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BM/E

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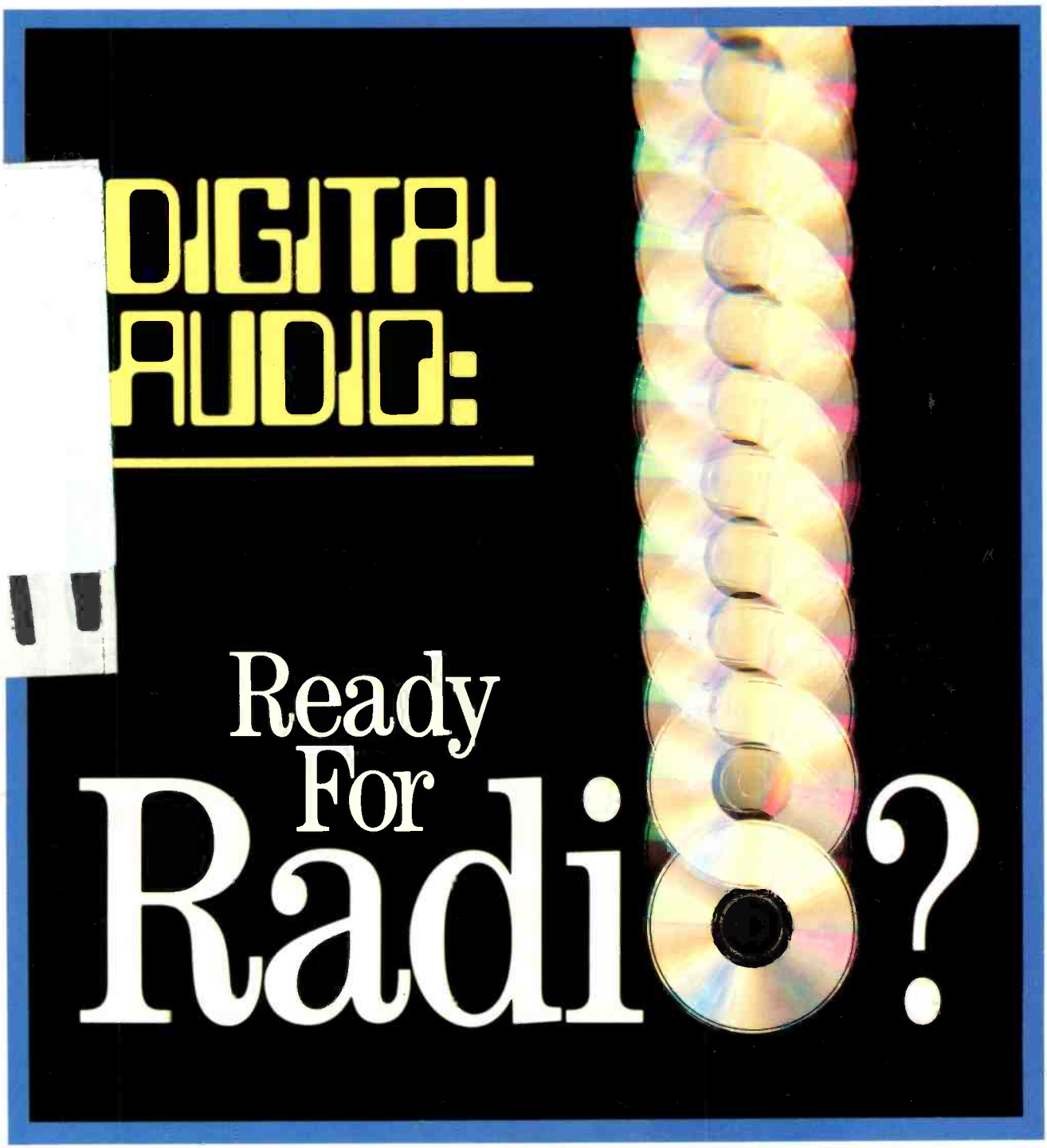

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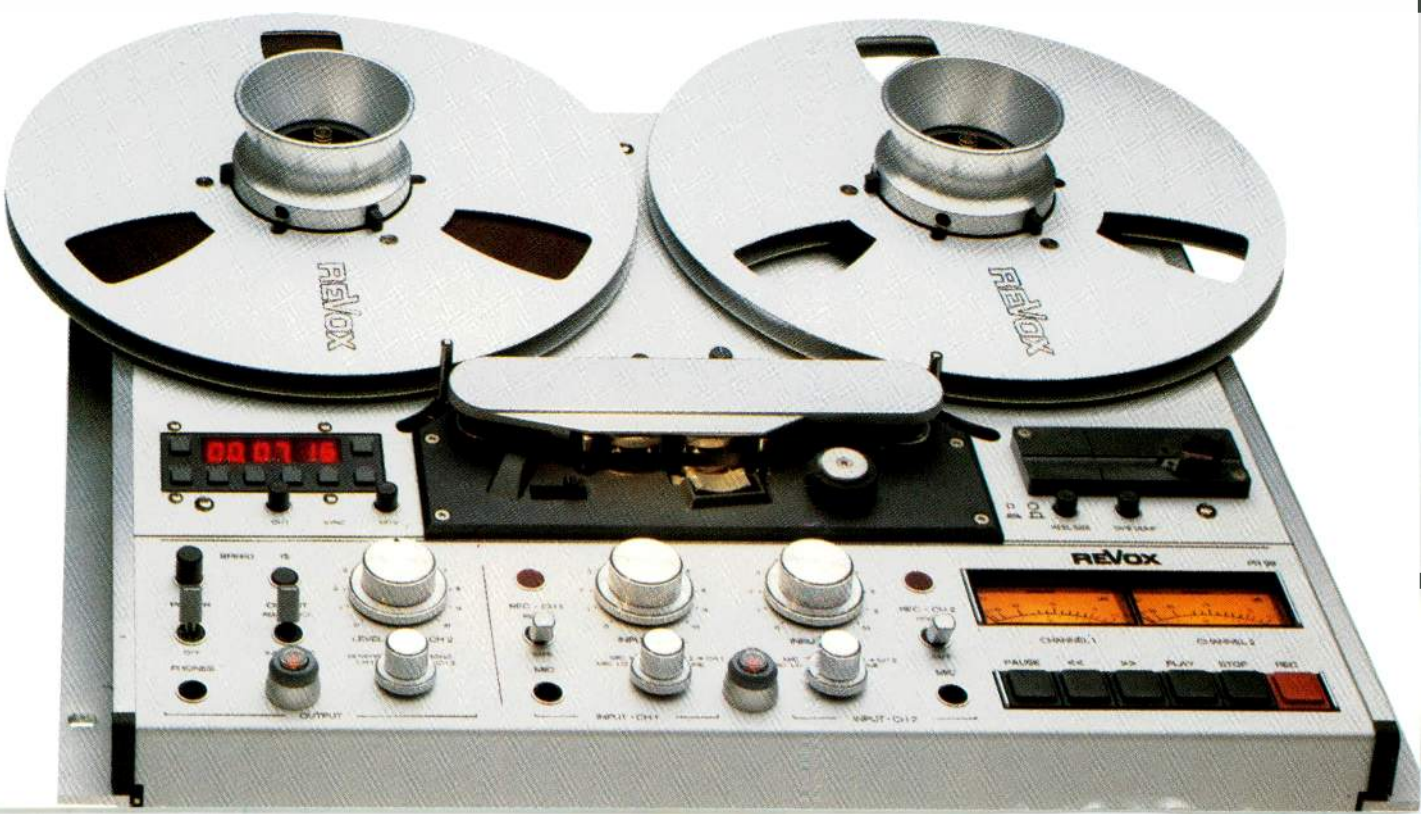

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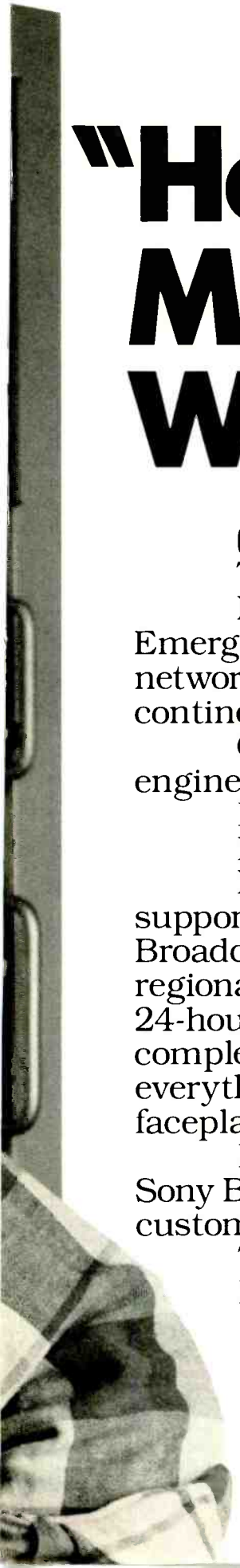

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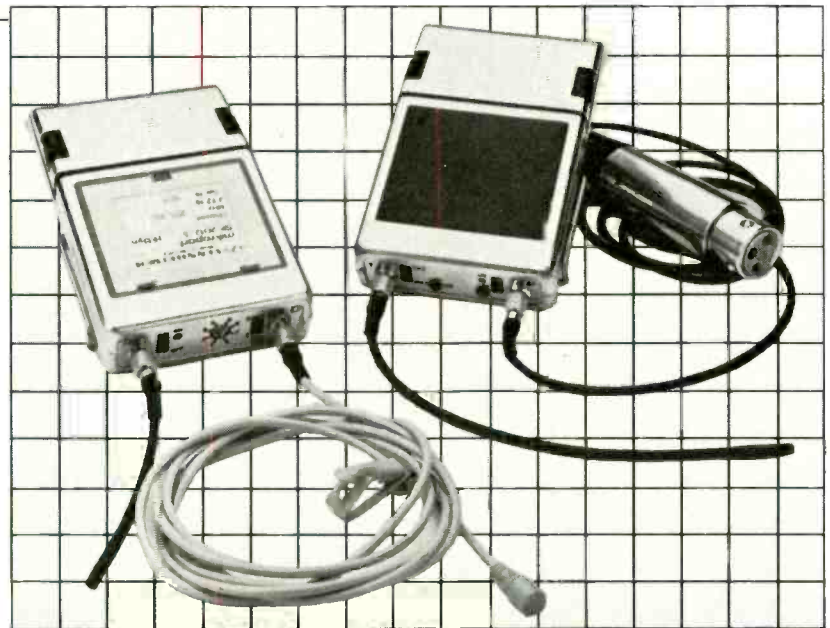

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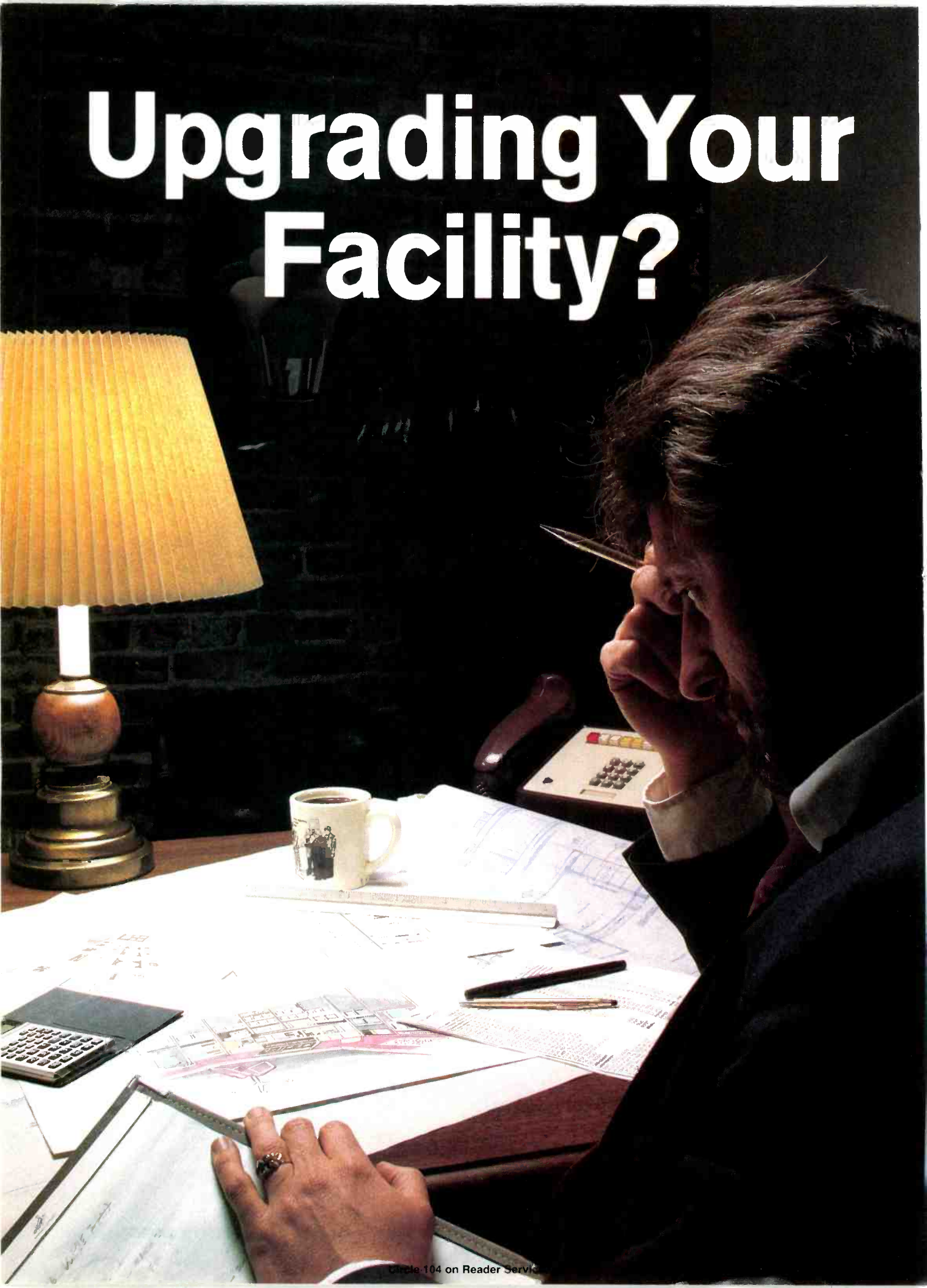

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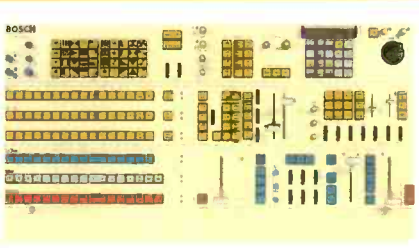

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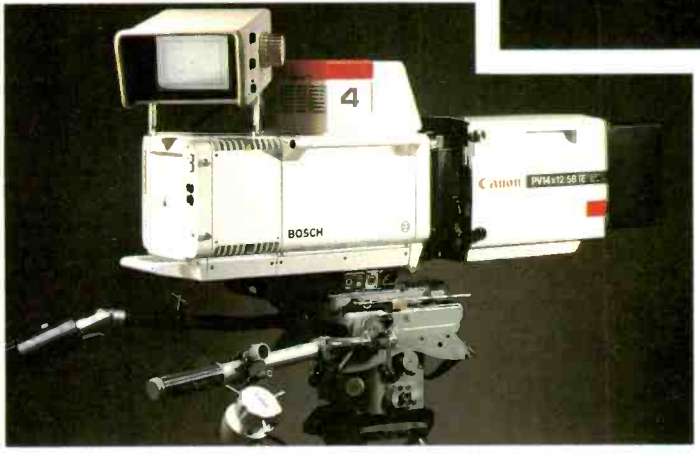

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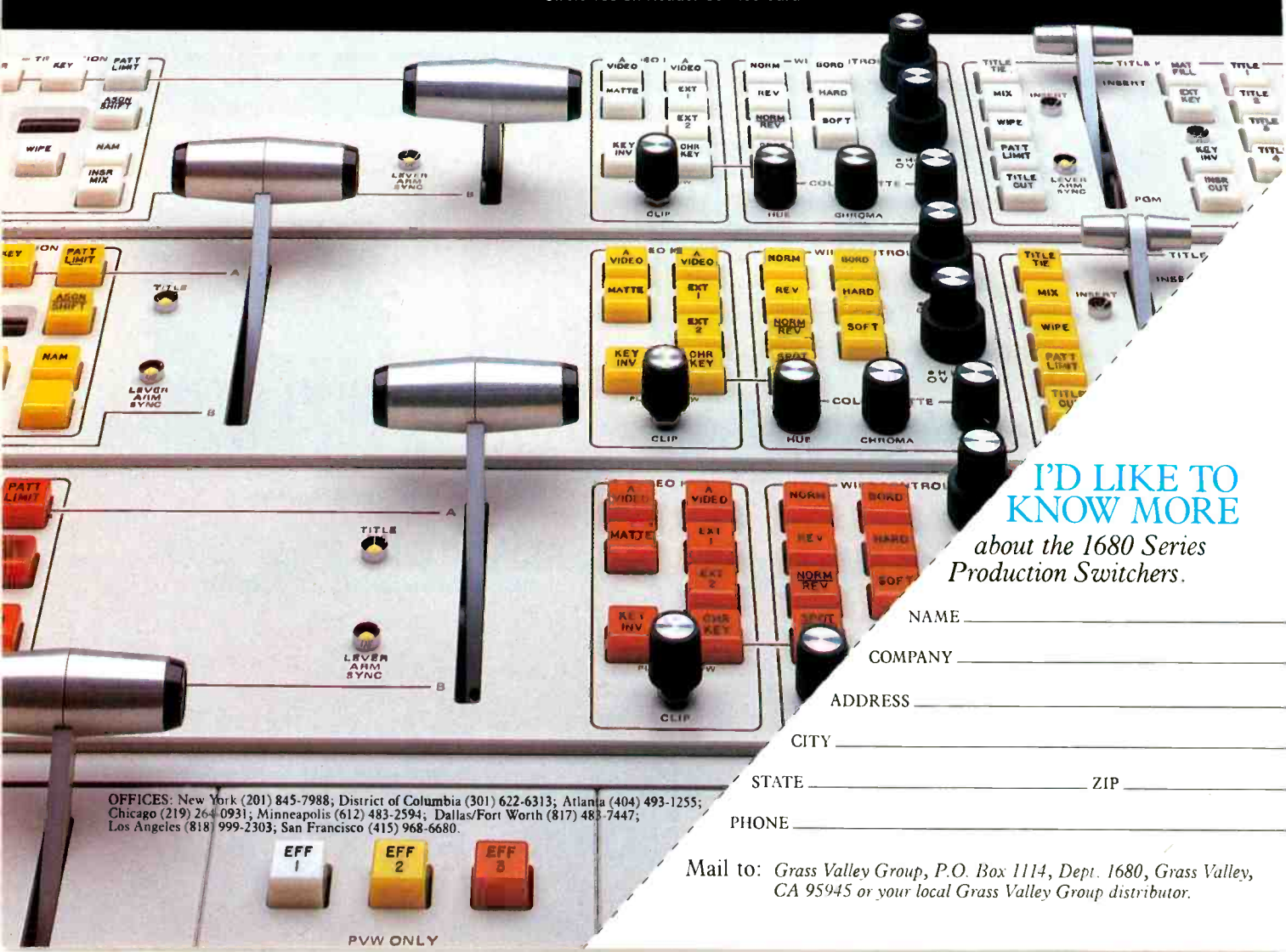

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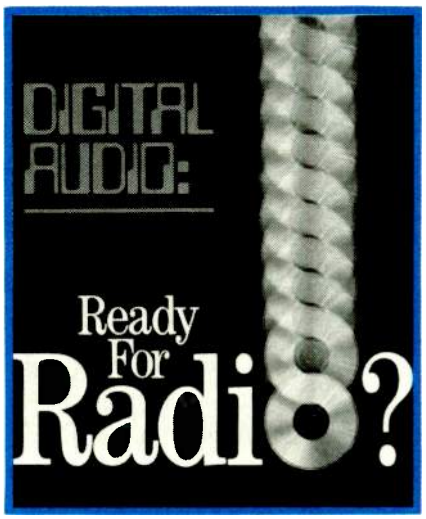

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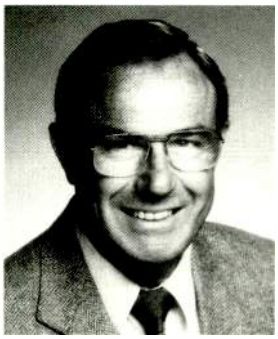

77 WILLIAM STRUBE

Features

Departments

Cover:

Digital audio helps radio with on-air sound, but is analog the true foundation of today's station? Photograph by Bruce Weintraub/ Photographic Illustrators.

An Industry Moves Forward

"We do know the industry is currently being driven by manufacturers who are responsive to the industry's needs and by an excited community of broadcasters."

The question burns in the minds of broadcasters, and, as always, burns hottest in the months immediatly following the NAB convention. The question is: Where is the industry headed? What is also implied here are other questions: Do we, as members of the industry, have control of the direction? Do we have control of the speed and the momentum? And, more immediately, what is in store for the second half of 1986?

In recent months, we at *BM/E* have run editorials on standards and practices; always a matter of concern to a technologically oriented business. This is, of course, due to the pressure that standards committees exert on both the manufacturer and the user (or at least they try to influence these factions) and, secondarily, as a result of the type of thinking representive of manufacturers and other organizations that participate in such committees.

It is essential that overall industry growth be understood, for we are at a crucial juncture. Broadcasting is now entering a stage of maturity. This business, after all, is still a relatively young one. Part of the new maturity is reflected in the positive, upbeat approach of broadcasters, in spite of confusion over standards or difficulties with collective or individual companies. Also part of the maturation process is the support by broadcasters of those manufacturers who are providing useful technology.

