year here, so that affected members may attend the Kansas School for the Deaf in Olathe, KS. KSD is a well-known educational institute for the hearing impaired, which has on occasion cooperated with local TV productions to provide sign language.

We have singled out KCMO, but we would also like to applaud the staffs of WDAF/TV 4 (NBC), KMBC/TV 9 (ABC), KCPT/TV 19 (PBS) and independents KSHB/TV 41 and KYFC/TV 50, all of metropolitan Kansas City, for their many efforts and involvement in area events and problems. We hope other US cities are as well-supported by their media.

Your opinions on our editorial, on other critical issues facing broadcasters, or on the views of our authors are welcome. Address comments to *Feedback* Editor, **Broadcast Engineering,** P.O. Box 12901, Overland Park, KS 66212.

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Unusual ground-breaking ceremony for INTELSAT

"Rather than the traditional ceremony with a gold-plated shovel, we decided to try something more in keeping with INTELSAT's role of international satellite communications," Gavin Trevitt, INTELSAT public information officer, said. A signal, traveling twice around the world via four satellites, triggered an explosion on July 20 to mark the symbolic start of the $50 million headquarters building for the International Telecommunications Satellite Organization (INTELSAT), located in Washington, DC.

The signal was initiated when Santiago Astrain, INTELSAT director general, pressed a button. Communications Satellite Corporation (COMSAT), the US member of the organization, provided a transportable earth station to beam the signal to the Atlantic Ocean Primary Path satellite (V F-3) in the 14GHz band. The signal came back at 4GHz to the COMSAT station at Etam, WV, for retransmission to the Atlantic Major Path 2 satellite (IV-A F-1) and reception at Madley, England. From Madley the signal was relayed to the Singapore Telecommunication Authority's Sentosa 1 earth station via the Indian Ocean Primary Path satellite (V F-4), beamed up again to the Pacific Ocean satellite (IV F-1) and down to the Jamesburg, CA, earth station.

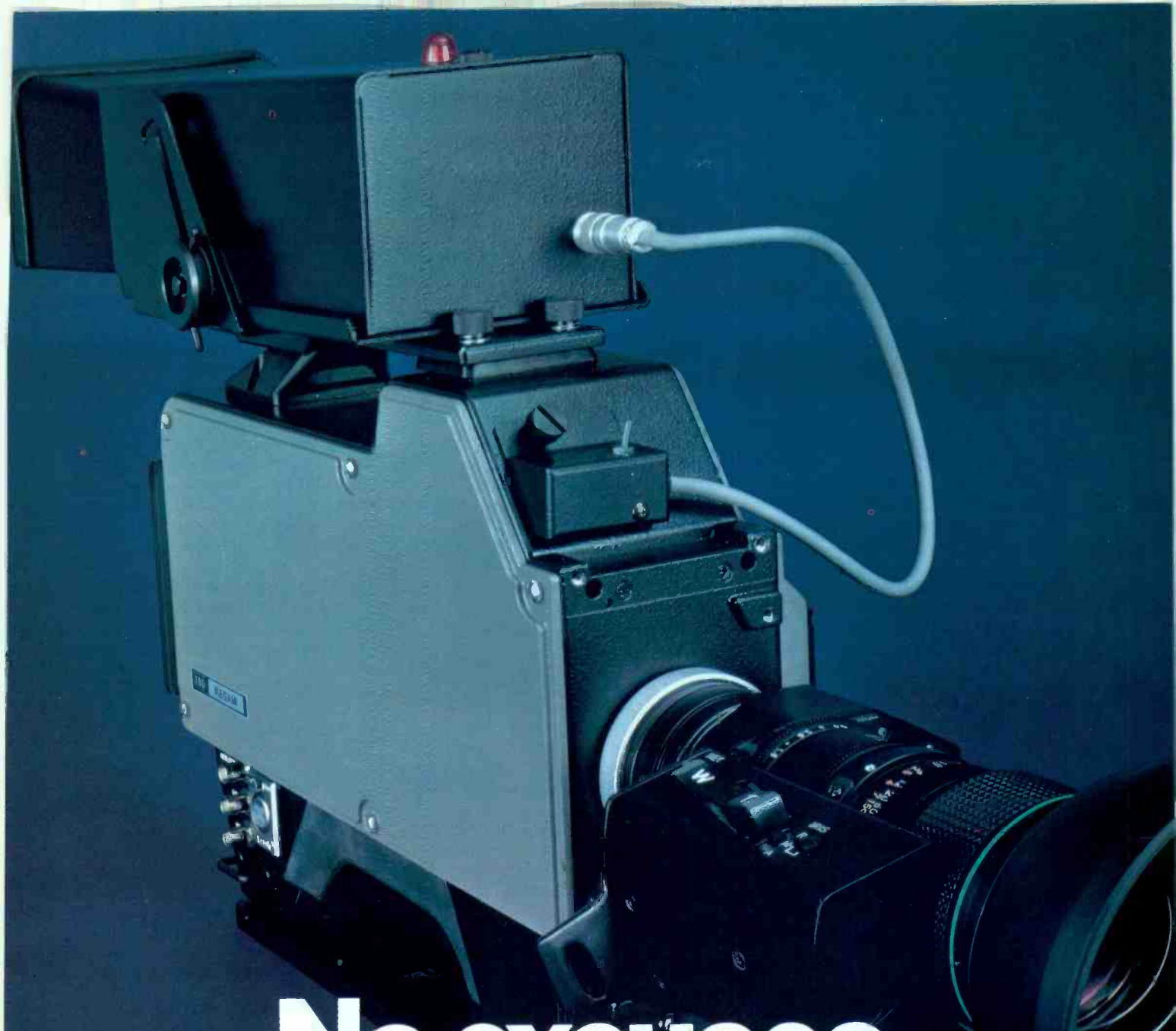
From Jamesburg the signal was returned along the same path to activate an automatic relay connected to the transportable earth station in Washington, DC. The relay detonated a ground-breaking explosion. The path length of 395,000 miles required less than three seconds for the signal to travel. En route it traversed all three types of satellites in operation in the 16-satellite INTELSAT system.

The new building, scheduled for completion in October 1984, was designed by John Andrews Int'l Pty. Ltd., Australia, as the result of a competition that initially involved entries from around the world. . Distinct features of the design involve its complementing of the present topography and vegetation of the site and its energy conservation aspects. Four- and 5-story 90'x90' elements (pods) are arranged to form a series of continuous interior atriums. Pools within the atria and outside will assist in maintaining the environment. Surrounding the building will be a park area that retains nearly all of the best trees originally on the site. The trees will also provide natural air conditioning, according to the plan.

Once completed, the building will house the INTELSAT organization, a 106-member body that owns and operates the satellite system. Nearly two-thirds of the world's overseas telephone calls and other telecommunications links, as well as almost all international transoceanic television, is carried by the INTELSAT system.

Delco picks Motorola AM stereo system for GM cars

Motorola said recently it was "extremely happy" that the Delco Electronics Division of General Motors Corporation has recommended that



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In EFP and studio production, the new HL-79D will deliver excellent results. In fact, if you don't have an Ikegami studio camera, chances are that the HL-79D will produce a better picture than whatever camera you've got on the floor.

Contact Ikegami and ask for a side-by-side comparison. Then you'll see why an Ikegami HL-79 crew can leave the excuses—and the backup—at the station.

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the AM stereo broadcasting system developed by Motorola be used on radios in GM vehicles.

Delco's recommendation follows extensive tests of several proposed AM stereo systems designed to determine which one best meets Delco's requirements for reception in a mobile environment.

Motorola also is producing an integrated circuit decoder, which detects the radio signal and converts it in to two audio channels. These decoders will be sold to receiver manufacturers worldwide.

For the broadcaster, Motorola has developed an FCC type-accepted exciter and modulation monitor, which broadcasters will need to convert an existing AM broadcast transmitter to AM stereo. Motorola is manufacturing the equipment and expects to license its design to others.

Harris response to Delco AM stereo announcement

Harris is disappointed that Delco has chosen not to recommend its linear AM stereo system to the General Motors' Car Divisions at this time. Although it is important, the Delco announcement is not a decisive factor in the AM stereo marketplace and will not cause Harris to alter its plans, according to Harris. The company added that it will continue to move ahead with broadcasters and receiver manufacturers for the final adoption of the Harris system.

Grand Ole Opry radio station on-air with AM stereo

One of the best-known voices of country music, the *Grand Ole Opry*, has entered the emerging world of AM stereo broadcasting.

WSM, the Nashville, TN, station that owns and broadcasts the *opry*, switched on a Harris Corporation AM stereo system during ceremonies on stage at the Grand Ole Opry House on Dec. 6. The Grand Ole Opry now covers 38 states east of the Rockies with its 50,000W signal.

MPR makes broadcast history with Christmas program

Minnesota Public Radio undertook the first live stereo trans-Atlantic broadcast to be digitally encoded, when it broadcasted "A Festival of Nine Lessons and Carols" from King's College Chapel, Cambridge, England on Dec. 24. The transmission used a Sony system of digital encoding equipment, and involved facilities of the British Broadcasting Corporation, the Public Broadcasting System (PBS), and the public radio satellite system. The US broadcast was a production of Minnesota Public Radio, and was distributed by American Public Radio to more than 100 public radio stations across the country.

The transmission began at King's College and traveled by land line to London. From London the signal traveled via microwave to the BBC satellite uplink in Madley, England. There the signal was sent up to the trans-Atlantic satellite. The signal from the satellite came down in Edam, WV, traveled to PBS in Washington, DC, where its digital analog was decoded, and then moved to NPR headquarters. There it entered the public radio satellite system, and was beamed to public radio stations all over the United States.

The BBC has accomplished two live digital relays (one of an Elton John concert from Moscow to London, and one of a BBC Symphony concert from Peking to London), using their own NICAM digital system. Never before has there been a live digital relay between America and Europe. A successful test of the system was performed for 30 minutes on Nov. 16.

Hubbard says copyright bill unfair to DBS

Stanley S. Hubbard, president of US Satellite Broadcasting Company, recently took exception to provisions of the cable copyright bill now being considered by the US Senate, contending that the bill (HR 5949) as passed by the House of Representatives would deny fair and even-handed treatment to new broadcast stations, including Direct Broadcast Satellite (DBS) stations.

Testifying before the Senate Commerce and Judiciary Committees, which are jointly considering the House-passed measure, Hubbard, whose company has recently been granted an authorization by the FCC for direct broadcast satellite service, said, "As written, the proposed copyright bill poses considerable danger to the unique opportunity which direct broadcast satellite broadcasting can provide for America to regain our electronic mass communications leadership in the world." Asserting that the fundamental question was one of fairness, Hubbard said that HR 5949 "is discriminatory in that cable TV systems will be required to carry the signals of existing TV stations as of Nov. 1, 1981, but will not be required to carry most new TV services that may be licensed after that date and that would serve the viewing public in their homes via direct, free, over-the-air reception." He said that under HR 5949 existing stations will have a significant and unfair advantage in the marketplace over new stations and services.

In response to a question from Sen. Bob Packwood (R-OR), Hubbard said that he saw no need to require cable broadcasters to carry other local broadcast signals, but that if the bill did include *must carry* provisions, he wanted DBS to be treated just like any other TV service.

Sen. Larry Pressler, (R-SD), asked Hubbard why free DBS TV services should be required to be carried on cable systems and yet pay DBS services should not be required. Hubbard replied that, "Any free broadcast service available to home viewers such as free DBS and LPTV should be treated the same as other free services and cable systems should be required to carry those service to home viewers."

"The American public is entitled to the broadest possible broadcast service, and the Congress should not be used to prevent new broadcasters from effectively competing in the marketplace," Hubbard said.

Canadians to prosecute unauthorized US signals

The Canadian government intends to prosecute enterprises using unauthorized US satellite signals for commercial purposes. Ernest Steel, president of the Canadian Association of Broadcasters, said that the CAB, which represents the majority of Canada's private stations, has been urging the government for two years to terminate illegal satellite services provided by a few licensed cable systems and by certain unlicensed commercial operations.

"Broadcasters live in an extremely regulated environment," he said. "It is only fair that others also abide by rules that ensure the delicate balances in our broadcasting system are not upset."

CAB maintains that imported US signals contribute nothing to Canada's broadcasting objectives, and reduce the advertising revenues broadcasters need to produce Canadian programs. The association also said that Canadians already have a multitude of authorized viewing choices available via cable and Canadian satellites.

High tech '80s to change TV quality

The dizzying rush to ever-higher technology in the 1980s will undoubtedly have a greater impact on television than any breakthrough since the advent of color, according to Dennis Farmer, market development manager, 3M Magnetic Audio/Video Products Division.

Although he concedes that prophecy in such a volatile field can be hazardous to the prophet, Farmer sees the following developments as probabilities, if not certainties, in the decade ahead:

- high resolution television, bringing

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Complex measurements are made automatically in tandem with the AA 501 Distortion Analyzer. These two TM 500 plug-ins can be mounted in the same or separate mainframes, or transferred to a portable mainframe for use in the field.

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- dish receivers, initially sprouting from the roofs of 800,000 American homes, to pick up broadcasts directly from satellites.

Farmer said he expected high resolution television to be commercially viable by 1986. However, he also said that factors—and the state of the economy four years hence is principal among them—can affect its acceptance in the marketplace.

"Estimates are that a movie company can reduce production costs by 20% by using videotape instead of film. Today, when movies are multimillion dollar undertakings, 20% becomes a big number."

Stereo sound, long needed and long in the coming, will, when mated with a high resolution picture, produce a new generation of TV sets that will make the present models seem primitive by comparison.

Digital tape, a development Farmer sees as a production tool of major importance, should be available by late 1986. Its primary advantage, he said, is that all transfers and tape generations will be perfect reproductions. Also, he said that it will be fairly simple to take a picture apart, process the components and reassemble it, similar to an electronic jigsaw puzzle.

The Direct Broadcast Satellite system (DBS) is scheduled to be operating in late 1985, but the prediction of 800,000 home subscribers at the outset must be taken with caution, Farmer said, because there are contradictory views on the future of DBS.

AM stereo at CES

Visitors to the Summer Consumer Electronics Show in Las Vegas heard AM stereo. Many manufacturers showed new receivers, and there was a stereo signal on AM to demonstrate. Through the cooperation of CRL Audio, Belar, Moseley and Magnavox, radio station KMJJ began broadcasting in AM stereo in early January. This broadcast will continue through April and the NAB convention.

The system uses the Magnavox PMX stereo exciter, the Moseley composite stereo aural STL and a new stereo matrix processor/limiter, the CRL model 1000A. This unit prevents loss of coverage in mono and improves the operation of the stereo exciter. Mono reception of the stereo signal is better than normal mono broadcasts. The new CRL unit was field-tested at WIRE radio during the Delco tests and will go into production early this year.

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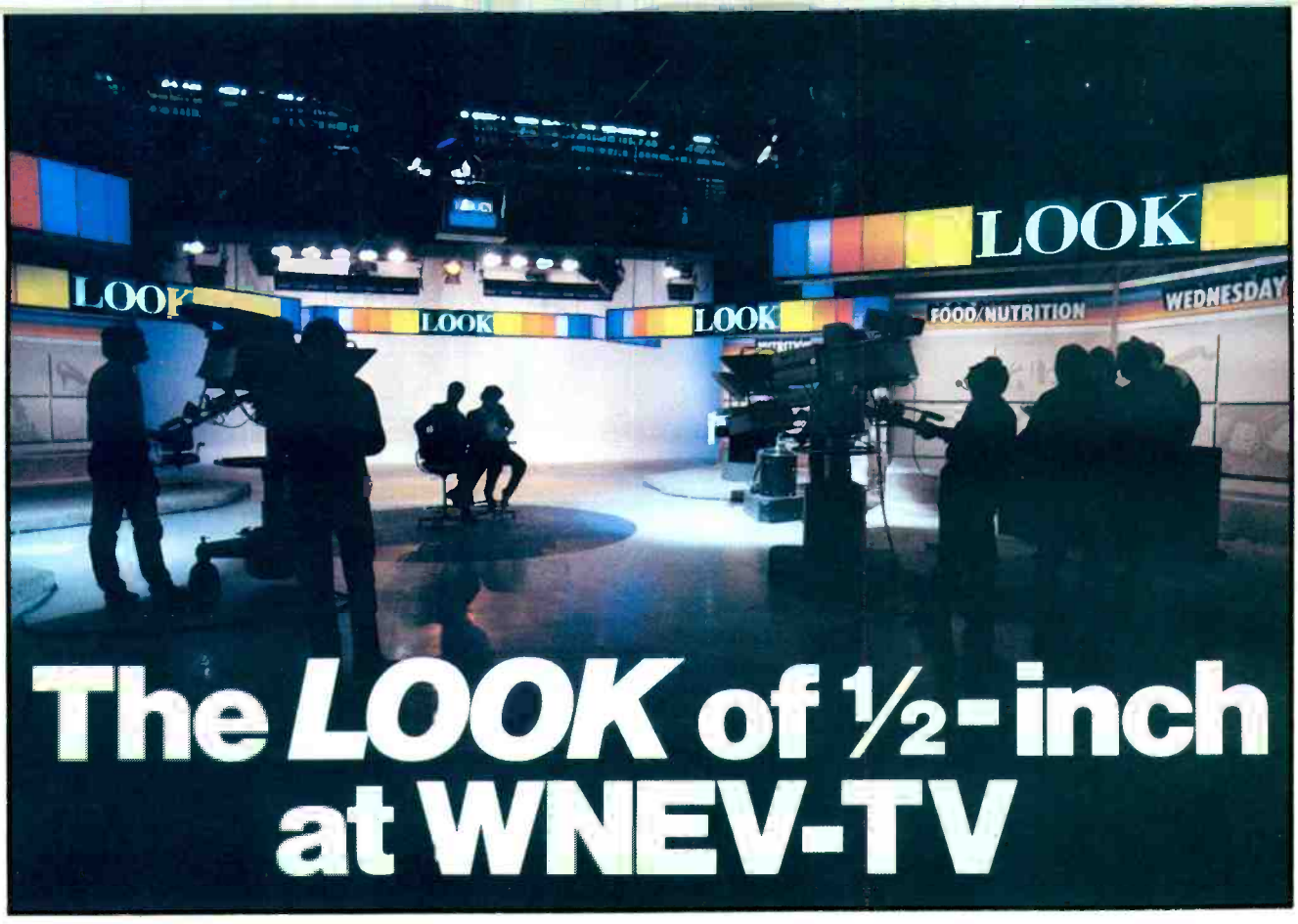

The *LOOK* of ½-inch at WNEV-TV

By Karl Renwanz
Director of Engineering
WNEV-TV, Boston, MA

On May 22, 1982, when CBS affiliate Channel 7 (Se7en) in Boston became WNEV-TV, two goals were immediately established. The first was to improve the newscast, which had not achieved any rating success since the station began operation in 1948. The second was to develop a local program unlike any produced to date.

A date for the newscast debut was established for Sept. 13, 1982, an aggressive goal by any standards. Included in the more than $1.5 million worth of equipment for our news were five new Ikegami HL-83 cameras, two live ENG vehicles, a pair of Sony BVU-800 ¾-inch tape machines, two Digital Video Systems Phaser IIA TBC frame synchronizers, a Weathergraphics computer weather system (marketed by McInnis-Skinner), a Grass Valley DVE Mark II dual-channel digital video effects system, a 12-channel RTS IFB system, Listec Digivision prompters, a 6-channel Harris IRIS II still-storage system and a Chyron IVB graphics system.

An active on-camera newsroom set using more than 6000 square feet was constructed. Two new anchors, Tom Ellis and Robin Young, are centered among six potential anchor desk positions.

Creating *LOOK*

The second goal of producing a unique, high quality local program was a ground floor up operation. All staff and equipment would be new. The program, titled *LOOK*, the dreamchild of Win Baker, president and general manager of WNEV-TV, was targeted for a Nov. 29, 1982, debut. Baker is credited with having originated and developed the *Evening/P.M. Magazine* format.

The monumental task of hiring more than 70 employees to shoot, produce and edit the program was undertaken by Jeff Schiffman, vice president, Programming. Engineering was busy evaluating equipment to be included in the more than $2 million capital investment for *LOOK*.

The chance to totally equip a large public affairs programming effort such as *LOOK* comes along infrequently in the broadcast industry. Normally a station will add a 30-minute live program, which will require a small addition in hardware, complementing the rescheduling of existing equipment in that facility. *LOOK*, with a staff of more than 70 and the aggressive goal of producing two hours of television five days a week, demanded more.

One of the primary concerns of this new program would be putting 1-person crews in the field for shooting without affecting the quality of what the crew brings back, thus keeping down the expense of field shooting. We looked carefully at the various formats already in use in the field to determine what our best approach would be. One-inch, which had the quality we were after, offered a heavy field package that could not be handled by one person. Also, the expense on 1-inch field equipment

Continued on page 22

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Exclusive video rights in the United States to the title and logo of *LOOK*, formerly the name of one of America's most popular magazines, have been acquired by WNEV-TV as the name for its new daily, 2-hour live information program. The purchase may mark the first time that the name of a magazine, no longer being published, has been revived for use on television.

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The WNEV-TV news set.

The *LOOK* live vehicle with its 46-foot mast extended.

The author, with some of WNEV-TV's newly purchased equipment. Shown (left to right) are a video waveform monitor, a Panasonic AU-300 ½-inch VCR, a Convergence ECS 103B editing console, a Panasonic AU-300, a Convergence SE-100 editing effects/switching system, an Ikegami HL-83 camera and a bolt-on Ikegami HM-100 M Format portable field recorder.

Continued from page 19

would be high. Portability that could be handled by one person was offered by ¾-inch, but it presented serious shortcomings in quality, especially in multigeneration color.

With the goal of keeping our quality higher than that possible on U-matic, we turned to the ½-inch formats to evaluate what was available. We determined that the M Format was the only format ready at this time, because the Betacam system uses a U-matic recorder in the edit room. We believed it was necessary to stay in the ½-inch format as much as possible, from shooting through the editing process.

We evaluated M Format cameras and tape machines in June and July of 1982 and found the quality to be strikingly better than ¾-inch U-matic and subjectively difficult to tell from 1-inch on many occasions. We found increased chrominance bandwidth and freedom from chrominance noise caused by velocity error. With no subcarrier present in component form, the absence of intermodulation between luminance and chrominance is a big advantage. This eliminates noise and the need for color frame edit considerations. The M Format not only enjoys superiority in video performance over the U-matic format, but in audio performance as well. Audio signal-to-noise was measured at more than 50dB. Audio frequency response was measured at ± 3dB from 30Hz to 21kHz. We believe this particular specification is equal to or better than that of Type C audio. M Format provides an extra 6dB of headroom over U-matic, at the same time providing a better signal-to-noise ratio.

The VHS videotape availability factor is favorable. However, we have found a need to use a super high grade VHS tape, because of excessive dropouts found in off-the-shelf VHS videotape. The servo system is designed around the T120 cassettes, but can handle other sizes.

There were, of course, drawbacks to consider before purchasing any M Format equipment. One drawback was the fact that there had been no format decided upon. Knowing the difficulty that would be encountered in making the format decision made us feel uneasy. Also, there was no known use of ½-inch M Format equipment approaching the scale we were considering. After considering the increased video and audio quality to be gained and weighing the portability needs and the cost of M Format equipment, we decided that M Format was the best way to go for WNEV-TV.

Another consideration when purchasing ½-inch is the fact that the present hardware does not include playback capability in the field. Considering the fact that most ENG teams use BVU-50s, which have no playback capability in the field, this problem was considered somewhat less significant. Furthermore, the few news crews in the field that use BVU-110s report that they do not always look at what they have shot in the field, primarily because, if they have not got video and audio, then the event has already passed by and there is no chance of reshooting the piece. In any event, this seems to be only a temporary disadvantage, as development of field play capability is under way.

Requests for quotes are sent to major ½-inch manufacturers and suppliers with a quick turnaround on delivery. The requests called for 12 portable field recorders to be used in either the 1-piece or separated field configurations, as well as 31 studio record/playback machines. The quote also called for timebase correctors, some with freeze-frame to enhance edit suite capability. Because there was no 3-machine edit controller interfaced to M Format machines, we discussed with major editing manufacturers the interface problems we saw ahead for the ½-inch M Format. One of the biggest problems faced by editor companies was limited

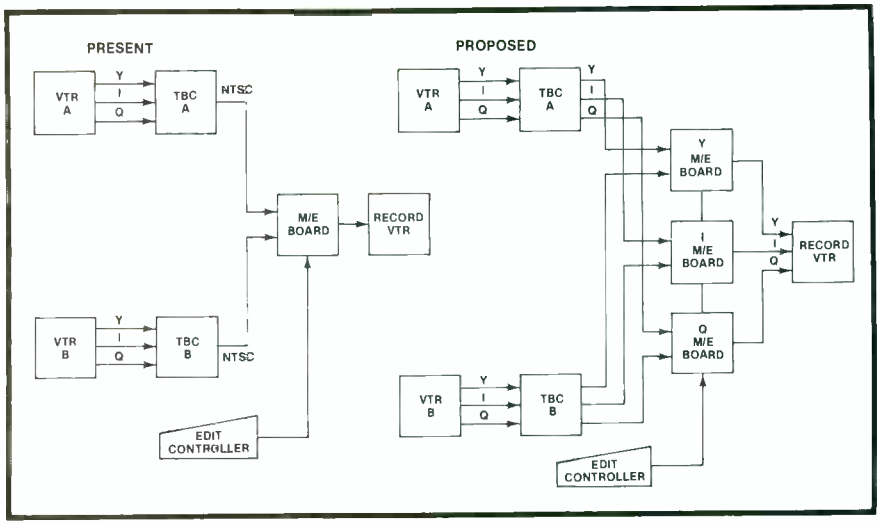
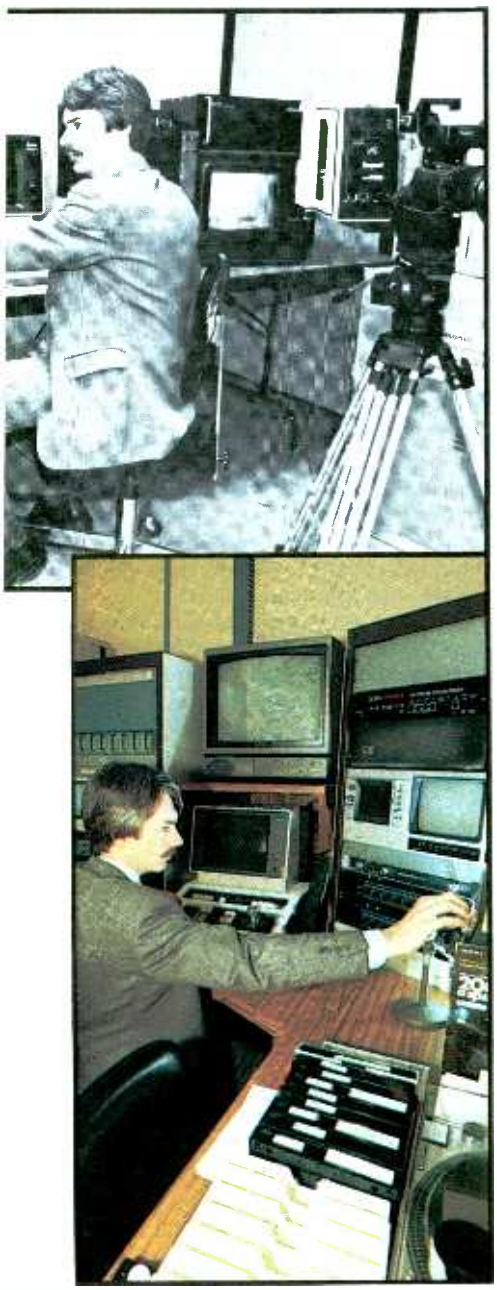


Figure 1. WNEV-TV edit suite flow chart.



The author, testing the 3-machine edit suite operation.

M Format machine availability. CMX and Convergence began designing their interfaces in our building using machines loaned to us for evaluation.

Timebase corrector evaluation took a considerable amount of time and effort and proved to be the most difficult decision. Three TBCs were found acceptable, each offering different features from still-frame to special effects. However, only one, Fortel, was designed to use the M Format's YIQ signals. The Fortel CYIQ 32 offers YIQ inputs that allow processing of the component signals. We asked Fortel to provide timebase-corrected YIQ outputs, which they agreed to do.

Understanding the edit suite flow chart will assist in demonstrating the importance of this TBC feature. (See Figure 1.) Luminance channel noise measurements proved the component luminance (dub output) to be at least 1dB better than the NTSC output. This holds consistent through multigeneration dubbing. Multigeneration high frequency components fared considerably better in the YIQ mode than the NTSC mode. The manufacturers clearly saw the importance of this when they provided component dubbing facilities.

One 2-machine edit suite is operating in the component mode through the dub connectors provided. This 2-machine suite takes up less than six feet of rack space, making it convenient to roll around as a mobile editing bay.

We felt that *LOOK* demanded 2-machine edit suites so that basic effects could be accomplished during the edit process. To allow A/B dissolves and effects to occur in the YIQ mode, timebase-corrected outputs must feed a switcher that can be controlled by the computer editor. To date, no manufacturer has a switcher specifically designed for this, but Brian Lay, WNEV-TV engineering manager, has been successful in paralleling Convergence switchers to prove the feasibility of this approach.

The mobile 2-machine edit suite.

The high quality possible on M Format equipment can be better appreciated on a YIQ color monitor, such as the Shibasoku CMM-20-11-YIQ.

The purchases for *LOOK* included the following: 31 Panasonic AU300 ½-inch studio VCRs; 12 Ikegami HM-100 ½-inch portable VCRs; nine Ikegami HL-83 cameras with 14:1 Fujinon lenses; six Convergence 103B editing systems; one Convergence 103A editing system; 15 Fortel CYIQ 32 time base correctors with TBC'd YIQ outputs; three Digital Video Systems Phaser IIA frame store TBCs; one live ENG/EFP vehicle with 2GHz and 13GHz frequency agile microwave; and one Chyron IVB. A large quantity of batteries, lights, tripods, audio mixers, microphones and other support equipment was also purchased.

Manufacturers and venders were required to supply most of the equipment in a short period of time because of the tight timeline of the *LOOK* project. Nearly every supplier came through within our 30-day time frame, even considering all the new technologies involved. However, one supplier was not able to live up to the commitment, and we were quick to cancel a fairly substantial order and place it elsewhere, getting delivery in two days.

A WNEV-TV editing suite

A typical WNEV-TV 3-machine editing suite (shown here) contains a wide spectrum of audio/video equipment. Just off the picture to the left are two of the three Panasonic AU-300 VCRs. The third unit is seen second from the right. The rack on the left contains an Electro-Voice Sentry 100A audio monitor; Panasonic black-and-white monitors; and two Fortel TBCs. The second rack from the left contains the Sony color monitor and Convergence 103 edit controller.

The rack in the corner contains the Digital Video Systems Phase IIA; Tektronix waveform monitor; Panasonic video monitor; a Crown International D75 audio amplifier; and two Shure Brothers 276 mic mixers. The right-hand rack houses an Otari MX5050B audio reel-to-reel recorder and a Technics SL1200 Mark II turntable, which are used when needed for additional audio capability.

The WNEV-TV ½-inch playback area for *LOOK*.

The *LOOK* set

LOOK, which airs Monday through Friday, 4 to 6 p.m., has an impressive set that occupies an entire 60' x 75' studio. Videotape is rolled directly off ½-inch M Format with TBCs and associated waveform and picture monitoring equipment.

All field crews were shooting by Oct. 8, 1982, with partial edit suite construction complete. The debugging process was less painful than projected. Nearly every major piece had one bug. The problems included an intermittent loss of Q and audio pumping caused by excessive limiting in the camera interface; apparent chroma loss on the VCR input; poor edit accuracy in excessively warm edit suites (we began with an air conditioning problem); and vertical blanking on edited masters that was still legal but did not meet stringent WNEV-TV standards. Manufacturers were quick to help solve these problems.

Because we were the first large-scale ½-inch user, choosing engineers to maintain this new technology required creative hiring. Hiring a handful of small-format technicians simply would not work. We thought that three technicians spread over six days, double-shift, would lend proper maintenance support.

The three technicians hired to maintain the ½-inch equipment came from diverse backgrounds, each bringing an expertise. They included an ENG maintenance engineer, a high technology design engineer from the computer industry and an experienced computer editor with good all-around technical knowledge, who assisted in evaluating the various editing systems available. All three were heavily involved in the construction of the seven edit suites, and we found their varied backgrounds to be helpful in solving typical new technology startup problems.

The experience gained in the installation and construction of the edit suites has been invaluable as a hands-

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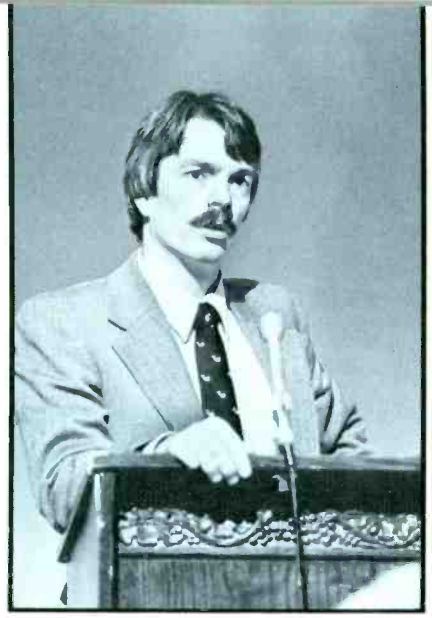
on training session, and manufacturers have been responsive to our training needs. Convergence, along with Lake Systems of Newton, MA, offered a 2-day on-site training session in October for all *LOOK* editors. Panasonic held a 3-day VCR training seminar on-site in December. Landy Associates provided Ikegami camera training. Training is as much of a morale boost as it is a technical learning experience.

To assist in the furtherance of new technologies such as the YIQ format, manufacturers of test signal generators should develop test signals directly applicable to the new formats. We found no digital test generator that makes it easy to design specification tests to check out state-of-the-art technology such as the M Format.

The use of M Format in ENG/EFP configurations at WNEV-TV has been a rousing success. With the ability to gather field information at quality levels higher than U-matic that contribute much less noise through the edit process, the quality of the on-air product is much improved. A surprising achievement also has been three hours of battery life in the field with our Anton-Bauer QPY-9N packs.

Next time you're in Boston, have a *LOOK!*



The author, addressing the New England Society of Broadcast Engineers.

About the author:

Karl Renwanz has been director of engineering at WNEV-TV, Boston's CBS affiliate, since June 1982. He is responsible for overseeing technical operations of the station as well as for setting direction regarding the acquisition of new equipment.

During the summer of 1982, Renwanz supervised the multimillion dollar revitalization of the station, which included a major purchase of ½-inch technology. Among the programs for which he is responsible are ***LOOK****, WNEV's daily, 2-hour, live information program and Channel 7's evening newscasts.*

Before his appointment to WNEV, Renwanz was director of engineering at WGBH-TV, Boston's PBS outlet. Before his 2-year tenure with WGBH, he was manager of operations and engineering at KVIE in Sacramento, CA. He was employed at KVIE from 1971, and while there, marketed and managed a TV mobile unit for West Coast sporting events.

Renwanz began his career in 1969 in commercial radio. From 1975 to 1980, he taught communications and broadcasting at American River College in Sacramento, CA. He also has a number of freelance credits, including being technical supervisor for the 1979 Pan American Games in Puerto Rico, as well as director of a variety of major commercials.

Renwanz has been a member of NAB and the NAB Subcommittee on Channel 6/FM Interference since 1979. Also, he serves on the Massachusetts Nonionizing Radiation Ad Hoc Committee.

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HARRIS

Circle (20) on Reply Card

Multiple relay sites for better ENG

By Bebe F. McClain, president, B. F. McClain Productions, Asheville, NC

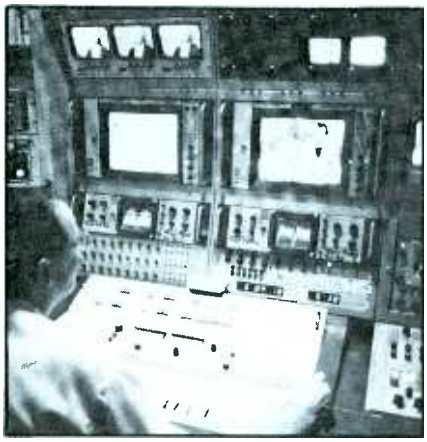
TV station KGTV, located in San Diego only a few miles from the Mexican border, enjoys a great climate and gorgeous landscape. The beautiful hills and valleys are breathtaking to view but are murderous to cover newswise. Also, the downtown area is growing so rapidly that every time a new building is completed, it complicates KGTV's efforts to broadcast live from that area. To assure that its news crew can go virtually anywhere in San Diego County and the surrounding area, KGTV has installed five ENG relay sites and has acquired the land for a sixth site. According to Clayton Brace, vice president and general manager, "We have put together a system that is infallible. We can get out of anyplace."

Ronald Mires, news director, a firm believer in expanding local coverage and originating *live* whenever possible, said that *KGTV News* averages three to six live segments each night. The station does such a good job of covering events in the Southern California area that ABC often uses KGTV's stories on its national news coverage.

KGTV was the first station in San Diego to offer live coverage of news events. It began five years ago with one quad horn-type system installed atop a downtown bank building. After meeting with success covering action downtown, they wanted to cover the surrounding area as well. LeRoy Bellwood, chief engineer, knew what a horrendous problem this presented because of the irregular terrain. He realized that one or two sites would not offer total coverage. Within a relatively short period of time he has overseen the installation of four more pickup sites, the most recent one being the first Miniscan antenna manufactured by M/A-COM Video Systems since that company bought the Antenna Division of Tayburn. This new receive antenna was placed at the station, which sits high atop a hill overlooking the city. Because of its good location, the antenna can be used to cover downtown stories whose line of sight to the system on the bank building has been, in many cases, blocked by new skyscrapers.

The new antenna is steerable, as are two other Miniscans used by KGTV from Tayburn. One of these is installed six miles northeast of the station at Cowles Mountain, CA, and the other is located about 35 miles northwest at Palomar, CA. Adding to this collection is an autotracking antenna (formerly by Tayburn; now available from M/A-COM under the name of *Superscan*) located 12 miles northeast at Soledad, CA.

