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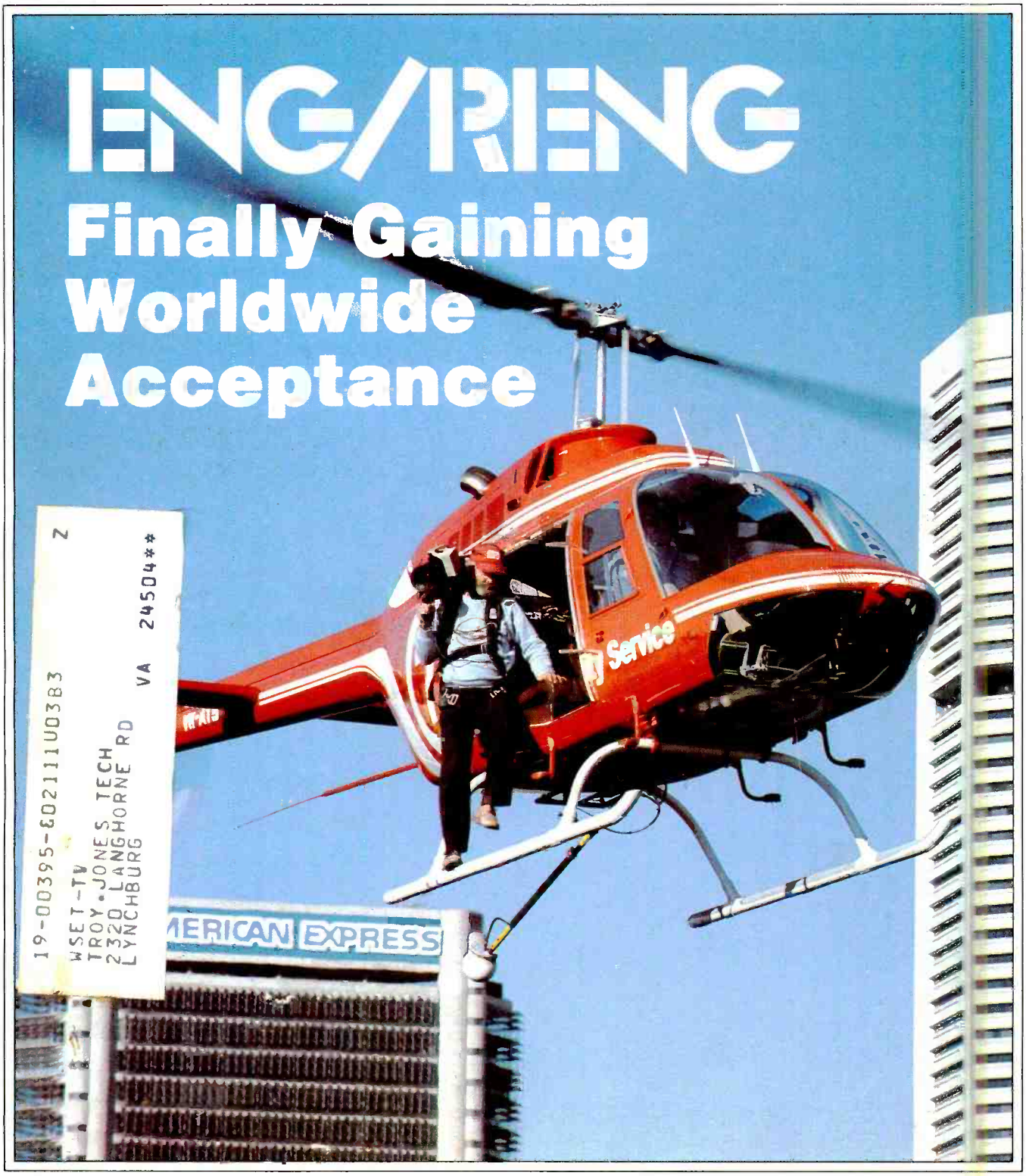

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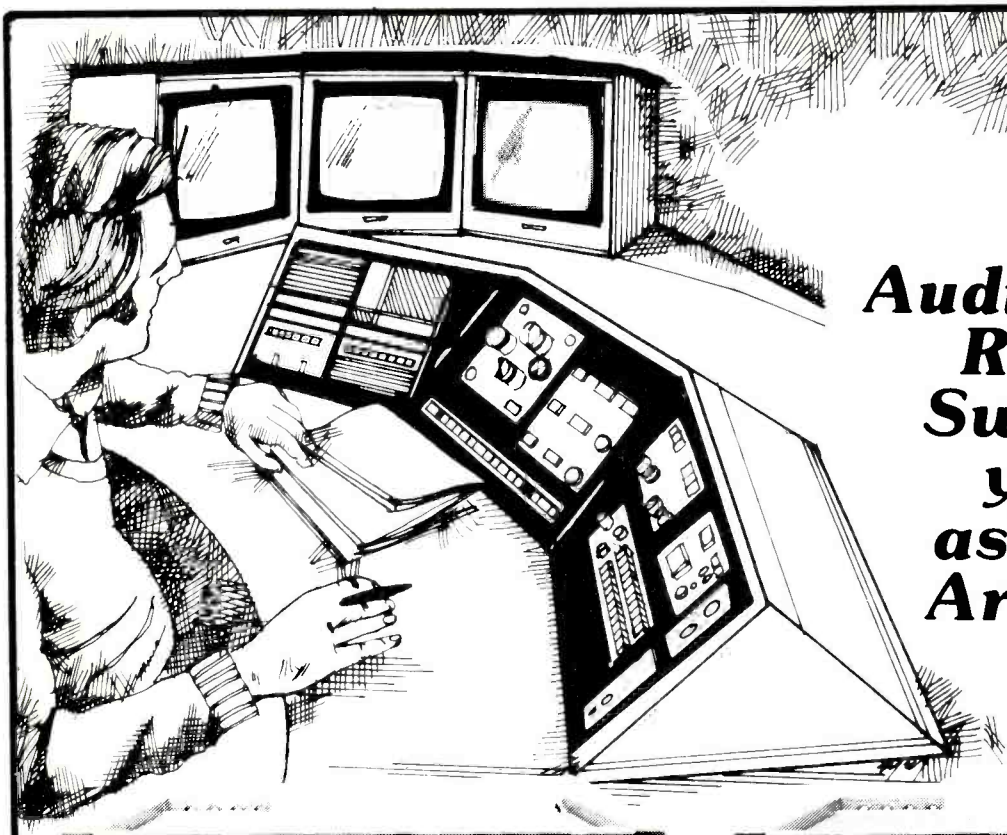

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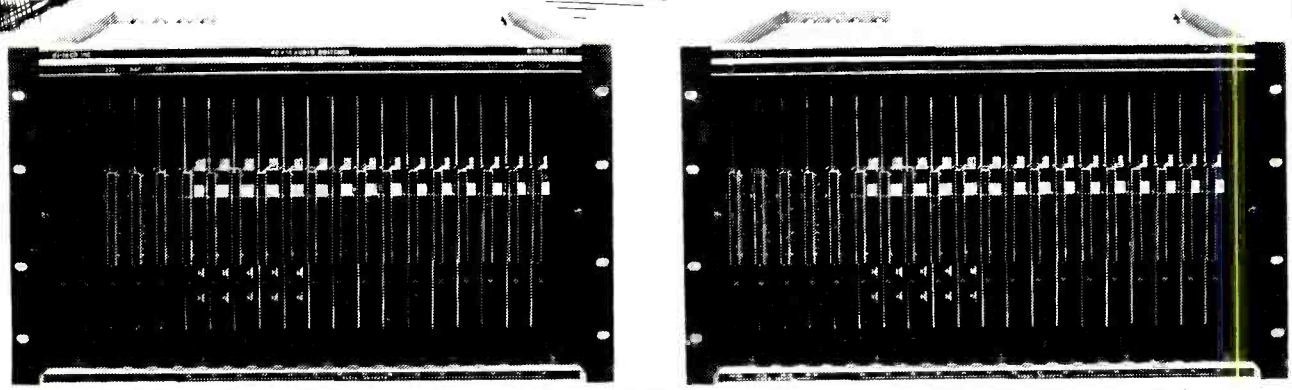

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18 Organizations
The emphasis is on the upcoming SMPTE and NAB conventions. First, a report on the SMPTE Television Conference to be held in Toronto, February 1-2. Then, an invitation from the NAB, with convention and hotel registration forms.

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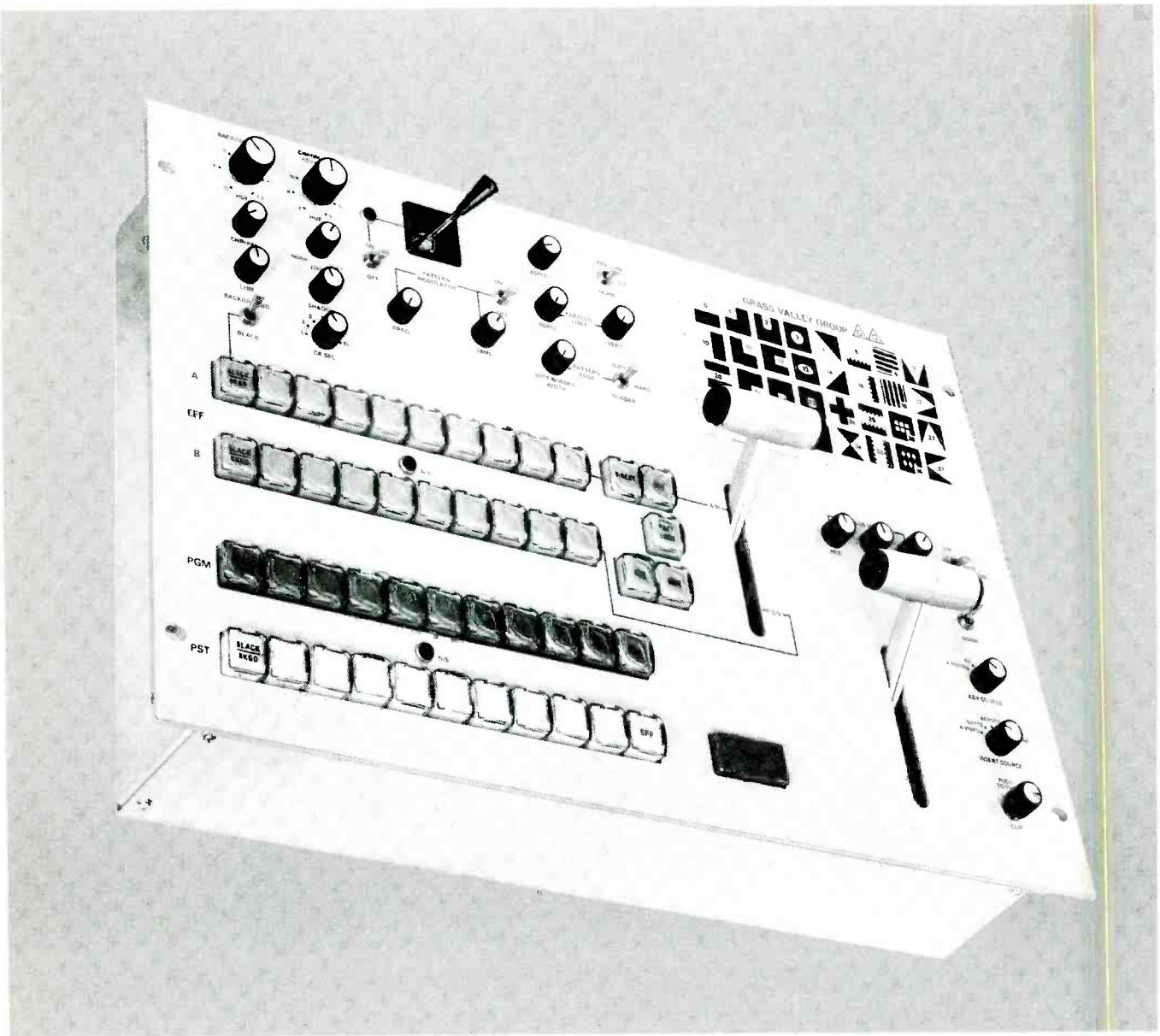
Cover — Channel 7, Sydney, Australia, covers the news where it happens with this specially-equipped Bell Ranger helicopter. The complete story on one of the world's finest broadcast facilities begins on page 26. *(Photo by Donna Foster-Roizen)*

OUR GOOD THING for



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UNITED KINGDOM

Audio show takes 'informal' step toward major status

BY DAVE McVITTIE

This year's Sound Broadcasting Equipment Show, held recently at Crawley Court, is the largest ever, with 27 exhibitors.

At a time when there is a lot of discussion in the United Kingdom about "too many" audio shows, it is surprising to see one show flourishing. Though not so surprising when you consider it is the only exclusively *sound broadcasting* exhibition in the U.K.

The 4th Sound Broadcasting Equipment Show was organized by Audio & Design (Recording) Ltd. to coincide with the ILR Chief Engineers conference at the IBA's Engineering Headquarters, Crawley Court, Winchester. And what began four years ago as a party in a hotel with a dozen engineers and two companies, has grown into a full-grown exhibition with 27 exhibitors and an excess of visitors — too many for the four short hours the show was open.

The importance of this sound broadcasting show, held in November, was emphasized by the new products announced.

Dave McVittie is with Audio & Design (Recording) in the United Kingdom.

John Lunsden of Radio Clyde talks with Mike Costello of Leevers-Rich Equipment Limited.

This year's Sound Broadcasting Equipment Show, held at the IBA's Engineering Headquarters, Crawley Court, included 27 exhibitors featuring the latest in audio equipment.

Alice (Stancoil) Ltd. unveiled several new products: the first production model of their STM8 stereo mixer designed for outside broadcast or self-op use, a working prototype of the ABCM series of modular broadcast consoles. Also on display was the TBU3, a fully automatic telephone balancing unit specially designed for radio "phone-in" programs. The TBU3 incorporates automatic balancing, filtering, automatic gain control, and noise reduction. The simplicity of operation and the speed with which it reacts to new line conditions, 30 milliseconds, make the TBU3 a very useful piece of hardware for any station broadcasting live phone-ins.

Audio & Design (Recording) Ltd. confirmed, by exhibiting the prototype, the rumor that the company is developing a new limiter and bandwidth filter exclusively for the broadcast market. Modular

Continued on page 8

When does a portable color camera become an affordable studio camera?

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In the field it's a fully self-contained portable camera that weighs only 20 lbs. (with our optional 12:1 zoom lens shown), so it's easy to handle. It's just as easy on the power, using only 23 watts. You can interface the AK-750 with any EFP system, because it can be externally synchronized with a single cable. Timing and phase adjustments are built right into the camera head. Or connect it to any studio system, simply by adding the optional Remote Control Unit and studio viewfinder.

Indoors or out, you can look forward to impressive performance: With an S/N ratio of 49 dB, and horizontal resolution of 500 lines center at the recommended illumination of 200 footcandles at f/4. There's even a +6 dB gain for a minimum illumination of just 15 footcandles at f/1.8.

Some impressive circuitry was built into the camera: Like a Y I/Q encoder, an RS-170A sync generator with genlock for studio or EFP use, and a color bar generator. It also features an optical black, and automatic white balance. And there's electronic color conversion, as well as a filter wheel behind the lens.

Horizontal and vertical blanking are both adjustable to meet a variety of recording or playback requirements. And your picture is always crisp and clear thanks to horizontal aperture correction and 1-line vertical aperture correction built right into the camera head.

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in design yet still fitting a 19-inch standard rack and consuming just 1u of rack space, the unit should prove useful to transmitter engineers who are hard pressed for space.

AKG Acoustics displayed a wide range of microphones suitable for broadcast use, including the new low-cost D300 dynamic series. Among their mikes and headphones was the new TD700 delay line first shown earlier this year.

Audix brought along their MTX1000 series desk in the wrap-around version for self-op use in ILR station and "conventional" format for general dubbing and recording applications.

Calrec Audio exhibited the Soundfield microphone, an extremely versatile mike which is used by the BBC.

North East Audio Ltd. (NEAL-Ferrograph) featured their Logic Seven series tape machines. Two customized versions were on demonstration, one of which gave, via an extended tape path, five seconds delay at 7½ ips. (Somebody was overheard to say that used at 15/16ths, you could go and have lunch before you needed to return and bleep out the obscenity!)

While talking of tape machines and loggers in particular, Leevers-Rich's slow-speed version of the Proline 1000 attracted a great deal of attention from some of the ILR engineers.

Shure Electronics Ltd., at the show for the first time, featured a new range of pick-up cartridges which were of great interest. The SC39 Series, which is the designation for these cartridges, have incredible resistance to accidental damage. Shure's unique retractable stylus design makes it virtually impossible to damage the stylus assembly. This is very useful when a "dropped" arm could quickly put a turntable off-air. Also new on the Shure stand was the SM81 microphone with the three-position bass response switch built into the mike body to provide adjustable bass roll-off.

Exhibitors and attendees had an opportunity to talk in an informal atmosphere.

The exhibition of some 27 exhibitors, while relatively small, is popular due to its informality that makes it more like an evening out with friends. But the show has a great potential which must be carefully exploited if it is to retain its "professional" standing. With continued efforts to ensure admission by invitation only and a watchful ear on the opinions of exhibitors and visitors as to the location and timing of the show, it could grow to become a major exhibition for sound broadcasting in the U.K.

Continued on page 10

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UNITED STATES

Comsat under fire

The scope of Comsat's operations are being questioned by the NAB and the FCC.

When Comsat announced a few months ago that direct satellite-to-home television could be a reality in the U.S. as early as 1983, it was emphasized that this would not be a substitute for existing commercial network and local television service. Rather, this would be a totally different TV service based on a monthly subscription fee.

Last month, however, the National Association of Broadcasters (NAB) went before the FCC to question the authority of Comsat to provide such a service.

The NAB told the commission that there is no statutory basis to permit Comsat to establish a satellite-to-home video programming service, and that neither the commission nor the courts is empowered to expand Comsat's powers.

According to the NAB, the Communications Satellite Act limits Comsat's authorized activities to satellite common-carriage service and only those additional activities incidental to its primary purpose. "Since Comsat's planned video service would not be a common-carrier offering, it falls outside the scope of its legally permissible activities," NAB said.

Under terms of the Act, the NAB noted, Comsat was to establish a global commercial communications satellite system which would reflect the benefits of satellite technology in service quality and charges. It said that Congress' use of the word "commercial" suggests that Comsat was to provide only communications common-carriage service via satellite. Thus, NAB said, although Comsat is different from other U.S. communications common carriers as the FCC has noted, "its primary mandate is to provide common-carrier services."

In a separate filing on an FCC Interim Report and Notice of Inquiry concerning Comsat's operations and structure, Comsat re-emphasized its position that current federal regulation of its activities is "fully adequate" and that governmentally imposed changes in Comsat's structure and operations are "neither required nor desirable."

Comsat is the U.S. participant in Intelsat, the International Telecommunications Satellite Organization, and Inmarsat, the International Maritime Satellite Organization. The legislation designating Comsat's participation in Inmarsat called on the FCC to conduct a study of Comsat's structure and operations to determine whether any changes are required to ensure that Comsat will continue to fulfill its statutory obligations effectively.

Joseph Charyk, president and chief executive officer of Comsat, has stated that the private, shareholder-owned corporation must have the flexibility to pursue new activities. This, according to Charyk, will enahle Comsat to preserve its momentum and vitality, and will place it in the position to make further significant contributions to the United States' efforts to improve and continue to reduce the cost of international communications services.

One of these new activities is the development of a direct satellite-to-home subscription television service. But still to be resolved by the FCC is whether this is going beyond the boundaries (and intent) of the Communications Satellite Act.

And, an even greater problem facing the FCC is determining the potential

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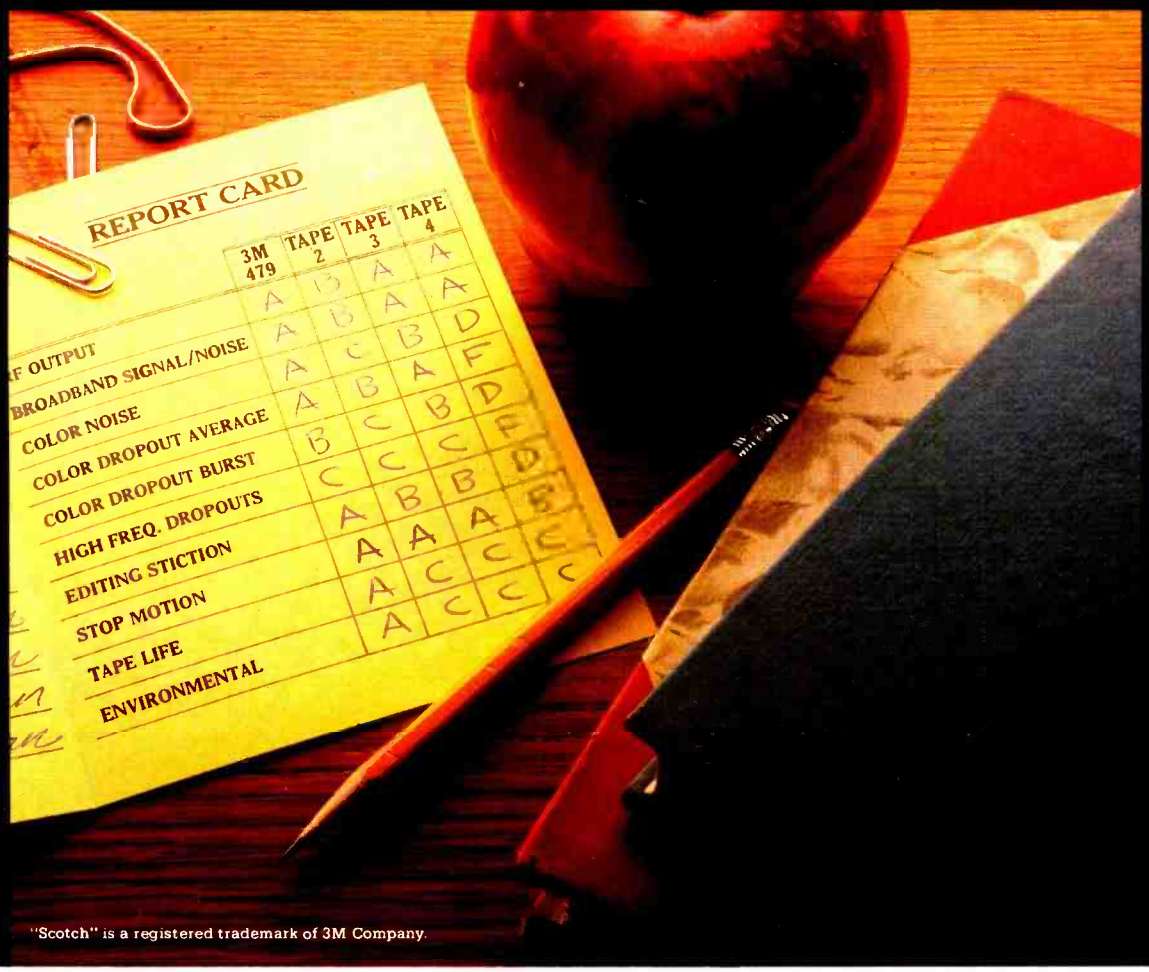

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impact of such a service on commercial broadcasters, which are still reeling from recent assaults by cable.

