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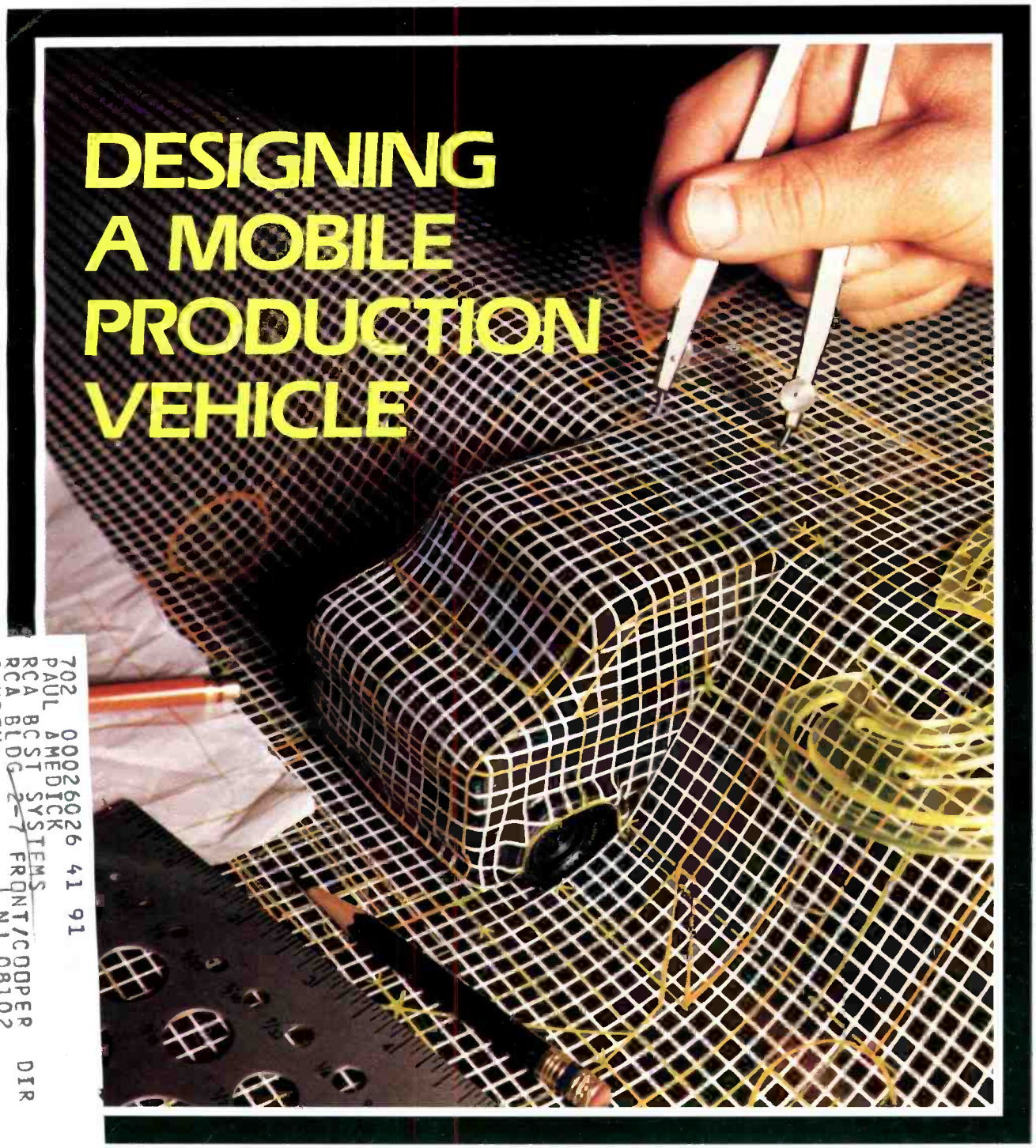

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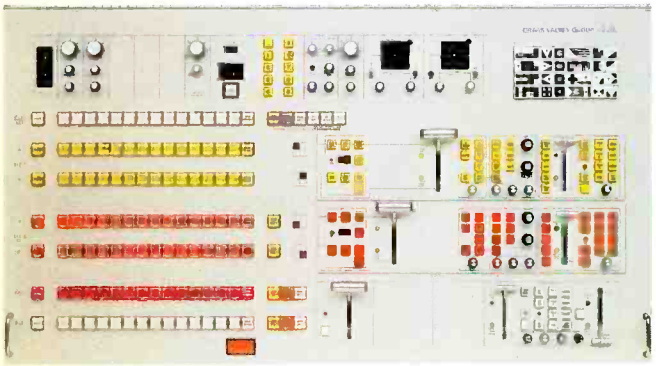

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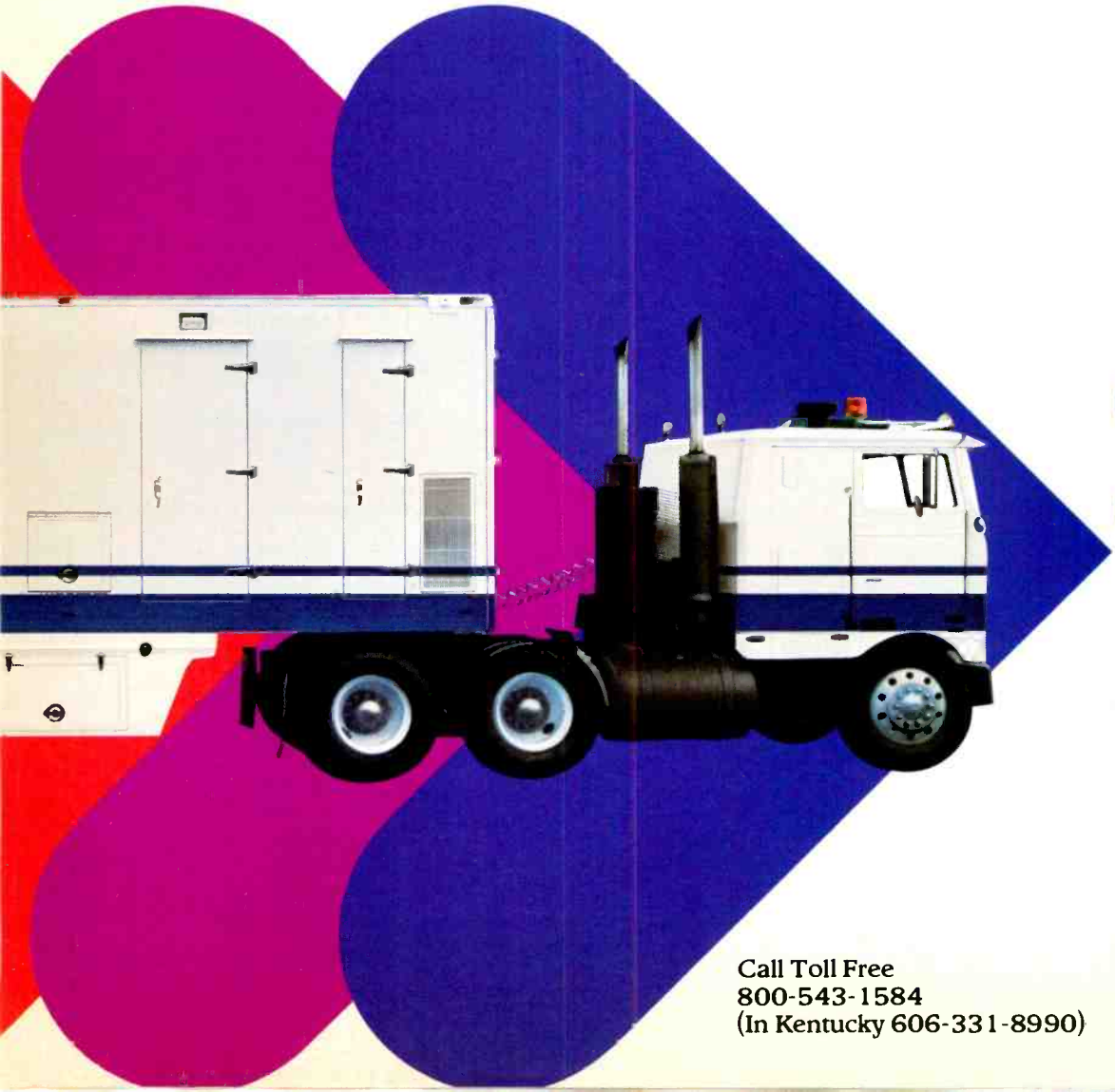

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MAY 1984 VOLUME 20/NUMBER 5

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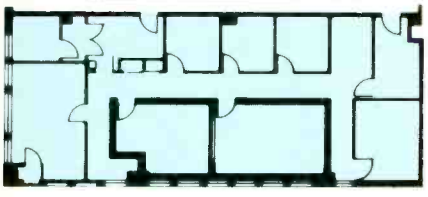

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EDITORIAL

Unanswered Questions on DBS

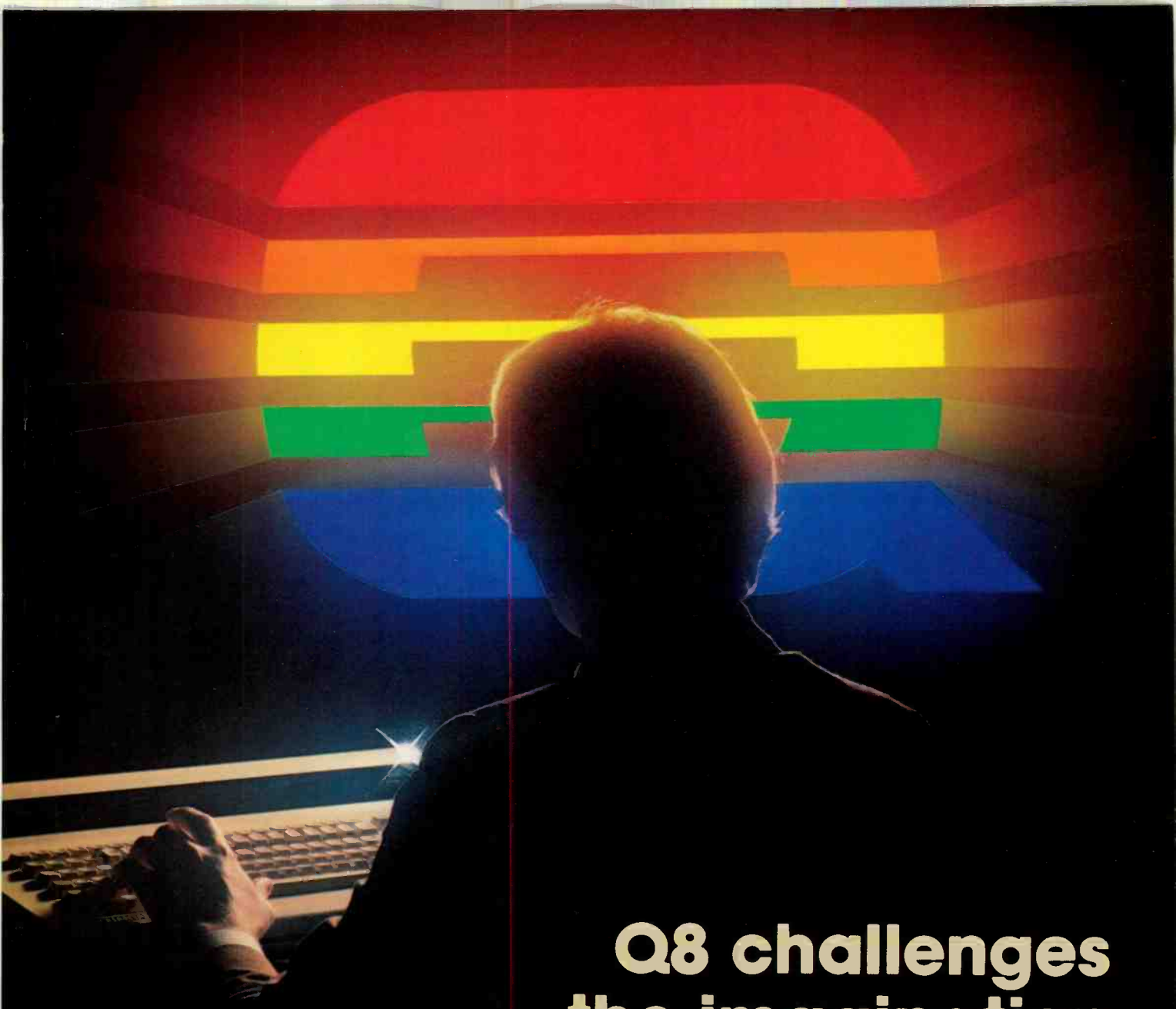
High-power DBS is closer than you might think. Satellite Television Corp's high-power DBS birds will go up next year. Production is underway on home TVROs, which Alcoa-NEC and Toshiba say will be available in quantity at surprisingly low prices. The 200 W transponders of high-power DBS satellites offer considerably better and more exciting service than do medium-power 20-50 W Ku-band transmission or the lower-power C-band service. It's not just a matter of antenna size or price.

No, the real advantage of high-power DBS is a signal quality superior to anything the American consumer has experienced so far—far better than most cable services and with none of the noise or ghosting so common with terrestrial transmission. This high quality will sell. That is why STC and Stan Hubbard of USSB believe DBS can compete with and even replace cable, assuming equivalent programming.

Add MAC (multiplexed analog component) transmission, now planned by STC and already adopted in Europe as the DBS standard, and you have a better signal yet—even with encryption. Furthermore, MAC is well suited to two-channel HDTV transmission.

Higher quality TV service to the consumer at a reasonable cost is possible. But who will be permitted to deliver signals on this new broadcast service? On the surface, one might assume there is room for plenty of players. After all, eight orbital slots at 16 channels each add up to 128 channels. But two of those slots are allocated west of the mainland U.S. and two are needed for the western time zones. The easternmost slot has a power eclipse before midnight, limiting its viewing time. Only eight channels per satellite have identical polarizations, so the practical Ku spectrum is limited.

Is first come, first served a satisfactory method of parceling out this valuable spectrum? Certainly the high risk involved has already screened out many, but is spectrum allocation on the basis of risk capital appropriate? In an earlier time, spectrum was set aside for the specific purpose of education. Is it prudent to try to envision such a social good again, or should the marketplace rule? How long should the current applicants be given to develop their proposed services? And for how long should a licensee have a hold on even a successful service, after due reward for risk? Should not the band be available to others on some kind of timesharing, fee-sharing basis? Now is the time to take a stand on these serious questions.



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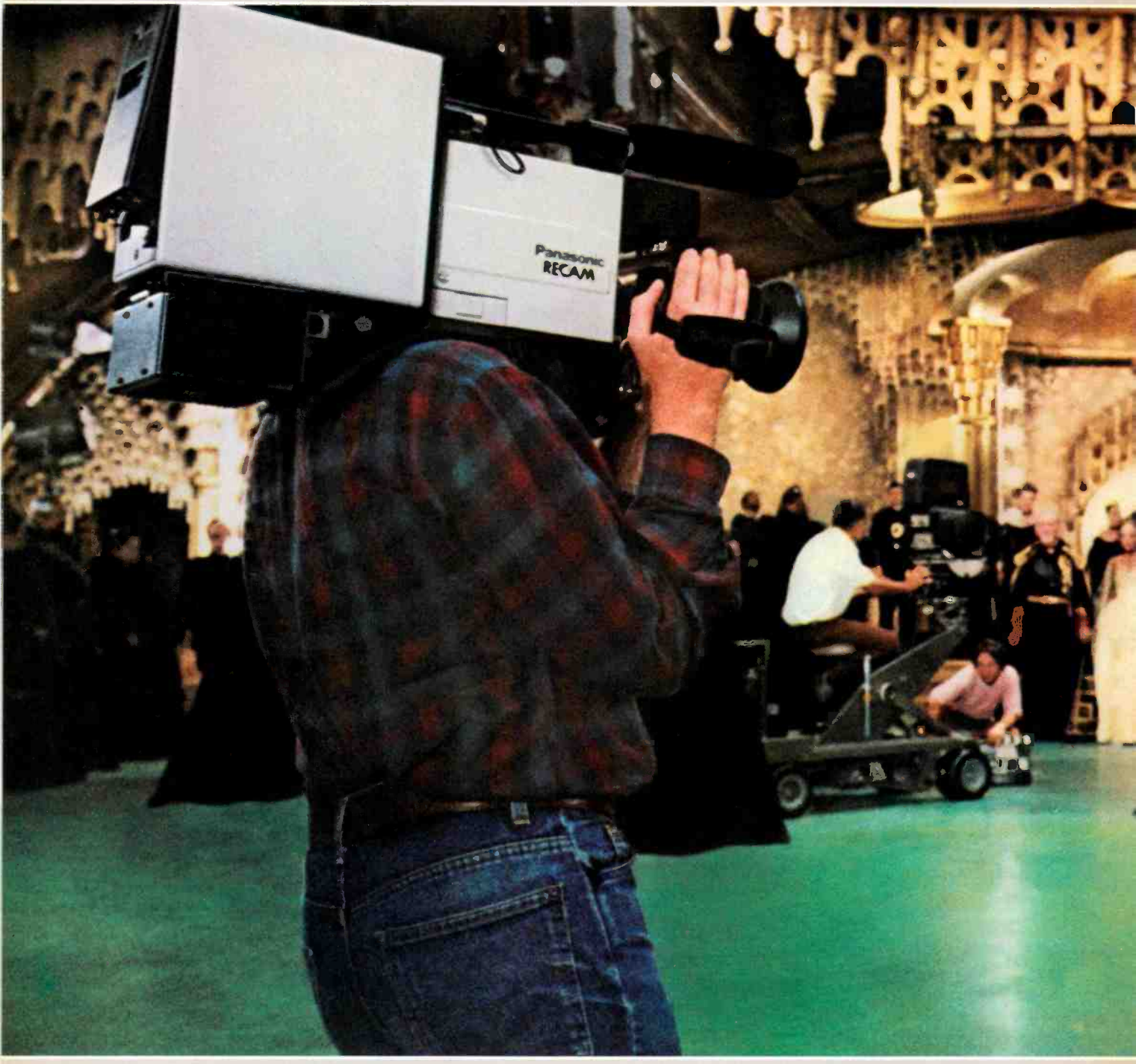

When Dino De Laurentiis and producer Raffaella De Laurentiis got together with director David Lynch to film Frank Herbert's classic science fiction novel, "Dune," they knew it wouldn't be easy. But it wasn't just the eight sound stages, desert locations, a cast of up to 20,000 people and a crew of 900. Perhaps Raffaella De Laurentiis said it best: "Dune is the most technical picture ever made."

That's why it was no surprise that Panasonic Recam was selected to record "The Making of Dune." The reasons: Recam's picture quality and technology. After all, Recam had already made headlines by recording ABC Sports' momentous ascent of Mt. Everest which was broadcast on "The American Sportsman." And "Benji," the new CBS television series, is also being recorded by Recam.

was selected to shoot of Dune."

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Zenith-dbx Stereo TV Wins FCC Approval

Accompanied by the sound of manufacturers gearing up to blast the consumer market, the FCC has endorsed the Zenith-dbx BTSC system of multichannel audio for television.

The system, named for the EIA's Broadcast Television Systems Committee, which recommended it, will provide more than stereo for television. Its "separate audio program" channel can operate simultaneously with the stereo channel, allowing second language programming, augmented audio for the blind, and features not related to the video program, such as radio or paging.

A second language option, operating in addition to the stereo channel, is expected to be popular in areas with large immigrant populations. Also, the Commission has ruled that public stations can make commercial use of the extra channels.

In making its decision, the FCC has tried to allow for future systems by only issuing guidelines for the TV aural baseband, but it also has protected the BTSC system to avoid problems similar to the AM stereo situation. Zenith's transmission and dbx's noise reduction systems have been required for first subcarrier use, and the pilot tone that switches on the BTSC decoders must be kept free.

Zenith and dbx say that the networks and "many television stations" have begun designing transmission and encoding equipment to carry the signals. Zenith is offering its patent licenses royalty-free, while circuit cards can be bought directly from dbx.

On the receiving end, consumer equipment manufacturers say they will be selling adaptors and stereo television sets by the end of the year, though only in high-end receivers for now. (Several major announcements are likely to be made at the Summer Consumer Electronics Show in June.) The commonly quoted price for adaptors is $100 without amplifier and speakers, and $200 for a complete package. VCR manufacturers are expected to come out with different options for recording additional audio channels, again in the more expensive models.

BM/E Salutes Winners of Best Station Competition

Best Station Winners (from left to right): John A. Moline, KNSI/KCLD; Tom Mann, WRC; Robert Rivlin, Editor, BM/E; *Scott Standiford, WKYS; Robert C. Wiegand, WPEC-TV; Lenny Davidowitz and Tom Saylor, Empire Video; Jerry Walker, Editorial Director,* BM/E.

Selected by readers' votes in close competition, the winners of *BM/E's* 1983 Best Station and Facility Awards were honored at a reception hosted by *BM/E* at NAB, April 30. Last year's event, the ninth annual competition, was distinguished by a new category, teleproduction facilities. The winning facility was Empire Video, New York City.

Also winning were WPEC-TV, West Palm Beach, FL, in the television category, and KNSI-AM/KCLD-FM, St. Cloud, MN, in the AM/FM category. A pair of Washington, DC NBC owned and operated stations, WKYS-FM and WRC-AM, won in the FM and AM radio categories, respectively.

What makes a winning station? For some clues, see *BM/E*'s December 1983 issue, where the original entries appeared. If you think your station could give the winners a run for their money, let us know. Send us a postcard with the station's name, address, and contact person. Rules will be mailed out later this year.

CBS Affiliate Starts Local NABTS Teletext

While teletext may not be a household word for consumers, a Charlotte, NC, CBS affiliate has become the first station in the country to offer a regularly scheduled, local origination teletext magazine since the FCC's recent deregulation of teletext. WBTV, licensed to Jefferson Pilot Broadcasting, inaugurated the service April 4, exactly a year after CBS initiated its national NABTS teletext magazine. The 20-page WBTV edition interleaves with the network's product.

Concurrent with the WBTV announcement, Matsushita Corp. announced the availability of Panasonic NABTS decoders in the Charlotte market, where NBC affiliate WPCQ carries NBC's NABTS magazine. The decoders, which retail for about $300, must be used in conjunction with receivers having RGB inputs, restricting them at this time to the very high end of the market. Matsushita says it will soon begin distributing the decoders in additional cities.

NBC is not lagging behind in teletext developement. Pier Mapes, the network's president, predicted, "1984 is going to be a year of promotion for teletext." He said NBC affiliate WDSU-TV would launch a major NABTS teletext promotion at the New Orleans World's Fair, including a local edition.

The Panasonic decoders read Line 21 closed captioning as well as teletext, and a CBS spokesperson said the network would start dual-channel, simultaneous Line 21 captioning and teletext next fall.

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684 New FM Stations Located by FCC

Proposed locations of 684 new FM stations have been released by the FCC, the largest block of FM assignments ever made. At the same time, the commission also acted on other areas of last year's docket 80-90, the FM drop-in proposal. (For a detailed look at 80-90 and its effects, see "FCC Rules and Regulations" in this issue, p. 89.)

Most of the 684 new stations will be added in southern states. Their exact locations are open to change, however, and the Commission is gathering notices until May 15 from those interested in the stations or nearby sites, and is willing to consider alternate locations within the areas it has named. Counter-proposals must maintain spacing with existing stations, and applications must be for a first local or full-time local station, or a minority-owned or public station. Conflicting cases will be decided according to the revised FM assignment rules.

Applications for the stations will be taken on a staggered basis, probably in early 1985. James McKinney, Mass Media Bureau chief, estimates the final tally of new stations could exceed 1000.

Broadcasters in the markets slated for expansion have mixed emotions about the prospective newcomers, according to an NRBA poll. Most radio executives foresee an increase in programming diversity, but at the expense of their own share of advertising revenues.

In related action, AM daytime stations may lose the diversity demerit they now receive when applying for an FM license in their own communities. Commission chairman Mark Fowler, asking for comments on the proposed move, said daytimers should be given "special consideration, perhaps special preference in any comparative hearing."

The FCC also set up a temporary 10-mile buffer zone for Class C stations with antennas under 300 meters. As part of the reorganization of FM assignments, the buffer is intended to allow stations to relocate and upgrade before the FCC reclassifies any FM broadcasters not meeting the requirements it laid out last year. The zones will expire in March 1987 when new classifications take effect.

And in a reversal of last year's deregulation, the FCC will now require radio stations to file quarterly lists of issue-related programming. Due to a U.S. Circuit Court's remand last year, the Commission had to reconsider its decisions to drop programming logs and ascertainment requirements. However, the new rules will not require explanations of how issues were determined, nor limit the list to 10 issues.

STC's HDTV DBS Plan Challenged at Meeting

The ambitious DBS plans of Comsat subsidiary Satellite Television Corp. were vigorously opposed by two other DBS applicants at the tenth American Institute of Aeronautic and Astronautic Communications Satellite Conference in Orlando last March. William Pritchard of DBSS and Stanley Hubbard, Jr., of USSB both objected to the recent STC and CBS filings to the FCC that requested six channels for each, on two orbital slots—all even-numbered chan-

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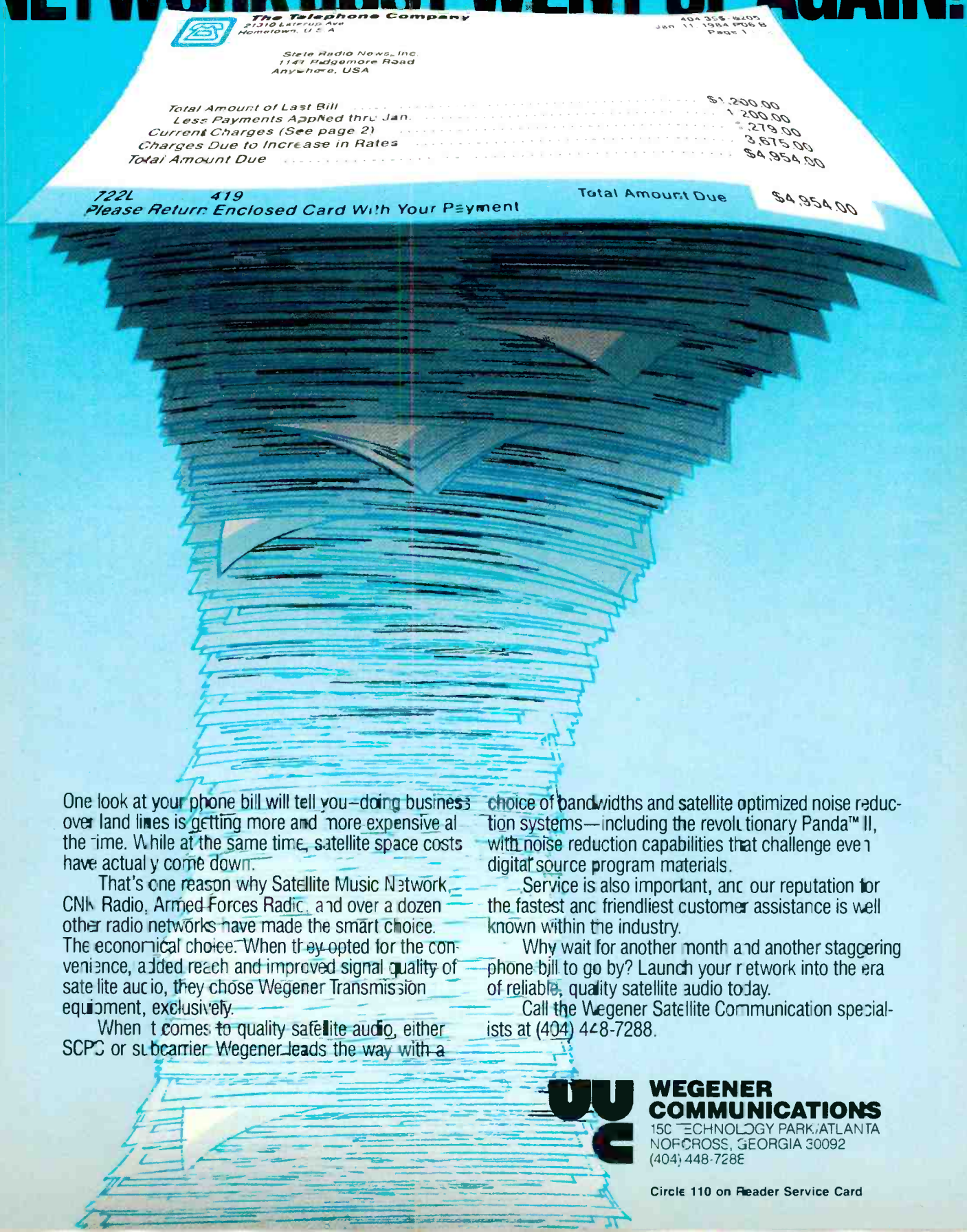

One look at your phone bill will tell you—doing business over land lines is getting more and more expensive all the time. While at the same time, satellite space costs have actually come down.

