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BM/E

BROADCAST MANAGEMENT/ENGINEERING

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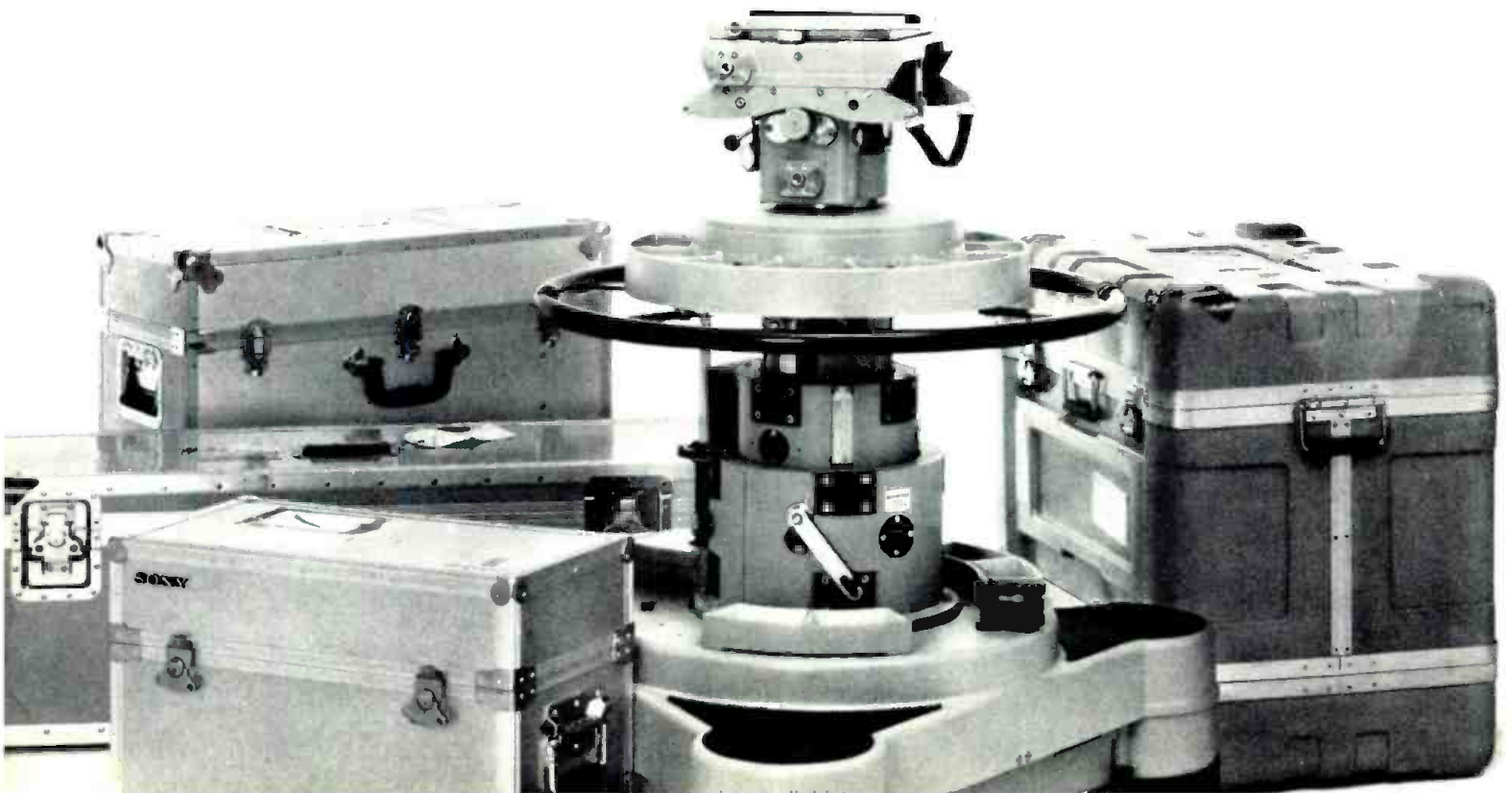