UNITED KINGDOM

Plans announced for Fourth Channel

With the installation of 30 new high-power transmitters by 1982, the Fourth Channel will reach 40 million viewers throughout the United Kingdom.

The Independent Broadcasting Authority (IBA) has announced plans to have 30 main high-power transmitting stations for the new Fourth Channel color television network operational in all ITV regions (except the Channel Islands) by November 1982.

The new stations will make the Fourth Channel available to 80 percent of the population in the United Kingdom, or more than 40 million viewers. The IBA also plans to build 18 additional high-power main stations, to be completed at a rate of one per month during 1983-1984.

The IBA has already awarded contracts to Marconi Communication Systems of Chelmsford and Pye TVT of Cambridge for the supply and installation of the 48 sets of high-power transmitters. These contracts, for the latest generation of UHF transmitters, are the most valuable ever placed by the IBA. Installation and commissioning of these new transmitters will begin in the spring of 1981.

These new high-power transmitters will comprise the first major television network to be based on the latest generation of high-efficiency klystron amplifiers. Except at Crystal Palace, all transmitters will use a single family of klystrons which are being supplied to Marconi and Pye by Mullard Ltd.

These devices, which typically have a conversion efficiency of about 45 percent, compared with about 25-30 percent of the earlier power klystrons, will not only reduce operating costs and conserve energy, but will make possible significant reduction in the size of the transmitting installations, including the cooling and power systems. They feature rapid warm-up when brought into service as a reserve unit; under such conditions they become fully operational in a matter of seconds rather than minutes.

The transmitters will also feature a unique microprocessor-based programmable transmitter control system which, in conjunction with control units to be supplied by the IBA, will provide automatic operation of the transmitters, together with external status indications and remote and supervisory functions at the IBA's new regional operations centers around which the entire network will be built.

In addition to this ambitious program, the IBA plans to continue plans already under way: extension of the ITV UHF network by the building of 70 new local relays a year; extension of the Independent Local Radio services; and concentration of the operational control of the entire ITV transmitter network into four regional operations centers. BC

Business Hotline

CONVERGENCE CORPORATION, manufacturer of the "Superstick editing systems," has begun its marketing program to increase penetration in the European market. The company, which has been active through Keeline Productions in London the past three years, began expanding its international operations at the Montreux Symposium and Technical Exhibition in Switzerland last May. At this show, Convergence formed the foundations for developing and establishing a direct relationship with a network of distributors in various countries throughout continental Europe.

According to John G. Campbell, vice president of marketing, "The philosophy of this new marketing program is to not only increase the penetration in Europe, but to increase the support for distributors and customers."

(Editor's note: See this month's Product Premier for a description of the Superstick systems, which interface with standard ¾-inch and one-inch Type C VTRs.)

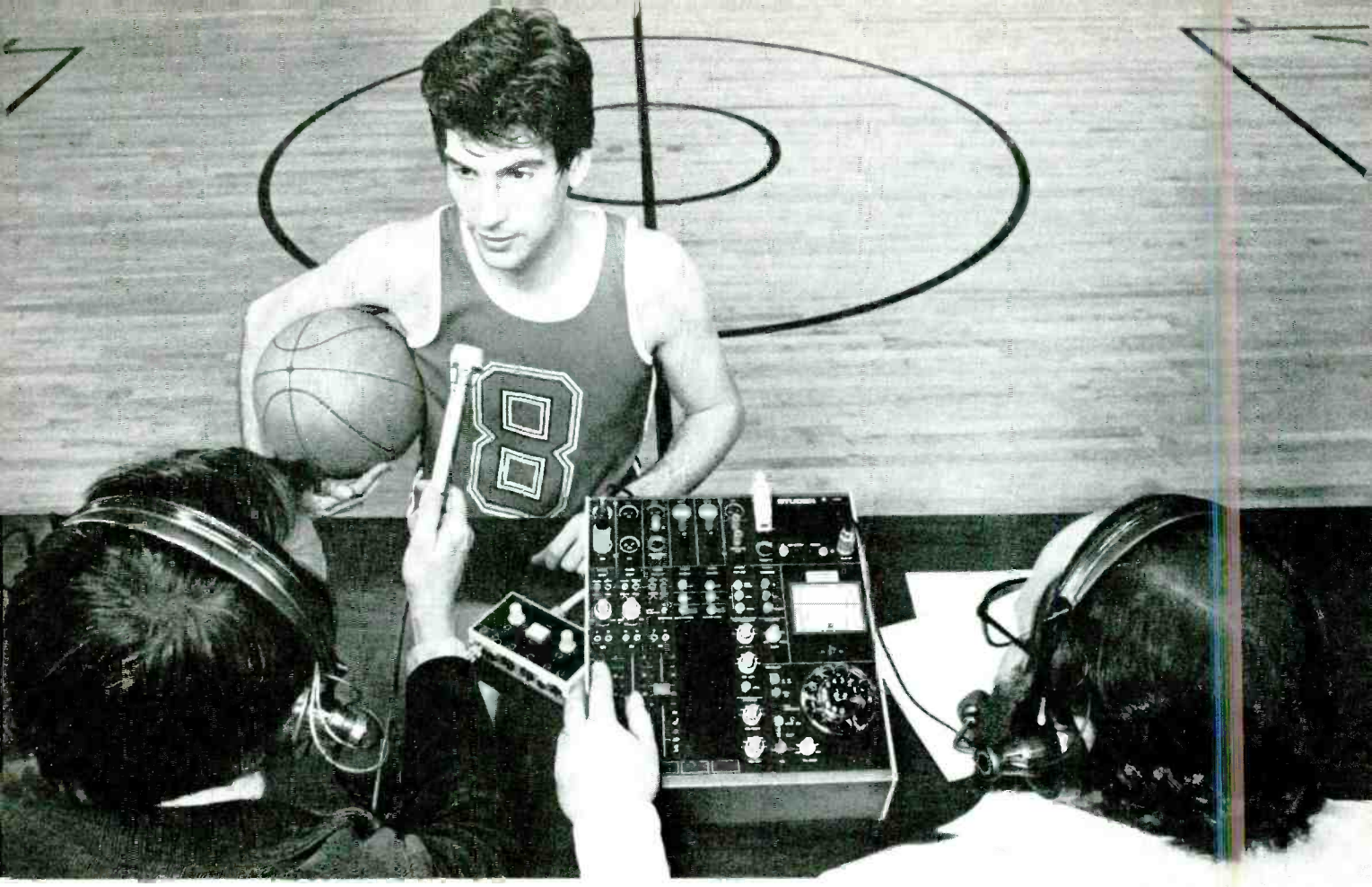
RTS SYSTEMS has moved into its new offices in Burbank, California. According to the company's president, Douglas Leighton, the new 14,000-square-foot headquarters houses expanded manufacturing activities, as well as RTS' staff, which has doubled in size.

RCA GLOBAL COMMUNICATIONS has been selected to coordinate a series of tests designed to evaluate the benefits of maritime communications via the Marisat satellite system for the People's Republic of China (PRC). The selection was made after a meeting with Chinese Telecommunications' officials in Peking this summer. Initial tests were scheduled to commence during the latter part of 1979. As coordinator, RCA Globcom will be the point of interface between the PRC and other U.S. companies invited to participate.

AMPEX recently reported an all-time-high second-quarter performance in fiscal year 1980, with a 61% jump in earnings before an extraordinary item on a 20% increase in net sales and other revenues. Earnings before the extraordinary item increased to $7 million, or 61 cents per share, from $4.4 million, or 38 cents per share, in the year-earlier period. Net sales and other revenues rose to $110.9 million for the quarter ending October 27, 1979, the best quarter in the company's 35-year history.

INDUSTRIAL SCIENCES of Gainesville, Florida, has completed a research and development contract for the Public Broadcasting Service. This contract included development of the broadcast closed-captioning system developed by PBS. Industrial Sciences is currently delivering units to PBS, ABC, and NBC.

SONY BROADCAST, a division of Sony Video Products Company, has announced the sale of more than $1.1 million in broadcast video production and editing equipment to three television stations owned and operated by Combined Communications Corporation, Phoenix, Arizona. The sales include studio and portable VTRs, ENG cameras, time base correctors, (SMPTE) time code generator/readers, U-matic editing videocassette recorders, plus other peripheral editing and production equipment.



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The 069 is Studer's complete go-anywhere, be-prepared-for-anything answer for broadcast remotes. For a full descriptive brochure, contact Studer Revox directly.

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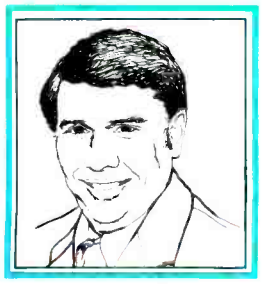

Deane C. Parkhurst has been appointed editor of BROADCAST COMMUNICATIONS, it was announced by Ron Merrell, vice president and editorial director of Globecom Publishing Limited. Parkhurst began his broadcasting career with an educational carrier current facility at Upsala College, New Jersey. Assigned to Fort Monmouth, New Jersey, and the Signal Corps during his army service, he was an instructor in the heavy-duty transmitter operation and repair areas. Parkhurst was an announcer/newsman at WSET, Glen Falls, New York, and was named program director of WHEN Radio, Syracuse, New York, in 1969. While there, he was host of a live television program on WHEN-TV (now WTVH). Parkhurst became station manager of KCEZ-FM, Kansas City, in 1973. He assumed additional operational duties at KCMO one year later. Most recently, he has served as vice president for Capital Counselors, a financial and managerial consulting firm responsible for communication and material presentation.

John Bayliss, president of the Radio Division, Combined Communications, and **Norman Wain,** president of Metroplex Communications, have been elected to the National Radio Broadcasters Association (NRBA) board of directors. Bayliss and Wain will serve as directors-at-large for a one-year term.

Pete Howard, vice president and chief consultant of Imero Fiorentino Associates, Consultants to the Performing Arts, has been nominated for an Emmy Award for Outstanding Achievement in News and Documentary Programming as lighting director (installation) for live TV coverage of the House of Representatives proceedings. Howard designed the TV lighting system to allow for continuous coverage in the House Chamber. Howard is well-known in the broadcast industry for his expertise in creative technical solutions to challenging production problems. Recently, he served as the production design consultant for the worldwide teleproduction of "Spartacade '79," the international sports competition in the Soviet Union.

Clarence Abram has been unanimously elected to the PBS engineering committee. He is engineering supervisor for WTVS, Detroit. The 25 members of the PBS engineering committee represent a broad spectrum of broadcast engineers from stations in a variety of areas — rural, metropolitan, university. Members act as consultants to PBS, gathering information on the engineering and technical problems stations face and making recommendations to PBS for solutions.

Hartford N. Gunn, Jr., vice chairman of the board of the Public Broadcasting Service, has been named senior vice president and general manager of KCET, Los Angeles. Gunn was president of PBS from 1970 to 1976, prior to serving as vice chairman of the PBS board. From 1958 to 1970, he

Continued on page 16

Announcing new AM/FM Stereo Consoles from ADM

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The new ST consoles offer a series of modular frames that we will equip to your particular needs. A variety of input, output and signal processing modules are also available to satisify your present requirements as well as future expansion. Each ST frame offers up to three separate stereo and one monaural output. All modules are front panel plug-ins. Electrical specifications set a new level of excellence for the industry.

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managed WGBH, Boston's public television and FM radio stations.

Mort Russin is the newly appointed sales/marketing director for closed-circuit television lenses, home video optics, and advanced optics and optical systems at Fujinon Optical. Russin, who held a similar position with Sharp Electronics, has more than 15 years of sales and administration experience within the industry. In his new position, he will be responsible for maintaining the company's leadership in CCTV lenses, introducing the company into the home video market, and marketing the company's new industrial optics. Fujinon Optical is located in Scarsdale, New York.

Martin Rubenstein has been appointed president and chief executive officer of Mutual Broadcasting System. He is now responsible for all activities of both the Mutual Radio Network and its owned-stations division. Other announced changes at Mutual include the resignation of **Gary J. Worth** as a network executive vice president and the dissolution of the executive committee that performed the functions of chief executive officer at Mutual since December 1978.

J. William Grimes has assumed the newly-created position of senior vice president at CBS Radio. He will be in charge of the CBS-owned AM and FM stations. Also at CBS, **Jack Stuppler** was promoted to director of administration, CBS Radio Network. Stuppler, formerly director of program practices at CBS Radio, joined CBS in 1950, holding various executive positions in radio sales and accounting before taking his present position. **Patricia Bernie,** manager of the CBS News' Rome bureau since 1974, is the new director of European operations, public affairs broadcasts, for CBS. Bernie, based in London, will be in charge of administration, financial matters, and operations for *60 Minutes* and other CBS News public-affairs broadcasts produced in Europe.

Mike Worrall has joined KRUX, Phoenix, as chief engineer. He has held positions at KWVE, San Clemente, and at KIFM and KFSD, San Diego.

Vince Caravello has been elevated to transmitter supervisor for KSDK-TV in St. Louis.

George Watson and **Paul Titchenal** have joined Midwest Engineering Associates, Peoria, Illinois, as consulting engineers. Watson was director of engineering for Mariner Communication, licensee of WITS, Boston; and KBEQ, Kansas City. Titchenal was chief engineer for WGTO, Cypress Gardens, Florida. BC

Moving Up

GILBERT R. KESSER has been elected chairman of the board of Micro Consultants Inc. (MCI/Quantel). GEORGE A. GRASSO has been elected to succeed him as president. Kesser founded MCI in 1975 and has served as president since then. Grasso has served as marketing vice president since joining the company in 1976. Micro Consultants is a marketing and engineering organization serving the broadcast industry. The company is the exclusive U.S. importer of advanced digital video products manufactured in the United Kingdom by Quantel Limited.

LEE RUBLE, operations and manufacturing manager at Vital Industries for the past 10 years, has joined Industrial Sciences as manufacturing manager. Ruble will be in charge of all phases of fabrication and manufacturing at ISI's Gainesville, Florida, location.

CHARLES A. BUZZARD has joined Dynasciences' video products as western regional sales manager. He will be based in Albuquerque, New Mexico, and will be responsible for sales and administration of all territory and dealers west of the Mississippi. Buzzard comes to Dynasciences with 20 years of experience as chief engineer at WLS-TV, Chicago, and eight years as regional sales manager at Philips Broadcast Equipment Corporation.

BILL J. CULBERTSON has been appointed RCA Broadcast Systems sales representative in the southern U.S. Culbertson, whose offices are in Dallas, is responsible for marketing RCA's line of radio and TV studio and transmitting systems in eastern Texas, Louisiana, and Arkansas. Prior to joining RCA, he was a southern area salesman for broadcast equipment at Telemet.

JOHN G. CAMPBELL, vice president of marketing, Convergence Corporation, is now responsible for private label and international marketing. As part of the company's expanded marketing program, Campbell will be in charge of all marketing, including both U.S. and international operations. In his new capacity, Campbell has announced two appointments. FRANK LOGAN, formerly Western regional sales manager for Convergence is now communications manager. PATRICE GARNER is advertising and promotion coordinator.

RICK PLUSHNER has become western district manager of Sony Industries' digital audio division. Plushner's responsibilities will be for the division's western half of the United States. Prior to this, he was president of Audio Design, Miami, Florida.

BILL ISENBERG has joined RTS Systems as senior design engineer for the firm's new professional audio products line (the 400 series). Isenberg was formerly in the research and development department at Pioneer of North America in Pasadena, was chief engineer at SAE, and also served as a design engineer at JBL Sound. He will be based at the new headquarters for RTS Systems in Burbank, California.

JACK E. BANISTER has been promoted to vice president, broadcast systems, Europe, Africa, and the Middle East for RCA International Ltd. (United Kingdom). Banister, who will be based in RCA's Sunbury-on-Thames offices near London, succeeds Patrick Murrin, who retired after 29 years with RCA.

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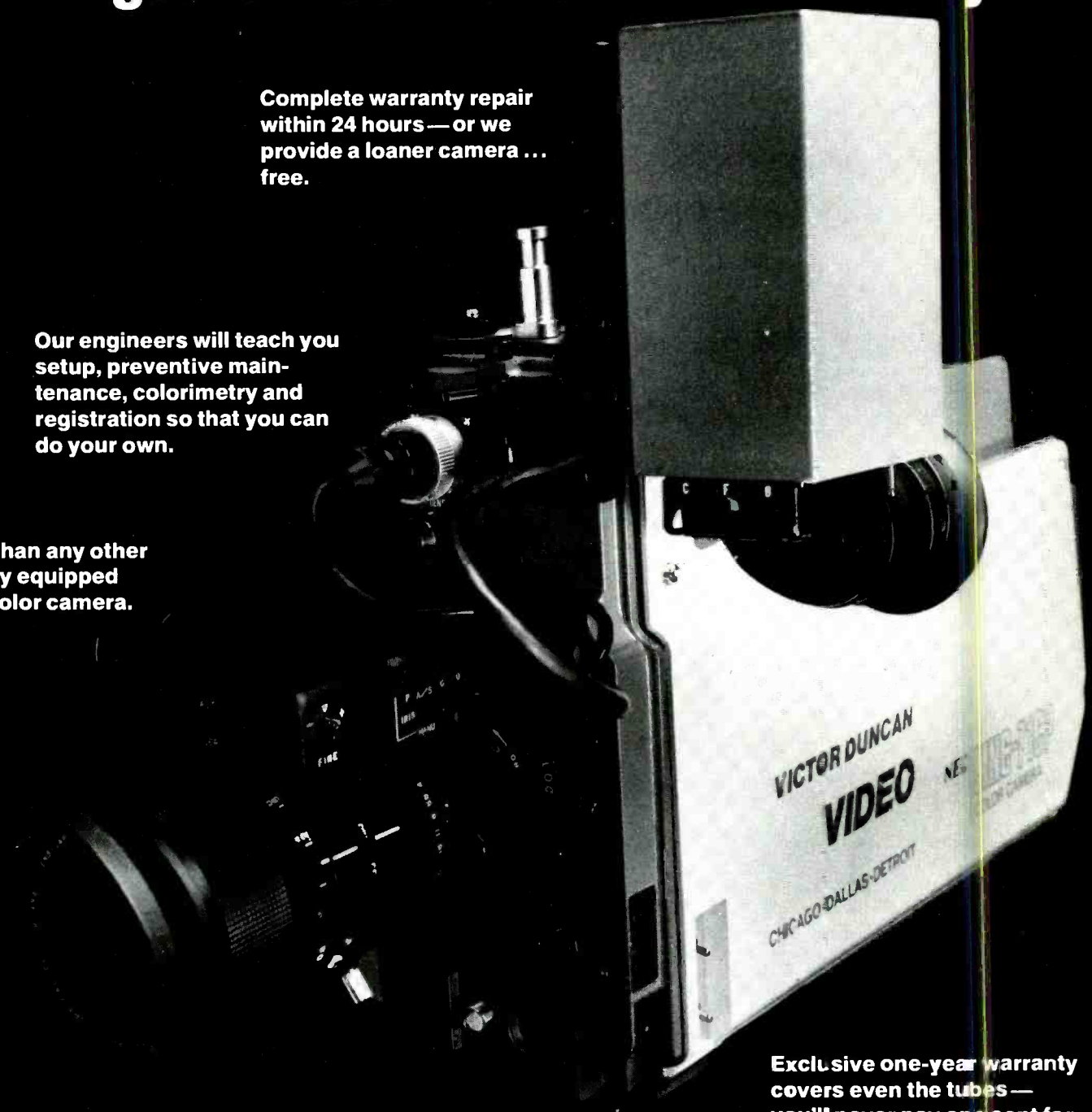
With a guarantee that stands behind you.

Complete warranty repair within 24 hours—or we provide a loaner camera ... free.

Our engineers will teach you setup, preventive maintenance, colorimetry and registration so that you can do your own.

Less cost than any other comparably equipped ENG/EFP color camera.



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Our easy-term "state-of-the-art" lease program allows you to update your equipment by giving you credit for up to 50% of your lease payments.

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How can we offer such a comprehensive program? We put the MNC-71CP camera through the most grueling test our 19 years in the production equipment business could devise. We assigned the camera to our rental departments in Chicago, Dallas and Detroit for a no holds barred trial. After a year and a half of air shipments, location shooting and use by both experienced engineers and novice operators, our MNC-71CP's are still low maintenance cameras. It's a money maker for us. It can do the same for you.

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SMPTE/Canada

The digital decade

The emphasis will be on digital technology at the SMPTE's television conference in Toronto.

The 1980s are here. And the program is set for SMPTE's 14th Annual Television Conference, slated for the Sheraton-Centre Hotel in Toronto, Canada, February 1-2.

This year's theme is "The Digital Decade." The focus of the two-day conference will be on the all-digital TV plant; digital signal processing; digital transmission and testing; and digital video recording.

In addition to the two-day technical program, the SMPTE Television Conference will be highlighted by an equipment exhibit that will feature equipment relevant to the program subjects. The conference will also have a Friday get-together luncheon, a Friday evening reception at Toronto's CN Tower sponsored by Digital Video Systems, and a two-day program for spouses. Additional sponsors will be Ampex of Canada; Sony of Canada; RCA; Leitch Video; and Robert Bosch, Fernseh Division.

The program is as follows:

Friday morning, February 1 – The All Digital TV Plant. Papers include "Integrated Circuits for TV in the Digital Decade," William Webster, RCA Laboratories; "The All-Digital Television Studio," Frank Davidoff, CBS Television Network, New York; "Report of The Working Group on New Technology," Robert Hopkins, RCA; "When Are Digits Going to Meet the Action," Richard Sanders, BBC; "Digital Audio Formats for Recording and Digital Communication," Toshi Doi, Sony, Japan; "The Future of the Digital TV Studio," Jurgen Heitmann, Robert Bosch GmbH, Federal Republic of Germany; "An Overview of Progress Toward the Digital TV Plant," Anthony Lind, RCA.

Friday afternoon – Digital Signal Processing. Papers include "Digital Video Processing — 1980," John Lowry, Digital Video Systems; "Component Versus Composite Coding for Television Signal Processing," J.L.E. Baldwin, IBA; "Three Dimensional Spectrum and Processing of Digital NTSC Color Signals," E. Dubois, M.S. Sabri, and J.Y. Ouellet, INRS-Telecommunications & Bell-Northern Research, Canada; "Mixing and Effects in the Digital World," Dennis Fraser, NEC America; "Software-Based Digital Signal Processing," Richard Kupnicki, Digital Video Systems; "Digital Picture Creation," Richard Shoup, Belmont, California; "A Multi-Function Digital Processor," Steve Kreinick, Thomson-CSF Labs.

Saturday morning, February 2 – Digital Transmission and Testing. "Fiber Optics, An Overview," Michael Ferguson, Bell-Northern Research; "Network Distribution of Digital Television Signals," Denis Connor, MacDonald, Dettwiler & Associates; "Testing in the Digital Video World," Kenneth Davies, Canadian Broadcasting Corporation; "Overview of Broadcast Teletext for NTSC Television Standards," John Storey, H.G. Brown, C.D. O'Brien, and W. Sawchuk, Canadian Department of Communications; "Progress Report of the EIA Teletext Systems," Robert O'Connor, CBS Television Network; "TV for the Deaf," John Ball, Public Broadcasting Service; "The Users View of Teletext Systems," Walter Ciciora, Zenith Radio Corporation.