Manufacturers themselves are going through changes, experiencing a subtle shifting of efforts.The trend toward fewer engineering-oriented companies and an increase in market-driven companies (with a solid engineering base) is another indicator of our coming of age. Such "rites of passage" developments were in evidence this year around NAB time: NBC's commitment to Panasonic's M-II; joint efforts by Sony and Ampex; Philips and Bosch; Philips and Studer; Dynatech forming an umbrella over Utah Scientific, Colorgraphics, and Quanta. All of these events signify a healthy growth in cooperation among companies trying to satisfy market demands with services as well as innovations in software and hardware.

Perhaps the answer to the question "Where are we headed?" will never be answered. We do know the industry is currently being driven there by manufacturers who are responsive to the industry's needs and by an excited community of broadcasters who wish to take us as far as we can imagine with momentum and control. In view of this, the second half of 1986 looks very bright, and the road to the future seems smooth.

I, as the new editor of *BM/E*, am proud to be a small part of this exciting industry, and I hope to see you down the road somewhere. Let's have some fun getting there!

Tim Wetmore

Tim Wetmore
Editor

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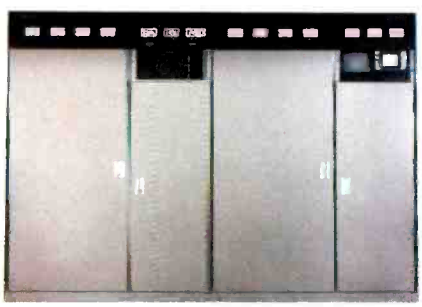
Harry Pappas was so impressed with his first Comark "S" Series 220kW Transmitter, he bought a second.

You don't get to be a leader in the independent television broadcast industry by making the wrong decisions about TV transmitters. When Harry Pappas was ready to build his New Super-power station, WHNS-TV in Asheville, N.C., he chose the Comark "S" Series 220kW Transmitter. In Harry's own words: "The transmitter lived up to the promises made by the Comark people...and then some. In terms of performance, specifications and efficiency ratings, I couldn't have asked for more."



Naturally when it came to choosing the transmitter for his next station in Omaha, Nebraska, there was only one choice: Comark's "S" Series 240kW rig.

At Comark, we are especially proud to have gained the confidence of a knowledgeable industry leader like Mr. Pappas. But building superior transmitters is only a part of our story. We continue to work even harder at building a superior transmitter company.

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Panasonic reliability. Recognized as a leader in professional electronics, Panasonic performance and dependability are at the heart of the M-II system.

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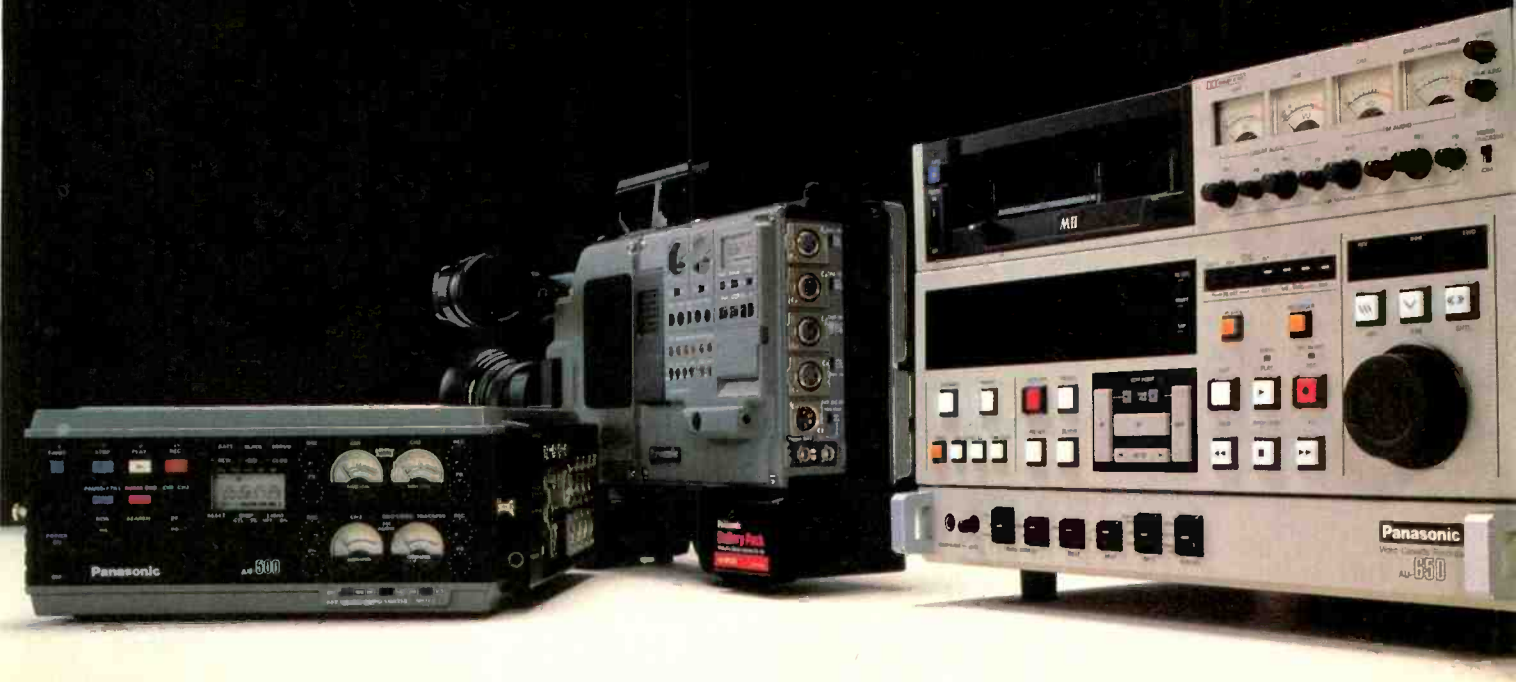

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Media Events Go Global via Satellite

Broadcasters and corporations alike are capitalizing on the availability of international satellite feeds. Two recent occasions showed how.

The first event formed part of the Coca-Cola centennial celebration. On May 8, satellite feeds handled on Intelsat, Brightstar, and Western Union systems were coordinated to allow choirs in five continents to be heard together live.

The problem of different "satellite bounce times" had to be overcome to achieve synchronization of the voices in the singers around the world. Tests well before the event were ruled out because of possible routing changes in the satellite hops.

Instead, engineers sent a beat pattern along five sets of two wires to the five continents' choir locations immediately beforehand to determine the length of the delay, which could be up to two seconds. With this information, the choirs started at slightly different times to achieve the desired effect heard in Atlanta.

The second event was the Sport Aid benefit held on May 25 to raise funds for African famine relief. In this case, simultaneous live feeds were handled from 13 sites around the world and transmitted as a single telecast shown in 50 countries.

Eight video signals were fed to London. These pictures were then sent to program directors at NBC in New York using a "quad machine" to allow all eight pictures to be sent on only two channels. When the director had selected the required feed, the channel would switch to carrying that signal only. According to Brightstar, Sportaid was the first occasion at which this split-screen feed was used.

The Sport Aid control room in New York, showing feeds from around the world, including some on split-screen "quad machines."

At NBC, the eight London feeds joined eight other feeds from around the world. In all, 23 transponders on 15 satellites—both international and domestic—were used over a three-hour time window. All but one of the feeds were on C-band.

According to the production organizers, more video signals were sent by satellite at one time for this one event than ever before. More than one billion televisions are believed to have received Sport Aid coverage.

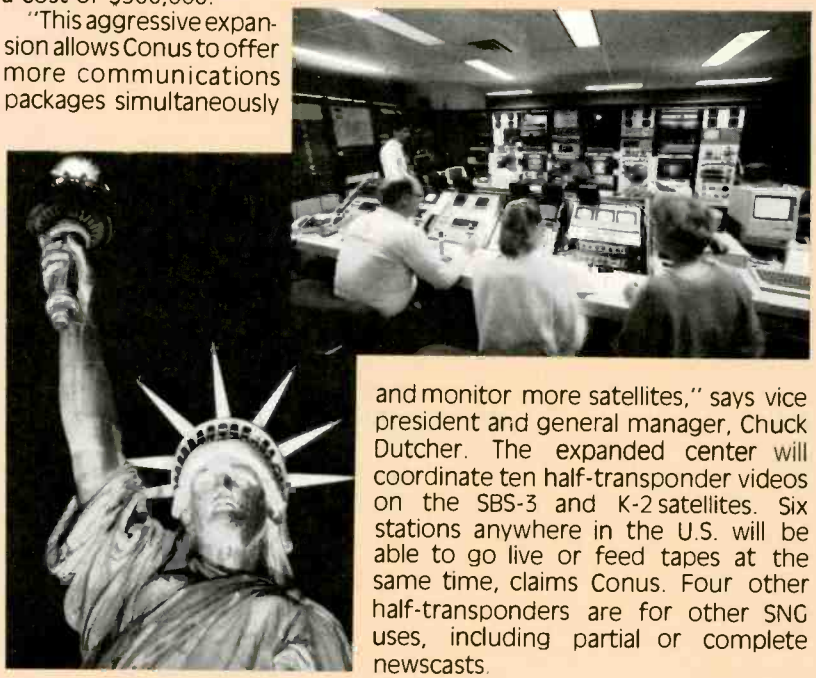
Visnews International coordinated the feeds on both occasions. Producers for the Sport Aid broadcast were Global Media, and for the Coca-Cola birthday party, C. Henning Studios in Atlanta.

Swearing by Satellites

The satellite and production records set by these events won't last long however. On July 3, 20,000 new Americans were sworn in live

Three hundred or more live shots will be relayed by Conus Communications to its member stations. They will go through its Ku-band satellite news master control center in Minneapolis, recently doubled in capacity at a cost of $300,000.

"This aggressive expansion allows Conus to offer more communications packages simultaneously and monitor more satellites," says vice president and general manager, Chuck Dutcher. The expanded center will coordinate ten half-transponder videos on the SBS-3 and K-2 satellites. Six stations anywhere in the U.S. will be able to go live or feed tapes at the same time, claims Conus. Four other half-transponders are for other SNG uses, including partial or complete newscasts.



Call for 1986 Best Station and Facility Design Competition Nominations

The Best Station and Facility Design Competition, which appears each year in the December issue of *BM/E*, is the industry showcase for recently built or renovated stations and teleproduction facilities. If you would like to see your station or facility featured in the competition, send the name of the person to whom the application package should be sent, address, and telephone number to *BM/E*, 295 Madison Ave., New York, NY 10017, or call (212) 685-5320. Please send requests for application packages by the end of August. Winners are decided by readers' votes and receive awards at a presentation ceremony during the NAB convention.

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From 4-wheel-drive ENG units to 45-foot mobile production vans – Midwest has built more broadcast vehicles than anyone. And as a leader in the RF industry, we've supplied hundreds of satellite systems across the country. Midwest is using this experience to produce the most efficient, versatile Satellite News Vehicles available. All engineering and construction are done under one roof, allowing the fastest delivery in the industry. And with over 30 offices, Midwest has the most complete service network offered by any Satellite News Vehicle supplier.

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via satellite as part of the Liberty Weekend Celebrations in New York.

Thanks to the latest satellite technology, recent arrivals had the chance to experience the feelings of past generations of immigrants as they passed the statue on their way to Ellis Island.

About four hundred new citizens were sworn in by Supreme Court Chief Justice Warren Burger on Ellis Island itself. Up to 40,000 others, in cities around the country, took the oath remotely. For those new Americans in four special locations—Los Angeles, St. Louis, Washington, DC, and Miami—the swearing-in ceremony was live by satellite.

ABC, which obtained the network exclusive for the event, worked with the Immigration and Naturalization Service and entrepreneur David Wolper, of Los Angeles Olympics fame, himself a one-time TV producer, to ensure the satellite linkup went smoothly, allowing the Justice's voice to be heard by all the participants and synchronizing the singing of "God Bless America" following the swearing in.

There were other satellite services in on the act, as well. According to Kelly Shannon at Conus Communications, 16 of its member stations were slated to send crews to the event, four of those—WBAL-Baltimore, WCVB-Boston, WCSC-Charleston, WTAE-Pittsburgh—with Newstar trucks. The Pittsburgh station and WTVJ from Miami, one of the cities involved in the satellite ceremony, were to originate their newscasts from New York for the entire week. Two of the trucks were to be located on Governor's Island, with one in Battery Park and one on Long Island linked by Ku-band to Manhattan.

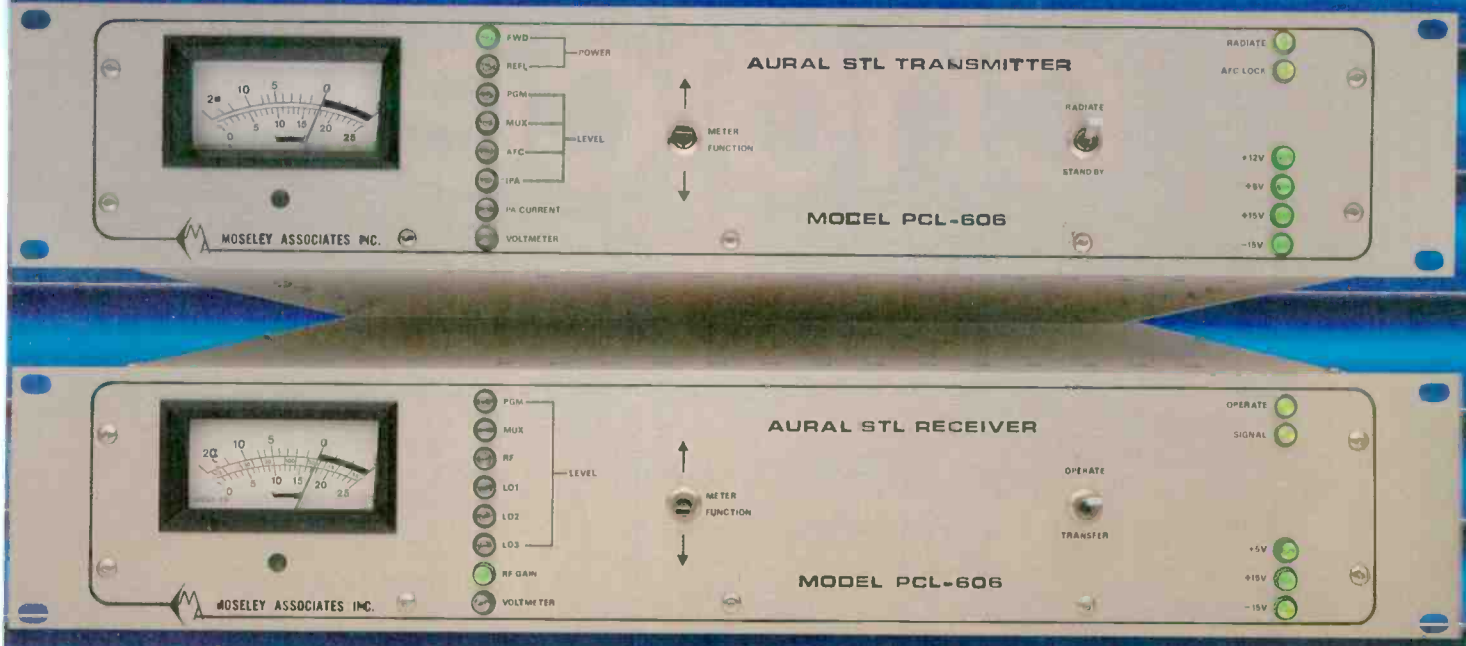
In related satellite news, Associated Press and Conus have announced the formation of a joint venture for a Washington video news feed service. The service, "TV Direct," will be available to all TV news operations and will be up and running by next month, says AP.

"TV Direct" will comprise live and taped video news feeds of Washington events provided by Conus's Washington Direct SNG facility, on-location local stories reported by AP staffers, and Videographs, AP's video-format news photograph service.

Radio '86 Lures Engineers

Now that the NAB has taken over the September Radio Convention, there's been a whole-hearted attempt to draw more engineers to the show, which has traditionally concentrated heavily on programming and management.

The number of engineering sessions has been doubled and they are now being handled by the NAB's Science and Technology Office. Topics slated as subjects of sessions include "AM



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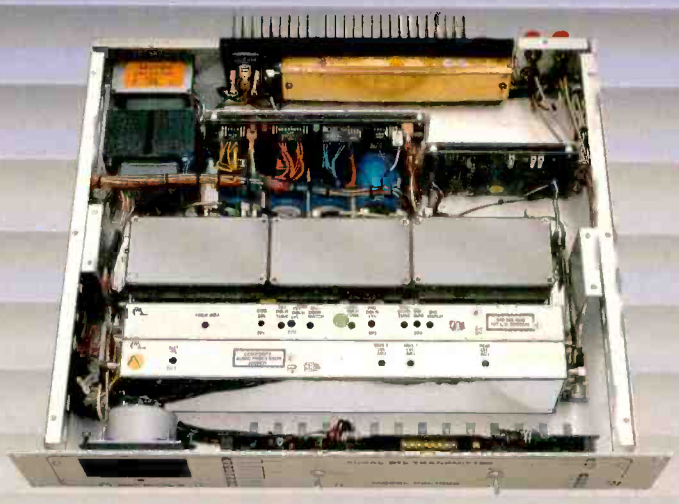

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Improvement," at which time a report on overmodulation and the NRSC draft voluntary standard for preemphasis are to be presented, along with a progress report on controlling electrical interference.

Other topics for engineers are new ideas for using AM stereo, FM upgrades and the new FMX system, directional antenna maintenance, grounding tips and techniques, strategies for lightning, FM antennas, studio design, and RF radiation regulations. Of special interest should be a session on new studio technology, including such topics as digital audio, CDs, and digital editing.

Digital audio, overall, is expected to be an especially hot item at the show, with the new CD "jukebox" or multiple-disc players taking center stage. Music syndicators will also no doubt have more offerings on CD.

Besides trying to lure more engineers to the show this year, the NAB will be repeating some of last year's efforts to get attendees onto the exhibit floor. Last year's successful lunch served alongside the exhibit booths will be repeated.

The show will be at the New Orleans Convention Center from September 10 to 13.

New AM Band Plans Proceed

Although it will be several years before the first stations are on the air, countries in this part of the world are expected to begin clearing 100 kHz of the AM spectrum of nonbroadcast services to make way for new allotments between 1605 and 1705 kHz.

A Western Hemisphere planning conference on the extended band held this spring generally went along with U.S. delegation recommendations. Allotments will be based on 1 kW of power with a nondirectional antenna on the border, and on 10 kW with a directional antenna 200 miles or more from a border. Technical standards will be the same as those now in force for the AM band in this country.

A second meeting on widening the spectrum is not scheduled until 1988. It is estimated that some 500 stations could be added to the spectrum, with the first ones signing on by 1990.

Complex Satellite Links Deliver Goodwill

Before any of the competition got under way at the Goodwill Games in Moscow this month, Turner Broadcasting was setting a record.

As a broadcaster from an Intelsat signatory nation, Turner was able to link up to Russia's Intersputnik Statsionar 4 satellite (a nonsignatory) to transmit the games from the Soviet Union to Atlanta.

To present 129 hours of television to audiences in North and South America, including U.S. syndicated stations and cable systems, Turner had to arrange links to several sat-

ellites in both NTSC and PAL. (SECAM signals from cameras in Moscow were converted at the Ostankino international broadcast center.)

Compounding the complexity of the games was additional coverage of an international basketball tournament taking place at seven venues in Spain. In the Soviet Union, 20 venues were in use from Moscow to the Baltic Sea. Turner had mobile vans on-hand for special interviews to augment the Soviet TV feeds from the arenas.

According to Jim Kitchell of Turner Broadcasting, to get the waiver to use Intersputnik required negotiations involving the FCC, U.S. State Department, Comsat, and Intelsat. After examining all the alternatives and recognizing that Statsionar 4 was to be a backup link, approval was granted for the duration of the games. "We've cleared a total of 23 circuits between the U.S. and the USSR," a weary Kitchell reports.

GE-RCA Merger Progress

The FCC has paved the way for completion of the $6.46 billion GE takeover of RCA. The commission has authorized transfer of all units, including NBC, to GE. The commission also approved short-form transfer of NBC from RCA to a newly created separate division of GE, which had promised to keep the network operation independent of the rest of the company.

GE has an 18-month waiver to comply with cross ownership rules and will sell radio stations in New York, Chicago, and Washington. There's specualtion that the loss of those major markets could prompt sale of the entire NBC Radio Network.

The FCC acted quickly on the proposed takeover, which was announced last December. GE said the purchase deal could be closed as early as this month.

TEAC Chooses DASH

In the relatively quiet war between digital audio recording standards, there is one more supporter in the DASH format.

Teac has said it will use the DASH format for its digital multitrack and two-track mastering recorders. The company plans a DASH digital recorder to be marketed next spring.

Teac joins Sony, Matsushita, and Willi Studer AG, in suporting the DASH format.

Mitsubishi, Otari, and AEG have come out in favor of a competing format, the PD or pro-digital mastering format. Mitsubishi and Otari both have digital recorders in this format, with a pro-digital introduction by AEG also slated for next year.

Teac says it selected DASH because of customer acceptance, technical standards, and flexibility, and because of its similarity to analog recording.

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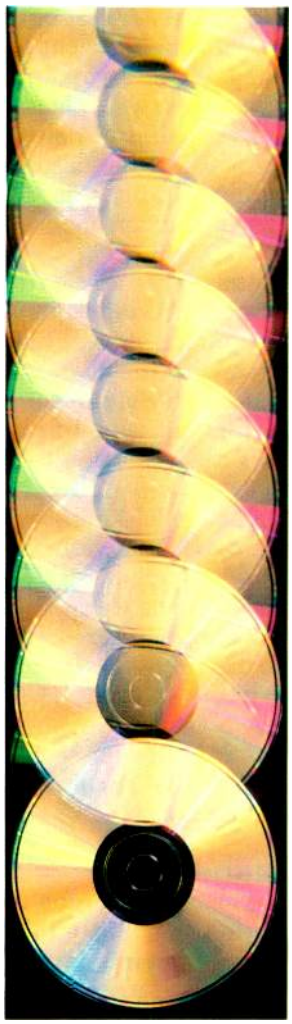


DIGITAL AUDIO

Ready for Radio?