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Broadband Information Services Inc.
295 Madison Ave., New York, N.Y. 10017
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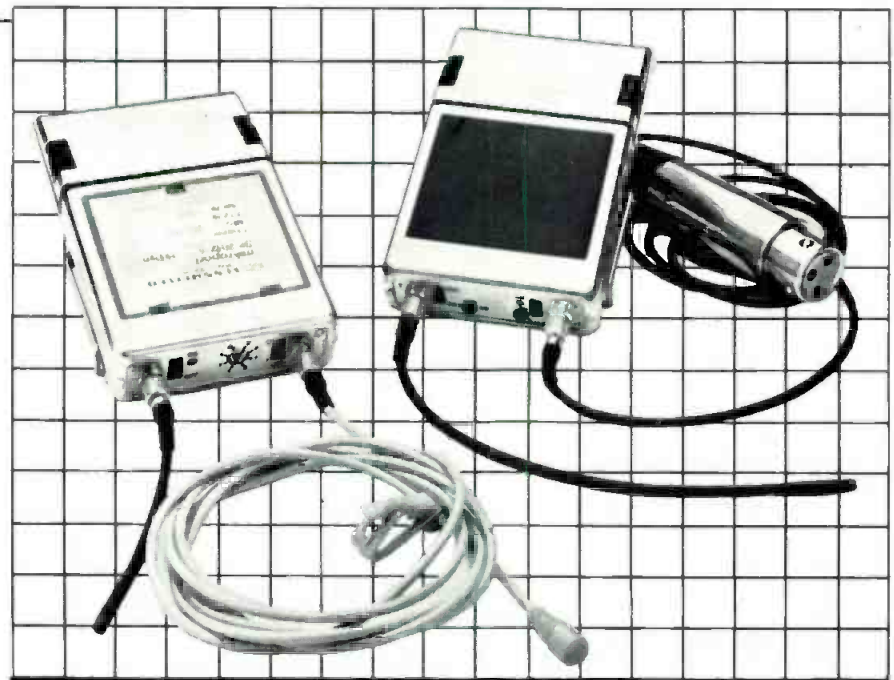

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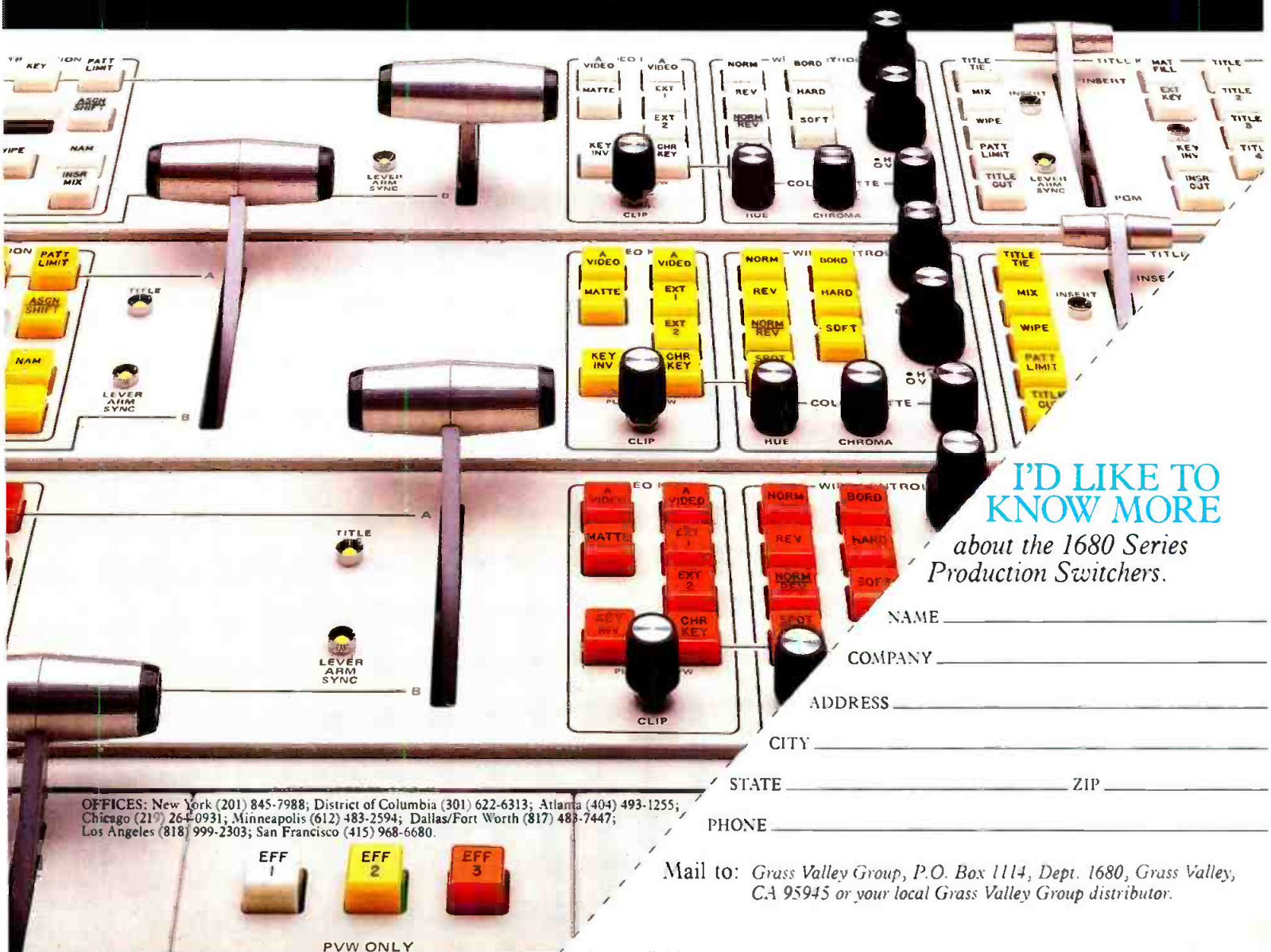