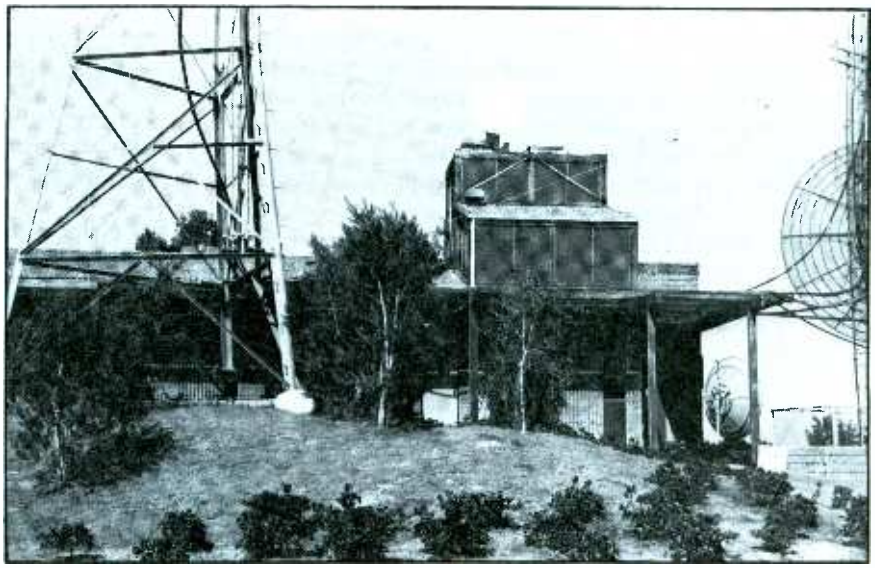
Because there could be a few places or tight spots that this comprehensive system might not cover, KGTV has its own helicopter that can hover



In the master control room, incoming ENG segments can be seen on the top left monitor.

LeRoy Bellwood, chief engineer, points out how the rough terrain demands multiple pickup sites for live ENG around San Diego.

The ENG command center operator remotely controls antennas at the pickup sites.



KGTV transmitter located on Mount Soledad above La Jolla, CA. The autotracker for ENG is located on top of the building.

DIGITAL TEST GENERATOR

DTG-1000N

- The DTG-1000N features five identical and independently microprocessor controlled 10-bit test signal data stores with precision D/A converters.
- Each data store contains 35 computer generated, standard and new test signals in EPROMs.
- Menu style listing of all available test signals on local and remote control panels together with full status indication makes test signal selection easy.
- Internal RS170A sync generator for genlock and accurate system phasing maintains zero SCH at all times.
- Five standard trigger signals can be locked to any test signal selection from data store #5 and retained in memory.
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- Remote control up to 1000 feet for each data store.

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anywhere and act as an airborne relay.

Two ENG vans cover the area sending signals via a 2GHz system to the relay sites where they are received and retransmitted using a 13GHz system to the central receive antenna at the station.

KGTV's new steerable Miniscan is installed at the station for ENG pickup.

According to Bellwood, the plans on the drawing board are to add a sixth pickup point on San Miguel Mountain southeast of the San Diego metropolitan area.

Having this capability to go live has enabled KGTV to keep its viewing audience well-informed concerning local activities, including the fires that swept Southern California in October. And, by using their pickup sites with their helicopter they were able to report, stop-by-stop, President Reagan's October visit to Mexico to meet the new Mexican president. The crews were able to follow the procession and arrival at the Del Coronodo Hotel for the official luncheon.

San Diego, the 25th largest market in the United States, is a competitive market. Mires commented on the importance of KGTV's multiple pickup sites by saying, "They give us, for the first time, the ability to go live from anywhere in our area of coverage. This major step forward has changed the complexion of TV news. What used to be *after-the-fact coverage* has become *right-now coverage.*"

Live coverage was what the management of KGTV wanted—and 6000-foot mountains were not going to stop them. Multiple sites equipped with steerable or autotracking antennas and vans and helicopters are what it took. And, as the San Diego area grows, KGTV will more than likely figure a way to broadcast live from any area that could possibly generate a news story.

Ron Mires, KGTV news director: Microwave ENG capability has changed the complexion of news coverage.

The Performance of a World-Class Studio Console.

With a Four Year Warranty & a Price That Makes Sense.

You're looking at our DC-38-8S. Built tough & engineered to perform like big, expensive boards you'll find in world-class recording studios. Its flexibility and features give you the ultimate broadcast production and on-air board.

Its price keeps you (and your accountant) smiling.

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While a lot of imitators are still playing catch-up, we're moving ahead: by subtly improving upon a design we pioneered in 1975; by maintaining our reputation for reliability; by realistic and affordable pricing. We figure we're still way ahead. Which means you can be too.

The Ramko DC-38 Series consoles are known to be highly interference free because we don't let RF and scratchy pots and switches attack the audio. All audio functions, from switching through attenuation are done via D.C. control.

NOT ONLY QUIET. CLEANER AND MORE ACCURATE.

All inputs/outputs have the benefits of solid-state, transformerless design. We discarded the problems that come with bulky, unforgiving and expensive transformers. Like distortion due to impedance mismatching and compromised frequency response. Not to mention hum that sticks to a transformer like a magnet.

We give you a solid-state, L.E.D. metering for much greater accuracy. A cleaner, tighter sound can be yours too because the slower responding, mechanical V.U. meter belongs to another era—not on a Ramko console.

FEATURES FOR THE REAL WORLD.

There's a dual cue mode that works by normal "potting-down" or by pushing a button so you don't have to change the mixer setting. All the pushbuttons are super-quiet. They route audio through error-free, solid-state logic without program-killing pops, clicks or momentary feedback associated with loud, clanking, short-lived mechanical switches.

Our exclusive electronic patch panels make selection of input gain extraordinarily flexible. From mic through line levels, and anywhere in between on each and every input. You have over four million combinations to accommodate any channel.

THE SECRET TO A FOUR YEAR WARRANTY WITH PARTS AND LABOR.

In the DC-38 you get three power supplies. L.E.D.s and lamps with an 11 year life expectancy. Pushbuttons spec'd at 20 million operations. Wear-resistant, crud-forgiving conductive plastic mixer pots that also take the heaviest of hands. In addition, all the critical electronic circuitry is burned-in so it doesn't burn-out.

And, no console made is easier to service.

THERE'S MORE.

Like over a dozen specific models in addition to our DC-38-8S. With spec's that compare to the ones on your left. Mono-Stereo. 5 inputs to 12, dual. Optional solid-state clock/timers and remote machine control interface.

We also have a free, two-week trial. So you can put our claims, and our reputation to the test.

Give us a call, now. Collect. Discover the performance and versatility of a world-class broadcast studio board.

Discover the pricing that's also made Ramko's radio equipment reputation red-hot.

DC-38 Series' Numbers

Output:	+21dBm max.
Signal-To-Noise Ratio:	−70dB
Frequency Response:	+0, −2dB 20Hz to 20kHz
Distortion:	0.3% or less
Crosstalk:	−70dB @ 1kHz
Inputs:	Up to 4 per mixer, balanced bridging
Price:	Single channel 5 mixer mono (SC-5R) thru dual channel 8 mixer stereo (DC-8Ms). $1808* to $3509*
	Dual channel 5 mixer mono thru 10 mixer stereo (DC-38 series shown). $3632* to $6762*
	Dual channel 12 mixer, slide atten., remote control. Mono $6432* Stereo $7998*

*Prices subject to change without notice.

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Circle (22) on Reply Card

ENG/EFP:

Notes from the field

By Bill Rhodes, editorial director; and Carl Bentz, technical editor

The menu of support equipment for an out-bound ENG/EFP crew is substantial. Our camera roundup touches on only one item on the well-equipped crew's menu—the camera. Other major and minor items include VTRs, helicopters, vans, battery packs, portable switchers, microwave links, camera stabilizers and a host of other items. And, don't forget the rugged carrying cases needed to protect delicate equipment.

An ENG crew not only needs to be well-equipped, but it also must plan ahead for extremes in weather conditions. Heat, cold, rain, snow, ice, sleet and wind are the bane of the ENG crew. And rarely are crew members recognized for their careful planning and heroic efforts, which, under trying circumstances, bring exceptional news coverage to the viewer.

Each year in this issue, we try to point out how equipment other than cameras aid ENG/EFP operations. This year we have elected to show just a few samples of systems that have been developed to help broadcasters and crews.

Equipment protection

Even the most rugged ENG equipment needs protection during transmit to the event site. Various types of equipment command special consideration. Many items need only a padded enclosure, but others are more suitably rack-mounted within the

transport case. Two examples of the many excellent products available are offered by *Thermodyne International Ltd.*: the Rack-Pack and Shok-Stop. A high density polyethylene developed by Philips Petroleum withstands high impacts. Field-replaceable hardware includes spring-loaded handles, re-

Continued on page 36

When you're Taft Broadcasting, you can't afford second best.

Taft Broadcasting is an immensely successful communication company with TV stations in seven major markets. Their quality standards are tough. Their business standards are demanding. And that's why, for the past three years, Taft has been sold on 3M Routing Switchers.

We lived up to their standards by saving them time and money. We saved them installation costs by setting up quickly and easily. We saved them equipment costs by doing more with less. And we saved them manpower and modification costs by expanding the system as their needs expanded. With 3M Routing Switchers, Taft was faced with add-ons, but never with obsolescence. They know our system will be as state-of-the-art tomorrow as it is today.

Our system can be as simple as a 10x1 or as sophisticated as a computer interfaced system controlling tape and film machines, printing logs, or connecting any combination of inputs to any combination of outputs. All at the touch of a button or the pulse of a computer command.

Virtually all 3M switching equipment is microprocessor-based, so you can delegate control to individual stations, yet lock out other stations to prevent operational interference. You can route audio and video separately. And all controls are connected by one coaxial cable.

We offer five series of switchers, with your choice of control panels. And each one is designed to stay on the job for years.

For a firsthand impression of 3M Routing Switchers, check with John Owen, V.P. Television Engineering at Taft Broadcasting. So far, he's only had one complaint: "I wish we would have had them in '76, '77 and '78".

If you'd like more information about 3M Routing Switchers, call us collect at 1-612-733-8132. Or write us on your letterhead at 3M Professional Audio/Video Equipment, Bldg. 223-5E, 3M Center, St. Paul, MN 55144. For inquiries from outside the continental U.S., call or write, International Operations, 3M, Bldg. 220-5E, 3M Center, St. Paul, MN 55133. 1-612-736-2549.

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THE ULTIMATE VTR. FAST, YET GENTLE. SOPHISTICATED, YET SIMPLE.

THE REMARKABLE VPR-3.

Twenty-six years ago, we introduced the world's first practical videotape recorder. Through the years, you've been telling us what you wanted in a single "dream VTR." Well, that dream's become a reality. The ultimate VTR. We call it the VPR-3. It's a classic. Light years ahead of the rest in technology. Ideal for teleproduction where time is money. For broadcasting where versatility is expected. And for satellite or cable distribution where dependability is a must.

More Features For Your Money

VPR-3 gives you a tremendous array of exclusive features designed to deliver more value for your money and help you get the job done better and faster. Our ultimate VTR's uncompromising features include: gentle air-guided and vacuum-controlled tape handling, tape acceleration to 500 inches per second shuttle in just one second with one-hour reels, "fail-safe" dynamic braking, fast (four fields maximum) synchronous lockup, flexibility to operate with three-hour to one-minute "spot" reels without adjustment, superior built-in audio features, automatic audio and video record optimization, simpler operation using a fluorescent system status display and soft-key-driven menus, as well as extensive and usable diagnostics.

The Ultimate Type "C" VTR

VPR-3. The ultimate one-inch Type "C" VTR. It's all you ever wanted. In a single machine. For the compelling details, contact your local Ampex sales representative, or write Willie Scullion, National Sales Mgr., Ampex Corporation, Audio-Video Systems Division, 401 Broadway, Redwood City, CA 94063. Sales, spares and service worldwide.

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Ampex Corporation · One of The Signal Companies

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stop

Continued from page 32

cessed hinges and latches. The containers may be ordered with watertight or vaportight seals, if the situation demands. A wide variety of easily stackable case sizes make up the Thermodyne line.

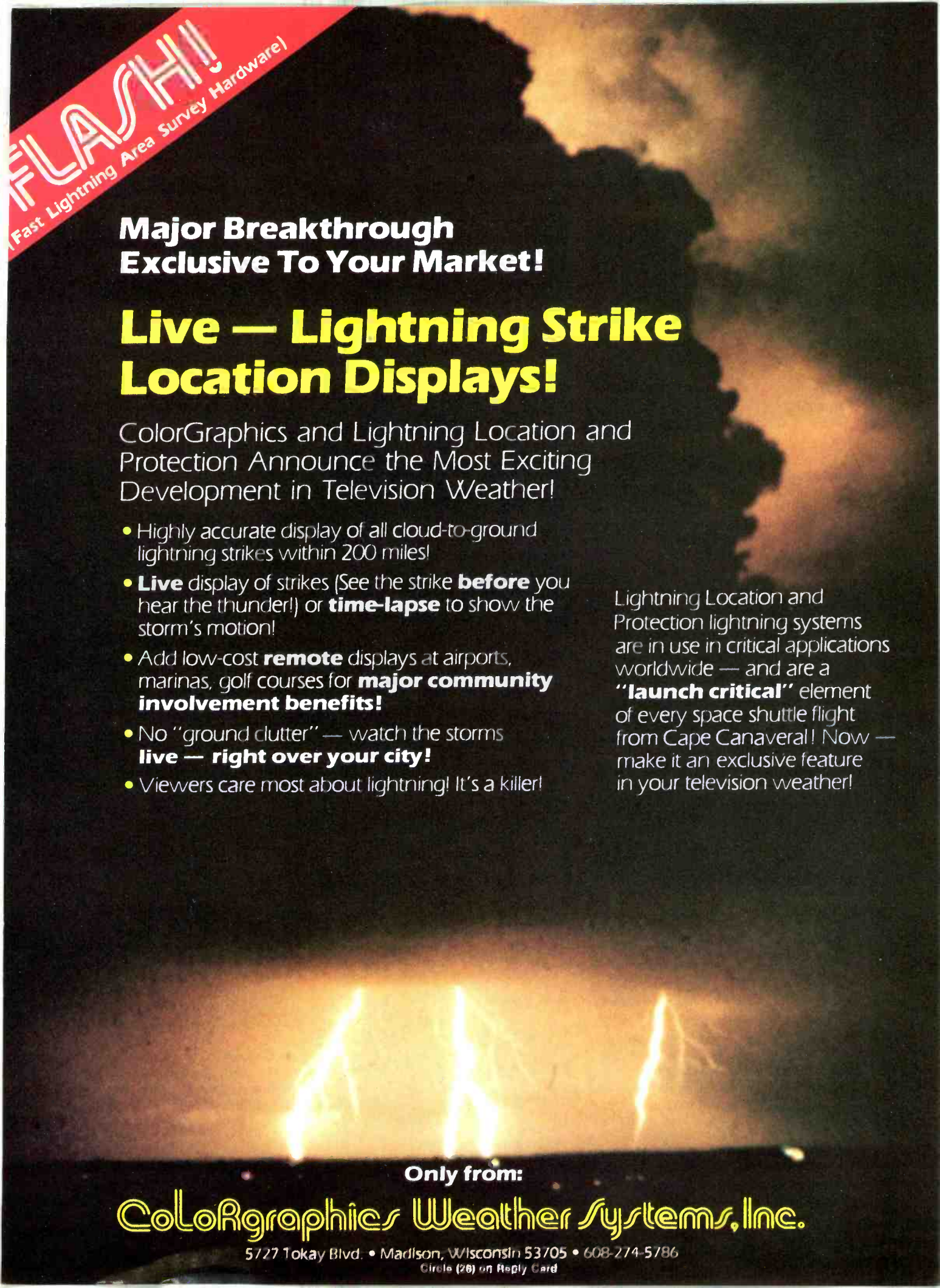
Protective cases for equipment may offer specialty functions as well. One example is the *Frezzolini Electronics* VC-1 case. Holding a total of six BP-90

type batteries, the VC-1 provides fast charge for one of the battery units and slow charge for another. Input power may be 110Vac or 12Vdc.

Mobile vans for ENG/EFP

The design and production of a mobile van for ENG/EFP requires resourcefulness and skill to handle the range of problems faced in field operations. When all is done well, the end result is a happy broadcaster or production facility. The following are brief details of some data on recent vans that have been developed to serve the industry.

Mobile vans come in large and small sizes. Shown here is the large *Unitel*



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ColorGraphics and Lightning Location and Protection Announce the Most Exciting Development in Television Weather!

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Lightning Location and Protection lightning systems are in use in critical applications worldwide — and are a **"launch critical"** element of every space shuttle flight from Cape Canaveral! Now — make it an exclusive feature in your television weather!

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Circle (28) on Reply Card

Video van parked outside the Nederlander theater in New York during the production of the Lena Horne show. Inside the van is an impressive array of equipment, including a *Grass Valley* 24-input 300-3A switcher and Mark II Digital Video Effects unit.

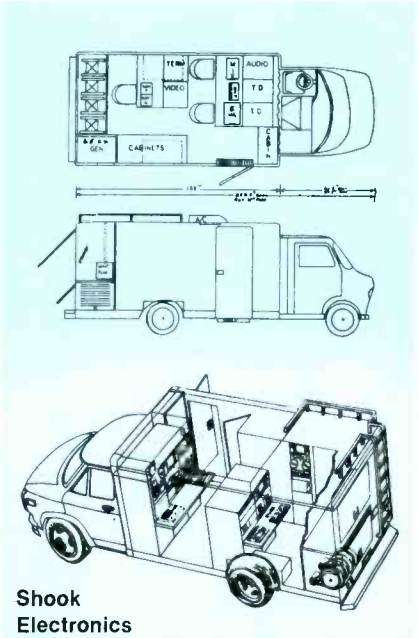
Quality Video of Las Vegas recently rolled into business with a 45-foot mobile TV facility built by a special unit of RCA's Commercial Communications Systems Division, Camden,

NJ. Designed for entertainment and sports production, the $3.5 million mobile unit features four *RCA* TR-800 1-inch videotape recorders and six *RCA* TK-47 automatic triax cameras.

Frank L. Anderson, vice president, engineering, Quality Video of Las Vegas, goes through final performance charts on one of four 1-inch VTRs.

Comcast Cablevision of Warren, MI, recently acquired its mobile production van from *General Television Network* of Oak Park, MI. The van is intended for local origination of sporting events, concerts, news and commercial production.

The vehicle is built around an all-aluminum *step-van* body. It features four *Ikegami* ITC-350 color camera capability, an *Electro-Voice* audio console, a *Crosspoint-Latch* 6112 special effects switcher, dual *Sony* VO-5850



videotape recorders with *Microtime T-120* time base correctors, a *Video Data* TP-2500 character generator and related support accessories. It has a custom roof-mounted camera platform, with removable guard rails, and on-board power capacity with a 15kW generator. Cost of the van is estimated at more than $100,000.

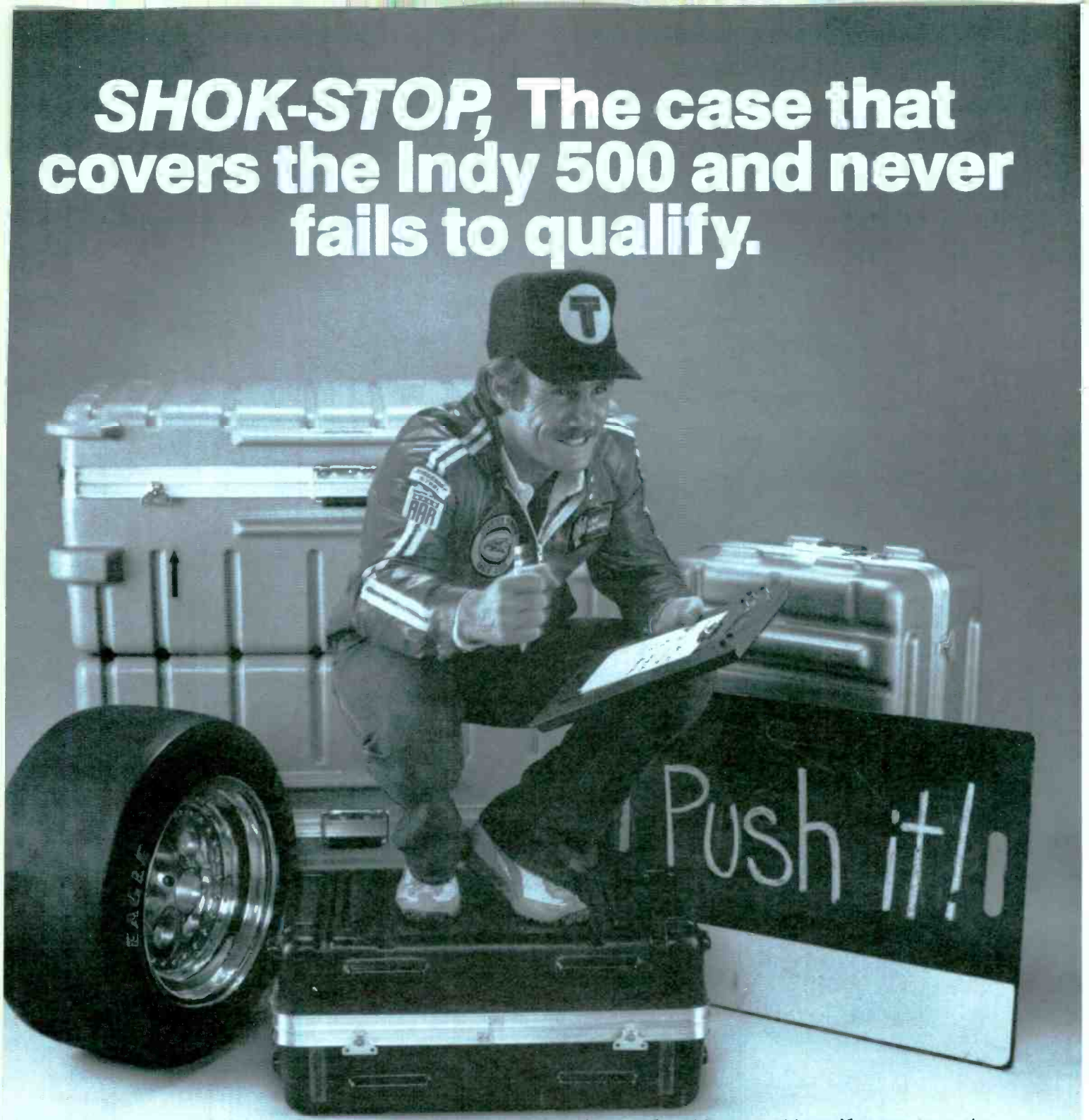
A relatively recent entrant into the field of customized van design and production is *Shook Electronic Enterprises* of San Antonio, TX. Shown on this page is one of the company's cost-effective and versatile mobile TV production systems.

Customized ENG vans

The M-1 ENG mobile unit built by *Midwest Corporation* for *Taft Broadcasting*'s WKRC-TV 12, Cincinnati, includes a pneumatically extendable (up to 35 feet) microwave mast, stabilizing jacks, a van-top camera platform with removable safety rails and external worklights. Inside the vehicle is the control panel for the electronic and utility power systems. Immediately below the panel is a portable U-matic VCR and the storage compartment for

an *Ikegami* HL-83 camera. To the right in the main electronics rack is a *M/A-COM* 21-channel transmitter, pan-tilt and polarization control panel, *TEK* 528A waveform monitor, *Shure* M267 audio mixer, *Kaitronics* video switcher, *QSI* source identifier and signal patch panels. The rack may be unlocked and rolled forward for maintenance. At center is a *Videotek* video monitor and *Sony* 800 series VCR.

SHOK-STOP, The case that covers the Indy 500 and never fails to qualify.



The Indianapolis 500. It's been called the ultimate test of man and machine.

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Shok-Stop babies sensitive broadcast equipment all the way to the track.

Our unique equipment case design incorporates "concertina" folds which absorb shock energy by "giving" slightly during impact.

And the outer material is a tough but resilient polyethylene that returns to its original shape to await the next jolt.

Inside, cushiony foam adds yet another layer of protection. With 98 "blank foam" cases and hundreds of custom patterns, we can transport virtually any piece of broadcast equipment with snug assurance.

What's more, only Shok-Stop hardware can easily be repaired on location. Because something as important as the Indy 500 shouldn't hinge on a hinge. You can depend on us from start to finish.

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Harris TC-90. The new ENG/EFP camera built for the way you use them.

Now there's an ENG camera designed for the real world of a news cameraman.

A *super-light* camera you can float on your shoulder hour after hour without fatigue. An ENG camera with *balance* for sure-footed shooting from impossible angles. With *low power consumption* that lets you keep rolling after others quit.

It's the new Harris TC-90.

The lightest, best balanced, least power-hungry, most rugged, low-profile three-tube prism ENG/EFP camera you can buy.

Only 7.9 pounds.

The basic TC-90 body weighs only 7.9 pounds, less lens, viewfinder, and battery. To realize just how light that is, the Ikegami HL-79 body weighs 13 pounds; the Philips LDK-14S is 11.9; and the Hitachi FP-22 weighs in at 11.7.

When you average the weights of the six cameras closest to the Harris TC-90, you'll find ours is 25 percent lighter.

The TC-90 is one of the smallest. But we deliberately made it a bit bigger than it had to be, to add balance and stability. A little longer, to let the cameraman grasp the lens in a natural, comfortable, controlled way. And we carefully shifted extra weight to the tail, so that the weight of the lens is counterbalanced for easy, smooth handling.

No blind-siding to the right.

The height of conventional ENG cameras blocks the sightline to your right. But the TC-90 has a low profile for peripheral viewing no other camera can equal. So you won't miss the action no matter where it happens.

That low-profile TC-90 body is built of graphite Nylon plastic, the same kind of material used for high-stress components in jet aircraft. Its strength-to-weight ratio is ideal for resisting damage from bouncing in the back of the van, from heavy weather, hostile newsmakers, inevitable accidents. The TC-90 housing should never need repair, which saves a lot of shots and a lot of money.

Inside that awesomely strong housing are, among other components, 14 LSI chips. They not only substantially reduce weight, but greatly reduce power consumption. You can keep on shooting with the TC-90 long after a conventional camera's batteries would run down. More than two hours on a fully charged 4-ampere/hour battery.

Built-ins, not add-ons.

Features that make the TC-90 a high-performance ENG/EFP camera are tucked inside, not plugged in or dangling from the outside. TC-90 on-board components include genlock, microphone amplifier, intercom amp, and CCU interface. And they're built into the price, too.

Also built in are the 24-hour Harris Hotline and service network.

Get all the specs on the new Harris TC-90 ENG/EFP camera. Fill in and mail the coupon today. Or phone. Ask for your own hands-on demonstration. You owe yourself a look at the camera somebody should have built for you a long time ago.

BE

☐Please call me to arrange a demonstration of the TC-90, lightest, best-balanced, lowest power consumption ENG/EFP camera.

☐Please send me your latest brochure.

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Broadcast Products Division
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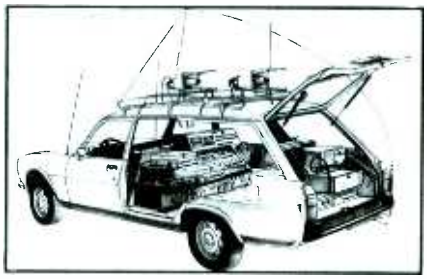
HARRIS

Circle (30) on Reply Card

International supplier

Outside broadcast vehicles from Enertec Schlumberger for radio or the aural side of television are well-known in European countries and Africa. The station-wagon-based unit includes a mixing console, two audio recorders, power amplifiers, two wireless mic systems, a 2-way radio for talkback, one or two 2-way VHF



radios for program signals, as well as cabling, mics and mic stands. Larger vehicles are also available.

Buy or rent?

This YES truck, a remote production studio on wheels, is employed by *YES Productions* of New Orleans to cover sports, musical events, pageantry of all kinds, telethons, political debates—you name it. YES Productions, a division of WYES-TV, also located in New Orleans, leases the tractor from *Lend Lease*.

Inside the trailer are five *Ikegami* 357 cameras and two *Ikegami* HL 79 cameras, along with a *Quantel* 5000, a *Chyron IV*, an *Audiotronics* 26-input audio console, a custom *RTS* intercom system, a 1600-3K *Grass Valley* switch-

er, 27 production control room monitors and three *Ampex* VPR-2B 1-inch videotape recorders.

BMS introduces GCA-ONE

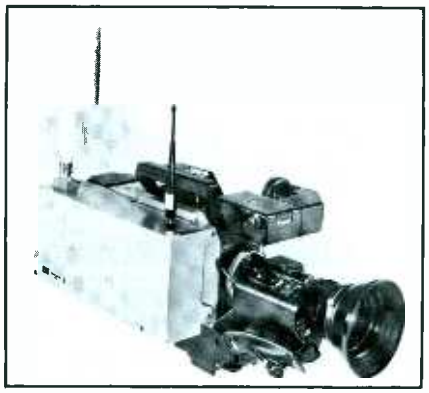
The *Broadcast Microwave Services* gyro-controlled antenna (GCA-ONE) provides stable pointing of the airborne transmitting antenna for long-range relaying. After acquisition of the link between helicopter and base station is completed, the craft may engage in standard maneuvers without additional antenna training by the crew. No further adjustment for azimuth is required as long as the craft remains within one-seventh of the initial base-line track distance from base station to relay point. Bank angles of 15° relative to line of sight will not reduce signal quality. Angles

to 55° will not upset the gyro platform. A control unit meter indicates antenna array direction relative to aircraft heading.

The radome covers an antenna system with 16dBi gain, beamwidth of 30° elevation and 17° azimuth at 2GHz. Unlimited rotation is possible with a slew rate to 60° per second. Also enclosed within the radome are the transmitter and receiver units, each frequency agile and weighing 2 pounds.

The camera/microwave link

For great versatility and complete camera mobility, *Ikegami Electronics* introduced the ML-83 microwave link at NAB-'82. The MCA microwave camera adapter, specifically designed for the HL-83 camera, transmits



camera video and program audio with an intercom audio channel in the 1.99-2.11GHz band. Any one of seven channels may be selected, while an option provides up to 13 channels. Once the link has been established, the antenna includes an automatic steering mechanism that allows a full 360° rotation. The antenna continues to transmit to that point regardless of where the camera is pointed. Distances to nearly a mile from the base station in a sector of 120° are possible.

At the base station, the 2GHz receiver separates video, audio and intercom in the TA-83 base station and RX control unit. Return information is transmitted back to the camera system in the 947-952MHz spectrum, including iris, centering, gain and pedestal controls in analog functions. Digital functions offer *bar on/off, iris manual on/off, white balance on/off, call* and *tally*. An intercom channel is also available.

HAVE IT YOUR WAY WITH HAWKEYE

Sources of ENG equipment

There are many different types of equipment that may be involved in any particular ENG operation. Sources for five of the major equipment categories have been listed here. Reader Service Numbers have been given for your convenience. For a listing of other equipment needs, please refer to the September 1982 *Buyers' Guide* issue of **BE.**

ENG battery packs and equipment for camera and VTR powering

Alexander Mfg. 245
Anton/Bauer 246
John Chiles 247
Christie Electric 248
Cine 60 249
Cinema Products . . . . . (*)
Comprehensive Video Supply 250
Enerlite Products 251
Frezzolini Electronics 252
G & M Power Products 253
Gould Battery 254
Kapco Communications 255
Multiplier Industries 256
North Wind Power 257
Perrott Engineering Labs 258
Portable Energy Products 259
Tungstone Batteries 260
Vanner 261
Yardney Electric 262

*For information, write: Cinema Products, 2037 Granville Ave., Los Angeles, CA 90025.

Equipment cases

A & J Manufacturing Company 263
A & S Case 264
Anchor Systems 265
Anvil Cases 266
William Bal 267
Calzone Case 268
Cases 269
Comprehensive Video Supply 270
Environmental Container Systems 271
Excalibur Industries 272
Fiberbilt 273
Hardigg Industries 274
Hervic 275
Innovative Television Equipment 276
K & H Products 277
KR Manufacturing 278
Star Case Manufacturing 279
Thermodyne Int'l Ltd. 280

ENG van and production units

A. F. Associates 281
AVT Television Productions 282
All Mobile Video 283
Brabury Group 284
Centro 285
ComCoach 286
Commercial Airborne Div. IFR Avionics 287
Crow of Reading Ltd. 288
Delcom 289
Dell Technical Vehicles 290
DYMA Engineering 291
Dynamic Technology 292
ENG (Electronic News Group) 293
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Conversations

Art Biggs, vice president, engineering, TV Stations Division, Corinthian Broadcasting Corporation, announced at the SMPTE convention in November that Corinthian had decided to equip its stations with the new Betacam ½-inch camera/recorder system. As such, Corinthian was one of the first groups of stations to select a ½-inch combination camera/recorder format.

Biggs coordinates major engineering purchases for the six Corinthian stations: KHOU-TV, Houston; KOTV, Tulsa, OK; KXTV, Sacramento, CA; WANE-TV, Ft. Wayne, IN; WISH-TV, Indianapolis; and WVEC-TV, Hampton/Norfolk, VA. In the following interview, he discusses why he invested in the ½-inch format and, in particular, why he chose the Betacam system.

The interview

BE: When did you begin to investigate seriously the ½-inch format and why did you select the Betacam?

Biggs: In the upcoming year, we need to replace large numbers of ENG cameras that have been in the field for five years. One of our choices was to stay in the ¾-inch format and replace only the cameras. Knowing that ½-inch equipment was just around the corner put us in a dilemma. We followed the SMPTE standards committee meetings closely. When the committee was unable to arrive at a single standard, we figured that we had to begin making our own evaluation of the situation. So we contacted Sony and other manufacturers.

At that point, we began to take a serious look at ½-inch and what the total cost to the company would be. This took several weeks—a lot of exploration into pricing, system merits and what we should do over a 5-year period. Surprisingly enough, staying with ¾-inch was going to cost a great deal of money because we had to purchase a large number of cameras up front.

I've never been ecstatic about the quality of ¾-inch, although it has improved in recent years. After seeing the results of the ½-inch playback with the R-Y, B-Y format that Sony came up with after the NAB convention, I was impressed with the quality. I was even more interested when I looked inside the machine. It looked like a broadcast-quality machine—not industrial quality. I hadn't seen the 3-tube camera yet, so we went to Sony and made some tests. Evaluation proved the camera to be excellent in performance, particularly in resolution over the field. It has superb corner resolution.

BE: You visited the Sony factory in Japan. Did you see Betacam equipment in production there?

Biggs: Yes. I saw the BVW-10 playback unit and the BVV-1 recorder in production. Lines were going and machines were rolling off the ends of the lines. It's surprising when you think that this format was not shown at NAB-'82, and six months later, production was rolling.

I haven't seen production lines like that in a long time. I was impressed by the intensity and the skills of the people involved and the way the equipment was handled from outset to completion. I never saw boards being pulled out and boards substituted as the equipment went down the line. Repair stations along the line dealt with any subsystems that did not meet testing specifications. As a result, a high percentage of completed machines met final test specs with little accumulation of defective boards or incomplete machines, thus creating minimal interference with ongoing production.

BE: As a recording system, what strengths of the Betacam impress you most?

Biggs: Betacam has several advantages. These include its size and weight compared to other choices. And the quality of the playback appears to be superior even without looking at it on test equipment. I think it's most apparent in scenes of fully saturated colors, particularly reds. Even to the eye on a monitor, it appears cleaner, with less noise. It doesn't have quite as much of the heavy, stringy-type noise as we've tolerated over the years.

In comparison with the M Format, the color components in the Betacam format aren't modulated in some manner on different carriers on the same track. They're time compressed on one track and, for all practical purposes, kept separate. You don't have the crosstalk that you might otherwise, and that's where it shows.

I also think the format lends itself to

Art Biggs at SMPTE-'82 in New York, discussing with the press Corinthian's selection of the ½-inch format.

Neil Vander Dussen (left) of the Sony Corporation and Biggs meet with the press at SMPTE, holding the Betacam which is launching Corinthian Broadcasting into the ½-inch format.

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BC4391 series	2160.00	BC4908 series	2035.00	5820A/L	3060.00	BC8134B	850.00
BC4532U	1325.00	BC4909	2145.00	7295C	2835.00	8480	1315.00
BC4592 series	2225.00	BC4992 series	2225.00	7389C	2855.00	BC8480	2015.00
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BC4594 series	2400.00					BC8541	395.00

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A toast at SMPTE for the $5 million order that firmly establishes the Corinthian Broadcasting commitment to ½-inch with Sony's Betacam system.

any future moves toward component handling within the TV station. It has the components that lend themselves readily to that.

BE: Is the job of the ENG camera operator going to be made much simpler? What will be the impact of the system at the station level?
Biggs: Our cameramen are going to be vaulted into an enviable lead—enviable, at least, to their fellow workers in the competition. It's going to take the other people a while to react to this. The cameras are lighter weight for good maneuverability, and crews will be able to stay in the field without fatigue for a longer period of time.

Breaking news stories in emergency situations require crews to be out there for a long time. They'll be able to get shots you could never get with our current production equipment because, in a lot of locations, once you set up, it's difficult or discouraging to move. You also have many pieces of equipment. But with the Betacam, it's easy to pack it up and move it to the other side of the room, get down on your knee and shoot up or whatever is required during the story. You don't have to wear a headset with it. It's got a built-in speaker for your ear on the headset. Our crews will have a big edge.

BE: What features are your stations most interested in?
Biggs: Weight, no question about it. We have 1-man crews at all stations. The camera/recorder that they take into the field weighs about 56.5 pounds on their backs, shoulders and the battery belt around their waist. We're proposing to reduce this to less than 21.5 pounds. That's a significant difference.

The cameras we have now weigh almost as much as the total Betacam unit. Also, the cameraman has a BVU-110 over the other shoulder and a rather heavy battery belt hooked around his waist. Not to mention the cables to the battery belt and to the recorder. The cables continually create maintenance problems.

BE: How important is the improved picture quality of the Betacam ½-inch format?
Biggs: It's important. But, truthfully, viewers will not be as aware of the improved quality as we might wish. That's true whether you buy a new transmitter or a new studio camera. The average viewer is not very aware of it. Especially given the fact that ¾-inch has improved. But looking at the long haul, in a 5-year context, you have to reach out and get the best quality you can with state-of-the-art equipment over a long period of time. Otherwise, at the end of the five years, instead of being a little bit behind, you're going to be woefully behind. Then the viewer would be more likely to notice.