"Digital" has become the catchword of the decade, with stations clamoring to play the latest CD releases. But promotional benefits aside, are compact discs and other digital audio systems ready for full acceptance into the radio station?

By Judith Gross

It's almost impossible to talk about state-of-the-art audio without using the word "digital" these days. It was only a matter of time before techniques perfected in the music recording studio, along with consumer demand for the compact disc, made the benefits of digital sound something for radio stations to explore. No surprise then, that "digital" was the most bandied-about word at this year's NAB show. And no surprise that radio engineers appear ready, and some of them eager, to be wooed into the digital camp.

But not so fast. While many stations are playing CDs and promoting them on-air, and while no less than some two-dozen radio equipment suppliers were marketing digital audio products in one form or another at this year's NAB show, some serious concerns about the state of the technology, especially its suitability to the typical radio environment, still remain.

The search for hardware

There are still only a few companies manufacturing players for the pro market. This has forced stations to use consumer models, sometimes with disasterous results. A major market announcer was recently chagrined when the station's player malfunctioned in the middle of a song, and it appeared to turn him, at least temporarily, against CDs as a reliable music source.

Two CD player manufacturers are no longer competing with each other for radio station business. At this year's NAB, Studer Revox and Philips joined forces, deciding that Studer would market both the Studer A725 CD player and the Philips LHH 2000 professional

CD player system in the U.S.

Dave Bowman, director of professional dealer products for Studer, says he sees a transition among radio stations away from the consumer models they were first using and towards acceptance of professional players. The reasons reflect the industry's specialized needs. Cueing is probably the most important function desired by stations. The Philips model uses a "flywheel," a separate panel with a round disc that can cue a CD cut up to its exact start time, much as the on-air talent would cue up a vinyl recording. The Studer player uses a pair of forward and reverse skip buttons, which sample the audio in small increments for cueing. The Studer unit is rack-mountable; the Philips, a table-top design

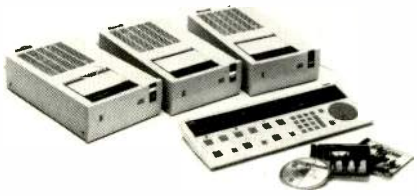
Both the Studer and Philips pro models are considerably more expensive than consumer CD players, with the Studer selling for under $2000 (pricing on the Philips players is not yet available). But the units are more durable and reliable than consumer units, withstanding stations' constant and not always gentle use.

Sony has also had a CD player for the professional market available for some time. Michael Feniello, marketing and administration manager for professional audio products, says that when the pro player was first introduced, it was ahead of its time.

"The radio market is still determining its needs in CD players," Feniello points out. "There will no doubt be refinements as the needs become more clear to the users."

Sony is marketing its CDP-3000 player in tandem with its CDS-3000 controller for two players. The player uses searchwheel cueing to find time codes and can cue to start times. Feniello says both units are durable and feature simple controls. The players are made to be controlled remotely from the controller or a PC, and the controller can preprogram start times for cuts to be played.

Sony is satisfied that the products meet the current needs of radio broadcasters for on-air and production enough to allow their acceptance into stations anxious to "go digital" quickly. The player costs $2100, and the controller, $1200.



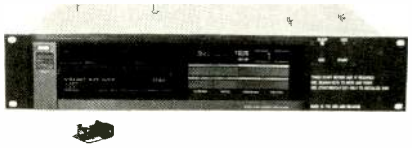
Philips LHH 2000 CD players have a controller and "flywheel" for cueing; Studer now markets them in the U.S.

For automated or semiautomated stations, there is a new approach to CD play—the multidisc changer, or "jukebox," which Sony and at least one other company are marketing to stations (see "Borrowing from the Jukebox" in this issue).

In addition to the Philips CD player, Studer continues to market its own high-end A725 player.

One additional hardware offering is a new product from Straight Wire Audio, the CDque. It's basically a consumer CD player that has been specially modified for broadcast use. However, it offers a compromise in price between the consumer and pro models.

Bill Sacks, president of Straight Wire, says the CDque is the most popular product the company has made. It offers cueing within milliseconds via a rollback to the beginning of the cut as defined by the disc's index codes. A cue button will "walk" through the cut to find the actual desired start point.



Straight Wire Audio's CDque is a specially designed player that offers precise cueing and meets broadcaster's needs.

One function that will please broadcasters is the ability to alter the "speed" of play—either faster, as many "top hits" stations do, or more slowly, for production applications.

Some stations eager to begin playing CDs will continue to buy the cheaper consumer players initially, and, even with the addition of an amp needed to boost the gain for on-air and the subsequent increase in S/N ratio, a station can probably still get a -80 dB S/N from a consumer model and have the benefits of digital as well.

But companies marketing CD hardware to broadcasters are looking for increased interest as the idea of the digital radio station catches on. Still to be solved, however, is the problem of getting music on CD that is tailor-made for radio, and that has become a software consideration.

Where are the CDs?

The one overwhelming problem that radio stations currently face when they decide to start playing CDs is their scarcity, especially in a form suited to individual music libraries. On cart, music can be sped up, shortened, and cued to a tight start. On records, music is acquired with little or no expense—since record companies still promote new releases on vinyl—and cueing records is a simple and time-honored radio tradition. Tape libraries from music syndicators, meanwhile, solve the custom needs of the station as well as adding automation capabilities where desired.

The story is different with CDs. There are still only a handful of pressing plants in operation, and most music masters must be "prepped" for CD recording. Then there is the matter of cueing.

Different discs have different access times, and different CD players operate at slight variations in speed. In addition, finding a specific cut on a disc is often difficult. If a station buys CDs off the record store shelf, there's no way

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to customize the music to specific needs. Then, too, there is some music that will probably never appear on CD. And even if CD production for consumers begins to boom, the radio market is considered too specialized for most pressing plants, which would rather concentrate on the mass market.

But even while CD production currently lags behind schedule, there are signs that the picture will change drastically over the next year or two. There are several CD plants currently under construction, with a projected 20 plants to be operational in the near future.

That still leaves the question of catering to radio's custom needs, but suppliers eager to fill this specialized market demand are beginning to emerge as well.

Kady Morant of Digital Programming Inc. believes that some 15 percent of radio stations are ready to embrace CDs today and another 30 percent, which include a mixture of both automated and live stations, will be readying themselves for CDs in the near future.

DPI was the first company to come forth with the idea of customized music libraries on CD that incorporate automation encoding right onto the disc. The encoding, which involves a cue tone, allows for automated control of CD players via large radio automation systems, solves the problem of cueing to different start times, and includes a database about the music, as well.

DPI is currently producing its first format, a rock library that extends back into the 1950s, and will tackle a country format next. After that, Morant says, there will be some production in other more specialized formats, as well as custom libraries requested by stations.

"We entered the field early and developed ongoing relationships with several plants," notes Morant. "The plants are being selective; they want ongoing relationships and are interested in short runs." DPI is projecting continued production of its disc libraries, with not more than 2000 copies of any one CD. The company is also interested in working with other syndicators who want to produce libraries on CD.

"We'd be giving syndicators a better tool, so all of their time doesn't have to be taken up with tape maintenence and they can concentrate on what they do best, which is programming." She says there has been interest in the company's music libraries from "about 1000 stations."

Broadcast Electronics featured a working model of DPI's disc incorporated into its automation system at this year's NAB, where, Morant noted, "CDs were going gangbusters." She expects that the development of multiple-disc players for the pro market, plus advances in CD mastering, such

Borrowing from the Jukebox

About two years ago, the Japanese Karaoke box, a CD jukebox, was brought over to see if there was any interest in the professional audio market. It was greeted with a great big yawn.

But in the last few years, CDs have started to become accepted into radio stations, and the idea of a multidisc changer, similar to a jukebox, started to seem like a good idea. It would be especailly suited to automated stations.

There are two systems being marketed to radio stations: one from Sony that handles 60 discs, and a joint product by Sono Mag and Allied Broadcast that handles 100 discs.

The Sony CDK-006 disc changer is designed for external microprocessor control via a proprietary Sony interface. It houses the 60 CDs in detachable storage trays, and the maximum change time between discs is 16 seconds. It uses timecodes on the disc to cue to the "start" as defined by the producer, but software could be written to cue the discs differently. They would have to be written for each disc, or cut, however, or have some set prefadeout relating to the timecodes. The 60-disc changer has dual phono outputs and features self-diagnostic capability. It will be available in late summer and retail at a price that stations will find attractive in comparison to large cart automation systems: $3500.

The Auditronics' CD Multi-Play System developed by Sono Mag and Allied holds 100 CDs and offers random access to any CD at any given cut on the disc. It operates via a microprocessor-controlled systems.

A key advantage of this "jukebox" type of player is that it will cue up to the actual start of the audio. Steve Sampson, executive VP of Sono Mag, says the player searches the disc for anything above -60 dB and cues to that point as the start. He reports that out of several thousands of CD cuts, there has been only one case where extraneous noise before the actual start of the music falsely triggered the system. The system has an internal memory into which nine cuts can be preprogrammed. The multiplay system can be connected to Sono Mag's Programmer, which could accommodate up to four players in full audio or live assist.

There are a few other bells and whistles included in the Sono Mag/Allied system. It will send back the running time in minutes and seconds of cuts as it plays by reading it off the disc directory and displaying it on a terminal. It can be programmed to switch to the next selection at a predetermined "time before" the end of the cut, and the companies are looking towards incorporating a "faster play" option for stations that speed up cuts. The Audiometrics unit sells for $3495, and Sono Mag is offering a special deal on two 100-disc players and its Programmer for $9995. The Programmer can handle a total of six CD players, four of which can be the 100 disc systems.

It's important to note that because of the access times of multiple disc changer/players—16 seconds in the Sony and a worst case of 28 seconds in the Audiometrics—radio stations will most likely need to buy at least two systems for quick cueing of segues. But even the purchase of two complete systems costs less than large cart automation systems.

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T-37 PRO Bodypack Transmitter

The T-37 PRO bodypack transmitter accepts all positive-biased and most negative-biased electret lavalier mics via an easy-to-use mini 4-pin XLR connector. Conventional panel-mounted mic on/off and recessed power on/off toggle switches are featured. The ultra-rugged case stands up to hard use.

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as the Philips twin-DASH system, will help CDs gain a permanent foothold into radio stations.

Another music syndicator ready to offer libraries on CD is Century 21, which, along with several other suppliers, offered a CD production library for radio stations this spring. Century 21's Dave Scott believes that CDs and radio station automation are a natural combination.

Unlike DPI, Century 21 will not use special encoding for cueing and sequencing but will rely on the P and Q tones recorded onto the disks.

"But we will master our CDs in such a way that they will be customized for radio play. Cue-to-the-next will be built-in, and the user with the inexpensive consumer CD player will sound just as good as the one with the expensive model," Scott says.

The P and Q tones Century 21 and some players use to cue discs signify the "start" of a cut on the disc, as defined by the producer who recorded it. There are slight variations in how much time there is between the so-called "start" and the actual first note of the song. In addition, there are varying start-time lags among the variety of consumer CD players.

"The worst machine is still able to cue up to about five frames (one frame is 1/30th of a second); much worse than a cart machine, which cues to about 1/10 of a second," notes Scott. He is concerned, however, about the time it currently takes to produce CDs.

"If I ask for a three-day turnaround, they (pressing plants) just laugh at me," Scott notes. "If I'm willing to contract for large volume, I might get them in 60 days."

Live-assist and automation

CDs in particular seem to be tailor-made to station automation because random access is a key factor in automated systems. Digital automation eliminates the need to handle bulk tape sources that are continually replaced due to wear. In supplying tape to stations, music syndicators have become dubbing services and tape handlers as much as programmers. Digital music sources provide an alternative.

Schafer World Communications, Sono Mag. Inc., and Broadcast Electronics all showed demonstration systems interfaced to digital audio equipment at the NAB show.

Schafer got into the game early, offering interfaces to CD players some three years ago. Both Schafer and BE also included the Microprobe Electronics Digi-Sound hard disk audio system in the demo, and both used DPI's encoded CDs, as well as traditional cart machines and tape reels.

President Robert Dix explains that Schafer is looking at other digital systems to see if interfaces can be developed. But he acknowledges that it may take awhile for broadcaster acceptance of digital audio. Schafer will market systems for stations still using analog today, and upgrade as the conversion to digital is made.

Sony's CDK-006 60-disc Auto Disc Loader also borrows from the "jukebox" idea to offer multiple CD play.

BE's Dave Evers believes the thrust toward digital automation will come first from the manufacturers, with stations continuing to convert as more equipment becomes available. But he believes automation that can interface to digital systems offer stations an opportunity.

"Automation will have an instant impact, because mechanical cart systems in this area have gotten so expensive, and the mechanics are so finicky that a digital system that's even slightly more expensive will offer advantages." He adds, "It's also more practical to replace entire trays of carts with digital sources than it would be to replace a single cart machine."

Both BE and Schafer are looking for a gradual phasing in of digital systems over the next few years, with "hybrid" automation, featuring digital as well as analog tape sources, all interfaced together. But both are firmly committed to addressing the needs of broadcasters who go digital. Dix predicted that Schafer's most updated Ready Spot system will probably "be the last random access cart unit that needs to be developed."

A major sticking point in CD automation is still cueing capability, however. The lack of a standard for P and Q codes, or index points, or time codes of CDs, and the varying lag time before the start of actual audio makes it an imprecise technique. Automated stations that want to use CDs either have to buy a special library, such as DPI's or Century 21's, or take advantage of two new developments in the field: one in hardware, and one in software.

The new hardware are CD "jukeboxes," or multidisc changers, being marketed to the radio industry. One produced jointly by Sono Mag and Allied solves cueing problems (see "Borrowing from the Jukebox" in this issue).

The software development is a new package being offered by Ron Schiller Associates to control CD players via an IBM PC/XT or compatible.

The CD Filer system works with Studer, Philips, and Sony CD players, and Schiller says he is working on an interface for the Philips "flywheel" cuer. The software allows for cataloging, sorting, and managing of over 2000 CDs, and it can operate up to 99 players. The user creates a database, which allows the machine to select specific cuts on a disc, and information about the cut, including time remaining during play, is shown on the terminal.

Another advantage is that an entire show can be preprogrammed in advance, with the discs inserted closer to air time.

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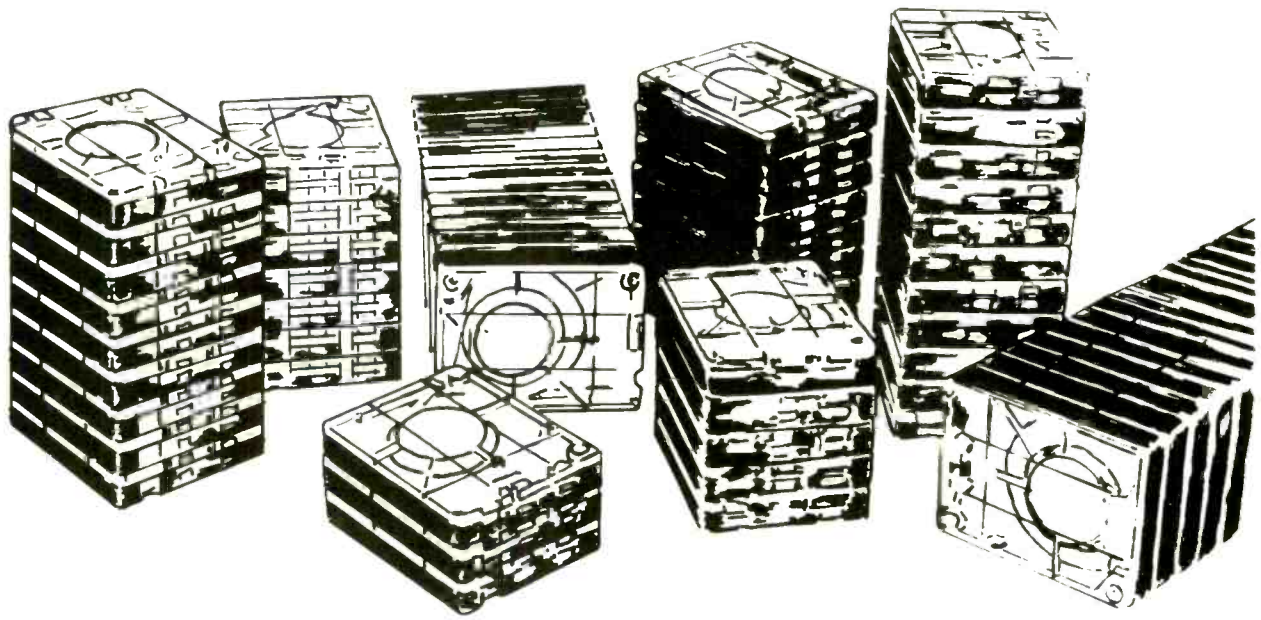

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The software can detect if the wrong disc is cued to play next.

Digital storage, playback

If radio stations begin to rely more heavily on digital music sources, the next logical demand will be for digital audio for spots, promos, jingles, IDs, and actualities.

Digital audio record/playback systems are still faced with the high cost of storage. For this reason, they are being marketed for shorter events, such as spots, and have almost completely shunned music libraries.

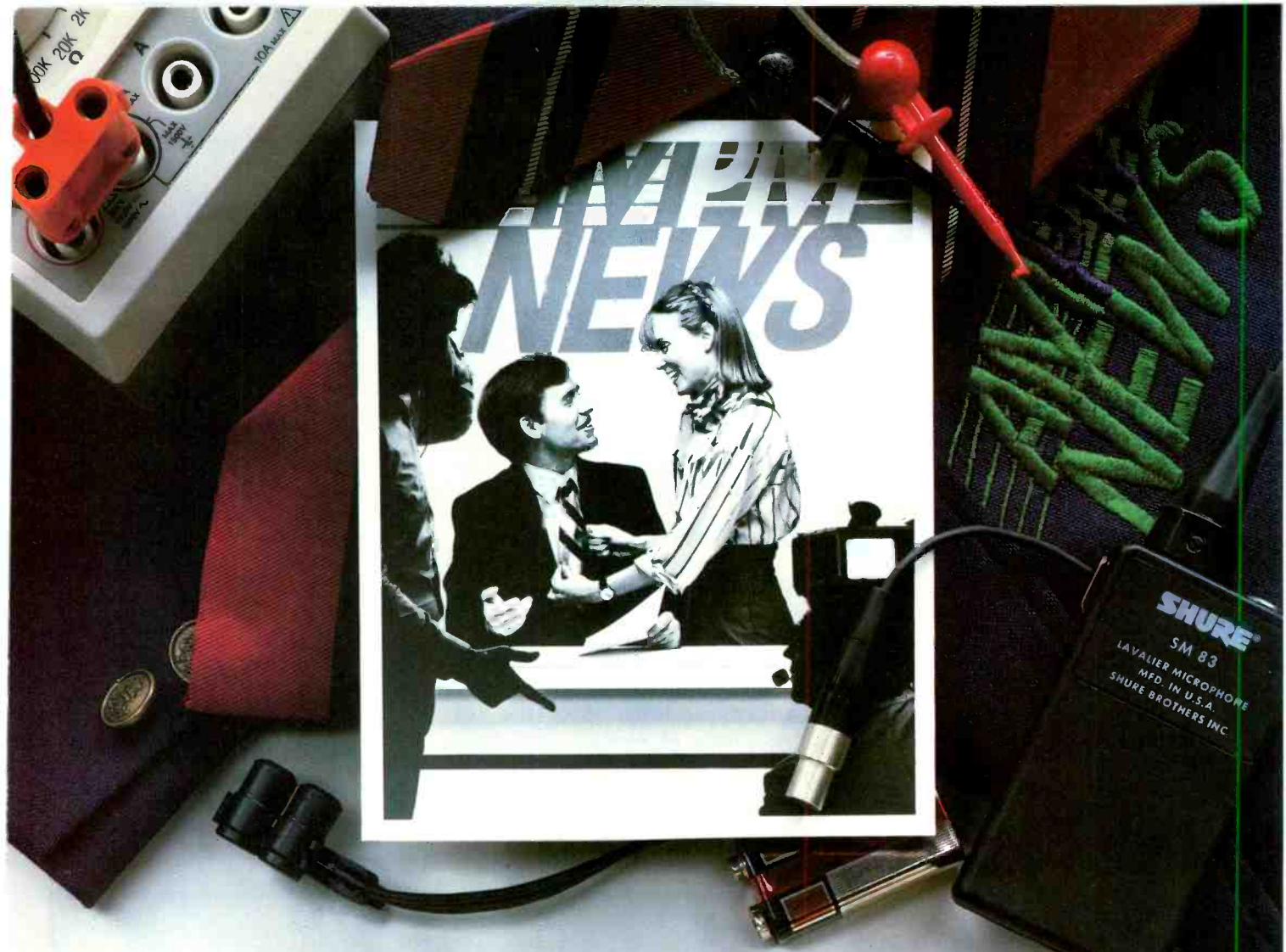
Compusonics is a company that has been marketing both a floppy disk–based system to radio stations and a hard disk–based system. The DSP-1200 spot player and DSP-1500 spot recorder, as well as the DSP-2002 hard disk audio computer, use the company's patented CSX encoding algorithm, a form of data compression. The algorithm allows about 6.6 megabytes, equaling four minutes of full bandwidth stereo, to be recorded for playback onto a specially formatted, high-density floppy disk. Storage capacity of the hard disk system is 143 megs, which will give 56 minutes of full bandwidth stereo audio. The spot player costs $3000, and the spot record/play unit is $3600; the hard disk system costs $47,500.