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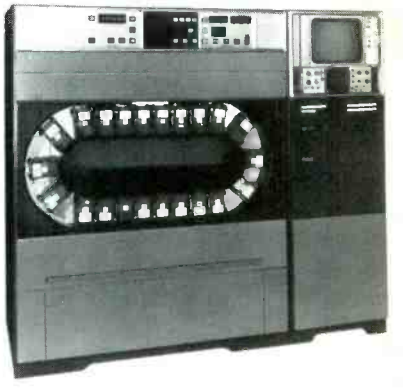
nels using the same-sense polarizations necessary for dual-channel HDTV transmissions. Such a request was declared by Hubbard to be "arrogant hogging of the spectrum."

STC's three-phase DBS plan includes beginning a five-channel service this year in the east, going to six channels in both the eastern and central time zones by 1985, and becoming national in 1986. By as early as 1987, collaboration with CBS should make it possible to transmit six channels of HDTV to homes, assuming the FCC concurs and TV sets become available, distinct possibilities according to STC's assistant VP of engineering, Ernesto R. Martin, who addressed the conference.

Both Hubbard and Pritchard objected to any plan that would give such dominant, well-financed applicants so many same-sense polarizations, and out of the middle of the band at that. Such a plan would force other weaker applicants to use cross-polarized channels, they argued. If STC and CBS get their way, said Hubbard, the only fair thing would be a law requiring all DBS receivers to be all-channel.

STC countered, however, that such all-channel receivers would be too expensive. Cross-polarized switches incorporated in home terminals would add about $60 to receiver prices, Martin said, not the $5 suggested by USSB. The higher figure was supported by Dennis Fraser of Alcoa-NEC, one of STC's home terminal suppliers. Only electronic pin diode switching, an approach still in the laboratory, would be cheaper, Frazer said.

All panelists agreed that some kind of standards for antennas, indoor receivers, and the encryption method were necessary to persuade consumers to buy DBS. No one envisioned consumers buying two antennas, two or more receivers, and a variety of decoders. Martin suggested that applicants less advanced in their plans than STC contact STC's suppliers. Hubbard stood firm, however, and vowed to "protect the American people" from unfair competition pushed by industry Goliaths.



Still Going Strong *. . . Contrary to the report in our story on Station Automation (March issue), the RCA TCR-100 quad cart deck is still alive and flourishing. RCA's VP of marketing Andrew Woywood reports 22 were sold last year, at a price of $200,000 each.*

An FCC industry advisory committee does hope to clarify what standards ought to exist, said Dr. John Clark, RCA director of space applications and moderator of the DBS panel.

Standards, whether de facto or FCC-imposed, undoubtedly will be influenced by STC's decision to adopt a multiplexed analog component (MAC)

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format for transmission. While the front-end portions of NTSC and MAC receivers would be similar, circuits theoretically would be optimized for one or the other. MAC may not be deemed necessary by those not interested in providing a pay service or HDTV. The question then becomes one of how much compatibility ought to exist or how much must exist if DBS is to capture the imagination of the buying public.

To the surprise of many attending the AIAA conference, none of the DBS panelists, including Ed Horowitz of HBO, saw DBS strictly as a rural service. The quality of the DBS signal, its low price, and an attractive programming mix make it an alternative to cable, MDS, SMATV, and VCRs.

Ownership, Attribution Rules Loosened by FCC

Ownership regulations loosened another notch as the FCC eased its definition of what constitutes media ownership and also set aside a 1970 proposal to divest all cable/broadcast cross-ownerships.

Major changes in the ownership attribution rules now define owners as those holding five percent of a company's voting shares. This new benchmark applies even in large corporations; the FCC has abolished the distinction between "widely" and "closely" held companies, i.e. over or under 50 shareholders.

Also receiving new quotas are institutional investors, who may now hold up to 10 percent of a company's stock without being defined as a media owner. The benchmark had been 5 percent.

Nonvoting stock and limited partnerships, in which "the general partner(s) is truly independent," will no longer confer any ownership status. This provision especially, the FCC says, should help new and small licensees obtain capital.

Videocom Satellite Associates board chairman Daniel Swartz (left) and director of telecommunications Frank Cavallo review marketing plans for the company's new Dalsat D-42 transportable earth station. The New England communications company has already used the dish, mounted on a 42-foot tractor-trailer, for presidential campaign coverage.

Officers and directors who are not involved with licensees within their company will no longer have to be reported as owners.

In other action, the FCC is reconsidering its stance on cross-ownerships. It has again grandfathered 13 cable/broadcast cross-ownerships that a 1970 ruling prohibited and has set aside five other cross-ownerships classified as "egregious" because they involve commercial stations supplying principal service within the cable community. First, the Commissioner says, it will consider a petition to drop the cross-ownership rule.

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NEWS BRIEFS

The NAB has published 1981 and 1982 **Television Market Reports,** listing total revenues, expenses, and before-tax profits of 82 markets in the 1981 report and 67 in 1982. To be covered, each market had to contain at least three stations, all of which had to have filed figures. For more information call 202 293-5121; to order call 800 368-5644. Cost to NAB members is $50 per report or $75 for both . . . . AGB Research PLC of London has established a subsidiary company, **AGB Television Research, Inc.,** in Hicksville, NY. AGB conducts audience research in 20 countries and is now testing its PeopleMeter in the US.

If the FCC does relax its ownership rules, the broadcast and entertainment industries could be the next area for **big acquisitions and mergers,** according to The Wall Street Journal. Though takeovers would have to be friendly due to license transferals, those companies said to be among the most vulnerable are ABC, RCA, Storer, Capital Cities, Scripps-Howard, Taft, Gulf, and General Tire (RKO) . . . . HBO has bought the nonexclusive use of most **Universal movies** for the next six years, starting with 1983 product, and reportedly will strike a similar four-year deal with 20th Century-Fox.

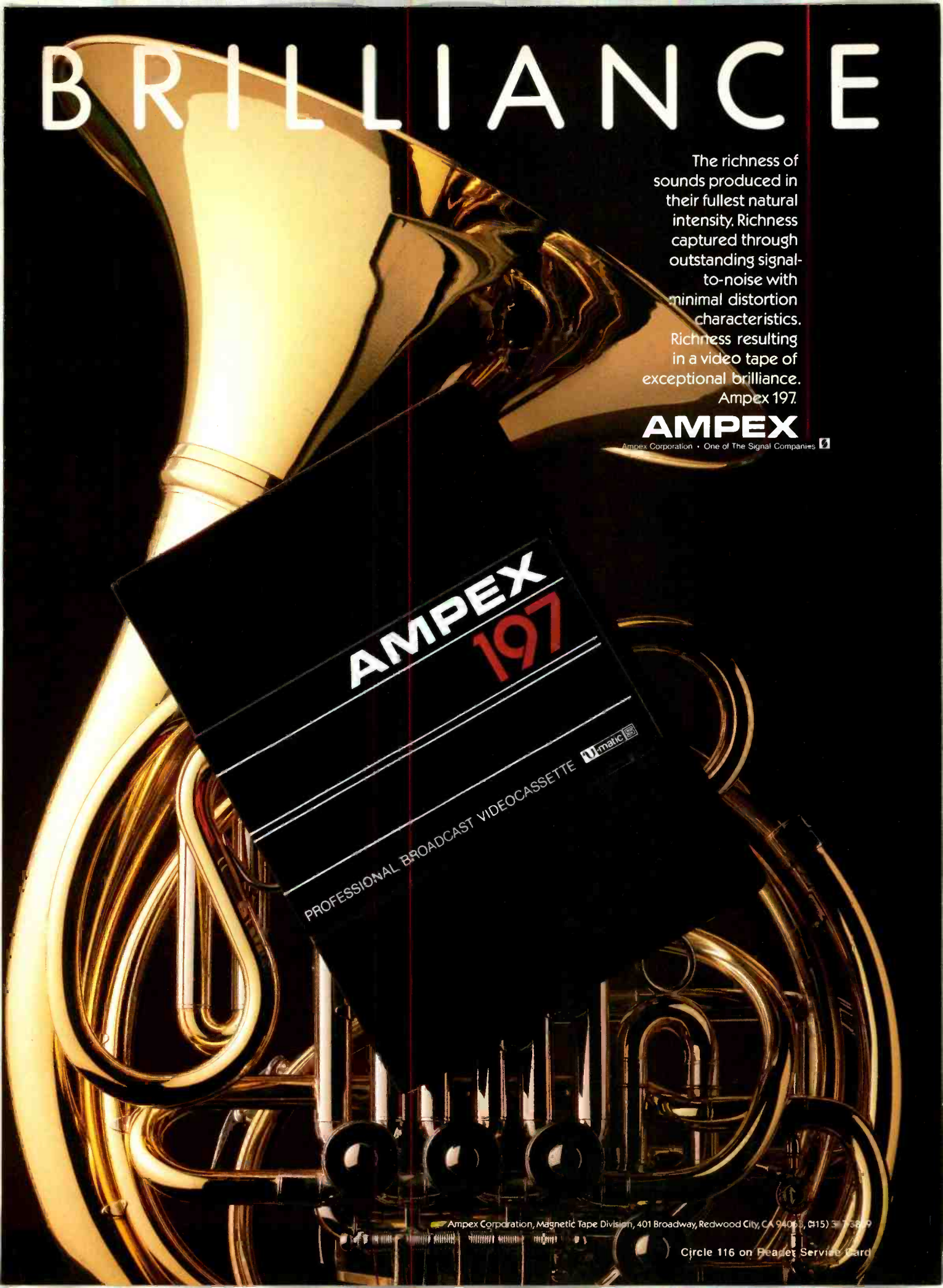
Outlet Co. has opened a **Washington, DC news bureau** to feed its five TV and five radio stations. Outlet was recently bought by Rockefeller Center, Inc. . . . . VideoStar Connections, Inc. and Pyramid Video, Inc. plan to build a **satellite communications facility** on top of the National Press Building in Washington, DC. Initial plans call for two transmit/receive earth stations using the Ku-band to access both US and Canadian satellites.

Due to judicial remand of its radio deregulation, the FCC will now require radio stations to file **quarterly lists of issue-related programming.** However, explanations of how issues were chosen won't be required, and lists can include over 10 issues . . . . The NRBA has put out a set of guidelines explaining how stations can protect **call letters, logos, and slogans** with trademark registration . . . . The FCC is mailing **pre-sunrise authorizations** to over 180 AM stations on Canadian Class I-A clear channels.

The NAB has asked that the FCC not drop its "major change" definition for FM and television **service area changes** of over 50 percent. The Association cites allocation and interference problems between Channel 6 and FM noncommercial stations . . . . The FCC has proposed allowing television stations to use the **vertical blanking interval** for data transmission in addition to teletext. The Commission expressed special interest in receiving comments on paging service requirements.

The NAB has come out in support of an FCC proposal to give traditional TV **translator applications** priority over LPTV applications in processing. The Association "objects strenuously," however, to the Commission's suggestion that financial qualification showings be dropped from the application form.

Metromedia has said it will sell **KJR-AM,** Seattle, to Ackerley Communications for $6 million. More of its AM stations are reportedly about to be sold . . . . Price Communications has bought **WTIX-AM** of New Orleans and **KOMA-AM** of Oklahoma City from Storz Broadcasting Co.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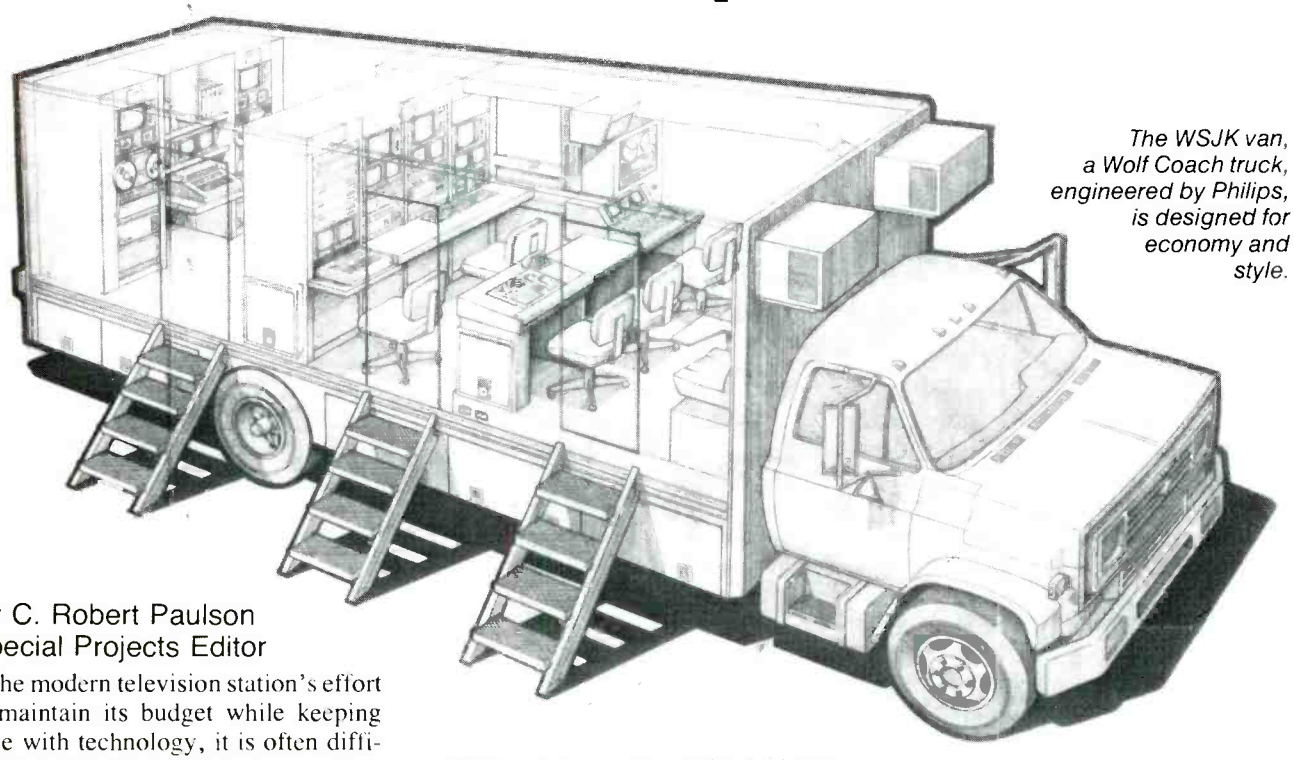
Budget-Conscious Station Justifies Mobile Teleproduction Cost



The WSJK van, a Wolf Coach truck, engineered by Philips, is designed for economy and style.

By C. Robert Paulson
Special Projects Editor

In the modern television station's effort to maintain its budget while keeping pace with technology, it is often difficult to justify the cost of such expensive and sophisticated equipment as state of the art mobile units. In the public broadcasting world, studio production systems are often old and post-production limited to cuts-only systems in TBC-less, CG-less, efx-less not-so-suites. Field production can mean breaking out single-camera/VTR systems that often date back to half-inch reel-to-reel Porta-Paks. There's seldom enough money to do more than support an always indadequate staff, plus occasional hardware purchases to keep the shop running.

WSJK-TV's studio production and post-production facilities, located on the University of Tennessee Knoxville campus, have been a cut above that poverty level for many years. However, until the 1982 Knoxville World's Fair opening became the agent for change, the station' ability to operate a mobile system was definitely in need of assistance. Mobile equipment included a couple of early-generation portable broadcast cameras and VCRs and a small two-camera van, which had none of the "production values" now demanded by every director.

Typical requests for mobile production services from University departments and state agencies were far beyond the capabilities of the station's existing equipment. Events coverage required versatility, ranging from the Governor's annual State of the State address to intrastate sports competitions, to state education meetings, to medical conferences and cultural events. Since the university and state agencies generally had adequate budgets to pay for their specal video service needs, the only problem was that the local station lacked the hardware required for such productions.

In order to meet this kind of market demand, WSJK-TV's mobile production capabilities were upgraded in the spring of 1982. The station was assigned the role of documenting and distributing videotaped programs of cultural, informational, and educational interest originating at the summer 1982 Knoxville World's Fair. The complexity and quality of these events required the coverage capabilities of a network-caliber production vehicle.

To satisfy the need, WSJK went to Philips Television Systems for the design and construction of a 22-foot television production system installed on a 30-foot van chassis. The van was custom-equipped to support North American Philips Corp.'s participation in the World's Fair, demonstrating the state of the art in communications technologies. WSJK-TV utilized the unit during the fair as its on-site operations base, and acquired it for full-time use at the fair's close.

Philips completed construction of the van in time to introduce it at the 1982 NAB show in Dallas. This author made use of it there at odd hours to complete editing of some NAB videotaped presentations and was impressed with its user-oriented layout. Post-production activities were carried

out with no interference to production demonstrations occurring elsewhere in the unit.

Full-time duty

After the shakedown at the NAB, the unit proceeded to Knoxville just before the fair's opening day. Suddenly it was on full-time duty without breaks—seven days a week, eight to 10 hours a day, for six months. Each shoot was a new remote at a new Knoxville site, and on many occasions several new set-ups per day were required.

Thus trained as a team by the time the fair closed, the WSJK-TV mobile unit crew and van went on the road. In the next twelve months they played at every major college football stadium in Tennessee, score of arenas, auditoriums, concert halls, and at the state capitol. Several out-of-state football games remotes added more stadium dates throughout the South. On an increasing number of assignments the van now rolls with a skelton WSJK-TV caretaker crew, and is set up and operated on location by local production crews.

Entering 1984, the station management looks at its telecommunications

At the character generator and video monitor station, Elaine Tomber overlays video credits.

vehicle as an income-generating asset, with potential for continually increasing its workload and its income. Net proceeds from rentals and production services billings are therefore being used to satisfy a long-term objective of making the unit even more rentable.

What made it possible for this unit to become an income-generating asset, rather than an expensive toy impossible to justify as a capital investment? There are many reasons, as Mike Knight, chief engineer at WSJK, recounts. They all relate to the vehicle design and its basic equipment complement. In the parlance of the computer industry, the truck is "user-friendly."

Meeting needs

"For instance," says Knight, "its size is ideal for our needs. It's not too expensive to take out, and we can drive it and park it just about anywhere. With everything inside turned on, including air conditioning, it draws 60 A maximum from a 208/220 V single-phase power line. We can therefore power up immediately anywhere we can find a standard 100 A electrical service drop.

"Next," Knight continues, "the video and audio systems in the truck can operate as a field production setup with ISO or switched feed videotaping, as a complete post-production editing facility, or as a field-based master control. At a news conference opening the

World's Fair, we supplied 25 video and audio feeds to the media pool, plus power to operate their pickup equipment."

A visit to the production control area reveals other facilities to support the van's master control capability. The telephone system provides five lines for connection to telco drops. Combined with a three-channel intercom and cue system, the production staff has simultaneous ability to conduct interviews with people anywhere in the world, talk back to announcers, cue talent and crew, call the shots, and develop camera and CG visuals for callup when needed.

Input and output interfaces are also included that provide tie-ins to telco standard 124 ohm video loop circuits. At the Knoxville Fair, this circuit ran 7000 feet back to the studio, eliminating risks of using microwave links in this high-noise environment.

For production operation, Philips initially configured the truck with three LDK 14 convertible studio/EFP camera systems, two automatic editor PVP-2B Type C VTRs, two ¾-inch U-Matic editing VCRs with TBCs, and a ¾-inch U-Matic portable. Spaces in the CCU rack and cable facilities were provided for two additional cameras (now part of the standard complement). All video sources were wired through a 12-input ADC video production switcher with an SEG and chroma key.

Videotape operator Al Campbell performs insert edit with Philips recorders in taping facility of van.

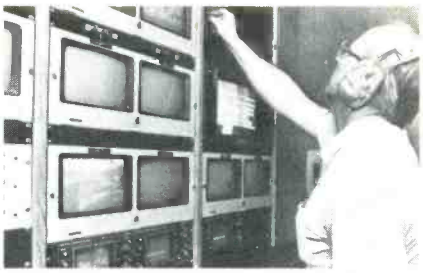
On-board Hannay motorized reels carry 1000 feet of multicore cable for each camera. Setup and strike have therefore not been laborious efforts. Knight indicates that he had been con-

cerned that many setup/strike activities would be difficult without triax, but this has so far not been the case. In any event, Philips product manager Nick LaBate points out that the LDK 14s can be converted quickly, even temporarily, for extended-run triax operation.

Master videotaping and post-production activities are organized in an area physically separated from production control. An Ampex TRE-2 cuts-only automatic editor controls the two Philips VTRs; the station currently does not see the need for expanding the system to A/B roll capability. As configured, interformat and multiple copy dubbing are readily accomplished by the editor. Feeds from production cameras, the CG, or external sources can be individually or composite taped and then cut into a final production.

Audio upgrades

Production audio facilities initially installed included a Richmond 24-input, eight-channel stereo audio production mixer configured for selectable mic and line level inputs. While adequate for most television broadcast activities, this system has been tagged for near-future expansion to make the truck "more rentable." A larger, more versatile board with several submixers will be installed to handle sound pickups requiring stereo grouping or coverage of a large orchestra.



Karl Tilley, WSJK-TV engineer, fine tunes video input at the camera control station located in the center area of the van.

Video capability upgrades meeting the "more rentable" expense justification began with the installation of ISO switchers for each VTR. Each includes a slow-mo controller for instant replays and three monitors continually displaying VTR input, output, and program. A dual-channel Chyron 4100 color character generator replaced the truck's original mono unit last fall. A second channel was added in time to meet NBC's demands for production capability at the 1984 SEC playoffs.

Thus equipped, and with the system I/O interfaces previously mentioned, the van is most useful as a "B truck" taping and graphics facility on network remote productions. To use its expanded production versatility as the "A truck" on WSJK-TV assignments, the station is buying a larger capacity video production switcher.

One initial design feature of the van won't need any upgrading, Knight points out. It's the "beautiful job Wolf Coach did on the interior spaces design, lighting, and decor. The trim and carpeting are both durable and elegant, and make people feel at home. The three comfortable chairs for the producer and guests in the VIP section right behind the switcher are the final touch."

Can a public TV station cost-justify a top-of-the-line teleproduction vehicle? WSJK-TV's experience proves that the answer can be affirmative—if the truck has uncompromising broadcast quality along with the versatility and adaptability to meet each client's specific needs. **BM/E**

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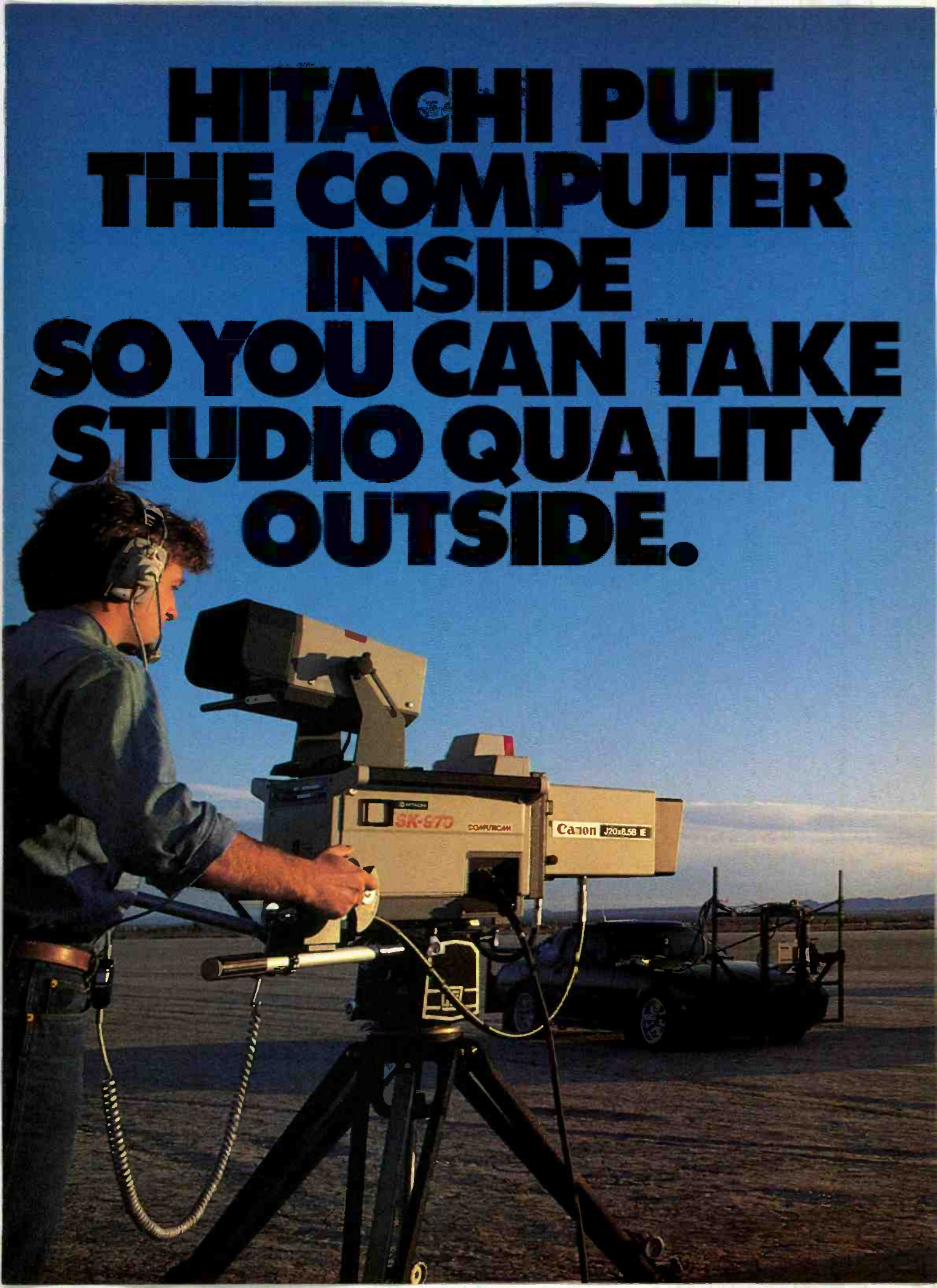

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International Radio Programming Market: A Definite Maybe

By John Storm Roberts
Special Assignments Editor

Although it is true that the levels of international radio programming sales are still a far cry from the sales figures achieved by TV programmers, there are new indications that the foreign market is beginning to open up for radio broadcasters. As proof, this year saw the beginning of the International Radio Programming Market, a conference/exposition held in conjunction with the MIDEM music market in Cannes, France.