Another Betacam plus is that it's not a patchwork approach. It's a system developed from the camera to the recorder and the player, and I think we're going to see a lot more developments in this system to enable it to be even more integrated in station operation.

BE: Do the stations plan to use Betacam equipment in work other than ENG?
Biggs: Yes. Each station, with the exception of one of the small ones, has at least two production crews. One of the production crews has the responsibility of shooting on-location commercials, on-location public service—any demands the station has for on-location production. The other production crew is involved in a Corinthian project requiring production of a daily 1-hour show. Each station contributes material to be included in a core show produced by Corinthian field teams around the country. In 1984, we will complete the conversion to Betacam by equipping our production crews with the equipment. That's part of the second step.

I think the ½-inch is so good that we're talking ENG now, but there's no good reason why ½-inch can't be put to a lot of other uses.

BE: What uses do you envision?
Biggs: Show-length tapes, half-hour shows—the quality is hardly discernible from 1-inch quality. People would think a long time before committing a prime time show to ¾-inch for airing. That's not a limitation of ½-inch.

BE: Have you compared operating costs? How does ½-inch compare with ¾-inch? Is it more economical?
A: It's a little early to tell because we haven't pinned down the actual cassette cost. It appears there's not going to be a huge saving there. It might be as much as $10,000 a year. Betacam battery costs should be a significant savings, however. The MP-1 battery is really an industrial, almost consumer-type item at an attractive price—$60 compared to $425 to $495 for other batteries and belts, or even the Sony BP-90 that costs about $300.

BE: Do you believe there will be standardization in the ½-inch area?
Biggs: It would be nice. It doesn't bother me terribly that there isn't a standard, which is evidenced by the fact that we have gone with the Betacam. I think there will be some tape interchange that's already established on ¾-inch that will stay because everybody's got ¾-inch players in their offices. I don't think they're going to change right away. The bottom line, though, is that there's little interchange of news tapes between stations. The news crews go out into the field, come back, edit their own stuff, play it and reuse the tape cassette the next day. We build 99% or more of the stories to feed our own newscasts. It's almost an autonomous operating entity in the stations.

BE: When do you expect delivery of your new systems?
Biggs: It is phased, with the first cameras to be delivered in the spring of 1983. We'll first shoot in ½-inch, then edit in ½-inch and, finally, broadcast in ½-inch. We should be totally converted by 1984.

BE: What is the size of this commitment to ½-inch by Corinthian?
Biggs: We're looking at 75 cameras and support equipment at a package price exceeding $5 million.

Editor's note:
Our *Conversations* articles provide a means of introducing new key people in broadcasting to our readers; a platform from which leaders in radio and television can voice opinions on broadcast issues; and a vehicle by which leaders in manufacturing plants can explain their positions in the marketplace.
In keeping with the purposes of these reports, Art Biggs, vice president, Corinthian Broadcasting Corporation, was interviewed concerning Corinthian's decision to equip its stations with the new Betacam ½-inch camera/recorder format.

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Once you look into an Ikegami monitor, chances are you may never look into buying a monitor from anyone else. And it's no wonder, since every Ikegami monitor is designed by the same demanding engineers who have succeeded in making Ikegami cameras synonymous with performance and reliability.

Look around. If you think you're seeing more Ikegami monitors at NAB, network and independent stations, professional studios, remote vans and corporate facilities in general, it's because you are.

Fact is, when you look into the Ikegami 8-Series standard and high resolution color monitors, you'll see more than 13V and 19V monitors (23V standard resolution monitor available). You'll see a host of standard features, from American Standard Matched Phosphors (not available on 23V) to a Shadow Mask Dot Matrix CRT to an Active Convergence Circuit to Delta Gun tubes and more. And you'll see a product name that says exceptional quality—every time.

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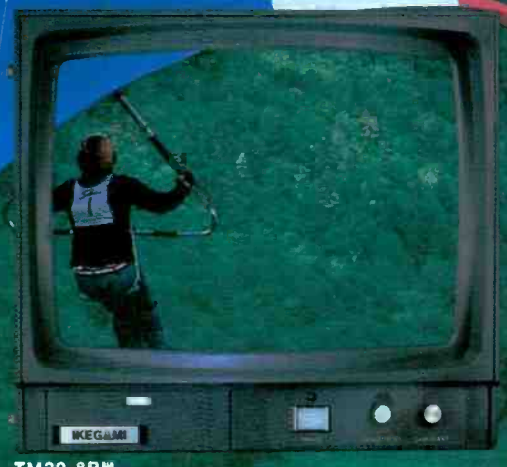
TM14-8R

TM14-2RHA

TM20-8R



TM20-8RH

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ENG camera update

Ikegami HL-79A

By Carl Bentz, technical editor; and Bill Rhodes, editorial director

For some years, the trend has been to miniaturize cameras as much as possible. Now, with many ENG cameras weighing less than 20 pounds, including viewfinder (and in some cases, a lens), the trend is toward operational ease and adaptability. Economics have called for cameras that required less operator adjustment during use, whether in the field or the studio. Almost all of the models listed in this roundup can be adapted to both applications. After all, if the investment must be made for ENG activities for news and other outside production shots, why not use that same equipment in the studio?

Information for this listing was requested from manufacturers. Materials received were augmented with information from our files in the BE data library. Generally all models listed are of 3-tube design with prism-optics. Most include automatic circuitry for setup and operational convenience with IC devices within the camera heads. Some include microprocessors (μP) that handle critical functions such as centering and registration. Several single-tube systems have been included, when they seem to meet the needs of less critical production applications. Video recording camera systems (VRCs) are also found within the listings. The combo VRC technology has quickly evolved into an acceptable format for the industry.

For space considerations, pickup tubes and devices have been abbreviated in this roundup. The following key lists those abbreviations. Tube patent/license holders of the various types follow in parenthesis.

CCD	Charge Coupled Device (NEC)
DGLO	Diode-gun Lead Oxide
DGP	Diode-gun Plumbicon (Philips)
HBST	High Band Saticon Trinicon (Hitachi)
L	Leddicon (EEV)
LOCP	Low Output Capacitance Plumbicon (Philips)
LO	Lead Oxide Vidicon
MOS	Metal Oxide Semiconductor (Hitachi)
P	Plumbicon (Philips)
S	Saticon (Hitachi)

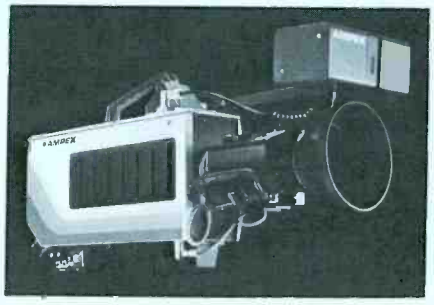
Bingo numbers have been given for most models for your convenience in obtaining further information on particular cameras.

AMPEX CORPORATION

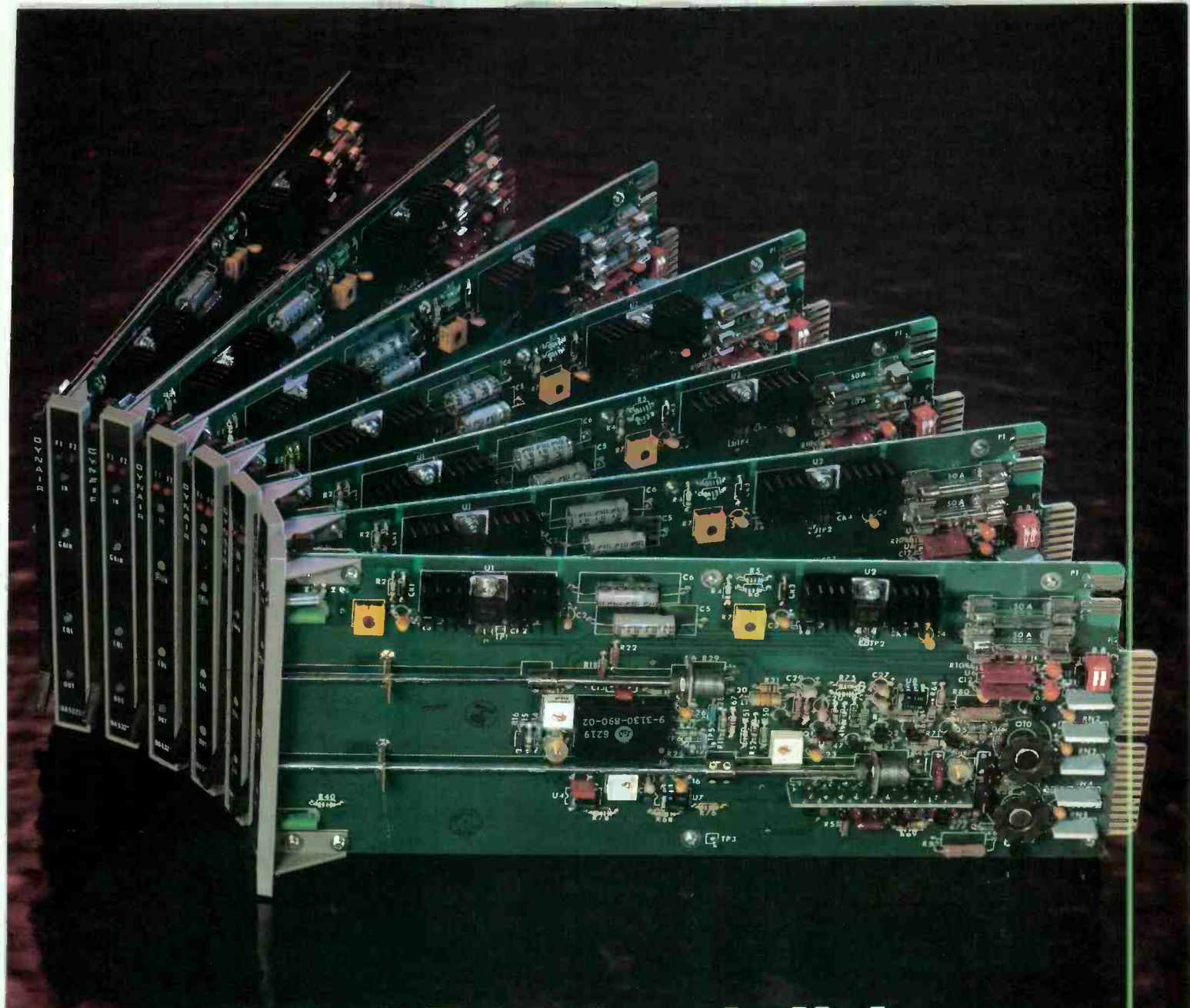
BCC-20 Digicam

Tubes: 3; P, DGP, L, S; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 53dB NTSC
Sensitivity: 200fc, f/4
Registration: 0.05%, SEC
Geometry: 0.1%, SEC
Resolution: 45%, P, DGP

Special Error Correction (SEC) combines with RGB horizontal aperture correction, H and V contours from green, mixed highs processing and noise reduction circuits. Automatics include beam control, iris, black/white balance and optional centering. Interchangeable system modules allow encoded video, triax, multicore and



Ampex BCC-20



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fiber-optic outputs. Microprocessor-controlled camera head converts to BCC-21 for studio. Weight of camera is 18 pounds.

Circle (201) on Reply Card

FPC-10(P)(S)
Tubes: 3; P, S; ⅔-inch
Optics: Middle index prism
S/N ratio: 59dB P, NTSC
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.5%
Geometry: <2%
Resolution: 600 lines

Two-line vertical aperature correction enhances video, with automatic

Ampex FPC-10

black/white balance, beam stretch and iris circuits for operator ease. The camera combines with the FPR-10 ½-inch M Format recorder to form the ARC-10 VRC system. The ARC-40 studio recorder and ARC-30 editing controller complete the system components. The combined camera/recorder unit weighs about 22 pounds.

Circle (202) on Reply Card

BOSCH/FERNSEH
KCA 100
Tubes: 3; P; ⅔-inch
Optics: Prism
S/N ratio: 53dB NTSC
Sensitivity: 125fc, f/2.8
Registration: 40ns, 80ns, 160ns
Geometry: 0.5%, 1%
Resolution: ≥40% G, 5MHz

H and V contour correction involves two delay lines with comb filtering

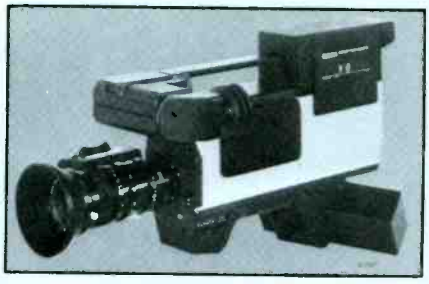
Bosch-Fernseh KCA 100

and level dependent coring. Black-and-white balance, iris and optional centering are automatic functions, as is beam control. Operation is possible with multicore and optical fiber cables, as well as with VTRs. Camera head weight is 13.6 pounds.

Circle (203) on Reply Card

KBF 1

Designed for use with a compact videocassette recorder, the KBF 1



Bosch-Fernseh KBF 1

forms a VRC system for easy field recording. Three ½-inch Plumbicons handle image pickup. Color balance, iris, video gain and beam control are automatically handled, including a memory for balance setting. The recorder uses ¼-inch CVC tape cassettes for approximately 20 minutes recording time. In the Bosch *Lineplex*

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In addition, standard features of the CVS 516WB include a 16 line window, with Gyrocomp, to correct your worst tapes. And, for better editing, Automatic Vertical Centering eliminates sync reset and throughput delay ambiguity.

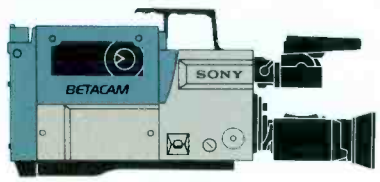
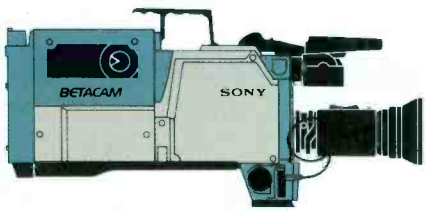
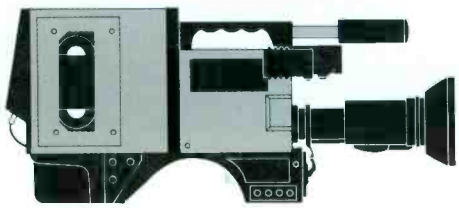
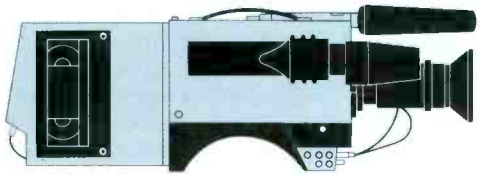
The CVS 516WB also features a DOC and chroma noise reduction. Plus a broadcast stable, gen-lock sync generator and a full proc amp with preset level controls.

For details about, and a demonstration of, this new generation TBC, contact your Authorized HVS Distributor, or HVS, today. Be sure to ask for our popular booklet about the advantages of digital time base correction when you call or write: Harris Corporation, Harris Video Systems, 1255 East Arques Avenue, Sunnyvale, CA 94086 (408) 737-2100.

HARRIS

Circle (42) on Reply Card

VERY VITAL FOR PRUDENT

Camera/Recorder Drawn In Scale	Weight In Pounds*	Length In Inches†
One Tube 	17.8	14.9
Three Tube 	21.9	17.1
Three Tube 	24.7	17.5
Three Tube 	27.6	21.5

*Includes camera, lens, viewfinder, recorder, battery. †Lens excluded. **Camera, lens, battery, battery charger, recorder, playback unit.

Logic dictates that before you invest in a camera and ½″ recorder system you should shop around. Carefully comparing such criteria as size, weight, image-making capability and price.

So we arranged a little shopping guide based on specifications from our competitors' 1982 brochures and our own. The results are quite revealing.

For news-gathering, the Sony Betacam™ one-tube with 400 resolution lines has striking advantages over the alternatives. While for field production the Sony Betacam three-tube with 650 resolution lines and 58dB signal-to-noise is superior to them all.

Of course, both Betacams have still more advantages that have not been included in the chart.

Physical advantages like the removal of most of the troublesome cables from the viewfinder, lens, mic to camera and camera to recorder.

Technical advantages like a recording format with both

STATISTICS CAMERAMEN.

Power Consumption In Watts*	Signal To Noise Camera dB	Signal To Noise Recorder dB	Price**
22	54	Lum Chrom 48/50	$38,500
31	58	Lum Chrom 48/50	$51,500
27	58	Lum Chrom 47/48	$62,000+
40	55	Lum Chrom 47/48	$70,000+

timebase corrector, carrying case. Based on estimated suggested manufacturer's retail price. All figures based on Saticon® Tubes.

a chrominance bandwidth and signal-to-noise performance greater than the competitions'; wideband chrominance components with no crosstalk or other artifacts; built-in Dolby® C noise reduction for high-quality audio; and most important, the playback unit has built-in TBC (an option on the competitions' units) providing full broadcast-quality output.

Betacam also offers major financial advantages beyond those shown. Namely, sparing you from having to invest in a whole new editing suite. It interfaces perfectly with the Sony U-matic® and one-inch suites you use now.

Betacam was planned as the logical progression of the total Sony Broadcast system. To find out just how logical, contact your Sony representative in New York/New Jersey at (201) 368-5085; in Chicago at (312) 860-7800; in Los Angeles at (213) 841-8711; in Atlanta at (404) 451-7671; or in Dallas at (214) 659-3600.

SONY® Broadcast

helical-scan format, auto assemble edits are included with two audio tracks and integral time code generation. Without lens the system weighs 15 pounds.

Circle (204) on Reply Card

CAMERA MART
EC-35, HL-79, HL-83 *(See Ikegami)*
XC-700 *(See Sharp)*

CINEMA PRODUCTS CORPORATION
EC-36 *(See Ikegami)*
MNC-81A *(See NEC)*

HARRIS BROADCAST
TC-90
Tubes: 3; P, S; ½-inch
Optics: Prism
S/N ratio: 55dB NTSC
Sensitivity: 56fc, f/1.4
Registration: 0.1%, 0.2%, 0.3%
Resolution: 600 lines

Contours are taken from green, along with H and 2-line V enhancement. The system also includes comb filtering and coring for picture sharpness with minimum noise. Black-and-white balance, iris control and centering are all automatic, with beam optimization circuitry included. A digital CCU is available to use with up to 5000 feet of coaxial cable. VTR and stand-alone operation is also possible. Camera without lens weighs 7 pounds.

Harris TC-90

Circle (205) on Reply Card

HITACHI DENSHI AMERICA LTD.
FP-22
Tubes: 3; S; ⅔-inch
Optics: f/1.4 prism, biased
S/N ratio: 55dB NTSC
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Geometry: 1%, 2%
Resolution: 580 lines, green

2H contour correction with comb filtering sharpens the video. Microprocessor-based circuitry offers auto black-and-white balance, centering, pulse canceling and fault diagnosis, as well as auto iris. The camera may connect to other equipment by coax or multicore cables. A remote operation panel is available for studio use. Without lens and viewfinder, the unit weighs 11.7 pounds. (The FP-21 does not include the μP-controlled feature of functions.)

Circle (206) on Reply Card

SK-91
Tubes: 3; S, P; ⅔-inch
Optics: f/1.4 prism, biased
S/N ratio: 57dB NTSC, Y
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Geometry: 1%, 1.5%
Resolution: 550 lines

Hitachi SK-91

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with General Electric Professional Large Screen Video Projection

With General Electric's exclusive system for bright, sharp professional-quality pictures, up to 25 feet wide, General Electric Professional Large Screen Video Projectors are making presentations more dramatic, more productive, and more convenient.

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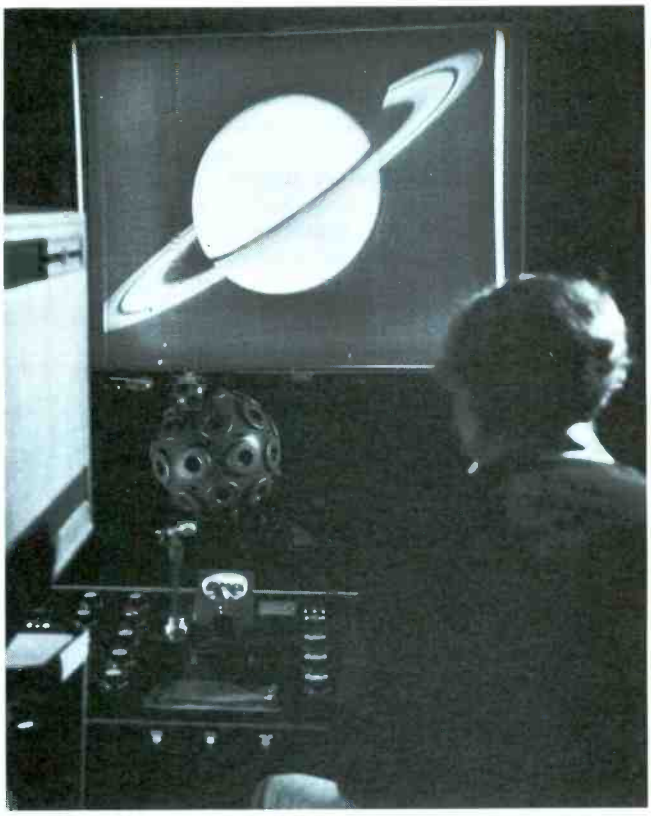
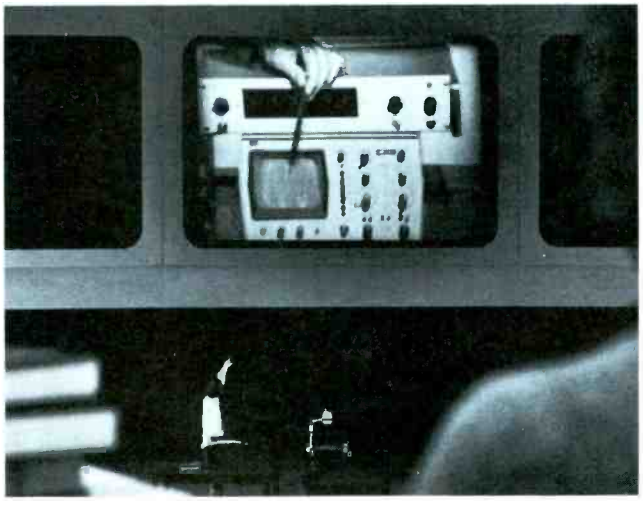
Television Production: Backgrounds for news programs, special effects, data display, program previewing.

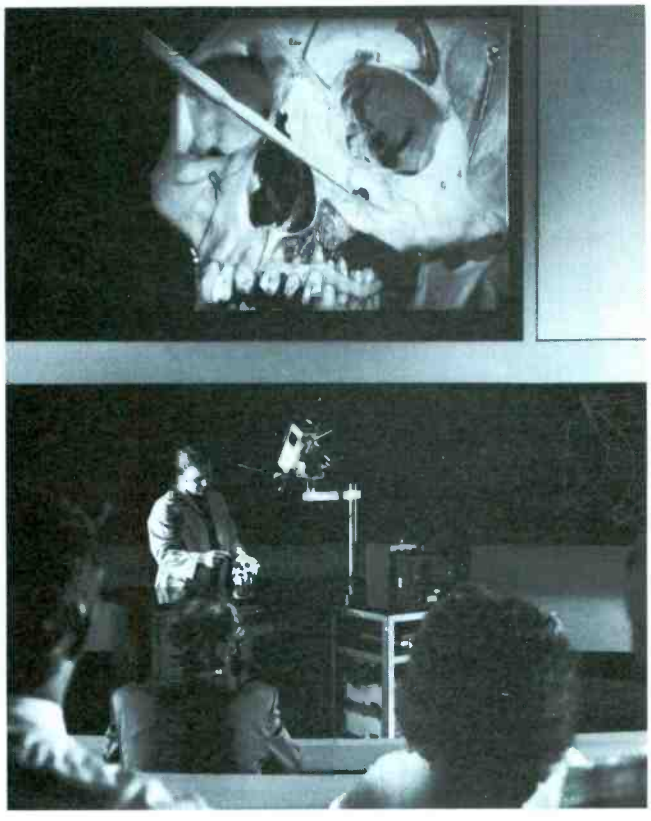
Call or write: General Electric Company, Projection Display Products Operation, Electronics Park 6-206, Syracuse, NY 13221. Phone: (315) 456-2152.



SELL-OUT CROWDS at Fiske Planetarium, Boulder, watched live NASA transmission presented by General Electric projector.



ENGINEERING INSTRUCTION displayed by General Electric projector in 820-seat auditorium at University of Cincinnati.



MINUTE DETAIL ENLARGED by General Electric projector for 150-student classes at Upstate Medical Center, Syracuse.

GENERAL ELECTRIC

Circle (43) on Reply Card

2W correction, vertical out-of-green signals and level dependent coring with comb filtering increase sharpness with minimum noise. Automatic circuits control the iris and black-and-white balance. Various output formats allow connection to recorders. A camera cable allows connection to an operating panel for studio applications. Camera weight with viewfinder is 9.7 pounds.

Circle (207) on Reply Card

SK-11
Tubes: 3; P; ⅔-inch
Optics: Prism
S/N ratio: 55dB, NTSC
Sensitivity: 200fc, f/4
Geometry: 0.1%, 0.2%, 0.4%
Resolution: 550 lines, green

Designed to closely match the SK-110 studio camera system, the SK-11 may be set up with the same automatic ease. Color balance, registration, H and V centering, size, linearity and skew are handled with μP-controlled designs. The camera talks in serial data with the CCU through a 24-conductor cable up to 2000 feet. Weight with viewfinder is 10 pounds.

Circle (208) on Reply Card

The go-anywhere ENG camera

At IBC-'82 and in his article for our December 1982 issue, Julius Barnathan, president, Broadcast Operations and Engineering, ABC, New York, called upon the industry to develop a *go-anywhere* camera for international ENG coverage. The industry is not at that stage in equipment design yet; broadcasters still have to use separate systems in countries that operate on differing standards.

The Sony Betacam: supposedly cards can be interchanged to adapt the camera to NTSC or PAL standards.

However, the industry is moving closer to the ideal situation called for by Barnathan and other broadcasters. Sony's Betacam system, as shown at the SMPTE meeting in New York in November, exemplifies how the industry is progressing. Sony is not making a big deal of it, but according to booth personnel, the side panel can be removed from the Betacam (as shown) and cards can be interchanged for NTSC or PAL formats. True, this is not as easy as a *flip-the-switch* design, but it is a move in the direction sought by broadcasters.

The VRC has arrived

The era of the video recorder/camera (VRC), or video camera-recorder combined system, has arrived. Introduced at NAB-'81/Las Vegas, these systems sparked high interest among broadcasters. However, acceptance has been somewhat slowed by natural caution for new systems introduced, but the real problem has been delivery. 1983 should be the turnaround year as broadcasters begin receiving production units.

Manufacturers have been quick to point out the advantages of these new systems for ENG/EFP work. To help substantiate the systems' capabilities, they have run exhaustive tests for comparative purposes. At the SMPTE convention in New York in November 1982, RCA showed press editors comparison data for the Hawkeye vs. ¾-inch and 1-inch Type C systems. (See Table I.) The data speaks for itself.

Table I.
Performance comparison – NTSC

	¾-inch	Hawkeye	1-inch Type C
Luminance bandwidth	2.5MHz	3.6MHz	4.2MHz
Luminance S/N ratio	46dB	47dB	48dB
Transient response (K-factor)	6%	2%	1%
Chrominance bandwidth	0.3MHz	1MHz	1.5MHz
Chrominance S/N ratio	38dB	48dB	48dB
Chrominance/luminance delay	100ns	30ns	25ns

SK-1
Tubes: 3; MOS; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 49dB, Y channel
Sensitivity: 200fc, f/2.8
Resolution: 450 lines

Contour correction is included in this solid-state pickup camera. The many usual adjustments for registration and geometry are not needed. Automatic color balancing is digitally accomplished and stored in memory.

Hitachi SK-1

Auto iris is smooth from average and peak mixed values. Video is available for various recorders through BNC or 14-pin connectors. The 7.7-pound weight includes the viewfinder.

Circle (209) on Reply Card

SR-1, SR-10
The SR cameras use the SK-1 camera packaged for VRC operation.

Hitachi SR-10

The SR-1 uses the ¼-inch compact videocassette for recording and the ECR-5 editing VTR in the studio. The SR-10 system employs the ½-inch M Format, with studio compatibility in the ECR-50 editing VTR. Weight of the ¼-inch equipment includes viewfinder, lens, battery and tape cassette at 16.4 pounds. For the ½-inch system with battery, tape and viewfinder, total weight is 20.3 pounds.

Circle (210) on Reply Card

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Circle (44) on Reply Card

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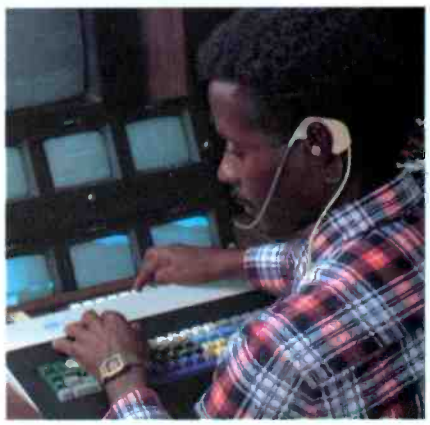
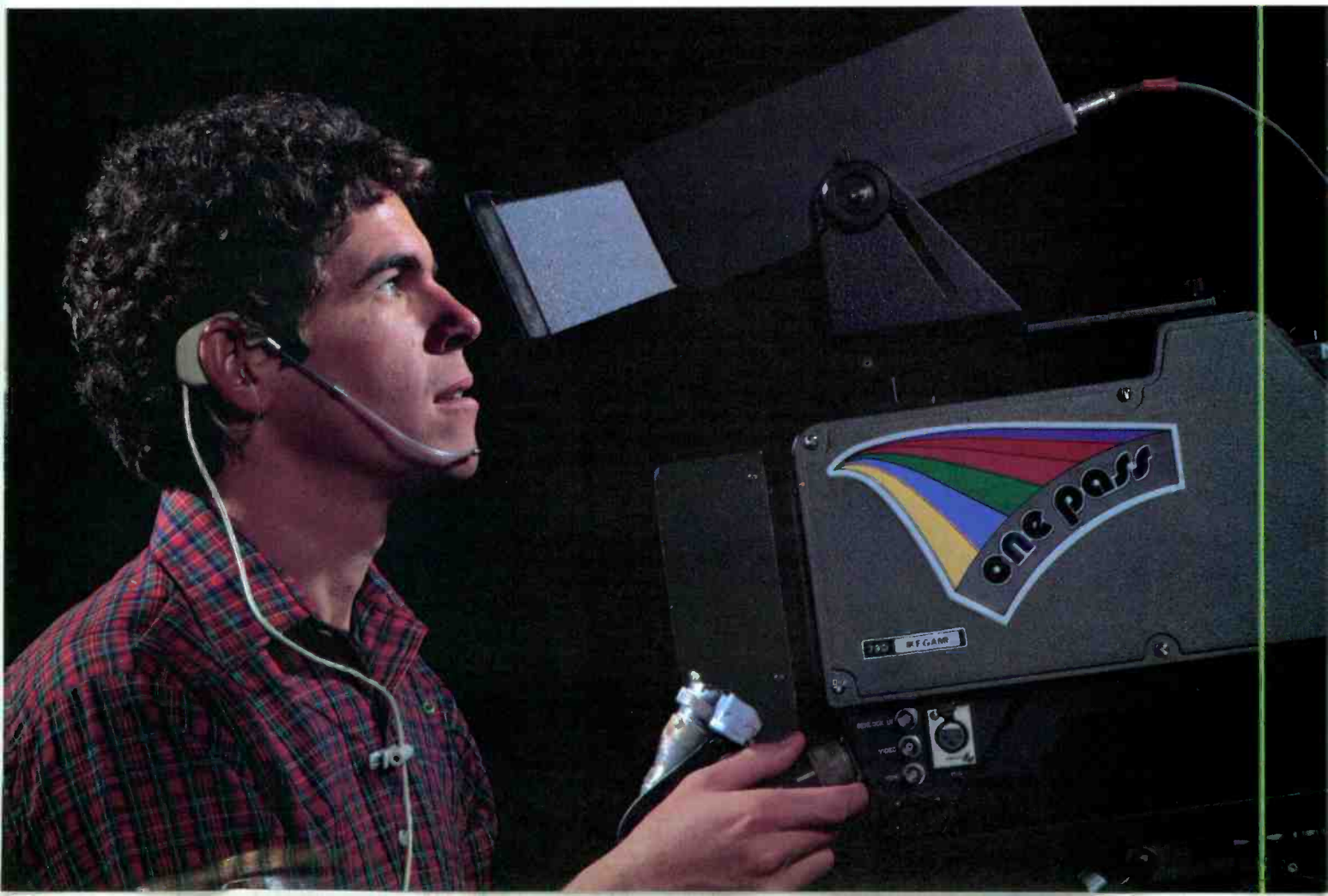
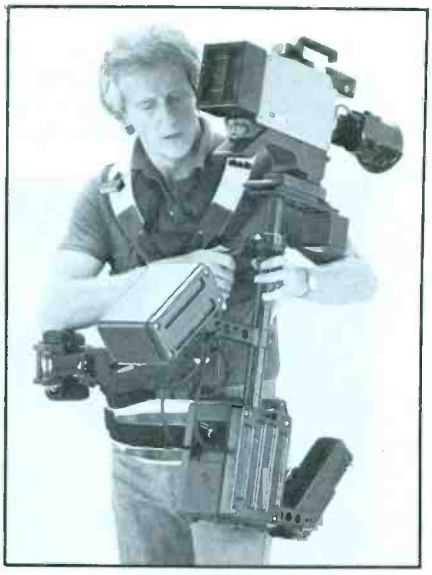




IKEGAMI ELECTRONICS (USA)
HL-83
Tubes: 3; P, S; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 55dB
Sensitivity: 200fc, f/4.5
Registration: 0.1%, 0.2%, 0.6%
Geometry: 1.5% overall, 2%
Resolution: >500 lines

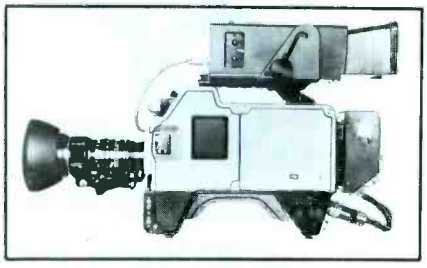
Coring, noise slicing and comb filtering are incorporated for increased sharpness and minimum noise. Auto beam control, white balance and iris control reduce operator requirements. Various adapter packages allow interface to an M Format recorder for VRC operation, a gen-lock system, the MA-83 multicore adapter for TV39 cable and a remote control adapter. Also, a portable microwave link system, ML-83, is available. Camera head less lens and battery weighs 9.7 pounds.

Circle (211) on Reply Card



Ikegami HL-83

HL-79A
Tubes: 3; DGP, P, LOCP, S; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 57dB, LOCP
Sensitivity: 200fc, f/5
Registration: 0.1%, 0.2%, 0.5%
Geometry: <1.5% overall
Resolution: >600 lines



Ikegami HL-79A

Detail correction includes coring, noise slicing and comb filters. Operational convenience is provided by automatic color balance with black stability and iris control. Adapters for multicore (MA-79) or triax (TA-79) cables and for conversion to the HL-790A studio system are available. Weight with viewfinder is approximately 15 pounds.

Circle (212) on Reply Card

EC-35
Tubes: 3; LOCP; ⅔-inch
Optics: Prism w/light bias
S/N ratio: 57dB
Sensitivity: 250fc, T/4
Registration: 0.05%, 0.1%
Resolution: 400 lines

Designed for electronic cinematography, setup is accomplished through μP circuitry. Image enhancement and out-of-band aperture correction are proportionally mixed. Gamma circuits match those of film. The operator familiar with film camera systems is free to shoot without making video adjustments. The T/stop lens retains a feeling of familiarity. Weight, including viewfinder, is less than 22 pounds.

Circle (213) on Reply Card

Now there's even more to look into

TM14-9RH

TM20-9RH

Ikegami's new Broadcast Color Monitors

Ikegami has just made it impossible for any quality-minded high resolution color monitor user not to consider looking into an Ikegami monitor.

They call it the 9-Series, two new monitors (13V and 19V) with standard features that include a High Resolution Shadow Mask CRT with a Self-Converging In-Line Gun; American Standard Matched Phosphors; a Comb Filter to preserve luminance resolution; pulse cross and R-Y/B-Y outputs. We think you'll call it just what you've been looking for.

Along with its streamlined design and easily serviced modules, Ikegami's new monitors follow in a tradition of excellence. Each offers high stability, exceptional performance and proven reliability.

Together with Ikegami's Delta-Gun Series, the 9-Series provides yet another reason to look into the monitors that more and more video users are spending their time looking into.

Isn't it time you looked into Ikegami monitors?

Ikegami

9-Series monitors

Ikegami is the supplier of Color Monitors to ABC for its coverage of the 1984 Winter and Summer Games.

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Circle (46) on Reply Card

ITC-730
Tubes: 3; S; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 54dB or better
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Geometry: 1%, 2%
Resolution: 600 lines

H and V detail correction is incorporated with a 2H corrector optional.

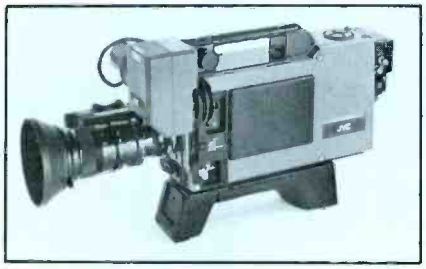
Ikegami ITC-730

The iris and white balance are automatic with an 8-bit memory for white balance. A beam stretch circuit aids highlight control. The system may be used as a stand-alone, genlocked through coax or through the CCU-730 control unit. Weight of the camera and a 1.5-inch viewfinder is 11.4 pounds.