Saturday afternoon – Digital Recording. Papers include "Overview of Digital Recording," Dominique Nasse, CCETT, France; "Digital Recording — Further Options," Charles Anderson, Ampex; "Digital Video Recording in the 625-line System," Hubert Foerster and Josef Sochor, Robert Bosch GmbH; "Experimental Digital VTR with Tri Level Recording and Fire Code Error Correction," Yoshizumi Eto, S. Mitra, Y. Hirano, and T. Kawamura, Hitachi, Japan; "Digital Video Recording: Some Experiments and Future Considerations," Masahiko Morizono, Hirofumi Yoshida, and Yoshitake Hashimoto, Sony, Japan; "Digital Audio Recording for Television: Some Choices," E. Stanley Busby, Jr., Ampex; "A Report on Digital Video Recording."

For further information on the SMPTE Television Conference, write to SMPTE, 862 Scarsdale Avenue, Scarsdale, NY 10583; (914) 472-6606.

SBE/United States

Elections slated

Nominations have been finalized for the annual election of officers.

The Society of Broadcast Engineers (SBE) has announced the nominations for the Society's 1980 elections. The nominating committee of Jim Hurley, Pete Ford, Al Hilstrom, and Ralph Thompson have forwarded the following names: for president, Robert A. Jones; for vice president, Ron Arendall; and for secretary-treasurer, Edwin T. Karl.

At press time there were seven engineers running for the board of directors, with six spots open. They are Eugene Hill, Len Ballard, Raymond Benedict, Hugh Cleland, Roger Johnson, Zaven Masoomian, and Jay Mathis.

The SBE also recently announced that the newly formed chapter in Fresno, California, already has had their second meeting. Carl Martin, president of Audicord, led the meeting with a talk on cart machines and problems related to audio cart recordings.

Then for the second year, the Society held what has become their annual chapter chairmen's meeting. They met in St. Louis recently, with their next meeting scheduled for Las Vegas during the 1980 NAB convention in April.

RTNDA/United States

News salaries up

The latest RTNDA survey shows that both television and radio news salaries are up.

If you're a typical local TV news director, you are probably making more money than you did a year earlier. And your salary is $20,800.

That's the finding of the latest staff/salary survey conducted by the Radio Television News Directors Association (RTNDA). The results of the survey were published in the RTNDA's monthly publication, the *Communicator*, which periodically canvasses both TV and radio newsrooms. The survey was under the direction of RTNDA research chairman Vernon A. Stone of Southern Illinois University.

According to the latest report, which was based on returns from 483 non-satellite commercial television and 400 commercial radio outlets, the average pay scales for news directors and anchorpersons have increased since 1977, some as much as 18 percent. Radio newsrooms share in the increase, but to a lesser extent than television.

While the typical TV news director in mid-79 made $20,800, the typical local TV anchorperson made $20,000. The survey also found that the nation's best-paid local news director gets $104,000 annually, and that $182,000 is the yearly compensation of the industry's most-valued non-network anchor.

Salaries for radio news directors range from $5,200 to $41,600 per year, with the best-paid radio newscasters making from $5,200 to $46,800.

On the other end of the spectrum, the lowest paid members of TV news staffs make from $100 to $400 weekly, with the median salary just $175 (a 9 percent increase since 1977).

NAB/United States

Ruling challenged

The NAB and FCC have joined forces to challenge a court ruling calling for the FCC to regulate radio format changes.

In a recent decision, the U.S. Appeals Court for the District of Columbia said it is the Federal Communications Commission's (FCC) responsibility to regulate radio station format changes.

The FCC felt that any format changes should be determined by station management. And following the appeals court decision, the commission requested the U.S. Supreme Court to review the case.

Now the National Association of Broadcasters (NAB) has filed a friend-of-the-court petition in behalf of the FCC. In its petition, the NAB said the appeals court usurped the FCC's policymaking role and "violated the constitutional and statutory scheme prohibiting censorship and encouraging free competition in radio programming." It pointed out that legislative history and Supreme Court decision support, if not require the FCC's policy judgment not to regulate to this extent. BC

SBE MONTHLY LOG

CHAPTER 1 — Binghamton, New York. John Windle of Stainless Inc. gave a presentation on "The Installation of FM Antennas on Towers."

CHAPTER 2 — Northeastern Pennsylvania. Nick Hudak, RCA, Camden, N.J., presented a program on "Practical Use of Microprocessor Control in an Automatic TV Camera."

CHAPTER 11 — Boston, Massachusetts. Robert Paulson, AVP Communications, spoke on "Audio Visual Technology for the 80's and 90's — Where we are and Where We are Going." This was a joint meeting with SBE and SMPTE.

CHAPTER 14 — Connecticut Valley. Jack Kean, director of engineering of WEDH, gave a presentation on "Satellite Transmission" and a tour of the WEDH facilities followed by a Q&A period.

CHAPTER 18 — Philadelphia, Pennsylvania. Kipp Rabbit of the Amperex tube division spoke on "The Use of the Plumbicon Simulator" followed by a discussion regarding keeping cameras in peak condition.

CHAPTER 20 — Pittsburgh, Pennsylvania. Walt Dick, district manager, Network Facilities Design of Bell Telephone of Pennsylvania, discussed the "Field of Fiber Optics — Bell of Pa's First Lightwave Transmission System."

CHAPTER 21 — Spokane, Washington. Vince Hoffart, chapter member, discussed the "Changes of a Four Tower Directional System to Change the Impedance to a Better Workable Value for the Maintenance of the Pattern."

CHAPTER 22 — Central New York. Tom Cavanagh, VTR technical officer, CBC Engineering Headquarters, Montreal, gave a presentation, with slide documentation, on "CBC Quadruplex Standard Alignment Tape."

CHAPTER 25 — Indianapolis, Indiana. John Lowery, president, Digital Video Systems, gave a technical presentation on "Digital Video Processing, The DPS-1" with Mike Perry of Midwest Corporation.

CHAPTER 26 — Chicago, Illinois. James C. Dolan, Jr., studio manager of Streeterville Recording Studios, discussed their recent $2.75 million expansion and explained the concept behind the studio layout and design. He showed the automated Harrison console, the only one of its kind in the Midwest.

CHAPTER 28 — Milwaukee, Wisconsin. Brian Tucker, representative of Studer/Revox America, spoke on "Design Parameters for Modern Tape Recorders."

CHAPTER 41 — Central Pennsylvania. A "brain-storming" workshop was held with the members and guests to formulate an agenda of interesting and new programs for the coming year. A total of 25 potential programs resulted from this session.

CHAPTER 43 — Sacramento, California. Greg Silsby of Electro-Voice gave an informative presentation on microphones, including insights to the design and performance of various basic microphone types.

CHAPTER 45 — Charlotte, North Carolina. Don Hoke, chapter vice president, talked about Southern Bell. Hoke has worked in many different areas with Southern Bell for the past 19 years and is presently the Southern Bell radio manager supervising the engineers responsible for radio and video work in North Carolina.

CHAPTER 47 — Los Angeles Area. Scientific Atlanta gave a slide presentation on earth stations.

CHAPTER 48 — Denver, Colorado. Luncheon meeting with a "General Technical Topics Discussion" among members and guests. Prospective members attending with a regular member received their lunch free.

CHAPTER 49 — Central Illinois. Tom Silliman, vice president of Electronic Research Inc. of Newburgh, Indiana, which is a major manufacturer of FM broadcast antennas, told of the design and installation of two antenna systems they had done on top of a 53-story building in Minneapolis. He explained how FM station coverage is affected by antenna gain, height, terrain and pole vs. side mounting of antennas.

CHAPTER 50 — Fort Collins, Colorado. Jim Andrews, Joe Woods and others presented a program on ham radio and ham television. Slides were shown on various ham communication facilities and amateur television systems.

CHAPTER 52 — Central Ohio. Tom Hingson, vice president of Tower Communication Systems Corp., discussed "Satellite Communications" from the past to the present and projected what is coming up in the near future.

CHAPTER 53 — South Florida. Robert Curwin of NEC demonstrated and discussed the NEC FS-15 Frame Synchronizer.

CHAPTER 54 — Tidewater Virginia Area. Bob Griffith of Telemet presented "Fiber Optics in Broadcasting" and demonstrated Telemet's Fiber Optic Video Transmission System.

CHAPTER 55 — St. Louis, Missouri. The SBE national officers in town for the semi-annual Chapter Chairmen Meeting provided the program that also included a Q&A session with chapter members.

CHAPTER 56 — Oklahoma. J. P. Shipley of RCA demonstrated and discussed "Modern TV Transmitters and SAW Filters."

CHAPTER 62 — Salt Lake City. Forrest Cummings, chief design engineer, and Tom Cauthers, district sales manager of Collins Radio, presented the program. A brief history of Collins Radio was given and a detailed description of the design and development of the Rockwell/Collins 828 D/E AM Transmitter.

For more information about the Society of Broadcast Engineers, contact Pat Satter, SBE National Office, P.O. Box 50844, Indianapolis, IN 46250; (317) 842-0836.

NAB '80

SIGHT & SOUND

Gettin' Ready for the

This year's NAB convention, scheduled for Las Vegas, April 13-16, will have the largest international contingent of broadcast personnel ever assembled. And for good reason:

The focus of NAB '80 is "preparing for the '80s."

The engineering conference will deal with satellite earth stations, AM stereo, expansion of the AM band, teletext, new communication techniques, and more. There will be two full days of discussions, paper presentations, and basic how-to workshops for television and radio engineers.

The radio conference will have more than 25 workshops designed to get you ready for the next decade. There will be sessions on sales, promotions, research, syndicated specials, and EEO. And new this year will be a basic engineering workshop for the general manager.

Television sessions will include marketing techniques to increase your ratings, news coverage, satellite technology, motivating your personnel, the impact of cable, and the latest ideas in programming.

And, of course, the NAB will feature the largest exhibition of broadcast equipment and services assembled anywhere in the world: 150,000 square feet of transmitters, video and audio recording equipment, satellite gear, engineering accessories, and syndicated shows.

1980 Convention Registration Confirmation

Name _____

Station/Firm _____

Address _____

City _____

State _____

Zip _____

---

*Delegates eligible to attend at member rate:

- Station Members of NAB, RAB, TvB
- NAB Associate Members
- Educational Stations
- Representatives of Foreign Countries
- Government Personnel not involved in Broadcast Activities
- Military Personnel
- Students
- Clergy
- Representatives of Educational Institutions and Charitable Organizations

Registration Form

(Please use typewriter)

Name _____

Title _____

Station or Firm _____

Street Address _____

City _____ State _____ Zip _____

Phone Number (during the day) _____

Check which meetings you principally plan to attend (check **only** one):

☐ Radio Management ☐ TV Management

☐ Engineering Technical

Use a separate form for each person registering. This form may be duplicated.

Deadline for preregistration: March 1, 1980. Full payment must accompany this form. Please do not include any other payments to NAB with this form. Make check payable to National Association of Broadcasters. Mail to: Convention Registration, NAB, 1771 N Street, N. W., Washington, D. C. 20036.

Registration fees (includes luncheons):

☐ Member* registration $115.00

☐ Nonmember registration $350.00

Total enclosed ..... ____

Note: On-site registration is $25.00 higher in each category. Additional luncheon tickets may be purchased at the registration desk. (Badges admitting spouses to meetings/exhibit hall will be available at no charge at the registration desk.)

Do not write below this line.

Signed _____

By _____

Hotel _____

H _____

Convention Audit

Primary Business (Check One Only)

☐ 1. Commercial radio station
☐ 2. TV station ☐ 3. both
☐ 4. Noncommercial radio station
☐ 5. TV station ☐ 6. both
☐ 7. Network: radio
☐ 8. TV ☐ 9. both
☐ 10. Military
☐ 11. Foreign broadcaster
☐ 12. Trade press/news media
☐ 13. College/university
☐ 14. Recording and/or film company distributor
☐ 15. News service ☐ 16. Law firm
☐ 17. Equip. manufacturer and/or distributor
☐ 18. Consulting engineer ☐ 19. Broker
☐ 20. Bank or financial institution
☐ 21. Government agency
☐ 22. Common carrier engaged in transmission and/or distribution of broadcast material
☐ 23. Advertising agency
☐ 24. Broadcast consultant organization
☐ 25. Research organization
☐ 26. National station representative
☐ 27. Local/regional station representative
☐ 28. Other
(please describe)

Primary Job Function (Check One Only)

☐ 1. Owner/corporate management
☐ 2. General management/administration
☐ 3. Engineering
☐ 4. Sales/marketing
☐ 5. Research and development
☐ 6. Teacher/student
☐ 7. Other
(please describe)

NAB Membership Status (Check One Only)

☐ 1. NAB active member
☐ 2. NAB associate member
☐ 3. Nonmember

1980s

As a member of the international broadcast community, you can't afford to miss NAB '80.

Complete the following forms and return them as soon as possible to the NAB, Convention Registration, 1771 N Street, N.W., Washington, DC 20036. To assure that NAB has received your registration, type your name and address on the 1980 Convention Registration Confirmation form. NAB will return this to you promptly. BC

National Association of Broadcasters 58th Annual Convention

NAB has options on rooms at the following hotels. All reservations must be made through NAB. Please complete one form for **each** room desired and indicate first, second and third choice of hotels. Please return your completed form as soon as possible.
Every effort will be made to fulfill your request with the type of room indicated at the hotel of your choice, **but we reserve the right to place your reservation where rooms are available.** Persons desiring rooms at hotels other than those listed should communicate directly with the hotel they prefer.

Any **cancellations** should be made **in writing** to the attention of Ms. Helene Stadler, Las Vegas Convention Housing Bureau, P. O. Box 14006, Las Vegas, Nev. 89114. Any **changes** should be made **in writing** to the attention of the confirming hotel.

Note: The Las Vegas Hilton has been designated as the Radio Hotel and the MGM Grand as the TV Hotel. To insure an equitable distribution of rooms for all NAB Convention delegates, only 2 sleeping rooms per hospitality suite will be assigned at the Las Vegas Hilton and MGM Grand Hotels.

All confirmations of rooms will be mailed to you by the hotel. Most hotels require a deposit or guarantee. If so, it will be noted on your confirmation and you must remit that amount within 10 days of the date of the confirmation. **Confirmed reservations will not be held after 6:00 pm unless room(s) have been guaranteed or secured with the appropriate deposit. Send all room deposits directly to the hotel.**
Mail form to:
National Association of Broadcasters
Convention Registration
1771 N Street, N. W.
Washington, D. C. 20036

This form may be duplicated.

Hotel Reservation Request Form

Choice	Hotel	Single	Double/twin	Suite — Parlor and 1 Bedroom	Suite — Parlor and 2 Bedrooms
_____	Aladdin	$46.00	$46.00	$140.00	$190.00
_____	Barbary Coast	50.00	50.00		
_____	Caesars Palace	48.00	55.00	145.00 - 175.00	200.00 - 230.00
_____	Castaways	40.00	40.00		
_____	Desert Inn	55.00	55.00	150.00 - 350.00	225.00 - 435.00
_____	Dunes	44.00	44.00	190.00	255.00
_____	Flamingo Hilton	47.00	47.00		
_____	Frontier	42.00	42.00	110.00 - 155.00	155.00 - 210.00
_____	Hacienda	40.00	40.00		
_____	Holiday Inn - Center	45.00	52.00		
_____	Imperial Palace	38.00	38.00	95.00 - 175.00	133.00 - 215.00
_____	Jockey Club	50.00	50.00	73.00	94.00
_____	Landmark	28.00/34.00	32.00/38.00	90.00	130.00
_____	Las Vegas Hilton	42.00/66.00	42.00/66.00	115.00 - 400.00	157.00 - 610.00
_____	Las Vegas Marina	45.00	45.00		
_____	Maxim	40.00	40.00	130.00	180.00
_____	Mardi Gras	28.00	34.00/38.00		
_____	MGM Grand	43.00	43.00	120.00 - 185.00	170.00 - 800.00
_____	Riviera	42.00	44.00/48.00	95.00 - 115.00	139.00 - 159.00
_____	Royal Inn	35.00	38.00/40.00	80.00	115.00
_____	Royal Las Vegas	32.00	36.00		
_____	Sahara	44.00	44.00	145.00	189.00
_____	Sands	34.00/65.00	34.00/65.00		
_____	Silver Bird	30.00	30.00		
_____	Stardust	30.00/60.00	30.00/60.00		
_____	Treasury	32.00	32.00		
_____	Tropicana	40.00	40.00		

Rates do not include a 6% Clark County room tax.
Return this form no later than March 1, 1980.

Name (Individual in whose name reservations should be made)

Call letters or firm

Address

City and State **Zip**

Type of Room **Rate**

Arrival Date **Time** **Departure Date**

Names of other occupants (for double/twin rooms or suites)

RON MERRELL

Along with equipment...

New remote vehicle lineup will challenge ENG in 1980

ENG/RENG Checklist

- ☑ Cost Effective
- ☑ Image Effective
- ☑ Improved Ratings
- ☑ Improved Profits
- ☑ Staff Challenging
- ☑ Community Service
- ☑ Greater Visibility

Now that it's finally 1980, we can take our first glance back at the decade of the '70s. With hindsight on our side, we can take our first shot at assessing its technical achievements and operational trends. And from TV's point of view, we'll have to come away concluding that ENG was significant on both counts.

While the opening round of ENG equipment had really been designed for everything but ENG, the competitive nature of the designers and users was such that by the time we crossed the finish line on the '70s, the Europeans had decided the equipment was good enough to meet even their standards.

Certainly the '70s left the industry a

Earth stations: A portable story

When science fiction author Arthur C. Clarke foresaw in a 1945 novel the development of satellite communications, many people thought HE had some signals crossed.

But in the 1960s and 1970s, fixed earth stations quickly became a reality and an important part of international communications. They brought in the world speeches from the United Nations, the Olympic games, and addresses by heads of state.

Soon it was not enough to beam the images of stately events across the world via fixed earth stations, and mobile earth stations began serving the worldwide need to know. Now there is a demand for mobile units that can be rushed to events around the world, from the site of earthquake destruction in Mexico to a ski tournament in Jackson Hole, Wyoming.

A new portable station is now being produced for marketing later this year. It's called the Compact 42, manufactured by Compact Video Systems/Sales Division of Burbank, California. It will be unveiled at the April show of the National Association of Broadcasters in Las Vegas and in May at the National Cable Television Association Convention in Dallas.

The complete Compact 42 is a 42-foot long semi-trailer with electronics and optional power modules, and a Scientific Atlanta five-meter aluminum dish that opens into a perfect, fully articulated parabola which retains the same electronic specifications as Scientific Atlanta's fixed-based antennas. The entire unit can be operated and set up by one person.

In these days of uncertain fuel supplies, the trailer's "backbone" carries 200 gallons of fuel. Two beds in a living quarter provide sleeping space for staff.

The parabolic dish is composed of 24 reflector panels. It folds in half for an easily transportable legal road width of under eight feet.

Pictures transmitted from portable stations which are not firmly anchored

WCCO, Minneapolis, takes to the air with this five-place Bell Jet Ranger III helicopter.

legacy of broadcast standard, designed-for-action video equipment. Bolstered by short and deep remote microwave relay systems, the video ENG package the '80s will inherit will add new challenges.

In this issue of BROADCAST COMMUNICATIONS, you'll see a wide range of ENG and RENG applications. The underlying theme collectively is that the technologies that breathed professional life into ENG are affecting practically everyone at station. WTHR will involve several departments on its way to coverage of the Indianapolis 500. In Sydney, Australia, everyone will get into the act as Channel 7 builds on its remotes' reputation. Meredith's KCMO in Kansas City will make weather reporting on the road a full-time commitment. Another station will show you how they challenged their staff with a "sting" operation.

Essentially, you'll discover, as *BC* did, that ENG-type equipment is finding uses far beyond chasing fire engines. You can call it electronic field production (EFP) if you like. But the fact is that this class of equipment has prompted several stations to take advantage of its flexibility and cost effectiveness. By looking at the '80s, it's a safe bet that the involved technologies will never allow us to return to TV isolationism. Of course, it doesn't end there.

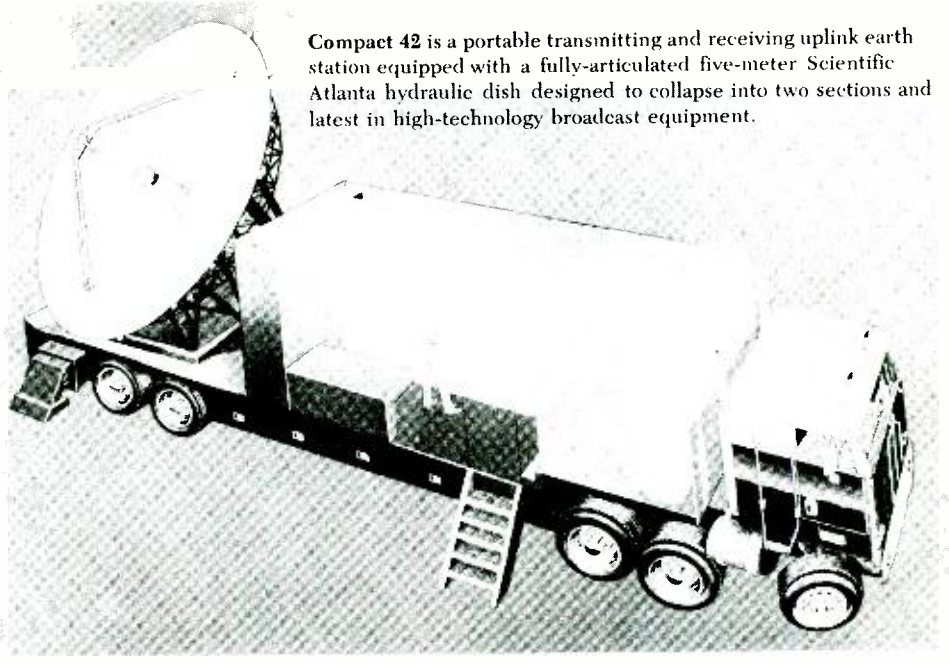
BC's article lineup this month also shows that to operate effectively we need to take a hard look at the vehicles that put our show on the road.

Despite the distinctive distracting sound they make overhead, helicopters are in demand everywhere. And you're correct. They are expensive. But as more and more stations are finding the ENG vehicle, from an operations standpoint, is as important as signal-generation equipment. And those who aren't opting for joining the TV air force when it enters their market are finding that trying harder or being second best isn't good enough.

In the dark ages of ENG, about the only vehicle available (designed with remotes in mind) was the van. And it wasn't long before film cameramen were spotting these vans bogged down in heavy traffic a full block away from the news site. Eventually, of course, microwave and field-production assignments breathed new life into the van business.

Meanwhile, a new breed of vehicles was brought in for the "live eye" and "eye witness" news operation. Examples of the varieties that are common now are caught on-site in several articles in this issue. And that includes radio units as well.

Continued on page 24



Compact 42 is a portable transmitting and receiving uplink earth station equipped with a fully-articulated five-meter Scientific Atlanta hydraulic dish designed to collapse into two sections and latest in high-technology broadcast equipment.

can suffer from poor transmission quality. In the past, stabilization systems were too flexible, allowing a dish-too much freedom to move in winds. To combat this, Compact 42 has legs that project from the trailer and are driven hydraulically into the ground. The system allows the dish to send signals even in winds of 50 to 60 miles-per-hour.

The trailer doesn't need to be repositioned at the site to properly align the dish module with the satellite, either. The dish rotates 180 degrees, which allows the operator to easily switch transmitting satellites if necessary.