Naturally one of the questions at the first Radio MIDEM was, "Is there, in fact, a potential market for US programming in the rest of the world?" The answer, as provided by the event itself, and particularly by a two-session symposium jointly organized by MIDEM and *BM/E's World Broadcast News*, was a definite maybe.

If there does prove to be a viable market, this will be because the nature of radio in many countries has changed.

Radio in most countries outside the Americas has traditionally been public-service (though it might carry commercials as a revenue raiser), normallly a monopoly, often government-owned, and usually national in organizational scope and to a large extent in coverage. These national radio broadcasters have tended to be highly self-sufficient as far as programming is concerned, and most movement of programming across frontiers has been by way of exchange arrangements—through such regional organizations as the European Broadcasting Union (EBU).

Over the past decade or so, however, a slow revolution has been taking place, impelled partly by the development of FM radio; partly (especially in Europe) by a need to deal with pirate radios which appealed more to the young than the official radio fare; and partly by the profit motive aided by a rightward electoral swing in many nations. This revolution has brought the introduction of private, usually commercial radio to countries ranging from Australia to France.

Antonio Piserchia (RAI, Italy), Tom Rounds (ABC Watermark), Bernard Palmer (BBC).

Alain Manevy (Radio France), John Storm Roberts (Editor, BM/E's World Broadcast News).

A small and unorganized trade in radio programming has already developed between these new stations and such American syndicators as Westwood One, which has sold *Dr. Demento* to several countries, including Australia, and ABC Watermark, whose *American Top 40* is also an international best seller. What is not yet clear is whether a major market can develop, given problems such as language barriers, differing program mixes, widely varied rights agreements, and lack of recognized pricing structures.

The international panelists at the MIDEM/WBN symposium first looked at the question of whether it is possible to come up with programming that can fit the enormously differing needs of broadcasters in different countries. They identified music (both pop and classical), drama, and documentaries as likely to attract international audiences.

The session made clear that, like the television programming market, the

RADIO PROGRAMMING

Rudolf Heinemann (WDR, West Germany), Norm Pattiz (Westwood One), Jerry Schoenbaum (Kenron Productions, New York).

Ted Dougherty (BBC), Guy Mazzeo (CBC), Simon Monceau (Radio Monte Carlo), Dean Grier (WFMT-FM, Chicago).

radio market will require careful development over a number of years. Nevertheless, panelists representing Radio France, Italy's RAI, the BBC, and program producers from the U.S. expressed confidence that the market will develop from the relatively limited exchange arrangements of today.

A major reason for this confidence is that radio stations are still growing in number—and with more stations will come the need for more material. Moreover, the technology is in place to deliver radio programming worldwide via satellite.

"These are exciting times for radio" as Westwood One president Norm Pattiz put it. "We are seeing a revolution on a global level, and like all revolutions we are not yet sure where it is taking us. Technology has now made it possible to realize the 'global village' envisioned a decade ago."

The panelists generally agreed that the growth of radio stations will create new forms of competition in countries that heretofore have not experienced it, and that this trend could only improve the quality and diversity of programming. However, they disagreed over what form this competition will take.

ABC Watermark president Tom Rounds, for example, predicted that radio in Europe will follow the format pattern set in the United States. But Radio France program consultant Alain Manevy held that the vast amount of material already being produced would set the pattern for future radio stations.

On the question of money, given the fact that radio budgets are almost uniformly tight, Pattiz suggested that to succeed, international programming will have to be delivered with commercial sponsorship or advertising. Agreeing that some form of revenue is essential to make programming available, BBC Transcription Service program manager Bernard Palmer argued that the nonprofit approach taken by his department will remain viable. Both RAI's Antonio Piserchia and RF's Manevy stressed the importance of co-productions in covering the costs of providing programs.

"I think we can do co-productions between two countries about world-famous figures and present two views of these people," Piserchia suggested. "Or we could produce programs featuring original sound effects that would overcome language barriers."

Nor are the sales or co-productions the only means of internationalizing radio. Some producers are already devising innovative alternatives. U.S.

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RADIO PROGRAMMING

Aidan Day (Amplecity, UK), Alberto Venturini (attorney, Italy).

Warren Bodow (WQXR-FM, New York), Pierre Chesnay (French Music Federation).

panelist Jerry Schoenbaum, of Kenron Productions, described a unique radio programming arrangement between his company and Radio Monte Carlo. Kenron delivers, by satellite, four hours of music programming a week, with company president Roni Abitbol, who speaks fluent French, as the DJ. Two hours of the satellite feed are broken into 15-minute segments so that Radio Monte Carlo can insert commercial messages. The other two hours are live and involve interaction between Abitbol and two RMC DJs. In addition, the live feed features call-ins from the RMC audience directly to New York. The show, called *New York, New York,* includes commentary about what is going on in the music world in and around New York City.

The crucial factor, Pattiz made clear, was to understand the basic structure of the target organizations. "The radio business in the U.S., for instance, is not a medium of programs, it's a medium of formats. Obviously that's not true everywhere, and I'd think that there'd be less of a problem elsewhere simply because there's more diversity of programming on individual radio stations."

Rounds added, "The Americans on this panel are the children of competition. When competition begins to rear its ugly head in Europe, format radio will almost necessarily have to come about. I don't know whether this is a happy outlook or an unhappy one. But when we're talking about format radio, we're talking about a much narrower audience than radio has ever had in Europe before."

The process of negotiating the use of radio programming internationally is, in a word, complicated. That was the message from the symposium panel on making deals. Although there are international agreements concerning rights, each country has additional complications such as union agreements that add up to a radio Tower of Babel. If the second panel, on deal-making, accomplished nothing more, it underscored the many barriers that need to be overcome.

Perhaps the whole question was best summed up by Italian international rights lawyer Alberto Venturini. Theoretically, according to Venturini, the issue was dealt with by the Treaty of Rome. But in Italy, for example, artists are protected in certain broadcasting circumstances, but not all.

"First, get yourself a good lawyer," he concluded, "and second, write a good agreement." **BM/E**

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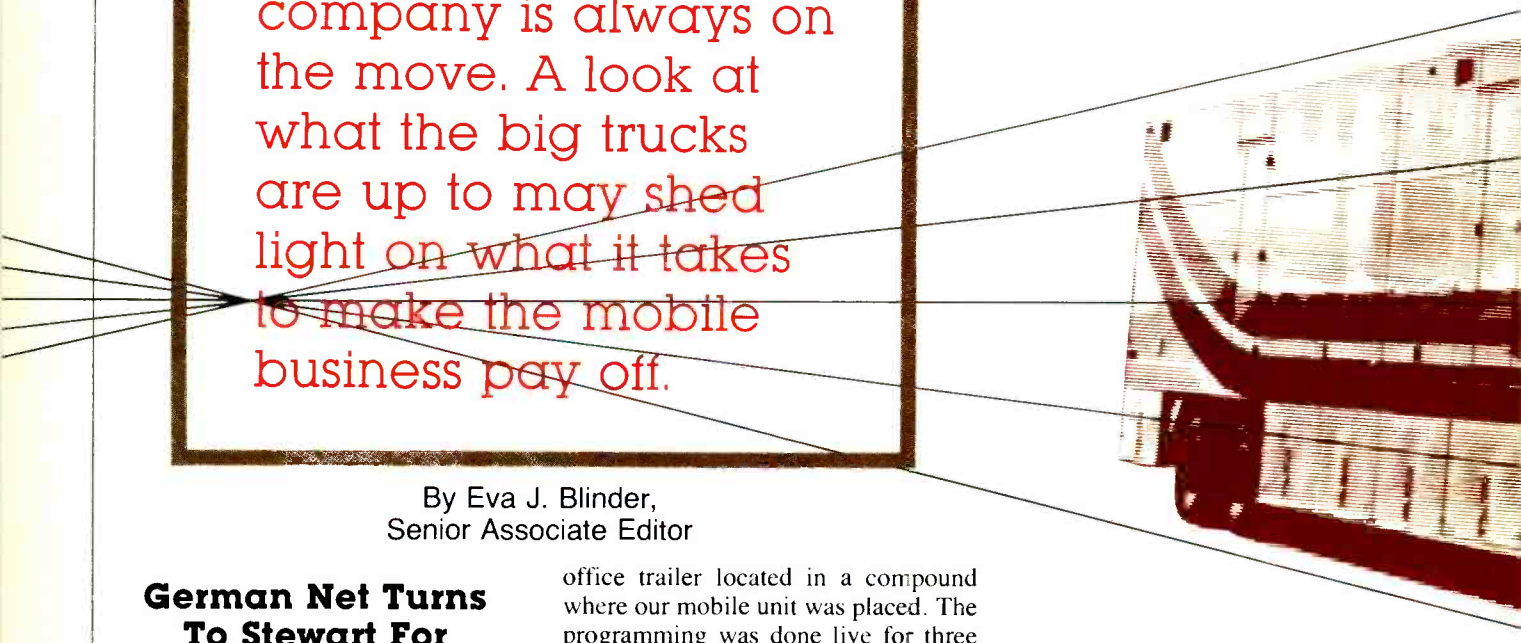
MOBILE PRO HITS

In the competitive world of mobile audio and teleproduction, a successful company is always on the move. A look at what the big trucks are up to may shed light on what it takes to make the mobile business pay off.



By Eva J. Blinder,
Senior Associate Editor

German Net Turns To Stewart For Transatlantic Broadcast

Philadelphia-based mobile facility E.J. Stewart celebrated the recent three hundredth anniversary of German immigration to the U.S. in an especially appropriate way—by providing facilities and technical staff for German television's live transatlantic broadcast of the local festivities. According to the company's Stan Leshner, the ambitious project involved two hours of live programming originated in Philadelphia aboard a visiting German tall ship.

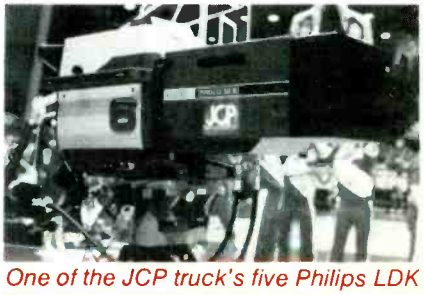
"ARD, one of the two German networks, sent their ENG crews to Philadelphia a few days prior to the event," Leshner recalls. "We set up two Sony BVU-800 editing suites in an office trailer located in a compound where our mobile unit was placed. The programming was done live for three different German shows, integrating featurette footage shot and edited by the ENG crews earlier that week."

For the live shoot itself, E.J. Stewart supplied three RCA TK-47s and two TK-86s, all with triax. One of the handheld cameras was placed in a lifeboat hanging over the side of the ship. "We were very careful to allow extra cable so that when the tide shifted, the cables were able to extend," Leshner laughs.

Foreign feeds are nothing new for E.J. Stewart, which has counted among its clients Canada, the Philippines, and the Arab networks. At press time, all equipment from the existing mobile unit was being transferred into a new, state-of-the-art truck, Starliner, scheduled to make its debut at NAB.

Crowe Covers College Cagers

John Crowe Productions' newest teleproduction truck has kept the company's new Dallas division just about as busy as possible. As of early April,



One of the JCP truck's five Philips LDK 6 cameras at the Arkansas vs. University of Houston game.

Mobile units

DUCTION

THE ROAD

This new trailer has helped John Crowe Productions expand into the Dallas market.

the new truck had logged 62 shoots since its January 1 inauguration. One of its many sports jobs was the Arkansas vs. University of Houston NCAA basketball game, produced for NBC late in February.

"We did all the Southwestern Conference televised games this season with our new Dallas truck and our home office truck in Houston," explains general manager Rusty Jones. The client for the basketball games was New York and Dallas packager TVS, which had brought the TV rights to the events. John Crowe provided all facilities and crew.

The new truck, designed by technical supervisor Don Wilson, was built at Shook Enterprises under Wilson's exacting eye. The 47-foot trailer carries five Philips LDK 6 computerized studio/field cameras, a pair of Ikegami HL-79Es (which Jones characterizes as "honeys"), and three Sony BVH-2000 VTRs, each with a slow-mo controller. The truck can handle up to six VTRs, as well as a second Chyron IVB-4100 with CCM module. The audio section is built around a 32-input Auditronics 110 board, and switching is a GVG 1600-7K 24-input switcher with Quantel SP single-channel digital efx.

Fiberoptics Ties Trucks At Links Tourney

"Million Dollar Baby," the mobile unit run by WKYT Productions of Lexington, KY, helped create a bit of history in remote TV production last July when it linked up via fiberoptics with WTTV's remote truck.

The event was the Mayflower Classic Golf Tournament in Indianapolis, IN. As an experiment, Belden Corp. lent the two stations fiberoptic cables to link their trucks, which were about a mile apart. Using the fiberoptics and Grass Valley modulators and demodulators, two one-way links carried video, program audio, and intercom signals. Although both trucks originated the signal at various points along the golf course, all signals were mixed for air in the WTTV truck and sent to the WKYT truck for transmission to telco. The experiment was so successful that WKYT used a similar link a few weeks later for the Children's Charity Classic Golf Tournament in Lexington.

Besides golf, the truck has produced telethons, baseball games, parades, beauty pageants, and entertainment specials. Its basic equipment complement includes Philips LDK 25 and Ikegami HL-79A cameras, Ampex VPR-2 VTRs, Chyron IV graphics, ADO, and an Auditronics audio console.

WKYT's "Million Dollar Baby" has produced a variety of sports and entertainment shows.

Turner Televises Sports With Brave New Truck

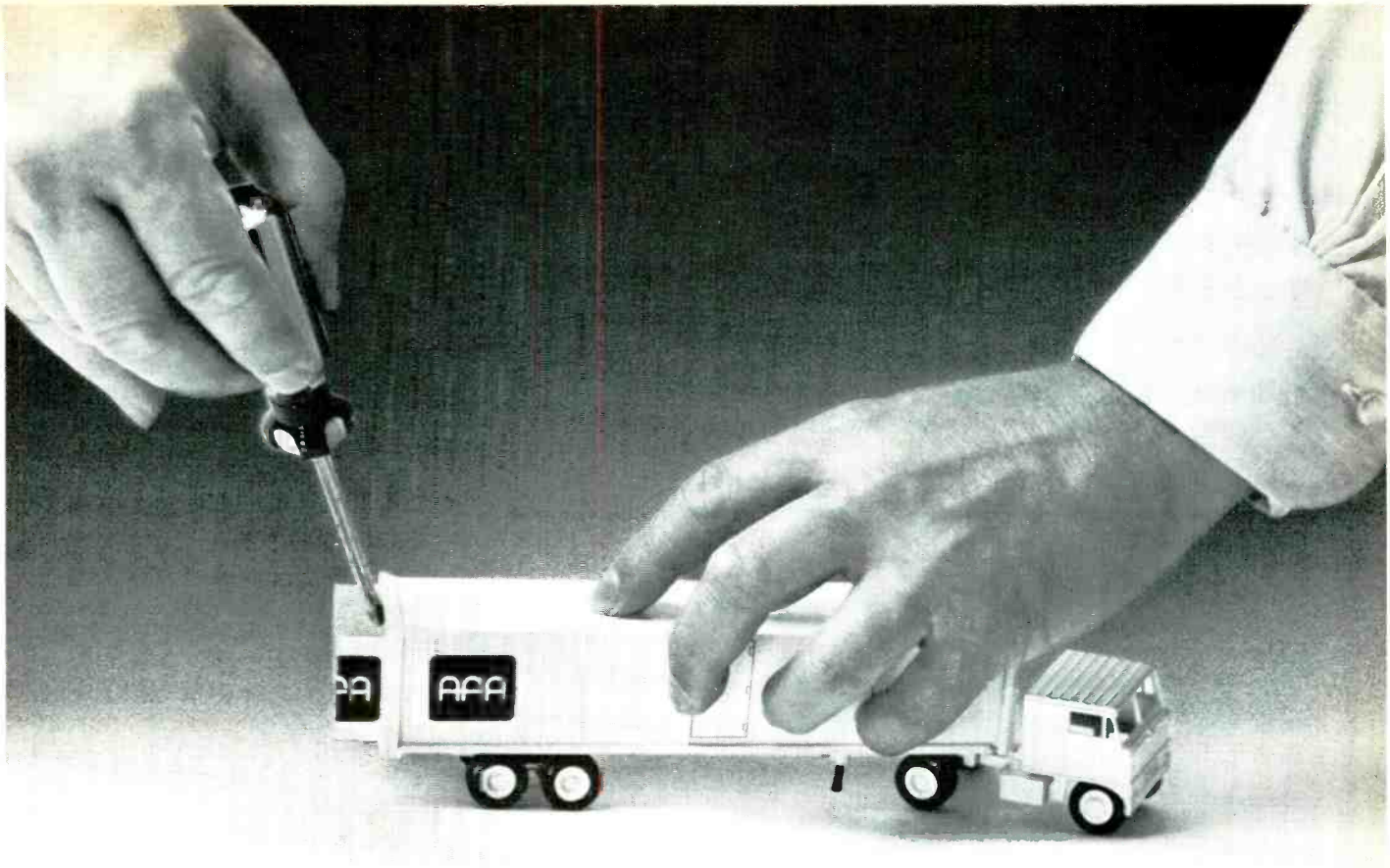
It should come as no surprise to anyone that facilities for the opening night telecast of the Atlanta Braves vs. the Philadelphia Phillies, out of the Atlanta-Fulton County Stadium, were provided by Turner Broadcasting System's Mobile Unit 4. The 45-foot trailer pulled out all the stops for the broadcast, using all seven cameras (five Ikegami HK-357s and two HL-79s, all with Fujinon lenses and triax) and all three Ampex VPR-2s with slow-mo. In addition, an Ampex VPR-5 portable one-inch VTR was used to record "wild footage" of pregame activities, which was then edited down for an open and bumpers.

Video and audio were split at the truck for the two feeds: a WTBS feed including on-site graphics and a "clean" feed for WTAF, which added its graphics in Philadelphia. Graphics capabilities of the WTBS truck include a Quantel SP-5000 and a Chyron 4100. Live pregame feeds were provided for CNN and WTAF, and a highlights package was edited on the fly for use during a post-game show.

Midwest Corp. is currently building a second teleproduction truck for TBS, scheduled to go into service June 1. The new 44-footer will have the same camera and VTR package as Mobile Unit 4, plus an Abekas two-channel still store, Grass Valley 300-3A switcher, Ampex ADO, Solid State Logic 6000E 68-input stereo audio console, Chyron 4100 graphics, and ROH IFB and phone system.


For the Atlanta Braves' opening night, Turner Broadcasting's Unit 4 provided Ikegami HK-357 cameras with Fujinon 44:1 lenses.

New TBS truck under construction at Midwest Corp.



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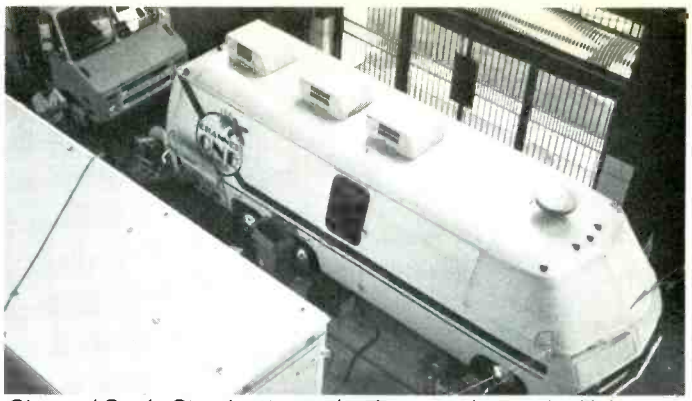
WYES uses its truck for in-house productions as well as for outside clients.



Channel One's Starshooter under the press box at the University of Alabama vs. University of Tennessee game in Birmingham.

A Day at the Races for YES Productions

YES Productions, the mobile division of WYES-TV, New Orleans, recently completed a live broadcast of the Louisiana Derby from the New Orleans Fair Grounds. The three-hour production, for the station's own air, involved live coverage of five races and taped coverage of the Fair Grounds Oaks Derby, held the previous day, along with taped background roll-ins.

The shoot used nearly all the equipment at YES's disposal: five Ikegami HL-357AT triax cameras, two HL-79DALs, and a Sony Betacam, which was used to record short interviews that were then bumped up to one-inch and used as roll-ins. The back stretch camera required a 3500-foot cable run (total cabling for the production ran over 7500 feet).

YES used its three VPR-2B Type C recorders, two for playback of features and one for slow-mo, and also recorded the event on cassette for later review. Effects and graphics took advantage of the truck's Chyron IVB and Quantel 5000 digital efx, along with the Grass Valley 1600-7K switcher. As with any sports production, communications were essential; the truck's RTS intercom and IFB system filled the bill.

Besides its own air, YES serves a host of other clients, including the networks, for sports and entertainment shoots.

Small Is Beautiful At Channel One Football Shoot

Although it is smaller than many large teleproduction trucks, the 30-foot Starshooter is flexible enough for a wide variety of assignments, according to the folks at Channel One Video Tape of Miami, which designed and built the unit in a GMC motor coach. All VTRs

Inside Encore's spacious audio room. Control room is visible through window at left.

Encore pulls up to Lincoln Center for a concert shoot.

have input routing switchers, slow-mo operators can be positioned in various locations within the truck, all monitors are patchable, and there is a wide range of keying capabilities.

That flexibility came through last fall, when the truck was commissioned to produce two SEC football games for the Sportview Network of Memphis. To meet the clients' requirements, Starshooter was tied to two other production vehicles, one housing two slow-mo VTRs and a Chyron IV, the other the VTRs recording the material for the coaches' show. The truck's usual complement of five Hitachi SK-96 computer cameras was rounded out with an Ikegami HL-79 triax camera. All 16 inputs of the Tapco audio board were called into service. For the first shoot—Alabama vs. Tennessee, in Birmingham—all systems operated smoothly and the weather was perfect. Continuous, cold rain cast a damper on the Tennessee vs. Georgia Tech game in Knoxville, but the few minor technical snags were easily corrected.

Reeves Dual Trucks Rate Lincoln Center Encore

Encore, the new mobile unit at Reeves Teletape, is just a little different from your standard teleproduction vehicle: it's not one truck but two. Unit A, a 43-foot trailer, houses the production, video, and audio areas, while Unit B, a 26-foot straight truck, carries the videotape and font sections. The dual-truck configuration results in a spaciousness almost unknown in mobile teleproduction, plus the capacity for a whopping eight VTRs (the trucks' usual complement is three).

This combination of comfort and capability has won Encore a variety of prestigious jobs, not the least of which is the PBS series *Live from Lincoln Center*. Reeves has handled the series

for the past seven years, and the new units, built and designed by the facility's engineering staff, easily took on the responsibility. Equipment for the demanding live shoots, most of which originate from the New York State Theater, includes five RCA TK-47Bs, two Ikegami HL-790s, a Sony BVH-500 portable one-inch machine, two ¾-inch VCRs, a Grass Valley 1680-24K switcher, Quantel DPE 5000 SP, dual channel Chyron IV 4100 graphics system, and a Neve 5114 audio board with 52-input, 24-output capability.

CRT Goes To The Limit At NASCAR Auto Races

Clarion Remote Television's 45-foot, Roscor-built trailer got to show its stuff at last March's Richmond 400 Winston Cup NASCAR race in Richmond, VA. The client, World Sports Enterprises, needed two full race shows—a tape delay one-hour program of the preliminary race for the USA Cable Network and a live three-hour telecast of the main event for Turner Broadcasting, plus a live weekly half-hour *Motor Week* program for WTBS. The shoot gave new meaning to the word "mobile," with one of the three remote control cameras mounted inside one of the race cars. Video from the camera was fed by microwave back to the CRT truck.

CRT supplied seven cameras (five Ikegami HK-357ATs and two HL-79Ds, all with triax) and four VTRs (three Ampex VPR-2Bs and a Sony BVU-110), and also interfaced a number of rental items into the truck, eliminating the need for additional vehicles. The extra equipment included three additional remote control cameras, a two-channel Abekas still store, and two additional frame synchronizers besides the Harris 690 the truck usually carries. The truck's custom-designed RTS communications system made additional phone lines—which World Sports has needed in the past—unnecessary.

One Pass Film and Video's Mobile One premiered at NAB last month. Shown here is the audio suite.

Clarion, which obviously takes its mobility seriously, has just moved from its old home in Evanston, IL, to new digs in Morton Grove.

One Pass Looks Ahead To L.A. Olympics

Although it didn't go into service until this month, One Pass Film and Video's new mobile production studio made its formal debut in April at the NAB show in Las Vegas. Mobile One, as the 45-foot trailer is dubbed, is already booked by ABC for the entire length of the Summer Olympics—no surprise, considering the quality of its equipment complement. The Centro-built truck, which was the highlight of its builders' NAB exhibit, handles up to 10 cameras and normally carries four Ikegami HK-357s and three HL-79EALs.

In addition to the cameras, the truck features a Grass Valley 1680 24-input, double reentry switcher and Utah Scientific routing switcher with breakaway stereo audio in its production suite, which features such amenities as seating for 12 and a wet bar. A 24-input Auditronics board is the heart of the audio suite, along with an Otari MX-5050 reel-to-reel ATR, TEAC cassette deck, and two ITC cart machines.

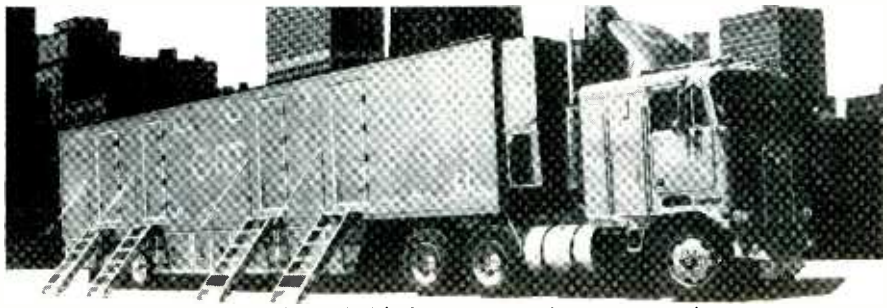
The graphics suite, also a separate area, features a Chyron 4100 dual-channel system with CCM. The truck also carries six one-inch VTRs, three Ampex VPR-3s with slow-mo and three Sony BVH-500s, as well as three Sony ¾-inch decks. It has full RTS intercom and IFB, plus Ikegami color monitoring.

Mobile Audio Mics Rock For Atlanta Simulcast

Mobile production isn't just video, as anyone who's used the 45-foot Mobile Audio trailer can tell you. The Rome, GA-based 24-track mobile recording studio recently supplied the facilities for an Atlanta radio simulcast featuring musicians Jason and the Scorchers. Contributing to the success of the live broadcast was meticulous mic placement, planned by director of production and engineering Al Craig.

"We used 57s on the vocals because that's what the band was used to," Craig explains. "On the drums our mic selection leaned toward the studio. We used D-12 on the kick, KM 48 on the snare, KM 86 on the highhat, 421s on the racktoms, 414 on the floortoms, overhead were Shure SM 81s. We used the direct feed in 414s for the base cabinet and the same setup for the guitars.

"Audience reaction was captured with AKG 460s," Craig continues.



CRT's Roscor-built trailer is available for sports and non-sports shoots.