The spot player does offer the same advantage of single-play events in a tangible form that stations have become used to with carts. But the biggest question standing in the way of the floppy disk's acceptance as a radio mainstay is its fragile nature. It's difficult for most radio veterans to imagine on-air talent gently inserting floppies into disk drives, being careful not to touch the read-write groove, and not subjecting them to the same rough treatment that has kept the ubiquitous plastic cart firmly entrenched in radio tradition.

Compusonics has only recently begun making deliveries to radio stations, and Schwartz says he will be watching closely to see how stations take to floppies.

"We are trying to determine their durability. If they are not at least as good as or better than carts, they can't be used. We certainly aren't going to push an unreliable technology on the industry; we understand well the needs of broadcasters," Schwartz maintains.

A different approach to digital audio storage entirely is taken by Broadcast Electronics with its solid-state RAM chip–based Digitalk. An updated version, the DV-2, is slated for availability in December. It contains 256K RAM chips and uses 80 chips to achieve five and a quarter minutes of mono, or 96 chips for six minutes of mono audio at 6.5 kHz. BE uses



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On-camera talent like the SM83 because its electronics provide for a dip in the mid-range, giving both male and female voices a smoother, more natural sound. And unlike its Japanese counterpart, the SM83 unplugs from the battery pack for easy storage.

Sound engineers appreciate the SM83 because its tailored frequency response requires less equalization. They like its low-frequency rolloff too, which quiets on-air rumbling and mechanical and clothing noise.

Set directors are impressed with the SM83's neat appearance on camera. The cord exits from the side and disappears from view, running down behind a tie, shirt or blouse.

Production assistants enjoy the SM83's mounting versatility. It comes with a single clip that works either vertically or horizontally, a double clip that holds two mics, and a universal mount that can be sewed, pinned or taped to clothing.

Repair technicians love the SM83's easy maintenance. The cartridge is easily accessible by unscrewing the end cap. And cable replacement requires only a screwdriver and tweezers; no soldering is necessary.

Field crews are also big fans of the SM83 because its electronic pack is powered by a standard 9-volt battery or by a mixer's phantom supply.

For more information on the Shure SM83, the little mic with big advantages, call or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204. (312) 866-2553.

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a proprietary form of "data compaction" to achieve its storage time and is not offering stereo or a higher bandwidth frequency response initially.

Geoffrey Mendenhall, VP of engineering for the company, feels that current hard disk systems are too costly and not as reliable as the solid-state unit. "Digitalk has no moving parts," he notes, "it won't wear out."

The DV-2 features sequential access to events, and direct access has also been added, which makes the system suitable for stations using satellite music formats that need to program continuous play of specific cuts.

Mendenhall believes that acceptance of digital audio storage and retrieval systems is several years down the road, and BE is still looking at a possible venture with Compusonics in the area of floppy disks, as well as continuing to explore other digital technologies.

The Sirius 100 Digital Audio Memory Machine is a new entry in the hard disk audio storage field from For-A.

Hard disk systems grow

There are four hard disk–based digital audio systems being marketed to the radio industry as cart machine replacements for spots and promos, and no two take the same approach.

Key questions about the systems focus on exactly what radio stations will be looking for should they decide to opt for digital audio storage and how much they will be willing to shift from tried and true practices to completely new ways of doing things. Since the PC has found its way into many of radio stations, the fear that radio talent and engineers would be adverse to adapting to a computerized way of doing business is no longer valid.

Other key questions are how much storage time will stations want, how user-friendly must the equipment be, and what additional functions, besides record and playback of digital audio, would a station want? The final issue is one of cost: can hard disk systems compare with the cost of cart machines?

An interesting new entry into the disk–based field comes from For-A, a company known for its video products.

The Sirius 100 Digital Audio Memory System made its debut at the NAB. It's a menu-driven, eight-input, eight-output, hard disk system that will be ready as a product by the end of this year. With eight disk drives, it's possi-

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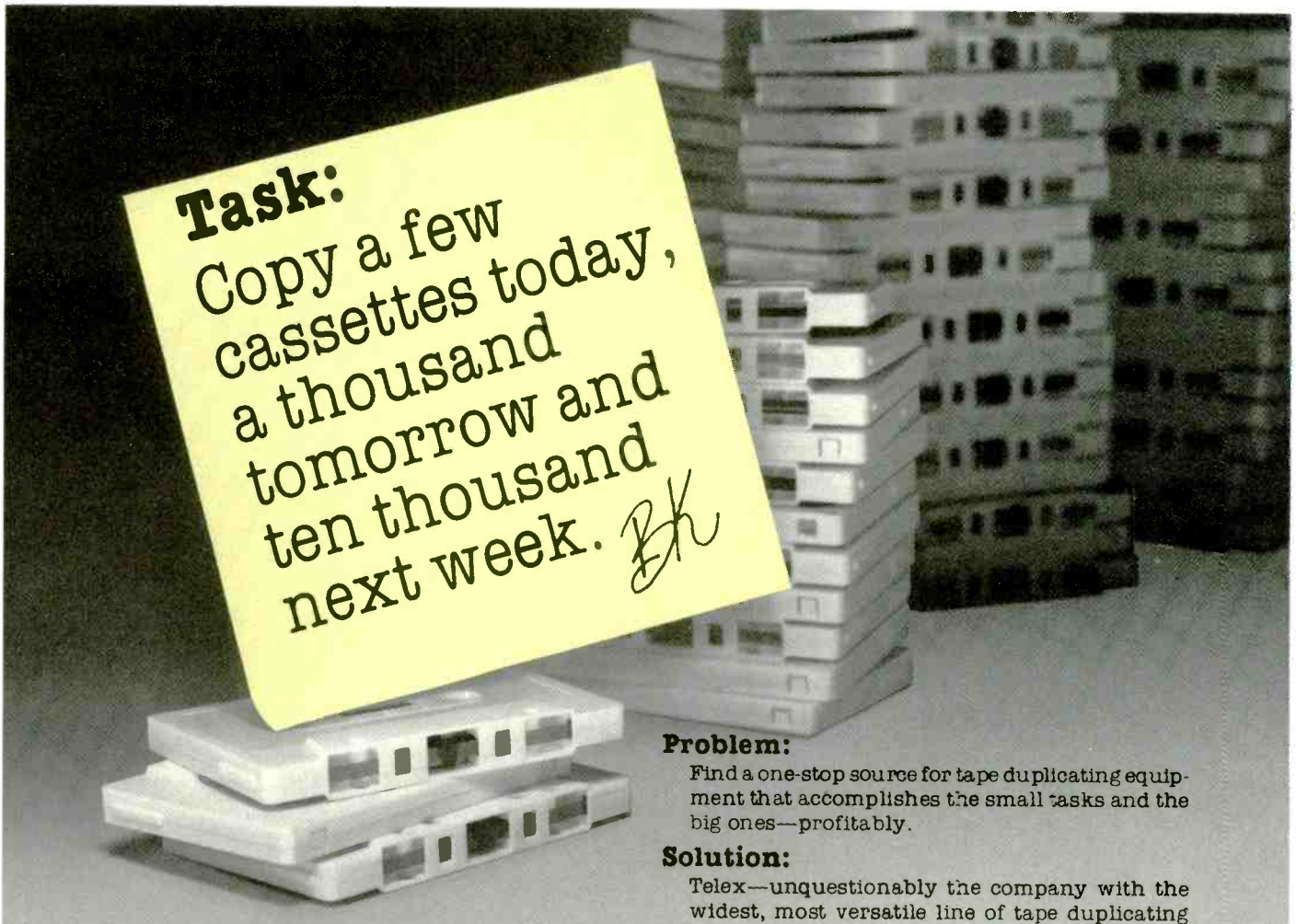

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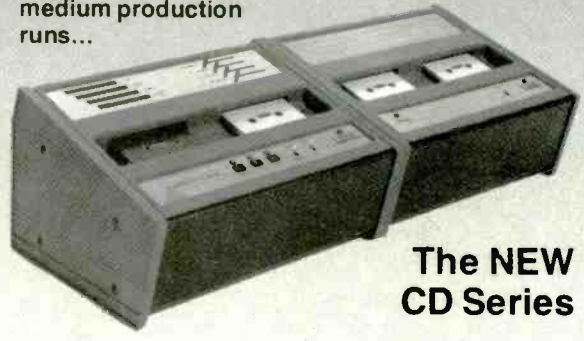

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ble to store 1000 minutes of mono audio at a 33 kHz sampling rate for 15 kHz frequency response. The eight inputs/outputs mean multiuser stations at remote locations can be set up, with all cuts available to any remote location as soon as they are recorded. Product manager Ray Blake says another possibility is using the eight channels as eight tracks for multitrack recording.

The Sirius 100 units are also designed to resemble cart machines, with easy start and stop operation. Editing capabilities, such as looping, are also possible.

Including main electronics in a rack-mounted unit, a keyboard, and remote record/play unit, the price tag on the Sirius will be about $35,000.

Another multistation, multiaccess hard disk–based system comes from a brand-new player in the field. Digital Broadcast Systems' Astre performs the functions of a digital audio record/playback system but also features scheduling/logging via computer and can offer manual, live-assist, or full automation control.

The Astre is a schedule-driven, software-dependent system that uses the Unix operating system. A station starts with a schedule of events to air, which is downloaded into the system. Events are recorded, and playback is with instant access from a keyboard. The multiaccess feature means that the scheduling can be done from sales, or programming, or any key location, with playback from the on-air studio. At the end of the day (or when desired), the system prints out a log of events that aired, so deletions are easily detected. All of Astre's functions are performed in real time from each station, and changes in scheduling are possible right up until air, which preserves one of radio's major advantages: immediacy.

President Richard Lavelle notes that the Astre's sampling rate and frequency response are variable. The system will operate at sampling rates up to 48 kHz and 20 kHz frequency response, or offer lower sampling rates for stations —such as all news—that may not need full bandwidth. Storage time on a single system 380 megabyte disk drive varies according to the sampling rate, with about 80 minutes of mono audio possible at 15 kHz, 110 minutes at 10 kHz, and 160 minutes at 7.5 kHz. Astre features 16-bit sampling.

Because of its price tag, about $75,000 for a system with one disk drive, a record/play channel each for on-air and production, complete software, three terminals, and printer, DBS is marketing the Astre to larger operations.

"The networks thought the price was inexpensive for what they wanted," Lavelle notes. "Stations spend about as much on cart

automation and an IBM PC to run it, and they don't get our multi-user capabilities," he adds.

Lavelle is convinced the time for digital audio in radio is here. "In fact," he says, "it should already have happened, given most stations' heightened awareness of digital because of CDs."

Microprobe Electronics Inc., meanwhile, has had its DigiSound hard disk system ready for about a year, and it was featured at several booths showing station automation at the NAB. It features rack or table-top mounting, with a soft membrane keypad and CRT screen. Digisound stores 76 minutes of mono audio with one drive, but drives can be added, and it can have either a 15 or 20 kHz frequency response.

MEI president Dave Collins says the system is a natural for automation and that original fears over radio personnel adapting to computer control have not materialized. He is positioning Digisound as a direct cart machine replacement and has sold some units, but there are questions of cost to consider. Previously, a one-drive unit cost nearly $28,000, which has been reduced to $20,000. Collins says he will maintain that price by breaking out some options. He will also offer a new "economy" model: the Digisound E, priced at $14,995. It has a more cost-effective disk drive, with 280 MB offering 62 minutes of mono audio.

"Then," Collins says, "we'll be able to comptete eyeball-to-eyeball with mechanical cart equipment."

One additional manufacturer marketing a hard disk digital audio system, but mainly to high-end broadcast operations, is Gotham Audio. Gotham also has both a large storage system, the Systex, and the EMT 448 Spot Player. The Spot Player offers removeable and nonremoveable hard disks, which resemble audio carts and offer the advantage of a tangible storage medium. Storage space is limited though, so the nonremoveable technology may find greater acceptance. The 5 mega-byte removeable hard disk offers 25 seconds of stereo audio at 20 kHz. The nonremoveable 100 megabyte hard disk will give seven minutes of stereo audio at 20 kHz. The system is PC controllable and can play back a series of test signals and tones.

The 100 MB nonremoveable drive system costs $16,000. The removeable disk system costs about $15,000. The Systex is $135,000 for two hours of stereo audio storage.

Sales engineer George Johnson sees a limited acceptance of hard disk systems, mostly for larger applications and among station groups. But he does point out that the cost of hard disk systems will be offset by a savings on cart replacement and cart machine

maintanence. "Yet," Johnson admits, " I really don't know if individual or small stations will find a use for digital audio systems."

Hard disk, floppy disk, and RAM chip systems are being readied for the broadcast market, but are radio stations ready to buy? The most expensive systems are major purchases that will be budgeted for—if at all—several years down the road. Test systems have to be up and running, and all the software and hardware bugs must be ironed out before stations will want to risk airing spots, which are their bread and butter.

In the meantime, stations continue to rely on their existing cart machines and make interim new purchases as their needs grow.

Tape systems survive

Cart machine manufacturers are beginning to think that the reliable, old tape-based audio cart and mechanical cart deck has been getting a "bad rap" with all the excitement generated over digital audio. They don't debate the technical advantages digital record and playback have to offer, and they generally acknowledge that someday, the radio station will no doubt be a digital world. But in the meantime, there's a chance that some recent improvements in tape-based analog recording, as well as some emerging technologies, may allow tape-based recording to compete with CDs and some of the new digital storage mediums for some time to come.

Originally, tape carts, which came into use in mono AM stations for voiceover commercials and IDs, and the machines designed to play them, didn't have the advantages of full fidelity audio—nor did they need to. It was only in a more competitive radio marketplace, first with the rise of tight formats requiring consistent cuts, then with stereo FM, that carts and machines came in for some severe criticism—a lot of it, unfortunately, deserved. The cartridge industry also suffered when consumers abandoned the eight-track cassette, which had used the same back-lubricated tape as carts and helped keep the supply of such tape abundant and of reasonable quality.

As is the current situation with CDs, the radio market was simply too small for tape suppliers to continue to market that tape, and companies in the cart machine business were forced to develop their own tape formulas. It took awhile for the problems to be ironed out, and, in the meantime, along came the first talk of digital.

But the cart machine makers weren't just resting on their laurels. Improvements to the original designs, making use of new technologies such as microprocessors, began to bring the cart machine into the current decade.

These advances, plus some of the built-in conveniences that carts have to offer in the "real world" of day-to-day radio are reasons why those in the cart machine business, and even some proponents of digital systems, believe replacements for carts will come about in a slower, more evolutionary way than might be concluded from all the enthusiasm surrounding digital audio.

"Digital isn't the only game in town, just the newest," observes Jack Williams of Pacific Recorders and Engineering. The company brought about one major improvement in cart technology with the introduction of its Maxtrax wider track format, standard on Pacific Recorders Tomcat machines and offered as an option on the company's newer Micromax machines, as well as on Fidelipac's Dynamax CTR100 series. The format is also available for other cart machine manufacturers.

Williams notes that one problem the new format has encountered is also a reason why many radio stations won't turn immediately to CDs and new music sources—they don't want to rebuild their entire libraries just to reap the benefits in audio.

Other improvements in cart machine technolgy have been developed over the last few years as well. ITC/3M, which claims a 67 percent share of the cart machine market in this country, says it sold more cart machines last year than ever, even in the midst of the excitement over new digital mediums. ITC/3M's high-end Series 99 machines feature "ELSA"—built-in tape erasing, splice locating, and automatic azimuth adjustment to eliminate phasing problems.

Fidelipac offers an advancement called "cartscan" in its high-end Dynamax CTR100 machines. It's an infrared scanning device that can detect such conditions as stereo-mono, matrix, and noise reduction encoding and switch the machine's record and playback accordingly. It will even flash a light to warn announcers when a live tag is needed on a spot.

"We're solving more problems with cart machines than radio stations ever imagined," says Fidelipac's Arthur Constantine.

ITC/3M's Bob Bomar agrees. "Our cart machines actually gave stations better quality than they were able to get from their source materials—vinyl and tape," he notes. "With digital sources, stations are just now starting to take advantage of the audio quality our machines do offer."

ITC/3M, Fidelipac, and Pacific Recorders all had demos at this year's NAB show comparing playback from a CD to that of a cart recorded from a CD, and all reported that even the most "golden eared" radio engineer was hard pressed to tell the difference.

But the speed of digital's acceptance into the radio station may rest on something that is more diffi-

cult to measure, namely the symbiotic relationship that has developed between the cart and the way a station operates. Digital system manufacturers believe that broadcasters are ready to begin looking at new ways of doing things and that they shouldn't be tied to the past. But will stations be willing to abandon techniques that have brought them ratings?

Constantine cites as an example the "morning zoo" format, which has enjoyed recent popularity. The quick-on-the-feet spontaneity of carted sound effects and voices played at the sheer whim of the on-air talent would not fare well in the preprogramming and logical forethought needed to run some digital systems. And last-minute changes are a reality at even the most sedate stations.

As Constantine observes of the digital systems, "Stations that get ratings can't use them, and stations that don't get ratings can't afford them." He adds that one of the reasons carts have become so much a part of radio is that "they make so much sense.

"The people who develop these digital systems aren't broadcasters," notes Constantine. "They don't realize that the equipment has to work when it's only marginally maintained, that it has to suffer the abuse of harried DJs, and that it's used on a 24 hour basis." He wonders what will happen the first time a hard disk–stored library crashes or a system gets hit by lightning.

Williams agrees that carts have found favor because they evolved with modern-day radio and have been fine-tuned to the industry's needs.

"Carts give the ability to produce in-house; they offer the advantages of single-play events, the way vinyl recordings did," he says, pointing out as well that cueing and quick find and startup is a problem for CDs in light of their time code inconsistencies and the varying speed of CD players.

"In the Tomcat machine, the talent could actually hold the 'play' button, jam in a cart, and have instant start," Williams explains.

The most recent player in the

Tape-Based Digital Emerges

There is no product available yet, but a recorder using digital tape technology is considered, by observers in the consumer market, to be just around the corner.

The Electronics Industries Association of Japan had previously given the go-ahead to two incompatible formats: the RDAT, or rotary digital audio tape recorder, and the SDAT, or stationary digital audio tape recorder. RDAT uses rotary heads and helical scan recording, very similar to videotape recording, but with a 4 mm digital tape. The technique allows for the high write speed needed to record high-frequency material. Over 100 manufacturers are apparently backing RDAT.

SDAT uses stationary heads in a longitudinal scan and requires thin-film heads for the necessary high-frequency recording. In some ways, it resembles analog tape more closely than does RDAT because it is possible to splice edit on the SDAT format. But SDAT does not seem to have the support RDAT enjoys, and the first projected consumer product will probably utilize the RDAT format.

Besides the excitement the new digital tape system have generated in the consumer market, the technology is being closley scrutinized by some cart machine manufacturers, possibly for the digital cart machine of the future. While the consumer forces seem to favor RDAT, it's possible that SDAT would make more sense for its use in broadcasting because it would avoid problems with rotary heads and because of the ability to splice edit. Another problem, which needs to be addressed, is the availability of digital tape for such recorders, although that problem could be solved by widespread consumer acceptance of the technology. No cart machine manufacturers will admit to serious consideration of tape-based digital recording technologies, but it's certainly on their list of future possibilities.

cart machine market is Otari, with its CTM-10 machine, which made its debut at the NAB show. National sales manager David Roudebush says the company looked closely at all digital technologies first and finally concluded that there is and will be a strong market for cart machines among radio broadcasters for some time to come.

None of the cart machine makers are dismissing digital audio and the impact it can and probably will have on improved S/N, dynamic range, and overall radio sound. They agree that CDs especially make good source material for carted music.

Williams believes that there is a place for CDs in the radio studio, as sources for carts, and on-air in classical and jazz stations, as well as new releases—after they are rushed to stations for quick promotion and play on vinyl.

But the general consensus is that initial problems with digital systems have yet to be ironed out, their costs have to come down, and all of the new digital medium, including CDs, will have to pay more attention to the realities of radio before they will replace carts and cart machines.

In the meantime, some emerging technologies may enter the picture.

Striving for quality

Otari, with its first cart machine, decided to incorporate the new HX Pro bias optimization from Dolby into its CTM-10. Bias optimization gives a tape more headroom for high frequencies, but its benefits are best achieved at slower recording speeds, around at 3 ¾ ips (at 0 dB reference) at 13 kHz. At 7 ½ ips, it gives 3.5 dB of high-end improvement (0 dB reference) at 13 kHz. But at higher speeds, the benefits drop off.

Dolby developed the HX Pro, and its new SR signal processing, for the multitrack recording market. SR especially is designed to make analog tape recording competitive with digital benefits. But Dolby says two cart machine manufacturers have discussed the possibility of incorporating SR processing into radio equipment, either as a built-in benefit to cart machines or as an outboard unit.

But the problem of using SR in a radio station is, again, one of encoding and decoding, which would mean a station has to build a completely new library in order to reap the benefits. The other factor is cost. Dolby estimates that incorporating HX Pro into a cart deck could raise the price of a unit by as much as $500. The addition of SR, meanwhile, could raise the cost of a cart machine some $1000. As ITC/3M's Bomar explains, "Stations have to weigh its merits and costs against the capabilities of existing products."

There will always be a question as to whether or not such advanced electronics actually benefit a station in practical terms, considering the limitations of transmitting systems and receivers; although new systems such as the FMX may raise the standards.

It's a safe bet that all the players in the high-end cart machine market want to keep pace with the state-of-the-art and that all are currently researching future products incorporating digital technologies. Broadcast Electronics continues to develop its Digitalk system and is still interested in a joint venture with Compusonics in the area of floppy disks. But probably the most intriguing new technology that could be adapted by cart machine companies is the new tape-based digital audio recoding systems being developed for the consumer market (see "Tape-based Digital Emerges" in this issue).

Yet so far, only one company has admitted openly to actually working on a digital product. ITC/3M's Bomar confirmed ongoing development of "a digital audio product to supplement (our) existing line." He says it will draw on the resources of parent company 3M, which means it could be either an optical or tape-based digital product, since 3M has been researching both. Bomar cautions that a new product in this field will be "significantly more expensive than current analog equipment," although it will offer "a new level of audio performance." He believes it will not be suitable for everybody.