Circle (214) on Reply Card

JVC COMPANY
KY-2700A
Tubes: 3; S; ⅔-inch
Optics: Dichroic mirrors
S/N ratio: 54dB
Sensitivity: 230fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Resolution: 600 lines Y

2-V and 2-H enhancement operate with contours from green for picture



JVC KY-2700A

clarity. Automatic circuitry handles white balance (with 8-bit digital memory), black stabilization and level as well as iris control and beam current optimizing. With the ENG configuration designed for VTR or standalone operation, the system may be used with the RS2000 remote control unit and 980 feet of multicore cable. A weight of 12.6 pounds does not include the viewfinder.

Circle (215) on Reply Card

KY-1900U
Tubes: 3; S; ⅔-inch
Optics: Dichroic mirror
S/N ratio: >52dB
Sensitivity: 230fc, f/4
Registration: 0.1%, 0.4%, 0.8%
Resolution: 500 lines green

2-H and line V enhancement is used in the KY-1900U system with contours taken from green. White balance with digital memory, black stabilization and iris control are automatic, along with beam optimization. Operation with 195 feet of multicore cable and the RS1900 control unit is possible. Without viewfinder, the camera head weighs 7.7 pounds.

Circle (216) on Reply Card

LINK ELECTRONICS LTD.
MNC82A *(See NEC)*

MARCONI ELECTRONICS
B3295
Tubes: 3; S; ⅔-inch
Optics: Prism
Sensitivity: 132fc, f/2.8
Registration: 0.1%, 0.2%, 0.4%
Geometry: 1%, 1.5%

Two-line horizontal and vertical correctors are complete with comb-filtering and coring circuitry for low noise, sharp pictures. Automatic facilities include auto iris, color balance and beam optimization. The camera may be operated self-contained, with a VTR, with multicore, coax or triax cables. RF digital operation is possible. Camera and viewfinder weigh 18.7 pounds.

Circle (217) on Reply Card

B3270 Mark IX portable
Tubes: 3; LO; 1-inch
Optics: Prism
S/N ratio: 59dB NTSC
Sensitivity: 100fc, f/2.8
Registration: 40ns, 80ns, 120ns
Geometry: 0.25%, 0.5%, 1%
Resolution: to 100%, 5MHz

Aperture correction, automatic registration and centering are available for easy setup. Also, color balance, master black, iris and dynamic gain may be controlled automatically or manually. Approximately 300 feet of multicore cable connects the camera to the CCU, unless the triax adapter is desired for almost 5000 feet of separation from the CCU. Camera and viewfinder weigh 16.5 pounds.

Circle (218) on Reply Card

NEC AMERICA
MNC-80 series
Tubes: 3; P, S, DGP; ⅔-inch
Optics: Prism
S/N ratio: 54dB NTSC

MODEL DSS-11 DIGITAL STILL-STORE

MEETS THE FIVE ESSENTIAL CONDITIONS FOR STILLS.

1. Simple operation. (Touching the digital still-store causes it to be operated instantaneously and freely.)
2. Fast read time. (0.35 seconds for 1 field, 2 fields, and 4 fields storage)
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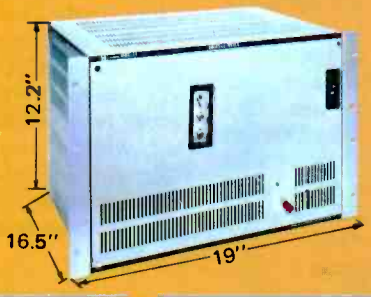

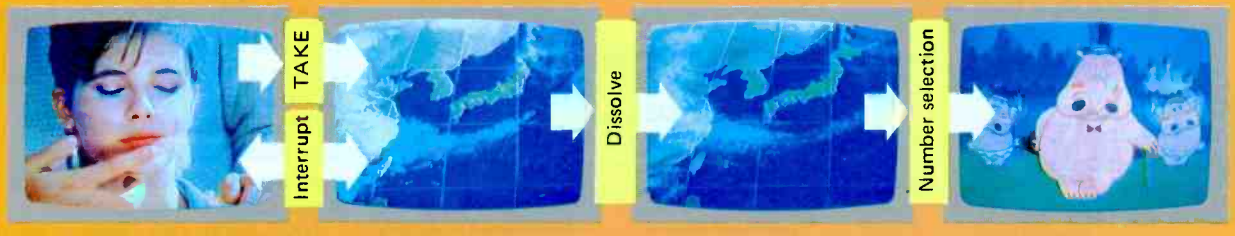

- Only the body and operation board need be purchased.
- Simple installation. Simply connect the body and operation panel with a 1 cm diameter cable.
- Program transmission possible.
- Convenient AS mode for emergency picture transmission. AS is the abbreviation for "picture after setting" and is used for picture material that arrives after transmission preparations are complete and for emergency messages. For example, if the AS switch is pressed, then 0 ~ 9 is pressed, the AS image is inserted directly during LIST transmission or in the next picture and operation is resumed according to that LIST.
- The output picture is switched over to the next picture under two modes;
  One with common switch and the other under dissolve (switched over to the next picture as if the last picture is dissolved).
- Control can be made by three types of monitor connection. Control can be made thoroughly with any method. Moreover, the comment can be watched on a 9" monitor.
  1. Use one unit of on-air color monitor.
     Operate by watching the on-air image output with comment.
  2. Use one unit of on-air color monitor, and one unit of next preview color monitor.
     Operate with the on-air image output and next preview output with comment connected to the on-air monitor and next monitor respectively.
  3. Operate with the on-air image output, next preview output and comment output connected respectively to the on-air monitor, next monitor and monochrome monitor.
- The operation panel is small enough (1/2 letter size) to be installed anywhere.
  Alphabetic comments are also included.
- The switch section of the operation panel can be removed and used up to 3 m away through an extension cable.
  Therefore, the operation board can be freely designed by installing the switches at the desired desk and connecting them to the operation panel with this extension cable.
- All operations which can be performed from the standard operation panel can also be remotely controlled from an external EDP.
- For the additionally installed disk, series connection which increases image capacity and parallel connection which makes the system to presently used type and stand-by type can be switched over by the switch in the main unit.

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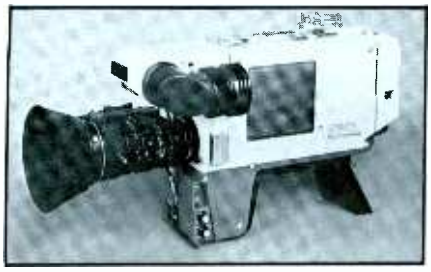
Phone 213·462·8945

Circle (48) on Reply Card

Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Geometry: 2% overall
Resolution: 500 lines

Contours out of green and a 2-line enhancement improve sharpness of the picture with minimum added noise. Centering, beam optimizing,



NEC MNC-81A

iris and beam control are handled by the circuitry for operator convenience. The camera may operate with a VTR, through multicore cable to 900 feet or 3000 feet of coaxial cable. Weight, without lens, is 11 pounds. The series includes the MNC-81 (NTSC), MNC-82 (PAL), MNC-83 (SECAM) and MNC-84 (PAL-M).

Circle (219) on Reply Card

NC-2000
Pickup devices: 2; CCD
Optics: "C" mount lens
S/N ratio: 46dB
Sensitivity: 114fc, f/4
Resolution: ≥240 lines

Two solid-state CCDs, one for green and one for red/blue, sense incoming light through filters. The fixed placement of the 489Vx384H element structure reduces registration and geometric errors once an original mechanical adjustment is made. An optional remote control unit is available for this lightweight unit.

Circle (220) on Reply Card

PANASONIC COMPANY/VIDEO

WV-777
Tubes: 3; S; ⅔-inch
Optics: Prism w/bias
S/N ratio: 55dB
Sensitivity: 190fc, f/4
Registration: 0.1%, 0.3%, 0.6%
Geometry: <2%
Resolution: 550 lines

1H and V image enhancers aid image crispness with beam control

Panasonic WV-777

reducing highlight overload. Automatic white and black circuits are digital. Y/C video and NTSC outputs are available. 14-pin, 32-pin and BNC connectors offer adaptability of application for ENG or studio in a camera head weighing 10.3 pounds.

Circle (221) on Reply Card

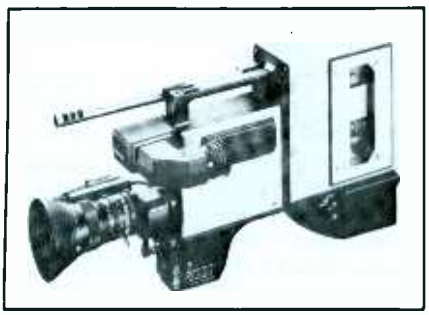
AK-710
Tubes: 3; S; ⅔-inch
Optics: Prism
S/N ratio: 52dB
Sensitivity: 200fc, f/3.5
Registration: 0.1%, 0.4%, 0.8%
Geometry: 2%
Resolution: 500 lines

Vertical enhancement and horizontal aperture correction are standard features, as are feedback beam control, auto white balance and auto iris. BNC, VTR and multicore cable connectors allow adaptable use. The system operates with the AK-7260 CCU. Camera weight with viewfinder is 11.7 (13.5) pounds. The AK-760 differs in type, but is similar in other specifications to the AK-710.

Circle (222) on Reply Card

RECAM (B-100S/P)
Tubes: 3; S, P; ⅔-inch
S/N ratio: 53dB S, 59dB P
Resolution: 550 S, 600 P lines

Two-line vertical enhancement, black stretch and corner registration



Panasonic RECAM

are offered with feedback beam control for operator ease. Automatic white and black balance with iris circuitry reduces adjustment needs. The RECAM camera section (AK-100) may be operated separately or with the RECAM AU-100 recorder for VRC operation. The system is backed in the studio with the AU-300 editing recorder, using the M Format of Y, I and Q video components. The B-100 VRC system weighs approximately 22 pounds.

Circle (223) on Reply Card

WV-3990B
Tubes: 1; S; ⅔-inch
Optics: Stripe filter
S/N ratio: 59dB Y

Panasonic WV-3990

Sensitivity: 140fc, f/4
Resolution: 300 lines

H and V aperture correction are used with beam control for applications in which slightly reduced picture quality may be considered. A digital white balance circuit includes a 6-bit memory. Options are available for studio use through a 19-conductor cable, with VTR operation through a 10-pin connector. Weight is 9.7 pounds in ENG configuration. (The WV-3890B is similar, but offers a 6:1 zoom lens, while the WV-3990B is fitted with a 12:1 unit.) Other 1-tube cameras include the WV-3150/3160 series and the WV-3400 series.

Circle (224) on Reply Card

PANAVISION ELECTRONICS (CEI)

CEI 340 American series
Tubes: 3; DGP, S, P; ⅔-inch
Optics: Prism
S/N ratio: 52dB
Sensitivity: 68fc, f/1.7
Registration: 0.1%, 0.2%, 0.3%
Resolution: to 500 lines

Horizontal and vertical coring circuits keep pictures crisp with automatics handling color balance, centering and iris control. The beams are optimized. The system may operate on 2400 feet of multicore cable with a CCU. Weight without a lens system is 21 pounds.

Circle (226) on Reply Card

PanaCam reflex electronic cinematography camera

The PanaCam enhances the CEI 310 camera with Panavision lens and operator-friendly controls for film-style operation.

Circle (227) on Reply Card

PHILIPS BROADCAST GROUP (CENTRAL DYNAMICS CORPORATION)

LDK 14LS
Tubes: 3; P, LOCP, DGP; ⅔-inch
Optics: Prism
S/N ratio: 57dB NTSC
Sensitivity: 75fc, f/2.8
Registration: 0.1%, 0.2%, 0.4%
Resolution: 400 lines

A 2-line image correction system includes coring and comb filter for picture sharpness. Automatic iris, color balance, centering and beam control

If you're a user of the current OPTIMOD-FM or OPTIMOD-TV, all it takes to optimize the available S/N of your phone lines or dual microwave STL is our new, economical Studio Accessory Chassis. By splitting the OPTIMOD system (putting the multiband compressor portion at the studio site of the STL), the Studio Accessory Chassis lets you preserve the open, transparent OPTIMOD sound — you no longer have to use a lower-performance STL protection limiter which could "fight" with your OPTIMOD and degrade your audio quality.

The Studio Accessory Chassis means convenience, too. By putting most of the setup controls at the studio, it lets you fine-tune your sound with the aid of your high-quality studio monitoring system — away from noisy blowers, and without time-wasting trips to the transmitter!

With the introduction of the Studio Accessory Chassis, we now offer a processing system — single or dual-chassis — that's ideal for *your* system. So OPTIMOD quality can work for you regardless of your STL configuration.

To find out more, see your Orban broadcast products dealer or contact us directly.

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Tame your telco lines. Soothe your STL.

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Circle (50) on Reply Card

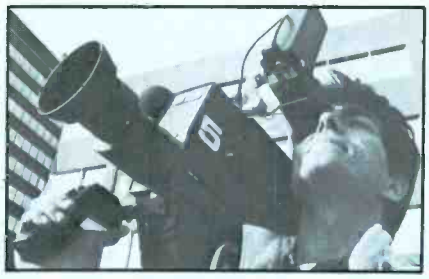
Philips LDK 14SL

reduce operator adjustment. The camera may be used with portable VTRs and may be quickly changed for studio operation with 1000 feet of cable to the remote control unit. Triax use is also available to 6500 feet. Camera weight is 13 pounds, including viewfinder. The LDK 14S model does not use low capacity tubes.

Circle (228) on Reply Card

LDK 44
Tubes: 3; P; ⅔-inch
Optics: f/1.8 prism
S/N ratio: 50dB
Sensitivity: 120fc, f/2.8
Registration: ≤60ns, 80ns, 150ns
Geometry: ≤1%, 2%
Resolution: 400 lines Y

Contours out of green combine with symmetrical horizontal and 2-line delay processed vertical contours to enhance picture sharpness. VLS and



Philips LDK 44

CLUE features in the control unit ease system setup for studio operations with a removable electronics pack that attaches to the camera for ENG operation.

Circle (229) on Reply Card

RCA COMMERCIAL COMMUNICATIONS SYSTEMS DIVISION
TKP-47
Tubes: 3; DGLO; ⅔-inch
Optics: Prism

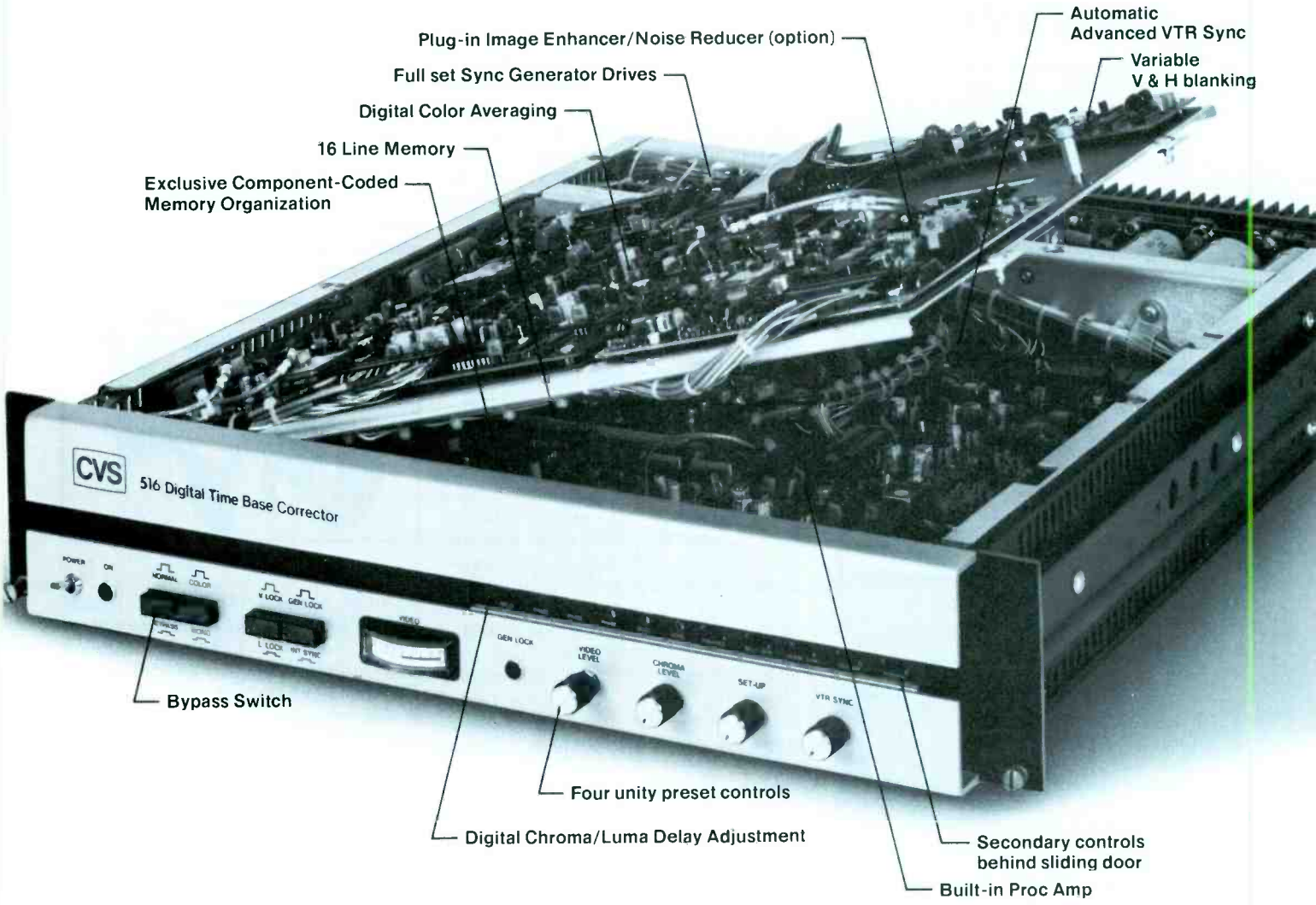
Designed as a companion to the RCA TK-47, the TKP-47 uses μP-

RCA TKP-47

circuitry and extensive LSI devices. Iris, black-and-white balance, pulse advance and cable equalization are automatic functions. Multicore coax and triax systems are available. A CPU processor and RCU remote unit may be used, as with the TK-47s, and the two cameras may be mixed and controlled by the same Autocam setup system. Weight of the TKP-47 is 17 pounds with viewfinder (without lens).

Circle (230) on Reply Card

Your best digital TBC buy for under $10,000.



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

The CVS 516 is ideal for broadcast, industrial and CATV applications because it has features that, before, you'd find only in TBCs costing thousands more.

Using the CVS 516 is easy. Front panel controls put you on top of your picture. Each control also has a pre-set unity position to give you a consistent starting point for all your tapes.

Improve your picture even more, at your option, by adding our moderately priced Image Enhancer/Noise Reducer. This plug-in card substantially reduces luminance and chroma noise, and significantly improves subjective resolution.

The CVS 516 weighs 35 pounds, stands 3½ inches high, and uses 175 watts — major advantages for EFP and local origination.

So, if you're looking for a TBC on a budget, look at the best — the Harris CVS 516! For full details and/or a demonstration, contact your Authorized HVS Distributor or Harris Video Systems today. Be sure to ask for our popular booklet about the advantages of digital time base correction.

HARRIS

HARRIS CORPORATION **HARRIS VIDEO SYSTEMS**
P.O. BOX 523, 1255 E. ARQUES AVENUE, SUNNYVALE, CA 94086
TELEPHONE 408/737-2100 **TELEX 35-2028**

Circle (52) on Reply Card

At the Frezzolini booth, the hybrid ½-inch VHS-C Frezzi On-board VTR, which may be attached to most ENG cameras, was shown.

A hybrid VTR

A new approach to the VRC system concept has recently been introduced by Frezzolini Electronics, Hawthorne, NJ. If an ENG camera is already available, and if the production requirements may be satisfied by a VRC system, purchase of an attachable VCR for any given camera makes economic sense. Enter the Frezzi mini video recorder.

Using the JVC HR-C3U compact VCR as a starting point, Frezzolini has evolved the VHS-C Frezzi On-board VTR system. According to Jack Frezzolini, a number of small modifications have been made to the JVC unit. In part the changes include use of a welded aluminum case, rather than the original plastic one; movement of signal connections to other locations to more easily facilitate the plug-on concept of the VRC system; use of a single audio track with switchable high/low impedance capability; and inclusion of several needed power defeat circuits.

The general specifications of the recorder remain unchanged. The VHS format is used, offering more than 240 lines resolution with a video S/N ratio of 45dB. Record time is 20 minutes using the TC-20 VHS-C compact videocassette. The recorded material may be played back on any VHS VCR, for which editing systems have already been marketed for some time. The recorder adds an additional 4.4 pounds without battery to the weight of an existing ENG camera.

The same system is being marketed by PEP, as the On-Cam VTR, series HK-V. PEP also offers the Newshawk-Combo recorder in two different equipment packages that include camera accessories and a compatible studio play/record or editing recorder. Package prices vary from $10,500 to $15,500 depending upon the studio unit desired. The field recorder, however, is the Frezzolini modification with the PEP label.

TK-710
Tubes: 3; S; ⅔-inch
Optics: Prism
S/N ratio: 52dB Y
Sensitivity: 200fc, f/3.5
Registration: 0.1%, 0.4%, 0.8%

RCA TK-710

Geometry: <2%
Resolution: 500 lines

Both H and V enhancement operated with comet tail suppression in R, G and B channels. The iris and white balance are automatic. A variety of configurations are available for production requirements. Weight of the camera head with viewfinder is 11.6 pounds.

Circle (231) on Reply Card

TK-761
Tubes: 3; various tubes
Optics: Prism
S/N ratio: 54dB NTSC
Sensitivity: 125fc, f/2.8
Registration: 0.1%, 0.2%, 0.5%
Geometry: 0.5%, 1%, 2%

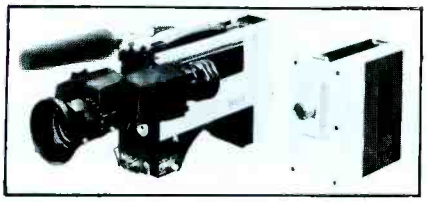
Image enhancement includes contours from green with coring and comb filtering. Auto white balance, flare control, iris and comet tail suppression are combined with cable equalization and cable timing in a medium-priced camera. The system is easily adaptable to any application, for example, to the TK-76, which uses a CCU. The camera, less lens, weighs 38 pounds. For use with triaxial cable, the TK-781 offers the same general specifications and complete adaptability.

Circle (232) on Reply Card

Hawkeye
Tubes: 3; S, P; ½-inch
Optics: f/1.4 prism
S/N ratio: 52dB prism
Sensitivity: 70fc S, 46fc P, f/1.4
Registration: 0.1%, 0.2%, 0.3%
Geometry: ≤1% overall
Resolution: 400 lines green

The HC-1 camera may be operated separately or combined with the HR-1 recorder for VRC operation, backed at the studio by the HR-2 recorder and HE-1 edit controller. Black-and-white balance, flare control, iris and comet tail suppression are automatic. Genlock operation requires an optional adapter. Weight of the camera and viewfinder is 9.6 pounds for Saticon tubes, 8.8 pounds for Plumbicons, not including the recorder, lens or genlock adapter.

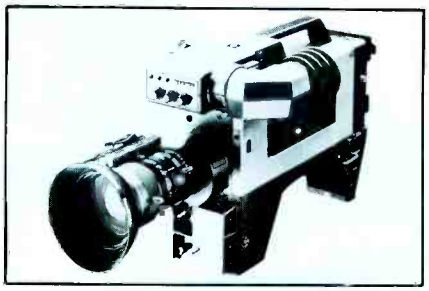
Circle (233) on Reply Card



RCA Hawkeye

SHARP ELECTRONICS PROFESSIONAL PRODUCTS DEPARTMENT
XC-800
Tubes: 3; S; ⅔-inch
Optics: Prism w/bias
S/N ratio: 54dB
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Geometry: 1%, 2%
Resolution: 550 lines Y

Detail correction is provided by level dependence, noise coring and comb filtering. An on-board μP circuit performs auto black-and-white balance and interfacing for digital remote control when a remote operation panel is used through a 26-conductor cable. VTR cables are also available. Weight with viewfinder is 12.6 pounds.



Sharp XC-800

Circle (234) on Reply Card

XC-700
Tubes: 3; S; ⅔-inch
Optics: f/1.4 prism w/bias
S/N ratio: 52dB
Sensitivity: 220fc, f/4
Registration: 0.1%, 0.4%, 0.8%
Geometry: 1%, 2%
Resolution: 500 lines Y

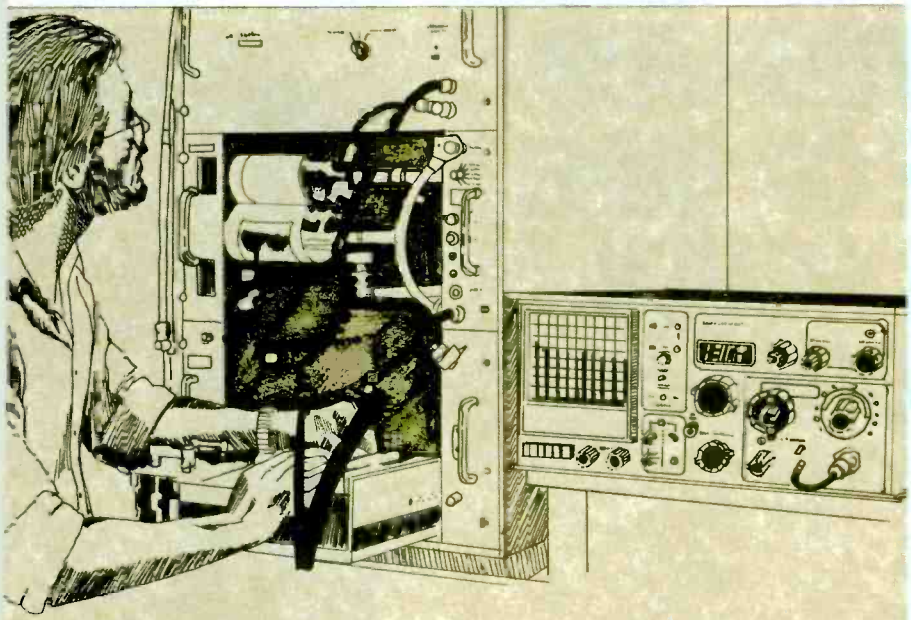
Horizontal and vertical detail correction are included in the XC-700 camera. The auto white balance circuit includes a memory and preset mode. Auto iris takes care of light levels. The unit operates with VTRs, gen-locked, or with a remote operation panel through a 41-pin connector. Camera head and viewfinder weigh about 17 pounds.

Circle (235) on Reply Card

SONY BROADCAST PRODUCTS
BVP-330A
Tubes: 3; DGP; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 57dB
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.5%

continued on page 74

NEW SPECTRUM ANALYZERS



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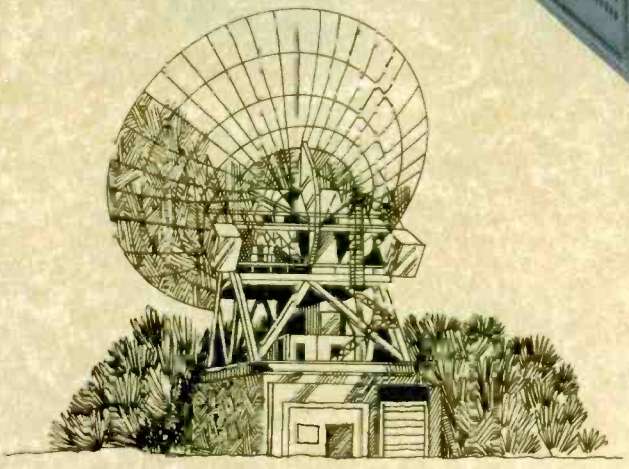
The Model 632B-1 compact Spectrum Analyzer provides excellent performance, high accuracy, ease of use and high reliability.

It is well suited for modern communications signal analysis, CATV, CB, wide range distortion and noise measurements, test equipment calibration, EMC tests, and other frequency domain applications up to 2.0 GHz.



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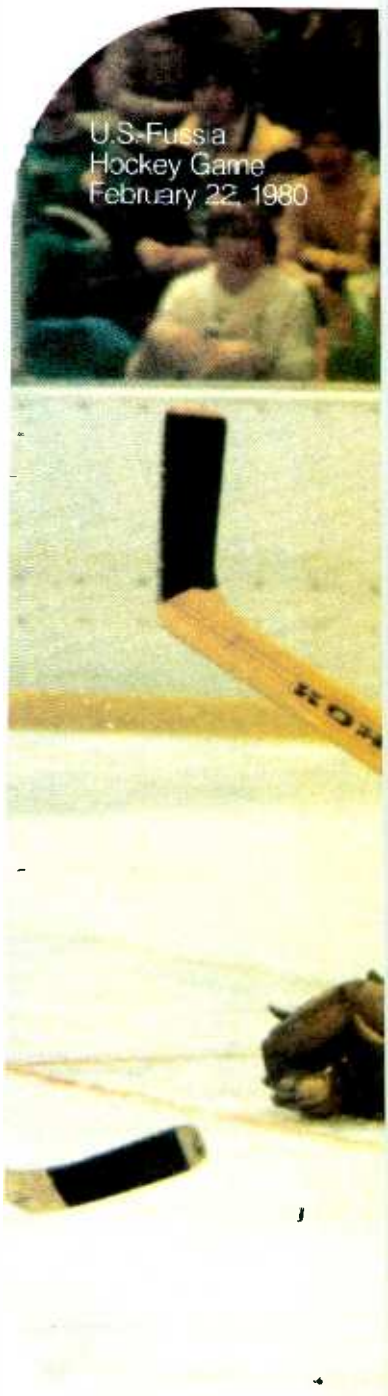
Polarad Electronics, Inc. 5 Delaware Dr., Lake Success, N.Y. 11042 Tel: 516-328-1100 TWX: 510-223-0414

IF IT WERE YOUR JOB TO GET THIS ON TAPE, WHAT TAPE WOULD YOU GET IT ON?



It's a complete mismatch. A collection of college amateurs together for only a couple of months against the equivalent of the Russian professional all-stars, a team that has dominated world hockey for a decade or more, a team that has recently embarrassed the NHL All-Stars with a 7-2 exhibition victory. But in the end, the amateurs win in a dramatic showdown for all the world to see at a time in world politics when a victory really counts.

America, like most of the world, will see the game on tape, recorded and broadcast by ABC-TV. In fact, many of the events at Lake Placid will be broadcast and rebroadcast to the world on tape under the most demanding time and temperature conditions. It's a one-chance situation all the way and the stakes are always high.

That's why Scotch® Video Tape was there when the U.S.-Russia Hockey Game was first recorded. And again when the Moon Walk was first recorded. And again when the Space Shuttle Landing was first recorded.

The Papal Tour of America. The Return of the Hostages. The Eruption of Mount St. Helens. Whenever there was one chance to get it, chances are they got it on Scotch Video Tape.

So whether your production is important to the world or just important to you, why take chances? Get it on the one tape you know will get it right.

Magnetic A/V Products Division/3M.

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HISTORY IS RECORDED ON SCOTCH VIDEO TAPE.

3M hears you...

3M

continued from page 70
Geometry: 1%, 2%
Resolution: 600 lines

Auto centering, auto color balance and auto beam control provide operator conveniences. Adaptations for studio operation include the CCU-300 control unit, operating through a maximum of 2000 feet of cable (compensated). VTR connections and BNC cables allow more portable operation. Weight of the camera head and viewfinder is 12.4 pounds.

Betacam system (BVP-3)
Tubes: 3; S; ⅔-inch
Optics: include bias light
S/N ratio: 57dB
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.15%, 0.3%
Resolution: >650 lines

Automatic controls include black-and-white balance and centering, with a choice of auto or preset auto white modes. Saticons are an *improved mixed field type*. The camera may operate separately or attached to the BVV-1 recorder for VRC operation. In

Sony Betacam

the studio, the BVW-10 cassette player interfaces to other units through a RS-422 bus. Alternatively to the BVP-3 camera, a single Saticon is used in the BVP-1 camera for operation with the BVV-1 unit.

BVP-110
Tubes: 1; HBST; ⅔-inch
Optics: Stripe filter
S/N ratio: 53dB
Sensitivity: 200fc, f/4

Sony BVP-110

Geometry: 0.15%
Resolution: 400 lines uniform

The single-tube Trinicon design avoids registration errors. Two-line enhancement is included, complete with level dependent set, noise coring and comb filtering. Both automatic white balance and preset white balance positions are available. The RS-170A system may be gen-locked with other system equipment.

For more information on these Sony products, contact Bill Parks, Sony Corporation of America, 9 W. 57th St., New York, NY 10019.

THOMSON-CSF BROADCAST

Microcam 301
Tubes: 3; S; ⅔-inch
Optics: Dichroic mirrors
S/N ratio: 54dB
Sensitivity: 230fc, f/4
Registration: 0.1%, 0.2%, 0.4%
Resolution: 500 lines, green

Dual-edged contour correction is used in both H and V circuitry for picture sharpness. An automatic iris system operates with auto white balance, beam control and black stabilization for operator convenience. Stand-alone operation of remote control through 984 feet of cable are possible. Total weight of camera head, viewfinder and a 14X zoom lens is 16.4 pounds.

Circle (236) on Reply Card

Microcam MC501
Tubes: 3; S; ⅔-inch
Optics: Prism
S/N ratio: 54dB
Sensitivity: 200fc
Registration: 0.1%, 0.4%, 0.8%
Geometry: 2% overall
Resolution: ≥600 lines

Two-line image enhancement includes comb filtering, level dependence and crispening. Digital techniques handle automatic black-and-white balance tasks. For EFP and

Thomson-CSF MC501

studio use, the RCS CCU unit is available. Camera head with viewfinder weighs 12.3 pounds.

Circle (237) on Reply Card

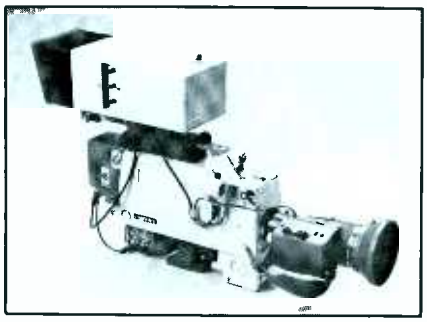
Microcam MC601A
Tubes: 3; P; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 56dB
Sensitivity: 200fc, f/4.7
Registration: 0.1%, 0.2%, 0.5%
Geometry: 1.5%
Resolution: 600 lines

Automatic beam control handles highlight conditions, while automatic black/white balance circuits ease operator adjustments. Various accessories are available to use the MC601A in the studio or for EFP applications, including remote control. Including a viewfinder, the camera weighs 12.4 pounds.

Circle (238) on Reply Card

MC701
Tubes: 3; DGP; ⅔-inch
Optics: f/1.4 prism
S/N ratio: 57dB
Sensitivity: 200fc, f/4.5
Registration: 0.1%, 0.2%, 0.5%
Geometry: 1%, 2%
Resolution: ≥600 lines

Automatic color balance and registration centering speed setup of the MC701, while auto beam control eases operation. Highly adaptable to the situation, the system includes a CCU for use with multicore cable up



Thomson-CSF MC701

to 1800 feet, or a configuration to use up to 4000 feet of triaxial cable. The 12.7-pound weight includes viewfinder.

Circle (239) on Reply Card

TOSHIBA ELECTRONICS

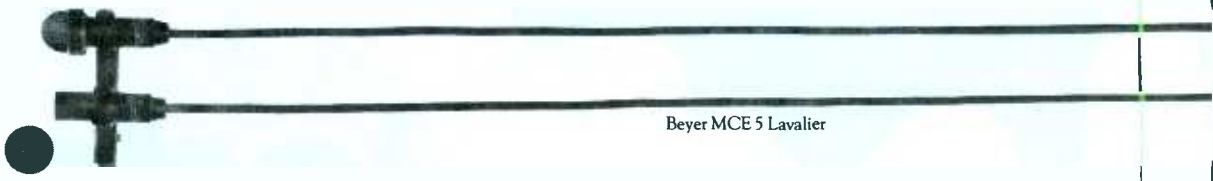
PK-60
Tubes: 3; P, S, DGP; ⅔-inch
Optics: f/1.4 prism
S/N ratio: >54dB
Sensitivity: 200fc, f/4
Registration: 0.1%, 0.2%, 0.5%
Geometry: 1%, 1.5%
Resolution: 600 lines

Detail correction circuits are used with auto beam control, white balance, iris and an optional auto setup system for ease in adjustments. Operation as a stand-alone unit, with multicore cable or with triax are possible. The 9.2-pound camera weight includes the viewfinder.

Circle (240) on Reply Card

Why Beyer mics represent a viable alternative to the usual choices in Broadcast.

Beyer MCM Condenser System



Beyer MCE 5 Lavalier

Beyer M 260

Now there's another high-tech German condenser system.

Until recently, film and broadcast engineers thought only Sennheiser and Neumann made high-quality condenser microphone systems. Now the Beyer MCM Series offers the same German excellence in design and construction, the same kinds of accessories (windscreens, pistol grips, shock mounts) and facilities for 12V and 48V "phantom" powering.

And since the MCM Series studio condenser mic is part of a system which combines power modules and different mic capsules (long shotgun, short shotgun, unidirectional, omni-directional and figure eight), you get more microphone potential for dollar output.

Like all Beyer microphones, the MCM Series is a truly professional instrument system suited to the widest range of applications in Broadcast/Film and Video post-production.

With lavalier mics, small is not enough.

Electret condenser lavalier mics like SONY's ECM-50 have proven useful for on-camera miking situations because of their reduced size. And while many of these mics offer good performance in a compact size, the Beyer MCE5 also provides extended frequency response (20 to 20,000 Hz) and durability in an even smaller format (diameter: 7 mm / length: 23 mm).

To optimize its compatibility with a variety of broadcast and film applications, the tiny black MCE5 is available in different configurations for powering interface and includes a system with accessories like windscreens, expansion mounts etc.

At Beyer Dynamic's ultra-modern manufacturing facility in West Germany, we hand-build virtually all of our microphones in the most evolved state of fine German engineering.

There's more than one way to bring out the warmth in an announcer's voice.