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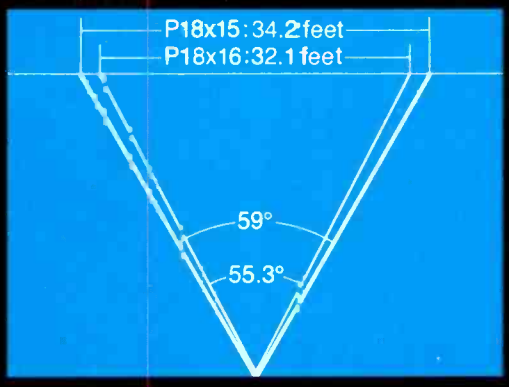

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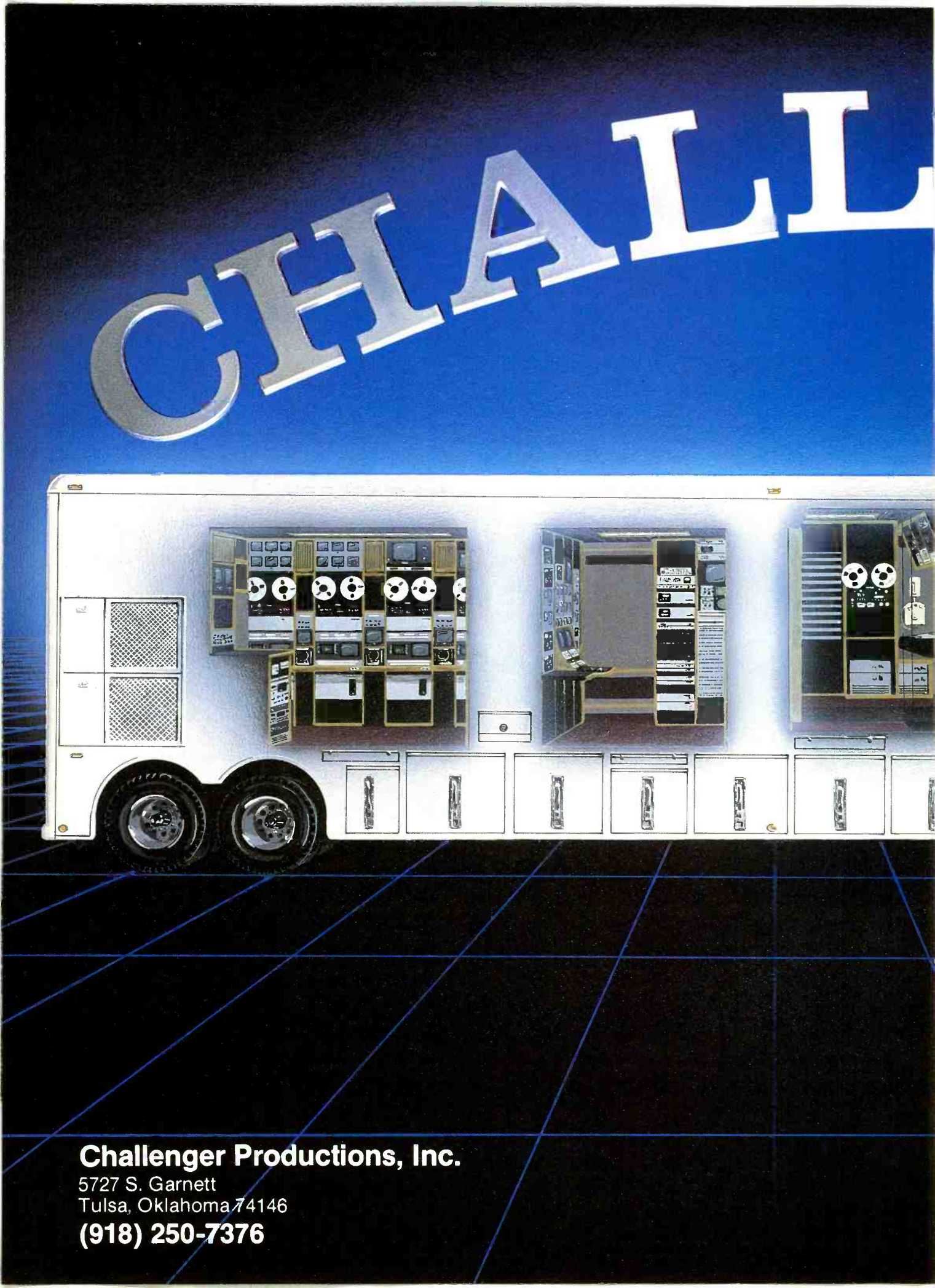

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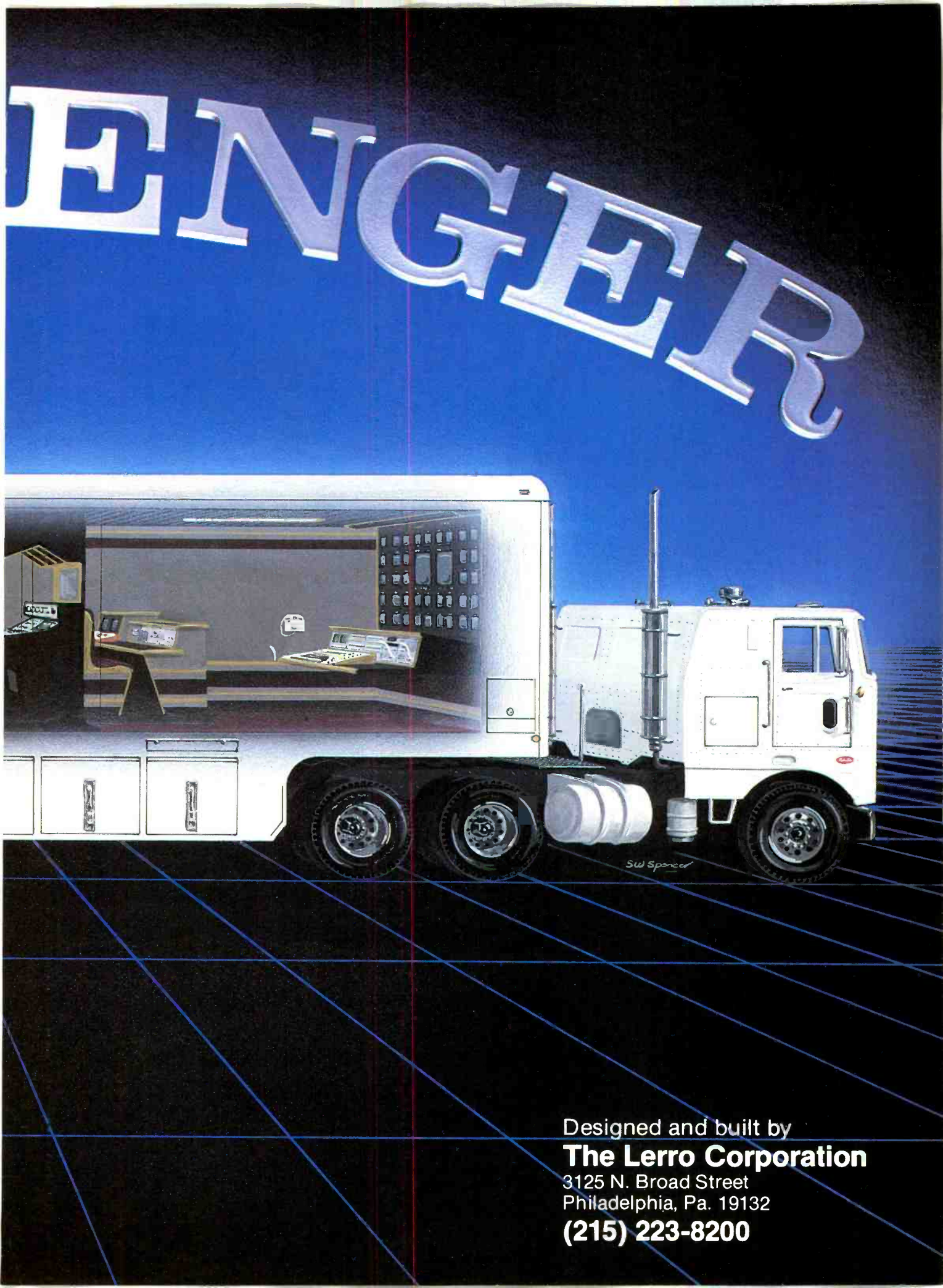

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Mobile Audio truck's control room features Panasonic video monitors and Fostex audio monitors.

Starfax clients can choose from Ikegami EC-35s and HL-79s.

"Signal processing was an unobtrusive as possible. We put a touch of compression on Jason's vocal and a gate on the drummer's vocal. Everything else was left alone. We had the Lexicon 200 digital reverb unit and it really proved itself on this one. Keven Burgart [Mobile Audio's engineer] and I programmed into memory reverb parameters we felt would suit Jason's music. When the band started a new tune, I'd listen for a few seconds, punch another reverberation register, and fade into the mix."

Of course, the truck has a busy recording schedule, using its dual Otari MTR-90 Series II microprocessor-controlled, 24-track recorders and 36-in, 24-out Sound Workshop Series 34 console, plus a BTX Softouch synchronizer.

Starfax Brings "Film Look" To Video Production

Starfax, Inc., of N. Hollywood, CA, seems to specialize in unusual jobs. Without its trucks, the company has traveled as far afield as China, for the recent PBS children's special "Big Bird in China." Closer to home, the Starfax 20-foot electronic cinematography van recently completed production of a film-style, hour-long special/pilot for Hotbound Productions entitled, "A Little Bit of Heaven."

Although the show was produced on videotape, it was shot film-style with a single Ikegami EC-35 electronic cinematography camera, chosen because its fixed focal length lenses and filters allowed the producers to achieve the "film look." The six-day shoot took place on location at the Crown Inn at Pasadena, CA, and made liberal use of Ultimatte to matte in special effects during production.

Effects also affected the choice of recording formats. According to Starfax's Belinda Merritt, the show was shot on Bosch B-format one-inch recorders because of what she describes as B's superior ruggedness in the field and in post-production, especially when effects require several generations. Final posting was performed on Type C machines, however.

GBH's converted Greyhound bus is a complete audio production and post room.

GBH's Magic Bus Captures Audio

One of the more unusual mobile facilities on the road is GBH Production's Unit 4, a converted bus capable of all phases of audio work, from live and taped production to final posting. The Boston-based bus, which serves both in-house public broadcasting projects and outside clients, recently completed the audio work for a PBS special featuring singers Tom Rush and Emmylou Harris performing from Boston's Symphony Hall. In the course of one week, the show was rehearsed, simulcast live locally, remixed, and packaged for national distribution—with all audio production and posting handled by the bus.

During the live broadcast, multiple music mixes were derived and distributed to stereo and multitrack audio master recorders (the bus carries two Otari MTR-90 24-track decks, Ampex ATRs, a custom 40 x 24 API mixing system, and a wide variety of efx). Production mixes were sent to various video machines for reference. Composite program mixes were simultaneously sent out to television air and two separate Boston market FM stations. Several backup program mixes were fed to the broadcasters in case of failure of the primary air feed.

Following the simulcast, the 24-track master tapes were locked up to a VCR and mixed to picture. The completed master audio mix was then edited and laid back onto the master videotape for national air.

NEP's SuperShooter at the Brooklyn Bridge Centennial celebration.

Fireworks Flash As NEP Celebrates The Brooklyn Bridge

Last year's celebration of the physical and symbolic link between two of the country's largest cities was carried across the nation thanks to NEP Communications' SuperShooter II. The large-scale trailer was on hand for the two-hour live broadcast of the Brooklyn Bridge Centennial, produced by local independent station WPIX-TV with the help of SuperShooter.

The truck, one of a pair operated by NEP (SuperShooter III is almost identical), shot the formal birthday celebration in its entirety, including the spectacular Grucci family fireworks, specially designed for the festivities. Millions of New Yorkers crowded the area, making maneuvering impossible, and lighting, especially of the fireworks, was difficult to control. For the shoot, the truck was equipped with five Ikegami HK-357A computerized field/studio cameras, all with Canon 40 x 1 lenses. Additional equipment included two Hitachi SK-91 handheld cameras, three Sony BVH-1100A VTRs, a Grass Valley 1600-3F switcher, Quantel DPE 5000 special effects unit, Chyron IV graphics, and Yamaha PM 2000 stereo audio console.

All Mobile Video Takes A Break For NBC Sitcom Segment

All Mobile Video, the New York City mobile production facility and post-production house, keeps itself busy with a wide range of assignments, including such diverse location shoots as the Macy's Thanksgiving Day Parage, the men's and women's surfing championships in Hawaii, boxing in San Juan (for Don King Productions), and the annual New Year's Eve extrav-

aganza in Times Square. The company's mobile unit recently completed a two-day shoot for NBC's *Gimme a Break*. The segment, which featured Nell Carter, Tony Randall, and Big Apple Mayor Edward I. Koch, took the van to famous Sardi's restaurant in Manhattan and to nearby Newark Airport. All Mobile prides itself on its versatility, and can outfit its truck to suit clients' needs with such gear as a GVG

Inside All Mobile's "Blue Cube" location truck.

1600-3D switcher, Chyron character generator, Ampex one-inch and Sony BVU ¾-inch VTRs, Ikegami HL-79 DAL cameras, and Grass Valley or Quantel digital effects units.

Bay Area Mobiletape Helps Dedicate Pipe Organ

As its name implies, Bay Area Mobiletape gets around, not just in its home region but throughout much of the west. Company president Skip Long estimates that perhaps 60 percent of the assignments for its 45-foot tractor-trailer are out of town, as far north as Portland, OR, and as far east as Dalls-Forth Worth, with frequent stops in Las Vegas. The truck stuck close to home the first week in April, however, to help San Francisco's Davies Symphony Hall inaugurate its new pipe organ, a contender for the title of largest in North America.

Local PBS station KQED-TV televised the organ's inaugural concert live from Davies Hall, with a stereo simulcast over KQED-FM. Bay Area Mobiletape handled all audio and video for the event, supplying three Ikegami HK-357 cameras with Fujinon 30:1 lenses and two Ikegami HL-79s with Canon 13:1 lenses. The two-hour show was also recorded on the truck's three Ampex VPR-2Bs. Titles and credits were produced on the Chyron IV. The

GVG 1600-3F switcher in production area of Bay Area Mobiletape truck.

truck produced both a stereo mix for the FM simulcast and a mono mix for television with its Yamaha PM-1000 32-input audio console.

While sports are the truck's bread and butter, accounting for about 80 percent of its business, entertainment gets close attention from the Bay Area Mobiletape staff. Recent shoots have included the 1984 Pasadena Rose Parage, beauty pageants, the California State Fair Opening, and the California governor's inauguration.

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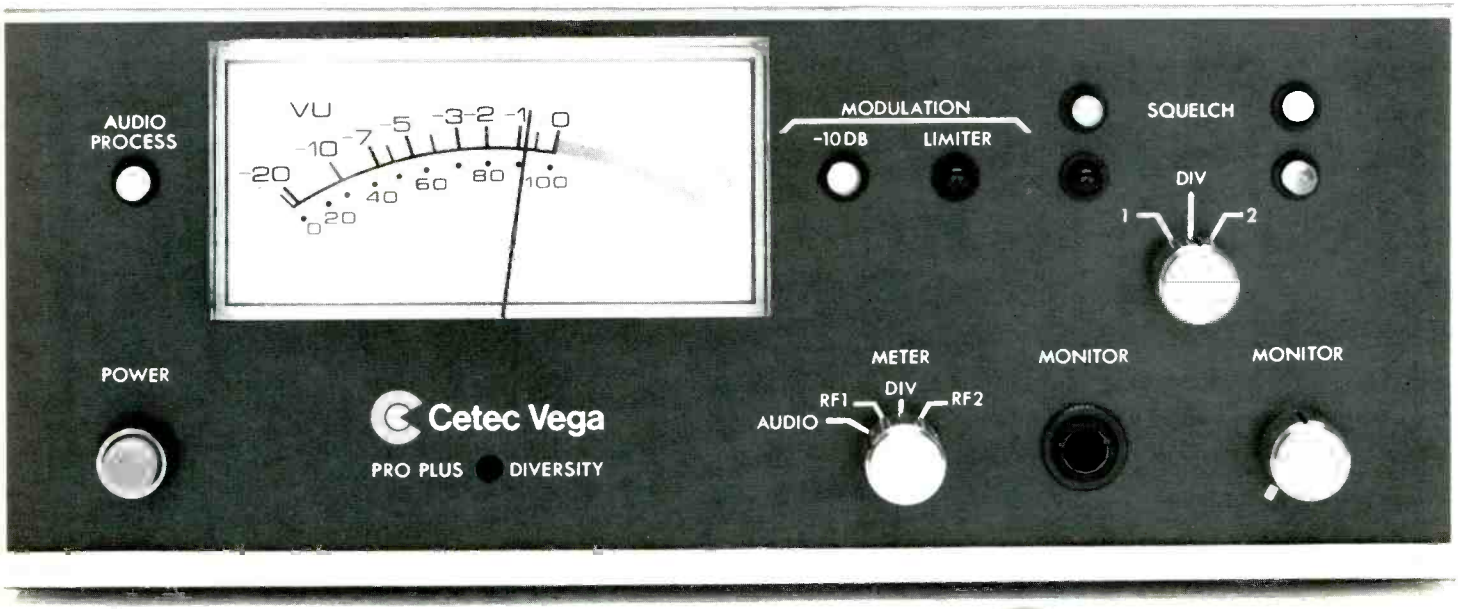

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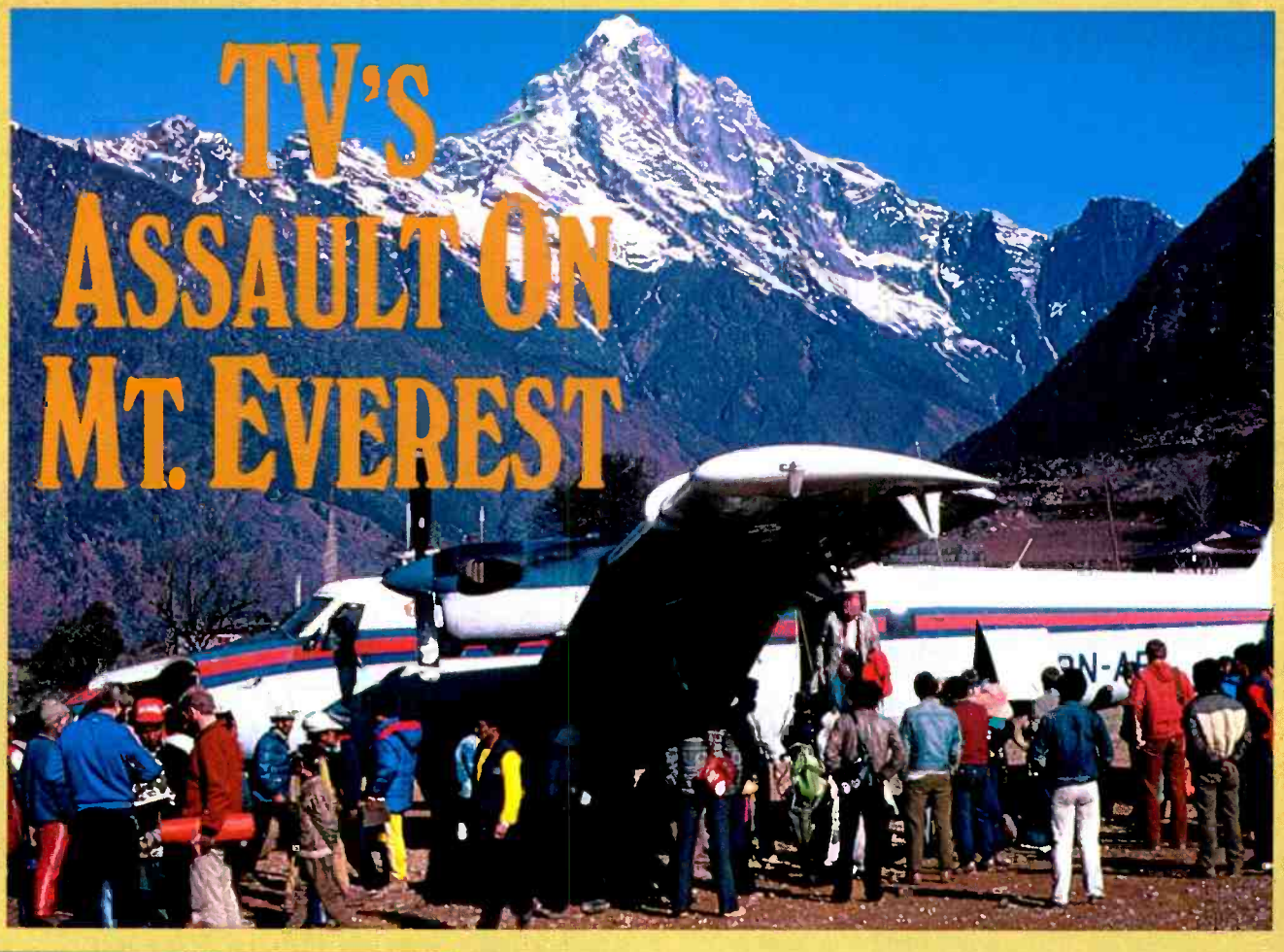
TV's Assault On Mt. Everest



1 The coming and going of this Twin Otter became a common occurance during April and May of 1983 in the small Nepalese village of Lukla. Over eight tons of climbing and camping gear were transported there from the U.S.; then, by smaller aircraft, to the foothill settlements 140 miles northeast of Katmandu. An additional ton of television gear also made its way to this middle altitude drop-off point at 9,200 ft.

By George Bell, Jr.
Associate Producer,
ABC's *The American Sportsman*

In 1953, Sir Edmund Hillary, a New Zealand bee keeper, reached the summit of Mt. Everest at 29,028 ft. Knighted for his assault on the world's highest peak, Hillary offered a black-and-white photograph of his sherpa, Tenzing, on the top as visual proof of their ascent. The frozen glimpse of that high place stirred a generation of explorers; Tenzing, planting a flag in a fierce wind, covered from head to toe in bulky, futuristic garb (like an antecedent of the astronaut age) expressed the vulnerability of human effort in remote places, and the hope that technology might expand our reach.

Thirty years later, a team of climbers returned to attempt Hillary's South Col route— by now a well-known way to the summit. ABC's *The American Sportsman* struck a deal with the Seven Summits Everest '83 Expedition to transmit video coverage of the ascent, via microwave and satellite, on a delayed broadcast to the United States. Although electronic coverage from the summit had been attempted before it had never succeeded.

The climber and cameraman selected for ABC's summit duties was 28 year old David Breashears. If he made it to the top, he would represent one end point in a complex line of support that stretched halfway around the world to another end point at ABC headquarters in New York. Ironically, Breashears' interest in climbing had been fueled many years ago when he had seen Hillary's picture of Tenzing on the summit.

With satellites in the firmament and state-of-the-art gear on the mountain, the prospect of an electronic image from the top of Everest became a symbolic and realistic goal, representing the stunning advance of broadcast technology over the past 30 years.

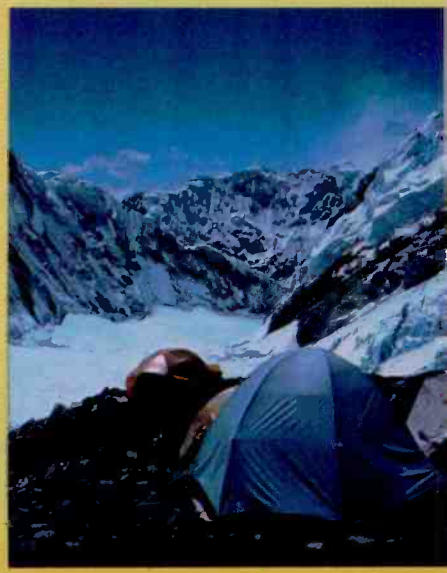
2 At Namche Bazaar, two days walk and 2000 ft. above Lukla, the gear was reorganized for a Yak train. About 100 of these shaggy beasts had been gathered at the Sirdar's (Head sherpa) house. They had descended to Namche but could go no further; Yaks suffer below 11,000 ft. A crossbreed of Yak and cattle known as a Zopkiok is often used at lower altitudes. The gear was now ready for one of two destinations: a makeshift electronic field shop in an abandoned hotel at 14,000 ft., or Base Camp at 17,500 ft.

3 It was another five days of trekking—through the alpine meadows, rainforests, and tundra plains—before part of the team arrived at Base Camp. Himalayan climbs work on a "pyramid principle." Every pound of gear needed at the summit requires a 100 pound multiple in support gear in the low camps; a similar ratio also exists for manpower. It's not surprising, therefore, that Base Camp sheltered 12 climbers, 29 high and low altitude Sherpas, a cook and four assistants, a few Sirdars, the Yak crew, and a score of runners.

4 The Expedition organizer Frank Wells looks through a 1000 mm lens, with a doubler, that allowed Base Camp cameramen to capture dramatic push-ins and pull-outs over the flanks of Everest. A few weeks later, cameraman Steven Marts, perched on Kala Patthar (a peak adjacent to Everest) would use this Recam configuration to record a shot from two miles away as the climbers struggled toward the summit.

6 After nine days of work, a path had been carved through the Khumbu. The climbers set Camp I at 19,500 ft. and Camp II at 21,500 ft. in the Western Cwm. Special barneys and heating strips, designed by Quest Systems, insulated the fully configured Recams in the −10 degree F chill above 20,000 ft. In Camp II, the transport mechanisms on the recorders revealed a propensity for freezing, and the half-inch tapes grew brittle. Breashears and Peter Pilafian, the middle attitude climber/cameraman, often warmed raw stock in their armpits when they got up.

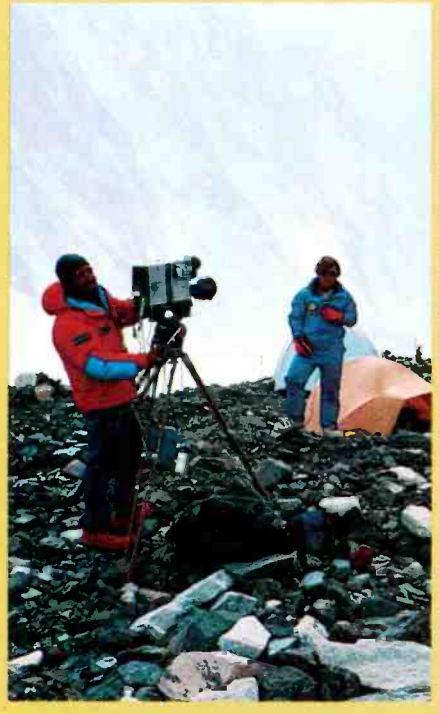
5 On the South Col Route, the most treacherous part of the climb comes first. The Khumbu Icefall is a 2000 ft. lethal ramp of glacial debris, where ice boulders of prehistoric dimensions shift with murderous ease. Charting a route through the Khumbu, small teams of climbers work in shifts to construct ladder bridges, chop ice steps, and establish fixed ropes over difficult pitches. (In 1982, three Sherpas and a cameraman were buried alive when the ice shifted during the filming of the Canadian Everest '82 Expedition.)



7 The field shop at 14,000 ft. was set up in the abandoned Everest View Hotel. Working in kerosene-heated rooms, two technicians checked tapes on Panasonic AU-300 playbacks with monitors. The tapes were shuttled off the mountain by low altitude sherpas, then taken from the Everest View by runners to the Lukla airstrip. From Lukla, the tapes were flown to Katmandu where ABC producer/director John Wilcox worked in an edit fortress of Panasonic gear. FM Communications were also handled by the field shop technicians: transmissions were accomplished regularly between Wilcox and the climbers.