The picture being painted, then, as radio's level of awareness about digital increases, is one of peacful coexistence between digital and analog systems in broadcasting today, as stations wait to get a closer look at the digital choices available and evaluate them against what has worked so well for them for so long. Almost all industry players agree that the future of radio is digital, but the verdict is still out as to how far off that future may be or what form it will take once it finally arrives. **BM/E**

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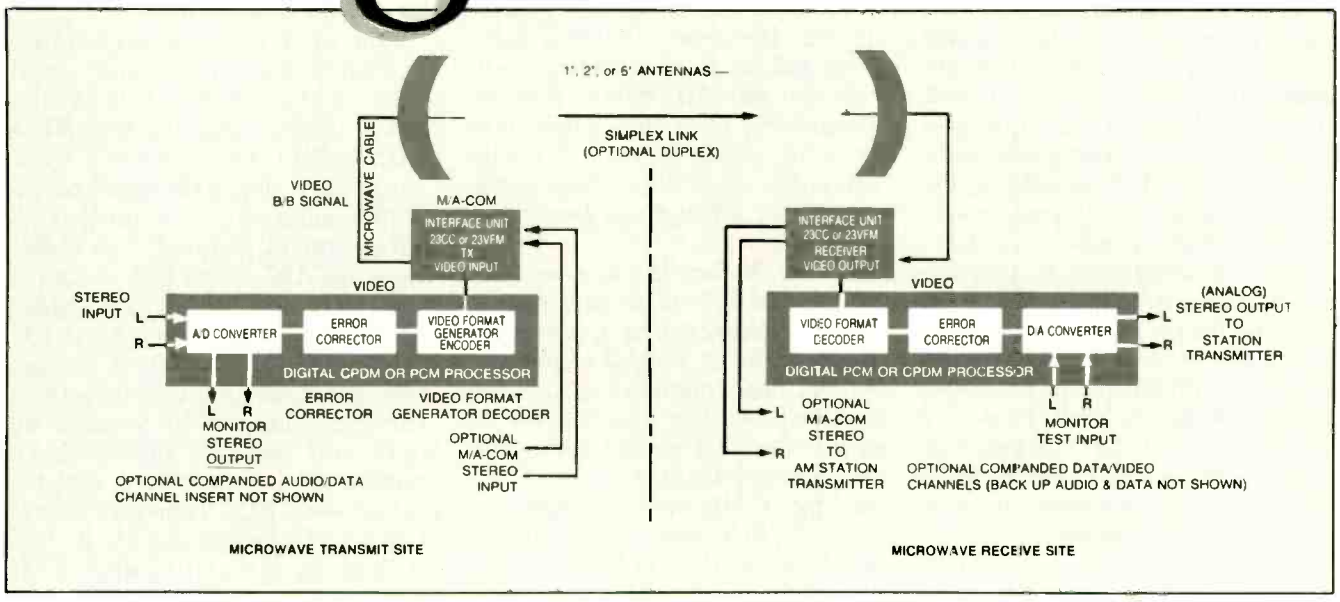


Digital modulation gives better quality sound on M/A-Com's 23 GHz microwave link.

STLs are taking advantage of newly approved high-frequency microwave bands as well as making more of the established bands.

By Hugh Aldersey-Williams

Finding a vacant studio-transmitter link (STL) channel in a sprawling urban center like Los Angeles isn't easy. "There just aren't any left to be found," says Michael Callaghan of the local AM/FM station, KIIS.

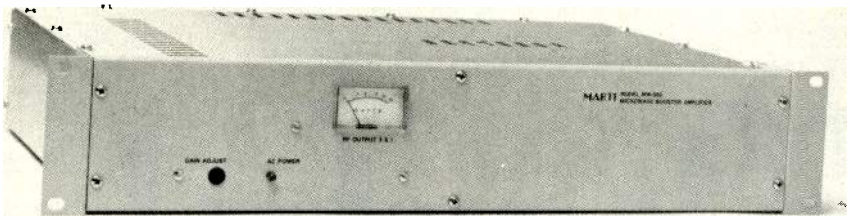
Los Angeles is one of the country's most congested areas for radio traffic, but the story is the same in many other locations. There has simply been too much traffic squeezing into too few bands. Already, says Callaghan, each available channel is used by a number of stations. And the problem is set to worsen. "Now that we have AM stereo," he says, "there is much more demand for these channels."

Callaghan's remarks, given in an engineering paper at the NAB last April, refer specifically to audio microwave transmission, but the situation is equally dire for video. With the arrival of AM stereo being paralleled by increasing implementation of MTS capability in television, all broadcasters are beginning to experience greater bandwidth demands. In addition, many audiophiles, by now accustomed to the fidelity of compact disc recording, would like to hear the same quality from their broadcast entertainment.

The heightened demand on microwave comes partly as a result of the divestiture of AT&T, which led to generally increased private telephone leasing charges in broadcast applications. There are claims of ten-fold and greater increases in costs in some cases for such services. Set against these rates, an STL can usually pay for itself in less than three years, say manufacturers.

Easily overlooked

The addition of stereo as well as consumer expectations for higher



As well as its narrowband aural STL-10 system, Marti has introduced the MW-500 booster to redirect microwave signals around obstructions.

signal quality overall clearly lead to increased bandwidth demands throughout the entire signal chain, from studio mic to home loudspeaker. A weak link in the chain renders all the improvements elsewhere along the chain useless, and the studio-transmitter link is surely easily overlooked in the process.

What is being done to give the STL the attention it deserves? On the one hand, some new bands have been made available by the FCC for STL purposes following petitioning by the NAB. These are at 18 GHz and 23 GHz, in addition to the established 7 and 13 GHz bands. For broadcast-quality video at these frequencies, there is the RS-250B standard, to which companies are beginning to comply. The Commission has also granted additional spectrum space for radio STLs in the 944 to 947 MHz range and has approved closer stacking of channels in this and in some other bands.

Some companies responded to these new opportunities with announcements at the NAB of STL equipment for the higher frequencies. Other companies are taking an alternative approach, aiming to compress the bandwidth requirement of existing STL equipment in the lower frequency audio microwave bands.

Old bands, new tunes

In aural transmission, the FCC's moves to alleviate STL congestion in urban markets have been two-fold. First, the Commission granted an additional 3 MHz, from 944 to 947 MHz, for STL use. This allocation will not in itself relieve the spectrum crowding, and the industry does not expect to receive further spectrum space for aural STL use in the foreseeable future. However, the FCC also proposed, in Docket 85-36, to divide the 950 MHz band—now encompassing frequencies from 944 to 952 MHz—into 25 kHz stackable segments. This move came into effect from December 16, 1985.

Under Docket 85-36, a composite STL for FM stereo would occupy 300 kHz (12 segments) in place of 500 kHz (12 40 kHz segments) before. The Commission says the new bandwidths are capable of supporting full stereo audio and two limited audio channels. According to Michael Callaghan at KIIS, the FCC proposal would supply the equivalent of 30 new channels to the Los Angeles area. "The beauty of that," he says, "is that most of that will be to AM stations."

The FCC proposal was not made mandatory for two reasons. The first was that the NAB pointed out to the Commission that manufacturers of STL equipment might not wish or be able to make the necessary equipment, leaving broadcasters unable to comply with the new regulation.

The second reason is that not every market needs the narrowband STLs—at least not yet. The FCC said that in markets where spectrum crowding on this band is not a problem, broadcasters would carry on using the full 500 kHz of bandwidth after the July 1, 1990 date from which the Commission's proposal will require approval of equipment used. The FCC is now soliciting comment on which areas of the country should be required to convert to the narrow channels.

Another concern brought to the FCC was that the narrower STL channels might not be able to carry stereo audio and additional channels for remote control and SCA use. Spectral overlap with the subcarriers used for these purposes clearly increases as the carriers are narrowed and stacked more closely. Subcarriers are affected to different degrees dependent on whether the STL system is SCPC or composite.

Narrow channels

One of the companies leading the move to narrowband aural STLs is Marti Electronics. At the NAB, it demonstrated four STLs with its STL-10 equipment, operating in a 500 kHz total bandwidth using the new stacked 25 kHz segment channels. An eight-segment AM stereo STL occupied 200 kHz, with the remainder taken up by a twelve-segment FM stereo STL. Thus, Marti claims, two stereo STLs could operate in the same bandwidth needed by just one before. The STL-10 narrowband transmitter and receiver won FCC type authorization shortly before the NAB.

Tests by Michael Callaghan at KIIS and Barry Victor of the Victor Group, both in Los Angeles, using the Marti STL-10 transmitter and receiver gave the following results, reported at the NAB. For a 15.4 mile link between Hollywood and Mount Wilson using a signal strength of 50 μV, Callaghan recorded an S/N ratio (p-p dynamic range) of 66 dB and a THD of 0.7 percent. Deemphasis of 75 μs was applied in the tests.

A second test using the Marti equipment, on an eight-mile grazing path from KFWB, in Montecito Heights near Dodger Stadium, to Hollywood using a signal strength less than 50 μV, gave an S/N ratio greater than 62 dB and a THD less than 0.7 percent, according to Callaghan. A third test, using prototype composite TFT equipment, was abandoned following an interference complaint from a station 250 kHz away. Both transmissions had been using the same polarization.

Callaghan and Victor note in

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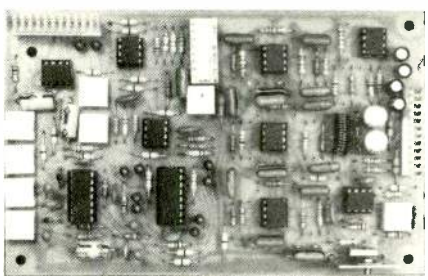

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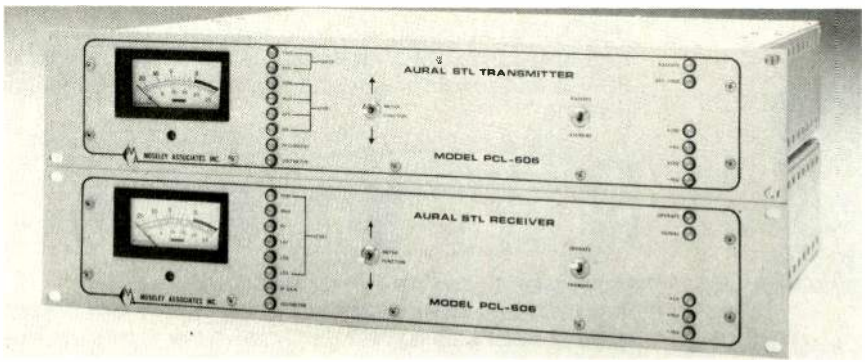


Moseley's PCL-606 STL operates in the 950 MHz band. Future models will use internal switching between different channel spacings.

their NAB paper, however, that earlier tests using Moseley's composite PCL-606/C system and a separation of only 125 kHz between the KIIS signal and the test frequency caused no problem despite the fact that the polarizations were again the same. The authors concluded: "It's now evident that painstaking selection of frequencies, high performance antennas, evaluation of the performance of existing equipment on adjacent frequencies, cross polarization, and complete path and power engineering studies will be necessary to achieve the success we seek."

Marti's SCPC system provides two 26 kHz subcarriers under the AM stereo operation and two 39 kHz subcarriers under FM stereo operation for SCA. The company claims, in its comments to the FCC, to "have found single channel per carrier (SCPC) techniques [to] offer immunity to interference, lower channel cross talk, lower receiver noise threshold, and higher signal-to-noise ratio than multiplexed (composite) FM systems in stereo STL/ICR service." Callaghan agrees that the scheme offers "minimal" interference into the subcarriers.

Also at the NAB, Marti announced FCC approval of its narrowband STL system under Part 74 of the rules for aural broadcast use and also under Part 94. The Part 94 regulates the private operational-fixed microwave service. It is important to radio broadcasters, according to Marti's vice president, M.E. McClanahan, because it offers many frequencies in the 928 to 960 MHz band (and other bands), which can be used for non-STL transmissions such as point data, background music, telemetry, and satellite program feeds.

Channels are allocated after a frequency search in 25, 50, 100, or 200 kHz segments, according to the use to which they are going to be put. A background music channel, for example, would require only 25 kHz, whereas some forms of data transmission might need to occupy the maximum bandwidth. Under Part 94, these frequencies can be used by broadcasters provided that they are not the final link for program material to the broadcast station.

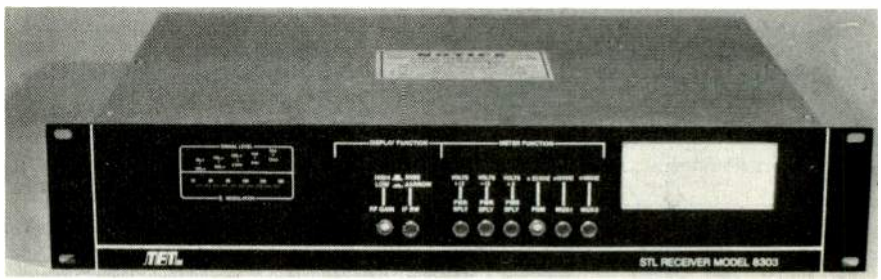
Composite STLs

Other manufacturers responding to the narrowbanding need at 950 MHz include Moseley Associates, TFT, and Micro Controls. Moseley has announced a spectrum-efficient version of its 950 MHz aural STL, designated the PCL-606SEC. The equipment can operate in low-density areas on 500 kHz and in crowded frequency areas on 300 kHz, with programmable control and jumpers to choose the bands required. Factory prealignment allows the PCL-606SEC to be internally switched after years without recalibration, claims Glenn Sanderson, Moseley's principal RF engineer. "A user could initially have the link configured for 500 kHz channel spacings and then change to 300 kHz operation when the need arose," he explains.

Narrowbanding degrades the S/N ratio. Sanderson claims a 70 dB figure for 300 kHz operation, as opposed to 75 dB at 500 kHz. THD is typically 0.5 percent, and stereo separation is 45 dB in the narrowband mode. Subcarrier possibilities are reduced to a 67 and 92 kHz scheme or 67 and 110 kHz. Spectral overlap prohibits the use of the 185 kHz subcarrier. The SCA S/N ratio at 92 kHz, with 10 percent injection, would fall from 55 to 46 dB under narrowband operation, according to Moseley. The company hopes to gain FCC type acceptance shortly for the new STL.

Another new composite STL taking account of the new FCC allocation proposal comes from TFT. Its 8303 receiver is designed to accommodate a mono STL user between two existing composite STL channels and is optimized to work at 250 kHz spacing. In addition, notes TFT's director of marketing, Jesse Maxenchs, the 8303 has a wideband/narrowband switch allowing it to be used in uncongested areas without any performance loss.

The 8303 is a modification of TFT's existing 8301 receiver, with sharper IF bandpass skirts to accommodate the closer channel spacing. Micro Controls is also working on narrowing the front



TFT's 8303 STL receiver can accommodate a mono user between two existing composite STL channels.

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ends and IF filters on its 950 MHz STLs. One benefit, according to company president Jeff Freeman, will be the capacity for AM stereo transmission. MCI hopes to release performance figures for the upgraded STL within a few months, he says.

KIIS's Callaghan stresses the importance of such early manufacturer involvement. Their active involvement with the tests, together with good results coming out of them, will lead to FCC cooperation for new approaches to solving the STL crowding problem.

Upward mobility

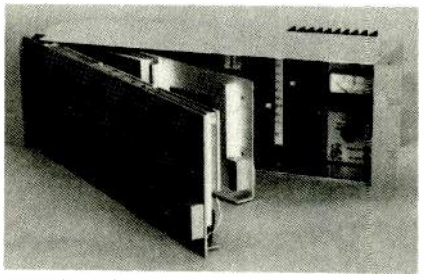
At higher frequencies of aural STL operation, there are also moves afoot to relieve congestion. Moseley's Glenn Sanderson suggests that the band from 1.5 to 1.7 GHz, currently used in Canada, could be made available to U.S. broadcasters. The path reliability of the band is similar to that for 950 MHz, he says, and it does not suffer from rain attenuation like the higher frequencies.

Moving up the spectrum and into video as well as audio transmission bandwidths, the FCC has proposed a more flexible stacking system in the 1990 to 2110 MHz and 6875 to 7125 MHz bands. Stacking was initially intended to be based on 1 MHz segments. More recently, the Commission instead adopted 250 kHz as the segment width with maximum authorized channel bandwidths of 17 and 25 MHz in the respective bands.

The Commission has suggested that 6 MHz amplitude modulated links currently used in the 13 GHz band might be feasible for remote TV pickup in these lower frequency bands. Channel availability could be doubled or even quadrupled, the FCC claims.

At 13 GHz, the FCC is examining frequency coordination procedures among the various fixed and mobile station services that operate on the same channels within that band. Manufacturers are responding by introducing more flexible STLs at these frequencies.

RF Technology's new RFL



New bands are being examined by RF Technology, which currently manufactures STLs for 7 and 13 GHz.

series of STL microwave links at 7 and 13 GHz are examples. The system has fault diagnostic features and is retunable in the field anywhere within the band of operation, according to Christopher Lay of RF Technology's communications marketing. "With frequency re-coordination an ever increasing occurrence," he says, "this has proved to be a very popular facility."

New frequencies

Of the two newest bands—at 18 GHz and at 23 GHz—for STL operation made available to broadcasters by the FCC, only the higher is being met with much enthusiasm from microwave equipment manufacturers. What little 18 GHz equipment is available is expensive.

One reason for this is that 23 GHz equipment has been manufactured in the past for nonbroadcast use. The FCC's authorization of the channel for broadcasters gave those companies another market without the need to modify the technology to the 18 GHz band. "More's the pity on that," says Ed Williams of the NAB's office of science and technology. "18 GHz offers some very interesting possibilities." He feels that it would not be hard for microwave manufacturers to develop 18 GHz STL equipment and that such equipment will become available when broadcasters start to ask for it.

There was no evidence of 18 GHz STLs at the NAB, however. Nonetheless, microwave companies are examining the possibilities offered by the band. RF Technology, for example, says it would be "foolish not to be looking very seriously at this attractive broadcast band." For the moment, the company has no product announcements planned. "It seems likely that 18 GHz will become a widely used band for short haul, high-quality TV and audio, leaving 23 GHz for more industrial requirements," predicts RF Technology's Lay.

The history of the 18 GHz band dates from 1984 when the FCC authorized 24 5 MHz channels for aural STL use. With cross polarization and high beam antennas, coordination on shared channels is relatively simple to achieve, notes Williams. In addition, the high capacity of the channels is suited to digital as well as analog modulation.

In his paper at the NAB, Williams described a scheme to overcome the current dearth of 18 GHz systems. A link could be designed using a 950 MHz STL transmitter and a combined UHF reference and multiplexer input to a mixer whose output could then be fed through a bandpass filter to the transmitting antenna.

There is a greater availability of links at the 23 GHz band. Although originally intended by their manufacturers for nonbroadcast—mainly private company—use, stations are now buying 23 GHz STLs for video and also for aural use, following indications from the FCC that broadcasters could apply at these frequencies. "There is relatively cheap video 23 GHz STL equipment available," notes the NAB's Williams. He says a complete system could be configured for around $10,000, including antennas and one video circuit and a single audio channel.

Among the new 23 GHz equipment at this year's NAB was the Microstar-23 system, made by Microwave Networks and marketed by Harris Broadcast Microwave, and the Starpoint 23 HPV video microwave radio from Motorola. At the time of the show, the Harris unit was claimed to be the only system available meeting EIA standard RS-250B.

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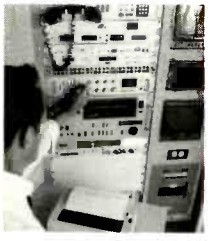

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The Microstar 23 is intended for broadcasters who would otherwise have used the crowded 2, 7, and 13 GHz bands—for which there are existing Harris Microstar products—for their short-distance video transmission needs. Its modular design allows the Microstar-23 to be configured in the field for simplex or duplex operation in nonprotected or hot-standby modes, according to Harris.

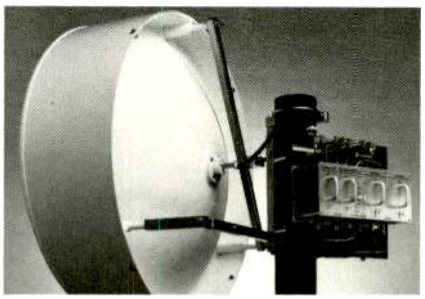
WITF, an educational television station in Harrisburg, PA, last month purchased the first Microstar-23 unit, which it will use to transmit programs originated at three college sites to a main studio.

Video links go aural

M/A-Com has had a 23 GHz STL for video use available for three years, but at this NAB the company demonstrated its use for aural-only transmission. The MA-23 aural STL uses digital audio processing to achieve up to 90 dB S/N ratio (110 dB dynamic range) compared with the typical analog S/N ratio of up to 70 dB for conventional links. Stereo separation in the 80 dB range is also attained, according to M/A-Com national sales manager, David Erikson.

M/A-Com's NAB demonstration used the dbx 700 Digital Audio Processor and the MA-23CC microwave link using companded predictive delta modulation to achieve the high sound quality required by major market stations. A second demonstration used the Sony Model PCM 701ES processor without companding to achieve 90 dB dynamic range. Both these designs take the digitized audio signal and convert it to video format for microwave transmission using the video baseband of the 23 GHz frequency.

Other methods for aural transmission over the new high-frequency links are to use either analog or digital subcarriers in the baseband above the video band or to use T1 channels over a digital microwave link. A possible drawback of these techniques for broadcasters is that they require stereo



The Microstar-23 from Harris Broadcast Microwave is claimed to be the first 23 GHz STL on the market to meet the RS-250B standard.

generation and some audio processing at the remote transmitter site because the recovered program audio appears as discrete left and right channels.