Broadcast engineers choose the E-V RE20 for many vocal announcing situations because of its wide frequency response (45-18,000 Hz)* and smooth sound. Beyer Dynamic's M 260 also provides the extended frequency response (50-18,000 Hz) and warmth required for critical vocal applications with one distinct advantage: its reduced size. Its compact and efficient ribbon element captures the warmth traditionally provided by this type of mic. And because it is considerably smaller than a mic with a large moving-coil diaphragm, the M 260 provides a natural, balanced sound image in a portable format that won't obscure copy or take up valuable space in the studio.

The Beyer M 260 has its own custom-designed ribbon element to optimize the mic's performance based on its Broadcast applications.

The Dynamic Decision

beyerdynamic

*Extracted from competitive promotional literature or advertising.
*Documentation supporting specific comparative claims available upon request.

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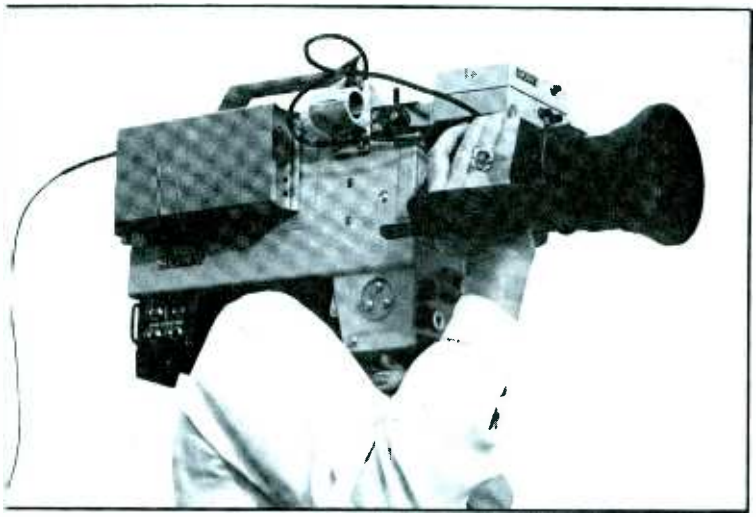
Fiber-optics and today's ENG/EFP



Camera person shooting with portable, battery-operated ENG/EFP fiber-optic video and audio transmitter affixed to camera.

By Shel Berenson, Artel Communications, Worcester, MA

The initial courtship of fiber-optics and TV broadcasting has resulted in a successful marriage between these two dynamic technologies. With the development of battery-powered, portable fiber-optic ENG/EFP equipment, network telecasts are now originating over fiber cables regularly. Coverage of Walt Disney World's EPCOT Center, the Space Shuttle landings and presidential newscasts are among the long list of ENG/EFP events that have been broadcast over portable fiber-optic video/audio links. The combined superior performance, ease of use and economy are the driving forces toward fiber-optic cables' wide acceptance as the *primary*, rather than alternate, interconnection medium.

Historically, coaxial cable has been the primary medium for the local transmission of single-channel video and audio signals. However, metallic cables, both coaxial and multicore, are limited in terms of performance and distance. Alternatively, shorthaul microwave links are limited by other physical, environmental and economic factors.

Fiber-optics is a unique technology, inasmuch as it encompasses the performance advantages of microwave in an ultralightweight dedicated cable. Fiber is, in fact, an optical waveguide. It is totally immune to all externally induced noise, impervious to electrical disruptions, virtually transparent at all video frequencies and is only a small fraction of the size and weight of ordinary metallic cables.

A fiber-optic system is functionally similar to a conventional cable or microwave system. It consists of a transmitter, receiver and the flexible fiber-optic cable that interconnects them. The transmitter converts the electrical video and audio to a composite optical (light) signal and launches the optical signal into the connectorized end of the fiber-optic cable. The light is guided through a mile or two of cable to the receiver, which reconverts the optical signal to electrical video and audio outputs. Because the composite video input/output is through 75Ω BNC connectors, and the audio comes in and out through 600Ω connectors, the entire fiber-optic system acts as a *black box* that interfaces between broadcast equipment. The camera, monitor and other equipment never know they are communicating through fiber-optics. The difference is that, between the transmitter and receiver the signal is optical, not electrical.

Light enters the end of the fiber from the transmitter's Light Emitting Diode (LED) and is guided through the cable to the photo detector at the receiver end. This *guiding* results from a phenomenon known as *total internal reflection* between two dissimilar glasses that comprise the hair-thin optical fiber. All the light that entered from the LED—and *only* the light from the LED—is guided to the end of the fiber, cable kilometers away, except for a slight dimming due to absorption in the glass.

The LED is modulated directly by the transmitter driver circuit, which contains the video and audio input information. As the composite video/audio voltage increases, the LED driver current increases, and so does the LED intensity (brightness). This is called Intensity Modulation (IM), the modulation technique of all LEDs and laser diodes. The intensity

If you want Plumbicon* picture quality from your next TV camera buy— insist on Amperex Plumbicon tubes.

If it's a professional TV color camera—it's available with Amperex Plumbicon tubes.

When you're paying top dollar for a professional TV camera, it is assumed by the manufacturer of the camera that you will specify the pickup tubes for your system. Obviously, the camera manufacturer wants to sell you *his* camera, and since he knows that the overwhelming majority of knowledgeable video purchasers will specify Plumbicon tubes, virtually every professional TV camera system produced for today's market is designed to use the Plumbicon tube.

The crucial factors of sensitivity, resolution and burn-in that affect the "total in-system performance" of ENG and EFP cameras and the consistent record of singularly brilliant performance of the one-inch and the 30mm Plumbicon tubes in studio cameras are generally credited for the professional's continued preference for Plumbicon tube-equipped cameras; that is why an estimated ninety percent of all network color broadcasting originates in Plumbicon pickup tubes.

Whatever your application — ENG, EFP or Studio; whatever the origin of your next camera — American-made or imported; and regardless of the camera salesman's personal persuasion (or his own compensation scheme) — you will get Plumbicon quality pictures only by specifying, insisting, demanding Plumbicon tubes in your camera.

Yours for the specifying, the full line of Plumbicon tubes — ½", ⅔", 1" and 30mm diameters, including low capacitance Diode Gun™ and special anti-comet-tail types — is available in the professional TV camera of your choice and is in demand today as never before by camera users in every segment of broadcast and corporate television.

There is only one Plumbicon, and that famous Emmy-award-winning pickup tube is available for the asking in every three-tube professional TV color camera sold today. For more information, contact: Amperex Electronic Corporation, Slatersville Division, Slatersville, Rhode Island 02876. Telephone: 401-762-3800.

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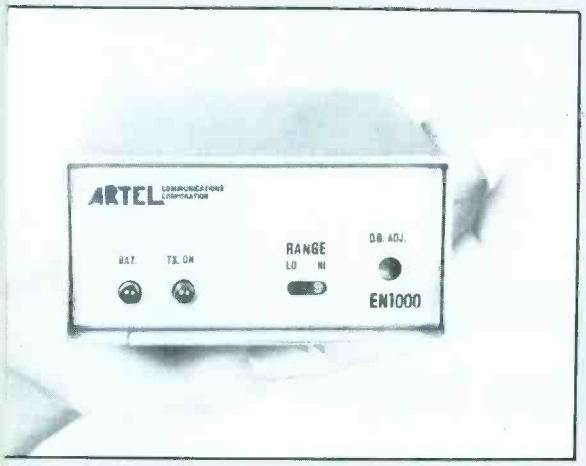

Artel's battery-operated, portable fiber-optic video and audio transmitter.

is always positive: off, bright or somewhere in between. Therefore, it is up to the transmitter electronics to translate negative (sync) information and give it a fixed positive value. Another function of the transmitter electronics is to linearize the analog LED output so that it meets broadcast distortion specs.

The LED output is coupled to the fiber through a female screw-type connector into which the fiber connector plug mates. This connector is on the outside of the transmitter unit, and is treated like a female SMA-type RF connector. Similarly, at the other end of the cable, the fiber connector launches its light into the receiver unit.

The intrinsic benefits of fiber-optics now allow broadcasters to ignore many of the problems that are associated with coaxial cable and shorthaul microwave. Among these new freedoms are the following:

•**No crosstalk interference**—Fiber-optic cables are totally immune to interchannel crosstalk, regardless of the number of video channels carried in either direction over the same small cable. By contrast, microwave transmission requires specific channel assignments, and is prone to adjacent channel interference.

•**Freedom from radiation**—Signals do not radiate from fiber-optic cables. They are resistant to intrusion, and are, therefore, used extensively for secure video, voice and data transmission. With increasing government standards concerning electromagnetic emission, the use of fiber-optics offers an automatic solution to electromagnetic pollution.

•**Noise immunity**—Because fiber conductors are totally dielectric, they are immune to induced noise, whether electromagnetic interference (EMI), radio frequency interference (RFI) or electromagnetic pulse (EMP). Routing becomes simplified. Fiber cables can be combined with, or run in parallel to, power lines without worry about transmission interference or equipment damage. Even intentional *jamming* cannot disrupt a fiber-optic cable signal.

•**No equalization necessary**—Fiber-optic cables are virtually transparent to all video frequencies. There is no significant high frequency roll-off as there is with coaxial cable. The fiber bandwidth far exceeds the signal frequency and remains constant within the parameters of the system. Setup is made easier and faster, and terminal equipment is simplified.

•**Electrical isolation**—The dielectric conductors in a fiber cable cannot conduct electricity. They do not act as antennas. They do not attract lightning, nor do they pick up inductive surges from lightning or corona discharges. Fiber cables can be used to transmit across very high voltage potentials without the need for isolation transformers. No ground loops or hum can occur. The protection and safety aspects alone can pay for the fiber-optic system.

•**Small, low weight cable**—An optical fiber is as thin as a human hair and weighs only one ounce per kilometer. After it is fully cabled for protection in field environments, it

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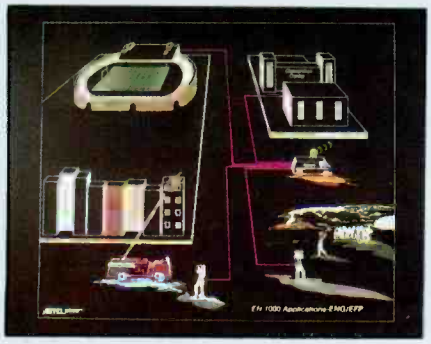
FUJI



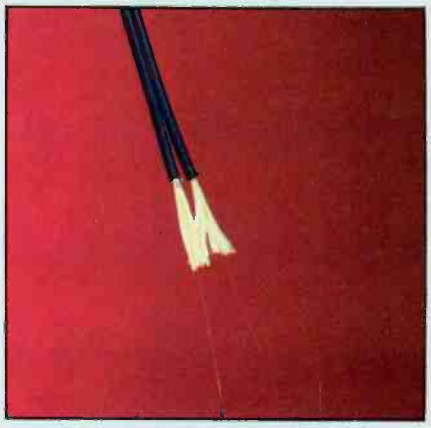
Fiber-optic cables weighing five pounds per 1000 feet connect the minicamera to the van over distances up to two miles, in locations where portable microwave cannot be used.

still can weigh less than 10 pounds per 1000 feet. With 36 or more fiber channels in a ½-inch cable, valuable conduit space can be conserved, each fiber replacing a 75Ω coax cable. In portable ENG applications, the transportation and deployment of such a small cable can save man-hours, allow the use of smaller vehicles and enable the user to set up quickly and easily.

•**Long distances, around corners**—Think of a fiber-optic system as a *bendable microwave link*. Whether the system is portable or fixed, the system will match (or exceed) microwave specifications over distances of several kilometers. The difference is that a fiber cable can go anywhere, regardless of line-of-sight capability. The cable can be payed out around obstacles and buildings, with the signal remaining superb.

•**Bandwidth**—The information-carrying capacity of the transmission medium. Coaxial cable is limited in its transmission of high frequency signals. This bandwidth limitation results in problems commonly encountered in video transmission, such as poor frequency response, chrominance-luminance delay and short-time waveform distortion. To solve these coax frequency problems, the transmission engineer resorts to the use of additional amplifiers and frequency equalizers. The result is expensive equipment that is time consuming to set up and maintain. Even worse, however, is the fact that equalization introduces high frequency noise and further increases the RFI and EMI problems that plague coax cables.

Fiber-optic bandwidth is sufficiently high that the system bandwidth is defined by the optical transmitters and receivers. A fiber-optic video system that is flat to 10MHz over 1000 feet distance will still be flat to 10MHz over 10,000 feet (3km) with no degradation. All that is required in bandwidth is that the fiber is capable of supporting the highest frequency of the system over the longest planned distance.



Dual-fiber tight-buffered cable stripped before connectorization with exposed fiber and yellow Kevlar.

In outside broadcasting applications such as ENG and EFP, fiber-optics open up new capabilities in video/audio transmission. Fiber systems offer the convenience of lightweight cable, with performance that rivals microwave.

In conventional ENG systems, the

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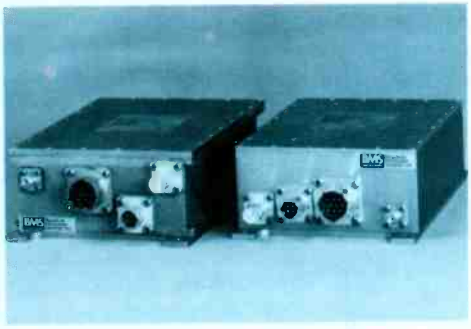

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mobile van is tied to the ENG camera by coaxial or multicore cables. The camera is restricted in distance from the van by the transmission loss of these cables. Often 500 feet is about as far as the camera can go before the picture quality degrades severely. Expensive equalizing equipment helps to restore the signal, but other parameters, such as signal-to-noise, suffer as a result. To solve this distance/quality problem, many stations have had to resort to using microwave from camera to van.

Fiber-optic transmission allows a direct interconnection from camera to van over cables as small as 0.1-inch diameter. Such a small cable would weigh between 5 and 10 pounds per 1000 feet, and can easily be payed out from the camera by a portable spool or pulled from the van. With a small battery-powered transmitter, the camera can travel up to two miles (3.2km) away from the van...around corners and inside buildings.

Fast-breaking news events can be covered quicker, with cable payed out as the camera crew walks. Setup time is greatly reduced, because no equalization, adjustment or alignment is required. Rugged tight-buffer cables can be laid along the ground, with no concern about crushing by people or vehicles. The van receives STL-quality video and audio, with virtually no signal degradation.

Fiber-optic connector being attached to a fiber cable using Kevlar as a strain relief beneath the crimp sleeve.

For longer-term events, such as conventions and sports, the portable transmitter may be powered by a 12Vac supply. In locations where programs repeatedly originate, the facility may be prewired with multifiber cable, which can easily be accessed at a junction box. Return signals, such as gen-lock and control signals, can be sent to the camera over a separate fiber in the same cable.

The advantages of fiber-optics to ENG and EFP are clear. Cleaner, higher bandwidth video and audio can be transmitted farther over smaller, lighter cables. Setup is faster and smaller ENG/EFP trucks can be used.

The small fiber-optic cable if damaged or cut can be easily field repaired using two standard connectors, a barrel adapter and some 5-minute epoxy. The field repairs can be accomplished in minutes, with the cut cable totally restored and spliced, and the system up and operational for its ENG/EFP use.

Beyond ENG/EFP, fiber-optics are becoming widely used for fixed installations that require totally transparent video communications, such as video teleconferencing, broadcast trunking, satellite up/down links and high resolution computer video graphics. Virtually any video signal that has to be transmitted more than 1000 feet should be sent on fiber-optics to get full quality.

What are the tradeoffs? There are none. Fiber-optic video communications is the rare technology that offers positive gains with none of the associated drawbacks. For the broadcaster, this is no longer tomorrow's technology, but today's practical transmission medium.

Editor's note: Portions of this paper were presented at the Second Annual WOSU Broadcast Engineering Conference held July 20-22, 1982, at Ohio State University. The conference was coordinated by John Battison, director of engineering, WOSU-AM/FM/TV.

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Fiber-optics:

Notes from the field

By Bill Rhodes, editorial director; and Carl Bentz, technical editor

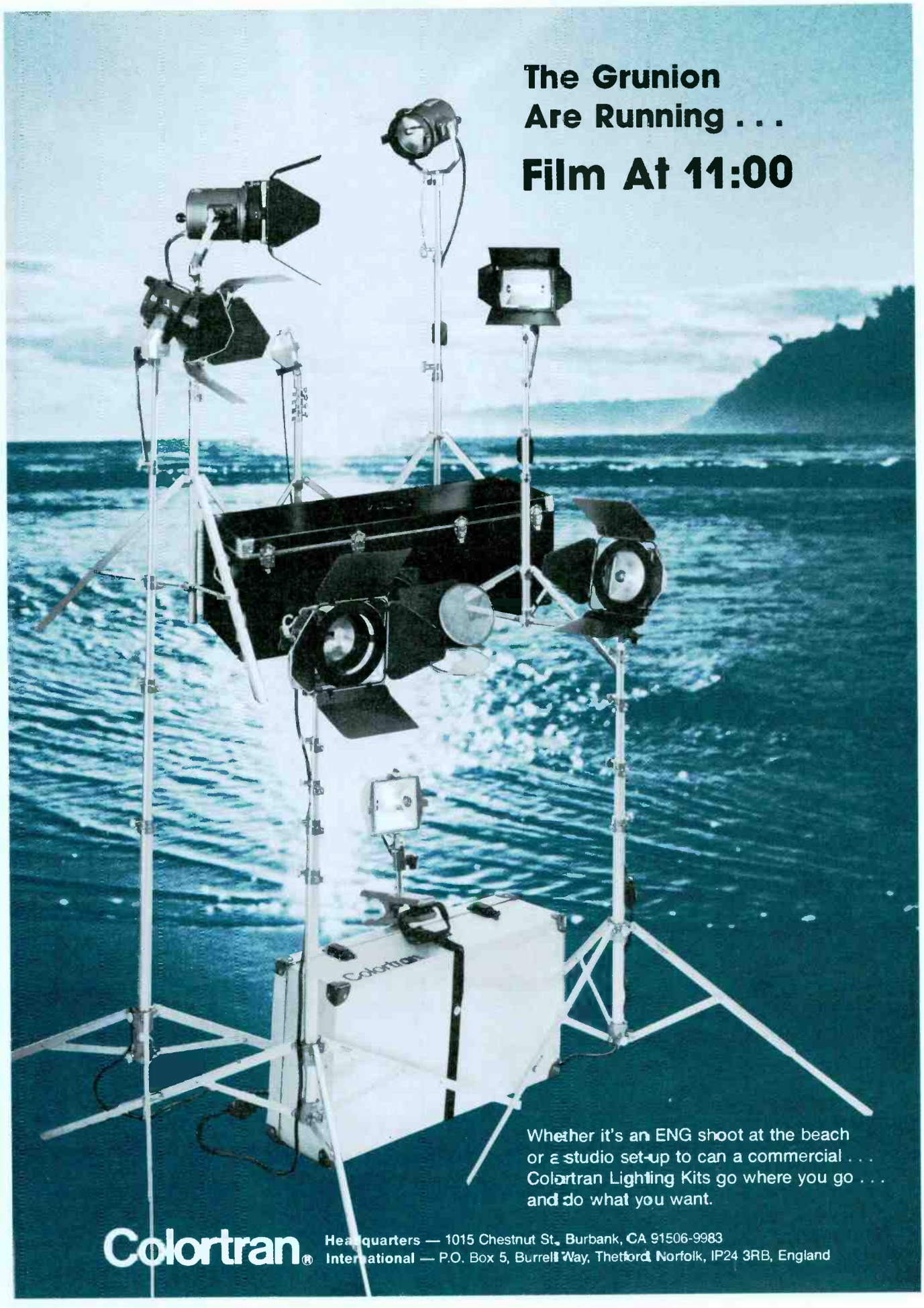
The field of fiber-optics has shown a growth pattern typical of new technologies that offer strengths and advantages over previous methods: starting slow and then mushrooming with growth and application. The two previous articles have considered selected aspects of fiber-optics of special interest to broadcasting. In this section, we are going to summarize just a few of the items related to fiber-optics that have come to our attention in the past couple of months. To a degree, this collection of data illustrates the marked growth of this field. Where data are available, we have provided Reader Service Numbers so that you may request items of interest.

Telephone long lines

A recent report from the *Wall Street Journal* announced that the *Japanese International Telegraph and Telephone Corporation* intends to interconnect the Japanese islands with Hawaii by 1988 with fiber-optics. To complement some 1000 lines by cables and an additional 6000 lines through satellite communications, approximately 4200 miles of optical cable will add 8000 to 12,000 lines of trans-Pacific communications between Japan and the Hawaiian Islands. *American Telephone and Telegraph* plans to augment the system with fiber links to the US mainland. At least $150 million in construction costs will not include research and development expenses.

Fixed or mobile links

Production and recording centers, TV transmission centers, STL applications and outside broadcasting needs may all be served by the OVID systems from *Standard Telephon und Radio AG*, Zurich, an ITT associate. The optical video transmission system from STR handles a video signal and two audio channels over distances of 8km. Several options are available for a variety of system applications, including the standard LED/APD diode, extended range use with a laser diode, increased dynamic range reception with a PIN diode, dual-audio channels and special shock and water environmental protection housings.



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OVID 1 is designed for temporary, mobile links, such as those used in sports coverage. OVID 2 is intended for fixed installations. Applications beyond broadcast include CATV and surveillance systems. For further information on the STR OVID systems, circle (365) on Reply Card.

Video/audio system

Introduced at NAB-'82, the *Grass Valley* WAVELINK system uses a unique FM-on-FM modulation scheme. Dual-pre-emphasized baseband audio signals modulate 100kHz oscillators which, in turn, frequency modulates oscillators at 8MHz and 9.8MHz. Those FM signals are summed with video for transmission using an LED. The modular system allows for planned future enhancements. Designed around broadcasting requirements, an unweighted signal-to-noise ratio of greater than 58dB video and 65dB audio are possible on a 2km fiber. The receiving system uses an avalanche photo diode, rather than a PIN diode; and provides AGC and squelch functions. Delay timing is adjustable as needed for precisely timed signals.

Diverse applications of the WAVELINK fiber-optic system include government security installations, educational institutions and the EPCOT Center in Florida. Broadcasters may also be interested in an interconnect system between the PBS distribution center on L'Enfant Plaza with a KRON-TV (San Francisco) news bureau in Washington, DC. With the Grass Valley 3290 system, a multitude of audio and video interference problems were eliminated.

Telelux

The Telelex system is the entry of *AEG-Telefunken* into the field of fiber-optics. Since 1966 the German-based operation has been developing equipment for use with data, voice and industrial TV applications. Another system specifically designed for voice and data is the DIKOS equipment, providing a usable bit rate of 8.192Mbit/s.

AEG-Telefunken offers an information packet regarding the concept of fiber-optics and the components involved. Included in this information is material on a welding system for fiber splicing. To obtain the packet of data, circle (366) on Reply Card.

CATV distribution and broadcast uses

One of the first uses of fiber-optics in cable distribution systems began operation in August 1982. The *Times-Fiber* Mini-Hub system is specifically designed for highly concentrated residential areas, such as condominiums and apartment complexes. The Storer Cable system involved is in Pembroke Pines, FL.

Through the use of a keypad, the Mini-Hub system allows cable subscribers to have 2-way communication between the subscribers' set-top converter and the local hub to access special cable services. The overall system involves Local Distribution Units (LDUs) and a Subscriber Programming Controller (SPC) at the cable head office. The system allows a reduction of data flow on 2-way systems, because most of the communications traffic can be handled by the LDUs. Such a system allows the individual subscriber to access special programming on pay channels as those services are desired. Billing is handled through the computerized operation, reducing clerical time at the cable office as well as technician time for possible changes in subscriber service access.

The Times Fiber Communications organization also offers a rack-mounted modular TFC-201 broadcast fiber-optic link for point-to-point distances up to 2km. The design allows future growth in applications transmission between the TV studio and earth station or broadcast transmitter, as well as interbuilding networks and video conferencing. For

Brilliant performer.

NEW WIRELESS

The Model 82 condenser wireless microphone has been added to Cetec Vega's professional hand-held line. The Model 82 incorporates the popular Shure SM85 condenser element and attractive black windscreen to provide:

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- Clean reproduction of close-up vocals with moderate proximity effect.
- "Crispness" and presence with high-definition midrange.
- Clear, scintillating highs with crisp upper register.
- Cardioid pickup pattern for effective rejection of off-axis sounds.

All Cetec Vega hand-held wireless microphones (including the Model 80 with the Electro-Voice EV-671 dynamic element and the Model 81 with the Shure SM58 dynamic element) have an attractively contoured black case with internal antenna.

Used with Cetec Vega professional wireless receivers, the FM systems operate on any crystal-controlled frequency between 150 to 216 MHz, at a range up to 1000 feet or more. Transmit-to-receive frequency response is almost perfectly flat from 100 Hz to 12 kHz with gentle rolloffs to 40 Hz and 15 kHz. Total harmonic distortion is typically 1/2 percent. System dynamic range is 90 dB when "Dynex" (transmit compression and receive expansion) is incorporated, with a resulting low noise floor.

Cetec Vega hand-held wireless microphones are newly redesigned for 20 to 30 percent additional battery life, using a commonly available 9-volt alkaline battery (Duracell recommended). Microphone sensitivity is easily adjustable with an audio gain control on the bottom, with an adjacent LED indicator to verify optimum setup. Power and audio on/off switches are also conveniently located on the bottom.

Write or call for further information and location of your nearest dealer: Cetec Vega, P.O. Box 5348, El Monte, CA 91731. (213) 442-0782 TWX: 910-587-3539

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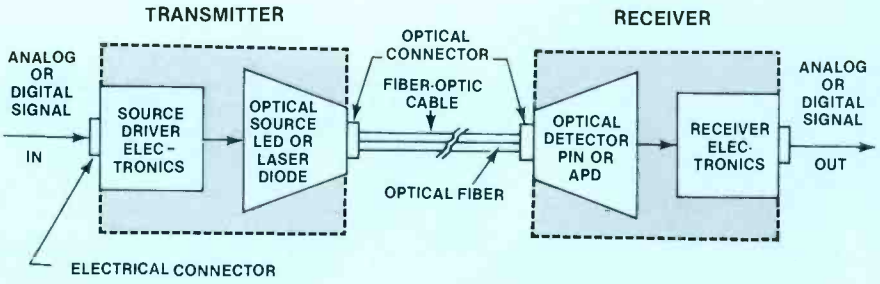
more information, circle (367) on Reply Card.

System design guide

The *Belden Corporation Fiber Optics Group*, Geneva, IL, offers a worthwhile 12-page guide book to optical link systems design. The booklet gives information on how to determine the needs for video, telephone and computer data intercommunications. An example of the graphics found in the booklet is shown in the accompanying schematic. To obtain a copy of the guide, circle (368) on Reply Card.

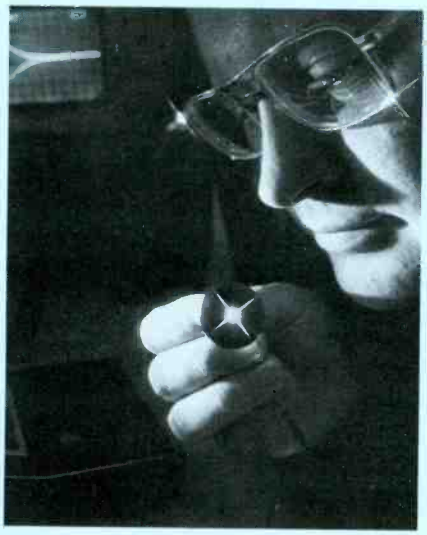
Systems data

Now available from *Math Associates*, Port Washington, NY, the brochure titled "Fiberlink Fiber Optic Transmission Systems" offers components specifications. Math Associates is involved in equipment for analog and digital transmission systems for dc levels, audio, video and RS-232C applications. The EK-1000 educational communication system provides an introduction into the areas of fiber and free-air optical links. From mining to space shuttle, Math Associates standard or custom products may fit the communications link needs. To receive a copy of the brochure, circle (369) on Reply Card.



Courtesy of Belden Corporation

Simple fiber-optic link



Light links

Spokes radiate from a device used to polish fiber-optic cable connectors developed at *Switchcraft*, a Raytheon subsidiary in Chicago. An initial order of 500,000 connectors will be used to interconnect fiber-optic cables to distribute TV signals in large apartment and hotel complexes. For more information, circle (370) on Reply Card.

Fiber splicing

The once-feared need for optical fiber splicing and maintenance is quelled though the introduction by *General Fiber Optics* of the 3020 splicing kit and the 3045 grinding and polishing kit. The splicing kit provides permanent bonding for field applications with standard assemblies for 125 micron cladding diameter fibers. Other materials are available for customer-specified diameter systems.

The grinding and polishing equipment includes polishing wheels, lapping film and slurry sets, tempered glass platform, 0.030-inch ID ferrules and instructions. For more information on these materials, circle (371) on Reply Card.

Local area networks

The *Siecor Corporation* is offering an 8-page brochure that describes its Local Area Network fiber-optical system called FiberLAN. This system is designed primarily for the field of data processing and telecommunications.

Siecor's technology background is derived from fiber-optic interests with the *Corning Glass Works* and *Siemens AG* organizations. Since its formation, Siecor Corporation has continued to grow in the areas of transmission products and services for communication, computer and industrial automation, offering both optical fiber- and copper-based products. More information on FiberLAN is available by circling (372) on Reply Card.

FOTDR for maintenance

In the event that your optical fiber system should need maintenance, the *Tektronix* OF150 Fiber-Optic Time Domain Reflectometer (FOTDR) pro-

vides quantitative and calibrated measurements of high accuracy and reliability. Precision-calibrated loss and distance measurements are possible with this rugged, portable instrument. A chart recorder for documentation complements the CRT display for measurements on multimode 125μm OD fibers with a core diameter of 50μm.

Equally applicable to installation procedures, the OF150 applies a pulse of radiant energy into the fiber under test. As the pulse travels along the fiber any discontinuities cause some energy to be reflected back to the instrument. Such reflections are processed and displayed on the CRT, chart or LCD readout, indicating distance and loss figures for the optical fiber fault. For additional information, circle (373) on Reply Card.

Analog optical system

Both rack-mounted and table-top equipment is offered by *GTE Lenkurt* in its 3120 optical transmission system. Specified for low-density communications, the 3120 family includes the capacity of 614 FDM voice channels, 24 or 48 PCM voice channels or one composite video signal on a single optical fiber. The repeaterless video quality offers a weighted S/N ratio of 65dB at 2km or surveillance quality video, weighted, of 45dB at 5km. Models are available for analog as well as digital systems use. For more information, circle (374) on Reply Card.

Conference proceedings

A publication of the papers and proceedings of the Sixth International Fiber Optics and Communications Exposition (September 1982) is available

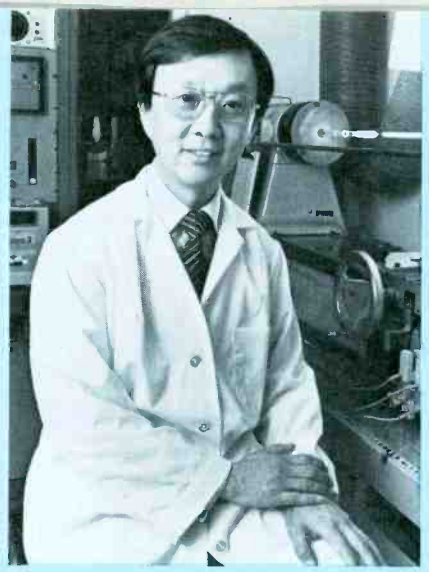
from *Information Gatekeepers*, Brookline, MA. Materials presented in the 250-page book cover the gamut of fiber-optics applications, research and development. For information about the proceedings book, circle (375) on Reply Card.

Fiber basics

Fiber Optics, by Edward A. Lacy, Prentice-Hall, Englewood Cliffs, NJ, was prepared for the average electronics technician as an introduction to the field of optical fiber communications. The volume discusses the fundamentals of light, light emitting diodes, receivers and fiber materials, presented for individuals who need a basic understanding of the communication medium. Materials presented are specifically aimed at the communications uses of fibers rather than industrial and medical applications. Price for the 225-page book is $20.95. For information regarding this book, circle (376) on Reply Card.

Fiber-optics textbook

The publication, *Optical Fiber Systems: Technology, Design and Applications*, by Dr. Charles K. Kao, McGraw-Hill, March 1982, sells for $23.50. Kao presents an overview of where and why optical fiber systems should be used. Guidance for system design, coverage of business aspects and market potential of fiber systems are given with more basic information on the concept and manufacturer of the materials involved. Kao refers to the publication as a textbook, not a source book, for those interested in using fiber-optics technology. For information regarding the book, circle (377) on Reply Card.



Kao, recently named to the post of executive scientist for ITT, has been one of the pioneers of this fast-growing field since 1963. Originally from Shanghai, China, he received BS (1957) and PHD (1965) degrees in electrical engineering from the University of London. He has received awards for his contributions to glass science and fiber-optics technology from the American Ceramic Society, the Franklin Institute and the Rank Trust Fund of England. He holds a number of patents and is widely published.

A recent issue of *Electrical Communications*, The Technical Journal of ITT, (Vol. 56, No. 4, 1981) contains "Optical Fiber Technology History and Future." In this article, Kao provides a quick overview of fiber-optics history, discusses some of the applications being tried around the world and makes some predictions for the future. His outlook for the medium is a bright one, indicating that many improvements will be made in the fiber materials. The necessary ancillary devices will soon be available to enhance the cost and technical advantages of optical fiber systems for many applications, some of which will be unrelated to telecommunications. It is his belief, however, that the technology will play an ever-increasing role in the evolutionary development of an integrated services digital network for the future.

Three exhibitors had fiber-optics equipment on display at SMPTE-'82/New York. For the complete story, see pages 126 and 127.

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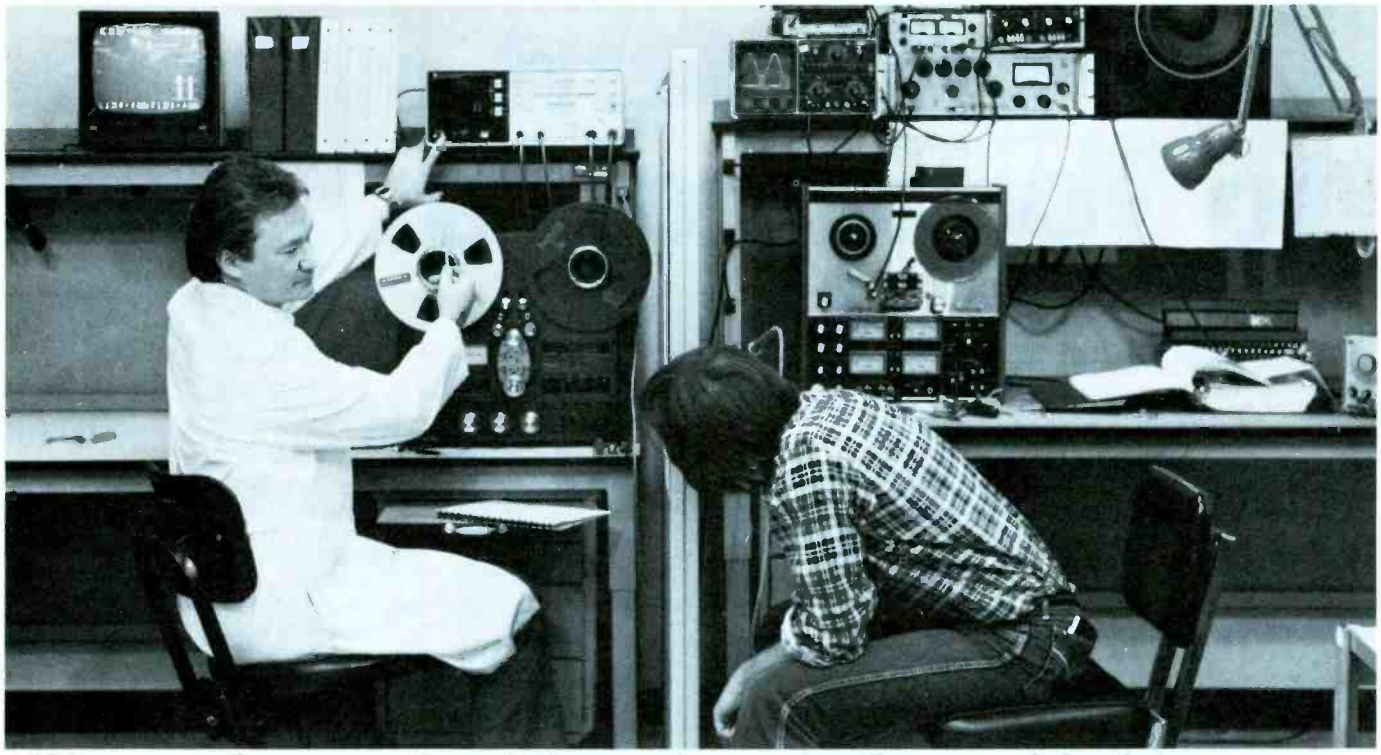

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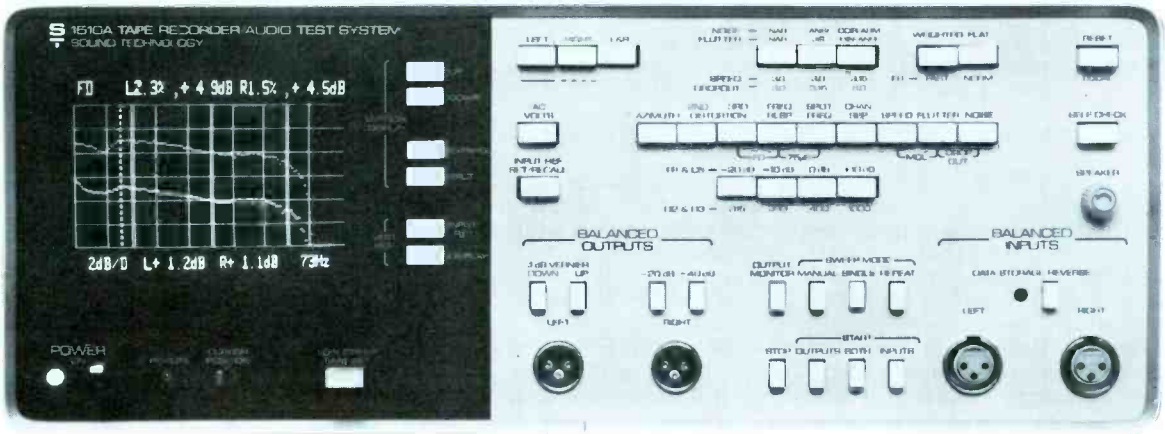

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- Nov. 7-12, 1982
- New York City
- New York Hilton
- Sheraton Centre Hotel
- 1177 registrants
- 12,000 attendees
- 142 exhibitors
- 356 booths
- Theme: "Commitment to Tomorrow's Technology"

By Bill Rhodes, editorial director

Leonard Coleman (black bow tie) dropped in at the press conference to greet members of the press. It was not revealed at the time, but Coleman was to be announced as the new president of SMPTE.