8 As Wilcox assembled a working rough-cut, updated each day, Teleglobe technicians erected electronic gadgetry of their own in the Sheraton. Their earth station equipment sprawled through rooms 101 and 102; a three metre dish was secured to the roof. The signal went up to an Intersat satellite above the Indian Ocean, caromed down to Madley, England, then up again to an Atlantic Ocean satellite, down into Andover, ME, and finally traveled by landline into New York.

9 A number of people had a hand in modifying this Panasonic WV3060 that would go to the summit: Merlin Engineering, ABC Engineering lab, and the technicians at the Everest view field shop. Specially equipped with a novacon tube, the camera was stripped of its viewfinder and handle, gasketed against snow, and cloaked in a neoprene jacket. A 30 volt lithium battery, designed by Duracell, powered the small microwave transmitter and antenna; a 15 volt lithium ran the camera; a nine volt alkaline battery, which failed, was slated to support a Sony ECM microphone. These items comprised the summit unit. Total weight: 4.5 pounds.

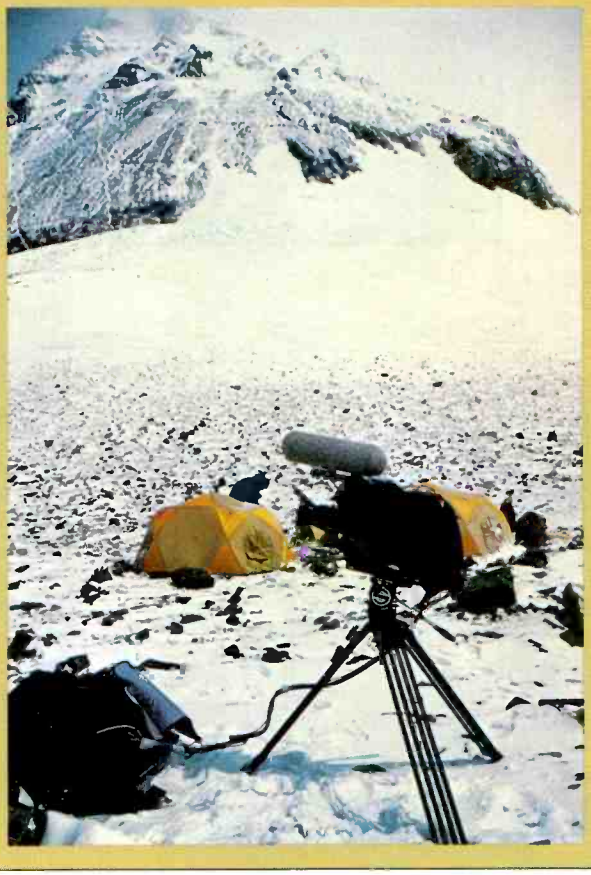


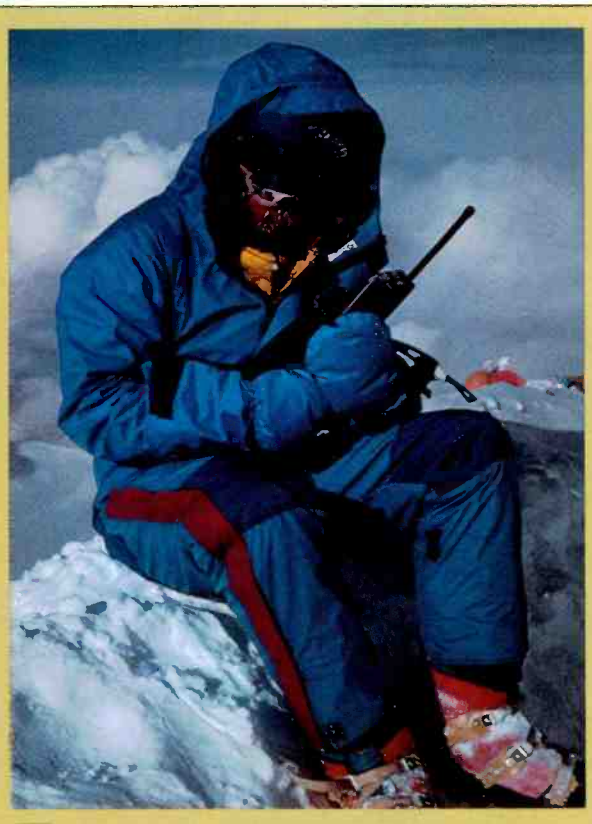
10 At Camp II, Peter Pilafian works with the Panasonic Recam in its one-piece configuration, shooting stand-ups with color commentator and climber Rick Ridgeway. Five Recams had been equipped with Saticon tubes to handle a broad color spectrum. A sixth three-tube camera was fitted with Plumbicon tubes. The vibrant picture quality increased the show's immediacy and gave it the feel of "docu-news."

11 Early on, climbing leader Phil Ershler declared that the team's objective was to place climbers on the summit, not produce a television show. ABC cameraman Breashears was not permitted to overnight in the high camps or consume its foodstocks. This forced Breashears to race dangerously between camps to record important moments. His acclimatization process was uneven and should have reduced his energy level. On the contrary, he seemed to get stronger as the climbers neared the summit. By late April, Camp III was set on the Lhoste Face at 24,000 ft.

12 Breashears gained a reputation for innovative, risky shots. Here he goes hand held over a ladder in the Khumbu (the Recam weights 22 lbs.), to convey the climber's POV over a deep crevass. All in a day's work for Breashears. In fact, the sherpas assigned to him often faded under a heavy load, or withered from a sudden change in altitude as they approached the blistering mid-day sun in the Western Cwm.

13 On May 6, tents were set in Camp IV at 26,200 ft. Average morning temperature: −20 F. Wind: 40 mpg. From this point forward, Breashears was part of the summit team. In these demanding conditions, the Recam had become an excessive burden and it was an enormous effort for Breashears to set it on a tripod.





14 May 7, 1983: climber Jerry Roach on top of the world. Despite a heavy snow storm, the team made it up, with Breashears leading the way to the summit. Almost immediately, he went to work, giving Sherpa Ang Rita the microwave transmitter and pointing him in the direction of the Everest View field shop, 14 miles away. Suddenly, the monitors in the chilly field shop lit up with crisp video from the summit.

15 Frank Wells and Seven Summits partner Dick Bass share the moment of jubilation in Camp II with commentator Rick Ridgeway. On May 15, the story of the successful climb aired as a one-hour special presentation of ABC's *The American Sportsman*. Through an incongruous meeting of ancient and modern ways in a remote country, the climb had brought the summit of Mt. Everest into the lens of an electronic age. After two years of negotiations and enormous logistical difficulties, state-of-the-art remote production techniques moved forward on the backs of a hundred yaks.

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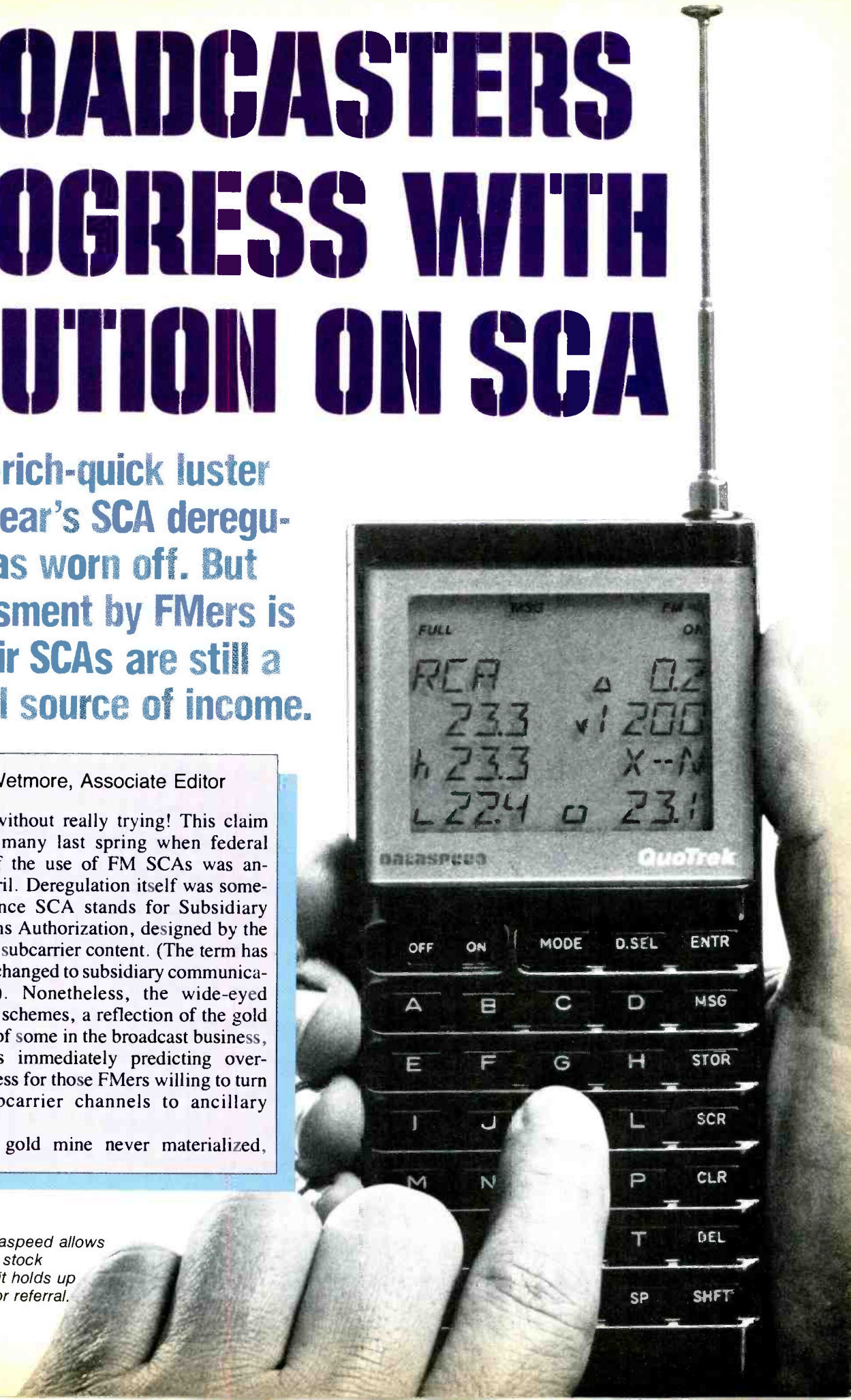
BROADCASTERS PROGRESS WITH CAUTION ON SCA

The get-rich-quick luster of last year's SCA deregulation has worn off. But reassessment by FMers is that their SCAs are still a potential source of income.

By Tim Wetmore, Associate Editor

Make money without really trying! This claim was made by many last spring when federal deregulation of the use of FM SCAs was announced in April. Deregulation itself was somewhat ironic since SCA stands for Subsidiary Communications Authorization, designed by the FCC to control subcarrier content. (The term has been officially changed to subsidiary communications services). Nonetheless, the wide-eyed money-making schemes, a reflection of the gold rush mentality of some in the broadcast business, had enthusiasts immediately predicting overwhelming success for those FMers willing to turn over their subcarrier channels to ancillary businesses.

Though the gold mine never materialized,



Quo Trek from Dataspeed allows the user to access stock quotations. The unit holds up to 40 companies for referral.

broadcasters have been left with a sense, to borrow a phrase, of cautious optimism. Such an outlook appears to be the sensible one, as new opportunities open up and as channel licensing fees level out at a reasonable rate. SCAs will allow FM radio stations—and AM and TV stations as well—to move into profit areas formerly reserved for Radio Common Carriers (RCCs) in paging, and for the Bell Operating Companies and cable stations who supplied "last mile service" for data transmission from earth stations to end users. Problems nevertheless remain, falling into three areas: legal, financial, and technical.

Legal questions

One obstacle still to be overcome before SCA use can become a complete success is the variation in state restrictions on stations' entry into SCA leasing. Some of the problems center around the fine (and sometimes indefinable) line between private and common carrier status. Other questions arise over responsibility for the contents of program material broadcast over the SCA channels.

The first legal step is to determine how much involvement the broadcaster wishes to have in a totally new financial venture. For many SCA applications, it is necessary to set up a separate company, which may mean expending as much energy, advertising, and promotional effort on the station's subcarrier as the owner would normally spend on the main channel. In fact, certain uses of SCA almost require the broadcaster to get into another business in addition to broadcasting.

For other methods of SCA use, mounting such an effort is not necessary and the station can simply lease the channel(s) out to other users. In this case, responsibility for the channel content may vary from state to state, as may the station's requirements while leasing its SCA. (The accompanying chart details the particular restrictions in individual states).

In regard to some of these restrictions, and in lieu of direct reference to individual program content, only a loose definition of the difference between private and common carrier is possible. This is unfortunate since broadcasters may inadvertently cross that fine line and become subject to areas of FCC regulations other than "normal" broadcast usage. In addition, they may fall prey to local utility commissions and various other political bodies. Still, it may be useful to review a general definition of "carrier" status.

When a station uses its SCA and wishes to remain a private carrier, it cannot connect directly to phone lines without going through the phone system, though use of time delay equipment now permits direct phone coupling. The broadcaster also cannot provide a service to the general public and can only provide a professional service to authorized users for business purposes or specific public services (for example, a reading service for the visually impaired).

Common carrier rating, on the other hand, permits both private and personal usage of the subcarrier material since such usage already falls under laws governing common carriers. What these loose definitions boil down to is that the station can, within legal limits, do anything it desires with its SCA if it is willing to answer to a different regulatory body or if it is willing to set up a separate company to lease the SCA channel(s).

SCA opportunities

After broadcasters have satisfied themselves as to where the new endeavor will land them in terms of legal postures, they can proceed to investigate the programming avenues open to the

David B. Lockton (left), chairman, and James F. West, president of Dataspeed in the firm's network control center.

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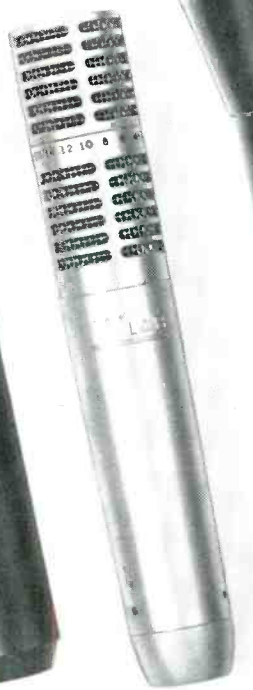
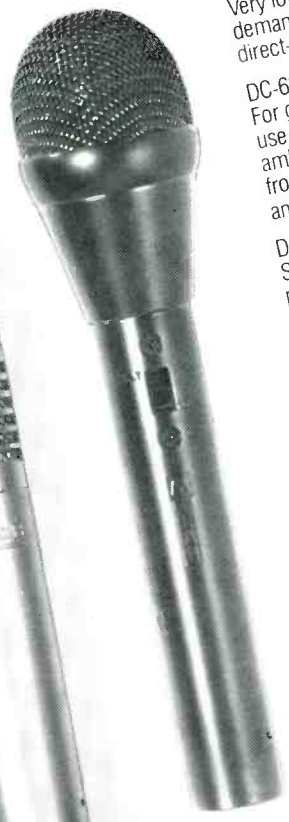

XY-82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subcarrier. Paging is a commonly discussed use for SCA, but there are many other possibilities. In addition to the ubiquitous Muzak and other background music services there are data transmission, stock quotes, slow scan video, and facsimile. And don't forget utility load management.

Let us, for the time being, forget utility load management since it places the broadcaster squarely in the lap of local utilities commissions and other government agencies. Rather, let's begin at the beginning: Muzak and other background music services.

Ken Cross, VP operations at Muzak, thinks the future of SCA is vital. "SCA is important because AT&T has filed for increases. Phone lines will become too expensive," Cross explains. "Also, because we believe in the future of SCAs, we are converting our national network of satellite antennas from four to 12-foot dishes. This will become necessary when spacing goes to two degrees and we feel like we should be up to date."

Group W's Muzak system is currently using Westar IV to service about 200 dishes that feed to their local subcarriers. The new system will use Westar V, employing some transmission via television subcarriers. The conversion at present is about 50 percent complete, using M/A-Com dishes with Wegener receiver equipment. The company has no further plans to modify the system once conversion is complete, nor does Cross plan to use more channels than he already has contracted.

While this may be true for Muzak, a long-established user of SCAs, such limited growth is not true for paging. Many hardware companies are getting involved as well, as providers of program services. One company often mentioned in this regard is Reach, Inc.

For many, the only substantial change in the FCC's deregulation of SCAs was the lifting of the previous restriction on broadcast-related services, allowing the use of any selective signal on the subcarrier. Enter paging. Enter Reach. This company is in the process of setting up a national network of mobile pagers using FM subcarriers as its transmission medium.

To belong to the national network, a station must become an affiliate. Required equipment purchases include an SCA generator operating at 92 kHz (67 kHz can be reserved for the broadcaster's own use); an amplitude compression limiter; and a Reachcast Terminal (these terminals have a range of service from 100 users to 10,000). The terminal interfaces the pager with the phone system. An additional cost is an affiliate fee ranging from $6000 to $35,000, based on market size.

The system has several configurations, implemented in different phases, and all going through the computer (Comterm hardware, using proprietary software) in the Reach headquarters in Lincoln, NE. The system in Phase 1 included 30 cities using the end-to-end signalling. With this setup, also called end-to-end dialing, every pager is on the same phone number; after dialing, the caller receives a beep and dials in the special page number for the person to be contacted.

This differs sharply from what the company is striving to achieve with the system in July of this year. By that time the company hopes to have realized its nationwide service using frequency-agile receivers and satellite delivery to individual stations. In this scenario, an individual customer within the system has a frequency-agile receiver that scans for the strongest signal as the traveler moves through a corridor of af-

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filiate stations. The receiver will draw in the strongest signal and relay the page. Any station along the corridor whose transmitter is switched on for this purpose will be paid. Every time the transmitter keys up, the main computer registers the fact and keeps a running account. The station will then receive a percentage of the final cost of the service to the customer.

A station stands to make money in this endeavor by selling time on the paging network to customers as well as selling or leasing the pagers themselves. The station management must decide how much effort to put into the new business and exactly how to arrange the financial structure to avoid any legal difficulties, determined on a state-by-state basis.

Cont. on pg. 64

SCA PAGING LAWS AND REGULATIONS [1]

	Open Entry	Restrictive	Exclusionary
Alabama			✓
Alaska		✓	
Arizona	✓		
Arkansas	✓		
California		✓	
Colorado			✓
Connecticut	✓		
Delaware		✓	
District of Columbia	✓		
Florida	✓		
Georgia			✓
Hawaii		✓	
Idaho	✓		
Illinois	✓		
Indiana		✓	
Iowa	✓		
Kansas		✓ [2]	
Kentucky		✓	
Louisiana			✓
Maine	✓		
Maryland			✓
Massachusetts		✓	
Michigan	✓		
Minnesota		✓	
Mississippi		✓	
Missouri		✓ [3]	
Montana	✓		
Nebraska			✓ [4]
Nevada		✓	
New Hampshire	✓		
New Jersey	✓		
New Mexico			✓ [5]
New York	✓		
North Carolina			✓
North Dakota	✓		
Ohio	✓		
Oklahoma			✓
Oregon	✓		
Pennsylvania		✓	
Rhode Island	✓		
South Carolina		✓	
South Dakota			✓ [6]
Tennessee			✓
Texas	✓		
Utah	✓ [7]		
Vermont	✓		
Virginia			✓
Washington	✓		
West Virginia		✓	
Wisconsin	✓		
Wyoming		✓	

1 This table classifies each state a s to how it treats new paging facilities. States in the "Exclusionary" category only permit new facilities on a showing of need for the service and that any established service cannot or will not meet the need. Such a showing is nearly impossible to meet. The "Restrictive" category includes states which merely require a new service to show public need. This showing may then be refuted by established paging operators. While theoretically "Restrictive" regulations impose less of a burden than "Exclusionary" ones, they can be just as difficult to meet depending on how great of a need showing is required. Finally, states classified as "Open Entry" place few or no restrictions on new paging facilities.

2 The Kansas Corporation Commission has initiated a proceeding to examine whether existing entry barriers are justified. A hearing was set for late January, 1984.

3 The Missouri Public Service Commission has issued an order stating that it believes it will be necessary to relax requirements applied in examining applications for authority to provide paging service.

4 A Governor's task force has recommended tihe complete deregulation of all radio common carriers. Deregulation legislation is expected to be introduced in early 1984.

5 The New Mexico State Corporation Commission has a proceeding in progress to determine whether it has jurisdiction over paging. A hearing on the matter was to be held in January, 1984.

6 A contested proceeding is in progress to determine whether the South Dakota Public Utilities Commission is statutorily required to impose an exclusionary regulatory approach. The Commission's initial decision was that State law does require such regulation. The matter is under appeal to the state courts.

7 The Utah Public Service Commission has issued an order stating it does not have jurisdiction over paging. An appeal is expected.

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5. User-friendly.
6. Quick response to customer's problems.

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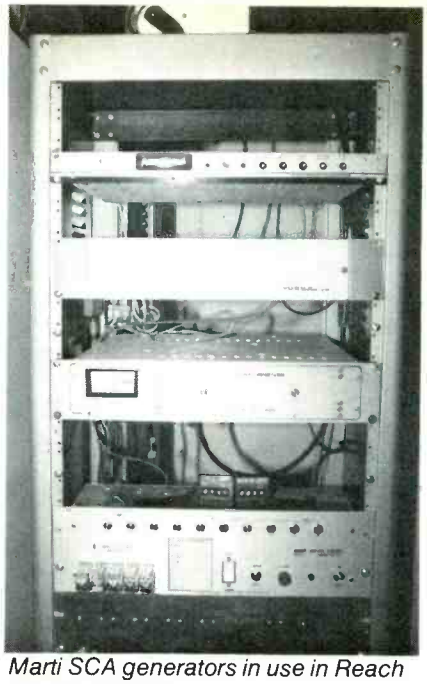
Other SCA possibilities

Broadcasters who may be reluctant to jump into an unfamiliar area like paging—that would appear to demand too much time and effort, perhaps detracting from basic main channel programming—still have other possibilities to consider. An easy way of capitalizing on the subcarrier's capabilities for supplemental income is simply to lease out one or more of the subcarrier channels on a monthly basis. Possible uses might include data transmission, slow scan video, or facsimile. Other projects have been launched for downloading of software to different customers and, for many years now, the use of SCAs for utility load management.

Some current SCA schemes propose to permit up to five channels of subcarrier broadcasting in addition to the main channel. One ambitious proposal is that of Comuni-Quik Corp., which uses McMartin's Super S transmitting system to allow up to five data channels on the subcarrier. The equipment will be bartered to stations in exchange for use, by Comuni-Quik, of some of the five channels. Comuni-Quik plans a nationwide network of 200 or more FM stations in the top 200 markets, with McMartin performing the hookups.

If it succeeds, such an arrangement will have an impact on the pricing of subchannel leasing costs. It is predicted by some that in the top markets channel leasing may run as high as $6000 or $7000 a month—perhaps up to $10,000 per month in the largest markets. In small markets, on the other hand, it could go as low as a few hundred dollars per month. While these figures are not standards to rely on, they do constitute a general consensus by those in the industry.

One system that is already underway is that operated by DataSpeed, which sends out stock quotations using Quotrek, a technology incorporating a portable receiver with two-way communication. The company's digital data compression, uplinking, and downlinking facilities are based in Burlingame, CA, and handled primarily by Equatorial Communications. Quotrek is currently operating at a 4800 baud rate and should be moved up to 9600 some time soon. The portable Quotrek unit is frequency-agile with LCD readouts and can store up to 40 stock symbols in its memory. The user needs only to enter into the unit the symbols for the desired stock quote and the unit will display the latest transmission it has received for that stock. There is enough room in the memory for a



Marti SCA generators in use in Reach paging network.

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forty-first stock as a last-minute addition to the overall menu.

Tapping raw data from the stock exchanges, the system uplinks them to Burlingame where the information is formatted and sent back out over the system for regular updates. DataSpeed uses the Satcom II satellite to transmit to participating stations and pays a flat fee to the broadcaster, plus a bonus in certain circumstances. The primary frequency for Quotrek is 67 kHz, but DataSpeed requires the right of first refusal on a station's 92 kHz channel as well.

These are not the only uses DataSpeed has in mind for FM SCAs. A new system soon to be in full swing will be Informa, an electronic mail and information system. Also in the works is Modio, a radio modem hooked to a personal computer peripheral which has a receiver. The unit plugs into a wall, has an outboard floppy disk, and the computer keyboard controls access to a financial data base.

Modulation Deviation Increased For FM SCAs

On April 7, 1983, the FCC amended Parts 2 and 73, authorizing FM subchannels to be used for both broadcast and non-broadcast services. Other restrictions removed expanded the usable channel baseband to permit instantaneous sidebands up to 99 kHz, and eliminated time restrictions and the restriction that subchannels had to be frequency modulated.

One restriction which was maintained in the 1983 ruling was a maximum modulation level of 100 percent for those stations using their SCAs. Fortunately for FMers, this restriction has now been amended. As of March 29, 1984, in an action on the Second Report and Order, the maximum modulation deviation is now 110 percent.

A problem still exists with this level, though. Until negotiations with Mexico are complete, FM licensees within 100 miles of the border are limited to 75 kHz and peak modulation not exceeding 100 percent.

With the Commission having realized that such increases in modulation levels can be operated without degradation to the main channel and without adversely affecting short spaced stations, broadcasters can put their efforts in the SCA department in high gear.

Other services combining SCAs and computers are provided by National Information Utilities of Washington, DC. Formerly, NIU had an agreement with NPR to uplink to the public radio member stations. In December 1983, after the joint venture failed to get off the ground, the partnership was dissoved.

Since that time, NIU has been developing further its hardware and software to uplink to other FMs for SCA use. Paul Geffert, senior VP at NIU, states, "We have since tested successfully all our equipment and will be in full operation sometime this summer."

The service being launched by NIU this summer will be the downloading of computer software to schools and businesses via FM subcarriers. Most of the information, in the case of schools, will be software delivered to the various school systems' computers, perhaps originating at school boards and government agencies or other central information locations.

"Eventually," says Geffert, "we will be involved with delivery of software to consumers, but until that opens up we will be concentrating on delivery of courseware to schools and software to government agencies." To do that, NIU will pay a set fee for the use of a station's SCA on a monthly basis, with a percentage of profits from the sale of software and courseware.

The revenue is generated by charging the schools a fee to receive the information. Determination of who is receiving transmission (at a baud rate of 9600) will be accomplished by the NIU computers, which, in conjunction with all member institutions, allow addressability to the school computers along with monitoring as to which location is receiving what information. "We see this as a very new technology," allows Geffert, "but there is a real commercial advantage though it may take until 1985 for us to realize that advantage."

Alternative data uses

In addition to the standard data uses and software delivery systems, a few new systems incorporating subcarrier use have recently been announced. Though it had been rumored to have begun for some time, the Mutual Broadcasting System's MultiCom was just switched on after March 19, 1984. Now operating with three stations, MultiCom is set up as a data delivery system for the distributor network of Amway, the Mutual parent company.

The broadcasting arm uses its satellite system capabilities to deliver information to the regional centers, coupling into the local SCAs in each town. Each site has an SCA controller using hardware developed by Mutual.

The Reach paging device.

Gene Swanzy, Mutual's senior VP of broadcast and communications services, reveals, "We can do voice and data alternately with all signals running through a master control, computerized switching system. Statitrol, a company in Denver owned by Amway, is assisting in the development of the microprocessor-controlled switching boxes." From this base, Mutual is thinking about becoming an information provider and distribution center.

Swanzy claims, "We are talking to companies about delivering information to other branches of their companies or delivering information from these companies to consumers. We think this will be an area opening up soon and will, in fact, be a future necessity for some companies."