Unsurprisingly, manufacturers of aural STL equipment at lower frequencies are skeptical about the suitability of video links for aural use. Because of the comparatively high cost and susceptibility to rain attenuation of the 23 GHz equipment, they say that it does not compete with 950 MHz band links. "We do not plan to manufacture equipment for the 18 and 23 GHz bands," says Marti's McClanahan. "We feel that our narrowband equipment, *if properly utilized by the industry*, will provide more than enough audio channels for aural STL."

Moseley's Glenn Sanderson estimates total system cost for equipment running at the higher frequencies will be about double that of a similarly performing 950 MHz system. Jesse Maxenchs of TFT agrees the 18 and 23 GHz bands are not competitive. He adds that the two bands can coexist with broadcasters using the high frequencies over short distances to get out of a city and then switching to the 950 MHz for a longer hop in a less spectrum-crowded area.

Rain attenuation is the other major problem that confronts microwave users at high frequnecies. Ed Williams at the NAB puts it succinctly: "18 and 23 GHz are not very good for long haul unless you're in a desert."

In ideal conditions, an often quoted maximum transmission distance using the 18 and 23 GHz frequencies is around 15 miles. Bad weather causes a very rapid degradation of performance. Rough figures given by Williams show a 3 dB/mile loss of signal in a moderate rainfall of one inch per hour. In a four-inch per hour downpour, the loss over one mile leaps to 18 dB.

Even proponents of 23 GHz operation concede that these levels of performance loss are unacceptable. Possible solutions could be to have 23 GHz microwave capability for occasional use only, or to keep a 950 MHz link on standby for times when the high-frequency transmission would suffer attenuation. The question for broadcasters is to weigh the chance of outtages at 23 GHz due to bad weather against the likelihood of finding spectrum space when it is needed at lower frequencies. **BM/E**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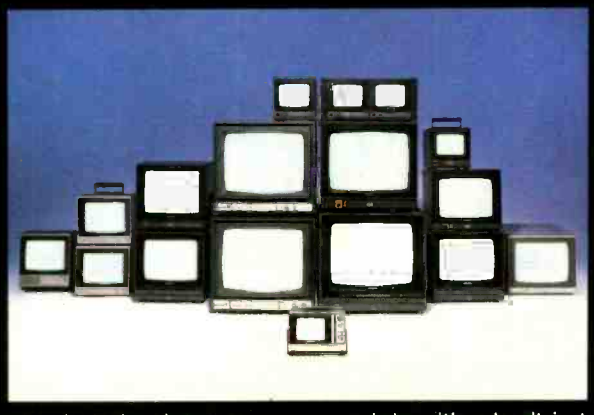

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REBUILDING AM

Broadbanding Your Own?

The drive for technical improvement and the promise of stereo in AM radio are bringing renewed attention to antenna broadbanding.

By Hugh Aldersey-Williams

Volumes of literature have been published about AM antenna broadbanding stretching back over many years. Now, the issue is more pressing than it has ever been, as AM stereo and other AM improvements slowly make their mark in radio broadcasting. The expected National Radio Systems Committee (NRSC) standard on preemphasis, for example, will be meaningless if AM antennas are not tuned. "The antenna is the final filter of a station's audio," reminds Michael Rau of the NAB office of science and technology.

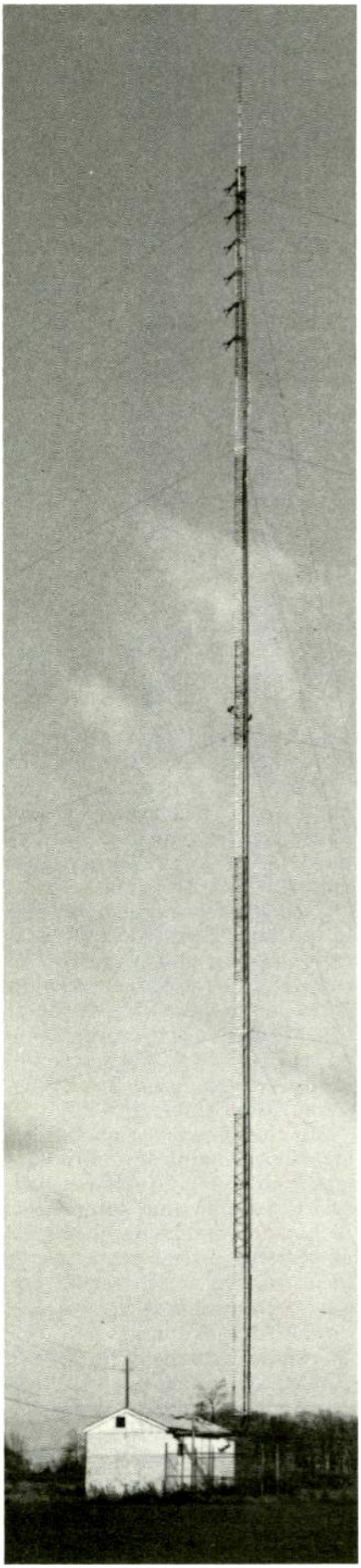
Despite the need for broadbanding and despite the fact that broadcasters are in a good position to troubleshoot their own antennas, they are frequently reluctant to do so. Why is this?

Some engineers are unwilling to meddle with such a vital piece of equipment where there is no room for error. Many stations might, for example, have two transmitters but only one antenna. The engineer can risk an attempt at adjusting the transmitter because there is always a standby, but an unsuccessful attempt to broadband the antenna could prove disastrous, perhaps impairing the station's pattern or taking it off-air completely.

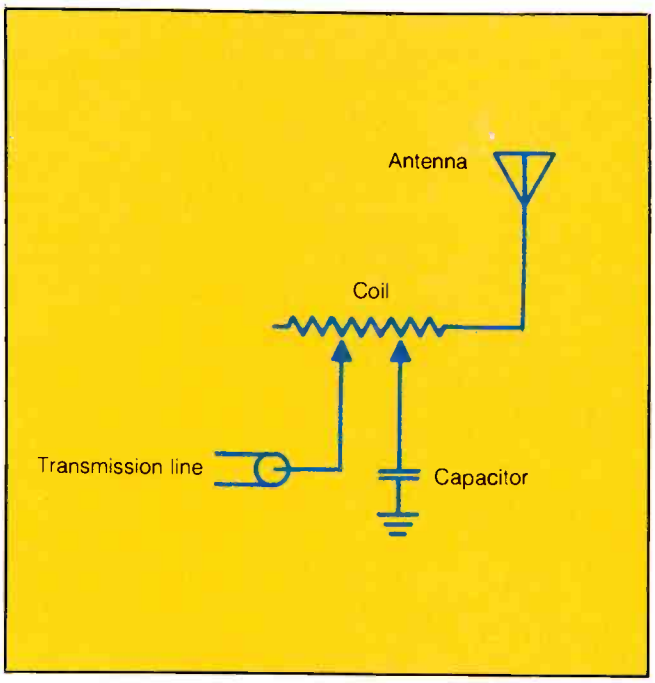
In other cases, what was initially thought of as a simple problem in arithmetic can build alarmingly as other factors— maybe an antiquated transmission line, the tower, etc—are brought into consideration. Many broadcasters have left the antenna, and the whole broadbanding issue, well alone.

Wideband receivers

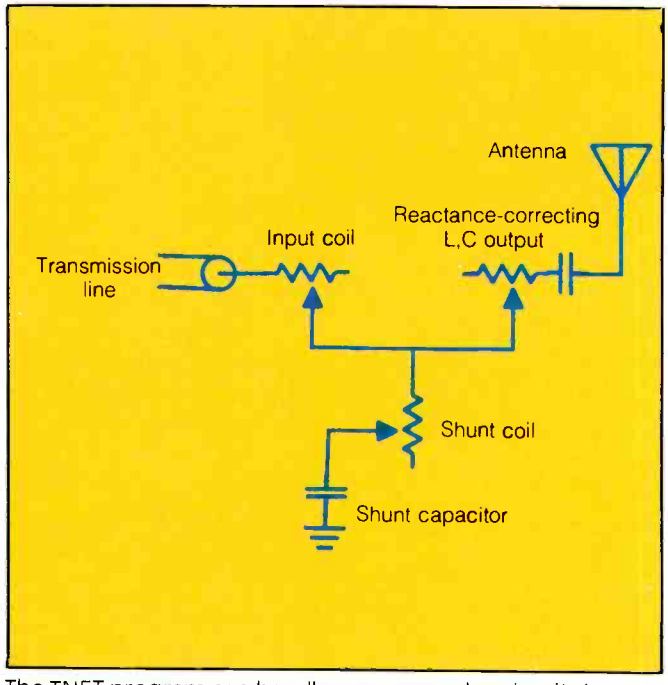
This technophobia is one reason for broadcasters' hesitancy in attempting broadbanding. Another is that there is as yet no obvious market for the higher quality signals broadbanding would provide.



The antenna is the "final filter" for high-fidelity AM sound (photograph courtesy LeBlanc and Dick Communications).



This simple network can match the source and load, but it ignores system bandwidth considerations (courtesy Carl T. Jones Corp.).



The TNET program can handle more complex circuit designs such as this generalized T network (courtesy Carl T. Jones Corp.).

Long-standing promises of higher quality receivers have been slow to be realized. Without a listening market with receivers that could appreciate the potential improvement, why should broadcasters make the effort?

Such progress as there has been in wideband AM receivers is basically the progress of stereo AM receivers, since the wider bandwidth is needed to create the stereo effect. "There is no new design being done in mono. Any AM mono radio is an old design," says Ken Brown, senior RF engineer at ABC.

Stereo AM receiver market penetration remains low. Probably less than one in 20 AM receivers sold is a stereo unit, according to industry observers. Receiver manufacturers, in some cases, appear to be waiting for increased consumer awareness. A Sony spokesperson, for example, says that market acceptance of its XRA-33 AM stereo car radio so far indicates only a tentative increase in wideband receiver demand. Bill Gilbert, a staff engineer at Delco Electronics, says his company is currently doing a market study to gauge people's awareness of AM stereo.

The vast majority of applications for AM stereo receivers are in cars. The market may be even slacker for nonautomotive AM stereo if the progress of another Sony radio is anything to go by. Its SRF A100 portable AM stereo receiver, introduced in 1983, has recently been taken off the market.

While manufacturers wait for greater consumer interest in higher quality AM, the broadcasters in turn wait for the manufacturers to introduce wideband receivers. This cycle of inaction is completed by the consumer, who waits, seemingly in vain, for some indication that there is even any potential for AM improvement.

Overmodulation

To break the cycle, broadcasters should first set their own house in order, admonishes ABC's Brown. He is referring to "splatter," which occurs when stations overmodulate to over 100 percent negative. When this happens, the carrier cuts off, and interference occurs in adjacent channels. "Splatter is largely caused by overmodulation," says Brown. "We should limit negative modulation to -99.9 percent." (Splatter and its relation to preemphasis of AM signals is covered in more depth in the first article in *BM/E*'s Rebuilding AM series: "Preemphasis: Key to AM Improvement," February 1986, page 25.)

Splatter is introduced in one of two ways, according to Brown. The first, which should be stamped out, is that it is introduced deliberately; it can be seen on a modulation monitor. The second way is unintentional and arises when a too-simplistic approach is taken to broadbanding. A folded unipole, for example, is not sufficient, Brown warns.

Splatter is more than an unpleasant noise for the listener. It's also the reason for many AM receiver manufacturers' refusing to wideband. Instead, they presently need to narrow the bandwidth to cut out the interference. Delegates at the NRSC meeting on preemphasis, held in mid May, found it an eye-opening experience to hear just how bad second adjacent channel interference was in their study area of Chicago, reports Gilbert, who is also co-chairman of the NRSC preemphasis committee. The committee is currently studying limiting the maximum

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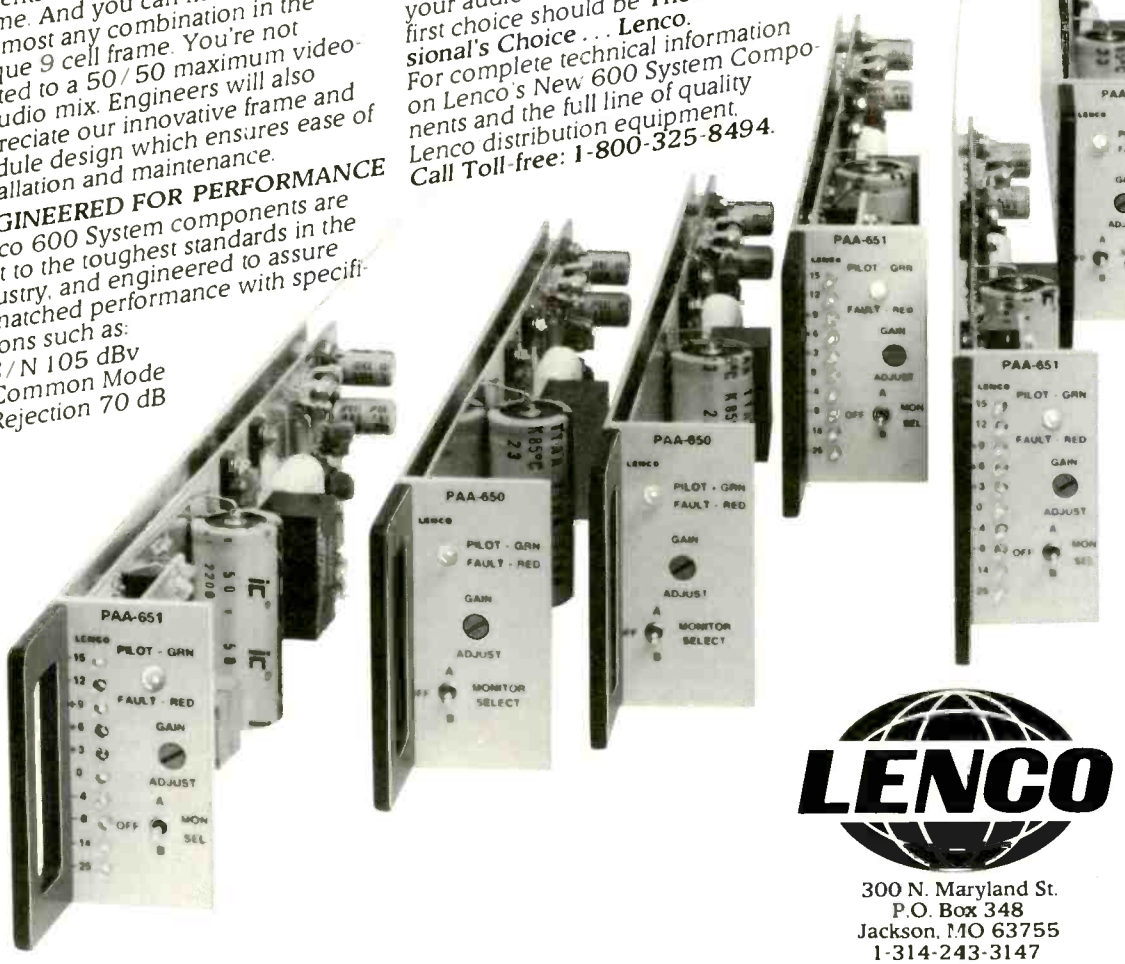

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Some see a conflict. Broadcasters are concentrating on getting the best signals to the majority of their listeners, whom they claim live in strong signal areas. The receiver lobby, on the other hand, wants to sell radios that will allow everyone in a given station's coverage area to receive an acceptable signal. "Radio manufacturers bluntly are going for the fringe audience," says Brown. Gilbert suggests the differences are not so great, however. "It's a cooperative process," he says. A preemphasis standard is expected by the Radio '86 show in September.

Healing thyself?

These are some of the symptoms that currently ail AM radio. One possible treatment is to broadband the antenna. But how is the broadcaster to tell whether this is appropriate? A method for diagnosis is needed.

For the most part, stations can undertake their own diagnoses. In cases where simple, nondirectional antennas are used, it may even be possible for broadcasters to administer their own treatment. By and large, however, the remedy is to turn to a consultant for the prescription. Identification of an antenna broadbanding problem is easy, says Edward Edison of Hammett and Edison consulting engineers in Burlingame, CA. But its correction may require the innovative engineering on which the consultant is up to date.

Now, there are new diagnostic aids in antenna engineering. One approach was described by William Ball of Carl T. Jones Corp. in Springfield, VA, at this year's NAB. Ball's solution lies in the use of a card-programmable hand-held calculator to lighten the load of performing the circuit analysis necessary to construct a matched network for a nondirectional AM antenna. Ball has also translated the programs into BASIC, FORTRAN, and Pascal programming languages.

The use of a calculator allows the broadcaster to go beyond simple back-of-an-envelope arithmetic. This approach taken in the past would probably have simplified the problem to use one capacitor and one coil in the network. The calculations might have shown a match between the source and load of an antenna, but it would only have been at the carrier frequency. Sidebands would have been ignored in this basic approach.

Ball's program, christened TNET, allows a series of networks to be calculated with various phase shifts. In working on tower coupling networks in the past, Ball says: "I came to the conclusion that in order to achieve a good broadband match, one had to consider the total phase rotation of the system, modify it where possible, and minimize as many undesirable effects as possible."

TNET can handle both the real

and imaginary components of the L, C variables of a network. Matrix calculations using the general circuit parameters are also possible for multiterminal networks. Repetition of the matrix calculations can be continued to include all the components of a coupling system. "What we have here," sums up William Ball, "is a method that will allow relatively simple analysis of complex networks."

Sideband analysis

A second computer program at the NAB was designed to cope with more complex problems. Jerry Westberg of Harris Corp.'s Broadcast Group described the results of a sideband analysis for a directional antenna system carried out on a DEC PDP-11 mainframe computer.

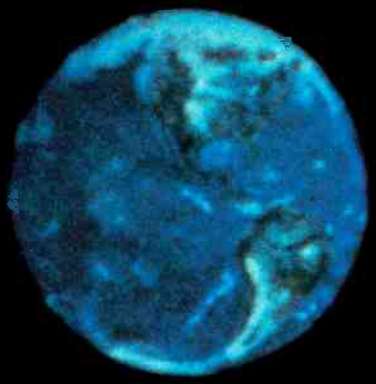
The program was designed to compare the field patterns that would result from different power dividers connected to antenna systems of different sensitivities. Such calculations might involve the manipulation of matrices of up to 40 x 40 elements, says Westberg, rather than the 2 x 2 matrices handled by the TNET program in the single antenna case.

The problem is that with directional antenna arrays, the complexity of the problem rises exponentially with the number of towers in the array. Even a four-tower array, recalled Ken Brown, required the solution of 21 simultaneous equations, a job not for a PC, but for a computer the size of a VAX.

In evaluating the performance of the power divider scheme, Westberg found that transmission line lengths and types, antenna coupling circuitry, phase shifters, and array operating parameters all affected its adjustability. Says Westberg: "The program we used takes into account the entire circuit."

These new techniques for looking at antenna performance demonstrate the potential impact that computers could have for AM stations. This computing power, together with commercially available programs or licensing and timesharing arrangements, would enable station engineers to do their own broadbanding calculations, at least in single tower circumstances.

The majority of stations could achieve much better impedance matches in their transmission networks using comparatively modest hardware. A personal computer or programmable calculator is within most budgets, if one isn't already owned by the station. All that remains is to make available for sale or license the antenna analysis programs that currently remain proprietary to the companies and consultants involved in antenna design. **BM/E**



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Engineering in the Client's Interest

From local commercials to elaborate productions, TV stations are making a mark in the competitive teleproduction business.

By Eva J. Blinder

For a television station, getting started in teleproduction is a logical extension of its current business. The equipment is at hand, and the sales department is bringing in the clients, so making local commercials "comes naturally" to stations all around the country. And once you're making commercials, why not move on to other kinds of clients and jobs?

It's at this point that what started out as a simple operation becomes clouded with complex questions. Producing commercials for your own clients makes obvious business sense, bringing in spots that otherwise would never see air. But a station-based teleproduction operation that services outside clients, such as local and regional businesses, may face serious competition from independent production companies as well as other stations. The more sophisticated the market, the more demanding the clients are of technical facilities and creative expertise. In all likelihood, the simple equipment setup that sufficed for the used-car dealer down the street won't satisfy a regional ad agency or major business.

At the same time, growth in the production operation may foster conflict within the station itself. If the production department shares its equipment with on-air or news operations, what happens when a hot story forces news into overtime—right into evening production hours already booked by a client? The obvious answer is to equip the production department separately. But is the extra expense justified? Does the market provide enough work to pay for the new equipment?

Scheduling conflicts are a major problem for in-house production crews. WCTV's extensive post-production facilities are shared between the station's own on-air requirements and the demands of its outside production services.

In almost every market, television stations are facing these questions and working out solutions based on local conditions. They range from purposely keeping the production department small and resolving all conflicts in favor of air, all the way to setting up a separate production company under the aegis of the station, with its own facilities and equipment.

Taking advantage

In Mobile, AL, CBS affiliate WKRG-TV has taken advantage of relatively light competition to build a serious outside production department. Although WKRG-TV Productions remains integrated into the station, it has sufficient staff and equipment resources to attract regional (and a few national) clients.