The 13-foot-long electronics module contains a standard electronics package that allows the unit to transmit on both uplink and downlink frequency bands, and contains redundant or non-redundant electronics systems.

The Scientific Atlanta electronics include the 3-kilowatt high-power amplifier, one frequency agile video receiver and loop test translator, and a video exciter with audio subcarrier.

On the road from ENG/RENG to radio/TV field production (FP)

We should always have known that TV ENG would be successful. The history of the broadcast business is steeped in what I like to call radio electronic news gathering (RENG). Why, the first broadcast, the one that got this business going in the first place (KDKA's elections report) was just a sampling of what would soon be taken for granted.

Radio's memory lane is crowded with the powerful sounds of Edward R. Murrow, the emotionally tragic on-site Hindenberg disaster report, FDR's declaration of war after the attack on Pearl Harbor, and so much more. And it was RENG.

But just as TV is finding out, going on the road certainly isn't limited to doing the news. Across the U.S. every morning, we hear helicopters chopping away overhead. Their traffic reports are vital to the motorist and a credit to the stations who operate them.

There's more. On-location radio field productions (RFP) are popular because they are profitable. But just as the articles in this issue show, vehicle or remote studio designs depend a lot on market needs. Budget and image are important considerations.

So what's the alternative? Just headings such as less community involvement, and less identity and visibility. Maybe even less profit.

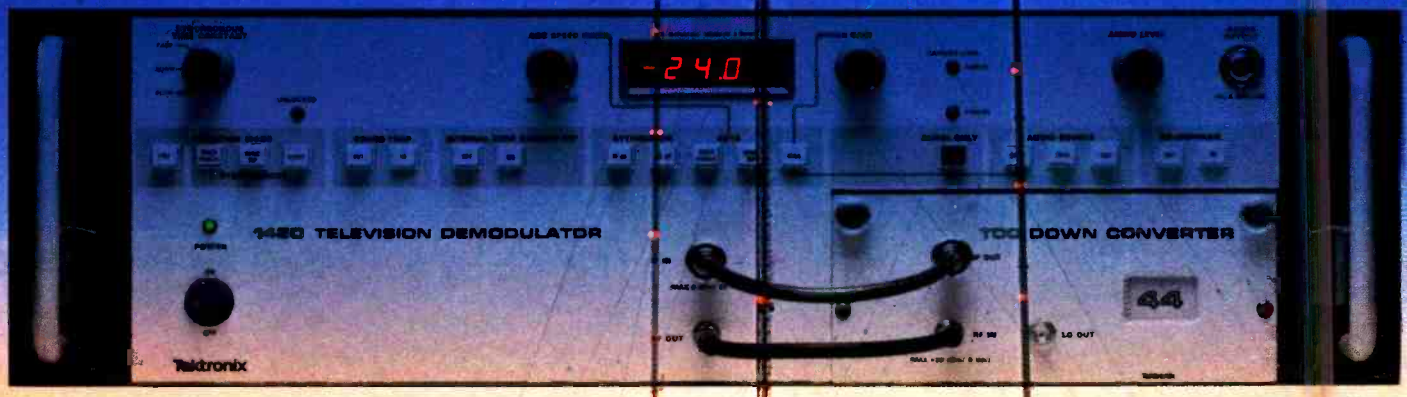
The NAB convention will come around again in a few months, and evidence of the growing importance of remote vehicles will be plentiful. You can expect to see helicopters and all manner of vans right on the exhibit floor.

So what we can look for in the '80s is the challenge and excitement of stations taking advantage of technology and mobile-vehicle innovations. Both will continue on their evolutionary way.

Small-market stations still won't buy helicopters or 50-foot vans, but they, too, will think more about getting on the road . . . despite the lack of consistent, fast-breaking news. Because we really will all find that ENG is not an end in itself. In fact, as we enter the 80s, we should file ENG under the more accurate heading of field production (FP) and not confuse the issue. Field production, as an operational concept, will make remote equipment all the more cost effective.

As the field production trend continues and its freedoms are exploited, the ultimate challenge will be to make the FP product relevant and effective. Sidetrack these requisites, and we'll find ourselves chained to the set again. BC

Clearly the Best.



1450-1 The Transparent Demodulator

One thing is crystal clear. You can't buy a better television demodulator than the TEKTRONIX 1450-1 System M Demod. Why? Because it's "transparent." The 1450-1 allows signals to pass through for inspection without altering their characteristics. In other words, if you use a 1450-1, you'll get the true picture of your transmitter's output.

You'll want to use the 1450-1 for other reasons, too.

Save time (and money) on transmitter alignment

- Synchronous detection eliminates confusing quadrature distortion.
- Precise bandpass characteristic and linear detector plus flat IF and video response give faithful signal reproduction.
- Split carrier sound detection speeds troubleshooting and alignment of the aural transmitter because no vision carrier is required.

Reduce equipment maintenance costs

- SAW filter IF strip requires no adjustment; extends time between normal periodic recalibrations.

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- Synchronous detection and dual video detectors operating in phase quadrature facilitate measurement of the incidental phase modulation of the vision carrier that appears as noise in the received sound.

You can use the 1450-1 anywhere — at the transmitter or off-air at a remote site — without attenuators or external amplifiers.

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JOE ROIZEN

In Australia . . .

Channel 7 challenges Sydney with an all-out news design

"If it walks, rolls, flies or swims, we can cover it."

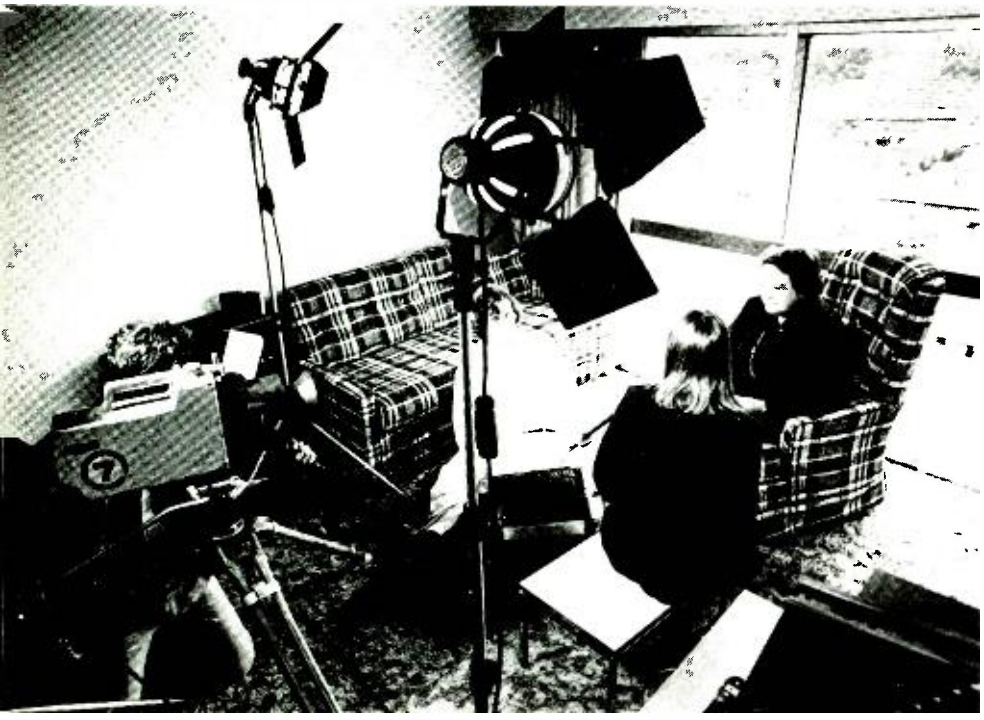
That's a paraphrase from Ted Thomas, the general manager of Sydney's frenetic and ultra-visible TV station Channel 7. He backs up that statement with an ENG-oriented facility that includes several mini mobile vans, a power cruiser on the harbor, a pontoon float plane, and a specially equipped helicopter that is virtually always ready for instant flight. An all-embracing microwave network with strategically placed relay stations that includes even the "copter" as a gigahertz repeater, gives the studio access to fast-breaking news stories from any point in this difficult terrain.

Joe Roizen, international video editor, is president of Telegen, Palo Alto, California.

Of course it takes talented people to optimize use of the available technology. Channel 7 doesn't lack for those, from the pioneering spirit of the engineering director Geoff Healy to the daredevil ex-paratrooper who shoulders his TK-76 while standing on the skid of the Bell Ranger (see cover), and everyone in between, Channel 7 is dedicated to keeping the Sydneysiders glued to the tube when a major event is on.

A modern station can't live by ENG alone, and Channel 7 has a well-rounded facility that is second to none. Housed in a sprawling complex are extensive program production studios, post-production editing suites, the largest film processing lab in Australia, a teletext nerve center, a TV commercial production company, the transmitter and tower, an array of parabolic dishes, the mobile unit garage, a helipad, and even a small earth satellite terminal.

Channel 7 is, in fact, the station with practically everything. And what they don't already have in-house, they are in the process of acquiring. Channel 7 is part of a conglomerate that is parented by a major newspaper in Sydney. There are actually several related companies that interlock functions and even provide outside services to the other stations in town. The sister companies include Channel 7, Custom Video, Mobbs Lane Production, Atlab, Seven Records,



An ENG crew does an interview show in downtown Sydney.

Cameraman Bernie Keenan stands on the skid of the helicopter while being attached to the frame by a small cable. *(Photos by Donna Foster-Roizen)*

Keenan, an ex-paratrooper, prepares for another airborne mission with his TK-76.

and a radio station.

Each company supports the other in some practical way. The morning musical interludes before Channel 7 begins its program day feature Seven Records jackets on video, while the audio comes from the disc inside. Custom Video does all the necessary internal post production, but also leases time to outside producers to keep the facility booked up. Atlab handles all the film generated at Seven, but its huge capacity is mostly dedicated to clients all over the Australasian area. Mobbs Lanes does commercials for Channel 7 sponsors, or any others they can serve.

Australia has been described as "America with an English accent." Australian commercial TV may also be conjured up as a combination of U.S. program style coupled with British technical standards. Channel 7's ENG operation reflects these characteristics very well as they send back good-quality pictures and sound from wherever the news is happening around Sydney. This isn't easy. Their hometown has perhaps the roughest topography for an ENG system to cope with.

Sydney may look like a beautiful city to the tourist admiring the jagged skyline, the blue-watered bay and the rocky promontories, but to TV signals it's a nightmare. The jagged maze of waterways, the hilly peninsulas, the crowded skyscrapers, all add up to a real challenge to get the signals back to home base at Epping, a suburb several miles from downtown where Channel 7's studio complex resides.

The basic system consists of three separate mini-vans each having the portable cameras, videotape recorders, microwave units, and other paraphernalia needed to cover the event, if it's accessible by road. Signals can be routed via a microwave relay station set

Continued on page 28

up on one of Sydney's tallest, the MLC Building.

If this proves impossible, the helicopter can be sent out to not only add aerial coverage of the scene from its own camera, but also act as a relay microwave unit for the ground station. A frame synchronizer is used at the studio as an infinite window to lock up the remote video feeds from the field.

Channel 7 cameras have frequently been mounted on a wide array of land, water, and air-based vehicles, but it's safe to say that the way they use their helicopter certainly attracts a lot of attention. The bright-red whirly bird with its prominent logo was specially adapted to its ENG function.

The electronic equipment was modified and installed so as not to unbalance the aircraft's center of gravity, while still leaving room for the pilot and passengers. With the iron nerve of a high-wire circus performer, cameraman Bernie Keenan stands on the skid, attached to the frame of the chopper with a small cable. He and his electronic camera are entirely outside, unencumbered by the plastic bubble or the limited view of the cockpit.

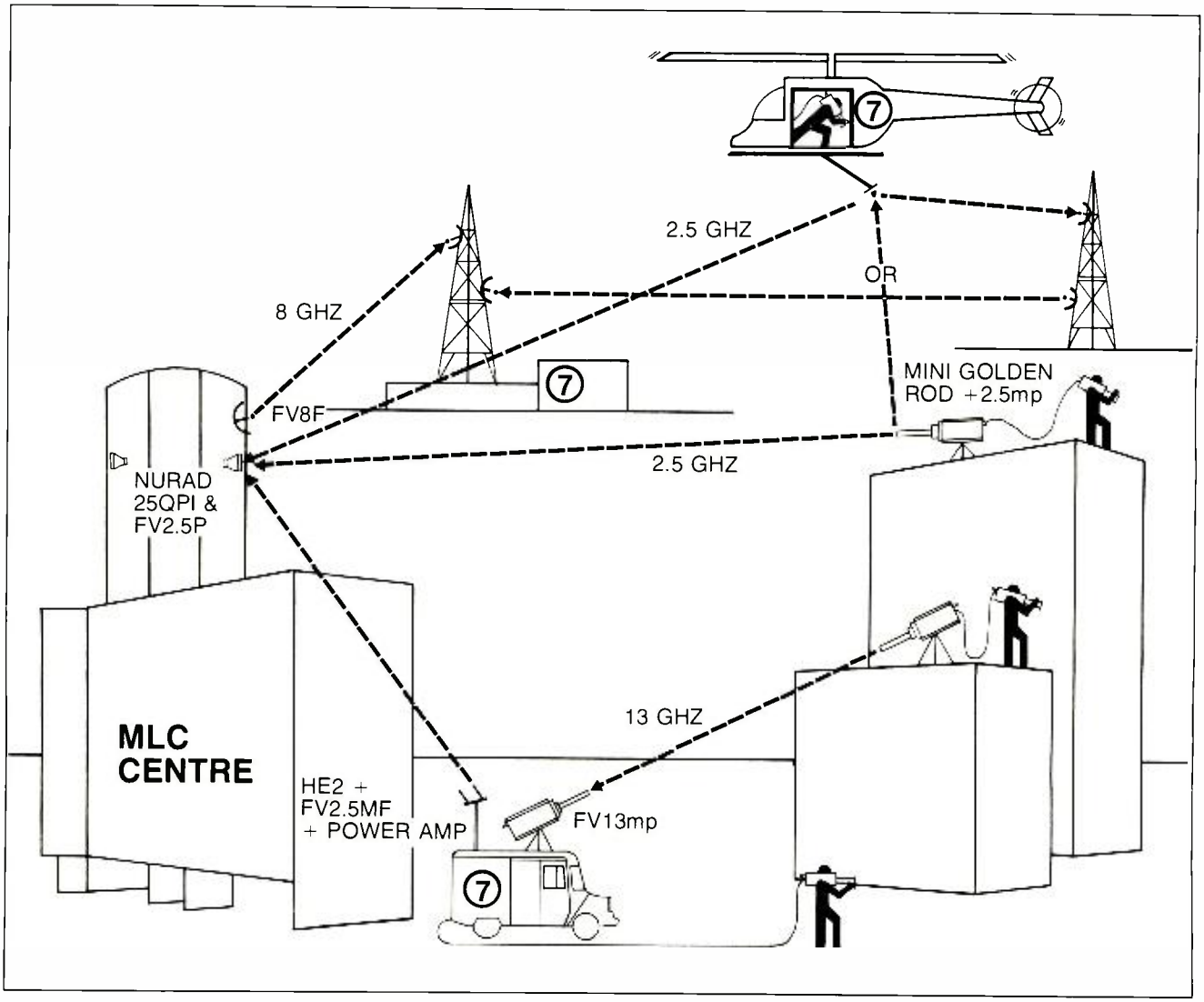
(It takes a special individual to do that, and Keenan is such a man. The story is that to fill his leisure time with less hazardous work, he teaches skydiving to neophytes in aerial acrobatics.)

According to Healy, the bottom line of the helicopter operation was to beat the competition to the site when a news alert arrived. To do this the electronic equipment had to be permanently installed so as not to waste time loading the gear. This led to problems of weight distribution, power, cooling and airworthiness, which were solved by their own engineering department in conjunction with the appropriate representatives of the airframe manufacturers and government agencies.

John Porter, the engineer in charge of this project, achieved all of the criteria by designing a package that fit on a bulkhead behind the passenger seat, and the space below the engine bulkhead and firewall. Extra power came from a second set of sealed batteries that didn't affect the charge on the helicopter's primary electrical power. The alternator on the chopper is large enough to charge both sets of batteries.

The transmit/receive equipment is Terracom, operating at 2.5 GHz. It can be used as a relay or a one-way transmit for the camera in the helicopter. There is

Continued on page 30



Channel 7's ENG network includes a variety of fixed and mobile relay points in Sydney from which fast-breaking news pictures can be sent back to the studio. The MLC Centre is the hub of this communications network with a Nurad quad covering the whole area. The helicopter also acts as a relay repeater station, and when necessary other microwave units are set up to cover normally inaccessible points.

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also a comprehensive VHF communication system so the camera operator can be on the director's talk back line if an EFP operation is taking place. Under these conditions a BVU recorder and a small color monitor are added to the equipment complement in the helicopter and a video operator rides in the co-pilot seat, monitoring video levels and color balance.

John Denver's popular Australian program was shot this way even in the remotest areas such as Ayers Rock in Central Australia. The microwave system that supports both the helicopter and the terrestrial ENG units consists of Nurad quads, Farinon receivers, and Terracom high-frequency gear, three suppliers not exactly unknown to ENG operations elsewhere.

Healy felt that they had achieved their goals of instant action. Within minutes of an alert, the Bell Ranger is airborne. Only the TK-76 portable camera needs to be plugged into a convenient outlet and the system is operational.

The ride we took demonstrated the forethought and versatility of this airborne camera platform. An open section in the bottom of the cockpit canopy permitted glareless photography. Independant pilot/passenger, pilot/ground, and passenger/ground voice communications made operations a lot easier, and the ample room in the rear seat accommodated extra people or equipment as needed.

Shepherded by Graham Storey, the news operations manager, Channel 7 news is a busy place. They regularly do three shows a day Monday through Friday, an 11 a.m. current affairs program, and a 6:30 p.m. and 10:30 p.m. news presentation.

Six news crews, three each on film and tape, gather the material in newscruisers, which carry a reporter, an audio and a camera operator. They are designed so simply that a non-technical camera operator can plug in the video and audio feeds, put up the antenna, and get a signal back to the station.

While the crews are evenly split, the actual ratio of tape to film usage on the air is 70:30%. Once they had a few weeks of 100% tape, but the editing bays got jammed up and they went back to film.

The 11 a.m. show is a one-hour program, which is usually relayed back via the MLC Building and recorded on a 1" tape in the studio. They are equipped to go live between the newscruiser and the studio, and they also have two small studios in Sydney, one of which is in the *Herald's* newspaper office. An anchorman in the main studio can be mixed with the two sources in town to assemble the program.

Any U-matic format tapes recorded on site come back to the studio for video processing. The first-generation playback goes through a Microtime 20/20 digital TBC with built-in enhancement and noise reduction. The corrected output is transferred to an Ampex Type C helical machine and edited in that format.

They very rarely put second generation U-matic images on the air because of limited picture quality. The quick response of the Channel 7 news department to local crime in progress was explained by Storey as he recounted the following event.

A bank robber took three women as hostages and shot a policeman. The call was received at noon and the first pictures arrived to interrupt the midday movie at 12:55 p.m. The competition was two hours behind because they had to set up link throughs. The bank site was in an awkward position and no line of site was possible. They set up a portable 2.5 GHz Farinon unit to get around the corner. The helicopter relay took over from there, and this news scoop was inserted live every 20 minutes.

Storey says that their news room is unique because it was designed from the ground up to satisfy a new operational concept. The central news area has peripheral rooms equipped to do voice-over on ENG tapes and film. A reporter coming back with a hot story can cut the script and head right into a cubicle to do his audio commentary.

A special news library has rapidly available archives on tape or film, there is an adjacent dubbing suite to mix background sound or effects and there is even a small interview studio that can operate on film or tape.

The editing bays associated with the news operation have four VPR2s and two BVU/BVE editing systems. There are also film editing facilities. To make them

Continued on page 32

This Channel 7 News Cruiser, equipped with TK-76 cameras, is one of several mobile vehicles operated by the station.

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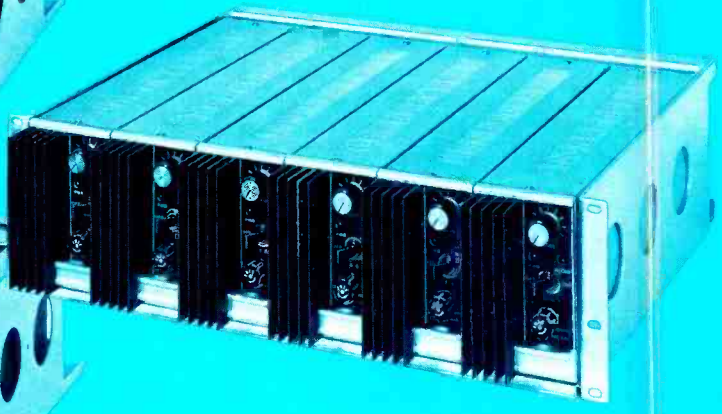

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fully self-contained, the news department has its own graphic arts group and a repair facility.

An interesting point brought out by Storey was that whether the original material was on film or tape, it went to air on 1" tape almost 100% of the time. He felt that convenience and uniform quality were the major reasons for doing this. Three of the VPRs were used for normal playback while the fourth could be operated in a slow or stop motion mode, which they found very useful.

Storey emphasized the community service aspect of their news vehicles. They have flotation equipment that can land on water, respond to large disasters like floods or smaller ones like shark scares (apparently they have a lot of the latter).

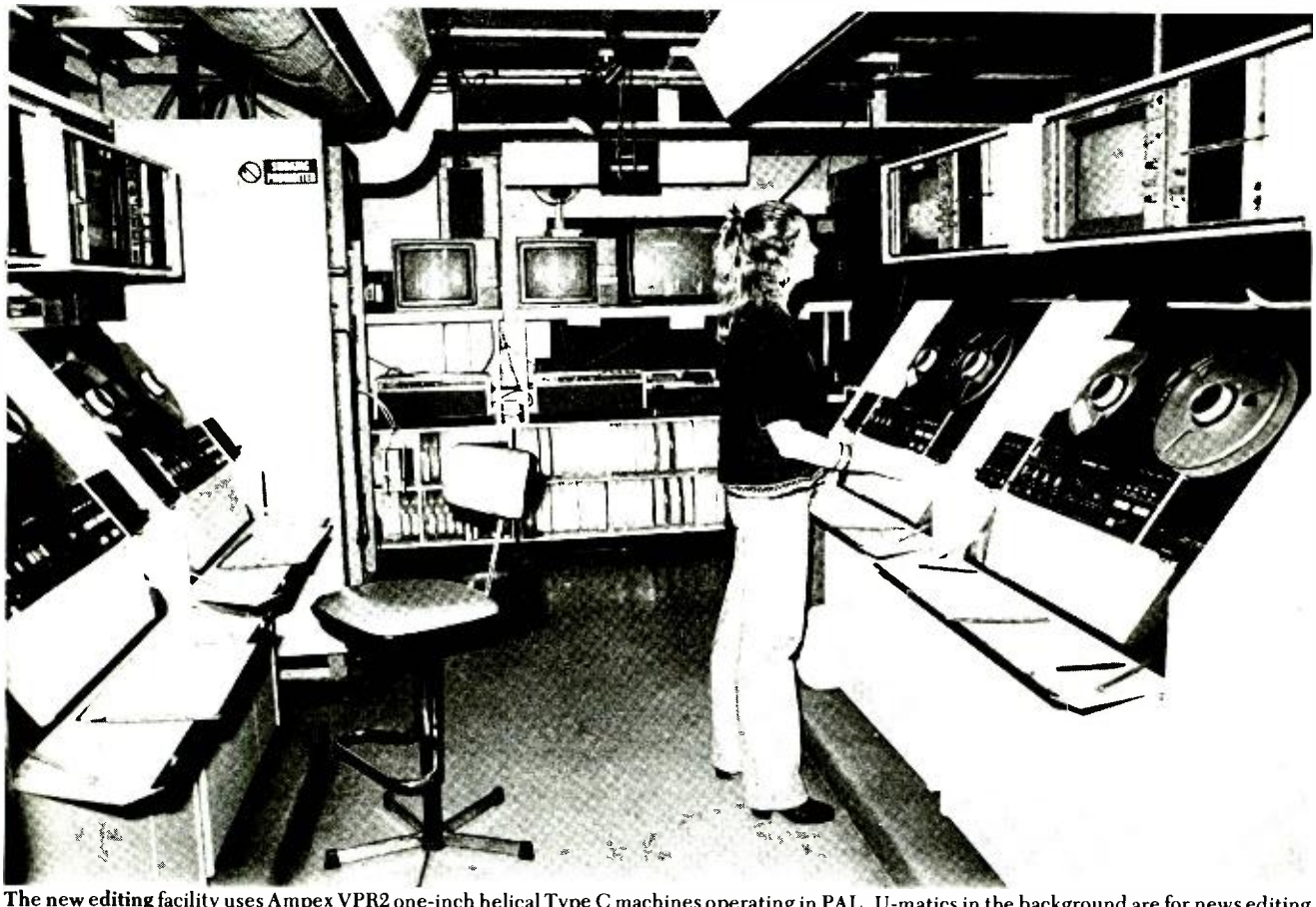
Stretcher kits are available and their pilots are trained to handle them. They cooperate with police or other civil authorities when their equipment can help.