An SCA network whose future looks bright and whose past has shown healthy growth for several years now is the Physicians Radio Network (PRN). Broadcasting to 40 cities, 37 of which are in the top 40 markets, the network pays approximately $2000 per month for a subcarrier lease and sells advertising time to pharmaceutical companies and other businesses selling products and equipment to physicians.

A current development, similar in nature to PRN, is the proposed Lawyers Radio Network (LRN). Potentially international in scope, this SCA service will transmit recent legal news to subscribers. The plan calls for the production of 24 hours of tape each week, categorized by specialty, and the provisions of receivers to subscribers. The network also projects a data service, live call-in and news programming,

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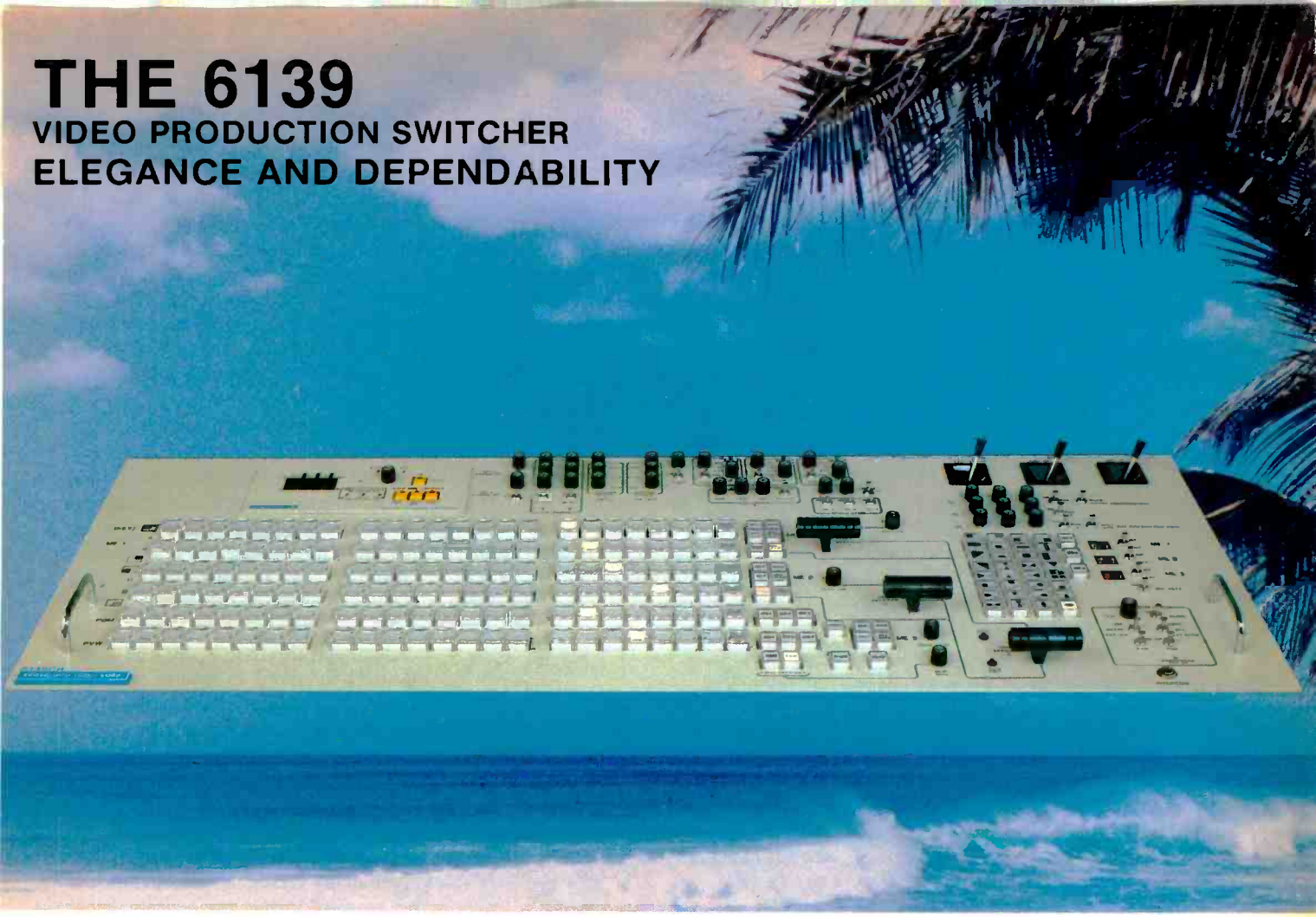

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and seminar programming as well as limited advertising time and recorded tape sales. There is some discussion at this point that LRN may become a part of the Comuni-Quik network.

Video on radio

A technology that has existed for some time and has recently received more attention is slow-scan video transmitted over an FM subcarrier channel. As a means of local area coverage, narrowband video signals may be broadcast using either 67 kHz or 90 kHz subcarrier channels. This type of broadcasting, exemplified by the Colorado Video system, is based on the digital conversion of conventional television signals by use of a scan-converter. This unit accepts a standard, wideband video signal, freezes a single image and, on command, generates a new video signal of the desired bandwidth or, in the case of SCAs, data rate. Both digital and analog types of transmission are available, as are options in transmission rates and resolution.

The receiving location for the picture uses a simple scan converter to reconvert the signal to standard television rates for viewing on ordinary monitors or TV sets. Direct modulation of the subcarrier by the video signal is recommended for the sake of efficiency, but very low frequency response is required in both modulator and receiver in such cases. Related audio program material may be transmitted on a second subcarrier, with receiver costs being approximately the same as for normal SCA installations.

Several slow scan systems transmitted via SCAs are now in use for delivery of still images to educational institutions, for catalog services, "storecasting" with pictures, advertising, teleconferencing, and for corporate instruction and information distribution. Again, there are two ways to go about the business of using this technology for SCAs. Broadcasters can choose either to lease out the subcarrier on a monthly basis to those involved in slow scan productions, or to get involved themselves with the complete operation.

Obviously, the variety of services available through SCAs, from slow scan video to data transmission, provides the broadcaster with many versatile choices on ways to make money. Yet, the possibilities do not stop there and actually more options continue to appear.

Technical questions

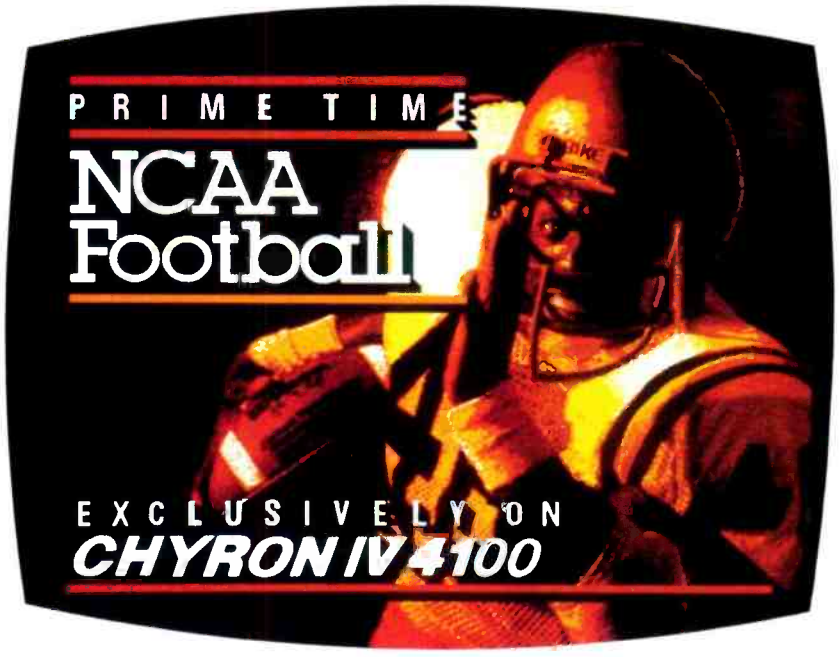
A recent NAB filing concerning AM subchannel use raises a number of significant technical questions. The filing was an attempt to get the FCC to preempt any state-level regulations restricting broadcasters' entry into businesses using SCA capabilities. This is particularly true, as it is with FM SCAs, in regard to paging applications.

NAB engineer Michael Rau states the technical case in this way: "We referred to it as subchannels, not subcarriers or SCAs, because of the low data rate. In addition, there has been some concern about interference with AM stereo transmission if the station uses its subchannels. There is concern that pilot tones in the stereo transmitters can cause problems with the receivers for AM subchannels. This is a legitimate concern, but if the subchannel is matched to the AM audio channels to avoid interference there may be no ill effects. This is unlike FM SCA, which can use any subcarrier frequency without any harmful side effect." Though this is the general consensus among knowledgeable engineers, much confusion remains.

Of course, FM subcarrier use still involves many technical considerations. The answers to the engineering questions are easier for the broadcaster to pin down than those to the legal and financially related problems, however. Purchasing of SCA equipment is being made increasingly simple by the improved quality of many SCA systems, by the limited amount of extra equipment required to set up a subcarrier, and by the recent advent of units combining all the separate elements into a single system.

According to Eric Small, vice president of engineering at Modulation Sciences, only four elements are required to add the SCA. "You need an SCA generator, an audio processor, a modulation monitor, and a properly tuned transmitter, a factor which most stations overlook," Small says. "In fact, to have a properly working SCA the audio processor, the modulation monitor, and the SCA generator need to be designed especially to work together. The alternative is to buy a combined system integrating all the functions into one box and to tune the transmitter properly."

In addition, with the opening up of the baseband for subcarriers to 99 kHz, and since there is no channelization of the SCA spectrum, just about anything can be done from 53 to 99 kHz as long



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as the process does not interfere with the main channel and the SCA modulation does not exceed 20 percent. "That entire 46 kHz spectrum," notes Small, "can be filled with one subcarrier to provide a channel nearly equal in quality to monaural FM and with companding it can be even better. Among other alternatives is to put a few dozen narrow-deviation teleprinter channels in the spectrum."

So the engineering requirements are not restrictive and the equipment investment, in view of the return for subcarrier projects, is quite modest. The remaining technical question, which has been quarreled over from the beginning of SCA use, is the overall effect on the main channel.

Two questions arise when discussing the effects of subcarriers on main channels. The first is concern that the SCA will produce "birdies" in the main channel, especially with stereo. This problem has been virtually eliminated since the advent more than 10 years ago of the phase locked loop IC stereo decoder in stereo receiver design. The chip decodes stereo without tuned circuits, and its inherent quadrature rejection supresses SCA interference by 40 dB. The result is no more "birdies."

The second question is whether adding an SCA will significantly reduce the coverage area of the main channel. After initial concern that the subcarrier would drastically limit main channel coverage, a backlash formed, of the opinion that there was absolutely no coverage reduction. Neither is true. There is a reduction in area coverage, though quite minimal. In fact, switching the main channel from mono to stereo produces a much greater S/N reduction than does adding a subcarrier. A single subcarrier channel will result in an S/N reduction of only 1 dB.

The one aspect of SCA that may affect main channel operation is the reduction in modulation that currently accompanies SCA operation. According to the SCA handbook produced by Eric Small, the original FCC notice of proposed rulemaking was intended to allow modulation greater than 100 pecent. This was based on the fact that the station could compensate for the modulation applied to one or two SCAs by increasing total modulation to 115 percent. No action was taken in the first Report and Order, but action was anticipated for the second Report and Order [see accompanying sidebar]. Meanwhile, Small writes, a station will have to give up 1 dB of modulation for each SCA. How serious 1 or 3 dB is depends on the market, format, and competitive position. Small suggests that it may be useful to put attenuators in the program line and listen to what the loss in modulation sounds like.

Tough choices

The technical questions having been largely answered, the broadcaster is left with the tough choices: legal and financial. How will any subcarrier activity affect his legal position? How will the subcarrier endeavors produce revenue? If and when they do, how much effort will have to be expended on an ancillary business for the broadcaster to realize his full revenue potential? The answers are not easily forthcoming and, in fact, vary from station to station, from market to market, and from business to business.

Two things, however, are definite. One is that SCA use is not a get-rich-quick scheme. The other is that with care and effort, broadcasters can make use of their subcarriers to increase revenues. **BM/E**

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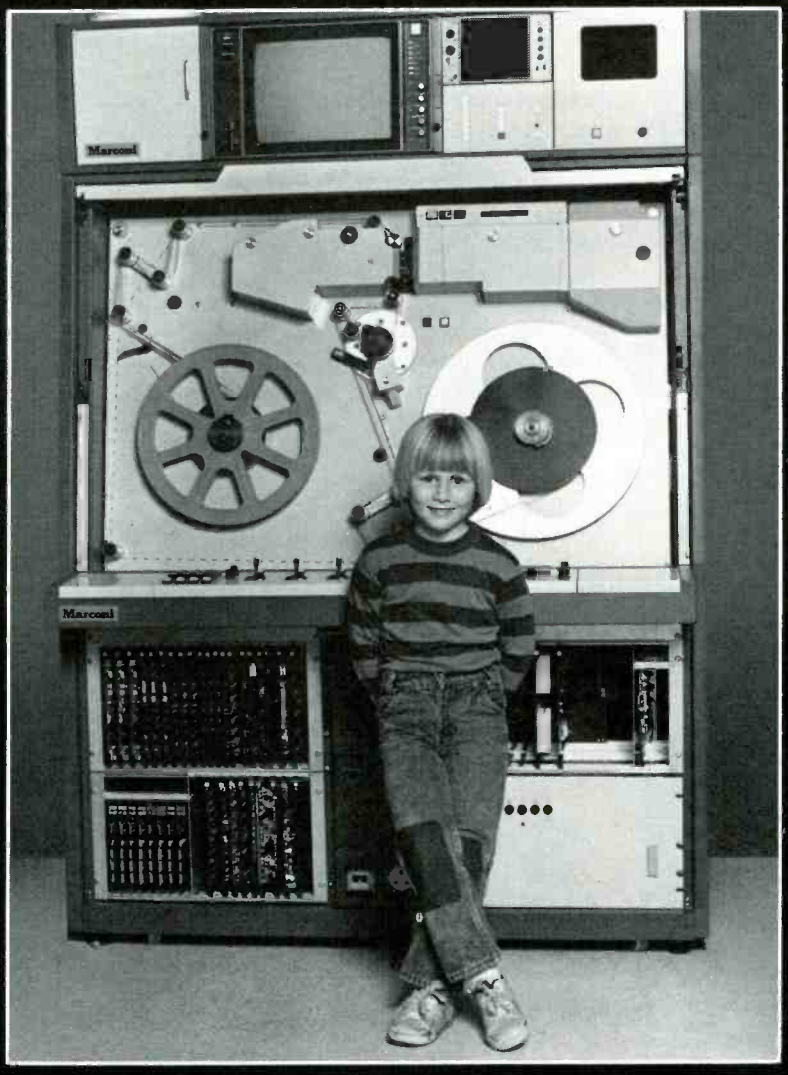

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Flexible Field Communications

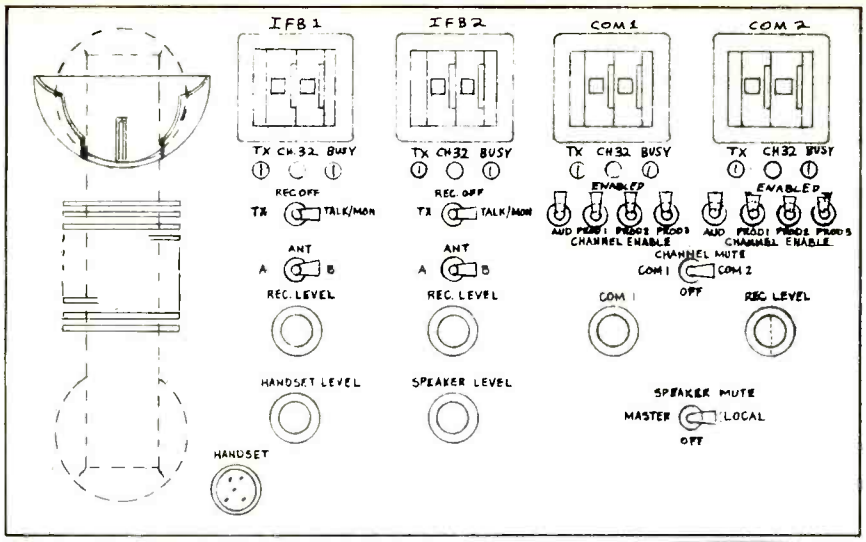
For EFP operations at the Summer Olympics, ABC got a state of the art communications system as agile as the athletes themselves.

By Harold Robbins
and Marc Wiskoff

While Southern California girds for what are expected to be massive traffic jams during the Summer Olympics, ABC is preparing to deal with another kind of traffic problem in remote pick up frequencies. Essentially, the problem is a shortage of remote pick up frequencies, especially for mobile operations.

The FCC defines a broadcaster operating outside its primary operating location as a secondary user, which means that the visiting broadcaster may have to share a channel on a secondary basis, apply for an STA on an unused channel if one exists, or risk getting shut out of any channel use. If you can get an STA or arrange to use an existing channel temporarily, the proper channel elements must be ordered as far in advance as possible and the anxiety-raising possibilities of something going wrong are ever-present. A better approach is to provide your field personnel with a communications system that is not only frequency agile, but field programmable and at the same time controllable.

Harold Robbins *is manager of RF Maintenance Operations for ABC and* **Marc Wiskoff** *is District Manager for special market applications for Motorola Communications & Electronic, Inc.*



This drawing shows the placement of the controls on the main control panel in the ABC truck. Note location of the handset on the left.

A basic ingredient of the mobile van communications system is the Motorola MCX 100 mobile radio.

The Olympics Challenge

In preparation for its extensive Olympics coverage, ABC contacted Motorola to design just such a state-of-the-art communications system for its Field Operations trucks. As the network outlined it, the system should be completely synthesized, capable of operating in a continuous duty mode for IFB and in an intermittent mode for two-way communications. In addition, provision should be made for selectable high or low power at a local control console. Finally, the system should allow the operator the flexibility of transmitting in either VHF or UHF and, if necessary, use both bands simultaneously without any degradation of operating specifications.

In response to these requirements, Motorola proposed the MCX100 mobile radio to provide both continuous duty operations for IFB and intermittent duty for two-way communications. This new mobile radio is synthesized and is available in both VHF and UHF so IFB and two-way systems can both be accommodated. In addition, the two-way system is complemented by synthesized handheld MX300 units with 48 channel capability. The receiving end of the IFM system includes monitor receivers (single channel units) which can be clipped on to the belt buckle of field personnel.

While Motorola was to supply the RF hardware for the project, Circuit Development Co. was to design, engineer, and fabricate the entire system. This task included both circuit design and electromechanical layout as well as testing the completed design.

The Van System

The Van RF Communications System (VCS) consists of four 32-frequency synthesized transceivers—two dedicated to IFB use and two for communications (COMM) housed in a main system rack with interference, audio, control circuitry, and power supplies. The rack provides audio and control connections for one main system control panel and up to three other similar sets of connections. These connections can operate with existing van audio and control circuits or with auxiliary control panels at various production positions.

The main control panel allows the audio operator complete access and control of the four transceivers. As a result, the audio operator can talk out or receive and select any frequency for which the transceivers have been programmed. The operator may assign either or both of the two selected COMM channels to production operators at the auxiliary panels or to predesignated audio and conrol circuits of the van audio system. With the van audio system as the modulation source, the remaining two IFB transceivers can be locked in a continuous transmit mode at the main control panel. The operator can talk out on either system with a telephone handset if need be. It is possible to select remotely either of two antennas for each of the IFB transceivers from the main control panel. A 15 dB, RF power attenuator is incorporated in the antenna circuits of the IFB transceivers during transmit and can be programmed to switch out when high power operation is required on certain channel frequencies.

Main Control Panel

The main VCS control panel consists of a housing and panel assembly flush mounted to the van interior walls or panels. A dynamic telephone-type handset provides for operator talk out and reception. There is also an integral front-mounted speaker within the panel, and a hangup cradle switch provides automatic speaker cutoff.

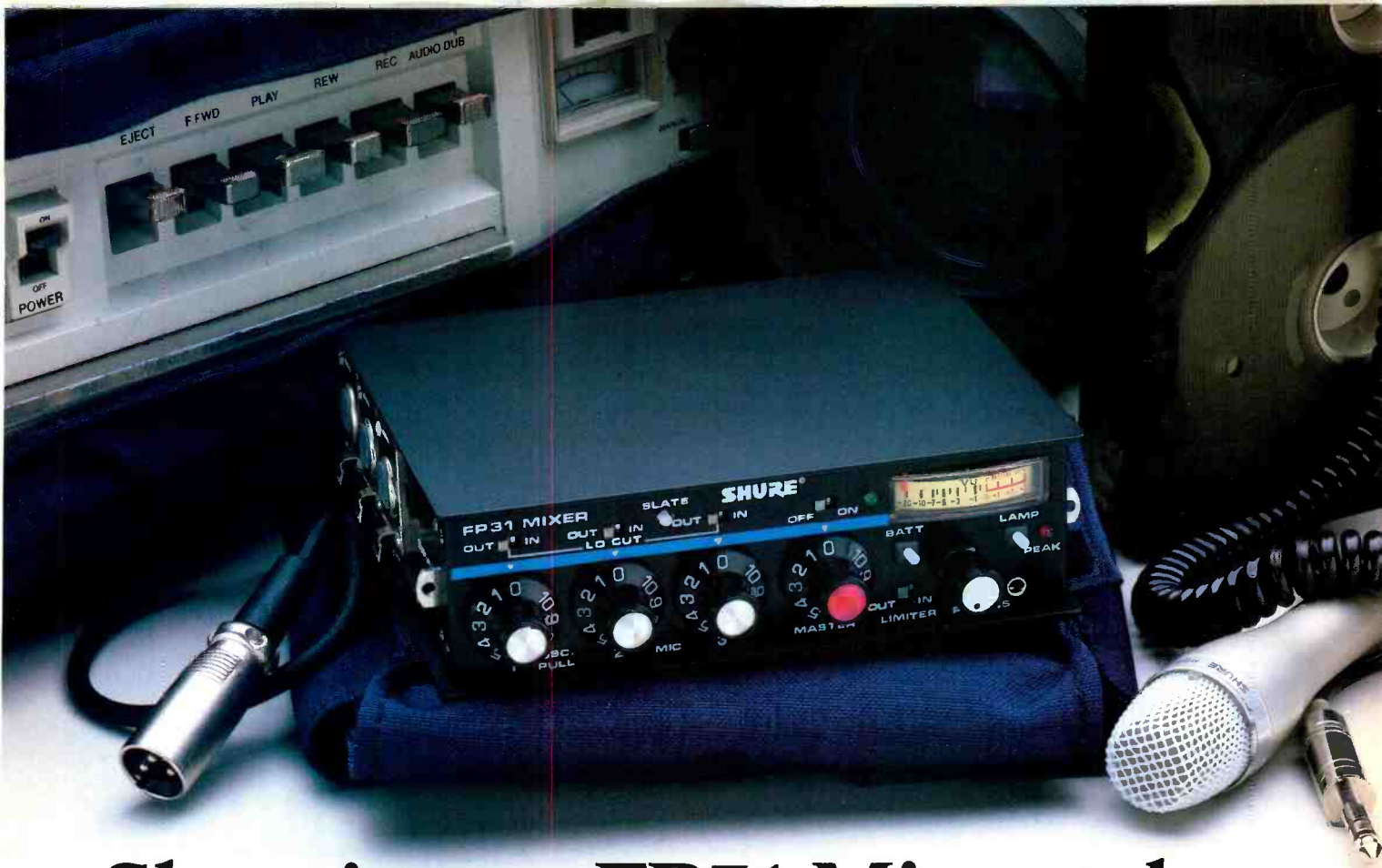
Here are the controls and indicators on the panel:

* Frequency Selectors. Four two-position thumbwheel switches designated IFB1, IFB2, COMM1, and COMM2 select frequencies 01 through 32 inclusive. The switch setting 00 and 33 through 39 also may be used to select frequency 32.

* Position Enabling—COMM channels. Four toggle switches for each of the two COMM channels enable PTT control to and from one to four control position combinations, designated Audio, Prod 1, Prod 2 and Prod 3. Production positions may be auxiliary control panels or high level input and output audio feeds.

The audio switch for each COMM channel has three positions. The "center" position disables that channel from its respective control. The "up" position enables that position. The "down" position is a momentary spring return that disables the tone squelch of the respective transceiver to monitor that channel prior to transmit. The three producton switches have two positions—the "up" position enables that channel and the "down" position disables that channel. When more than one channel is enabled for a position, the transmissions occur simultaneously on both channels from that position. Reception is also simultaneous, with the audio arriving at the speaker and handset having been mixed prior to the audio power amplifier stages.

* Channel Enabling—IFB Channels. There is one three-position toggle switch for each of the two IFB channels. The "center" position disables the respective receiver and transmitter. The "left" position keys the transmitter PTT and enables the external audio



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The FP31 can be powered by two internal 9-volt batteries, or from an external 12-volt source. A green LED flashes to remind you that the mixer is on. Phantom and A-B power are also provided to operate lavalier and shotgun microphones.

A slate tone can be laid down on the tape for locating specific takes, and there's also a built-in mic for voice slating.

The mixer also has two separate mic/line outputs for 2-camera shoots and a tape output to feed a cassette. For monitoring, there are two stereo headphone jacks—one $\frac{1}{4}$-inch and one for miniplugs. The FP31's rugged nylon carrying case allows you easy access to every mixer function and lets you piggyback the mixer on your VCR or other equipment.

For ENG, EFP and film use, Shure's FP31 has everything you need to make your mix a perfect success. Coming from a mixer this small, that's quite an accomplishment.

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Equipping the Main System Rack

The equipment rack for the field operations truck can be installed in one double door cabinet presently housing one of the three exisitng van communcation system transceivers. The rack contains the following:

1. Four 32-channel synthesized customer supplied mobile transceiver units, each contained in separate filtered, RFI shielded enclosures.
2. A fan ventilation system consisting of a blower and manifold to maintain air flow over the power amplifier heat fins on the four transceivers.
3. Plug-in, front accessible circuit cards for audio input, output, control switching, and logic circuits.
4. Antenna outputs for the two COMM transceivers directly wired to front-mounted antenna connectors.
5. Antenna outputs for each of the two IFB transceivers feed through a 15 dB power attenuator which can be automatically switched out by means of coaxial type antenna relays during receive and high power operation on specific channels. The output of each attenuator/relay feeds the common ports of a single pole, double throw antenna selector relay which in turn feeds a front-mounted antenna.
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input circuit. The "right" position unkeys the PTT, and enables the handset PTT switch and disables the tone squelch for channel monitor purposes. Activation of the handset PTT switch permits the main console operator to talk out on either or both of the IFB channels while providing priority override of any COMM channels.

* Antenna Switch. Each IFB channel transceiver can be switched via a coaxial relay in the main rack to one of two antenna ports. This switch, designated "A" or "B" operates this relay.

* Receiver Level. Each of the four system receiver audio inputs to the main panel are mixed prior to the

speaker and handset earpiece amplifiers. The receive level pots conrol the amount and proportion of audio reaching the mixer. These controls affect only the audio heard at the particular position.

* Channel Mute Switch. Each of the two COMM channels has a three-position toggle switch that attenuate the receive audio level of either channel by a preset amount adjustable from 0 to 20 dB. The "left" position designated Comm 1 attenuates Comm 1 audio. The "right" position designated Comm 2 attenuates Comm 2 audio. The "center" position designated "off" switches out the preset attenuator.

* Speaker Level. This pot adjusts the audio level reaching only the speaker.