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1. Indicate your buying status on the following types of equipment. Please use the boxes to indicate how many of each type of equipment you have now or intend to buy:

		intend to buy		
	have now/ on order	within 3 mos.	within 6 mos.	within 12 mos.
Betacam recorder/cameras	☐	☐	☐	☐
M-format recorder/cameras	☐	☐	☐	☐
CCD cameras	☐	☐	☐	☐
Studio/EFP cameras	☐	☐	☐	☐
Portable VCRs	☐	☐	☐	☐
One-inch VTRs	☐	☐	☐	☐
MERPS automation for news	☐	☐	☐	☐
Art/paint systems for news graphics	☐	☐	☐	☐
Dedicated image processing for news	☐	☐	☐	☐
Satellite truck for news gathering	☐	☐	☐	☐
Satellite uplink for news exchange	☐	☐	☐	☐
Newsroom computers	☐	☐	☐	☐
ENG vans	☐	☐	☐	☐
Microwave equipped helicopter	☐	☐	☐	☐

2. Looking ahead to the coming year, what will be your station's number-one purchase priority? _____

_____

3. About engineering at your station:

Do you have a separate engineering staff for news? ☐ Yes ☐ No

What is the title of the person who heads news engineering? _____

4. About expenditures for cameras and VTRs:

What percentage of the news equipment expenditures goes toward cameras and VTRs? _____%

What percentage of overall equipment expenditures goes toward the news department? _____%

5. Do you foresee CCD cameras having an impact on equipment purchases for news within the next year? ☐ Yes ☐ No

6. Will you attend the RTNDA convention in 1986? ☐ Yes ☐ No

Check all previous years that you have attended RTNDA:

☐ 1985 ☐ 1984 ☐ 1983 ☐ Prior to 1983

7. About the stories on video production and news in this issue:

Did you find them informative? ☐ Yes ☐ No

Did they contain enough detail? ☐ Yes ☐ No

Did you read all of them? ☐ Yes ☐ No

8. Did you pass this issue on to others? ☐ Yes ☐ No If yes, how many? _____

9. About yourself: Do you work at a:

☐ TV station
☐ TV network
☐ Radio station
☐ Other (specify) _____
☐ Radio network
☐ Production company
☐ Post-production facility

Are you a:

☐ Chief Engineer
☐ Production manager
☐ Engineer
☐ Operations manager
☐ General manager
☐ Other (specify) _____

Do you:

☐ use the equipment?
☐ make buying decisions?
☐ make buying suggestions?
☐ evaluate equipment?

NAME AND TITLE _____

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Mobile, AL's WKRG-TV has developed a strong niche in its relatively small market. Here, a crew member sets up a shot for a Delchamps Food Systems spot.

"We've been pretty successful mainly because in this part of the country there's not that many people who do this," states production manager Ed Whatley. According to Whatley, until very recently the other stations in WKRG's market "didn't try to compete with us" in commercial production. WKRG's main competition has come from outside the market, from cities such as Baton Rouge, New Orleans, Atlanta, Nashville, and Jackson, MS.

In the past two years, however, the number of stations in Mobile has grown from three to six, and independent production facilities have also increased. The increased competition has changed the character of the market, Whatley says.

"The biggest challenge I've found here is that for so long it was such an isolated market," he explains. "...It's awfully hard to compete with some people because they'll do it for nothing. They'll do it every day, just to do the job. They don't understand that if we'd all get our rates in line then we'd all make money.

"The business is there, it's just a matter of going to get it. A lot of big industries in this area are now just discovering videotape. It's not a sophisticated market, but it's got possibilities."

Staying competitive means offering clients facilities that will do the job. The WKRG production department boasts two production control rooms that can be mixed together for large projects. One has a Grass Valley Group 300 switcher, the other a Vital switcher. The two rooms control a total of seven Sony one-inch VTRs, ranging in model from 1100s to 2000s, along with a Thomson-CSF Vidifont Graphics V character/graphics system. A Dubner paint system will be installed shortly. As of now, the station does not have computerized editing.

An important part of WKRG's client production workload consists of mobile shoots. The station operates a 17-foot Wolf Coach cube van with up to five Ikegami HL-79 cameras and a Sony switcher. Whatley notes that the van design was deliberately kept simple, without many of the bells and whistles found in large trailers.

The production department control room equipment is shared with news operations, and this occasionally leads to conflicts. To keep these to a minimum, clients book production time three weeks in advance, with the news production schedule always taken into account. If news knows a special event, such as a local election, is coming up, "they'll book production time with us just like a client will."

"The operation of the television station comes first," Whatley insists. "The bottom line is it's a television station, not a production company." Keeping "a little flexibility" in the schedule avoids conflict most of the time.

Tight market

Although Oklahoma City has three independent production companies, KOHK-TV Studio 25 gets most of its competition from a pair of local network affiliates, according to production manager Jerry Rodgers. The station does business as Studio 25 to emphasize that it has a production department separate from on-air and news operations.

"One of my main draws is that I don't have to shut down for newscasts," Rodgers asserts. "The others do." If needed, he adds, his production crew can keep going 24 hours a day, seven days a week, although normal production hours are 8:00 a.m. to 10:00 p.m.

"We're filled to capacity probably 75 percent of the time," he estimates. The production department works on station promos about eight hours a week (12 hours during sweeps). "The rest of the time is available for me to sell."

Studio 25 is equipped for full client services, with an on-line CMX 3400 computer editor controlling four Ampex VPR-2B one-inch VTRs and two AVR-2 quad decks. Other post-production equipment includes a Chyron 4, a GVG 1600-7K production switcher with E-MEM and two channels of digital effects, an NEC Optiflex for perspective and rotation, and an Aurora/75 animation computer.

Two studios share three RCA TK-47B studio cameras, an Avab 2002 computerized lighting control board, and an ADM 32-channel audio console. In addition, the station operates a small mobile unit with an Ampex VPR-20 one-inch portable and an Ikegami HL-79 camera. The total production department staff of 11 services two shifts, day and evening.

All equipment, except one of the VPR-2Bs and the two AVR-2s, is dedicated to the production operation. "Very rarely do I have to hold the client up because of equipment," Rodgers claims.

Studio 25's projects range from large-scale industrial presentations to commercials, the latter generally coming through local or

in-house agencies.

"Last year, revenue-wise, we probably made the biggest percentage [of our income] from doing industrial presentations," Rodgers notes. "...Number-wise, we don't service hundreds of industrial clients, but when they come in they reserve large blocks of time and pay for large blocks of time." Revenues from KOHK's production operation are around $1 million a year, according to Rodgers. Generating more, he feels, would necessitate attracting clients from outside the Oklahoma City market—something he's not sure is feasible.

"Dallas is about 212 miles south of me, so its hard to compete," he complains. "It's even hard to get business out of Tulsa," only 100 miles away. "If they really need the razzle-dazzle, they just fly right over me and keep going to Dallas." Many of those who do so are seeking the capability of a Rank Cintel film-transfer machine, not available in Oklahoma. "We don't have enough business to warrant the purchase of such a device," Rodgers adds.

Finding a niche

Even without a separate production department, WCTV, located in the Thomasville, GA/Tallahassee, FL, market, manages an impressive job of attracting clients for its outside production services.

"Our market is quite a bit different than most Florida markets," says WCTV production manager Tom Gay. "This is a seat of government and also a university area. There's not much manufacturing here, so we don't have that market to go after, but we do a good bit of work for various Florida state agencies, producing public service announcements that we ship around the state. We have to bid on it, but we get quite a few because we can cut our costs below what an independent production house would charge, because our main business is to operate this television station."

One problem Gay encounters is client stereotyping of the kind of work television stations are capable of. He notes, however, that "people are becoming more and more aware" of the station's capabilities.

Equipment, shared with the station's own production and on-air needs, includes Ikegami HL-79s and Sony U-matics for field assignments. "We still shoot ¾-inch in the field," Gay relates, "but now we're one-inch in-house, so we dub up to one-inch." The station's two studios, which produce four and a half hours of live programming each day, have three Ikegami HK-357 computer setup cameras, Ampex one-inch recorders, a 3M D-8800 character generator, and a brand-new NEC System 10 DVE, one of the first in the country. The station has no computerized editing, although "that is one of the next steps we hope to take," according to Gay.

KOHK's Studio 25 crew working on a local commercial spot. The Oklahoma City–based station's projects range from on-location shoots to large-scale industrial presentations.

With all the live programming, "occasionally conflicts do arise," Gay admits. "But normally, in every case, in the bid process clients always give adequate time for conception, production, and dubbing. With our other clients, we stress up-front that our primary obligation is to our commercial on-air clients, and they take precedence."

Flexibility and preplanning are key factors to WCTV's success. Since the station staffs three separate production shifts—with a total of 25 people—"we can schedule some production with a crew that may be going through a slack period," Gay adds.

Going all the way

For an example of the ultimate in station-run teleproduction facilities, one need look no further than WHAS-TV, Louisville, KY. Well, a little further: WHAS's production arm, Louisville Productions, is a separate company owned by the station. It treats the station (almost) as just another client and, in turn, buys services from the station.

According to Ed Tonini, general sales manager for Louisville Productions, the operation started out about 14 years ago in the usual way—as an adjunct to the sales department, making commercials for air.

"After two or three years of operation," Tonini continues, "...it grew to the point that it became an independent entity. As the years went on, smaller and smaller percentages of the work were generated for the local station, to where now virtually none of the work we do is aired on WHAS. The majority of our business is even outside of this market. In fact, the mix in our business is about 65 percent in the area of business communications....The majority of our work is nonbroadcast."

The operation's size is such that it is structured into four operating groups. LP Film and Tape is the production arm, with facilities for

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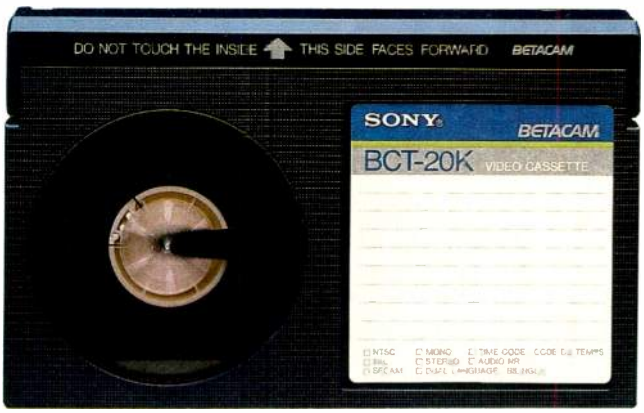

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35 and 16 mm film as well as one-inch and ¾-inch tape. LP Post, with three full-time editors, has two computerized edit suites, one for one-inch and a brand-new one for ¾. The third operating division, LP Business Communication Group, is a concepting group that comes up with creative ideas for clients and determines the best way to fulfill their objectives.

The fourth operating division, LP Satellite Services, is the marketing arm for the Kentucky Teleport and provides transmission services for clients worldwide.

Louisville Productions has its own offices, two studios, and a one-inch edit suite all located within the WHAS building. A ¾-inch edit suite is located in another building.

The one-inch suite features a two-channel Ampex ADO with the Infinity effects package, a Thomson-CSF Vidifont Graphics 5 with Vidifex, along with an Ampex ESS-3 digital still store, GVG switcher, and Vital SqueeZoom. The Sony BVE-5000 editing system controls three Sony BVH-2000 and two Sony BVH-1100 VTRs.

The ¾-inch suite, just going online at press time, is one of the first in the country to utilize Sony's brand-new SP U-matic equipment. Equipment includes a GVG switcher and Sony 3000 editing system, controlling three new SP U-matic decks, one with AST heads for slow-mos. The room is digitally interfaced to co-located 16-track and 32-track audio studios with Sony one-inch layback recorders.

One of the two studios has an attached control room and the ability to go to three Ikegami HK-312 cameras, although most shoots are single-camera "film style." The second studio is a smaller insert stage. A brand-new, powerful stereo routing system from Image Video Systems connects every audio and video source in the building.

Although Louisville Productions does plenty of location work, it does not operate a mobile unit; location work, with Ikegami HL-79EAL cameras and a Sony BVU-500 recorder, is again done film style, complete with filtering packages and HMI lighting.

New ¾-inch editing suite at WHAS's Louisville Productions is one of the first in the country to employ Sony's SP U-matic decks.

With so much capability of its own, Louisville Productions operates virtually independently of WHAS-TV.

"When the station comes to us, we treat them as a customer," Tonini asserts. In turn, Louisville Productions buys electronic art services from the station, which has a top-flight art department complete with five full-time electronic artists and an Ampex AVA-3 graphics system. [The WHAS art department, headed by Cathy Galvin, is described in *BM/E*'s May 1986 issue, p. 23.]

"The resources we have been able to purchase from Cathy have given us tremendous strength," Tonini adds.

Nonprofit profit

As a public station, WXXI in Rochester, NY, is prohibited from turning a profit. In these days of reduced funding, however, public stations have a greater than ever need to generate income, and WXXI has found producing shows for outside clients an excellent fundraiser.

"What we market is excess capacity," says production manager Mark Leonard. No separate department or personnel is devoted to client production.

The station concentrates on remote work, renting its six-camera mobile unit to other television stations and corporate users and doing sports remotes for regional networks and ESPN. A little over a year old, the truck is a Gerstenslager trailer with six Ikegami cameras, including HK-357s, an HL-79D, and an HL-95. It carries four Ampex VPR-2B one-inch VTRs and a Grass Valley 1680 switcher, plus Chyron graphics. WXXI's studios also are used by clients, including occasional teleconference origination.

Because all facilities are shared, conflicts are inevitable. "It's always a challenge," Leonard says. "Most of the in-house production I try to schedule as far in advance as possible so we have some idea of where the windows are for clients."

Competition for the WXXI trailer comes from all around the east coast.

"We get the majority of local Rochester business," Leonard says, "but as far as the region, we are probably competing with some of the larger trucks. But in some cases we are more available than they are, so people can use us on shorter notice." The truck's rates also are "negotiable," according to Leonard, for additional competitive leverage.

When in Rome

What kind of teleproduction work could a TV station possibly find in the competitive Los Angeles/Hollywood market? The client roster at KCOP reads like that of almost any other Hollywood production house: serial TV program syndicators.

For the past nine years, KCOP's production department has provided the facilities for *The Joker's Wild*and *Tic Tac Dough*, two popular syndicated game shows. Both shows are ceasing production this year, however, so John Braislin of KCOP's Chris-Craft Videotape Center says he's seeking more of the same.

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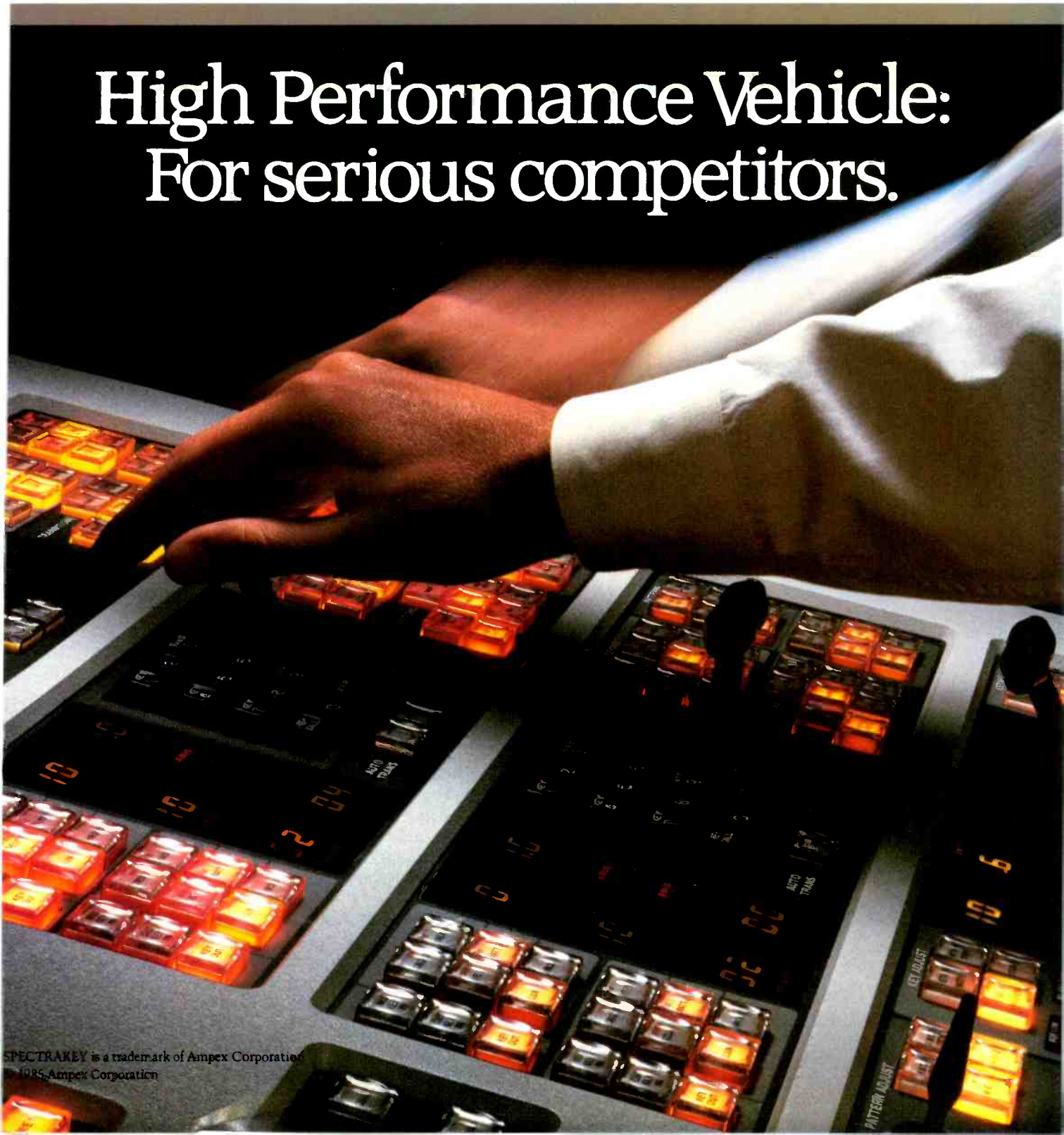

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WXXI's teleproduction trailer does the bulk of the station's client work.

Compared to many of the independent facilities in his market, Braislin says, his is a "small" facility. Two studios are shared with the station's on-air operations; one is about 6500 square feet with seating for 200 viewers, and the other is about 2000 square feet. The small studio is usually tied up with KCOP's public affairs and news programming, so it is the larger that is used most often for outside production.

Available equipment includes Ampex VPR-2 and VPR-80 VTRs, RCA TK-46 cameras, CDL 480 production switchers, a Thomson-CSF Vidifont Graphics 5 character generator, an NEC E-Flex DVE, and a CMX 340 editing system.

In addition to the series work, KCOP does some commercial production and often serves as a location for movie crews. "We have a control room that overlooks the stage with a glass window, and they love that," Braislin says. Another source of revenue is telethons, both local and national but mainly the former. The station also does some teleconferencing. It has chosen not to pursue mobile jobs.

Even with the shared facilities, conflicts have been kept to a minimum, Braislin says.

"Yes, we have had conflicts," he admits. "Fortunately, management is very understanding and we are usually able to work it out by rescheduling what the station is doing. But air comes first. Generally, we've been able to resolve the conflicts quite well."

The station sees two other local television outlets, KTTV and KTLA, as its main direct competitors. "We're friendly competitors," Braislin says. "We all know each other, and we'll help each other when we can." But he concedes that business right now is "as tight as I can ever remember it."

Making it work

There's probably no place market differences show up more sharply than in local teleproduction. Each market has its own distinctive competitive environment, shaped not only by local business but also by pressures from the surrounding areas. Each market, too, has a characteristic mix of available clients. Their real or perceived teleproduction needs, degree of sophistication, and budgets will directly affect the kind of work that is available.

To be successful, then, a station must accurately gauge market demands and then weigh this information in the light of its own in-house needs. Even if a well-equipped production facility can succeed financially, it must do so without draining the resources required for the station's primary business—broadcasting. But with careful planning, client work can enhance a station's image and expertise while boosting the bottom line. **BM/E**

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Equipment Acquisition at the Group Level

A case study of the planning and management process of large-scale capital investment in equipment.

By William Strube, Director of Engineering, Meredith Stations

Group-level buying offers many options and advantages not associated with single-station/single-product purchases; among which should be listed substantial cost savings due to the size of the negotiations. Such leverage can provide other benefits as well. However, the group buy can cause as many problems as it solves, and this is where careful planning enters the picture. Part of such planning involves the coordination of the needs of all stations within the group. If as many stations as possible are on the same purchasing schedule, and the particular equipment needs coincide, then a prime opportunity for the group buy would be at hand.

> *"At the Meredith stations, we plan our purchasing cycle to cover a three-year time span, so when the need and timing among several stations occur simultaneously, group-level acquisition makes sense."*

At the Meredith stations, we plan our purchasing cycle to cover a three-year time span, so when the need and timing among several stations occur simtaneously, group-level acquisition makes sense.

Difficulties can arise here because if the director of engineering dictates to the local chief engineer what he is going to buy, he then has a built-in excuse if the equipment doesn't work in his station, and the responsibility reverts to the director. If the local chiefs are each authorized to select the vendor and the product, then each has individual responsibility.

Further, the Meredith group is a mixture of affiliate and independent stations in markets covering a wide range of ADIs. It has no "typical" need for equipment for news, local program, and spot production. For instance, its news operations range from almost nonexistent to several hours per day integrated with network news feeds.

In this regard, each local chief is the best judge of his station's ongoing needs for facilities modification and capital equipment acquisition. Only our local news, production, and operations department heads, working with the chief engineer as an ad hoc yet permanent planning task force, can accurately translate future broadcasting plans into an acquisition plan structured in appropriate phases.

A good example of the possible pitfalls involved with group-level buying would be in the purchase of

Editor's Note:

If a television station is going to stay competitive in today's active broadcast industry, tight management and creative planning are essential elements in achieving the station's goals. This holds true to a greater extent on the group level, especially when the target of management's plans is the purchase of large-scale, expensive video equipment coordinated among several stations at once. The matters of concern go beyond negotiation of the purchase price, delivery, and other particulars to include the relationship between the group representative (director of engineering) and the individual chiefs, the mix of stations (i.e. independents, affiliates, etc.), and coordinating needs, timing of delivery and installation, as well as various other technical and financial obstacles.