A case in point happened nearly two years ago when Australia's most-wanted criminal was holed up with an arsenal of guns about 180 miles south of Sydney. The police couldn't get their own equipment in time and the Channel 7 helicopter, looking like a gunship instead of news chopper, was used to apprehend the villain.

They also make their equipment available to the fire chiefs who need to survey bush fires and direct operations. It's not unusual for a police or fire chief to go up with their cameraman to look over a dangerous situation. This same rescue or public service can just as well

Channel 7's leading men

Geoff Healy, (at left) engineering director, has helped make Channel 7 one of the finest facilities anywhere. The station's sprawling complex includes extensive program production studios, post-production editing suites, the largest film processing lab in Australia, a teletext nerve center, a TV commercial production company, the transmitter and tower, an array of parabolic dishes, a mobile unit garage, a helipad, and a small earth satellite terminal. Commenting on Channel 7's facilities, Ted Thomas, (right) general manager, said, "ATN 7 is a complex which is in the fourth year program of modernization, and we expect to be on schedule for the full implementation of our plant. In the meantime, even as we expand, we serve our community with the best and most exciting television we can provide."



The new editing facility uses Ampex VPR2 one-inch helical Type C machines operating in PAL. U-matics in the background are for news editing of material shot in that format.

involve a power cruiser or a float plane during a yachting or other aquatic event.

Like Canada and Great Britain, Australia has both national non-commercial TV (Australian Broadcasting Commission) and American-style advertisement-sponsored TV. ATN 7 is a member of the Federation of Australian Commercial Telecasters. It forms part of a network consisting of other Channel 7s in Melbourne and elsewhere. To provide the commercial production facilities that some of their sponsors might need, a separate company called "Mobbs Lane Productions" was set up.

Michael Hudson, the post-production supervisor at Mobbs Lane, explained their operation. They shoot on original 35mm film, but transfer this to quad tape at Custom Video using a Rank Mark III telecine. Time code is added and U-matic work copies with time code are also recorded.

The U-matic tapes are used to generate an edit decision list on a Convergence ECS 1 unit tied to the U-matic play back VTRs. The edit decision list goes into the computer and controls the quad master recording.

Even though they start with film, they can deliver to air on the following day, mostly because the film processing and the post-production are in-house.

Australians are sports fanatics. To cater to this national characteristic, ATN 7 fields an array of mobile vehicles that includes a Marconi-built, six-color monster (costing one million dollars), which is busy all year with sporting events. This van has a heavy duty-cycle, due to Channel 7's exclusive rights to the rugby league's top football team in Sydney.

There is also a two-camera Mercedes van. It has a Marconi Mark VIII portable camera and an AVR 2 quad machine that is being phased out in favor of a one-inch Type C VTR. This is used for EFP inserts for dramatic programs. Of course, the three news cruisers with their TK-76 cameras can also be used to extend coverage of a major event.

There are also support vehicles for the large vans. One is for extra cable to cover the long runs. Another is for lighting and screens to do chromakeys on site. An auxiliary power unit puts out 150 KVA from a diesel-driven alternator and is sound-proofed to avoid any noise pollution in Sydney suburbs, where noise abatement laws are strictly enforced.

Editor's Note: Channel 7's commitment to an ENG-oriented facility is only part of their unusual story. In an upcoming issue, we'll continue their story and describe their application and use of teletext. BC

BARBARA PARKHURST

Weather remotes forecast more viewers and ad dollars

Skies are bright and sunny for KCMO-TV's newscasts, which took a 10-point lead in the November Arbitron ratings. The 10 p.m. weeknight news attracted 39 percent of the audience, a six-point gain from the same time last year. (The other major stations registered 29 percent and 22 percent.) Phil Jones, general manager of the station, is quoted as crediting every-night, outside weathercasts as being an important element in this success story. On the horizon, too, are more ad dollars, as the 100-percent commitment to weather on-location pays off.

Today, KCMO-TV has made a 100% commitment to having weathermen do their programs live outside of the studio. This means not only here or there, now and again, but seven days a week, two shows a day. And such dedication includes light or dark, rain or shine, wind or cold.

Almost two-and-a-half years ago, KCMO-TV (Kansas City) experimented with what they now call "Live Eye Weathercasts." They put the weatherman live on-location, using ENG-type equipment. But it was by no means permanent. Not an everyday occurrence. These remotes were scheduled

Continued on page 36

Fred Broski broadcasts outside on-location in the parking lot of a local shopping center. Weather maps show relatively "balmy" atmosphere at this 6 p.m. shoot. *(Photo by Ron Merrell)*

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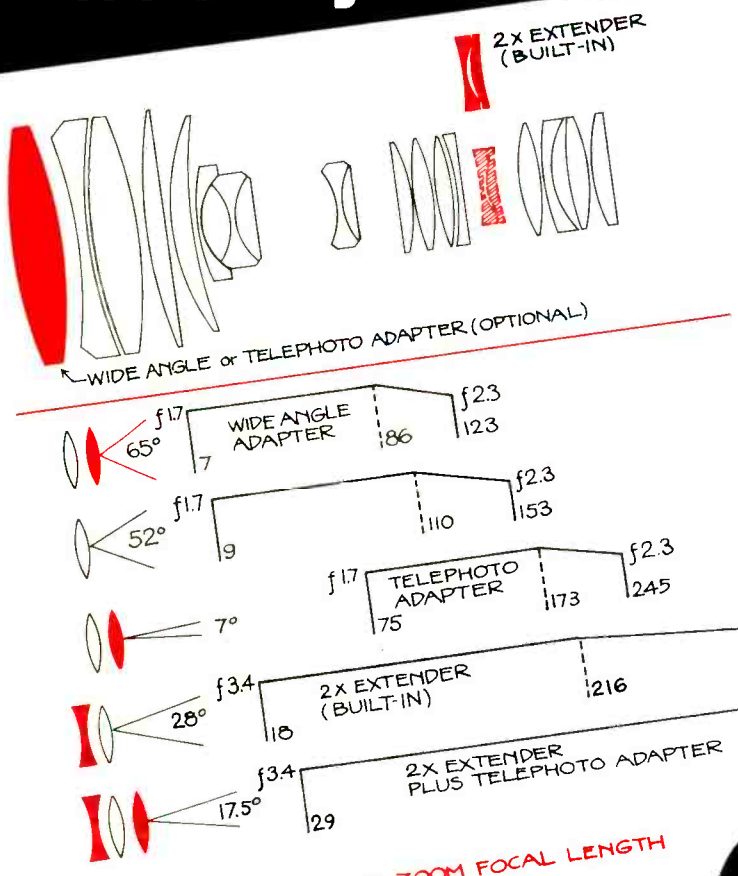

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into spring's daylight-saving time, when it would be warm, and light would be no problem. One or two weather remotes were aired per week.

Again, last summer, the station presented the weather against a live backdrop of a local swimming pool or tennis court action. As before, they did it only during daylight-saving time.

But tonight, tomorrow night . . . and probably next week . . . viewers in Kansas City can get their weather literally from "where it's at."

What led to KCMO's decision to make such a full-scale commitment to continue for some time into the future? Has it been successful in terms of manpower, audience response and equipment use? What about expense? What kinds of problems have there been?

Answers to these questions were readily available from Mike Casserly, KCMO's news director, and the weathermen themselves, John Yates and Fred Broski.

We followed the crews around while they set up and watched while the weathermen battled the elements and electrical-gear failures to present a professional program. An added element, we discovered, was not always the weather, but the fact that being live on-location adds another dimension that is different and challenging.

Taking first things first, we asked Casserly to fill us in. He explained that over a two-year period, the station got enough response to the outside weathercasts — from viewers and people in the business alike — that they thought the station should consider making it a full-time commitment.

The next question they pondered was, "Are we going to have the idea be to get the weatherman on location in the midst of 'something' . . . whether it's a swim meet, a parade, or a baseball game . . . or is getting them outside where the weather is the most important thing?"

Casserly emphasized that the primary concern was, and is, to get the weatherman into the elements. He doesn't necessarily have to make a three-ring circus out of it. If there's a location available and it works out, fine. That's kind of a bonus.

The object was to maintain the credibility of the weatherman. Have him give the highs, the lows, all the weather news he would normally give inside the studio, but get him outside, because that's where the weather's happening.

"Just as you wouldn't cover a news or sports story from your desk," he explained, "you shouldn't cover the weather news from inside the building.

"There really isn't any trick to it," he continued. "We're doing what we normally would be doing for a regular live situation for a live news story. We set up a microwave dish on location, using the same ENG-type equipment and procedure. The only difference is that we have to take the maps along, and there is a time-logistics problem in getting the weather information to the weatherman."

KCMO-TV has two mobile units available for ENG-type work. One is the "Live Eye" unit, or "Unit One," and the other is the production department's "Mini-Mote," which is equipped to do field commercial work. It also has a microwave transmitter.

Casserly continued, "So, we said, well, we have that production unit available, and we also have Unit One. If we're going to do this, we ought to make it not just on the six o'clock news Monday through Friday, or not just three times a week, but we ought to do it seven days a week. And we ought to let the Monday-through-Friday guy, John

"What's the latest?" John Yates checks with the station prior to showtime. Location was indoors to coincide with KCMO's turkey auction for the Mayor's Christmas Tree Fund. *(Photo by D. C. Parkhurst)*

Yates, and Fred Broski, the weekend man, both do it. They have different styles, and they'll adapt to it in different ways."

And they were true to their word. On a Tuesday night, we had a sampling as we stood by while John Yates prepared to broadcast from a local shopping mall. This was a two-in-one proposition, since the station was sponsoring a pre-Thanksgiving turkey auction to raise money for the Mayor's Christmas Tree Fund. The weather could be live on-location, and the station's promotion received an extra plug. A neat tie-in.

Ted Rice, the cameraman, pointed to the rainswept parking lot. "We normally would be outside," he explained. "But the event is happening inside, so that's why we set up here."

Yates leaned on the lunchroom counter, phone to ear, while he took down the latest weather information being relayed. The other two members of this three-man crew set up the camera, lights, maps and transmitter, and positioned the truck outside with the microwave equipment on it.

Rice stood by. All was ready.

Or was it?

"We've got a zero reading. Your picture is totally unusable. It's breaking up," came the voice on Ted's two-way.

His engineer, Jess Sherwood, was in the truck, adjusting the dish. "Nothing . . . something . . . 10% power . . . 30% power . . . zero power . . ." we heard the voice from the two-way report.

"We've never had to scrub one before," Rice said calmly.

Just as it seemed there would be a first time, an acceptable picture was established, and Yates gave a fast introduction to the turkey and the weather. Then followed a concise summary of the weather.

In contrast, the weekend man, Fred Broski, stood atop the parking garage of a hotel, overlooking the Christmas lights of another shopping center about five stories below. We stood with him while cold wind — it seemed colder every second — whipped his hair.

"This is it! This is what's exciting," he said. "I love it."

Then, just seconds before air time, the weather map blew over, and the light crashed to the ground. Undaunted, Barbara Bowen, who was handling the

Continued on page 38

camera, grabbed a battery belt and light. Engineer Streeter Funk stood by in the Mini-Mote. Broski asked someone to stand behind the map and hold it. Right on cue, his opening line was, "Just look at those gorgeous lights behind me."

Tense moments? Problems? Yes. But *no more* than can and do happen on any other type of live remote. Usually, all goes smoothly, Casserly said.

Aside from problems generated just by the fact that Murphy's law can run rampant during a live remote, we wondered if they'd had trouble getting adequate lighting. And, we asked Casserly, are there equipment problems when it rains or snows?

"So far, we haven't had any precipitation, rain, problems," he answered. "But it's something we are anticipating. We have protective gear for the camera on order so that, if we need to, we can put that over it. Although one alternative is to move the camera underneath a ledge or place it indoors if it's raining. Then, put the maps outside.

"When it starts snowing, the real problem we could run into is the temperature and the freezing of the electronic parts in the equipment. That's always been kind of a problem. Not so much with the camera, but with the batteries."

He went on to explain that now that daylight-saving time is over, every broadcast is done when it's dark outside, so there could be quite a bit of drain on the batteries. When possible, they try to plug into AC. If the battery belts are used at the six o'clock location, there isn't always enough time to recharge before the 10 o'clock shoot. Then, if they have to use the batteries again that night, the lighting is sometimes not the quality they would like.

What happens when their ENG-type equipment is needed to cover a news or sports event elsewhere in the city? Suppose there's a flood, fire, or the manager of the baseball team is fired? What happens to this 100% outside commitment then?

Casserly's answer: "We've also rigged up an around-the-station hookup so the weatherman can be outside the building, and we can use equipment right from the station. This is done via coaxial

Continued on page 40

Forecast for YOUR station

Clear skies . . . in terms of increased visibility for your station. Each time the ENG-type equipment goes out and the crew sets up, people notice.

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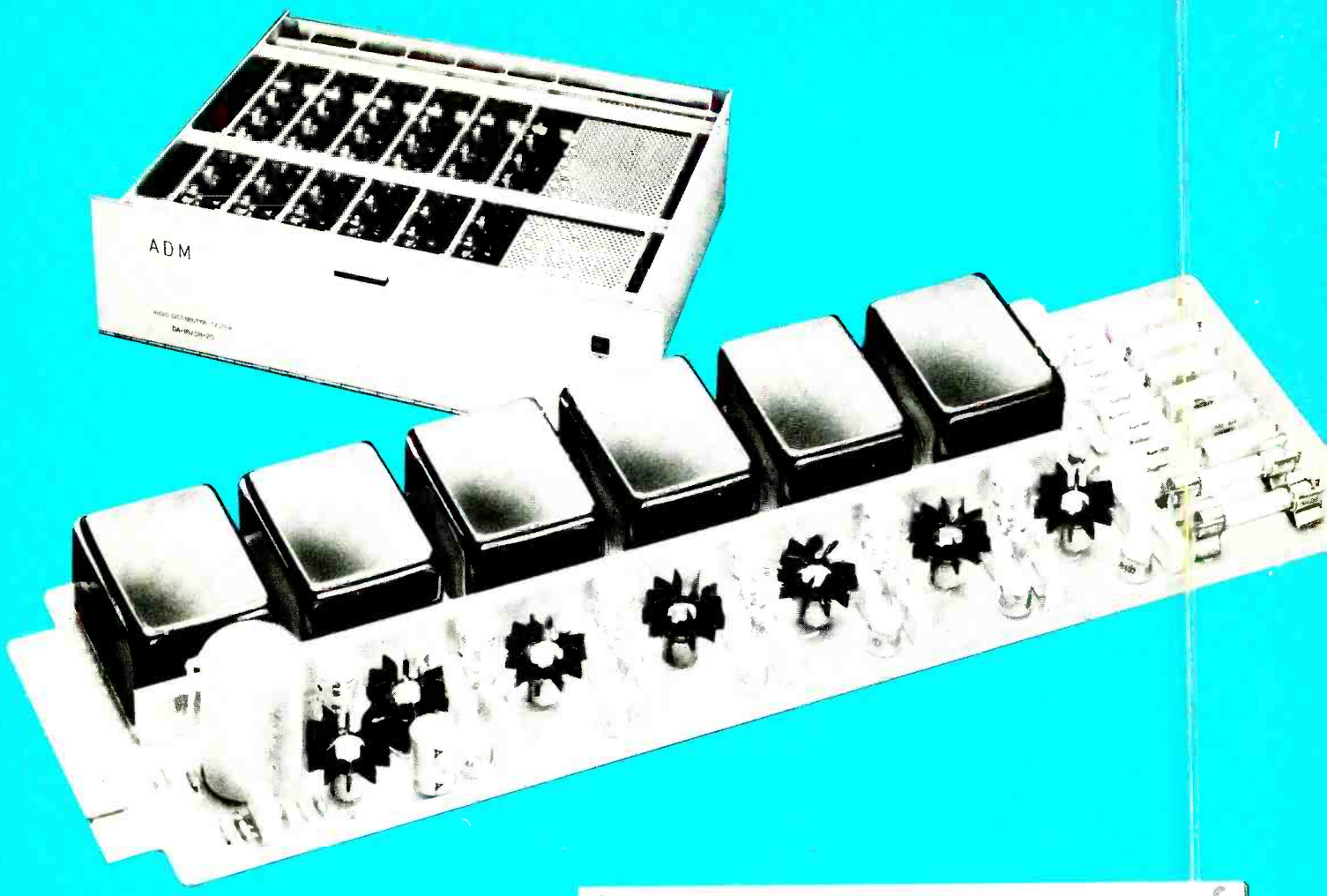
Extended forecast . . . more viewers. Think about it for a minute. If 50 extra people see each of KCMO's two remotes a night, that's 100 people a day, 700 a week, 36,400 a year.

Local forecast . . . even without a 100-percent commitment to weather remotes, you can bask in that kind of sunlight.

Local statistics . . . more viewers add up to more advertising dollars.

John Yates presents an indoor version of weather-on-remote. Interested viewers watch the crew, which includes Ted Rice on camera and Jess Sherwood "at the controls." *(Photo by Denise Nevinger)*



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Engineer Sherwood keeps the show on the beam. That night, line-of-sight contact was difficult because of buildings and other obstructions. But a professional job was done by all. *(Photo by D. C. Parkhurst)*

cable, freeing the microwave equipment."

Sometimes the weather itself doesn't cooperate. One night the 30-35 mile-per-hour winds blew the dish around so that the picture wobbled, and the signal danced off course. Broski, who was already on location, quickly drove back to the station and broadcast from outside the building. (By the way, this emphasizes the need for leaving ample time to check the signal before airtime.)

Flexibility in the system is important. By using the three possibilities — Unit One, the Mini-Mote, or the around-the-station hookup — KCMO is fulfilling its goal of 100% outside-of-the-studio weather reports. Casserly estimates that 50% of the time they are on remote location, and the remainder of the time they are just outside the building.

Is this expensive? Casserly doesn't think so. They are using existing ENG-type equipment and personnel. But they did have to build weather maps, since the studio maps stay inside. The outside maps are patterned after their studio models, except that they are covered with an extra plastic coating. If it rains or snows, the paint won't run.

How has the public reacted? The advertisers? Do they like it?

"There have been no (real) complaints," according to Casserly. "The feedback we have gotten is that people are curious to see where he's going to be. Is he really going to be out there freezing, with his hair blowing?"

Several people have called with questions about where the next remote will be. People seem to like the idea that the weatherman can be caught outside on a bad day, just like everybody else . . . or that he can enjoy a crisp, clear evening. "There's a little sympathy there," Casserly points out.

Negative response has been very small, and viewers have had no trouble understanding why it's a good idea to put the weather on remote.

Not so incidentally, putting the ENG-type equipment into weather remotes makes the station more visable all over the city on a regular basis. This, Casserly adds, was another reason why he and station manager Phil Jones made their decision to go remote.

"Phil had a similar experience in Buffalo," Casserly said. "His station was not doing the remotes, the competing station was. It was a large success in the market, and he wanted KCMO to do it in this market." Casserly and Jones got together and discussed it and quickly decided it would add a new dimension to the news.

"People sure come out when they see us setting up," Broski said. "They all want to see what we're doing."

Now, as for advertisers. Casserly has had no direct feedback from advertisers. But he has heard other sources in television, radio and advertising agencies say they "think it's an interesting idea. They, too, are curious to see where he's going to be and if he's going to get rained on like everybody else."

John De Roche, KCMO's general sales manager, thinks these remotes are an "important part of the news. Anything we can do different is very positive. And that's the way the advertisers have reacted, too."

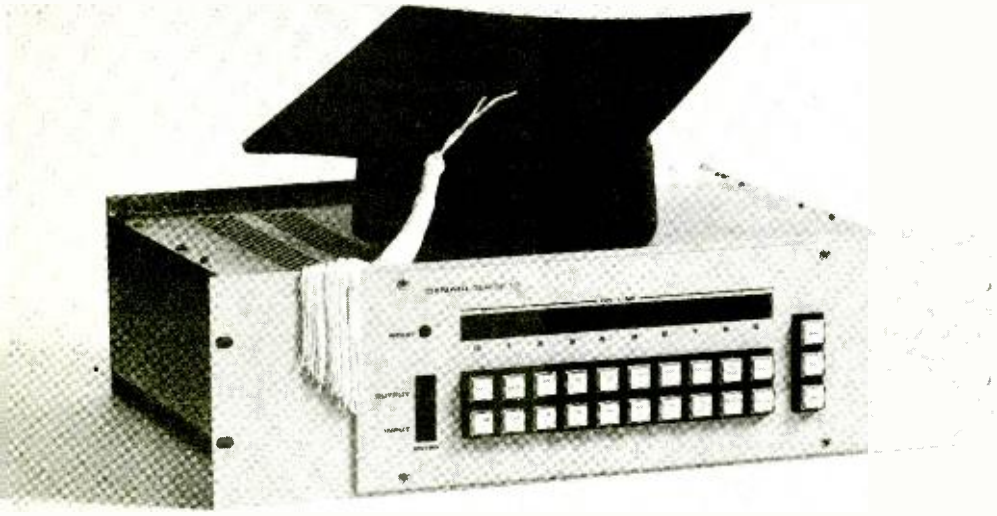
Casserly's most important consideration as news director is that it doesn't appear that location is such a gimmick that the viewer will lose track of the weatherman's credibility. Fred Broski, John Yates, or whoever, should still give the same amount of weather information.

"We have a creditable news presentation. We don't want viewers to feel that we are doing a real hokey thing outside where we wear whistles and bells and climb trees and all that other stuff.