* Handset Level. This pot adjusts the audio level reaching only the handset earpiece.

* Speaker Mute. This three-position toggle switch is designated from left to right—master, off, local. In the "off" position the speaker audio is present with the handset on or off the hookswitch. In the "local" position the speaker will mute whenever the handset at that position is off the hookswitch. In the "master" position, the speaker will mute whenever any handset is off the hookswitch.

* TX Indicator. Each of the four transmit channels has a red LED. All indicators for a particular channel will light at all positions whenever that transmitter is activated.

* Channel 32 Indicator. Under each channel frequency selector switch is a yellow LED designated Ch. 32. If any of these switches are set to 00 or 33 through 39, channel 32 will be selected and the LED will light.

* Busy Indicator. Also under each channel frequency selector switch is a green LED designated "busy." Whenever a properly tone-coded signal is received on that channel the LED will light at all positions.

Production Control Panel

The production or auxiliary panel provides the operator handset and speaker access to either or both COMM channels. The production operator, however, does not have the capability of selecting either channel or frequency. The production operator talks out and receives on either or both channels designated by the main operator.

Nevertheless, the production operator has full receiver audio control over the assigned channels by using the individual channel receive level pots or the channel mute switch. **BM/E**

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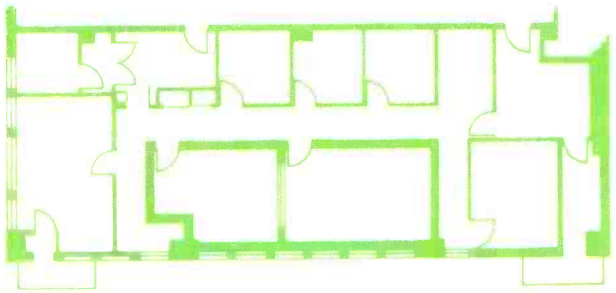
PART 13



DESIGNING A MOBILE PRODUCTION UNIT

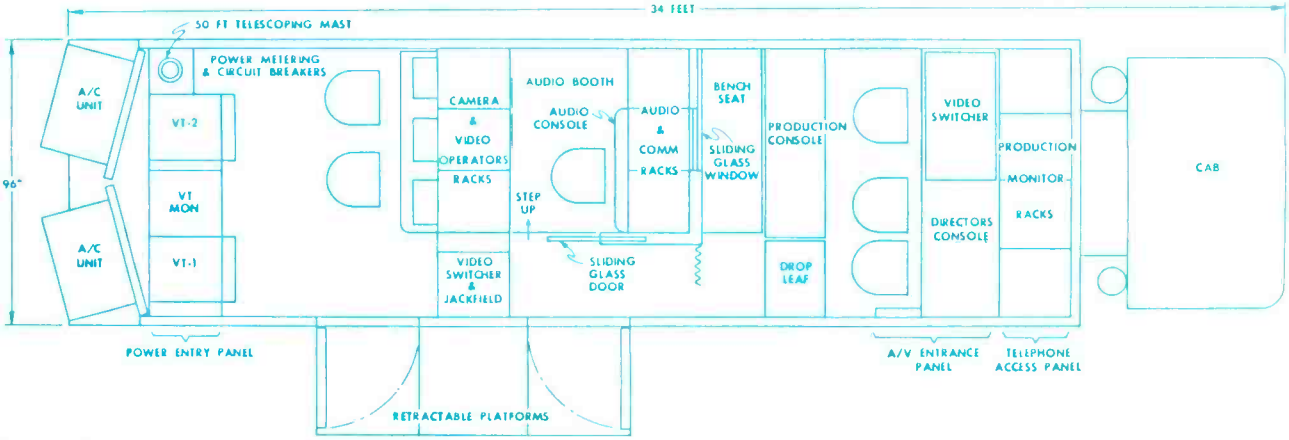
BY TOM CANAVAN

Although there has been a revolution in both the size and the capabilities of virtually every piece of electronic equipment used in television production, there remain two very key areas where no major breakthroughs have, or are likely to take place. The size of the human operator remains relatively constant. Secondly, practicality, and sometimes the law, dictates a rather unimaginative standard in the way we can move a mobile production package around on our highways. Thus, even while electronic systems become smaller, permitting more power for a given size, human factors and basic restrictions on types of vehicles still necessitate the proverbial "trade-off" situation in mobile unit design.

The evaluation of physical space, then, becomes the primary step in any new mobile design, and, since this space is largely determined by these unyielding human factors, very careful consideration must first be given to the intended application of the unit. It is obvious, of course, that an ENG crew does not require a 40-foot semi-trailer, and, conversely, a network most likely cannot employ an eight-camera, four-wheel drive van for a football game. But in between these extremes, there are some very often overlooked decisions to be made. Will the unit be used exclusively by an unchanging in-house staff, or is it likely that rentals, unknown special events, or a flexible equipment complement will dictate the need to accommodate more personnel? What is the possibility that the "sports" unit will be rented for an "entertainment" production? Each of these potential applications dictates an entirely different complement of operators, production personnel, and "hangers-on," and thus, a radically different assignment of space. In addition, within a given range of applications, operating "style" may also affect space considerations. Will the director do his own switching? Is there a need for a senior video position?

The result of this careful evaluation of intended applications for the unit should be an idea of the range of personnel which must be accommodated. And this factor, coupled with the equipment list required for the applications, allows the selection of the actual type of vehicle.

Tom Canavan *is manager of the systems division of A.F. Associates.*



Proper layout is essential not only for operator convenience but to assure long vehicle life. Poor weight distribution over the chassis and axles can result in serious operational or structural problems.

Production area of a typical large mobile unit constructed by AFA. Windows permit viewing of other work areas.

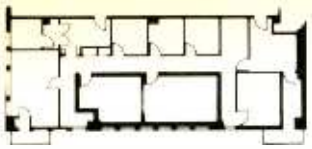
VEHICLE TYPES

Remember that the "box," whether it is a van, "bread truck," or semi-trailer, is the second area where technological innovation is somewhat stunted. Vehicles can only be approximately 8.5 feet wide at best, and no more than 13.5 feet high, if one wants to move around on interstates. And, while recent changes in federal regulations permit longer trailers, we certainly are nowhere near any " revolutions" comparable to the size improvement in color cameras of late. Thus, while you may be able to put eight miniature cameras into the same space now occupied by four larger models, you will still need the space to accommodate the additional operators.

Other than "people" space, a close look must be given to operating terrain, extremes of climate, local ordinances, availability of types of fuel, and ac power. Here, again, the "in-house" dedicated unit is at an advantage because all the factors can be known. But the unit which must travel extensively or go on rentals often necessitates planning for extremes.

LOADING REQUIREMENTS

Next to personnel allocation, by far the most important factor in choosing and designing a mobile production unit is loading requirements. There are countless instances where the wrong choice of vehicle type, or number or placement of axles, have permanently disabled a mobile unit. Electronic equipment can be replaced on a regular basis—the vehicle cannot. Enough emphasis cannot be placed on the weight factor. A complete study should be done of desired layout, depicting each rack, console, and storage location and indicating the weight distribution at each location. This will enable the vehicle manufacturer to recommend an adequate chassis and properly place the axles. A major decision must be made at this point regarding the vehicle—whether to go with a "conversion" of a standard stock-type body, or whether to build a custom body. This decision may also extend to the chassis. A standard body/chassis will have the advantage of lower cost and quicker delivery, and with a certain amount of conversion work, can be turned into a television vehicle.



FACILITIES DESIGN AND ENGINEERING

The custom body/chassis is designed from the ground up as a remote production vehicle. It usually costs considerably more, and has a longer delivery (four to six months) than a conversion unit. However, if time and budget permit, the custom body is usually the wiser decision. Apart from the obvious advantages of having exactly what you want, the custom unit allows much more control over weight distribution and handling. The body of the unit will be built with the intended application in mind, allowing proper reinforcement around openings, yielding a much longer service life. With a properly designed custom body unit, whether it be a medium size truck or a 45-foot trailer, a life of 20 years plus is not unreasonable.

Whether the vehicle is converted or custom, air-ride suspension is mandatory for medium to large units. On trailers, a choice must be made whether to order an air-ride "fifth wheel," or utilize an air-ride tractor. With some types of trailer construction, an air-ride fifth wheel will cause some loss in interior height in the front compartment. With a standard fifth wheel end air-ride only on the rear axles, full interior height is maintained, but only air-ride tractors should be used.

AIR CONDITIONING

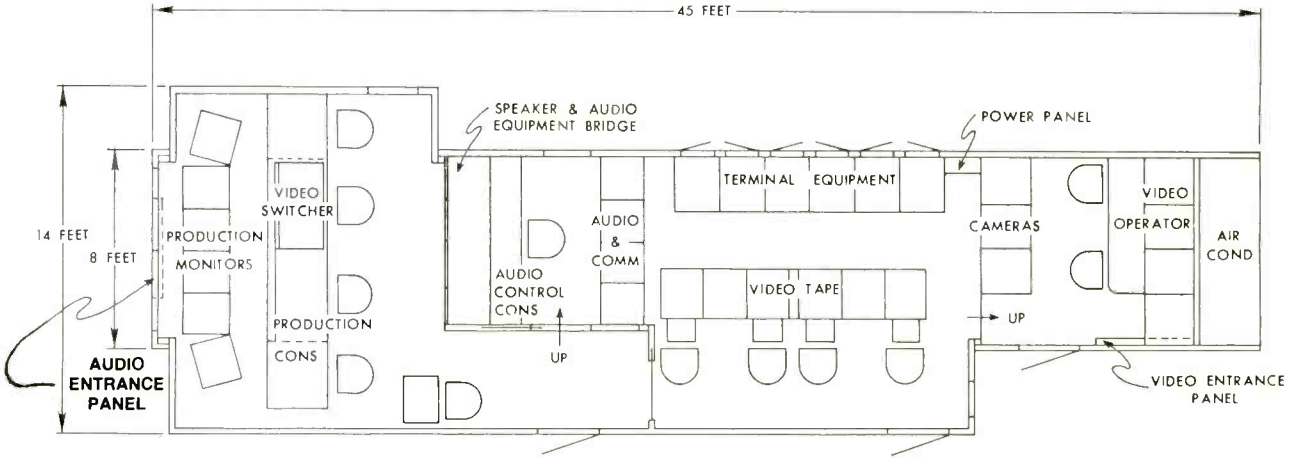
Returning once again to our personnel complement, equipment list, and intended application study, we are now able to evaluate the air conditioning and heating systems. All television mobile units will most likely require some type of environmental control. The largest units with the widest range of terrain requirements will need air conditioning systems with redundancy, personnel heaters, and perhaps humidity control. Small units restricted to a stable climate may be able to exist on a small RV type air conditioner or heater. In evaluation of requirements, equipment heat load, number of people, number of smoking people, outside climatic extremes, acoustical considerations, and weight are all factors to be considered.

Once these requirements are known, a selection can be made on the air conditioner type. For medium to large units where four to 16 tons of air conditioning may be required, there are two general categories: "commercial" and "custom." Commercial units are relatively standardized; they are often available as "catalog" items, with quick delivery and lower prices. Custom units, however, are designed to fit into a given space, often have more features, but cost considerably higher and have lead times in ordering of up to four months. In evaluating which type to utilize, consider the following: reliability, ease of access for service, availability of service representatives in the intended range of locales, price, delivery, and manufacturer's reputation for support. In the largest mobile units, the choice usually winds up with the custom system because it provides the widest range of flexibility in location, redundancy, specialized modes of operation, noise control, and configuration.

Whatever unit is eventually selected, insure that it is readily accessible for repair without having to remove the entire unit or reconfigure equipment—and locate the unit based on an evaluation of the weight distribution plan.

Special attention must also be given to acoustical factors. Where necessary, the compressors and blowers should be shock mounted, and a sound deadening wall constructed between the air conditioners and any operational compartments. Wherever practical, a dual system is a better choice. The use of two three-ton units instead of a single six-ton unit will enable limited continued operation should one fail. In addition, some design criteria may permit assignment of one unit to equipment and the other to personnel. This is an ideal situation to strive for, as it permits adjustment for personnel comfort without affecting equipment temperatures. Automatic dampers can be installed to divert air to the opposite system should one unit fail. Also, whether commercial or custom air is chosen, insure that your system is fitted with a "hot gas bypass." This feature allows the compressors to run continuously, eliminating power dips caused by compressor cycling.

The power system is the next major area of concern. Here again, no matter what the size of your intended vehicle, the present and future application and the range of locales for operation will play a major part in the selection



Some of the space limitations imposed on vehicles that travel the highways can be ameliorated with new truck designs. Expandable side panels, illustrated here, can increase truck width from eight to 14 feet.

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of a power system philosophy. For small units ranging from one or two camera ENG units up to three or four camera EFP units, some type of on-board power is generally the rule. This permits the maximum flexibility in terms of quick setup/teardown, and the extremes of geographic location often demanded in EFP. Once a mobile system exceeds this size, however, the inclusion of an on-board generator is very rarely necessary in the United States. Most locations where these medium or large units would be used will have some type of power available, and, since larger trucks are usually scheduled in advance, sufficient time will most likely exist for service to be brought in if not available permanently. In the rare cases where this is not feasible, rental generators are not that difficult to find.

For the basic small mobile unit, on-board power systems are relatively straightforward. As with air conditioners, it is usually a better decision to have two generators each handling half the load rather than one larger unit. This is especially important in terms of space allocation and weight distribution, but also plays an important role in backup for a single generator failure. In addition, one generator can be assigned the non-critical, unregulated air conditioning and lighting loads while the other handles the regulated equipment load. A simple, quick means of changeover should be planned in the event of failure. Here again, careful consideration must be given to acoustical factors and ease of access for service.

For the larger units that will operate solely from external power, a basic decision must be made whether to go with single phase or three phase power systems. Single phase power has been more easily found in the past, but requires larger, and thus heavier, air conditioners. However, more facilities appear to be offering three phase power today. This permits a better distribution of on-board loads. Evaluate your intended venues carefully before making this decision. A few isolated exceptions to your rule can always be accommodated by a rented generator.

The on-board power should be distributed into two general classifications: technical and non-technical power. The "technical" load comprises all electronic equipment, and should be properly isolated, regulated, and monitored. The "non-technical" load consists of the air conditioners and lighting. In this case, there is usually no need for regulation. No matter what power scheme is used, a ground-fault system is a must.

Where ultimate reliability is required, a system of patches or changeover switches can be included to bypass a defective ISO transformer or regulator. All power, of course, should be distributed through appropriate master, submaster, and individual breakers. Bringing power into the vehicle is simplified if you utilize an appropriate gauge "welding cable." This cable is considerably lighter than the multi-conductor power cables used previously and, by terminating the cables with "Camlock" type connectors, various lengths of cable can be created quickly.

For setup purposes, it is a good idea to have available at your power input panel a 120 volt retractable power cable

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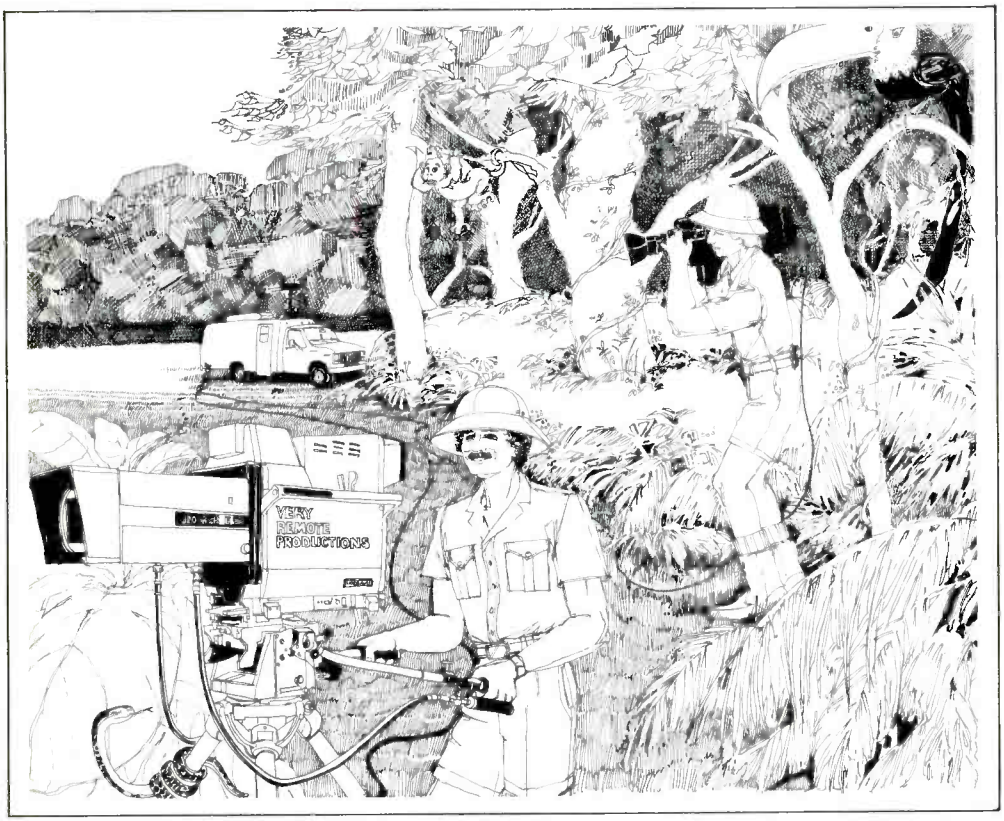

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with a standard plug on the end. This can be quickly plugged into a nearby outlet to provide immediate partial setup lighting while the main power is being connected.

LIGHTING

Lighting can also be distributed into two general classifications: work and operational. Fluorescent fixtures can be installed as "work" lighting to provide maximum illumination during setup, teardown, and maintenance. Appropriately placed 120 volt or low voltage track lighting on dimmers is the best choice for "operational lighting." Don't forget to provide complete outside illumination, storage compartment lighting, and, perhaps, some battery-operated interior lighting on timers.

Very few of the mobile television units ever built have sufficient storage space. Most often, storage is the last item to be considered in planning a unit, and consists of whatever space is left after as much equipment as possible is crammed into a given box. But most cameras cannot operate without cable; most units cannot turn on without power; and 10 field cameras will do no good without 10 tripods and pan heads. Storage must be planned early in the design process. It is as much a part of the weight distribution as a VTR or camera. Each item to be carried should be inventoried prior to design, and then assigned its own individual location in the design process. If there isn't

ABC's "mini-mobile" unit is a three-camera entertainment-type truck, a good example of the medium-sized straight truck.

enough room to carry essential items, either the vehicle must grow, the project scaled down, or a support vehicle must be added. All of these are expensive options if discovered at a late stage. In addition to the obvious rear door compartment in small vans, or skirt compartment ("belly boxes") in trailers and trucks, don't overlook hiding places such as rack-storage drawers, under-bench cabinets, in-floor compartments, custom interior cabinetry, etc.

LAYOUT

In any mobile unit design, there exists a dynamic relationship amongst all of the requirements. Weight distribution can't be completed until a basic layout is conceived. But this layout may need to change dramatically if the rear axle loading is too high. Once again, due to the unchanging size of the human operator and restrictions on the size of the mobile unit itself, the creation of a workable, flexible layout is one of the more difficult design tasks. Here the relationships of all the tasks and personnel must be evaluated against the individual applications and operating style.

The area usually considered the most critical and most dependent on "style" is the production area. Whether this is simply one half of a rack desk in a van, or a 15x12 foot compartment in an expandable trailer, dramatic differences exist in the design of a unit for entertainment work versus that for sports productions. Will the director do his own switching, or must there be space for a TD, producer, executive producer, three ADs, a statistician, and five VIPs?! In the case of entertainment work, there may be a need for a lighting director position; for sports, the character generator operator may need a position. Styles differ between East Coast and West Coast production compartments: the latter tends to be more "dressy" while the former are "utilitarian." In short, because the production area's most important function is to house people rather than equipment, it deserves the attention, in the planning stage, consistent with the needs of personnel who must often spend many hours in one position.

AUDIO

The audio area also requires some special considerations. In all but the smallest of units, audio should be completely isolated. Even in two- or three-camera units, a clever way can usually be found to isolate audio. Don't

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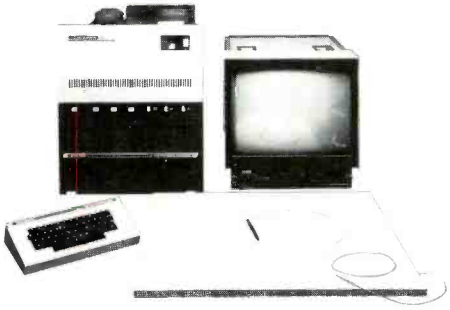

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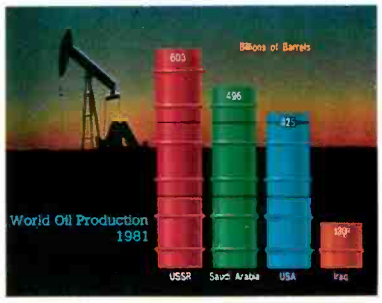

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overlook the employment of the passenger compartment in a van or "bread truck" type vehicle. In a larger vehicle, where a whole compartment will be dedicated, careful control of ambient noise (in both directions) is essential for proper monitoring and to avoid distraction in adjacent compartments.

As audio grows in stature as part of the TV signal, equipment complement will change. Plan early for a full stereo installation. Certain types of sports production and most entertainment work will require a large number of microphone mixers. If this is a good part of your mobile work, you'll need a console with a minimum of 24 input channels with possible sub-mixer provisions. Because of the human-engineering factor necessary in console design, they tend to eat up more space per function than almost any other piece of equipment. Be careful of restricting future console expansion by designing a layout which restricts the width of an audio console. Except in very customized boards, the width of the console is going to be a minimum of 1 to 1.5 inches per fader. Thus, expansion from a 24 to 36 input board in the future can require a minimum of 1 to 1.5 feet additional lateral space. There is no way to re-orient this additional space requirement in most situations.

The video control and VTR areas are the most dense in terms of equipment, with highest ratio of controls per operator. These areas tend to be designed by first allocating equipment space and then finding room for the people. Take the opposite approach. Evaluate what your personnel requirements are, and what they may be on a rental or at an unforseen event. Will your cameras always be shaded by a video op, or will a network require an SVO position? Will you need a slo-mo operator for that special local game? Will the character generator operator always operate from the truck? What about a "transmission" man for the network feed? Plan equipment layout based on operator needs, placing most-used controls within comfortable reach. Power supplies, storage, distribution equipment, etc. can go at the very bottom or top of racks, leaving the central locations for operational equipment. Provide an even weight distribution and cooling flow, avoiding "hot spots" which will tax air conditioning. Carefully evaluate maintenance access requirements. Those pieces of equipment accessible from the front can be loaded in racks against a wall if you provide proper wiring harnesses and/or access doors from outside. If at all possible, always plan on some empty rack space for the extra camera, VTR, or VCR that always shows up.

The obvious bottom line in mobile unit design is to do your homework well in advance. With the awareness firmly in mind that people and physical space are the most rigid factors, evaluate your plan of business, applications, and style very carefully. Your end result can then be the best "formula" for your own operation. For there really can be no "standard" vehicle or "catalog" item in mobile units, although a cost-effective unit can be built which avoids most trade-offs and yields a production system that can grow with its user for many years. **BM/E**

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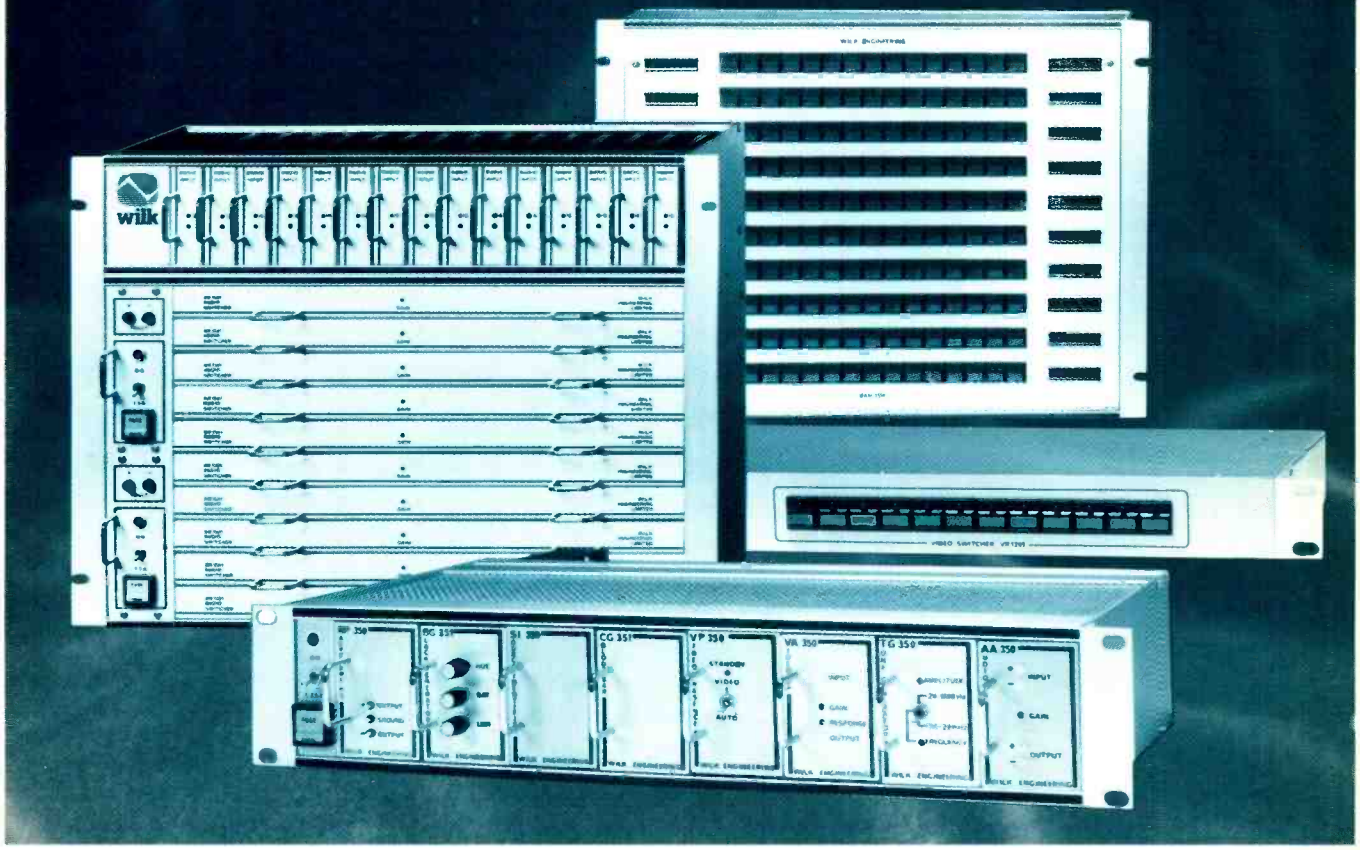

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Evaluating the Impact of 80-90

Harry Cole, FCC Counsel

Almost one year ago the Commission adopted a Report and Order in BC Docket No. 80-90, an action which substantially modified the Commission's 20-year-old allocation scheme for FM channels. Nine months later, in March, 1984, the FCC finally took the first steps toward implementing those modifications. But despite this welcome sign of progress, it appears that no actual allocations attributable to Docket No. 80-90 are likely to be made until the end of 1984 at the earliest. Here is where things stand on the 80-90 front.