The pride and joy of the Society of Motion Picture and Television Engineers (SMPTE) is its annual fall conference. The 124th SMPTE Technical Conference and Equipment Exhibit emerged as one of the society's best conferences, but its statistics do not tell the whole story. The record number of exhibitors strained resources this year. The conference spilled out of the Hilton into the Sheraton Centre next door. This posed problems for attendees and exhibitors. Even so, there was not enough space for exhibitors. Some 35 to 40 potential exhibitors were rumored to have been turned away. And, the split exhibit space was not good for booth traffic.

As a result of these problems, the SMPTE has now decided that forthcoming fall conventions will be held in formal convention centers so that all exhibitors can be accommodated under one roof.

The scope of the SMPTE-'82 show did not differ markedly from that of previous years. Only details of the overall picture for the show changed. For the press, the show involved several distinct phases:

- a SMPTE meeting for the press;
- technical sessions;
- exhibits and special showings;
- standards meetings;
- Awards Banquet; and
- press breakfast meetings and hospitality suite gatherings.

But there is also one general social event to which the press is invited. This event is a reception, sponsored by Eastman Kodak, which occurs the evening before the convention officially opens. All registrants and press are invited, and, as usual, Kodak put on another grand reception this year.

The press meeting

On the day before the convention, the SMPTE held its traditional meeting for the press. This often is the time that the president, in this case Charlie Anderson of Ampex, gives the press an overview of the conference to come; introduces key members of the SMPTE so that new press attendees know them; and points out anything spectacular that may be expected at the convention.

Old hands at these meetings anticipated a surprise introduction of the new president for SMPTE because Charlie Anderson's term was nearing its end. However, this was not to be the case. The announcement was being held for formal release at the Awards Banquet.

At the press gathering, major addresses were given by Roland J. Zavada of Eastman Kodak, SMPTE's engineering vice president; and Leonard F. Coleman, also of Kodak, SMPTE's financial vice president.

As the engineering vice president, Zavada filled the press in on how the SMPTE works internally and cooperates with worldwide organizations in recommending standards for film, video, TV and allied industries. As he always does, Zavada covered the SMPTE efforts in standardization thoroughly, lucidly and quickly. And there was ample time for the press to badger him about our participation at the standards meetings. This is traditional because the press has to have SMPTE clearances on its statements before publication—a restriction that eager reporters find objectionable.

In summary, the press meeting was an excellent one. However, when it was over we realized that the SMPTE-'82 conference would probably not stand out as a landmark in history. Unless, of course, something unforeseen were to happen. And that is exactly what *did* happen, but we'll cover that event elsewhere.

Technical sessions

The program chairman, Gary Borton of Eastman Kodak, assembled an excellent array of papers for both film and television. For television, sessions were grouped as shown in Table I.

In all, about 118 papers were delivered during the five days of the conference. Because most of these papers will appear in future issues of the *SMPTE Journal*, they will not be summarized here. However, brief comments on the opening session are warranted.

On Monday, the opening session was a joint event for all attendees, those from both the film and TV industries. The open-

The maximum for the minimum

In designing the HK-302, Ikegami kept the frills —and the price—to a minimum while maximizing the performance. And that helps keep a moderate equipment budget from interfering with first-quality program origination.

However, staying with the basics doesn't mean sacrificing advanced technology. The HK-302's highly efficient optical system coupled to ⅔" low capacitance diode-gun Plumbicon* tubes and high transconductance FET pre-amps deliver sharp, low noise pictures (S/N 57 dB) with excellent colorimetry. And the compact camera head includes a full range of operational automatics to ensure consistent signal quality.

Built-in test, maintenance and operational features are integral parts of this camera's "basics" as well. A comprehensive test pulse system lets you adjust the video with the pick-up tubes off or removed.

Complete monitoring circuitry and a broadcast quality sync generator with genlock are also standard features.

To add to the versatility of the HK-302, use the Ikegami automatic highlight compression option. It ensures highly detailed pictures even in high contrast scenes.

With the HK-302 you don't have to mortgage your station to afford prime time performance. So if you're looking for the maximum in studio production capability with a minimum of cost and maintenance, look over the Ikegami HK-302. For complete information and a demonstration, contact Ikegami.

Ikegami HK-302

Ikegami Electronics (USA), Inc., 37 Brook Avenue, Maywood, NJ 07607. (201) 368-9171
Northeast: (201) 368-9171 ☐ West Coast: (213) 534-0050 ☐ Southwest: (713) 445-0180 ☐ Southeast: (912) 924-0061 ☐ Canada: (201) 368-9179

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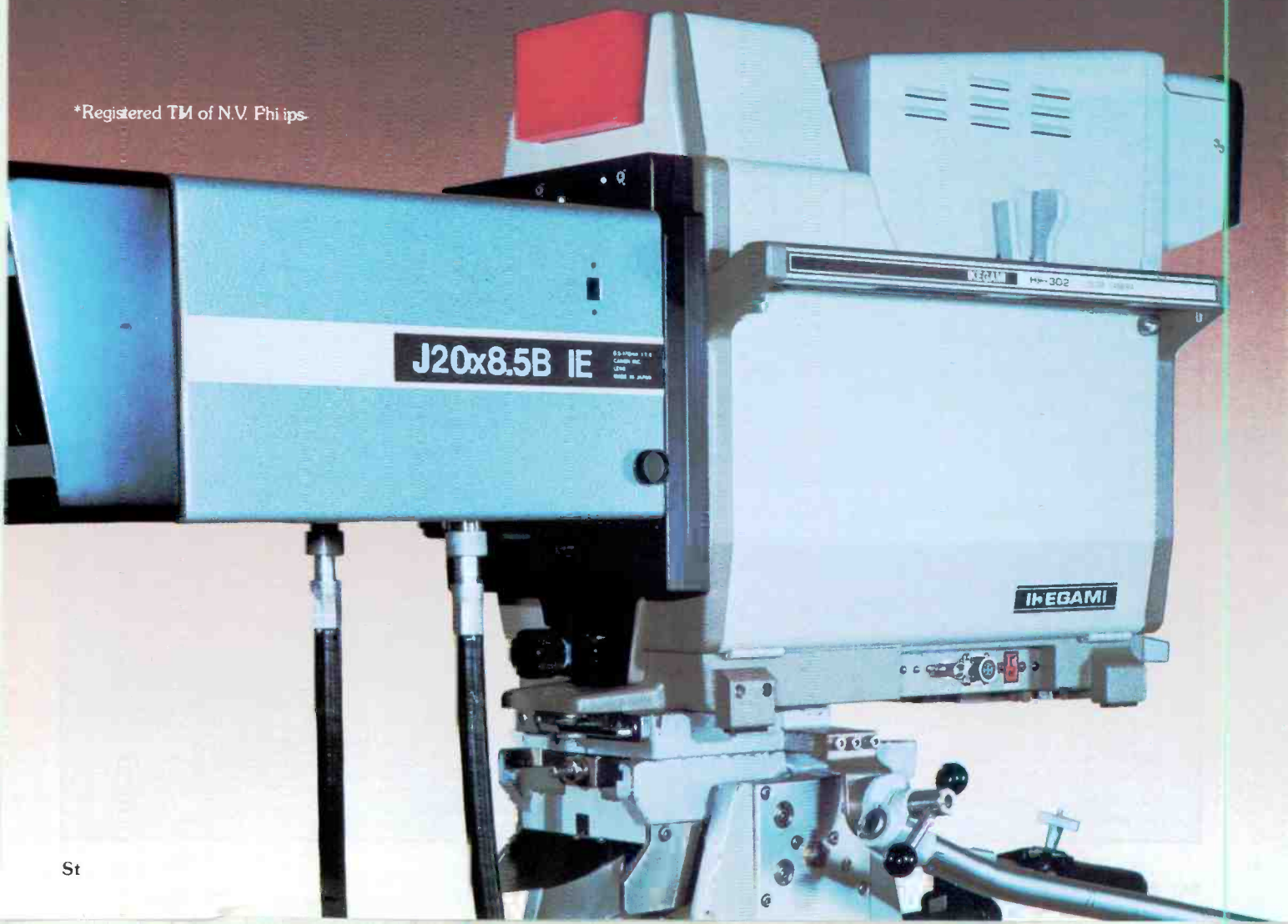

St

ing welcome was given by Leonard F. Coleman, financial vice president of the SMPTE. This was particularly significant because it was his last major address to the attendees from this position. Four hours later, at the Awards Luncheon, Coleman was named the new president for SMPTE.

Three major addresses were on the opening session program. Two were by guest speakers: Judith Schwan, assistant director, Research Labs, Eastman Kodak; and Dr. Kerns Powers, staff vice president, Commercial Research, RCA. The third was by Roland J. Zavada, engineering vice president for the SMPTE and a member of the Eastman Kodak Company. All three presentations focused on the conference theme—"Commitment to Tomorrow's Technology."

In terms of graphics, Schwan's paper was the most comprehensive, dynamic, aesthetically pleasing and creative presentation I've ever seen. It was a monumental credit to the vast resources at Kodak to turn out a graphic masterpiece. And her message to attendees was as sharp as her graphics. She covered new trends in film and video, from Kodak's point of view and from that of the whole industry. From her position of high visibility at Kodak, she sees, as the bottom line, a merging of new film and video technologies for the benefit of each.

Powers titled his paper, "The TV Look—the Next to the Last Debate." He began by pointing out that the SMPTE only serves one industry: the production, distribution and display of entertainment and information to consumers. Within that framework, photographic and electronic techniques are but subcategories representing different media for distribution.

Table I.
SMPTE-'82 TV session

Commitment to Tomorrow's Technologies—Gary L. Borton, *chairman*
Small-Format Cassette Videotape Recorders—Bernard Dickens, *chairman*
Technology in Lighting—E. Carlton Winckler, *chairman*
Film-to-Tape Interface—Robert Lund, *chairman*
Future TV Studio Design—Frank Davidoff, *chairman*
TV Audio—Frederick Remley, *chairman*
TV Production—Robert Muller, *chairman*
TV Post-production—Max Berry, *chairman*
Videotape Recording—William Connolly, *chairman*
International TV Technology—Paolo Zaccarian, *chairman*
New Technology for Television I—Joseph Roizen, *chairman*
New Technology for Television II—Charles Rhodes, *chairman*

Photo courtesy of SMPTE

Charles Anderson, SMPTE president, outlines the forthcoming conference for members of the press.

Coleman delivers his last address as the SMPTE financial vice president and his first as its new president.

Table II.
SMPTE-'82/New York exhibitors
Use our Reader Service Card and the numbers indicated to obtain product data from the convention exhibitors.

Company name	Reader Service Number
Adams-Smith	(380)
ADDA	(381)
A.F. Associates	(382)
Agfa-Gevaert	(383)
The Allen Products Company	(384)
American Data	(385)
Amperex Electronic	(386)
Ampex	(387)
Amtel Systems	(388)
Angenieux	(389)
Anton/Bauer	(390)
Arriflex	(391)
Asaca/Shibasoku Corporation of America	(392)
Audico	(393)
Audio Kinetics	(394)
Belden Communications	(395)
Bell & Howell	(396)
BIAS (Data Communications)	(397)
Bolex (USA)	(398)
Bosch (Fernseh)	(399)
Calzone Case Company	(400)
The Camera Mart	(401)
Canon USA	(402)
Central Dynamics/America Data	(403)
Century Precision Cine/Optics	(404)
Cetec Vega	(405)
Chyron	(406)
Cinema Products	(*)

*For information write: Cinema Products, 2037 Granville Ave., Los Angeles, CA 90025.

Company name	Reader Service Number
Cinematography Electronics	(407)
Cinemills	(408)
Cine 60	(409)
CMX Systems/Orrox	(522)
Coherent Communications	(523)
Colortran	(410)
Commercial Electronics	(411)
Comprehensive Video Supply	(412)
Control Video	(413)
Convergence	(414)
Corporate Communications Consultants	(415)
Crosspoint Latch	(416)
Datatron	(417)
Digital Video Systems	(418)
Dolby Laboratories	(419)
Eastman Kodak	(420)
ECHOlab	(421)
EECO	(422)
EEV	(423)
Elmo Manufacturing	(424)
Feathercam	(425)
For-A Corporation of America	(426)
Fortel	(427)
Frezzolini Electronics	(428)
Fujinon	(429)
Fuji Photo Film USA	(430)
General Electric	(431)
Goldberg Brothers	(432)
Grass Valley Group	(433)
Grumman Aerospace	(434)

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Company name	Reader Service Number
Harris	(435)
Harrison Systems	(436)
Hazeltine	(437)
Hitachi Denshi America Ltd.	(438)
Hollywood Film Company	(439)
Hudson Photographic Industries	(440)
Hughes Electronic Devices Corporation (HEDCO)	(441)
Ikegami Electronics (USA)	(442)
Image Video Ltd.	(443)
Industrial Sciences Inc. (ISI)	(444)
JVC Company of America	(445)
Kinotone	(446)
Kliegl Brothers Lighting	(447)
KLM Associates/Oldelft	(448)
Knowledge Industry Publications	(449)
Lab Methods	(450)
Lafayette Instrument	(451)
Lake Systems	(452)
LaVezzi Machine Works	(453)
Lenco	(454)
Lexicon	(455)
Lipsner-Smith	(456)
Listec TV Equipment	(457)
Lowel-Light Manufacturing	(458)
LTM Corporation of America	(459)
L-W Int'l	(460)
Magnasync/Moviola	(461)
Magna-Tech Electronic	(462)
Marconi Electronics	(463)
Matthews Studio Equipment	(464)
MCI/Quantel	(465)
Merlin Engineering	(466)
Microtime	(467)
Midwest	(468)
Millimeter Magazine	(469)
Mitchell Camera	(470)
MM Editing Systems	(471)
Mole-Richardson	(472)
Motion Picture Enterprises	(473)
Multi-Track Magnetics	(474)
Nagra Magnetic Recorders	(475)
NEC America	(476)
Neumade Products	(477)
O'Connor Engineering Laboratories	(478)
On Location Publishing	(479)
OSRAM Sales	(480)
Otarl	(481)
Oxberry Div. of Richmark Camera Services	(482)
Panasonic Industrial Company	(483)
PEP/Electronic Applications	(484)
Phillips Test & Measuring Instruments	(485)
Plastic Reel Corporation of America	(486)
Precision Echo	(487)
Quanta	(488)
Rank Cintel Ltd.	(489)
RCA	(490)
R-Columbia Products	(491)
Rohde & Schwarz Sales Company	(492)
Rosco Laboratories	(493)
RTI/Lipsner-Smith	(494)
RTS Systems	(495)
Sachtler Corporation of America	(496)
Sennheiser Electronic	(497)
Sharp Electronics	(498)
Skotel	(499)
Sony Corporation of America	(**)
Steenbeck, Inc.	(500)
Stellavox	(501)

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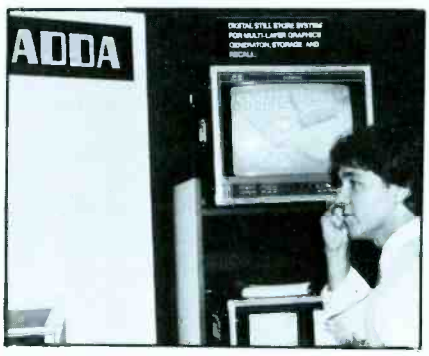
Company name	Reader Service Number
Strand Century	(502)
Sylvania Lighting/GTE	(503)
Tayloreel	(504)
Tele-Cine	(505)
Telescript	(506)
TV Equipment Associates	(507)
Telex Communications	(508)
Tentel	(509)
3M	(510)
Tiffen Manufacturing	(511)
Union Connector	(512)
Universe Stage Lighting	(513)
Via Video	(514)
VideoPro (CES Publishing)	(515)
Videotek	(516)
Vital Industries	(517)
Westrex Division of Litton Industries	(518)
Winsted	(519)
Xetron	(520)
Zellan Enterprises Ltd.	(521)

Powers went on to discuss the so-called *film-look* as the *ultimate* in visual quality. The future will certainly see a contest between higher definition tape and 35mm film in the post-production suite. But, in cinematography, he sees a different contest brewing. The battle will not be HDTV vs. 35mm film but, rather, 16mm film cameras vs. the ½-inch VRCs (combined camera/recorder systems). Although he acknowledged that the flaws for TV imagery outnumbered those for film, he believes that a constructive look at the flaws for both areas will lead to joint progress in future technologies.

Zavada outlined for attendees the ongoing efforts by the SMPTE for standardization. The major efforts, naturally, are being devoted to film and video/TV technologies, but the scope for SMPTE's work, under its charter, extends far beyond these bounds. Zavada's address was an in-depth treatment of the current standards status. 1982 saw some significant progress. Readers may look forward to an early issue of the *SMPTE Journal* for a copy of Zavada's detailed report.



ADDA digital still-store

Exhibits

From the exhibits standpoint, SMPTE-'82 was another exciting show. There was new equipment introduced, some of which we saw at IBC-'82 in England. However, most manufacturers were holding their new products for major announcements to be made at NAB-'83/Las Vegas.

Because the NAB show is so close, we have elected not to report in-depth the exhibits at SMPTE-'82. However, there were some things that particularly impressed

us, and we will single a few of these out for special mention. Readers who would like to obtain exhibitors' literature may use Table II and our Reader Service Card to request full-line or new product only data from exhibitors.

- ADDA featured its digital still-store system and provided us with a graphic to introduce this section of our show coverage.
- **Angenieux** featured its new 15X9 all-weather lens for ⅔-inch ENG/EFP cameras.
- **Anton/Bauer** featured its new 100% reliable and safe battery-charging system.
- **Asaca/ShibaSoku** proudly displayed its equipment and added a gimmick: a handy slide rule for metric/English conversions. (Also, look for a special announcement by Asaca in our March issue.) Of special significance at its booth, Asaca showed the CB53A1 color bar signal generator, with character generator/insert capability.
- **Ampex** was especially excited about offering the first Poniatoff Gold Medal Award for Technical Excellence at the show. (See page 110.) Also, Ampex exhibited its extensive line of products, including the new VPR-3 and VPR-5 recorders announced at IBC-'82 (See **BE** November, page 106) and its M Format ARC-10 camera/VTR system with complete editing facilities.
- **BIAS/Data Communications,** in stepping up its marketing communications program, announced at the convention two additions to its existing control automation product line. These represent options for TV stations that are not on the BIAS Traffic System or that operate on smaller budgets.

Photo: Bebe McClain

At the Bosch/Fernseh suite, Henri Zahn (left) holds up the new KBF-1 combined ¼-inch camera/recorder system with its shirt-pocket cassette. On the right, Gerd Boch holds the camera separate from its recorder.

- **Bosch/Fernseh** had its normally impressive booth, but the exciting action was off the convention floor in a hospitality suite. Shown there was the prototype FGS-4000 videographics system that combines character/art generation and animation into a single, powerful system. It is expensive, but it provides a powerful command of visual effects, including zooming, positioning, overlapping, variable transparency, color mixing, variable light sourcing, and 2-D and 3-D perspectives. Also, the operator has total control over character generation. In the technical program, John Briggs of Fernseh presented a paper on the system.

Shown also was the Bosch KBF-1 LINEPLEX ¼-inch cassette recording

system for ENG/EFP, which weighs 15 pounds. In the technical session, H. Zahn described the system's double-multiplexing processing and recording method.

As a balance, Bosch-Fernseh also displayed its new FPS-1000, a low cost digital art/graphics system that can be used stand-alone or connected to an existing character generator.

• **Central Dynamics/American Data** shared a common booth and displayed their new CD-480-6S production switcher, the AD-3100 series production switcher and the 2300 DAs. In an adjoining booth was the **Philips** line of broadcast cameras, both studio and ENG/EFP varieties.

• The big news for **Cinema Products** was its new Steadicam Universal model III, which is versatile, flexible, lighter and streamlined. Shown also was its new J-6 Joystick zoom control for camera operators.

• **Convergence** featured its EDL-90 Edit Decision Lister and a film software package for the 104 controller.

• **Corporate Communications** had a spectacular display for its 60XL-B film-to-tape and tape-to-tape transfer system with scene-by-scene color correction.

• **Crosspoint Latch** demonstrated its 6139 video production switcher with lots of interfaces and field-expandable capabilities.

• **Datatron** introduced its ST-3 moderately priced editing system and demonstrated new features with the Vanguard editing system, including the HELP software and Smart-Scan slow-motion editing.

• **Digital Video Systems** featured its Phaser IIA TBC/frame synchronizer; the DPS0103 component TBC; the Phaser IV low cost synchronizer; and the Phaser V and VI synchronizers with added capabilities.

• **EECO** made a strong appearance at the show. Introduced and demonstrated was the new Intelligent Video Editing System (IVES) designed as a complete post-production system. Low-priced and easy to use, the IVES-I is offered as an ideal system for networks, production houses, ENG operations, corporate productions or cable operations. Also shown was the PGT-560 portable time code generator, a miniature battery-operated SMPTE/EBU code source. In a separate effort, Karen Mills of EECO presented a paper on the new editing system characterized by its synergistic approach to video post-production.

• **EEV** made a major presentation of its range of Leddicon and Vidicon pickup tubes for TV cameras and film chains, particularly the following: the new ½-inch lightweight P8470; the new generation 1-inch HOP Leddicons type P8147; front- and rear-loading 1-inch diode-gun Leddicons P8190/P8196; the ⅔-inch diode-gun Leddicons P8460/P8462; and the 30mm broadcast Leddicons P8400/P8401. Also displayed was the 7-segment alpha-numeric character display tubes.

• **Fortel** drew sharp attention with its C-YIQ[32] TBC billed as providing pure power for the new Type M VTRs. Also shown were the new CCDHP time base corrector that uses digitally controlled CCDs for signal transparency and the Y-688[32] total error corrector designed to reduce or eliminate the cause of many color under VTR degradations.

Photo: Bebe McClain

Philip Godfrey of ABC Engineering inspects the Frezzolini system that provides an interface for attaching a small JVC portable VHS recorder to any ENG camera.

• **Frezzolini** had an unusually high visibility at the show, both in its booth and in the **PEP** booth, with the showing of a hybrid camera/VTR system, an alternative to the new VRCs coming on the market. The system features the ½-inch VHS-C *Frezzi-on-board* VTR. This system apparently took camera manufacturers by

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surprise, some of them had not even seen the hybrid systems on display before the press found them. But, Frezzolini also introduced a host of new power supplies, chargers, power packs, mounting brackets and accessories for attendees to see.

• Of all the exhibitors, **Fuji** and **Kodak** probably had the most visibility at the convention, each for different reasons. Both had impressive booths and lots to talk about, but they also excelled in other areas. Kodak had its evening hospitality event for attendees and sponsored much of the participation at the convention. Fuji sponsored the coffee and rolls for morning breaks, appreciated by all early risers.

• **Grumman** put on a commanding display of readiness for the era of high quality, stereophonic television by demonstrating its Rainbow Sound system. Featured was the 501 sync proc for maintaining an SCH-timed plant. A color encoder option supports graphics generation and provides a YIQ output for ½-inch component recorders. The stereo audio demonstration illustrated a method for encoding a channel of audio into a video format using the sync proc with color encoder.

• **Harris** made two major market thrusts at the show. One was for its IRIS II digital image system, which features a new lightweight data cartridge for low power RSD drive. Features of the system include picture compression/positioning, digital keying, DNR, cartridge data storage and portability for studio or mobile use. The other was its complete line of microwave equipment for ENG/EJ and other communications. Of special interest to attendees were the miniature/portable, frequency-agile video and sound transmission systems to replace cable or bulky equipment.

• **Harrison Systems** featured its TV-3 stereo TV console, which can be configured in a variety of ways, each optimized for specific applications. Also announced was the new TV-4 series stereo TV production console featuring state-of-the-art design and boasting ultrahigh quality, ultrahigh performance and ultralow price.

Photo: Bebe McClain

At the Hitachi booth, a crew from ABC's *American Sportsman* and ABC Engineering inspect the SR-10 combined chip camera/VHS recorder for possible use on mountain climbing expeditions.

• **Hitachi** had a spectacular exhibit. An important item was the introduction of its instant TV studio (ITVS)—a complete, self-contained, pretested, plug-in-and-run, prepackaged TV studio (all costing about $38,000). Also featured were the SK-1 solid-state ENG camera; the SK-11 studio portable camera which is used with the SK-110 full auto-setup camera system; the SK-91 EFP color camera and the SK-91SD diode-gun Saticon ENG/EFP camera; the SR-10 ½-inch cassette camera/recorder combination system; the HR-50 ½-inch portable VTR; the HR-211/200E 1-inch helical teleproduction VTR; and the ECR-50/50C ½-inch VTR editing system for the M Format.

• **Ikegami** featured its HL-83 ENG/EFP/VCR combo system, but there was no literature available. The system combines the HL-83 with the HM-100 recorder for a complete package. Also shown were the HK-322 fully automatic studio/EFP camera and the EC-35 electronic cinematography camera.

• **Image Video** featured its line of master control switchers, both customized and the standard 8200 or NTSC or PAL, and its new 7001 dual-video mix amplifier in a single-rack unit.

• **JVC's** impressive exhibit contained its cameras plus the following: the KM-2000 effects generator; the C-2082UM 19-inch video monitor/receiver with stereo sound; the TM-22U portable video color monitor; and the compact ½-inch VHS-C compact videocassette model HR-C3U weighing in at 4.4 pounds.

• **Kodak** introduced its new Datakode magnetic control surface, which links film imagery to the automated, computer-assisted system used in post-production. It

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consists of a transparent magnetic coating across the back of motion picture film, thereby enabling machine readibility and, perhaps, aiding origination/distribution operations.

• **Lake Systems** featured its LA-KART multiple-deck random access video cart system for handling station break and programming needs. Boasting cost effectiveness, simplicity, high reliability and exceptional flexibility, it features touch-terminal control and display, choice of formats (U-Matic, Type M, Type C), modular construction, and the capability to control up to 30 machines.

• **Lexicon** featured its model 224 digital reverberation system and a demo setup to let attendees experiment with the system.

• **LTM** exhibited its range of lights and support equipment, but the hit of show at the LTM booth was its fiber-optics lights for the industry. The system's light without heat provided an impressive demonstration. (See our fiber-optics section for more details, beginning on page 76.)

• **Marconi** displayed its range of test instrumentation for broadcasters, but of special note was its new 2306 2GHz modulation meter that serves also as a counter, RF power meter and audio analyzer.

• **Multi-Track Magnetics** featured its MST-100, an easy-to-operate synchronizing computer that uses the VITC to slave almost any VTR to any sprocketed film recorder/reproducer to a field accuracy of one-half frame.

• **Nagra** made an impact at SMPTE-'82 in two ways. First, in its own booth, it featured the Nagra recorder line, with special emphasis given to the Nagra-T transportable audio recorder designed to accept reels up to 300mm(11.8-inches). Second, in the Ampex booth, the Kudelski-produced VPR-5 1-inch helical-scan VTR on a Nagra C base was displayed. The two combined gave Nagra high visibility.

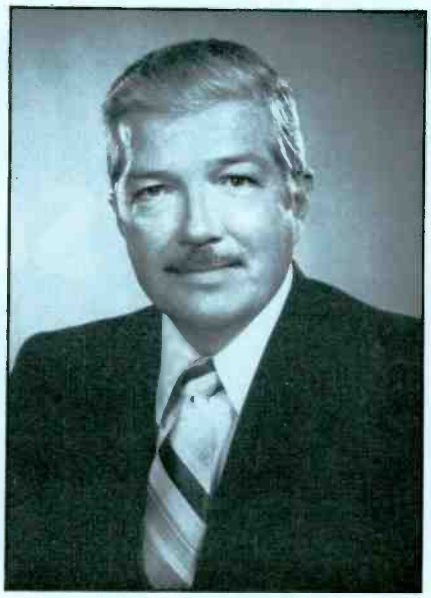
• **On-line Computer Systems** displayed its CyberLimn computerized color videographics system designed to meet the needs of broadcast and production studios.

• **Otari** made a number of business, people and product announcements at the show, but an especially interesting item was the announcement of the new model 5050B-II ¼-inch, 2-channel reel-to-reel recorder. Replacing the former 5050B, the new unit features integral microprocessor control, a real time electronic counter, LED display, memory rewind function and compatibility with dbx noise reduction products.

• **Panasonic's** big push at the show was for its B-100 RECAM in-camera VTR system with companion AU-A30 editing controller and AU-300 studio VTR. (See our special ENG section for more details, beginning on page 19.) But also shown were the new AT-H190G/H130G color monitors and studio systems.

• **PEP** introduced its new combo charger, a portable ac adapter in combination with a fast charger; introduced its UNL universal overnight charger; and showed its full line of power packs and accessories for ENG/EFP. However, the most immediately noticeable product in the PEP booth was a hybrid camera/recorder, the Hitachi SK-91 with Frezzolini recorder attached.

Woywood



Howe

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Volpe

• **Philips Test & Measuring Instruments** displayed its professional TV test equipment, but special emphasis was given to the PM5548 video level meter and the Philips signal monitors.

• **Precision Echo** introduced its SQUEEZER, a video image compression system for the video industry, and showed its EFS-2 Image Maker and EFS-1B Frame Bank.

• **Rank Cintel,** coming off a strong showing at IBC-'82, used the SMPTE-'82 as an occasion to launch its new, high performance sound follower into the American market. The FeRRIT (Ferro Recording and Reproducing Interlocking Transport) separate magnetic sound follower is a 16/17.5/35mm record/replay machine designed for telecine, VTR and sound-dubbing applications. Also shown was the MkIIIC flying-spot scanner for high quality film-to-tape transfers.

• **RCA** made excellent use of opportunities at this show. Although it had been shown in a suite at IBC-'82, this was the first open showing of the new TKP-47 portable automatic camera with a head weight of only 17 pounds. The camera's reduced size and weight are the result of ⅔-inch tubes and compact packaging of circuits and components.

Other cameras shown included the TK-47B automatic studio camera, a second generation offering improved operation and performance with a new *smart* remote control unit; the Hawkeye camera/recorder system; and the low cost TK-710, a 3-tube portable ENG camera.

Complementing its camera line, RCA displayed its TR-800 1-inch VTR and its TK-290 automatic telecine camera.

But one of the highlights for the press was to meet some of the new key people for the RCA Broadcast Communications Systems Division, the RCA division that reproduces studio and transmitting systems for radio and TV for worldwide distribution, as well as cable TV equipment, plus handles installation and service. These included Dennis J. Woywood, division vice president, Broadcast Video

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Systems, who is responsible for product management and engineering for studio and field color TV cameras, VTRs and control equipment; Joseph B. Howe, division vice president and general manager, Broadcast Communications Systems; W. Arnold Taylor, division vice president, Marketing, who supervises marketing of a complete line of radio and TV systems for transmitting and studio use worldwide; Joseph C. Volpe, division vice president, Broadcast Transmission Systems, who is responsible for product management and engineering for broadcast transmitters and antennas, and for technical services.

But that was not all. Tucked away in the corner of the RCA booth was a guest exhibitor whose system is covered elsewhere in this report. (See *Telemetrics.*)

• **R-Columbia Products** showed its line of wireless intercom headphones, but stressed its line-powered model TP/IC professional intercom featuring instant hookup, 2-way intercommunication with plug-in modular installation.

• **RTI** featured a host of new products, including the TV-2000 film editing system designed specifically for the TV industry; three new videocassette evaluator/cleaners for ¾-inch, Beta and VHS formats; the DATA-FILM 820 computerized information reporting system for film inspection, editing and programming; its 35mm power rewinder for heavy-duty service; and a new line of metal 16mm reels and cans of high quality and budget price.

• **RTS Systems** introduced its 802 Master Station professional intercom system featuring Z80 microprocessor control; up to 12 channels of 2-way communication; front panel programmability; an extensive range of command functions; separate talk/listen switching; 1-way announce/page; IFB (program interrupt); squawk address; station isolation; program monitoring; multisource audio selection for mono/stereo headsets; and signaling circuitry.

• **Skotel** introduced its 014 video character insert module and showed its line of portable time code generators/readers and VITC time code equipment with data-in-video capability.

• **Sony Broadcast** had an exceptional show, mostly because of the breaking news on Betacam. Normally, at the Sony press breakfast, the Sony staff covers all its show products. But this year, the staff concentrated on the Betacam. Then later, during the show, the deal was consummated in which Corinthian Broadcasting adopted the Betacam system. A major press meeting was held for this event at the Sony booth, leading to the interview with Art Biggs, vice president, engineering, Corinthian, that is carried elsewhere in this issue, (page 48). The transaction involved 75 camera/recorder systems and more than 50 Betacam editing systems and accessories. (The package price was more than $5 million.)

Sony showed, for the first time in the United States, its BVP-3 Betacam, a new ⅔-inch tube design called the "Mixed-Field" Saticon. Yielding higher performance with less power consumption, the system interfaces with Sony's ½-inch camera/recorder system.

Also Sony announced four new accessories for the Betacam: the CA-3 and CA-300 camera adapters and the VA-1 and VA-1V VTR composite adapters.

Sony also announced that the Gannett News Service, Washington, DC, has also adopted the Betacam for its news operation. Herb Schubarth, Gannett's vice president of engineering, said that the move, in effect, obsoleted its ¾-inch equipment. Gannett has opted to start with the 1-tube camera, but stands ready to upgrade to the 3-tube system if that becomes necessary.

Other action at the Sony booth included showing the BVP-330A, an upgraded version with new precision deflection yolks and dynamic focusing; Sony's complete range of studio equipment; and the MCI/Sony consoles and recorders, including the new JH-800 compact mixing console, the JH-110C8 multi-track recorder, and the JH-110B stereo recorder.

Another item of interest at the Sony booth was its DCU-300 digital command unit for use with the BVP-300/330 series portable production cameras. Following the show, one of the networks was receiving this system for evaluation as part of a major, worldwide broadcast event.

• **3M** exhibited its equipment and film products, with special emphasis on the new 350/351 magnetic film and the 226/227 studio mastering tape. Prominent in equipment was the #D-8000 graphics generator and the TT-7000 1-inch C Format VTR.

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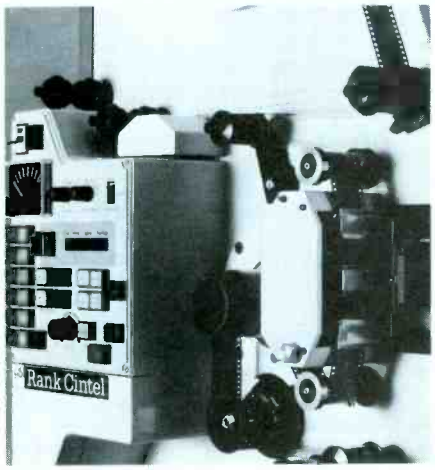

The FeRRIT sound follower

telecine. The advantages of using the light-source to scan the film are plain to see, particularly with negative film: pictures that are high in contrast, resolution and definition but low in noise. Flying-spot picture quality and operational features like 16mm/35mm/Super 16/Super 8/slide capability, programmed color correction and variable speed between 16 and 30 f.p.s. make the Rank telecine the definitive film/tape transfer machine.

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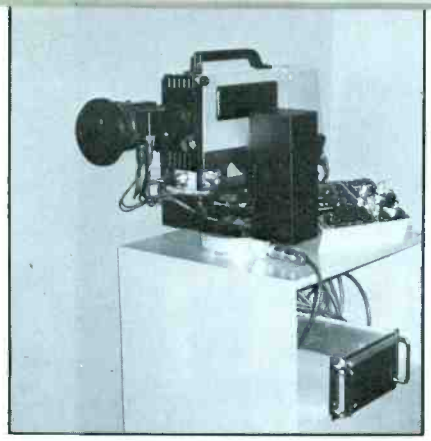

The Telemetrics 360° remote pan-tilt system was scheduled for delivery soon after the convention.

• **Television Equipment Associates** showed its new Secrette dynamic headset intercom for ENG camera operators and its Slimgard headset for high noise applications.

• **Telemetrics,** sharing a corner of the RCA booth, displayed its new 360° pan and tilt table, which is integrated into triax-connected ENG camera controls.

• **Telex** showed its wireless mic systems, with special attention devoted to its new WHM-300 (electret) and WHM-400 (dynamic) hand-held transmitter/microphones.

• New from **Tentel** was a Tentelometer tape tension gauge for 1-inch C Format VTRs. To come soon will be calibration kits and a universal video head protrusion gauge.

• For **Vital Industries,** the big news was its forthcoming 25th anniversary year, an event which Vital will probably celebrate all of 1983. At the show, Vital concentrated on SqueeZoom-1982, with its own input routing matrix for each channel, and SAM, Vital's computer-controlled system for automating all on-air equipment.

Standards progress at SMPTE

One of the major functions of the SMPTE is to help develop recommendations for standards for the broadcast and film industries. Committees meet throughout the conference, working toward the goal of standardization. The press is invited to attend these meetings, but we are restricted to clearing any progress statements through session chairmen before publication.

From SMPTE-'82/New York, the following announcements on standards activities have been submitted to us by the SMPTE:

•*The New Working Group on Component Analog Video Standards held its first meeting on Nov. 10 at the SMPTE Technical Conference.*

The second meeting of this Working Group wos held in Redwood City, CA on Dec. 8. Those interested in component analog video are invited to attend future meetings and become members of this group, which is chaired by Merrill Weiss, Westinghouse Broadcasting Company, KPIX, San Francisco.

•*On Nov. 8, a meeting of the Working Group for the Standardization of Digital Control of TV Equipment was held to continue the joint deliberations concerning the proposals for the standardization of control language. Approximately 30 people attended, including members of the EBU Ad Hoc Group on Remote Control.*

The development of specifications has been proceeding rapidly as it has been the principal topic of attention of the subcommittee composed of the EBU and the SMPTE groups, formed at a joint meeting in London, England, in July 1982.