"If it continues to go the way it's going now, that is, if we are able to do it with very little extra cost and audience response continues to be good, I would assume we would do it for a long time. Indefinitely, I'm sure." BC

Adjustments are made on the transmitter, which is hard-wired to the Minicam and focused on Unit One's mobile van some distance away in the parking lot. *(Photo by D. C. Parkhurst)*

The Story of The Smart Little Switch



- It's a quick-thinking, high-achiever in the solid-state video and audio switcher class.
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- If it loses power, it remembers its status — puts everything back in place when power is restored.
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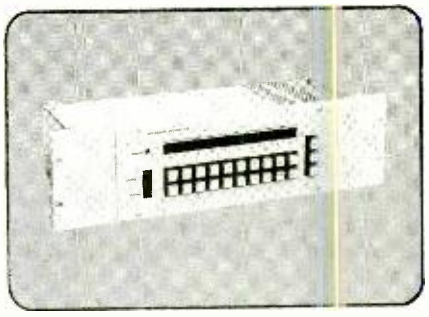
- It can tell up to three switchers what to do and provides tally as a standard feature.

The Series 10 solid state switching family puts a lot of large-switcher capability into small broadcast, educational, and industrial systems. It gets its smarts from a microcomputer based control system. Available only in a 10 x 10 matrix, which is both cost-effective and small in size, the smart little switch fills small-systems applications where big things need doing.

Separate solid state matrices for audio and vertical interval video switching are available — and all systems come with tally as a standard feature. Matrices can be mixed in all combinations up to a total of four, for multi-level audio, audio-follow-video, RGB, and data switching applications.

The real genius of the Series 10 however, is its high degree of flexibility in providing local and/or remote control in any combination to meet a variety of needs — and remembering everything — even when the power fails. Now that's a lot of big system smarts for a little switch.



Remote Switcher Controls When control of the switcher from another location — or two, or more — is a requirement, master control panels can be added in racks or on desks located up to 2000 (RG59) feet away. They can be programmed by internal switches to run the entire matrix, one bus, or display the status of all outputs.

But there's more to the story of the smart little switch and how it all comes packaged in self-contained units — including the master controller — enabling add-on of many of the system elements at a later date. Why not join the smart set and get the details on our ingenious little switch.

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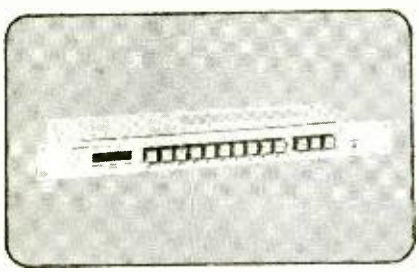

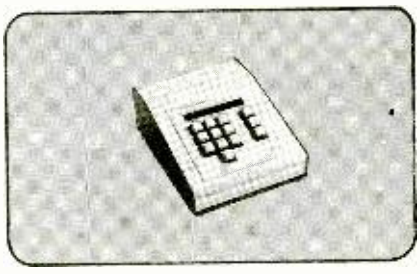

Remote Bus Controls Single bus remote control can be added at any time for one or all outputs. The same 2000' of RG59 cable used for remote master controls provides communication for the rack or desk units. They're smart too — with their own microcomputer for communication, keyboard and LED scanning. Set the bus location with internal switches and it will appear on the front panel's LED display!

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TV show puts the BIG STING on Denver underworld crime

"The Biggest Sting" was a unique program produced at KBTV, Denver, with unusual cooperation from the FBI and local law enforcement officials. It was not an after-the-fact assemblage reporting burglary busts through interviews, but a filmed documentary of the actual roundup and arrest of an entire burglary ring.

David Busch is a free-lance writer from Ravenna, Ohio.

KBTV's investigative reporter Ward Lucas and news photographer Tim Dietz worked closely with Lakewood, Colorado, police to film the program that outlined the entire undercover operation in vivid detail. For more than eight months Lucas and Ward crouched in the back of undercover police vans during stakeouts, filming through one-way windows. They followed police vehicles as recipients of stolen property raced through residential streets to avoid capture.

Lucas and Dietz also covered officers' meetings with underworld figures. In one instance, Dietz found himself oddly functioning as a pair of eyes for the police when his Nightscope telescope-equipped CP-16R camera provided the only clean view of two men breaking into a warehouse.

Though only Lucas, Dietz and KBTV news director Roger Ogden knew fully what was developing during the ultra-secret undercover operation, the entire news staff helped pull together bits and pieces of the story. Most had little idea of what they were filming or why it never appeared on the air.

By the time the "sting" came to a head, and the arrests of the implicated ring members were made, KBTV had a compelling 60-minute documentary already assembled and ready for air. Only two "holes," left for plugging-in footage of the arrests, had to be filled before airing.

Details were released to the public on a Monday afternoon. They were told that Lakewood police, working in cooperation with the FBI, had completed a year-long "sting" of phony fencing operations using undercover officers. The next evening, viewers tuned in

Continued on page 44

Ward Lucas, right, talks over a new assignment with KBTV news director Roger Ogden.

WTMJ wanted digital effects during the fact not after.

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Ray Hernday, Chief Engineer, WTMJ.

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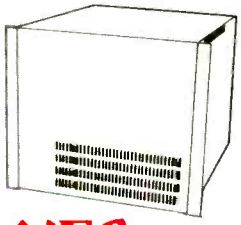

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Lucas in a rare stand-up. He prefers filming events as they happen rather than explaining what happened.

to the documentary special. "The Biggest Sting."

The program, shown at 8 p.m., was so gripping that KBTV reran it the following Saturday. A five-part mini series for the regularly scheduled evening news was also completed.

A host of local and regional recognition followed, culminating in an IRIS Award from the National Association of Television Program Executives for the best major-market documentary. It was also nominated for a national and regional Emmy.

What captured the public's imagination was that "The Biggest Sting" was a rare crime documentary that *showed* rather than told the story. "There was hardly a talking head," Lucas says.

How did it come about?

"I heard about the storefront fencing operation through contacts and approached the Lakewood police to see if they would take part in a documentary about the burglary problem," Lucas says. "They agreed that if we kept the information off the air until the operation was completed, we could go along on undercover operations." Lucas got Ogden's OK to proceed, and he and Dietz were freed from daily assignments to work on the burglary story.

"I shot film for nearly two months without knowing what was going on," Dietz recalls. "All I knew was that we were doing something secret, and none of my film ever got on the air. Finally, Ward told me what we were doing."

Lucas and Dietz were on call 24 hours a day. Whenever the Lakewood police let them know something was breaking, they jumped.

Several times they crouched in police vans filming as an undercover officer sold "stolen" television sets to a fence. KBTV's wireless microphones recorded sync sound of the transactions.

Once they filmed a stereo being sold by a fence, and then followed police vehicles through the streets as the man was chased and arrested. Because the transaction took place away from the storefront "fence" headquarters, police were able to arrest the suspect without blowing the cover of the bigger operation.

In this segment, Dietz and another photographer, Sam Allen, leaped out of their van nearly as quickly as the police, so footage of the car chase, shot through the windshield, was followed by tight, close-up shots of the bewildered suspect as he was handcuffed and taken away.

Lucas believes the most dramatic footage was coverage of an actual burglary.

"We were very lucky," he says. "Police officers who have seen the film say average cops can go for their entire career without seeing something like this."

As part of the attempt to stem the rash of burglaries, police were staking out warehouses and other buildings that had been victimized more than once in recent months. Dietz and Lucas went along on two of these stakeouts without result. On the third try, they hit paydirt.

"I had done some tests with a Nightscope telescope attached to a CP-16R camera and was set up in the back of the police van a few yards from the front door of the building," Dietz recounts. "Looking through the viewfinder, I suddenly saw two men approaching the door."

As he watched and filmed, the men tossed a brick through the glass. They fled, apparently waiting to see if police would be summoned by an alarm. When everything remained quiet for 15 minutes, they came back. Within a minute, they had entered the building and were passing typewriters and adding machines out through the broken window.

"I described what was going on to the officer in our van, and he relayed the information to other officers by radio," Dietz says. "At the right moment, the police moved in and arrested the burglars."

This was one of many segments of the story where Dietz had to bend conventional newsfilm techniques.

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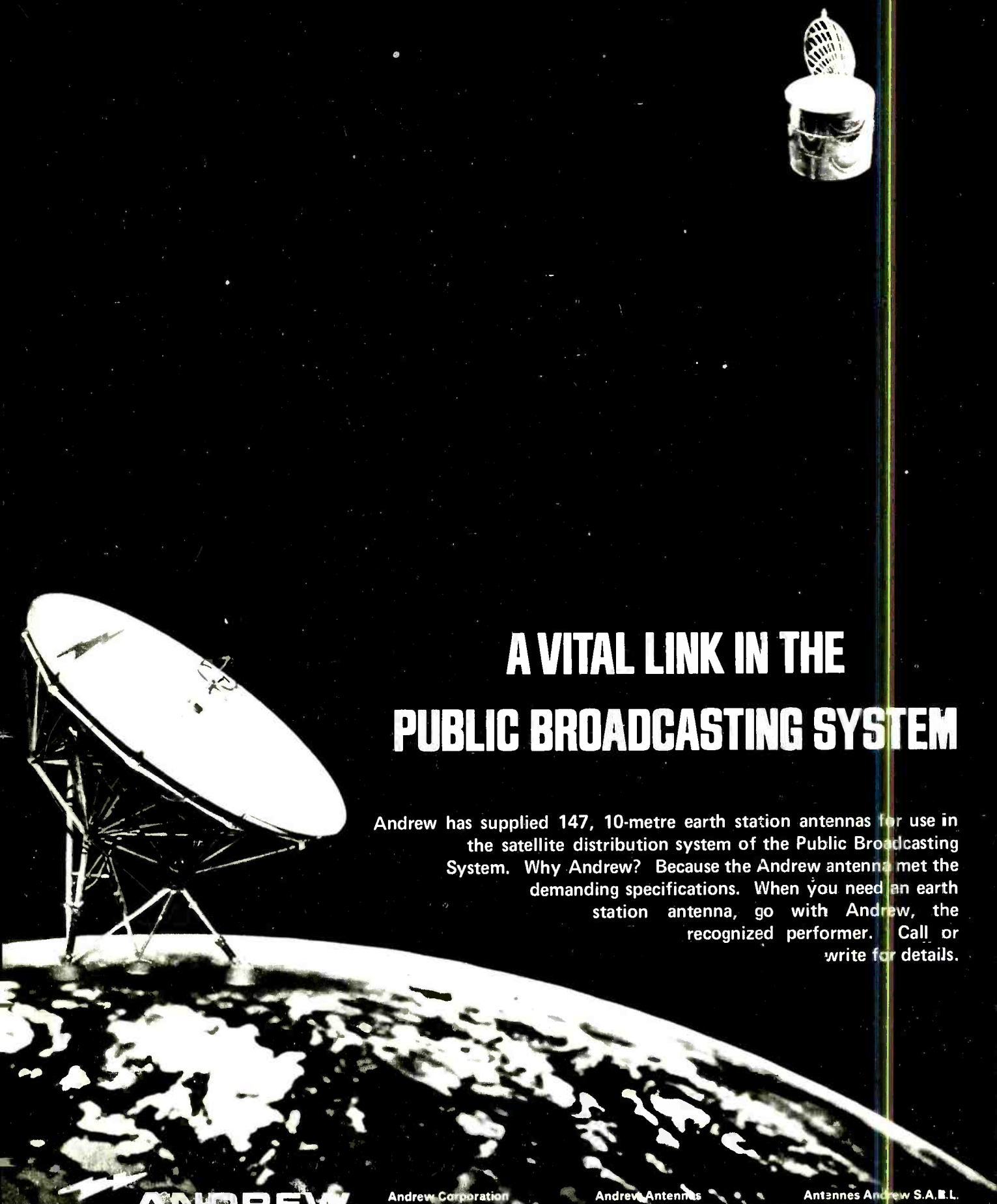
Film for "The Biggest Sting" was transferred to one-inch tape for post-production.



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"There were many times when we shot in near darkness with the Nightscope telescope," he says. In this instance, he exposed Eastman Ektachrome video news film 7240 (tungsten) four stops beyond its recommended exposure index. "The film has good latitude and recorded an acceptable, in fact, realistic image even under those conditions."

Under the best of circumstances, he had to be able to work and move fast, and often in tight quarters. Most of all, Dietz had to be unobtrusive. "The mobility of the film camera was a great advantage," he says.

The documentary also included sequences videotaped by the FBI working with a concealed camera at the storefront headquarters used for fencing stolen goods. They tape-recorded all kinds of transactions for stolen goods, ranging from TV sets to cars and trucks. There were also some chilling moments.

At one point, a suspect bragged that if they needed to have someone "taken care of," he could arrange it. He guaranteed results and then pulled a 45-caliber gun.

"I trust you now," the suspect said. "I just wanted to show you what I had brought, just in case. Next time I come here, I'll leave it in the car."

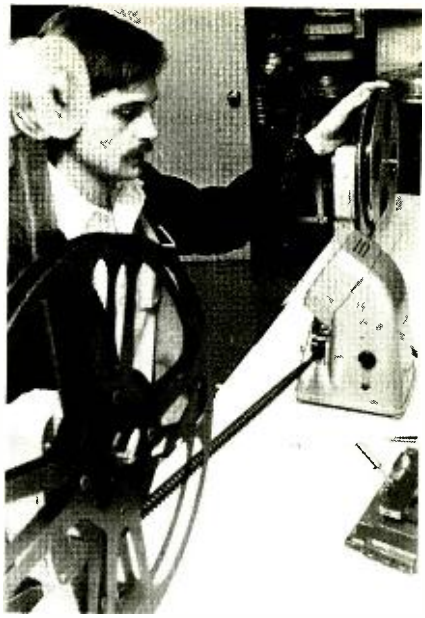
Shortly thereafter, Denver was embarrassed by a blatant theft. A family moving to the area had a rental truck with all their belongings stolen from a motel parking lot. Among the items stolen: a breathing machine used by the family's young asthmatic daughter.

One of the storefront's regular "customers" showed up a few days later, bragging before the hidden camera that he had been in on the well-publicized theft.

Up until a month before the big roundup, Lucas had a drawer full of exposed and processed film, but no clear idea of when and how the documentary was going to take form. "We realized things were coming to a head, and began post-production," he says.

All of the film and ¾-inch videotape was transferred to one-inch tape for editing. During that period leading up to the arrests, the entire program was readied for airing with the two holes left for sequences documenting the arrests.

That almost became a real problem. At the last moment, the FBI decided against allowing news photographers at the arrest scenes. By then, however, Lucas had many other contacts. One of them tipped him off about the times and places where arrests would be made.



Tim Dietz edits film for a follow-up report to "The Biggest Sting."

Ogden had five news crews working from late Saturday evening through the next morning covering the arrests. Lucas and Dietz, accompanied by a second news photographer, honed in on the arrest of the suspect who had bragged about being a "hit man."

"We covered that from every angle," Lucas says.

The final editing was done just prior to air time.

By then, the public knew something special was coming. On-air promos for a "special documentary" had been shown for several weeks. The station also placed ads in *TV Guide* and local newspapers. However, the subject matter wasn't revealed until the program was aired.

"The station depended a lot on Ward's reputation," Ogden says. "The tag line went: 'Ward Lucas has never disappointed Denver viewers with his investigative reporting.'"

Lucas returns the compliment. "Only an aggressive news operation would be willing to let two staffers work almost full time on a story for eight months, and pull other reporters and photographers in to help as needed," he says.

He applauds local police as well. Lakewood police and others saw "The Biggest Sting" as a way of showing the public how difficult the burglary problem is and how it is being handled.

"Maybe this will encourage police in other cities to cooperate more with their own local news media," Dietz notes.

Lucas and Dietz are hard at work now on a follow-up to the "sting" story. Typically, Lucas declined to rough out the exact content of the piece, but said, "We hope the next piece will wake up a few people in the city of Denver."

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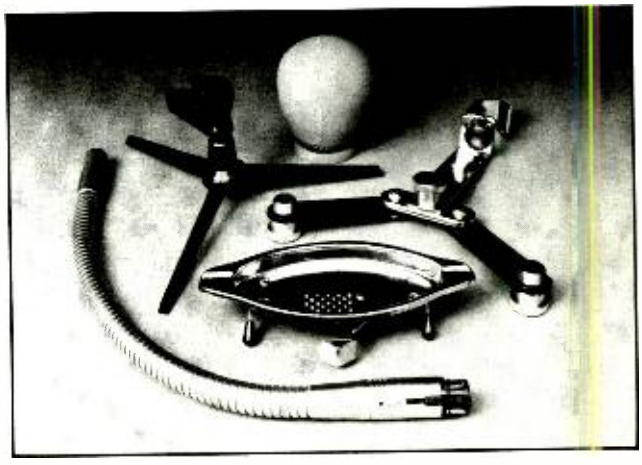

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JUDITH GAGEN

IMAGE-EFFECTIVE ENG:

State-of-the-art puts WTHR on the road to versatility

WTHR, Channel 13, the NBC affiliate in Indianapolis, has moved forward in recent years to increase the technical capacity of the station, employing an extensive array of new production techniques revolving around ENG equipment. The ENG equipment has been employed to greatly expand the station's news coverage, both on the ground and in the air, as well as being used to facilitate other production projects.

The total WTHR mobile fleet consists of one helicopter, three vans, two Blazers, and seven news cars. The station has eight ENG cameras; seven are used basically for news, one for production.

The newest vehicle is a Bell Jet Ranger 500 helicopter, designated as "SkyWitness 13," the first news helicopter in Indianapolis to be wholly owned and operated by a television station. SkyWitness 13 has a regularly assigned reporter covering news stories throughout the state, both by tape and live transmission.

For transmission, the helicopter has two Tayburn omni-directional antennas extending below the craft from the skids. One is for receiving, and one is for transmission, radiating with an omni-directional pattern. Each of those antennas also is equipped with a two-directional horn antenna.

These antennas provide a figure-eight configuration and have higher gain signal for greater distance transmission and reception. The reason for two different types of antenna systems is to provide repeater configurations. Thus, the helicopter can be used as a relay station to repeat the signal from distant ground sites back to the base station.

Inside the helicopter are a Sony BVU-100 recorder, a Tayburn TBR-202-AB/2 2-GHz video receiver with two RF channels and two aural subcarrier channels, and a Tayburn TBT-202-AB/2 2-GHz airborne video transmitter with two RF channels and two aural subcarriers.

With this equipment, the helicopter can transmit to one of two receiving stations. On top of the Indiana National Bank building in downtown Indianapolis, the tallest building in the state, are four-quad horns feeding into 20 dB pre-amps. At the broadcast transmitter site on the city's north side is a Nurad Superquad four-foot parabolic with a radome, side mounted at the 900-foot level of the transmitter tower. This unit has a 30 dB pre-amp, top-mounted, feeding a 1⅝-inch heliax transmission line. A signal being received at that side is relayed via STL to the studio location in Indianapolis.

All field units, including the helicopter, then have a choice of either receiving site for transmission from the field. In addition, the helicopter will be fully equipped with a portable video transmitter with a parabolic antenna for ground-to-air transmission from distant locations.

Using all this equipment allows the news department to dazzle viewers with the sight of an anchorman in the studio talking live with a field reporter many miles away, either on the ground or in the air.

There are three basic, outside broadcast vehicles. Unit 14 is a news vehicle, a Chevrolet Suburban four-wheel drive that is used to plow through snowdrifts and icy roads in the harsh Indiana winters. It has a Wilburt telescopic mast, a Pelco pan-and-tilt head, and a dual "Golden Rod" antenna built by the ENG Corporation of Concord, California. It is equipped with a Microwave Associates MA-2CP frequency agile transmitter with a PA200 power amplifier. For portable use, it has a MA-13CP portable transmitter and receiver. Inside is a Sony BVU-100 tape player/recorder and two monitors, a Videotek color monitor for off-air and line, and a black-and-white Panasonic. The entire system is designed for quick and simple setup in the field.

Unit 14, a four-wheel-drive news vehicle that can make it to the scene in any weather, is equipped with a Wilburt telescopic mast, a Pelco pan-and-tilt head, and a dual Golden Rod antenna built by ENG Corporation of Concord, California.

Judith Gagen handles press information for WTHR-TV, Indianapolis, Indiana.

NewsCenter 13 photographer Pat Costello (left) and reporter Cameron Harper deplane from SkyWitness 13, WTHR's new Bell Jet Ranger news helicopter, on their way to cover a story.

ENG camera use varies with each news vehicle, but the news department has two RCA TK-76s, two Ikegami HL-77s, and four Thomson MC-601s from which to choose. The power system for Unit 14 consists of a 1000-watt inverter operating from the main vehicle alternator and a 3500-watt gasoline generator for fully portable operation.

The second news van is designated "Unit 4" and is a Chevrolet van equipped with a four-foot parabolic antenna and Microwave Associates' 2-GHz transmitter. This system compensates for its lack of antenna height by less side-lobe transmission and multi-path reflection. Inside Unit 4 is a Sony 2850 recorder/player and three monitors, one color and two black-and-white.

The power system is a 1000-watt inverter and a MA-13CP portable transmitter and receiver. Unit 4 operates basically the same as Unit 14, covering news stories throughout the city and state, with the single disadvantage of not being a four-wheel drive vehicle.

The third outside broadcast vehicle is called "Special Segment 13," and is used primarily for production purposes. It contains a switcher capable of mixing and effects so that multiple cameras may be programmed. A Panasonic AK-750 camera is used with this van. Because of its production capabilities, it can be used with a camera control unit.

Inside the van are two Sony VO-2850s capable of previewing and editing in the field. The audio facilities consist of TEAC reel-to-reel audio recorder/player and dual Shure microphone mixers. Portable power is supplied by an 1800-watt inverter. The monitors are set up with one color line monitor, one color preview line monitor, and three black-and-white source monitors.

All the mobile units have wireless microphones, as well as wire systems. To communicate with the mobile units, two-way radio uses a central repeater located at the transmitter site that amplifies all signals received from the field to the base.

In terms of outside production, the ENG equipment is used to tape two editorials each week. The locations are determined by the context of the editorials. In addition, various children's specials have also been done on location from such places as the grounds of the Indianapolis Museum of Art, a farm on the city's north side, and at an 1836 Indiana village that has been reconstructed in its entirety.

WTHR also participates annually in the Cerebral Palsy Telethon. The various ENG mobile units are used for both live and taped inserts. Some Telethon events come from locations such as shopping malls, where collections and special fund-raising auctions are taking place.

The ENG equipment is also used extensively in the station's coverage of the annual Indianapolis 500 auto race, one of the most important events of the year. Coverage is extensive, involving daily and special reports on qualification weekends, race coverage, and post-race coverage.

Last year marked the inauguration of a new use of ENG at the track. A golf cart was equipped with a portable microwave system, audio mixer, and camera. It had complete freedom to rove anywhere around the Indianapolis Motor Speedway, relaying signals back to the central tower location. This new "micro-van" proved to be extraordinarily useful in getting quickly in and out of places like the pits and the garage areas.

This year, the ENG equipment was used to tape a special holiday station spot that featured WTHR staffers, local celebrities, and business, civic and government leaders from all over the state and city. Done in the center of Indianapolis, the location was the site of the world's largest Christmas tree. (The "tree" is actually the spiraling Soldiers and Sailors Monument strung with lights, surrounded by spectacular holiday decorations and an ice rink!)

Features for public-affairs programming, sales presentations, and station specials can also be shot with the ENG equipment. This past September, WTHR celebrated its new affiliation with the NBC Network by staging a massive Doc Severinsen concert at Clowes Hall in Indianapolis, complete with NBC stars and executives.