In the interest of taking a "hands on" approach, *BM/E* has asked William Strube to provide readers with a case history of some equipment buys at the group level. The management perspective offered here takes into consideration budgets, equipment needs, individual station differences, and the successful handling of the available tools by the leader of the buying team.

electronic paint systems, although all eight Meredith stations might have budgeted for the devices in the same year. Local needs again range from almost none to sophisticated 3D animation systems due to local competitive situations as well as market size. There probably isn't a single computer graphics system vendor that offers the depth and breadth of product lines, price, and features to satisfy the needs of all of our stations. Also, because of the diversity of our needs, there currently is no justification for putting in a full-blown system at one station and tying into local terminals at the other stations.

Case history: camera buy

Operating within the parameters of our three-year acquisition cycle, we began planning in 1983 for what turned out to be the purchase and installation of nine Philips studio cameras in 1985. These cameras were purchased for WOFL in Orlando, FL (CE Jim Doyas), KCTV in Kansas City (CE Joe Snelson), and KPHO in Phoenix, my station. We began negotiations with four camera vendors at the group level simply because three of our stations had slotted new studio cameras into the same budget year of 1985/86.

Before the 1984 NAB, we had decided that the selection of one vendor to supply cameras to all the stations might be advantageous. After visiting all the camera exhibits, we eliminated all but four vendors with computer-based studio cameras for further evaluation. They were invited to bring units to Phoenix for a rigorous hands-on evaluation.

At the start of the evaluation, each vendor was invited to give his standard demonstration and sales pitch and to present a technical lengthy list of evaluation criteria.

Included in the list were items and price proposal for the nine-camera buy. They all knew we'd be examining not only the camera but also the company and their technical support people against a lengthy list of evaluation criteria. Included in the list were items such as picture quality, auto setup features (especially the ease of realigning the camera after changing pickup tubes), diagnostics software and its means for presentation, and the engineering and technical support structure.

Software update policy was another important criterion for judgement as were additional software development plans, documentation, prior business relationships with the company, and warranty and loaner policy to keep a camera up and running. In addition, service support response time and speed and accuracy in troubleshooting, both on the phone and on site, were of importance.

Note that reliability wasn't on our performance evaluation list because you can't quantify reliability of anything in a short test period. But, it is important to ask, as we did, questions about reliability of the vendors and earlier purchasers before extending the invitation for demonstration. Nor was price on the initial evaluation list, not because it wasn't important later, however. In the final selection process, price ranked between two and four on a scale from one to ten (one having highest priority).

> *"In weighing all the advantages and disadvantages, group-level acquisition should be considered on a case-by-case basis."*

Conclusion of evaluation

The technical evaluations were concluded by videotaping footage from each camera in operation on the news set, split screening it with one of our 1973 vintage manual cameras to give us a valuable standard of reference in the second-round vendor selection effort. Since, at the end of the technical evaluations, we could not determine any performance differences among the four cameras on the basis of the subjective test material, the individual chiefs left the selection up to me. Although each CE still had the option of dealing with a different vendor, they felt the group buy would put them money ahead.

In late June 1984, we received three refined, three-camera price-and-delivery proposals, quoted against detailed camera capabilities and specifications drawn up by each station. Variables included lenses, pickup tube types, camera accessories, triax cable complements, patch panel needs, and installation locations. We then integrated the best price offers and delivery promises from the four vendors into the technical evaluation findings to make our choice.

The Philips LDK 6 came out ahead in our evaluation, in part due to the total computer control of the full range of every adjustment. Recalibration after a tube change can be handled by any of our video operators within minutes, and the Philips software support has been exemplary. Updates installed and checked out by their field technical support have kept our cameras up to date since they first went on line.

Other evaluation elements

For our three stations, a delivery commitment down to a given week or even within a month wasn't crucial to vendor selection. We were replacing very old cameras, and the sooner we did it the better. However, we didn't have to phase camera cutover into a schedule driven by a facility's remodelling or relocation. If that situation exists, the initial evaluation checklist must include an "on-time delivery record" item. In our particular case, the only requirement was that all the cameras be installed, signed off, and paid for in the fiscal year when the budget was available.

In a similar situation involving both large investment questions and availability of the appropriate

technology to our group, six Meredith stations are using video cart machines; three Ampex and three RCA machines, all of them old and in need of being replaced.

One of the problems that has arisen in regard to cart automation is the disruption of the three-year planning schedule usually adhered to by the group due to the format situation being very complicated. There is a need at the Meredith stations for more than 40 carts, with additional pressure coming in stations having to handle 15-second spots. This, of course, means twice as many individual carts will be necessary, requiring larger capacity machines, greater inventory capabilities, and the ability to expand on whatever system is chosen.

We are desperately looking for a solution in this department since it is necessary to fit the acquisition into our three-year buying schedule. In addition, we want to expand our whole automation system into a configuration that provides us with downloading capability. Our intent is to take the next day's events schedule from traffic, and download directly into the on-air cart machine as opposed to having a paper playlist generated by traffic and a technician slowly type into the machine, operating at much reduced efficiency. Systems under consideration have been Ampex and Sony units, and, currently high on the list, are units from Asaca and Panasonic because of the future expansion capabilities provided.

Sometimes the group-level buy is the way to go, while often it is not the most efficient way to handle the acquisition. Choosing a vendor for any major equipment purchase is a long process today, and there should be no shortcuts, especially with performance differences in certain kinds of equipment being so subtle. In the end, you are often making a choice of people and the support team. In weighing all the advantages and disadvantages, group-level acquisition should be considered on a case-by-case basis, centered on your team plan. **BM/E**

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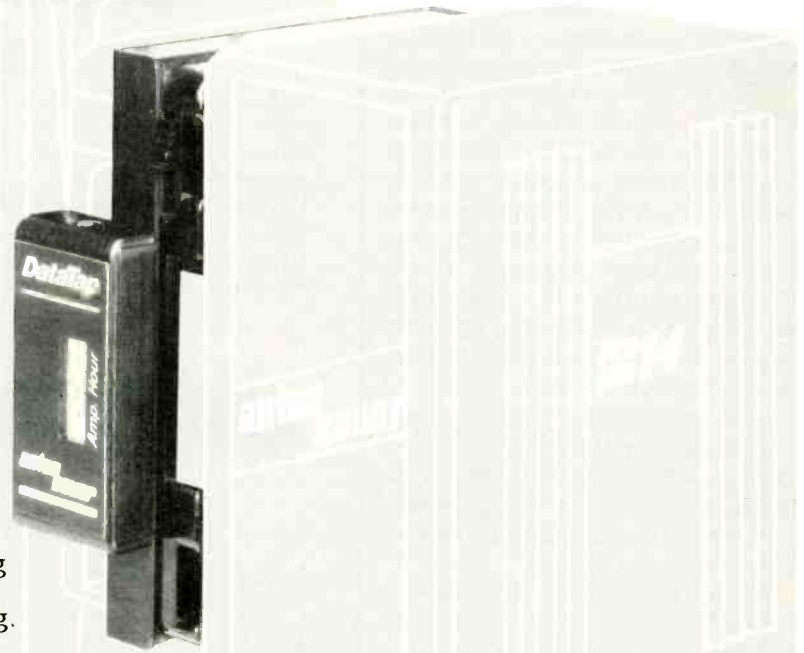

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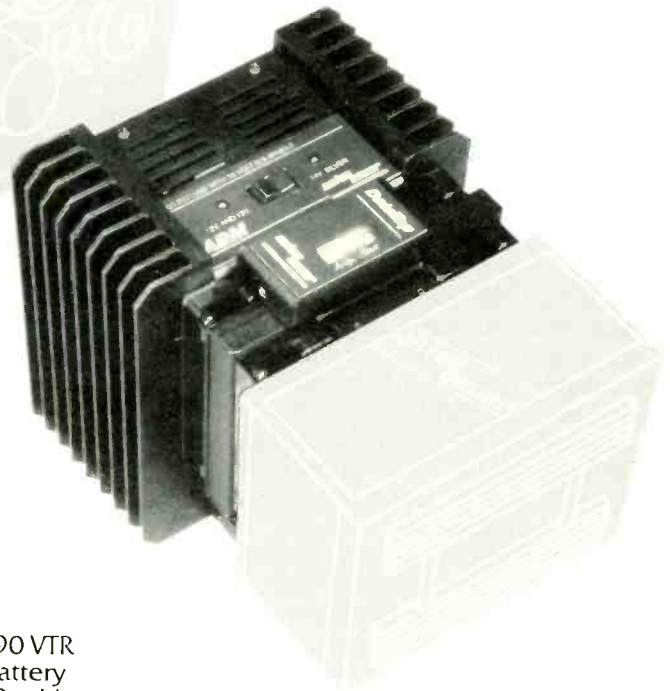

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Outside exhibit area at last year's RTNDA in Nashville, TN, resembled a mini-NAB. This year's exhibit will be even bigger.

Equipment Is Lead Story at RTNDA Meet

Satellite newgathering looks to be one of the hot topics featured at the over 100 exhibits at this year's RTNDA show.

When RTNDA downlinks into Salt Lake City, UT, for its forty-first International Conference, it will bring with it the association's biggest-ever equipment exhibit, along with an information- and celebrity-packed program.

At press time, 100 exhibitors had signed up for booths as large as 2500 square feet, larger than any yet seen at an RTNDA show. The equipment area, up one-third in total size from last year, covers over 100,000 square feet. The exhibition, meeting sessions, and conference headquarters will convene at the Salt Palace in Salt Lake City.

To encourage news directors to bring along their engineers for help in evaluating equipment, the association is offering complimentary one-day registration to station, group, and network engineers who attend the convention and visit the exhibits on Friday. A special Thursday evening reception will welcome engineers.

Satellite newsgathering continues to be a hot topic among news directors, indicated by a slew of satellite-related exhibits and several satellite-related workshops. Also well-represented on the exhibit floor will be makers of graphics and weather systems.

Tom Brokaw, anchor of the *NBC Nightly News*, will deliver the opening address Tuesday evening, August 26, following presenation of the RTNDA National Awards. The closing speaker, at Friday's Paul White Banquet, will be Fred Friendly, former president of CBS News and now Edward R. Murrow professor emeritus at the Columbia University Graduate School of Journalism. **BM/E**

RTNDA Program

Tuesday, August 26
RTNDA National Awards Presentation
Speaker: Tom Brokaw, NBC News

Wednesday, August 27
Exhibition Grand Opening, 10:00 a.m.
Luncheon Speaker: TBA
Third-World News in Main Street America
Management Session
Radio News Promotion
Television Newswriting
News from Space
How to Have Award-Winning
Photojournalism in Your Shop
Radio Newswriting

Thursday, August 28
Luncheon with Exhibitors
Journalism Ethics
Women's Resource Center
Investigative Reporting
Future of Radio News
Satellite Newsgathering
Reception for Engineers

Friday, August 29
Minority Delegate Breakfast
Radio News Idea Exchange
Television Video Formats
Education and Electronic News

Paul White Banquet
Speaker and Award Recipient: Fred Friendly,
Columbia University Graduate School of Journalism

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Odds and Ends

By Harry Cole, FCC Counsel

This month presents yet another grab bag of Commission decisions of which you should probably be aware. These include the latest development in the long-running saga of the "issues/programs list" and a whole new policy governing the FCC's role in allegations of obscene programming.

Issues/programs lists

Once upon a time, when regulators ruled the world, the Commission developed a complex reporting system aimed at assuring that broadcasters were aware of the problems, needs, and interests in their respective communities, and that they were providing nonentertainment programming responsive to those problems, needs, and interests. This system—generally referred to as "the ascertainment process"—hit its high water mark in the late 1970s.

Not surprisingly, when the deregulators took over control at the end of the 1970s, one of their first targets was the ascertainment system. After some initial tinkering with the ascertainment process, the deregulators abandoned that process in favor of marketplace forces in the context of the commercial radio deregulation proceeding.

One remaining vestige, however, of the ascertainment process called for the preparation of annual issues/programs lists, in which each licensee must list at least five needs and/or interests of their communities.

The trouble was that, in the previous radio deregulation decision, the Commission had eliminated the requirement that licensees maintain program logs. But program logs were a primary source for the public to determine each licensee's actual program performance. Without logs, the public—and, ultimately, the Commission—would have only the annual issues/programs lists from which to evaluate the licensee's programming. And, in the view of the U.S. Court of Appeals in

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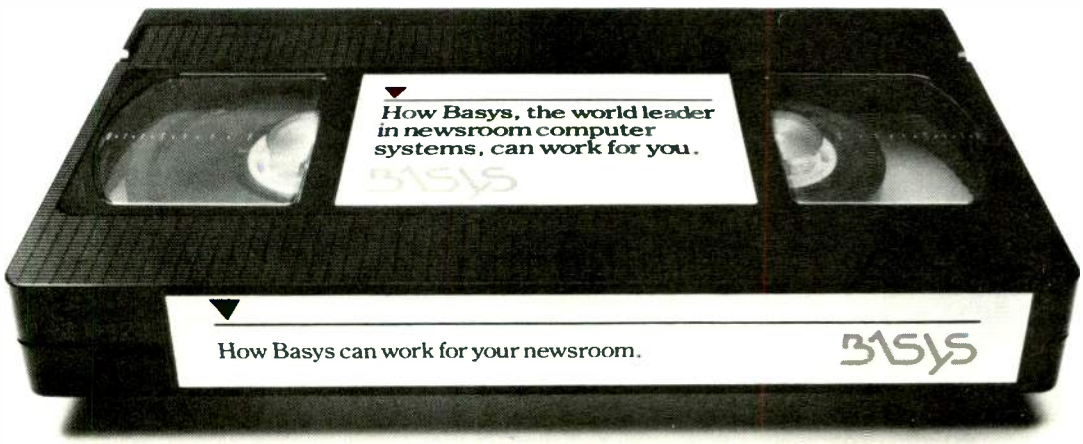

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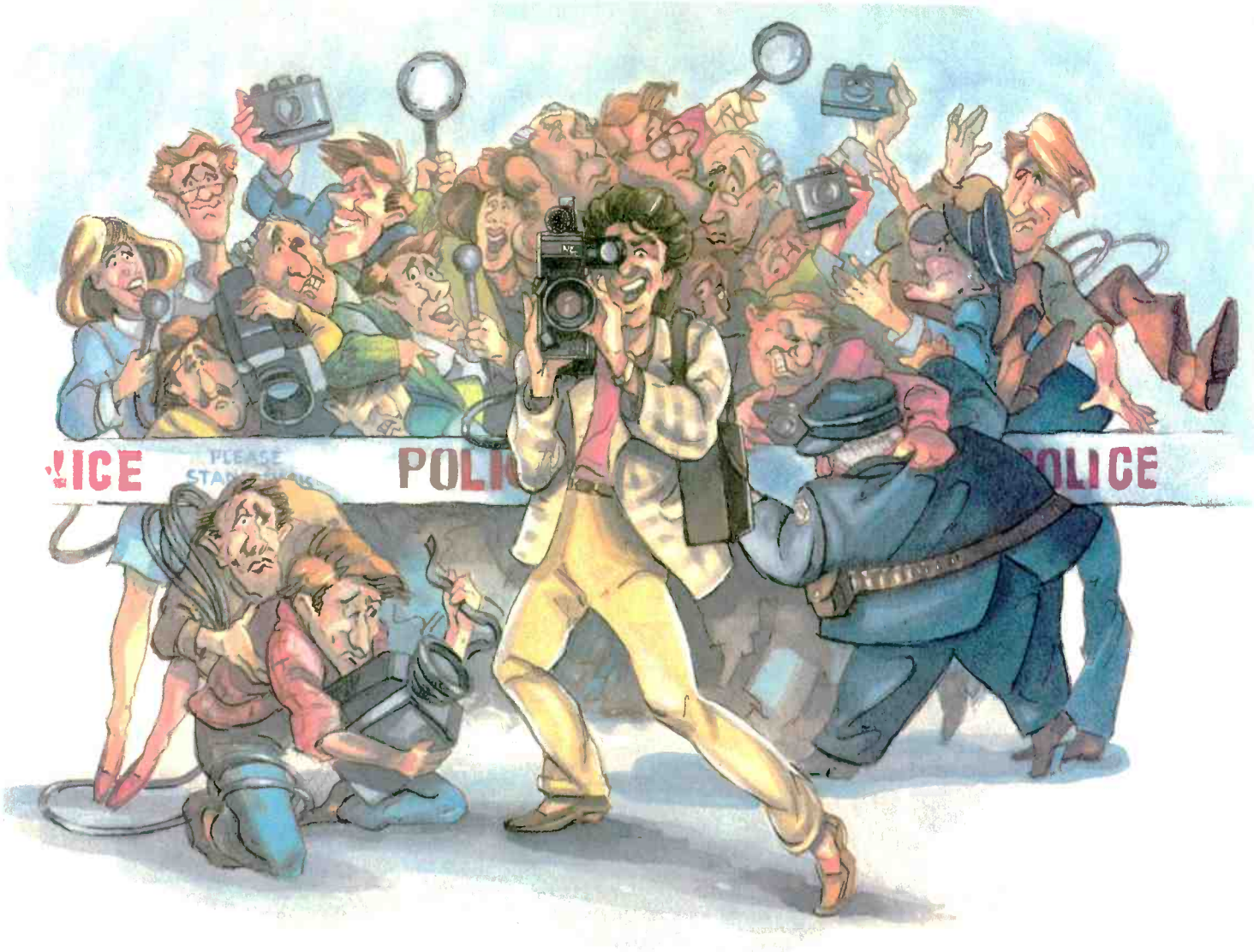

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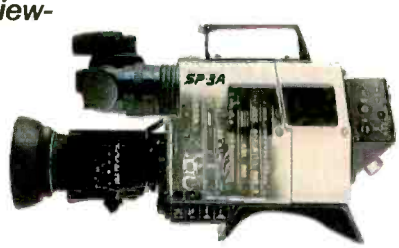

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Washington, that was simply not enough. Accordingly, in 1983, the court sent that aspect of the radio deregulation proceeding back to the Commission for more work.

In response, the Commission played with the issues/problems list concept. The result, reached in 1984, was a modified list requirement entailing a quarterly list of at least five to ten issues, together with descriptions of illustrative programming. The Commission was taken back to the Court of Appeals, and, last December, the court again turned thumbs down on the FCC's approach.

Now, more than five years after the initial adoption of radio deregulation, the Commission has taken its fourth shot at designing a recordkeeping requirement that will give the public what the Court thinks the public needs, while still relieving broadcasters from excessive and unnecessary paperwork. This time, the FCC appears to have taken its cue from the court itself. In its December, 1985, opinion, the court noted that the Commission did not appear to have given adequate consideration to the "significant treatment" alternative. That alternative would require each licensee to certify that the programs listed in the quarterly issues/programs list represent its "significant treatment" of community issues. And, sure enough, the Commission has now adopted the significant treatment approach.

Obscene programming

Historically, the Commission has stated that it shares authority and responsibility for enforcing the prohibition against the broadcast of obscene material. Of course, the Department of Justice and the various state attorneys general also have some authority and responsibilities in that area. But, like it or not, the Commission is included on that august list. The FCC has not flexed its censorship muscles very often, or with particular force, but it has at least indicated to the broadcast industry and to the public that it has those muscles to flex.

In April, however, the Commission announced that it would no longer take the lead in this area. Instead, it will consider allegations of broadcast obscenity only if and when the people involved have been convicted of obscenity in a criminal prosecution.

In the Commission's view, its resources can be better spent elsewhere than on inquiries into whether particular programming is obscene. As the FCC sees it, that's what local prosecutors are out there for.

Nonetheless, the laws prohibiting the broadcast of obscene matter are still on the books, and it is possible that local officials might, in some cases, choose to prosecute. Even in today's relatively liberal society, though, the broadcast of anything that could even arguably be characterized as "obscene" remains a rarity. BM/E

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DubMaster Automates CMX Editor

A new software program that automates the repetitive video dubbing process for CMX 340X, 3100, 3400, and 3400A editors has been announced by Editing Services Co. The DubMaster software is designed to control video/audio switching, GPI, and any one VTR in a repeated bars/VTR/black cycle.

The program loads in a few seconds and works unattended for up to 1000 dub cycles. While the run is in progress, the system displays the current pass number and the elapsed time within a cycle. DubMaster's ease of use allows rapid switching from a dub system to an edit system, cutting down on the CMX unit's idle time. The software is released on a license-only basis.

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Leitch Intros Test Generators

Two new NTSC test generators have been announced by Leitch Video of America, Inc., Chesapeake, VA. The STG-2500N NTSC Studio Test Generator is a compact, 1 RU unit that provides 22 computer-generated video test signals for baseband and general in-plant studio equipment uses, available at low and high APL. Test signals are stored in EPROMS, and conversion to analog form occurs with 10-bit precision.

The XTG-2500N NTSC Transmitter Test Generator, the same size as the STG-2500, generates 22 test signals for AM and television transmitter applications.

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Computer-Generated Storyboards

LAKE Compuframes has developed a new storyboard system that utilizes nearly any word processor or graphics program to print storyboard notes and directions directly from a computer. Compuframes are pin-feed, continuous forms that tear down to standard 8 ½- by 11-inch sheets. The board sheets come in four formats: six frames per page or three frames per page, both in either single or four-way visual frames.

Any word processor with pagination, margins, page breaks, and headers can conform to the Compuframes' format, and graphics programs can be adapted to print out directly on the sheet boxes. A 500-sheet box costs $42.95; 2500-sheet is $168.95.

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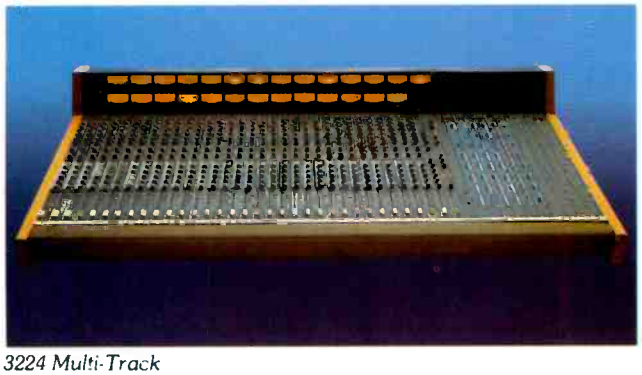

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