A proposal for the Virtual Machine was submitted for discussion and approval that incorporates the following principles:

- *conformity with the recommendation of the ISO/OSI model at the level 5/6 Service Access Point;*
- *a well-defined data structure based on defined logical descriptions of the functions (KEYWORDS) and their parameters (NAMES AND VALUES);*
- *efficient use of the communications channel; and*
- *flexibility to allow future growth and additional user-defined features.*

In subsequent discussions by the full committee, a consensus was developed supporting these proposals, which was to be circulated for comment and final approval.

The Awards Banquet

One of the highlights of the fall SMPTE meetings is the awards presented to leaders in the industry. This is also the occasion for bringing in new officers. At SMPTE-'82/New York, the president, Charlie Anderson of Ampex, passed the keys of office to Leonard F. Coleman of Eastman Kodak, formerly SMPTE financial vice president.

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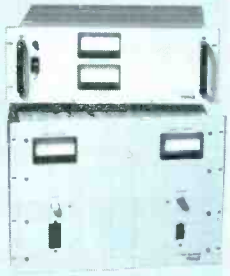

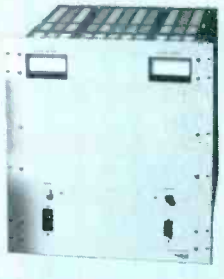

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Dr. Ray Dolby receives SMPTE's first Alexander M. Poniatoff Gold Medal for Technical Excellence. Outgoing president Charles Anderson presents the award and offers congratulations as Lynn Robinson, SMPTE executive secretary, looks on.

The entire awards program will be treated in depth in the forthcoming *SMPTE Journal*. However, we would like to comment on two especially significant awards.

The first is the creation of a new award, the Alexander M. Poniatoff Gold Medal for Technical Excellence. This annual award is sponsored by Ampex to honor its founder, the late Alexander M. Poniatoff.

The purpose of this award is to honor the recipient by recognizing outstanding technical excellence of contributions in the research or development of new techniques and/or equipment that have contributed significantly to the advancement of audio or TV magnetic recording and reproduction.

The SMPTE was pleased to present the First Alexander M. Poniatoff Gold Medal Award for Technical Excellence to Dr. Ray M. Dolby in recognition of his contributions to the advancement of magnetic sound recording. Dolby is noted for his pre-eminent work in the design and application of noise reduction systems for use in sound recording. Many millions of individual pieces of equipment now feature Dolby noise reduction systems, of great significance to improved stereophonic performance in these machines.

The second was the SMPTE Progress Medal, the highest award bestowed by the society. It is the purpose of this award to honor the individual by recognizing outstanding technical contributions to the progress of engineering phases of the motion picture and/or TV industries.

For 1982, this distinguished award went to Frank Davidoff, now retired but formerly staff consultant in advanced technology for the engineering and development department of the CBS TV Network.

In presenting the award, the SMPTE stated, "It is most appropriate, at a time when television is on the threshold of applying compatible digital video specifications, that we honor a man who has devoted his energies and skills in directing and motivating the developing of a sound technical approach to digital video specifications while maintaining high technical quality. The combination of a missionary's zeal, effective international leadership and basic educational tutorials in the digital field has and will benefit the world TV industry."

The final notable function of the awards banquet is the announcement of New Fellows elected into the society. For 1982, the following were elected:

- John B. Aldred, *Rank Film Laboratories.*
- Edward J. Blasko, *Eastman Kodak.*
- Zhei Jian Chan, *China Central TV.*
- John Corso, Jr., *W.A. Palmer Films.*
- Roland F. Ebbetts, *Filmatic Laboratories Ltd.*
- Jesse T. Ellington, Jr., *Consolidated Film Industries.*
- Rune Ericson, *Film AB Rune Ericson.*
- Robert P. Gyori, *Deluxe Laboratories.*
- Lee V. Hedlund, *RCA.*
- Karl H. Kruger, *Canadian Broadcasting Corporation.*
- John de Sola Mosely, *Quinta Enterprises.*
- Colin F. Mossman, *Rank Film Laboratories.*
- Robert W. McAll, *Digital Video Systems.*
- Lester Shorr, *Paramount Pictures.*
- Alvin J. Siegler, *CBS Television.*
- Karel G.M. Staes, *Agfa-Gevaert.*
- Aleksandar Todorovic, *Televizja Beograd.*

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LPTV:
A review of the rules

By Donald L. Markley, facilities editor, D.L. Markley & Associates, Consulting Engineers, Peoria, IL

In the spring of 1982, the FCC issued a Report and Order which terminated BC Docket #78-253. This was identified as an inquiry into the future rules of low power TV (LPTV) broadcasting and TV translators in the national telecommunications system. The actual function of this Report and Order was to finalize the rules for low power television. Before this date, more than 5000 applications had been filed for low power TV stations based upon a notice of proposed rulemaking which generated comments and input into the commission, leading to this Report and Order. The documents run about 64 pages in length and contain a detailed study of the low power service and the criteria that led to the commission's decision.

It is highly recommended that those who are low power applicants, or who are involved in low power television, read the entire rulemaking. It is the purpose of this article to simply touch on the major points of that rulemaking.

One of the most significant features of the Report and Order is that the commission has again leaned toward the marketplace to rule low power television. To quote the commission, "Accordingly, we resolve our first decision criteria with the conclusion that the low power service, as authorized herein, is likely to provide program service that is responsive to public demand without the necessity of regulatory intervention by the com-

Table I.
Spacing requirements for LPTV stations

No detailed study required if distance from LPTV to station exceeds:		
LPTV	**Regular VHF**	**Regular UHF**
Co-channel	210 miles	210 miles
± offset	150	150
± 1	90	75
± 2,3,4,5	.....	20
+ 7	.....	60
− 14	.....	70
− 15	.....	75

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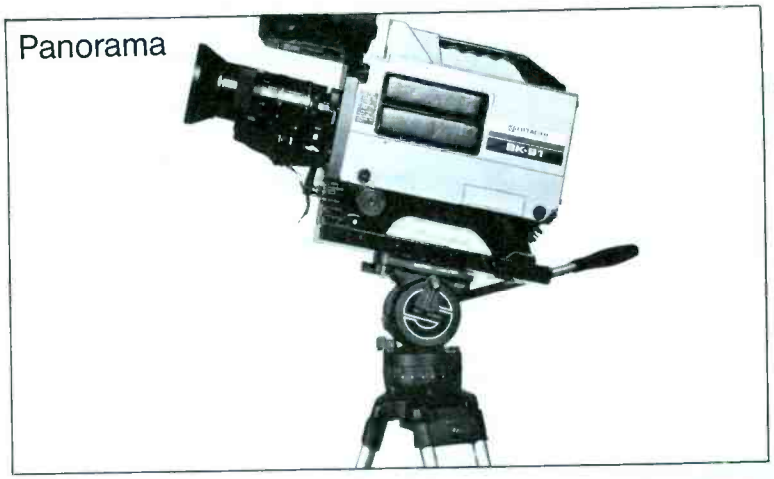

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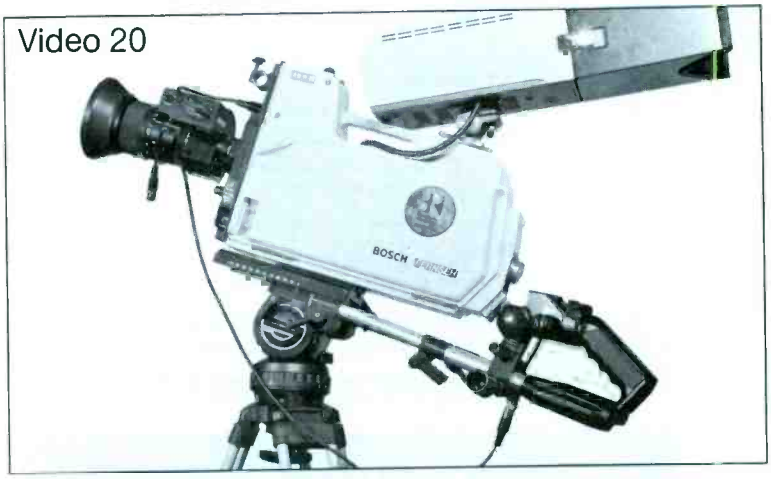

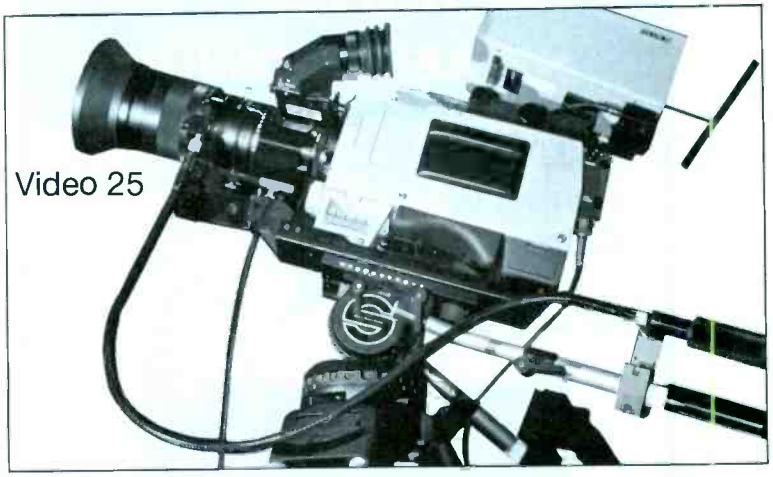

Table II.
Low power television protection criteria

Protected Contours: Regular TV – Ch. 2-6; 47dBu.
Ch. 7-13; 56dBu.
Ch. 14-69; 64dBu.

Translators or LPTV – Ch. 2-6; 62dBu.
Ch. 7-13; 68dBu.
Ch. 14-69; 74dBu.

Proposed LPTV	Regular VHF	Regular UHF	Translator or LPTV
Co-channel ± offset	45dB D/U, F(50,10) 28dB D/U, F(50,10)	45dB D/U, F(50,10) 28dB D/U, F(50,10)	45dB D/U, F(50,10) 28dB D/U, F(50,10)
+1 Channel –1 Channel	– 6dB, D/U, F(50,50) – 12dB, D/U, F(50,50)	– 15dB D/U, F(50,50) – 15dB D/U, F(50,50)	– 6dB VHF, – 15dB UHF – 6dB VHF, – 15dB UHF All F(50,50) D/U
± 2,3,4,5 Channels	.....	32km (20 mi.)	.....
– 14 Channel	.....	– 23dB D/U, F(50,50)**	– 6dB D/U, F(50,50)**
– 15 Channel	.....	– 6dB D/U, F(50,50)**	– 6dB D/U, F(50,50)**
+7 Channel	.....	0dB D/U, F(50,50)**	0dB D/U, F(50,50)**

*Only if protected station is using ± 1kHz frequency tolerance.
**Must be outside of protected contour.

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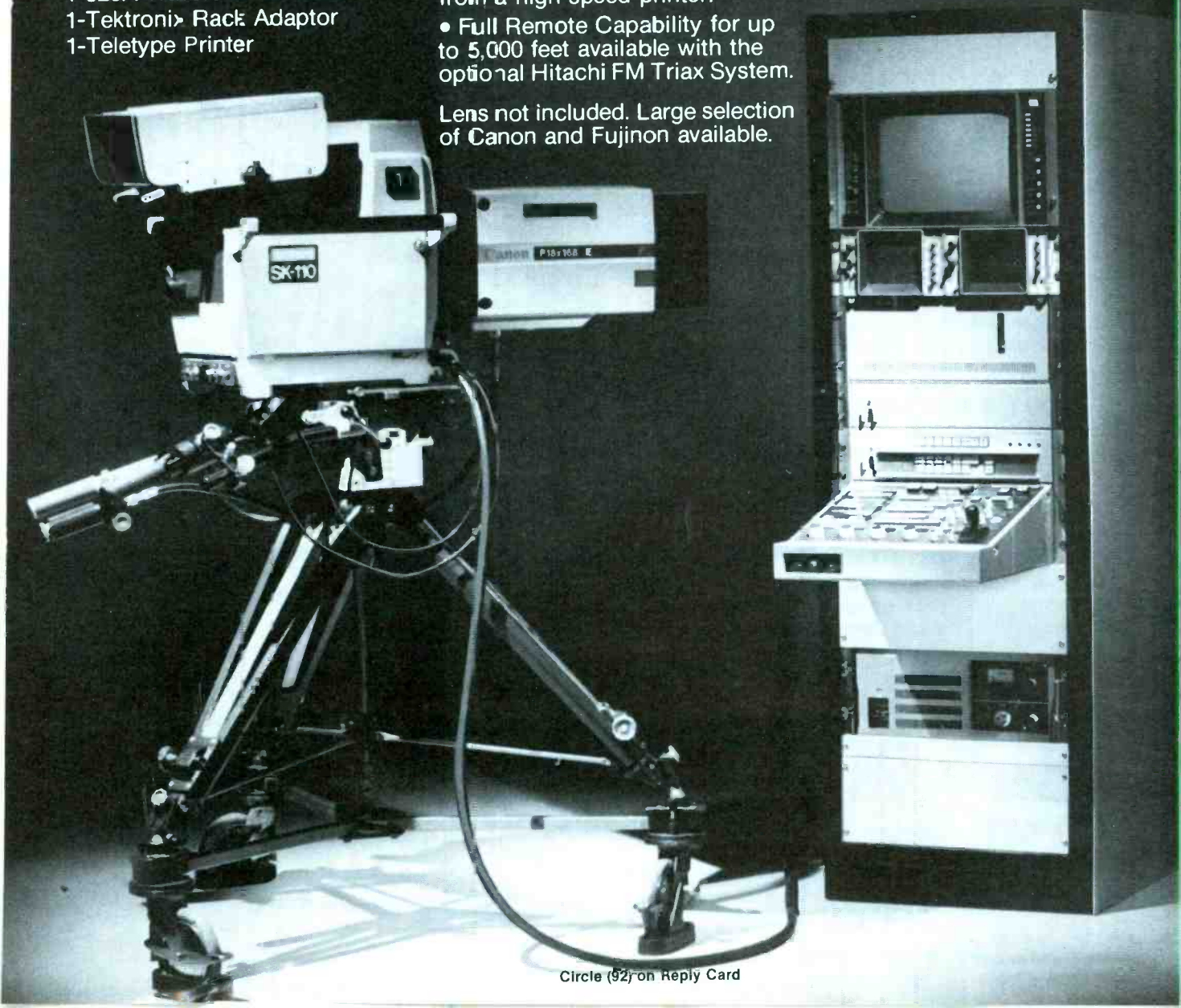

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mission." The rest of the rulemaking appears to lean heavily upon that criteria and actually applies a minimum level of regulation to the low power services.

However, the commission is adamant in one specific area. Low power television will be a secondary spectrum priority. That will assure protection to full-service stations. Secondary spectrum priority means that low power stations may not cause interference to existing full-service stations, and that low power stations must yield to facility changes of existing full-service stations or to new full-service stations, if any interference should occur. Interpreted, that means that a low power station can't bother a regular station. If a regular station, either new or existing, performs some changes which would cause it to be interfered with by the low power station, the low power station must go away. There is no change in this from the interim policy.

New UHF and VHF low power facilities will be permitted on any channel in either the VHF or UHF portions of the band. The maximum power that will be permitted for VHF facilities will be 10W except where a 100W station is proposed on an assigned channel. On UHF channels, the maximum power will be 1000W. Where the proposed low power facility is within 250 miles of the US-Canadian border, or within 250 miles of the Mexican border for VHF stations, or 199 miles for UHF stations, any authorizations will be conditioned on Canadian or Mexican concurrence with the station.

As to spacings or protections to existing stations, the commission has specified a table of mileage separations that will permit an application to be filed for a low power station without further study. Those mileage separations are shown in Table I. Also it is possible for additional stations to be granted that meet necessary desired-to-undesired ratios (D/U). These are field ratios at the protected contour for existing stations. This contour and the D/U ratios are shown in Table II.

It should be noted that these D/U ratios will not be considered by the commission as absolutes. For example, the commission has stated that, as low power stations are authorized and cases of interference identified, it may refine its criteria and make changes as necessary to eliminate interference to the primary station. The commission also has made note of the fact that low power use of some TV channels may be subject to interference from authorized land mobile, point-to-point or FM stations. The low power facility is not protected from interference from those services.

The commission has adopted extensive rules in the LPTV service to protect land mobile channels from interference. New Section 74.409 identifies each land mobile protected area by city, state, latitude/longitude and channels involved. These protected areas are forbidden for LPTV use on the channels identified and, in some cases, on adjacent channels. In a similar fashion, protection has been provided to some off-shore radio telecommunications service stations. This is in keeping with the policy that LPTV is a secondary spectrum priority and shall not cause interference to existing systems or services.

There will be no non-commercial channel reservations as the Report and Order now stands. Non-commercial and commercial applicants will be treated in a similar fashion and no distinction made for non-commercial station operation. Educational operators will be permitted to run commercials.

For low power facilities and for existing translators, a protected contour has been established. These protected contours and the desired/undesired ratios are also shown in Table II.

Terrain shielding is not treated in this Report and Order. It is stated that this area would be more properly treated in a proceeding of its own. Antenna front-to-back ratio has been ruled a safety factor in ensuring that proper protection will be given to existing stations. With respect to cable systems, the commission has stated that low power operators will be responsible for taking corrective action, when their signal interferes with any other service, if the interference is from improper operation or maintenance. The cable operator will be responsible for correcting interference in the cable distribution system and its subscribers connections. The commission will expect all parties involved to work together to resolve interference. If no such resolution can be accomplished, then the matter may be brought as a last measure to the commission who will act to afford protection to the earlier service. It's the old rule that the new guy protects the existing systems.

The application for LPTV will continue to be FCC Form 346. However, that application has been modified somewhat to include such items as a frequency offset to minimize interference to co-channel facilities. The commission has decided to process these applications in a slightly different fashion than normal broadcast applications. If the application is in error, it will be returned.

Those applications that were on file had from June 24, 1982, to Sept. 21, 1982, to be brought into compliance with the existing rules. Applications will be based on an "A" cutoff list, and those applications that are mutually exclusive with those on an "A" list will be placed on a "B" cutoff list. This is in accordance with standard commission practice for broadcast facilities.

For applications which are mutually exclusive, the commission has outlined a much briefer and less expensive hearing procedure than the broadcast industry is accustomed to for full-service facilities. Those who are involved in such proceedings should discuss this matter with their attorneys, as the full treatment of the hearing procedures is beyond the scope of this article. However, the commission has clearly stated that there will only be two comparative issues that will be considered in hearings. These will be diversification of control of the media and more than 50% minority ownership. With only diversification and minority ownership being criteria, the commission believes that all hearings will be resolved in a much prompter fashion than normal broadcast-type hearings.

It is interesting that the commission has decided to adopt no ownership restrictions for low power service. In other words, the low power facilities may be owned by cable systems, networks, existing broadcast facilities or by large group owners. There will be no cross-ownership, duopoly or maximum number of stations specified. Obviously multiple ownership will be limited by the diversification rules, especially in those markets where the stations are most desirable.

Construction and operation

The standard routine will be followed in that a construction permit will be issued followed by a license. The commission has eliminated the 3-year rule for low power service, but has decided on a 1-year holding period on new low power licenses.

Concerning the operation of low power stations, normal EEO reporting will be required of large operations. Licensees will have to measure carrier frequencies at least once a year and as often as necessary to assure compliance to the frequency standards. Proof of the measurements must be certified by a holder of a general operator's permit. Maintenance logs will be required. Subscription television will be permitted without any rules such as "compliments-of-four restriction." There will be no require-

ment concerning any minimum hours of free program. Any network affiliation agreements will be subject to the same regulations as for full-service stations.

Concerning operators, a licensed operator, any class, must be on duty and in charge of the transmitter when program origination is taking place. For the purpose of these rules, program origination is anything other than directly retransmitting the signals from another station. Even more simply put, if you are modulating, you must watch the transmitter; if you are only translating another station's signals without going to baseband, you can operate unattended with conditions.

The commission has decided to permit agreements concerning whether or not a low power station will be carried on a cable system to be made by the parties involved. It is the commission's opinion that this may encourage low power applicants to seek out remote, unserved areas where cable is thought not to be viable economically.

Low power stations will have to observe the requirements in subpart G of the rules concerning EBS procedures with one exception: Low power stations will not be required to install an encoding device for generating the 2-tone attention signal for EBS.

It should be noted that this brief summary has not been intended to fully cover all of the requirements of the new rules or to outline all of the reasons for the rules being created in their existing form. This article has attempted only to touch on the highlights; to provide some idea of the content of the Report and Order. Those who are more interested in low power television, or those who have applications on file, are encouraged to consult their consulting engineer and their attorney for more detailed answers to their questions.

- Oct. 1-3, 1982
- Shoreham Hotel, Washington, DC

LPTV East-'82:

Programming and LPTV applications

By Frank A. Camoro, general manager, The Institute For Low Power Television, Norwalk, CT

The National Institute for Low Power Television sponsored its second annual conference and exposition in Washington, DC, Oct. 1-3, 1982. The program featured more than 40 seminar/workshops and an exhibit hall with more than 70 LPTV manufacturers and suppliers. The attendance and exhibit participation was good, but nothing like what is expected at LPTV West-'83.

Nine months ago, the biggest problem the LPTV applicant faced was getting a construction permit. Now with the FCC stating that the current backlog of 6500 applications will be dealt with within one year, the LPTV owner/operator must concentrate on the next step—the task of completing financing arrangements, constructing a station, staffing up and facing the most critical problem of all, what to put on the air.

The National Institute for Low Power Television set the course to help solve this critical problem. The Programming Festival (held in the exhibit hall) was the first step in bringing the programmer and the LPTV broadcaster together. The festival featured syndicators: Freemantle USA, Reeltime Distributors, Vu TV and VC III Cable Vision. Also participating were satellite programming services such as PTL Network, Satellite Programming Network, SIN Television Net-

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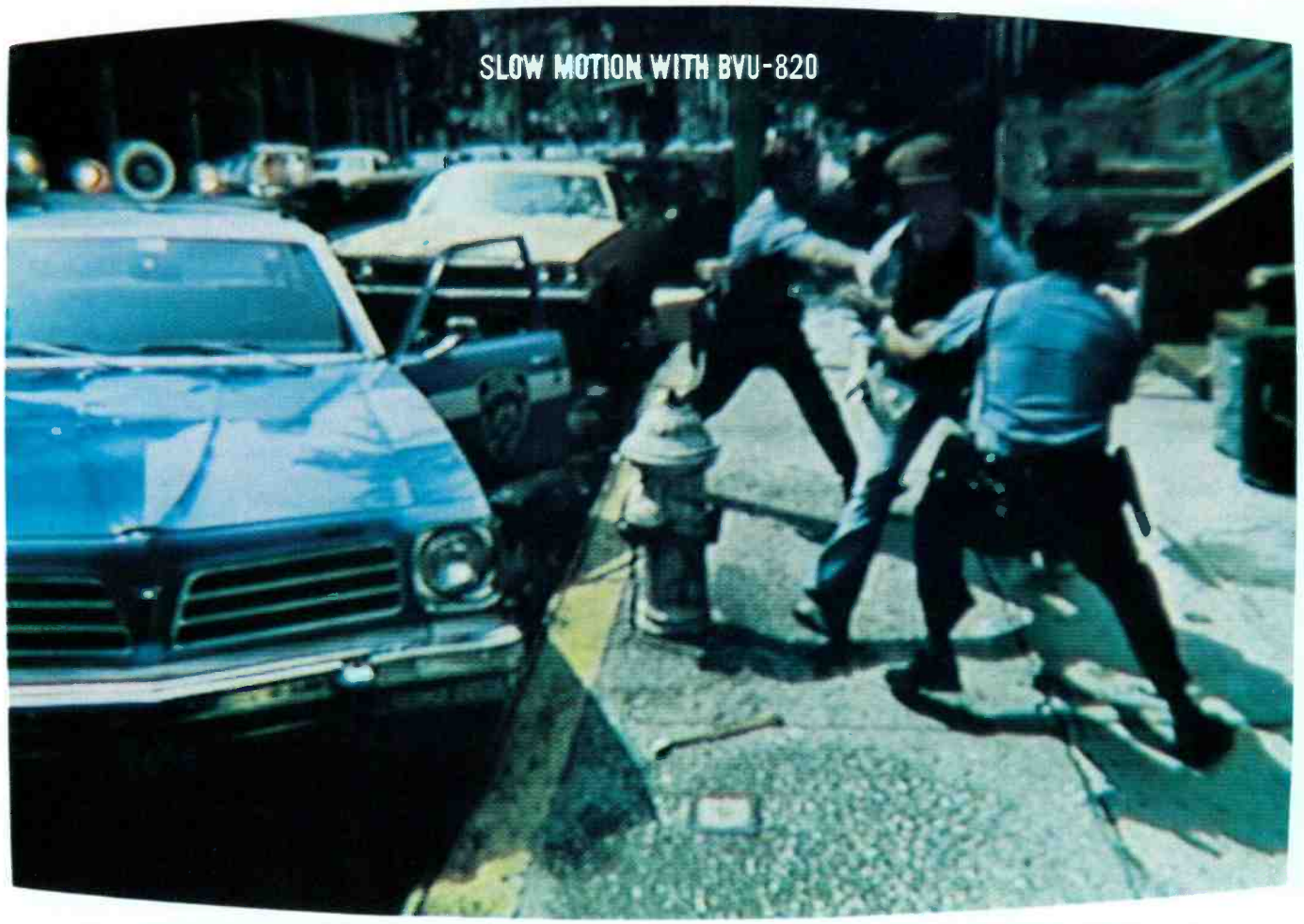

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Without it, the BVU-820 is capable of up to 10x play speed—fully viewable.

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For all the facts on the state of the art, from the people who invented it, call Sony Broadcast in New York/New Jersey at (201) 368-5085; in Chicago at (312) 860-7800; in Los Angeles at (213) 537-4300; in Atlanta at (404) 451-7671; or in Dallas at (214) 659-3600.

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work and the Financial News Network. All of the satellite services are providing 24-hour service or service on a part-time basis.

Raymond International viewed its *How to Win Audiences with Game Shows*. Also a great deal of excitement was created by two LPTV Networks—Genesis Corporation, which signed up 26 CPs for its network, and General TV Network.

Public service programming made its presence felt with representative programming from March of Dimes and Real to Real. Alphanumeric services such as The Associated Press and United Press International made their service available for viewing. Subscription TV services were represented by Selec TV of California, which presented its pay service to festival watchers.

Through the efforts of the NILPTV, Turner Broadcasting announced it will be making their *CNN II* news service, *The Mike Douglas Show* and other programming available to the low power broadcaster on an equal basis to the service being provided to the full power broadcaster.

In unprecedented statements made separately at LPTV East-'82, both Sen. Ernest Hollings (D-SC) and Larry Harris, chief, FCC Mass Media Bureau, predicted large increases in licenses granted in the coming year.

Hollings assured his keynote audience that the FCC will be processing "hundreds of licenses a month by this time next year or earlier." Harris, at the FCC Forum presentation, projected the figure to be "650 per month." Both looked to a bright future for licensees, with Hollings likening the situation to a chicken and egg proposition, stating that the market won't be there until licenses are granted.

Hollings pledged his support in the legislative area and agreed that the FCC, with newly allocated funds for a computer and a lottery in place, is "working right along with us."

He congratulated the attendees for being part of this pioneer industry and reaffirmed his belief in the spectrum belonging to the public.

When introducing Hollings to the LPTV audience, David Chiefetz, executive director of the NILPTV, noted that at the beginning of any new industry there are a few key influential people who are instrumental in getting it off the ground. In the case of LPTV, Sen. Hollings is such a man, he said. In recognition of this "hard working senator who makes things happen," the Institute proudly presented him with its first Pioneer Award.

Harris, addressing an eager evening audience with many questions, spoke

first about the newly structured Mass Media Bureau of which he is the chief. The fourth division of the bureau, Media Services, will include LPTV as a separate branch. He sees video services as a wave of the future and cited low power's 6500 applicants, and the potential for 12,000 to 14,000 after the freeze is lifted, as the perfect example of that wave.

He also noted that low power is as needed in the cities as in the rural areas and pledged to get applications granted as quickly as possible. LPTV, he insisted, is the "small person's game." It is relatively inexpensive with the ability to provide a unique service to the community you're in, he said.

Harris also admitted that "all the rules should have been established" before the FCC accepted any applications. Currently, processing is on the upswing. He predicted processing 650 applications a month with the backlog wiped out in less than a year. New applications will then be accepted.

Harris insisted you don't have to be the "Big V" or the "Big U" to make money in communications. In the question-and-answer session following his presentation, Harris dealt with the "must carry" issues and expressed his concern about them. He also commented upon the *quality* and *quantity* of equipment that was on display in the LPTV East Exhibit Hall as being proof of the growing commitment that manufacturers have toward LPTV.

Harris advised the program supplier at the show not to "wait until there are 4000 stations on the air before you get into the LPTV market. Do it now while it's just beginning."

Many of the main syndicators were seen observing the festival and taking their notes. Representatives of Viacom, Columbia Pictures, Worldvision, 20th Century Fox and Four Star were attending seminars and meeting with representatives of the National Institute for Low Power Television.

With the success of the LPTV East show in mind, efforts are being stepped up to bring more program executives to LPTV West, Jan. 24-26, 1983, at the Disneyland Hotel in Anaheim, CA.

For details, contact the author at: National Institute for Low Power Television, c/o Conference Management Corporation, 17 Washington St., P.O. Box 4990, Norwalk, CT 06854; 1-203-852-0500. Attendance is already anticipated to be approximately 4000 for LPTV West-'83. More exciting news is expected to break at the conference and a recent LPTV station is to be duplicated for attendees to see a broadcaster "in operation."

Conversations

By Bebe F. McClain, president, B.F. McClain Productions, Asheville, NC

van der Kaay,
holding the MA/2MX microwave transmitter.

Erik van der Kaay, president, M/A-COM Video Systems (MVS) was interviewed recently by the author. The following is part of their discussion, which encompasses MVS' recent expansion and trends in ENG/microwave.

McClain: Why did M/A-COM Video Systems (MVS) buy part of Tayburn?
van der Kaay: Tayburn had demonstrated a unique capability in building a cost effective tracking antenna system. We think that the majority of broadasters' needs for tracking antennas can be met by the Tayburn autotracker. They also developed a very sophisticated microprocessor remote control system, which offers virtually unlimited flexibility in the control of multiple ENG sites and offers, as well, extensive pre-programming for positioning.

McClain: When did MVS buy the Tayburn line?
van der Kaay: Negotiations for the acquisition took place in February and early March 1982. The final court approval was received in April 1982.

McClain: Will MVS continue the product line?
van der Kaay: It is our intent to continue the product line. We hope to expand it into different frequency bands.

McClain: What products will not be continued?
van der Kaay: M/A-COM Video Systems purchased only the Tayburn antenna line, including local and remote control modems. Other Tayburn product lines were sold to different companies. As you know, Tayburn made two types of autotracking antennas, models 500 and 600. The latter is a smaller, lighter weight system, that accommodates up to a 4-foot dish.

McClain: Will MVS service Tayburn equipment already in the field?
van der Kaay: In the near future, we will offer full service capability and spare parts to those customers who have Tayburn antenna systems.

McClain: What about Tayburn offices and personnel?
van der Kaay: To the best of my knowledge, Tayburn will cease to exist as a company. I understand that virtually all of its personnel have found other employment.

McClain: What Tayburn product are you the most excited about acquiring?
van der Kaay: The most exciting part of the Tayburn antenna line is the new 600 model, which is lightweight, small and offers multipolarization tracking capability over the complete 2GHz and 2.5GHz band. Couple that with our new microprocessor modem, and you have spectacular capability at a reasonable cost.

McClain: Is MVS planning further expansion?
van der Kaay: We are presently reviewing our long-term strategy to see if we should broaden our product scope in such areas as satellite ENG, TV transmitters and digital video, to name a few. Whether we do that by internal development or acquisition is a question of economics.

McClain: What trends do you see in microwave/ENG equipment?
van der Kaay: There has been a definite trend toward miniaturization, but transmitters probably are not going to get much smaller. We're almost at the limit for reliability and maintenance. With ultraminiaturization, you use microwave integrated circuits with bonded semiconductors, and even the big stations cannot handle the maintenance.

ENG transmission could go digital if the VLSI technology can reduce the size of the modems. Another possibility for the future is having two video channels on one microwave carrier by transmitting alternate frames with computer interpolation between the two frames to fill in the missing information.

McClain: Will small stations use microwave/ENG techniques?
van der Kaay: Yes. Low power broadcasters, in order to compete with cable, will have to offer some local origination programming. They will probably start with the small portable 13GHz systems as main ENG links. These systems are simple and require little training.

McClain: What about new circuitry in future products?
van der Kaay: Possibly LSI will become important. Also, we plan to use FET technology to eliminate low frequency high power amplifiers in transmitters and low noise amplifiers at the receive sites. This will increase efficiency and sensitivity, and reduce the cost of transmitters. FETs will be standard features on all microwave equipment of the future. (We have some now.)

McClain: What does the future hold for 23GHz and 40GHz microwave equipment?
van der Kaay: 23GHz equipment will be confined mainly to cable and industry. There are applications for shorthaul STLs and TSLs, if the FCC opens up the band to broadcast. 40GHz equipment has possible use for

portable ENG systems (one mile) within two years.

McClain: How will your recent corporate changes affect broadcasters?

van der Kaay: M/A-COM Video Systems is one of 20 operating companies of M/A-COM, our holding company. Microwave Associates originally began as a components company, but Microwave Associates Communications split off years ago, as an equipment and systems company in broadcast, CCTV and cable.

Recently, the cable section was made into another company. So, M/A-COM Video Systems focuses principally on broadcast and CCTV. This change will enable us to better define the market, and, in the end, to better serve broadcasters.

McClain: What advice would you give microwave equipment purchasers?

van der Kaay: Start small, experiment and work up carefully. For $15,000 you can be on the air with one portable microwave system. Use that to form future plans. Also, consider stocking critical spare parts to avoid downtime.

McClain: What projects are you working on for the future?

van der Kaay: We are working on miniature portable systems. Also, we plan to make MX transmitters in 2GHz, 2.5GHz, 7GHz and 13GHz, so they can be used worldwide. We are also working on low cost ENG systems for small broadcasters and cable operators.

McClain: What major problems in microwave technology are you (M/A-COM) trying to solve?

van der Kaay: We are trying to find better ways to reduce interference. One solution is to find other bands, such as 40GHz. We are also working on fade problems, especially in audio, which goes first when fading starts. If we could transmit digital audio, the audio would stay as long as the video.

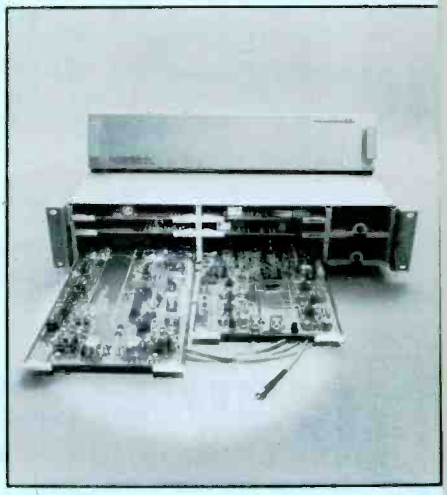
Editor's note:

Our *Conversations* articles provide a means of introducing new key people in broadcasting to our readers; a platform from which leaders in radio and television can voice opinions on broadcast issues; and a vehicle by which leaders in manufacturing plants can explain their positions in the marketplace.

In keeping with the purposes of these reports, the author interviewed Erik van der Kaay, president, M/A COM Video Systems (formerly Microwave Associates Communications).

Over the years, the staff of **Broadcast Engineering** has met with people from M/A-COM at the NRBA and NAB conventions to discuss the company's growth and product line. We have been pleased to bring our readers updates on the company's equipment and formal articles, which resulted from those meetings. This report is one more step in letting you see inside the operations at M/A-COM so that you can anticipate the organization's plans to serve broadcasters.

Fiber-optics at SMPTE



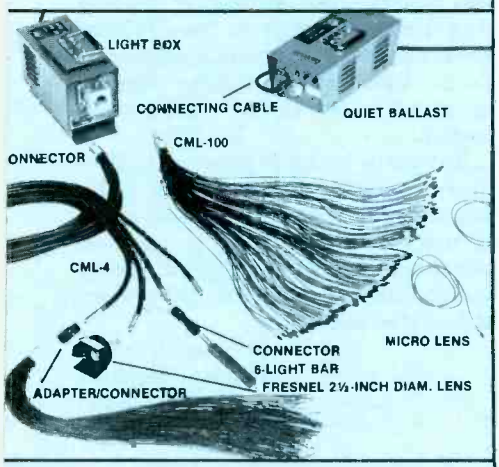
(a)

Three exhibitors at the recent SMPTE-'82/New York convention were found to have fiber-optics equipment on display.

In (a), *Grass Valley* displayed its Wavelink fiber-optics communications system to handle dual-channel audio (two boards pulled from the tray) with one channel of video. The new audio system uses a unique FM-on-FM modulation scheme; in (b), *LTM Corporation of America* exhibited its fiber-optic lighting system that delivers 5600K light with no heat; and in (c), *Sony* used a fiber-optics hookup from its camera display at SMPTE to a rack-mounted digital command unit (DCU-300) on the other side of the Sony booth. This was somewhat of a *sleeper* at the show. No big deal was made out of it because the DCU-300 will work via triax or fiber-optics linkage. But, following the show, this fiber-optic linked system was headed to one of the networks for evaluation.

optics

E-'82



(b)

(c)

feedback

Regarding composite processing

An insidious concept has swept into FM broadcasting within the last few years, an industry that was built entirely on the concept of quality and high fidelity transmission.

Now that FM has taken the majority of the listening audience with this ideology, the trend has shifted toward the concept that may have caused the downfall of AM broadcasting: *Louder is better.* Quality audio is no longer a primary consideration to a disturbingly large number of FM stations. Audio processing has evolved from overmodulation protection to flame-throwing weapons in the so-called *loudness wars.*

Among the most devastating processors are the devices used in the composite signal path. Although providing absolute peak modulation control, they introduce undesirable artifacts into the baseband frequency spectrum—harmonic distortion products produced by composite clipping. A spectrum analyzer provides proof of their existence with clipping levels as small as 0.25dB. These products infiltrate the L – R modulation sideband spectrum, thereby degrading crosstalk and stereo separation, even if the pilot carrier is not involved in the clipping process.