While the concert itself was a "Big Event," it was also being taped to be shown as a two-hour prime-time special on the following Saturday. A large remote van controlled three studio cameras inside the hall and three ENG cameras outside. This video was layed down from a central switching site on 2-inch tape.

The three ENG cameras outside the hall were controlled through the "Special Segment" van, with video being laid down on an Ampex VPR-1 machine. These cameras recorded video from a parade of limousines carrying stars and dignitaries. Special material from a pre-cocktail party, a post-concert dinner party, and overhead shots of the whole affair shot from a helicopter was laid down on Sony BVU-50 portable machines. The 1-inch and ¾-inch materials were dubbed to 2-inch and edited together with the master tape from the remote truck.

All of this improved and increased tape and live coverage via ENG is complemented by the addition of a Vital SqueeZoom to the main production switcher, A VIX 114-4A. The SqueeZoom is a two-channel device which varies the size of a picture to compress or enlarge in the horizontal or vertical dimensions, positioning that picture anywhere in the reconstructed frame and allowing for effects such as push-offs, covers, flip-overs and hall of mirrors. The SqueeZoom will accept two non-sync signals from remote sources such as any one of the news vehicles.

Inside the main studio are four editing benches, each with two Sony BVU 200 tape machines and one BVE-500 editor. Other tape machines are used for screening and planning. Each of the editing benches has switch selection from any source in the field.

Combined with the helicopter, the news vans, the production van, and the new special effects capability in the switcher, the on-air look at Channel 13 has a new and extraordinarily versatile appearance. BC

RICHARD BIERCK

Expanded ENG/film reporting pays off in the ratings

It is not uncommon for motorists in Tulsa, Oklahoma, traffic to see vehicle bumpers bearing a message from the local ABC affiliate, KTUL-TV: "8's THE PLACE."

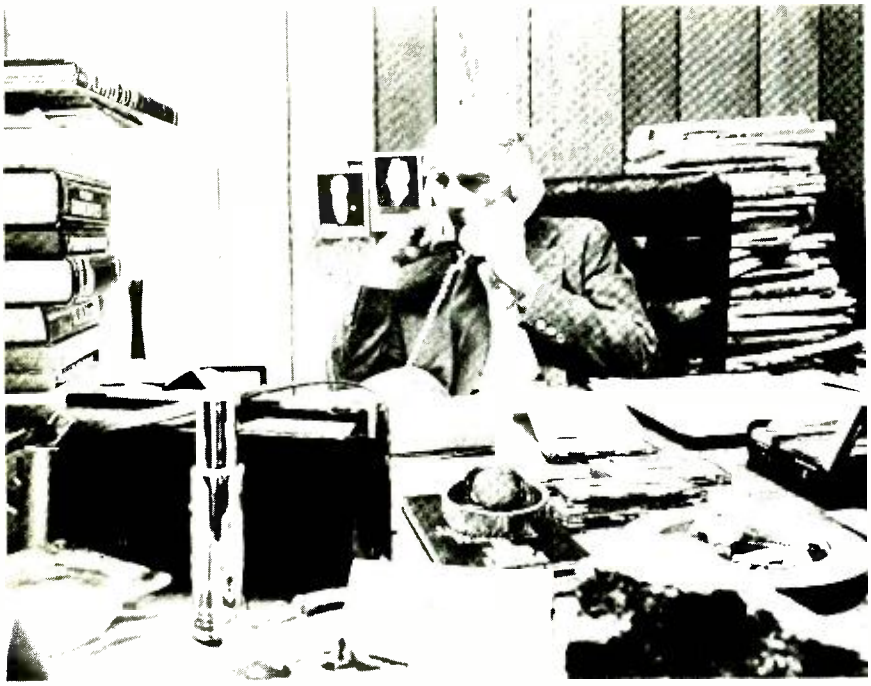
Neither is Channel 8's message a rare sight in places as far away from Tulsa as Muskogee (60 miles) and Fayetteville, Arkansas (120 miles).

However, the station's high profile stems from much more than bumper stickers. KTUL has a distinct record of community involvement, accented by community-interest series, a special projects team that has won awards for documentaries, and direct involvement of news personnel with the various community groups.

During the last several years, KTUL-TV news broadcast ratings have shot far ahead of those of competitor stations. In this same period, the 5:30 news was expanded from 30 to 60 minutes. The expanded evening news carries an

Richard Bierck is a freelance writer from Durham, North Carolina.

Pilot/photographer Sam Millington stows camera in preparation for take-off. After the station management found Millington, a former cropduster, at a local aeronautics school, chief photographer Carols Hernandez taught him to shoot film.



Bob Gregory, director of KTUL's Special Projects team, at work. The award-winning team travels the world to do contract work and documentaries for airing.

average of 23 visual news stories and features.

The news staff, which includes 17 full-time news photographers and 12 reporters, has captured numerous awards in recent years. These include the Associated Press awards for Best Documentary in 1976 and 1977; Best Photography in 1976; Best General Reporting in 1975, 1977 and 1978; and Best Newscast in 1976 and 1977.

In 1975, when KTUL was running second in ratings, the station doubled its early-evening-news air time and changed from one anchorman to a male/female anchor format. Around this time, the station began sending news crews to outlying areas.

Nielsen ratings for March 1976 showed KTUL substantially ahead of another local affiliate, which was also making the change to one-hour evening news. This gap has since broadened. Recent Nielsen ratings showed Channel 8 had 110,000 homes during its 10 p.m. news broadcast.

Assessing the reason, general manager Tom Goodgame says, "It was a combination of many things we were already doing, I believe, but we kept adding new pieces to the total picture, and we have always tried to improve on the things we were already doing."

News director Stan Hopkins agrees. "It would be hard to pinpoint any one thing; it was a combination of factors."

During the pivotal ratings period of '76-'77, the station established bureaus in Muskogee and Fayetteville, Arkansas. The Fayetteville bureau was set up, in part, to cover news — and especially sports — from the University of Arkansas. Also, the station began to keep an eye out for coverage potential at an even greater radius in parts of Missouri and Kansas, where KTUL-TV broadcasts are picked up and relayed by area cable television operators.

To enhance coverage of these and other areas, the station leased — and later bought — an airplane, promoted as the "Skyroamer," in 1977. The plane, which picks up bureau film daily and eases coverage in other surrounding areas, is piloted by a former cropduster the station plucked from a local aeronautics school. Chief photographer Carlos Hernandez then taught the pilot to shoot film, just as he does with the beginning photographers the station recruits.

Just as the station has figuratively brought the outlying areas closer to it with the plane, it also has endeavored to lessen the distance with a strong commitment to community involvement.

"When we finish a news broadcast," Hopkins says, "people are always calling in, wanting to thank us for a story — or criticize it, or give us a related news tip. But whether or not they have a tip, we always try to listen; the reporters come to the phone and talk with them. It means a lot to the viewing public to talk with their news station; and when they do have a tip, we are the station that gets the phone call."

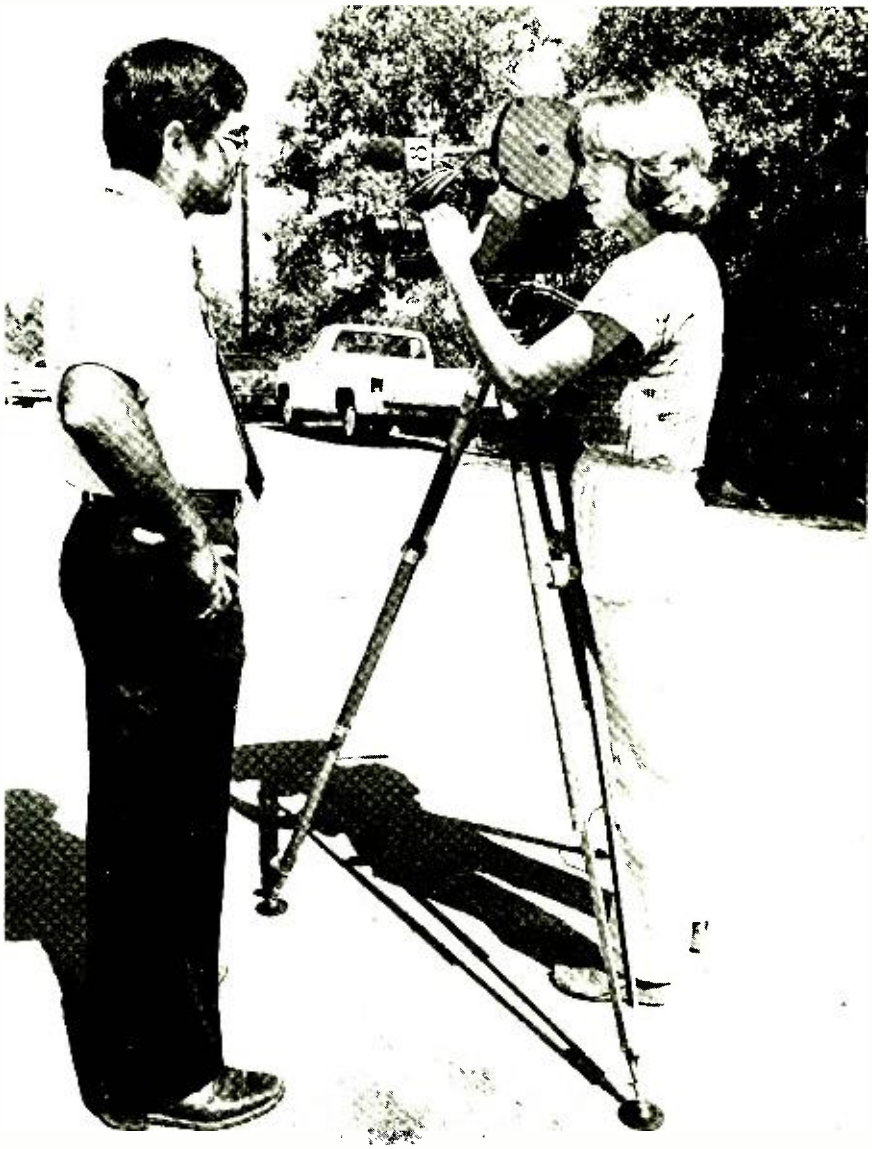
KTUL viewers get regular opportunities to do more than talk on the phone with news personnel. They get to

Continued on page 52

watch some of them run around in their shorts — basketball shorts, that is. The KTUL basketball team, which includes Hernandez and Hopkins, travels to gymnasiums all over their viewing area to play local community teams to raise money for area charities. "When we get to some of the outlying areas, the gyms are always packed," Hopkins says. "It means a lot to them that we cared enough to come and play in their communities.

"The station's news philosophy embodies a straightforward approach unfettered by dramatic conclusions," Hopkins says. "James C. Leake, Sr., the station's owner, believes that it is the average person — John Q. Public, if you will — who matters. We try to keep him informed on the things he needs — and wants — to know." Leake, incidentally, also owns KATV in Little Rock, Arkansas.

This approach is echoed by Goodgame. "When you're promoting your news as the best around, you had better be there when something is happening," he says. "We want to make sure we don't miss a big story. But we also have to make sure that we take a look at virtually every story to learn its potential. When there is a manhole cover upended in our area and three people are looking down the manhole, one of them ought to be from Channel 8."



Carlos Hernandez, KTUL-TV News chief photographer, helps photographer Trish Freeny line up a shot. Hernandez says many of the photographers who get their start at KTUL conceive and execute their own feature ideas within a year after beginning work.

While the station's photographers alternately use ENG and film to their best advantage, about 85 percent of the footage aired is film.

The news department has two RCA TK-76 ENG cameras and nine film cameras. The ENG equipment is used at meetings, hearings, longer press conferences, and some sporting events, as well as to cover late-breaking news. The film cameras are used everywhere else, especially in action situations.

"The mobility of our film cameras is an important factor in our ability to get fast-moving stories," says Hernandez. "Moreover, whenever possible, the station's news photographers use tripods with their film cameras."

The station installed a new Jamieson film processor in January 1979. The machine is designed for Process VNF-1 used with Eastman Ektachrome video news film.

The station's predominant use of film gives it flexibility on the scene of spot stories, says Hernandez. Two years ago, when a Tulsa area athletic stadium collapsed, Channel 8 was there with both ENG gear and film cameras.

"The photographer with ENG was unable to move in to get shots of emergency workers tending to victims — it was just too crowded," recalls Hernandez. "But with the film cameras, we managed to get some good shots in tight, crowded scenes. Luckily, none of the victims died." For that story, KTUL won the AP's Best Spot News Award for 1977.

The station runs regular photo features, often at the close of the evening broadcast. Virtually all are done on film because Hernandez believes it has a more dramatic look, and there are fewer lighting hurdles.

"This quality of film is also helpful on pieces that are more than just photo features. We did a social issue type of series once on the urban Indians of Tulsa and the problems they have," he says. "One of the places we were shooting was kind of poignant. The kids were running around the rundown apartment with flies all around their faces; the screen door had holes in it. There was just no way to set up lights beforehand. Because of the situation, we had to just walk in and start shooting, using a floodlight bounced off the ceiling."

A weekly feature on the 5:30 news is "Crimestoppers," in which police narrate reports of crimes while actors stage them before Channel 8 cameras. The goal: Trigger the minds of viewers — who may have been witnesses — into remembering seemingly insignificant observations that may be clues to crimes. So far, the closing of several cases has been attributed to the series. "In many ways, doing this is a photographer's dream," Hernandez says. "We set up the scene, the lighting, everything we can. In that sense, it's like doing a movie."

News director Stan Hopkins goes over a list of stories for the station's daily one-hour news/information show.

The nature of the story frequently dictates which camera is used. "We are training everyone to use all of our equipment so we can eventually achieve total interchangeability and flexibility between film and ENG for handling all news coverage situations that arise," he says.

Characteristic of KTUL's commitment to informative feature programming is the station's special projects team, which does documentaries for airing and on a contract basis for clients. The division's work has included a documentary on the oil industry in Oklahoma, for which the station won the Chicago International Film Festival award. One of the division's more recent projects is a 90-minute special on Will Rogers which Will Rogers, Jr., called "The final piece on my father." The projects take the four-person team around the world.

"We've got 13 or 14 projects pending right now, and about 20 more in the hopper," says special projects director Bob Gregory, a former reporter for KTUL who worked for CBS News in Washington before returning to Tulsa. BC

DENNIS MARTIN

Air talent scores high on KGUD sports remotes

Four days notice wasn't much time to prepare for our first football game remote, but then that's radio. . . .

KGUD (which has not yet celebrated its first-year anniversary) was contacted by the athletic director of Banning High just a little more than a week before an out-of-town game was scheduled. It was difficult for management to refuse because the team had won every game to date, and the school just happens to be in our city of license.

Being somewhat new at remotes, we unfortunately do not own an RPU or even a portable mike mixer. With only about a week before the game, we had to act quickly.

A standard telephone dial-up circuit was ordered for the field's press box (dial-up was chosen to minimize costs and expedite installation). We requested that it be installed no later than noon — eight hours before the game — but it was still terrifying to be at the mercy of Telco. When we arrived in the early afternoon, we found the line installed and working, and perhaps more remarkable, noise free!

Dennis Martin is chief engineer of KGUD-AM, Banning, California.

Since time simply didn't permit us to purchase or otherwise procure equipment, we had to use some basic gear on hand, such as a *passive* two-mike mixer, Gates Unimote mike amplifier, CBS AM Volumax (with clipping diodes removed), and, of course, a phone patch. A block diagram of the system appears in Figure 1. For convenience, all ID's were done live at the game, and spots were inserted at the studio.

There was nothing technically superior or innovative about our approach, but it did work well and reliably. Without question, the one single factor that made the remote *sound* professional was our talent. Ernie Russell, a 10-year veteran of radio sports announcing did the play-by-play. Richard Lemire handled the color. He's been actively involved with sports announcing for over six years.

Although they had never worked together (they didn't even meet until just before the game), each was a master at his job. Transitions from one to the other went smoothly, in a very precise and descriptive announcing style. Both were unfamiliar with the teams, so school spotters and the field announcer assisted whenever possible.

After the successful completion of our first game — perhaps slightly overcome with confidence and enthusiasm — management decided to cover the next football game. Engineering was relieved, though, when we learned that it

Richard Lemire, foreground, handles the color commentary during football games.

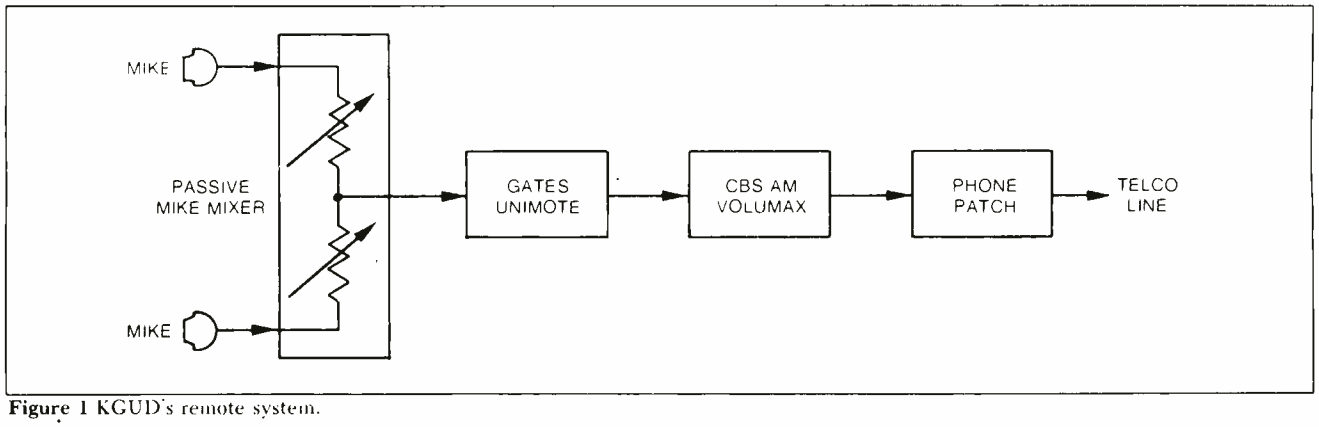


Figure 1 KGUD's remote system.

was to be played at home, only three miles from our studios.

The school's principal, however, expressed his concern over the possible impact on attendance, and thus revenue. We suggested that we might try a special promotion of the game during the week. "Bring your radio to the game . . . enjoy the in-person excitement *and* listen to play-by-play and commentary."

Since the season was coming to a close, he permitted us to cover it as an experiment. And as nearly as anyone can determine, attendance didn't decrease. In fact it might have increased!

At the financial end of the spectrum, our sales people were warmly accepted by local advertisers, and game time was perhaps sold with less "salesmanship" than regular air time. Sponsors seemed pleased to be able to indirectly support the high school while underwriting our costs.

Although our game sales are just about covering our expenses, there are some very important benefits in the form of station promotion and increased listener loyalty. We always display a station banner at each game, and local press and word-of-month promotion have proved invaluable.

At the same time, we're building loyalty within the community — not only support for the team itself, but also for our station, which is supporting the community. This involvement, we feel, just can't hurt.

As every engineer might dream, we hope to acquire a full complement of remote gear, if we continue. But in the interim, it is a challenge to work with our on-hand equipment. The listener, who might *think* the sound isn't quite as good as it could be in terms of fidelity, still receives excellent game coverage, which is definitely more important than sound quality. It may be simple technically, but there is no reason why it can't *sound* professional.

And that's how we play the game.

BC

Play-by-play announcer Ernie Russell, left, interviews the coach of the visiting team.

RICHARD SWEETLAND

KRIO runs remote studio through a tight budget

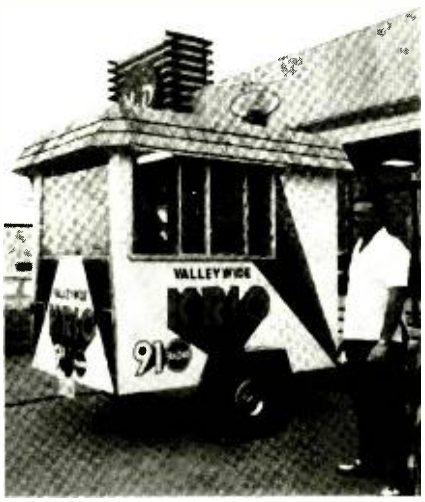
When we first started to investigate the possibility of having a remote studio at KRIO, we discovered there were two different types. The first consisted of two turntables and a mixer board patched back to the studio by phone lines. It looked more like a child's lemonade stand than a professional broadcasting operation. The second type was usually a remodeled panel truck with a self-contained studio costing 10 to 20 thousand dollars.

The first type wouldn't present the image or the flexibility we wanted. The second type was not economically feasible for our station. What we needed was an alternative that would meet the following requirements:

- Present a professional appearance in keeping with the station's image.
- Have the ability to do a complete remote broadcast while maintaining high technical quality.
- Be economical to build and operate.
- Place the disc jockeys in an enclosed area that is still visible to people who come to see the remote broadcast.
- Have the adaptability to use either a remote pickup transmitter or phone lines to send the signal back to the main studio.
- Have a PA system that could amplify either the radio station's program or whatever was being played in the remote studio.

In order to keep the size and cost of the studio within reasonable limits, we decided to build a small trailer that could be easily moved around by our station wagon. Once the unit was transported to the remote broadcast's site, the station wagon could be removed. The car would then be available for other uses and would not block traffic at the remote site.

> "In order to keep the size and cost of the studio within reasonable limits, we decided to build a small trailer that could be easily moved. . ."



The KRIO remote studio is actually a small trailer that can be pulled by a station wagon. The studio is large enough for the D.J. and one guest who can be interviewed during the broadcast.

The resulting unit is large enough for a D.J. and one guest who can be interviewed during the broadcast. The studio has three large windows to provide maximum visability for the D.J. and those watching him. Two side windows can be opened so that the D.J. can talk to the people outside and hand out promotional prizes.

The two major pieces of equipment we had to buy for the remote studio were the Marti M-30BT/TPS remote pickup transmitter and the combination Shure M67 and M675 mixer board. Both units have performed flawlessly with only a minimum of maintenance. We also have two used Collins cart machines, two Russco turntables (chosen for their rugged construction), a Kenwood receiver, and an old PA amplifier.

Our first major problem was with the air conditioning unit, a necessity in south Texas. To keep the cost down we installed a used unit that had been in the station manager's house. But the power requirements of the unit were so great that it would sometimes cause the circuit breaker in the sponsor's store to trip. We would loose all the power to the remote studio and interrupt the broadcast. This problem was solved by replacing the old air conditioning unit with a new, small, high-efficiency one.

Another problem occurred because

Richard Sweetland, formerly chief engineer at KRIO, McAllen, Texas, is now with KMIX, Modesto, California.

Inside the remote studio are two Russco turntables, two Collins cart machines, a receiver, Marti pickup transmitter, Shure mixer board, and PA amplifier.

our long power cable caused a voltage drop, and the different remote locations sometimes had a slightly different voltage. So it was necessary to install a variable step-up transformer to provide the proper voltage to the equipment.

We also found that certain "extra" items are extremely useful. Among them are a pocket radio to be used as a portable monitor; an extra microphone; one hundred feet of microphone cable so that we can take a microphone out of the studio and into the audience; an extra length of coax cable so that we can mount the antenna on top of a building if necessary; an assortment of patch cords to patch the output of our remote studio into the PA system in the sponsor's store; a spare phone stylus; and a compass and map for setting up directional antennas.