- allow Class A FM stations to operate on channels previously reserved for higher power Class B or C stations.
- create three new classes of FM stations—B1, C1, and C2 — with maximum facilities and minimum mileage separations different from those assigned to existing Class A, B, or C stations. The B1 Class was accorded maximum power of 25 kW and maximum height of 100 meters (328 feet). The C2 Class was accorded the same maximum facilities allowed for Class B stations, 50 kW effective radiated power and 150 meters (492 feet) antenna height, and the C1 Class was permitted to operate with maximum facilities of 100 kW power and 300 meters (984 feet) antenna height. (*BM/E*, Sept. '83, p. 107.)
- require existing Class B and C stations to meet or exceed minimum facility requirements within three years or be downgraded to a lower class of station based on their actual operating facilities.
- convert the technical FM rules, including mileage separations and antenna height, to the metric system.

The purpose of these changes was to increase the availability of FM channels. This was to be accomplished by taking advantage of the fact that the former allocation system accorded stations protection based on utilization of maximum facilities, even though many, if not most, stations actually employ facilities substantially below maximum. Thus, the Commission "shoe-horned" into the existing scheme the three new classes of station, and provided that stations previously designated as Class B or C stations would have to meet new minimum facilities requirements if they wished to be entitled to the same protection standards they have enjoyed thus far.

In making these sweeping changes, the Commission was not unmindful of the interest the availability of new channels was likely to generate. Indeed, some observers thought that one of the primary reasons for the three-year delay in acting on the 80-90 proceeding, which had been initiated in 1980, was the FCC's awareness of the deluge in allocation proposals, and ultimately applications for new stations, which was almost certain to be generated by adoption of the proposals.

On March 1, 1984, the Commission took two separate actions relating to Docket No. 80-90. First, it disposed of a number of petitions for reconsideration involving various aspects of the 80-90 changes. Second, it adopted a Notice of Proposed Rule Making in which it set forth the 684 communities eligible for its proposed new allocations and requested comments and counterproposals thereon. Both of these actions should be of interest to existing and would-be FM broadcasters.

Second Thoughts

In addressing the various petitions for reconsideration which were filed, the Commission changed its original decision very little. The most significant change involved the establishment of a 10-mile "buffer zone" to protect the interests of existing Class C stations presently operating with antenna height of less than 300 meters (984 feet).

Class C stations in that situation have to upgrade their facilities to meet certain minimum levels, including increasing antenna height to at least 300 meters. As a number of petitioners noted, a licensee's ability to find a site suitable for a 300 meter tower is already dependent on such factors as zoning regulations, air hazard considerations, land availability and the like. In the Commission's view it was not appropriate to add to these problems the possibility that allocation of new channels on the periphery of the station's service area might further limit the permissible range of sites. Accordingly, the FCC agreed to create the "buffer zone" to protect Class C stations with less than the minimum antenna height necessary to warrant Class C classification for the station. This protection will last only three years, *i.e.*, the time during which any Class B or C station with less than the minimum facilities will have to file an application to increase facilities to at least the minimum or face re-classification to a lower class of station. Class B stations will *not* be given "buffer zone" protection because there is no minimum antenna height necessary to achieve classification as a full Class B station.

In releasing its disposition of the petitions for reconsideration, the Commission also established the effective date of the new rules. That date is March 1, 1984. This is significant because it starts running the three-year period during which Class B and C stations with less than minimum facilities must file applications for increased facilities or be downgraded. Such applications must be filed by

March 1, 1987.

Other matters considered in the FCC's treatment of the petitions for reconsideration include the following:

- stations operating with beam tilt will be classified according to the effective radiated power in their main lobe.
- for classification purposes, after the three-year period passes, stations may not operate with power in excess of the maxima stated in the rules, although they may use antenna heights greater than the maxima if transmitter output power is reduced.
- applications by Class B or C licensees seeking to upgrade to meet the minimum facilities requirements will be treated as being for minor rather than major changes. This will cut down on the procedural burdens involved in preparing, filing, and processing such applications.
- Class C licensees wishing voluntarily to reclassify their stations to a lower class may do so without having to go through a rule making proceeding to amend the Table of FM Allocations to reflect the lower class channel allocation.

Proposed Allocations

In its Notice of Proposed Rule Making, the Commission has listed the 684 communities eligible for newly-available allocations which it believes should be made first. That list has received a good deal of publicity, and copies can be obtained from the Commission or trade associations. The proposed allocations were arrived at through computer analyses based on the newly-adopted technical standards, as well as a four-tier set of allocation criteria applied to communities for which a need for new FM service had previously been expressed. The criteria by which those communities were selected for new allocations included, first, the availability of local service. The communities included under this criterion have no local commercial radio service and are located more than 10 miles from cities with populations of at least 25,000.

Second is the availability of only local daytime-only service. The communities included under this criterion have daytime-only stations and are located more than 10 miles from cities of 25,000 or more.

Third is the asserted need for station(s) to serve the minority population of the community.

And fourth is the asserted need for station(s) to provide noncommercial educational radio service which could not otherwise be provided within the portion of the FM band reserved for such service.

Additionally, the FCC's computer was programmed both to provide stations operating on the proposed channels with some leeway in locating their transmitter sites outside of their communities, and also to allocate channels to communities based on population (with smaller cities getting lower class channels). And, to make sure that the new channels were spread around as much as possible, the computer was instructed to make one allocation to each community before any community could receive a second channel. When all these standards and criteria were applied to the FCC's previously established list of about 1,400 communities needing new FM service, the computer found that 684 of those communities could be given new channels. These are, of course, the 684 towns listed in the Notice.

What Next?

The obvious question is what to do if a community in which you are interested does or does not appear on the list. For openers, the Commission is requiring an expression of interest in its proposed allocations before it will consider them further. This means that, even if the FCC has proposed a particular allocation, the Commission will not adopt that allocation unless someone expresses interest in utilizing that channel in that community. Thus, if you have any interest in any of the listed proposed allocations, you would probably be well-advised to make that interest known to the Commission by filing comments in support of the particular allocation in question.

Suppose, however, that a community in which you are interested was not fortunate enough to make the cut in the FCC's computer, and thus is not listed in the Notice. The Commission is willing to accept counterproposals to any of the proposed allocations listed, provided that such counterproposals include a statement by the party that it would apply for the requested channel if it is allocated; would provide the proposed community either its first or second aural service, its first local service, its first fulltime local service, minority service or public radio service; and include a showing both that the proposed channel can be allotted consistently with the distance requirements to all existing allocations and stations, and also that the counterproposal is short-spaced to one or more of the allocations listed in the Commission's Notice. In other words, counterproposals which are not mutually exclusive with any of the allocations listed by the Commission will *not* be considered at this point, but will instead be returned to the proponent. Such proposals may then be refiled at the conclusion of the Commission's consideration of this proceeding.

Parties interested in filing supporting comments or counterproposals were given 60 days, up to and including May 14, 1984, within which to submit their materials to the Commission. Once all the comments and counterproposals are in, the FCC will analyze them, enter any acceptable counterproposals into its computer, and release a listing of all channel allocations under consideration. At that point interested parties will be given yet another chance to comment on the proposals. Such replies are intended to involve comparisons of conflicting proposals, and not discussions of the comparative needs of the communities involved.

In making the final evaluation among conflicting proposals, the Commission intends to rely on four priorities for FM channel allocation which it adopted in 1982. These are: (1) provision of first fulltime aural service; (2) provision of second fulltime aural service; (3) provision of first local service; and (4) other public interest matters. The FCC is proposing to weight these factors with the following priorities:

First aural service	4
Second aural service	3
First local service	3
First fulltime local service	2
Minority or public radio service	2

A community falling in more than one of these categories would be given full points for the highest priority and an "enhanced priority value" equal to one-tenth the value of each additional category applicable to it. Thus, a proposal

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which would provide a first aural service to a community with no local station and which would provide a minority service in that community would be given a total priority factor of 4.5, *i.e.*, 4 for first aural service, 0.3 for first local service, and 0.2 for minority service.

The Commission's idea, of course, is to mechanize the allocation process as much as possible. By reducing the factors to be considered to a very limited number of easily quantified questions, the FCC will be able to run them through the computer rapidly, and thus speed the final allocation process. In cases of ties, situations where conflicting proposals involve communities with equal weighting factors, the FCC will generally grant the allocation to the more populous community.

Once all the comments and counterproposals have been reviewed and assessed, the Commission will issue a Report and Order adopting final allocations. To avoid a flood of applications for the new channels, however, the Commission does not intend to open them all up at once for applications. Rather, it is planning on staggering the effective dates of the assignments to spread out the incoming flow of applications. Exactly how it would achieve this staggering has not been decided yet, although some factors which might be considered in the process include staggering based on: (1) geographic regions or states; (2) alphabetical order of the communities; (3) population size of communities, with the largest to be considered first; or (4) channel numbers. And once everything is over and this rule making proceeding is terminated, the Commission will again begin to accept new petitions for rule making as it has in the past. However, if the number of petitions filed at that point becomes "unmanageable," the FCC has indicated that it might feel the need to initiate a second "omnibus" proceeding akin to the current one.

Potential Impact

Finally, in a brief discussion relating to the processing of applications for use of the to-be-allocated channels, the Commission has requested comments on the possibility of altering the effect the ownership of a daytime-only station would have on an applicant for a new 80-90 FM channel. Under existing standards, ownership of such a station would result in a comparative demerit under the "diversification" aspect of the FCC's comparative broadcast policy statement, which governs the outcome of standard comparative hearings. However, the Commission is sensitive to the plight of daytime-only licensees, and is considering eliminating that demerit, and possibly even according local daytime-only operators a preference.

As indicated above, comments and counterproposals were due to be filed on or before May 14, 1984. Comments could concern not only the various proposed allocations, but also such matters as the priority system by which final allocations are to be made, the appropriate means to stagger the influx of applications for new stations, and the question of the treatment of applicants who happen to own daytime-only AM stations. Since all of these matters could prove to be important, interested parties might wish to reflect on how their own situations could be affected. And, if it looks like any or all of these matters would be important, they may wish to make their own feelings known to the Commission *before* the FCC acts. Your communications counsel will no doubt be able to assist you in this effort. **BM/E**

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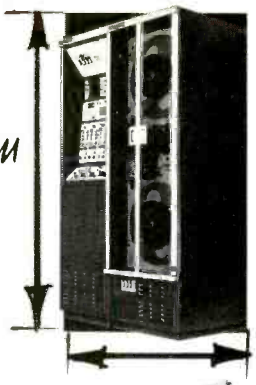

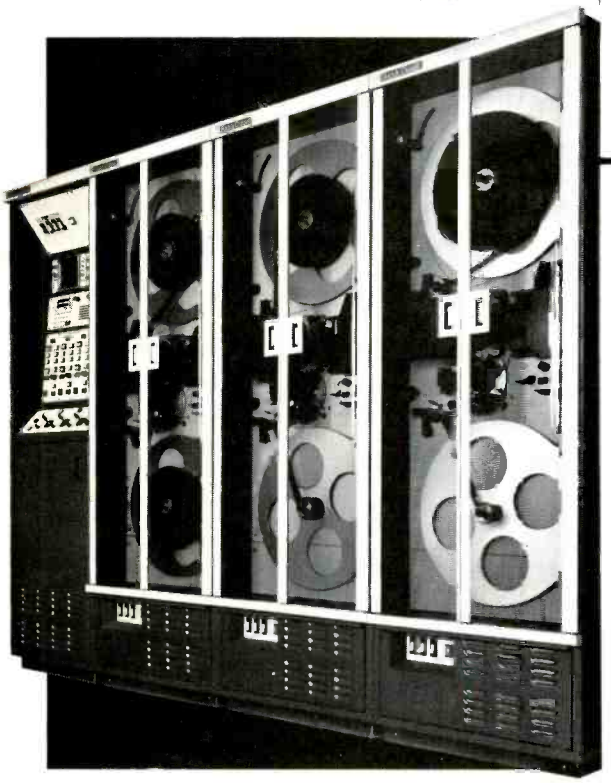

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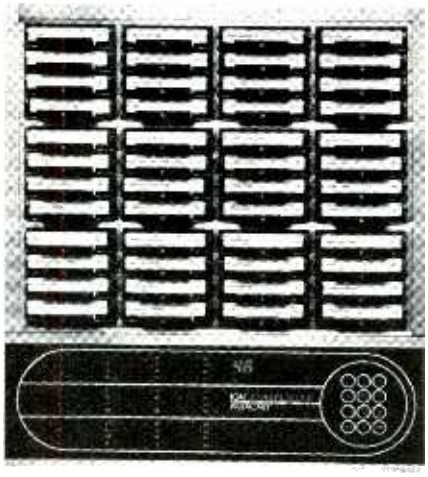
broadcast EQUIPMENT

IGM Updates Instacart

The standard Instacart has provided instant access to the location of any "carted" material since 1969. The latest version of the improved Instacart has many new features designed to enhance radio and television production needs.

The unit now has mono or stereo operation in all cartridge capacity configurations including 12, 24, 36, or 48 carts. Wide track heads are also now optional. A microprocessor-controlled front panel opens for servicing, while touch pad switches permit manual operation. There are new modular power supplies, preamps, and data and program amplifiers using any 5534 ICs.

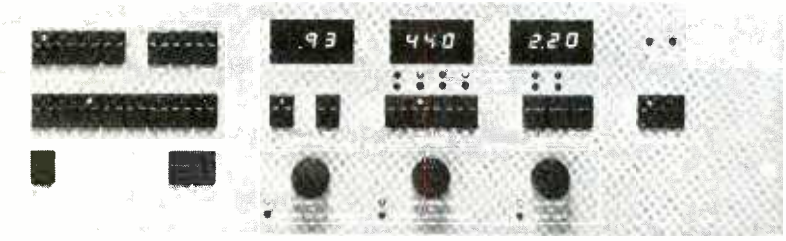
Other features include audio muting at the end of the 150 Hz tone coming at the end of each cart, individual level and equalization controls for each preamp, and a one shaft and capstan motor for each bank of 12 trays. The capstan shaft is fully supported by three



sealed, precision bearings and two motor bearings. An RS 422 serial interface is available along with a parallel interface to duplicate older Instacarts. Also standard are XLR audio connectors.

For More Information
Circle 250 on Reader Service Card

Orban Programs For Parametric EQ



Orban has introduced a new programmable parametric equalizer. The new unit is a two channel, four band per channel device which can instantly store and recall up to 32 different EQ, high and low-pass filter, and level settings from its own non-volatile memory.

The front panel provides controls for only one band of EQ while the user selects which band is to be modified by means of key switches on the front panel. Three digital LED displays provide an accurate and repeatable read-out of parameter values. The two channels track accurately in stereo, and up to 28 channels can be connected together and controlled simultaneously.

Equalization setups are stored and recalled by executing simple keystroke sequences. The physical position of the controls will always correspond to the recalled value of the stored parameter, even if the controls have been moved since the setting was stored.

All parameters of the unit are programmable as well as high and low pass filter settings and input level. Similar to the Orban 622B, the new unit uses a Constant-Q design which offers extensive attenuation capability in addition to 16 dB boost.

The unit will communicate with a host computer by means of an optional IEEE-488 or high speed serial interface.

For More Information
Circle 251 on Reader Service Card

Burr Adds Satellite Control System

The new Mini-Trol is an economical satellite antenna control system which has been designed to eliminate electronic problems without the use of pots or Hall Effect sensors.

The operation of the new unit is simple with the user required only to push either the east or west button. An indicator light comes on to reveal if the dish is moving in the right direction. When the dish reaches the extreme end of travel in either direction, the light goes out and special circuitry in the control shuts the power off.

The actuator features heavy zinc plated tubes, die cast aluminum power head, and a special weatherproof boot as standard equipment. The system is rated at 1000 pounds thrust and 5000 pounds static loads.

For More Information
Circle 252 on Reader Service Card

Philips Develops TV Stereo Modulator

Philips Test & Measuring Instruments has announced a new TV stereo modulator, Model PM5672. The unit is a complete television modulator that converts a video signal and two audio signals into a VHF or UHF signal.

The modulator can be considered a stereo/dual sound version of the company's previously introduced Model 5671. New SAW filters and synthesizers have been used to include many new features such as vestigial side band characteristics, group delay pre-correction, and precision meters for modulation indication. Other features include stereo sound or two different sound channels in accordance with the German two-carrier system, and low distortion and low spurious signal content.

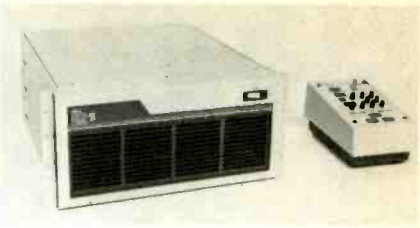
The PM5672 is designed for use in high quality distribution systems. The efficient filter characteristics prevent interference problems when several channels are transmitted through a single cable. The unit is also suited to function as a complete TV transmitter when the output level is sufficiently boosted by a power amplifier.

For More Information
Circle 253 on Reader Service Card

NEC Has E-Flex Combiner

The new E-Flex combiner with line chromakey has been announced by NEC. The new unit option combines the video outputs and key signals of two separate E-Flex systems, enabling the special effects editor to treat the combined output as one single video output with one key signal. The option is useful in post-production facilities that use production switchers with only two video mix keyers.

The combiner includes a digital line chromakey adapter and a digital mixer-keyer. The mixer-keyer digitally combines the outputs of two E-Flex systems into one video output, and through digital processing, the line chromakey function provides a stable, high quality key signal from each of the E-Flex systems. Color detection and assignment are automatic.



The new system also features a color cancelling circuit using digital processing, selectable key signals and priority background/foreground settings for each E-Flex system separately, and an event memory for storing combiner and keyer functions to be included in programmed two channel event sequences for later playback.

The E-Flex Combiner/Chromakeyer is priced at $22,500, with the combiner only $17,000.

For More Information
Circle 254 on Reader Service Card

Valley People Enters T&M Market

In a departure from the products normally manufactured by the company, Valley People has introduced the Advantage Model 310, an audio noise and level meter. Intended for use in broadcasting and recording situations, the unit sells for $399.

To eliminate unwanted noise, RF, and hum pickup while allowing measurement of extremely low level signals, the unit incorporates isolated, balanced, Trans-Amp, proprietary differential inputs. A 10 Hz to 100 kHz wide band filter allows insertion of an external weighting network as required by the user's measurement application. To achieve accurate measurement of noise (in an actual 19,980 cycle bandwidth through incorporation of 18 dB/octave filters with appropriate −3 dB points) the system uses a 20 Hz to 20 kHz multiple pole filter.

An additional multiple pole filter, 400 Hz to 20 kHz, is employed to remove the lower four octaves of the audio spectrum in order to eliminate measurement errors caused by ground loops and other low frequency noise sources. An A weighting filter correlates noise measurement to loudness as perceived by the human ear, while a CCIR weighting filter allows noise measurement to be equated to current European standards.

Additional features of the Advantage 310 include peak, average, and RMS detector responses. In addition there is a detector output, preamp output/return, and full scale range select.

For More Information
Circle 255 on Reader Service Card

Laser Power Meter From Leader

The new LPM-8000 Laser Power Meter provides a fast method of measuring the power output from laser devices used in many digital audio disk and video disk players. Two wavelength and three power measuring ranges are available on the LPM-8000, giving the instrument the ability to be used in the servicing of laser disk equipment.

The new unit consists of a main body and a separate sensor connected by cable. The new instrument is small in size, light in weight, and is battery operated. Wavelength measurement range is 750 to 820 um and power measurement ranges are 0.3, 1, and 3 mW, full scale.

Accuracy of the instrument is stated to be within ±5 percent of full scale. Using a silicon photo diode sensor, the sensing area is 10 mm diameter and the power supply is a nine volt dc battery.

For More Information
Circle 256 on Reader Service Card

BUSINESS BRIEFS

Motorola has announced that its C-Quam AM stereo stystem has been selected for use by **Westinghouse Broadcasting and Cable.** According to Motorola this brings the number of radio stations who have chosen the C-Quam system to more than 150.

Convergence has revealed that its edit controllers have been approved by the FCC as being in full compliance with regulations regarding radiant and conducted interferences . . . . **Bonneville Productions,** under a major reorganization and name change, is now known as Bonneville Media Communications, adding a media/marketing department, an account services department, and an international relations department.

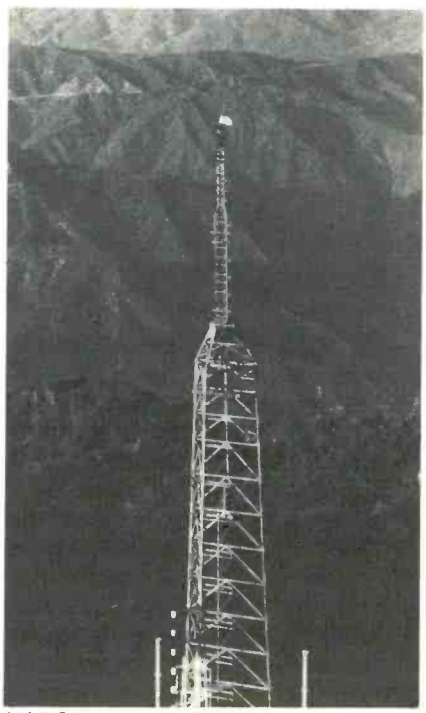
Peter Dare, product manager for the Sony Betacart MERPS system, outlines its features during product introduction in early April (also see BM/E*'s story on MERPS automation in the March 1984 issue). Forty single-event cassettes are automatically identified to the system controller through bar code, and automatically inserted and removed from four specially-adapted Betacam players. Primary application at this time is for on-air playback of news events, though spot automation is also possible.*

Fuji marked the end of its first 50 years of operation on January 20, 1984 . . . . **TFT** has reorganized its 24 hour emergency service to operate from Silicon Valley with a 24 hour phone, for customer assistance through a clearing center for all its products . . . . **BGW Systems** and **Nakamichi** have announced a joint venture. Under terms of the new venture, BGW Systems will provide expertise in design, development and manufacturing, while Nakamichi will provide R&D funding, tape recording technology, and volume manufacturing from Japan.

Conrac, in its annual financial report, revealed sales of $141.1 million for 1983, an increase over 1982's figure of $116.2 million . . . . **Zenith Radio** reported earnings for 1983 of $46.3 million, compared with a restated loss of $24.3 million in 1982 . . . . **Shoreline Teleproduction** Systems has an agreement with **3M** for exclusive Southern California distribution of the new 3M Paint System.

Broadcast Properties of Bryan, Texas recently purchased **Harris** STX-1A AM stereo exciters for all three of its AM stations . . . . Harris has also been awarded a $10 million contract by **Isacomm,** a subsidiary of **United Telecom,** to supply more than 100 satellite ground stations for a new communications network . . . . **Harrison** has sold the PP-1 post-production console to **20th Century Fox** for its new Los Angeles studios.

Three **CMX** 340XL systems for machine control and video tape editing in the **CBS Network** delay project at Television City in Los Angeles have been installed . . . . **Cosmos Broadcasting** has purchased three **RCA** TK-47B automatic studio cameras for a variety of services in a 5000 square-foot telecommunications center at the World's Fair in New Orleans later this year . . . . **TCS Productions** has selected **Midwest Corp.** to design and construct a new 44 foot mobile production unit for use in sports and entertainment productions.



KABC's new 350-foot tower was galvanized by American Hot Dip Galvanizers and supports a 150-foot FM and TV antenna. The structure is located at the station's transmitter site on Mt. Wilson, above the shadow of the San Gabriel Mountains.

EECO has appointed five new regional distributors to handle its computer controlled video production and editing equipment. Northern California will be covered by **Adolph Gasser** in San Francisco; Oregon and Washington will be handled by **A&G Associates** in Portland and Seattle; Nevada will be covered by **Media Solutions** of Las Vegas; Texas, Illinois, and Michigan will be administered to by **Victor Duncan;** New York City and surrounding areas will be serviced by **MPCS Video Industries** in NYC.

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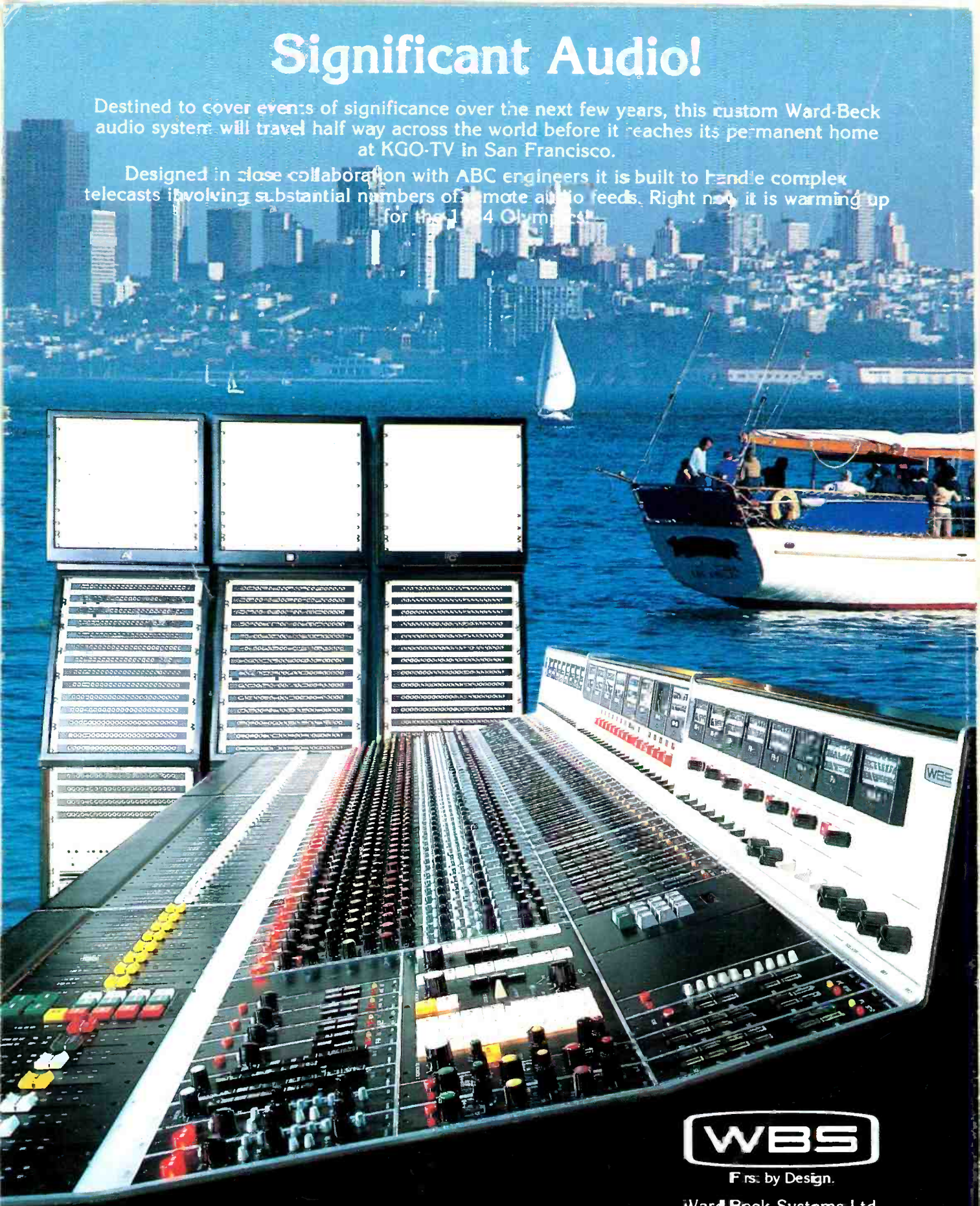
Designed in close collaboration with ABC engineers it is built to handle complex telecasts involving substantial numbers of remote audio feeds. Right now it is warming up for the 1984 Olympics.



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