Although design engineers are striving to produce exciters with ultralinear modulation characteristics—for example, the FX-30 and the new MX-15—some FM engineers are defeating this quality effort by literally connecting a diode clipper at the input of their exciters. The audible result is a far cry from the high fidelity capability of the modern FM transmission system.

Instead of trying to blow each other away in *loudness wars* as AM radio has already done, we should all strive to use audio processing to transmit our programs with the highest fidelity within the capability of the present state-of-the-art.

Edward B. Bench
James C. Hopkins
KNJM, FM108
St. Louis, MO

Salary survey reprint

We would like to request permission to reprint the article, "Broadcasters' Salaries: A National Survey," (**BE** October 1982, page 26), in a future issue of the Alabama Broadcasters Association newsletter. We also request permission to use all or part of the boxed statistical data accompanying the story.

We thought this was an excellent article that would be of great interest to Alabama radio and TV stations.

Ben K. McKinnon
Executive director
Alabama Broadcasters Association

Address change

In our November issue, on page 60, a chart summarizing 1982 satellite positions was listed as being available from Kintech. Since that time, Kintech has relocated. The following is the new address: 1310 Titania Lane, McLean, VA 22102.

BE *staff*

Comark achieves single-waveguide multichannel transmission

Comark Communications has proved the feasibility of single-waveguide, multichannel power transmission. Comark has recently installed a pair of 55kW klystron transmitter systems at a single site serving two stations simultaneously. One of the transmitters serves Channel 43, Melbourne, FL, while the other unit serves Channel 52, Cocoa Beach, FL. A single-waveguide run, used to transmit both signals, was installed on the 1000-foot tower. Since the stations became operational in August 1982, no power or quality degradation has been detected.

Dick Fiore, Sr., originator of the system, said, "This system provides for the simultaneous transmission of two TV channel signals traveling through one square waveguide transmission system. This design reduces costs and tower requirements significantly. Separate transmitting antennas—or broadband arrays—can be located at the top of the tower to further reduce costs."

A technical paper detailing this new advancement is available on request from Comark. Contact Stu Kravitz, director of marketing, Comark Communications, Route 309 and Advance Lane, Colmar, PA 18915; 1-215-822-0777.

Satellite distribution project announced

Satellite Systems Corporation has announced its appointment as prime contractor for Louisiana State Radio Network and Mississippi State Radio Network on a unique satellite distribution venture. Two uplinks and 89 receive terminals will be used in this project, with one uplink to be located in Jackson, MS, and the other in Baton Rouge, LA.

Modulation Associates will provide electronics equipment designed to operate on a narrow bandwidth low dBW carrier. The small aperture antenna selected meets 2° spacing requirements, and is provided by Comtech Antenna Corporation.

Narrowband Communications Company will supply satellite space segment, a revolutionary, low cost concept that promises to have a profound effect on satellite transmissions. Space segments will now be available to the potential user that previously found satellite distribution costs prohibitive.

California Microwave invests in TXR

California Microwave has announced that it has purchased majority interest in TXR, a Sunnyvale, CA, company formed to specialize in digital microwave local distribution systems. TXR's product, a packet-switched digital microwave system, provides local digital interconnection by microwave radio for business users' data, video conferencing and voice communications as an alternative to local telephone company connections. TXR will operate as a subsidiary of California Microwave.

Neve provides turnkey package for NOS

Neve Int'l has announced completion of a major turnkey project for NOS, the Nederlandse Omroep Stichting. Three large outside broadcast vehicles were involved, the final pair delivered in July 1982. One was for television, the others for radio. All were fitted out by Neve with a range of equipment in addition to their own 8108 48-channel/32-track music consoles.

Equipment installed included multi-track tape machines, noise reduction systems, equalizers, noise gates, limiter/compressors, distribution amplifiers, video monitoring and control systems, and custom-designed powered cable reels.

ISI selected to Top 500 US companies

INC. Publishing Company has announced that ISI of Gainesville, FL, has been selected as one of the Top 500 fastest growing companies in the United States. Only six telecommunications companies were selected. Of these, ISI is the only manufacturer of audio-video processing equipment to rank in the elite group.

The 1982 *INC.* Private 500 is a charter roster of 500 of the fastest-growing privately held smaller businesses in the United States.

As a manufacturer of audio-video production equipment, ISI has achieved tremendous growth. Having "chosen not to participate in the recession," the company has experienced an unprecedented growth rate of 312% in sales over the last five years.

ITT net income up 6% in third quarter

International Telephone and Telegraph Corporation announced recently that net income for the third quarter of 1982 rose 6% over the 1981 third quarter.

Antenna Technology Corporation expands TV broadcast market

American Forces Radio and TV Service has announced the purchase of a Simulsat 7, a multiple-beam satellite antenna capable of receiving all domestic satellites simultaneously with conventional 7m quality. Antenna Technology Corporation, manufacturers of the Simulsat 7, has also received orders from Vision Cable for three Simulsat 7s for its fringe footprint Florida locations. The Simulsat 7 offers a view of the full geostationary arc and can accommodate up to 20 satellites simultaneously.

Shure forms new division

Shure Brothers has announced the formation of Shure Electronics of Illinois, a Division of Shure Brothers Inc. (SEI).

The division will be involved in the manufacturing, marketing and sales of Shure's communications microphone products, including mobile and base station microphones. It will also be responsible for the manufacturing of Shure circuitry products. The division was formed to expand the company's service to the commercial and industrial markets.

Manufacturing facilities for the new division will be located at 985 Chaddick Drive, Wheeling, IL. Sales/marketing and engineering departments will be located at Shure's Evanston, IL, headquarters.

Harvey Amend will serve as SEI's operations manager and will be responsible for manufacturing, engineering, purchasing, production control and materials functions. Harry Waller will be SEI's sales/marketing manager and will be responsible for the division's marketing activities.

Centro sells two $3.25 million broadcast trailers

Centro Corporation of San Diego, CA, has constructed two 45-foot TV broadcast trailers valued at $3.25 million each. The first, for the Triax Company of Alpine, UT, was delivered to Imo, Nigeria. The second, for Triax Int'l Ltd. of Windsor, England, was to be delivered to Plateau, Nigeria. The trailers will provide TV broadcast facilities for the two states.

associations

National Association
of Broadcasters
1771 N. Street, NW
Washington, DC 20036
1-202-293-3570

NAB applauds CRT decision

Edward O. Fritts, NAB president, issued the following statement in response to the Copyright Royalty Tribunal's decision recently increasing the rate that cable television pays to carry distant TV station signals.

The new adopted formula which is set on a multiple scale is, at minimum, an 8-fold increase over the old figures.

The tribunal's actions recognize to some degree the marketplace inequities wrought by the FCC's elimination of distant signal and syndicated exclusivity protection.

Therefore, NAB is pleased with the decision. This means stations will be compensated more in line with what our programming is worth for at least some of the distant signals being imported by cable systems.

The major parties involved—broadcasters, cablecasters and program producers—have hammered out a joint agreement which is presently before the Congress. Its enactment into law would provide a balance of interests in this complicated area and would resolve in great part controversies which have embroiled these embroiled for entirely too many years and at too much expense.

More spectrum needed for STL stations

The FCC has seriously underestimated broadcast demand for aural broadcast studio-to-transmitter and intercity relay stations (STL stations), the NAB said in comments filed with the FCC in Gen. Docket No. 82-335. NAB reiterated its call for additional spectrum and said that the commission has compounded the error by proposing an unsatisfactory solution to the severe frequency shortage already experienced by the STL service.

In its filing, NAB again urged the FCC to reallocate 942-947MHz for the exclusive use of STL stations, as NAB had requested in a pending petition filed in 1976. NAB claimed that the proposed shared use of 2130-2150MHz and 2180-2200MHz is inadequate to meet the current and projected needs of STL stations, although it may have limited use for digital transmission services. NAB also concurred in the abandonment of a proposal to permit STL station sharing of the 2110-2113MHz and 2150-2160MHz bands.

The association called for the allocation of 899-902MHz and 938-941MHz to STL stations on a primary, exclusive basis in markets where the 942-952MHz band is already saturated. It also asked the commission to provide spectrum and/or transmission standards that allow broadcasters to use digital technology in their STL communications links.

Stations should determine SCA uses

The NAB said it believes that FM station licensees, not the federal government, are in the best position to determine the uses and operating hours of Subsidiary Communications Authorizations (SCAs). NAB said it supported the concept of affording broadcast licensees discretion in deciding on the uses for their SCAs and concurred with the FCC's proposal to abandon its requirement that SCAs only be used during hours of main channel operation.

NAB also called for the elimination of the current requirement that FM broadcasters obtain authorization from the FCC before using their SCAs. Also, the association supported the FCC's proposal to eliminate SCA program logging.

Although supporting removal of use and time limitations, NAB said that the commission must adopt and maintain technical standards that will allow expanded SCA activity without jeopardizing high quality main channel programming.

Caution advised in adopting FM blanketing rules

The NAB has said the FCC's proposed rule to revise FM blanketing interference would place an unwarranted burden on FM licensees. It said that the agency should proceed with caution before adopting more restrictive and demanding rules.

NAB said it would be unwise for the commission to create a new standard of liability whereby a broadcast licensee would be held financially responsible for correcting the recep-

tion problems of the public. It noted that the FCC recognizes that FM blanketing has been caused in large part of the proliferation of inferior radio receivers. Also, NAB said broadcasters only should be responsible for correcting problems expressly associated with blanketing interference.

Fritts requests compensation for US broadcast stations

Edward O. Fritts, NAB president, has asked members of the US Senate to support a change in the current provision of the Radio Marti authorization bill to make financial compensation to US broadcasters mandatory. The bill, now pending before the US Senate, presently gives the FCC discretionary authority to direct government reimbursement to affected broadcasters for expenses incurred in mitigating the effects of Cuban radio interference.

Although the NAB has not taken a position on the establishment of Radio Marti, recognizing it as a foreign policy issue, Fritts did propose recommendations that could minimize Radio Marti's potential to exacerbate the existing Cuban interference problem.

Court asked to uphold FCC on common AM-FM ownership

The NAB has asked an appellate court to uphold the FCC decision not to initiate a rulemaking proceeding that would result in a rule prohibiting the common ownership, operation or control of more than one AM or FM station in a market and requiring divestiture of existing AM/FM combinations.

The National Association for the Advancement of Colored People (NAACP) had petitioned the commission to institute the proceeding and when the agency refused, it asked the US Court of Appeals for the District of Columbia to review the decision.

Countering NAACP's argument, NAB said the FCC made a rational decision and had adequately explained the facts and policy concerns it relied on in arriving at its decision.

NAB noted that the FCC is wholly justified in not instituting the proposed proceeding based on a number of factors: There is wide diversity of broadcasting stations in the industry due to the growth in the number of radio and electronic media outlets; the pending nature of ongoing FCC proceedings; established commission policies such as AM/FM nonduplication rules; and tax certificates and distress sales policies that have produced results in establishing greater minority ownership.

NAB also said that divestiture of AM/FM combinations would cause financial dislocation of the broadcast industry and disruption of broadcast services.

Limited use of STV suggested for public TV

Public TV stations should not be granted unlimited authority to use subscription television (STV) to raise funds, according to a recent NAB filing with the FCC. It suggested that authorization be granted on a limited, case-by-case basis when STV is a noninterfering adjunct to free noncommercial program service.

NAB said that it has actively participated in helping to resolve public television's financial crisis and has supported public television from its inception. But the association raised several points about the proposal:

- Conceptually, charging the public to watch public TV programming seems out of step with the essential nature and rationale for the existence of the public broadcast service.
- Unlimited STV operation by noncommercial licensees seems impermissible under the Communications Act.
- Benefits may be illusory or problematic, and STV operation has the potential for serious negative results for non-commercial stations. STV as a cure could be worse than the disease.

Frequency coordinating committee formed

The SBE has announced the formation of a National Frequency Coordinating Committee made up of representatives from the major networks, as well as radio and TV facilities around the country. Richard Rudman, an SBE director, engineer-

ing manager of KFWB in Los Angeles and chairman of the Southern California Frequency Coordinating Committee, will serve as chairman of the National SBE Frequency Coordinating Committee.

NRBA

National Radio Broadcasters' Association

1705 De Sales Street, NW
Washington, DC 20036
1-202-466-2030

Spectrum fees *not* endorsed

Spectrum fees are subject to future escalation and are potentially dangerous, according to NRBA. NRBA has discussed with Congressional leaders several possible methods of achieving the full and true deregulation of the radio industry through legislation embodying a wide range of potential solutions. One concept that was discussed was the 50-year contract proposal that would completely remove the government from all regulation of radio except the technical management of radio spectrum space.

None of the proposals advanced by NRBA or receiving serious consideration from NRBA for inclusion in future legislation contained spectrum fees.

Delco picks Motorola's AM stereo system for GM cars

After five months of testing and evaluation, Delco Electronics, a subsidiary of General Motors, has recommended the Motorola AM stereo system for incorporation in the radio receiver design for 1984 GM vehicles. If approved, Motorola would produce and sell its IC decoders to Delco, which detect the radio signal and convert it to stereo. Delco said Motorola "offers the highest quality performance at a cost-effective price."

Delco conducted the tests and evaluation programs using radio station WIRE, Indianapolis, IN, in conjunction with Harris, Magnavox and Motorola. Delco invited all proponents to take part in the project but Belar, Fisher and Kahn did not participate. GM has 31% of the car radio market in the United States.

Reaction by receiver manufacturers was guarded. Although admitted to be a significant decision, it was said to not be the last chapter of the AM stereo debate.

However, NRBA Engineering Consultant Harold Kassens of the A.D. Ring Company called it a watershed decision. "There is no point for the receiver manufacturers to compete with GM in producing a different stereo system. What's good for General Motors should be good for the country," Kassens said.

Members voice support for position on merger

A large number of NRBA members have spontaneously responded to recent talk of an NRBA-NAB merger. The statement, authorized by NRBA's Executive Committee, reiterated NRBA's intention of obeying the mandate of its nearly 2000 members to remain a radio-only organization.

Every letter received supported and applauded the clearly stated position to remain independent of NAB.

Information service

NRBA's Washington office is now open until 6:30 p.m. daily to help answer radio questions. NRBA's Radio Central Information Service will provide answers to inquiries concerning legislation, rulings, regulations, reprints or anything related to radio management. Most non-legal questions can be answered immediately.

new literature

Berk-Tel
–Brochure: "Everything You Need to Know About Plenum Cable," (8 pages), free.
Circle (545) on Reply Card

Bird Electronic Corporation
–Catalog: "SF-83 RF Power Analyst Series," (4 pages), free.
Circle (546) on Reply Card

Equipto Electronics Corporation
–Catalog 170-82: "Heavy-duty Modular Electronic Enclosures," (64 pages), free.
Circle (547) on Reply Card

John Fluke Mfg. Company
–Brochure: "Fluke 4½-digit Low-cost DMM's," (6 pages), free.
Circle (548) on Reply Card

Leader Instruments Corporation
–Brochure: "Oscilloscopes," (8 pages), free.
Circle (549) on Reply Card

M/A-COM DCC
–Brochure: "M/AESTRO," (4 pages), free.
Circle (550) on Reply Card

MO'DAY International
–Reference: *Satellite Surveyor*, quarterly issues, $17.95 per year.
Circle (551) on Reply Card

Microtime
–Brochure: "S-130 Full Frame Synchronizer," free.
Circle (560) on Reply Card

National Association of Broadcasters
–Com/Tech Report Vol. 1, No. 1: "The Opportunities of Channel Leasing: Strategic Considerations for Broadcasters," (12 pages), $5 for NAB members; $15 for non-members.
Circle (552) on Reply Card

Pace
–Catalog: "Electrical Rework and Repair Equipment," free.
Circle (553) on Reply Card

Polyline Corporation
–Catalog: "Summer 1982 Professional Sound Recording and Duplicating Supplies," (32 pages), free.
Circle (554) on Reply Card

Smith Electronics
–Brochure: "Can Your Equipment Meet the New FCC/EMI Limits?" free.
Circle (555) on Reply Card

Tab Books
–Text: *Broadcasting Law and Regulation*, R. Terry Ellmore, (504 pages), $24.95.
Circle (556) on Reply Card

Topaz
–Reference manual: "Noise Suppression Reference Manual," free.
Circle (557) on Reply Card

US Instrument Rentals
–Catalog: "Instruments for Rent, Lease, Purchase" (112 pages).
Circle (558) on Reply Card

Varian Associates/Microwave Equipment Division
–Flyer: "H-series UHF-TV Klystron Focusing Electromagnets," free.
Circle (559) on Reply Card

new products

Video pointer

APIS Corporation has announced the availability of the APIS 1-Video Pointer. The Video Pointer positions arrows and other commonly used symbols by way of an X-Y controller contained within a membrane control panel. Additional features include small, medium and large selections of eight arrows and eight other useful symbols.

Circle (525) on Reply Card

Distribution amplifiers

Video Aids of Colorado has offered a packaged version of its popular video and pulse distribution amplifiers. The VAC model DA-10, distribution amplifier assembly, consists of four video or pulse amplifiers in any combination, fully assembled and tested in a high quality rack-mountable cabinet. Each distribution amplifier is ac-powered by separate on-card power supplies.

Circle (526) on Reply Card

Fiber-optic links

Meret has made available fiber-optic links that have linearity and dynamic range at frequencies of up to 35MHz necessary for transmission and reception of high resolution composite video signals for television, computer graphics and simulation systems. Called the MDL 270/280TV series, these systems exhibit differential gain of less than 1% and differential phase of less than 1% degree. Dynamic range can be specified from 57dB for a 500m 30MHz link to 40dB for a 2km 35MHz link.

Circle (527) on Reply Card

Proc amp

Knox Video Products has introduced the model K700 video corrector, a proc amp, chroma corrector, noise reducer and image enhancer in a 1¾-inch-high rack-mount unit. The unit provides the user with correction of both luminescence and chroma without the use of expensive waveform monitors or oscilloscopes. Up to 6dB of noise reduction and continuously variable image enhancement are also front-panel controlled. The automatic wide-window gen-lock proc amp provides completely regenerated sync, burst and blanking on the output signal.

Circle (528) on Reply Card

Degaussers

Recording tape degaussers from *Audiolab Electronics* serve audio, video and computer users. The TD-1B handles ¾-inch to 10.5-inch reels. The TD-2A erases up to 14-inch reels of 2.5-inch width tape. The TD-3A is designed for heavy-duty use on reels to 14 inches of 1-inch tape.

Circle (529) on Reply Card

Audio mixer

A compact, rack-mountable mixer, the M406, from *Yamaha Combo Products* easily interfaces to an ENG van system. Six inputs include phantom power capability. Three-band equalization is available on each channel and pan pots direct each channel to stereo outputs.

Circle (530) on Reply Card

Broadcast mixer

The MX-84, introduced by *RCI (Recording Consultants Inc.)*, is a high quality remote broadcast mixer featuring an 8 x 12 mix via pan pots and two 8 x 1 utility mixes for "IFB," "mix minus" or local PA.

All main mix inputs and outputs are transformer-

balanced with XLR connectors and allow 20dB of headroom. Line outputs and Telco inputs also have binding posts for easy connection to phone lines. The intercom and talent "IFB" system is built-in for party-line communication with the studio phone line, engineer, producer, director and talent.

Circle (531) on Reply Card

Coil cables

Philatron International, manufacturer of electronic wire, cable and accessories, is introducing a new line of low cost, lightweight, custom retractile coil cables designated as the Philacoil Series.

The Philacoil line of cables feature: lighter weight, lifetime memory, anti-sagging, low temperature flexibility to −70°F, resistance to most chemicals and oil, ozone resistance (will not crack) and abrasion resistance. These cables are available in any custom color desired.

Circle (532) on Reply Card

Wireless microphones

At the AES Convention last October, *Cetec Vega* demonstrated how a wireless microphone and wireless intercom system enhance the capabilities of a voice recognition system for security and industrial applications. A Cetec Vega model 77 Dynex pocket transmitter with lavilier microphone was used to access "Herbie," a voice recognition computer, through a model 63 Dynex diversity receiver. The computer responded through a QX-1 wireless intercom base station transmitter, which was heard on a QR-1 wireless intercom receiver and headset. The audience could hear both sides of the conversation through loudspeakers in the booth.

Circle (533) on Reply Card

Audio level control

A dual-channel compressor expander system, the model 610 from *Valley People*, may be used for independent channels or stereo processing. *Linear integration detection* and *peak reversion correction* concepts improve dynamic integrity and reduce pumping of audio signals.

Circle (536) on Reply Card

Telephone/cart interface

For those many uses of recorded messages accessed by telephone, the FB-1 telephone interface from *ITC/3M* provides answer-only access to the tape machine. The FB-1 starts the machine when the telephone number is called and hangs up the line once the cartridge hs been rescued.

Circle (537) on Reply Card

TV transposers

Magnetic AB offers the 8000 series of digital TV transposers for UHF and VHF use. Power levels of 10W, 50W and 100W for VHF, or 2W, 10W and 40W UHF are developed from solid-state circuitry for CCIR B, D, G, H, I, K, M and N standards. Power is provided from 220Vac/50Hz or + 24Vdc.

Circle (538) on Reply Card

Tape heads

The *JRF Company* now offers complete ½-inch, 2-track head assemblies for retrofit application on MCI JH-110A tape recorders. These new head assemblies are reported to provide a substantial improvement over standard ¼-inch, 2-track specifications and join the company line of replacement devices, which includes units for Ampex and Scully machines, as well as relapping services.

Circle (541) on Reply Card

calendar

February-May

The Radio-Television News Directors Association has scheduled the following regional meetings:

- Northern California Chapter, Feb. 5, Bay Bridge Holiday Inn, Emeryville, CA;
- Region 9 with Georgia and Alabama UPI broadcasters, March 24-26, at the Holiday Inn, Gulf Shores, AL;
- Region 11, April 9, at Curry College, Milton, MA;
- Region 1 with SPJ/SPX, April 9, at the Sheraton Spokane, Spokane, WA;
- Region 14 with Georgia UPI broadcasters April 22-23, at the Stadium Hotel, Atlanta, GA;
- Region 13, with Virginia AP broadcasters, May 7,at the Sheraton Fredricksburg Inn, Fredricksburg, VA;
- Region 14, with Florida AP broadcasters May 14 at Busch Gardens, Tampa, FL; and
- Region 12 with Pennsylvania AP broadcasters, May 20-22, at the Pittsburgh Hyatt, Pittsburgh, PA.

For more information, contact: RTNDA, 1735 DeSales St. NW, Washington, DC 20036; 1-202-737-8657.

February-June

The Institute for Graphic Communications, specializing in small-group, intensive 2-day conferences for manufacturers and users, has announced its early 1983 schedule of conferences. Conference titles include: *Optical Videodisc Systems; Electronic Imaging; HDTV Systems; Interactive Integration of Text and Pictures;* and *Direct Broadcast Satellite Systems.*

For more information on dates and exact locations of the conferences, contact: Richard Murray, Director of Conferences, Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115; 1-617-267-9425.

Feb. 2-11

Plans are under way for the *23rd International Television Festival* to be held in Monte Carlo, Monaco. The festival will be comprised of two categories: a fiction program and a news program. Also three special professional events will also be scheduled: an international forum on new images with an exhibition on new products and services offered by the National Institute of Audio-Visual Communication and the International Marketing Video; an international market on movie and television with a new category for video specialists; and an international market on video rights.

Winners of the competition will be awarded the Golden Nymph, the TV equivalent of the Oscar.

For more information, contact: Monaco Tourist & Convention Bureau in New York at 1-212-759-5227 or write to the Organization Committee, 23rd International TV Festival, 2a, Boulevard des Moulins, Monte Carlo 98030, Monaco.

Feb. 4-5

The *17th Annual SMPTE TV Conference* will be held at San Francisco's Hotel St. Francis. Program Chairman David Fibush, Ampex Corporation, announced that the theme of the conference will be "Pictures of the Future." The program topics are Recording the Pictures, Generating the Pictures, Manipulating the Pictures and Programming the Pictures.

An equipment exhibit will be held with the sessions. Only equipment that is relevant to the technical program will be on display.

More than 600 technical and management people in broadcasting are expected to attend. Additional informa-

tion on the Television Conference and Exhibit is available from SMPTE, 862 Scarsdale Ave., Scarsdale, NY 10583.

Feb. 7-8

Phillips Publishing and Schnader, Harrison, Segal & Lewis law firm will sponsor the *Conference on Ku-Band Satellite Communications in the '80s* at the Hyatt Regency in Washington, DC.

The conference will be chaired by Dr. Delbert D. Smith, a partner at Schnader, Harrison, Segal & Lewis of Washington, DC, and Philadelphia. Other speakers will include representatives of all major Ku-band satellite communications licensees and applicants, earth station suppliers, providers of Ku-Band satellite services and software, financiers and government officials. For more information, contact: Phillips Publishing, 7315 Wisconsin Ave., Suite 1200N, Bethesda, MD 20814.

Feb. 15-17

Shure Brothers and HM Electronics are sponsoring a special *Microphone Applications Workshop* to be held at the Syn-Aud-Con Seminar Center in San Juan Capistrano, CA. The 3-day workshop will give a limited number of attendees an opportunity to work with microphone experts in a hands-on situation.

The program will include mixing sessions using live musical groups. Each basic microphone type will be analyzed with the Time-Energy-Frequency (TEF) analyzer developed from the Heyser/Cal Tech patents. Interpretation of the data will be performed by Shure and HME representatives, followed by subjective analyses by the staff recording authorities.

The fee for the workshop is $600 per person, payable to Synergetic Audio Concepts. For more information, contact: Synergetic Audio Concepts, P. O. Box 669, San Juan Capistrano, CA 92693; 1-800-854-6201 (outside California) and 1-714-496-9599 (in California).

April

George Washington University, Washington, DC, has announced its Continuing Engineering Education courses to be held in Washington, DC, and San Diego, CA. Course subjects include: Antennas and Arrays; Microwave Systems Planning; Advances in Electronic Technology I; Advanced Topics in Digital Signal Processing; Advanced Radar Technology; Advances in Electronics Technology II; and Modern Air-To-Air Radar Systems. For more information, contact: Douglas Green at 1-202-676-8512.

April 10-13

The *NAB 61st Annual Convention and Exhibition* will be held at the Convention Center in Las Vegas, NV. The convention is divided into three main areas—Radio: The Name of the Game is the Bottom Line; TV: An Industry in Transition; and Engineering: Keeping Pace with the State-of-the-art.

The show, which features radio seminars, discussions of TV trends, exhibits and demonstrations, will be kicked off with the State-of-The-Industry Address given by NAB's new president, Edward Fritts. Following the address, the Distinguished Service Award will be presented to an outstanding industry representative. The Oak Ridge Boys will perform Sunday night and Bill Cosby will close the convention on Wednesday, April 13. For more information, contact: NAB Convention Information, 1771 N St. NW, Washington, DC 20036.

people

Hans D. Batschelet has been appointed president of Studer Revox America. He replaces **Bruno Hochstrasser,** who has returned to the Studer factory in Switzerland to assume the position of product manager for Professional Recording Systems.

WNEV-TV SE7EN has made the following appointments: **Robert Schaefer,** news director/executive producer for the Cable Health Network and former managing editor at KRON-TV, San Francisco, has been named managing editor; and **Edwin Diamond,** a 30-year veteran journalist, has been named media critic.

The Society of Motion Picture and Television Engineers has presented **Hirozo Ueda,** managing director of Fuji Photo Film Company Ltd., with the Herbert T. Kalmus Gold Medal Award. He was honored for his role in the development of Fuji's negative and positive photographic materials, including the Oscar- and Emmy-winning A250 ultrahigh speed color motion picture film.

Ogden Prestholdt, who continues as partner in A.D. Ring and Associates, has been appointed vice president, engineering, and consultant to Harrison Systems Ltd.

Allsop has made the following changes: **Ron Morgan,** former director of the Fidelity Accessories Division, has moved into the newly created position of director of marketing for the entire company; and **Jeff Heininger,** former national sales manager of the Fidelity Accessories Division, has stepped into the position vacated by Morgan as director of the division.

The International Council of the National Academy of Television Arts and Sciences (NATAS) has presented its Directorate Award for 1982 to **Akio Morita,** chairman and co-founder of Sony Corporation. The award recognizes individuals and organizations responsible for "outstanding contributions to the advancement of international television." The award was presented to Morita for his leadership of Sony and its contributions to the broadcast industry over the past three decades.

David Wilson has been promoted to manager of BBC Teletext. He will be responsible for advancing the Ceefax service and promoting TV software packages.

The first Alexander M. Poniatoff Gold Medal for Technical Excellence was presented to **Dr. Ray Dolby** by the SMPTE at its fall conference. Dolby was cited for his contributions to the advancement of magnetic sound recording. He is noted for his pre-eminent work in the design and application of noise reduction systems for use in sound recording.

Jack B. Hanks has been named manager of 3M's Broadcast and Related Products Division. He succeeds **William H. Madden,** who has been named general manager of the Industrial Mineral Products Division. Hanks had previously been marketing operations manager for 3M's Magnetic Audio/Video Products Division.

Richard S. Bodman has been elected president of Satellite Television Corporation (STC). Since 1980, Bodman had been president and chief executive officer of COMSAT General Corporation, another subsidiary of COMSAT. In another announcement, STC elected

Michael S. Alpert as executive vice president.

George Marti, Cleburne, TX, who designed and developed remote broadcast and studio transmitter link equipment now in use throughout the world, has been named first recipient of the Texas Association of Broadcasters President's Award for Special Achievement. Marti was a unanimous choice as the first to receive the honor, in recognition of his many contributions to broadcasting.

Datatron has announced that **Joseph Horning,** formerly Western regional sales manager, was promoted to national sales manager, Video Systems Division. His responsibilities will include the management of video system sales and service, as well as that of the video distributor organization throughout the United States, Canada and Mexico.

Micro Communications Inc. has announced the appointment of **Howard E. Bouldry** to the position of vice president. Bouldry will head the combined marketing, engineering, production and administration efforts of MCI. In another announcement, **Dennis M. Heymans** was appointed production manager and will supervise manufacturing and testing of RF components.

Gene Swanzy has been appointed senior vice president of Broadcast and Communications Services for the Mutual Broadcasting System. He will continue to serve as the network's senior manager for broadcast operations, network transmissions, traffic, professional engineering and technical operations.

The appointment of **Robert E. Foltz** as manager/distributor sales has been announced by Phelps Dodge Communications Company. Foltz will be responsible for the company's line of land mobile antennas, associated devices, marine antennas and mounting hardware.

Craig P. Kemper has joined Blonder-Tongue Laboratories as sales manager, LPTV-STV Products. He was formerly Midwest regional sales manager for EMCEE Broadcast Products.

COMSAT announced that **Bruce D. Smith** has been elected president of COMSAT Technology Products. In this newly created position, Smith is responsible for the management of the corporation's telecommunications equipment manufacturing and marketing activities, and his election furthers the implementation of a corporate reorganization announced last September.

Stephen J. Skirpan, founder of Skirpan Lighting Systems and inventor of numerous patents in the field of stage lighting control, has opened operations as an independent technical consultant. He has been active in the field since graduating from Yale in 1956. His contributions to stage lighting control are well-known and have set many high standards for the industry. He may be contacted at 26800 North Iron Canyon Road, Canyon Country, California 91351; 1-805-251-5521.

Steve Armstrong has been named Western regional sales manager for JBL's Professional Products Division. Armstrong will supervise all sales of JBL's professional products in 13 Western states, including Alaska and Hawaii.

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FOR SALE: 2 – TEKTRONIX 520 A VECTORSCOPES. Completely recalibrated and serviced by Tektronix, $4200 each. 1 – TEKTRONIC RM 529 Multi Standard Waveform monitor. Tested and working, $800. 2 – TEKTRONIX 604, X-Y Display Units (Similar to type 602). Tested and working, $2000 each. 2 – GRASS VALLEY GROUP 900 Series Sync Generator Trays with 900 power supply and extender cards, $100 each. 3 – GRASS VALLEY 950 Sync Generator Modules, $100 each. 3 – GRASS VALLEY 955 Color Lock Modules, $100 each. 2 – Complete BOSCH BCN 40 or 50 Spare Part Kits, new in case, $2000 each. PLEASE CONTACT: Mr. Roger Brett, Chief Engineer, CAMRAC STUDIOS, P.O. Box 9298, Reno, Nevada 89507, (702) 323-0965. 1-83-1t

AMPEX MARK X video head assy., 5 mil ball, near new condition. Call Bruce Cable, (301) 939-0792. 1-83-1t

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WANTED TO BUY

WANTED: Pre-1928 radio equipment and tubes. August J. Link, Surcom Associates, 305 Wisconsin Ave., Oceanside, CA 92054, (714) 722-6162. 3-76-tf

HIGHEST PRICES PAID for 112 Phase Monitors and for clean, 12 year old or less, 1 KW and 10 KW AM Transmitters. All duty and transportation paid. Surplus Equipment Sales, 2 Thorncliffe Park Dr., Unit 28, Toronto, Canada M4H 1H2, 416-421-5631. 2-79-tfn

WANTED: STATION LIBRARIE'S OF MUSIC, 16" ET's, 12" Transcriptions, 45's, 78's, LP's. Boyd Robeson, 2425 W. Maple, Wichita, KS 67213, (316) 942-3673, 722-7765. 5-82-tfn

WESTERN ELECTRIC AUDIO, transmitting, studio equipment. Also looking for Western Electric vacuum tubes. Bruce Gentry, 624 Plymouth Ave., Mattydale, N.Y. 13211, (315) 455-7257. 1-83-1t

NEED TO BUY CAMERA PEDESTALS, Television Products, TVP-P-50. Contact: Ernie Rinaldi, 800-423-3640 or (213) 843-2288.

HELP WANTED

TRANS-AMERICAN VIDEO one of the leaders in the field of Post Production/Editing, has immediate openings for qualified individuals in the following positions: **POST PRODUCTION MAINTENANCE ENGINEER** – Must be familiar with Type "C" VTR, Grass Valley Switching equipment and Digital Theory. Strong background preferred. (213) 460-2143, Ralph McDaniel, V.P. **REMOTE TRUCK MAINTENANCE ENGINEER** – State-of-the-Art equipment. Experience with Norelco, Ampex, RCA equipment. Type "C" format. Digital electronics. Must be willing to travel. (213) 460-2347, Bob Sofia. Good salary and benefit package for individuals with strong qualifications. 12-82-2t

HELP WANTED (CONT.)

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(717) 655-1458

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DIGITAL DESIGN/MAINTENANCE ENGINEER. Major Post Production Facility, located in Florida, with the latest in digital equipment has opening for experienced Television Engineer with heavy digital background for a combination design and maintenance position. Salary open. Contact: Michael Orsburn, Director of Engineering, (305) 920-0800. 1-83-3t

AUDIO ENGINEER: Do continuous preventive maintenance and repairs on reel-to-reel, cartridge and cassette machines, plus associated gear. Grow into maintenance of all video recorders. We are a medical audio network and video publisher. All benefits. New York City. Send resume to Engineering Department, 15 Columbus Circle, 7th Floor, New York, NY 10023. 1-83-1t

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TECHNICIANS – NEW SATELLITE OPERATING CENTER looking for maintenance technicians with a minimum of three years experience in maintenance of videotape machines, 2", 1" and related broadcast equipment. Please send resume and salary requirement to P.O. Box #65, Northvale, NJ 07647. 1-83-1t

VIDEO SALES – Major N.J. video dealer offers a challenging opportunity for professional video sales people. Previous industrial and/or broadcast experience required. Salary commensurate with experience. Commission, car, excellent fringe benefits. Reply in confidence to: Video Corporation of America, 1913 Route 27, P.O. Box 697, Edison, N.J. 08818. 1-83-tfn

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MAINTENANCE ENGINEER: Requires the ability to repair and maintain broadcast video production and post production equipment which includes: Sony and Ampex one inch type "C" VTR's, ¾" VCR's, GVG switchers, CMX and Epic computer editors, Rank Cintel Mark III Flying Spot Scanner, RCA and Ikegami cameras, and various types of support equipment for above. Also involved in the job will be assistance with on-going projects dealing with development and installation of new facilities. Resumes & inquiries to Taylor Phelps, One Pass, Inc., #1 China Basin Bldg., San Francisco, CA 94107. 1-83-1t

TELEVISION MAINTENANCE ENGINEERS
CABLE NEWS NETWORK

The leading news system in satellite communications has career opportunities for broadcast maintenance engineers. Openings are now available in Atlanta for engineers experienced in studio and ENG equipment maintenance. CNN, as a part of Turner Broadcasting System, offers an excellent benefit and compensation program. Interested maintenance engineers may call (404) 898-8700 between 9 A.M. and 5 P.M., Monday-Friday, Eastern time, or send resume in complete confidence to:

TURNER BROADCASTING SYSTEM, INC.
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Attn.: Jim Brown
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IMMEDIATE OPENING FOR TV broadcast maintenance engineer...general class FCC license required plus a minimum of 1 year experience maintaining studio equipment. KBIM-TV is an Equal Opportunity Employer. Send resume to Gene Rader, KBIM-TV, P.O. Box 910, Roswell, N.M. 88202-0910. 11-82-3t

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Qualifications: Minimum seven years satisfactory and significant television broadcast equipment maintenance; or B.S.E.E. plus three years significant television broadcast operations and maintenance experience.

Excellent fringe benefits are available; salary will be commensurate with qualifications and experience. The search committee will begin review of applications on January 17, 1983. Letters of interest and resumes should be sent to:

State University of New York
Central Administration

Office of Personnel and
Affirmative Action, S-125
State University Plaza
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   26 ☐ TV, AM & FM Station
   27 ☐ CATV Facility
   28 ☐ Non-Broadcast TV including Closed Circuit TV (CCTV)
   29 ☐ Recording Studio
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   C ☐ **Operations & Station Management/Production & Programming**—VP Operations, Operation Manager/Director, Station Manager, Production Manager, Program Manager, News Director and other Operations Titles

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For dependable, quality audio, make sure all the parts get along.

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Technical harmony is essential to clear professional audio. All the components have to get along before the system can deliver its full potential.

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