Our remote studio has done an excellent job of meeting our original objectives. Proof of this is that our rental fees for the remote studio paid for its construction in the first two months of its operation.

Editor's Note: There are definite advantages to being highly visible in your community. In fact, your remote vehicle can be more effective than billboard advertising. But the key to selecting the type of vehicle you use is your assessment of what will aid your image, not detract from it.

The KRIO vehicle works well in the McAllen, Texas, market because the unit enhances their image and boosts their visibility. And it also promotes the D.J. to the public at the site and to the participating merchant. For stations without a bottomless budget, it's a very cost-effective operation. BC

LARRY TITUS

WTIC engineering packages remotes you can depend on

WTIC radio has been doing remotes for over 50 years. The early remotes required three to five engineers on-site at all times, and several back at the station. A typical remote included two 16-inch transcription turntables, several mixers, microphones, and miles of wire. Usually half the equipment in the engineering shop was brought along to insure quick repair if something broke, which always happened.

Through the years, the equipment and approach to a remote have changed. Transcription turntables have given way to cart machines. Bulky mixers have become small transistorized mixers. And miles of wire have been replaced by walkie-talkies.

At WTIC (Hartford, Connecticut) we do about 20 remotes a year. Some last for an hour; others can last for two to three weeks. Their widely varied locations prohibit use of one mobile vehicle or set-up. It is not unusual to find us at a local ballgame one weekend, a championship golf tournament the next week, and in a farmyard the following weekend.

The present WTIC remote package revolves around a central core. It has five phone lines and various peripheral equipment that can be added for a specific remote. One phone line is the broadcast line, a 5 to 8 kHz line, which carries the audio from the remote site to the studio.

The second line is a 5 kHz line that carries undelayed, uncompressed audio to the remote site from the studios. This line is used for the announcer's headset and for driving the PA system.

The third line is an audio cue line from the site to the studio, usually an inexpensive 3 kHz line. Announcers' cues to the studio, as well as a beep tone cue, are put on this line. The fourth line is also an inexpensive line used to carry audio cues from the studio to the site, and tells the announcer what is up next. The last line is a straight, measured, business-line telephone.

If for some reason the broadcast line fails, the announcer can still go on the air over the audio cue line. The phone then serves as a backup cue line. Occasionally we will substitute a radio remote pickup unit for the broadcast line, and walkie-talkies for the cue lines.

The central core consists of four Shure M67 mike mixers. Two mixers are tied together for the mikes and additional inputs. The other two are used for monitoring and cueing. On a remote, the personality has several options for a monitor. He can listen off air via a local AM receiver, he can listen to the audio on the monitor line from the studio, or he can listen to the local mix. All options are available through one of the Shure mixers.

The peripheral equipment we add when needed includes additional mikes, reel-to-reel tape machines, cart playback tape machines, cassette machines, remote lines, and a base station for walkie-talkie pickups. Any mixture of peripheral equipment can be added or removed before or during a remote without any down time.

The audio cue line from the remote is derived from the same mike that the announcer uses for his broadcast mike. If a producer is also at the remote, he has a headset that contains a mike that also

Producer Charles Brown and sports announcer Arnold Dean at operating position of WTIC's Greater Hartford Open coverage trailer. After initial setup, no engineers are required on site.

Larry Titus is chief engineer at WTIC, Hartford, Connecticut.

Sports announcer Arnold Dean works on upcoming events at the GHO. WTIC's remote package fits on a table made for the occasion. Room is available for guests at the table in the foreground.

feeds the cue line. Cues from the studio appear at two places at the remote site. If the announcer desires, it can come through to his headset, or it can come from a speaker located near the announcer.

The addition of the two-way radio base station at a remote gives flexibility to the personality who is on location. It allows him to call for actualities from other personalities around the remote site. For instance, during the Eastern States Exposition, we can locally air reporters covering a milking contest and riding the roller coaster rides. Or we can get direct local traffic information from our airplane without having to turn back to the studios for the pickup.

During the Greater Hartford Open Golf Tournament, we had two base stations set up with three walkie-talkies covering the course. When we were airing the airplane on one base, cues were given to the field reporters over the other base station.

The walkie-talkies have been modified so that the reporter wears a headset with a boom mike attached. The mike feeds the walkie-talkie. The headset is split so that one ear hears the audio from the walkie-talkie, and the other ear hears an AM radio hidden in a box that he wears. The antenna for the walkie-talkie is attached to the headset so that it is high above obstructions. The push-to-talk switch is remoted to a small button on the end of a coil cord.

When the reporter is moving, he can drop the push-to-talk switch, and it will hang from the box. The reporter's hands are then free. When he has to go on, he grabs the push-to-talk switch — and he's all set. This arrangement goes beyond use at remotes. The news department is beginning to take these units with them when covering a news story.

Up until a couple of years ago, if the remote lasted several days, we would order the phone lines only for the duration of the daily broadcast from the remote site. This required an engineer to be at the site every day to check and see if the phone lines were up yet. Usually he would have to arrive at the site several hours early. Occasionally, the lines would be put through only minutes before the broadcast. We now order the lines for 24 hours a day for the duration of the entire broadcast. With a "keep alive" tone on the lines, the engineer can check the line status from the studios. Since less engineering time is spent on the remote, the cost of keeping the lines open all the time is offset.

Because of the changes we have made in our remote broadcasts, engineering time has been cut down to setting up the remote, handling the rare equipment failures, and tearing down the remote. Our equipment redundancy and interchangeability has added to the overall reliability and quality of the remotes we do at WTIC. Regardless of a station's vantage point on the evolution of our non-static-state-of-the-art, and despite the depth of the budget, it is possible to improve operations and profits through technology. BC

Ross Miller, vice president of programming, and traffic reporter Kathy Klark with new walkie-talkie setup (dubbed the "GHO boxes") prepare to cover some of the events at the Eastern States Exposition.

Side view of the WTIC remote package at the Eastern States Exposition. Producer Jeff Winn and announcer Ted Dalaku operate the gear. The remote base station is located beneath the table. Only the remote mike is necessary. The antenna for the base station is located on the roof of the building.

DENNIS MARTIN
and BRUCE PLASSE

FM'S LIMITING ELEMENT

An inside look at peak limiters PART 1

Thirty years ago FM radio was a relatively unheard of commodity. Ten years ago it was making heavy dents on the broadcasting horizon. Today it's here in full force. It's not about to go away, and the ratings prove it.

Although this may appear as a tremendous success story, the popularity has taken its toll. Competition has grown fiercely, not only between AM and FM stations, but especially between FM stations themselves. Certainly, as one result, signal processing is of major concern at most broadcast facilities, and quite often is highly classified information not to be shared with the competition.

One station in a neighboring market recently installed a new limiter and billboarded it in a media blitz as glowing space-age technology. The limiter is common and had already been installed at several other stations in the same market. Altogether, many radio stations today evidently feel that success is due to audio processing as much as — if not more than — programming, and strive to find ways to increase modulation even by as little as 3%.

To meet the demand, manufacturers are offering a multitude of audio processing devices, each boasting unique and different features, with a variety of price tags and subsequently complex mechanisms. It's almost a full-time job just to research and keep abreast of this fast-paced part of the industry.

In this eight-part series we will take an in-depth look at FM stereo peak limiters with emphasis on state-of-the-art hardware commonly used to increase apparent loudness and prevent overmodulation. Many units offer compressor and even compressor/expander characteristics in addition to their peak-limiting abilities, qualifying a single device to replace several in the processing chain.

It is hoped that the information presented in this series will enable the quality-conscious broadcaster to select and operate his equipment to the best advantage, since a limiter is capable of doing great harm to the station's sound if used improperly.

During the early years of FM radio, limiters were few, simple, single band, and usually quite slow — at least by today's standards. They could have been considered the weakest link in the audio chain. But back then FM was largely background, and often not financially self-supporting. The FM loudness race did not exist.

Prior to the widespread use of magnetic tape, programming material was comparatively less demanding, containing little high frequency energy as well as exhibiting poor transient response.

Inferior as it all may appear, the equipment, programming, and performance were generally accepted as adequate.

Today FM limiters are plentiful — with more than a dozen available — each boasting unique specifications and terminology that can simultaneously dazzle and confuse even the most astute audio expert.

Units are generally complex, ranging from a single to eight frequency control bands. Design is completely solid-state, and response is usually quite fast. The current problem is not locating a limiter, but understanding its advantages and disadvantages, and making the ultimate decision, which not only could affect the sound quality of the station, but the all-important ratings as well.

Before we delve into how the current generation of limiters works and some of the problems that can arise in operation, let's divide them into two primary groups for discussion: single-band and multiband.

The single-band unit concept, as we have seen, is just about as old as broadcasting itself, and units of this type are still manufactured today. They are the simplest, processing all frequencies throughout the spectrum in one single, active limiter frequency band.

Multiband devices, however, are a somewhat newer achievement and, because of their increased complexity, require a more involved study.

A multiband limiter is a unit that offers two or more independent frequency *and* limiter bands in parallel. Although this concept is older than many people realize, the technique was not exploited until recent years. The advent of integrated circuits and practical active filters, together with the need for improved level control, has made multiband financially feasible and state-of-the-art attractive.

One such limiter became available as early as the 1960s. Stations still use this popular model today and don't even realize that it works on a multiband principle. That the limiter was multiband was often difficult to determine by visual inspection, since only one meter was generally provided.

Readily available today are limiters with two, three, and eight individual frequency bands, or a broadband limiter

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combined with one or more frequency selective limiters. (We're still wondering what ever happened to four, five, six, and seven band units!) Most feature a multitude of very impressive controls and often separate meters for each band.

The need for a multiband limiter increased as more and more broadcasters began to demand more and more from their limiters to achieve the ultimate in loudness. This was also done to help overcome the loss in signal-to-noise ratio — about 10 to 20 dB (depending on signal strength and receiver bandwidth) — when receiving a station in stereo, compared to mono reception of the same signal.

Single-band units, which were satisfactory for many years, now prominently displayed a significant problem. When operated at high compression levels, the sudden appearance of a high-amplitude, low-frequency signal would cause the mid- and especially the high-frequencies to abruptly and very noticeably disappear. In severe cases, continuous pumping is the audible end result, given the right programming and operating conditions. Thus, today's multiband generation of limiters evolved.

Next month's installment of this series will dig into the operation of single-band and multiband limiters. Then we'll get into pre-emphasis and Dolby FM, clipping limiters, and a host of other dimensions of FM's only limiting element.

BC

GLOSSARY

From the authors: To assist the reader in understanding our meanings in the context of this series of articles, and to provide a basis for discussion, we are including our definitions for selected signal processing and associated terms. These are based on published definitions (the few that exist), as well as a survey of manufacturers and equipment. The definitions have been purposely geared toward broadcasting, and may therefore differ somewhat from other audio fields. We suggest you take a moment to review them, and possibly keep them handy during your study of the articles.

AMPLITUDE RANGE: In program material, the difference between the softest and loudest sounds, usually measured in dB.

ATTACK TIME: The amount of time it takes for a limiter, or other such device, to react to a new peak by reducing it in amplitude. Broadcast devices often respond in micro- or milliseconds.

AUTOMATIC GAIN CONTROL (AGC): A device that "rides gain" in an attempt to reduce amplitude range, and provide a more constant output

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FM's limiting element

level. Often the same as, or similar to, a compressor.

BACKGROUND NOISE: That noise which occurs in the transmission/reception process, due to atmospheric and electrical phenomena.

CLIPPER: Or peak clipper. A device that *removes* the peaks from a signal, thus increasing distortion. The circuit can be as simple as a diode, and its attack time is generally considered instantaneous.

CLIPPING: Also known as peak clipping, it is the process whereby peaks of a signal are removed, not attenuated, at the expense of increasing distortion. It is used because of its instantaneous action.

COMPRESSION: The process of decreasing the amplitude range of program material, yielding a higher average level, with the amount of reduction often measured in dB.

COMPRESSION RATIO: In a compressor or limiter, a measure of the change in input level, divided by the change in output level, stated as a ratio. Often referred to as compression slope, especially when plotted in graph form.

COMPRESSION SLOPE: Same as compression ratio.

COMPRESSOR: A device that is used to reduce the amplitude range of program material by attenuating high-level signals, and produce an output signal with a higher average level. A compressor usually has a compression ratio of less than 10:1, with relatively slow attack and release times.

DE-EMPHASIS: Attenuation of high frequencies by a specified amount. For example, where the time constant of 75 *us de-emphasis* is used, 15 kHz is *reduced* by about 17 dB as compared to frequencies of 400 Hz and below.

DYNAMIC RANGE: A measure, usually in dB, of the system's maximum signal level (or other specified reference point), as compared to the noise level.

EXPANDER: A separate device, or function of a compressor or limiter, that increases the amplitude range and lowers the average level of program material by decreasing its output level at a faster rate than the input signal is decreasing. In some units, this function occurs to a preset point (if possible, just below the softest sound and just above the noise level) where a noise gate will operate to cutoff the output, thus increasing dynamic range by not passing noise only.

EXPANSION: The process of increasing amplitude range, thus producing a lower average level.

EXPANSION RATIO: In an expander, a ratio found by dividing the change in input level by the change in output level.

FM LIMITER: The same device as a limiter, except that it incorporates internal pre-emphasis (usually 75 us for standard FM and 25 us for Dolby FM broadcasts) to theoretically anticipate the effects of pre-emphasis in the transmitter. Complimentary de-emphasis in the limiter's output circuitry restores flat frequency response below its threshold.

GAIN REDUCTION: Often abbreviated GR, a measure of the amount that a signal is attenuated (compressed), generally stated in dB.

LIMITER: A device that works to primarily prevent peaks from exceeding a certain limit, while restricting the amplitude range of program material by attenuating high-level signals. A limiter usually exhibits a compression ratio of more than 10:1, has a very fast attack time and a reasonably fast release time.

LIMITING: The process of precisely controlling peaks by attenuation rather than clipping, thus providing a compression action.

PEAK LIMITER: The same device as a limiter, but this term is used to positively differentiate it from a compressor, which usually does not respond to peaks.

PRE-EMPHASIS: Increasing the amplitude of high frequencies by a specified amount. For standard FM transmissions, where the time constant of 75 us *pre-emphasis* is required by the FCC, 15 kHz is *boosted* by about 17 dB, compared to frequencies of 400 Hz and below.

RECOVERY TIME: Same as release time.

RELEASE TIME: A measure of the time it takes for a limiter, or other similar device, to return to a specified point, such as its threshold, after a peak has occurred. The time can range from milliseconds in limiters, to seconds in compressors.

SHELVING: The electronic process of creating a "step" or "shelf" to boost or reduce all frequencies by an equal amount above or below a certain frequency.

SIGNAL PROCESSING: The act of creating a change in program material by reducing amplitude range, controlling peaks, re-equalizing, and so forth.

SPECTRAL DENSITY: A measure of the amplitude versus frequency characteristics of a sound source.

THRESHOLD: The point at which the action begins to operate on the input signal. In a compressor or limiter, all signals *above* this level, or all signals *below* this level in an expander, will be modified by the specific process.

ENG products still on top

For more information on products highlighted in this section, use BC's convenient Reader Service Card.

Our editorial emphasis this month is on ENG, EFP, and RENG. To continue the theme, our product section will start off with selected products that will add to the outside-the-studio production equipment arsenal. Probably no other category of equipment has seen the kind of R&D concentration that ENG has been getting over the last few years.

Be sure to watch this column in upcoming issues for continued tracking of what's happening to remote broadcast equipment. And if any of these products match your needs, just circle up the appropriate reader service number on the Reader Service card in this issue.

Portable color camera (Circle 101)

TOSHIBA INTERNATIONAL — Deliveries are now being made of the PK-39 ENG/EFP portable color television camera from the Broadcast Electronic Systems Division of Toshiba International.

The camera is completely self-contained and is offered with both ⅔" lead oxide and diode gun tubes, providing increased resolution. Weighing under 23 pounds, the complete camera, with lens, can also be used in the studio with an optional five-inch view finder. Signal-to-noise ratio is better than 51 dB.

The camera offers a remote panel that provides full production control. Other features include bias lighting, automatic white, and automatic beam control. Built in are a processing system, color encoder, sync generator, color bar generator, contour enhancement circuit, and monitoring system. Fully-processed NTSC, PAL or SECAM color signals can be obtained directly from the camera by adding a DC power source.

Portable ENG receiver (Circle 102)

MICROWAVE ASSOCIATES — A new 2 GHz portable ENG receiver is now available from Microwave Associates Communications. The unit, called the MA-2P, is designed as a companion to both the MA-2CP and the MA-2EP portable microwave transmitters previously introduced. The MA-2P features frequency agility over 21 channels in the 1990 to 2110 MHz band. Either 12 VDC or 115/230 VAC source voltages may be used. Selection is made by substituting power cables. A low-noise preamplifier is included as a standard feature and provides a receiver noise figure of 3.5 dB.

The unit is housed in a lightweight, weather-resistant, cast-aluminum case. Plug-in modular construction is used throughout. Front-panel metering functions are provided for power supply voltages, local oscillator operation, discriminator, and AGC level. Audio output impedence is 600 ohms balanced in three switchable ranges, 0, +9, or +18 dBm.

ENG cue transmitter (Circle 109)

COMREX — A new one-watt IFB system combines and retransmits program and instructions from an ENG van to field personnel. Comrex's CTA cue transmitter takes up 1¾ inches in a standard 19-inch rack. It accepts two audio inputs and controls levels so that program is heard continuously. Instructions (from two-way radio or local mike) override the program audio as they occur.

The model LPQRA cue receiver is pocket-sized (3"x5"x1") and battery powered. Equipped with a sturdy leather belt pouch, it is useful for studio floorman cueing, also.

ENG "quartz" lighting

CINEMA PRODUCTS — "Quartz" location lighting kits are available from Cinema Products. The Aero-Kit is compact enough to slide under an airplane seat or fit easily in the trunk of a small car. It includes two focusing spot lights, one focusing fill light, three 10-foot three-wire cables, three 15-foot three-wire extension cables, one gaffer grip, three light stands, and an aluminum case.

Their CP/Pro-Kit is for studio and location lighting. It is a professional five-light, 4.3 kw "Quartz" lighting kit. Total weight is 69 pounds, and there is a carrying case.

For further information on these products, write to Cinema Products, 2037 Granville Avenue, Los Angeles, CA 90025; (213) 478-0711.

New interface (Circle 104)

CONVERGENCE CORPORATION — Newly released from Convergence is an interface for the BVH-100 1-inch Type C VTRs. The company says this new interface for the Superstick editors provides a capability to use the Sony 1-inch Type C as either a source or record VTR in a videotape editing system. The new capability is also designed to answer the needs of many who want to mix 1-inch and ¾-inch formats.

The 1-inch Type C VTR can be used with the ECS-101, ECS-102, or as any one or all of the VTRs on the multi-source post-production ECS-103 system, where A/B rolls and special effects are possible.

The interface is available for immediate delivery and can be purchased with new edit systems or added to present systems to provide a 1-inch capability.

Convergence also has announced that their new *Operation and Maintenance Manual* is now available for the ECS-100 Superstick Series Editing System. Divided into three sections, the manual includes System Operation; Preliminary Set-up Adjustments with system interconnect diagram; and Theory of Operation with schematics, assembly, drawings, parts lists, system block diagrams, and extensive tables. The mannal is available for $125.00.

Graphic titler (Circle 103)

SYSTEM CONCEPTS — The first production model of its newest teleproduction graphic titler, the Quantafont™ Q-VII, has made its debut from System Concepts.

The microcomputer-based Q-VII is unusually compact (17" wide, 19" deep and 6¾" high) considering that standard

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features include Nanolog™ character refinement circuitry; shadow and full border edging; colorized characters with video matte and auto-fade; multiple resistent fonts including true upper and lower case; random access to 192 positionable titles; insert/delete and open/close editing; sync-lock and color phase lock; positionable crawl; partial page roll to a positionable location; and more.

ACE program for graphics system (Circle 105)

DYNASCIENCES — Recently introduced is a unique program feature to Dynasciences' model 9048 video graphics system. Called "ACE," the feature allows both storage and recall or pre-programmed events, including roll, crawl, flash and title. ACE comes standard on the video graphics system, in addition to such features as instruction channel, zoom on one font, colorizer, edger, electronic cabinets for desk-top use, and a digitizer that builds fonts and logos not part of the original unit.

Digital recorder (Circle 108)

SONY — A new portable digital audio recorder, a fixed-head four-channel unit using ¼-inch videotape at 15 ips, is being introduced by Sony Industries' Digital Audio Division. Called the PCM-3204, it is designed to achieve maximum compatibility with professional recording and edition techniques currently being used in studios. Using the recorder, punch-in and punch-out synchronized recording is possible with splice-free electronic editing. It also incorporates SMPTE time-code tracks enabling multi-deck synchronization.

The PCM-3204's complete A-D and D-A conversion and recording/playback capabilities allow it to interface with both existing analog equipment and the new generation of digital audio systems. Its 16-bit linear quantization system provides a dynamic range of over 90 dB, with distortion better than 0.05% from 20-20,000 Hz. Frequency is flat within to .5, −1.0 dB over the same range. Wow and flutter are undetectable.

Videotape recorder (Circle 110)

3M/NEC — The model TT-7000 one-inch high-band helical-scan videotape recorder, now available through 3M's Mincom Division, features an advanced-technology aided-track-following option, audio as well as video confidence heads, and unobstructed rack mounting. 3M and NEC recently announced agreement to market the NEC system. It's modified by 3M's addition of the aided-track-following option, in the U.S. and Canada. NEC will market the full system elsewhere.

The TT-7000 uses the full-scan Type C format, compatible with SMPTE standards; it is designed for production studios, TV remote vans, and TV studio use. The aided-track-following feature is based on 3M's long history of designing instrumentation and professional audio recorders. It includes an instantaneous servo system controlled by a microprocessor.

Precise editing and speed variation with no loss of synchronization is available through use of the aided-track-following option combined with the optional NTC-10 time base corrector.

Wireless mike (Circle 113)

RF TECHNOLOGY — The RM-101 one-channel system is this company's newest ENG and EJ wireless mike system. Its 1½-pound receiver offers the flexibility required for on-location, hand-held video and film camera use without sacrificing audio quality.

The system includes a receiver that can be operated from a camera battery pack, or internal NiCad or 8 penlite batteries, dual receiver antennas, transmitter with antenna, connectors and battery charger. Diversity reception circuits are similar to the company's RM-100, -102, and -104 systems. Operational range of the RM-104 is up to 500 feet, and this can be extended with high-gain antennas.

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THIS MONTH'S HALL OF FAME

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How many manufacturers go NEC under cover?

NEC, as the world's third largest manufacturer of semi-conductors, provides LSI and hybrid circuits for most manufacturers. Our Broadcast Equipment, which reflects the professional standards you expect from NEC employs chips developed exclusively for our own use. Below are but a few accomplishments that reflect our dedication to tomorrow's technicues:

LEFT—NEC's complete color encoder as used in the MNC series of ENG/EFP cameras for long term stability and negligible power consumption.

CENTER—NEC's 8-input/1-output video switcher with switching logic and wideband characteristics permitting 4-channels of digital audio multiplexed with video. The heart of the NEC TKA-105 Routing Switcher.

RIGHT—NEC's 16K mosfet ram for high-speed applications in NEC's FS-15 Frame Synchronizer and DVE® Systems.

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