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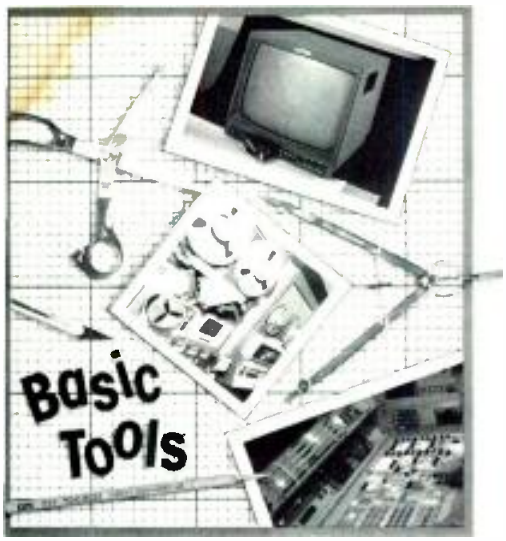

BM/E
BROADCAST MANAGEMENT/ENGINEERING

FEBRUARY 1987 VOLUME 23/NUMBER 2

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Features

Departments

Cover:
As illustrated by our cover, basic tools in the broadcast industry, and in others, are the backbone of creative efforts.

The Look of '87

"It appears that 1987 will be a year of recovery, though modest, and that the new Congress will take notice of many important issues."

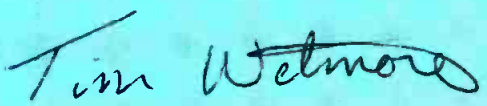
Having just come off a relatively slow year for the broadcast industry, most of us are looking to the upcoming year with a sense of reservation. Of course, there is a great deal of excitement around as broadcasters prepare for new challenges, along with the new Congress and the FCC beginning to address the political and legal issues that will affect our industry.

In this issue we have included the results of our industry survey, and we have found that the excitement is justified. It appears that 1987 will be a year of recovery, though modest, and that the new Congress will take notice of many important issues. The FCC, too, must address concerns such as must-carry and the recently resurrected difficulties with compulsory license.

There are, of course, many other issues at hand, but the positive note on which 1987 will start should help the industry rally to a strong beginning. If any of our respondents are to be believed, budgets are up, equipment will be bought, and new and innovative programming is predicted; all of this from the mouths of the broadcasters themselves. Yes, it looks as though, after last year's rather depressing year, the new one will be better.

So, take the time to look over our Survey of Industry Needs, see if your plans coincide with those of your colleagues, and let us know how you feel. After getting the good word from our detailed charts and graphs, go out and make it happen.

We would like to take this time to thank our loyal readers for participating in the many projects sponsored by *BM/E*. Beyond the survey, we send many questionnaires, and the reponse from the industry is very rewarding. In this vein, time is running out for you to mail in your votes from December's Best Station and Facility Design Competition. Reward the people who work hard to make this an innovative business to work in. Vote!



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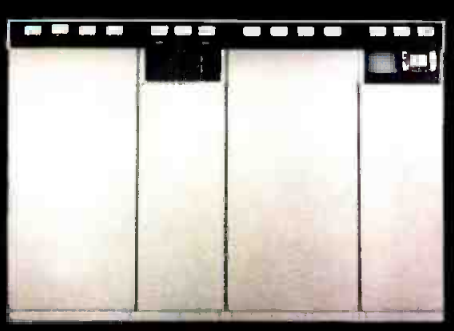

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Studer A820, A812 and A810 recorders are at the leading edge of microprocessor control technology. The common design goal: unprecedented transport quickness, sonic accuracy, and production flexibility.

A New Concept – It began with the A810. Utilizing innovative microprocessor control networks, Studer engineers developed the first "computer age" recorder based on a total systems integration concept.

Extended further in the A812 and A820, this concept is now revolutionizing production and maintenance procedures in studios all around the world.

Programmable for Your Production – The old approach to recorder design had one button for one fixed operating feature. Then Studer opened a whole new realm of flexibility by making a variety of features user programmable. Greater operating flexibility was easily achieved without extra options or costly custom modifications.

Studer pioneered this concept, and today no other recorder line comes close. On the A820 and A812, for example, over forty different features can be programmed and assigned to any panel button. Even highly specialized production demands are easily accommodated. For example, three different sequences for start locate and rollback are available.

Essentially, every button on a Studer does something *you* want it to do.

Faster Set-Up – Studer was also the first to offer digital setting and storage of audio alignment parameters. Alignment parameters are keyed directly into the ma-

chine or transferred via serial interface from an outboard computer. Non-volatile memory holds data for two tape formulations at all four speeds.

Interchangeable Cards – All three recorders share the same new generation of plug-in audio circuit boards. Noise and distortion specifications are significantly better than designs from just a few years back. Advanced phase compensation improves high frequency dynamics. And both transformer and transformerless inputs and outputs are available.

Systems Smart – For complex audio/video/film production systems, available options include center track time code, serial data bus, and special FM pilot and Neopilot versions.

A820: Ultimate Mastering – The fastest, smoothest, most "intelligent" tape transport ever made. Period. Available in ¼" or ½" two-track versions.

A812: Mid-Sized and Sophisticated – An all-new transport with 12½" reel capacity, the A812 offers the same operating system software as the A820.

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Technology.

Panel Examines Employment

Television and film craft unions must make a concerted effort to retrain their members to work with new technologies, according to a panel of experts at last December's Convergence II forum, in Montreal.

"Technology and the Changing Workplace: Labor Relations in Film and TV" was one of many seminars at Convergence II, a four-day conference on the impact of film and television. The seminar was moderated by Peter Broderick, a U.S. labor relations consultant, and included panelists Rinker Buck, senior editor of *Channels* magazine; Paul Siren, of the Association of Canadian Television and Radio Artists (ACTRA); and Elizabeth Stanley, a Los Angeles-based labor-relations expert who has specialized in retraining film cameramen for video.

"Job security is dead," said Buck. "The unions are really negotiating who gets the new jobs, not who keeps the old ones."

Buck also stated that advances in technology are as much an opportunity for organized labor as they are a crisis for them. "The networks decided to do an end run around the unions," said Buck, pointing out that large employers, such as CBS, are contracting out for computer graphics specialists for use during the elections. "Is the union foresightful enough to see that those jobs come under their jurisdiction? I think they are being passed by."

Siren agreed, saying that history has shown that unions resisting change get left behind. He suggested that fragmentation of the industries' many crafts made adaptation difficult.

"An attempt to bring about a unification of a number of crafts, skills, and disciplines to cope with change is the best possible way," said Siren.

"The big question is whether the unions can make the changes needed quickly enough," said Stanley. If not, she feels unions "will become marginalized."

Broderick said that the increased use of computers for editing and location management, and the trend toward producing outside of Los Angeles and New York, furthur complicates the issue. But, in his view, the loss of jobs remains one of the union members chief concerns.

"Wages and job security are still priorities," he said. "Keeping up with the new technology is not as hot for the rank and file."

In Siren's view, reluctance of some union members to retrain may be a matter of pride. "There's a tremendous fear that you'll look like you can't cope with all the new things being thrown at you," he observed. He added that lost jobs and union frustrations may result in a political reaction.

"Communities are devastated along with the individuals who lose jobs," said Stanley. She cited

HDTV (high-definition television) demonstrations at the FCC, in Washington, D.C., last month compared standard NTSC video with that of HDTV technology. Earlier, on December 5, 1986, television history was made when HDTV was broadcast over standard UHF TV channels for the first time. The transmission, from a special antenna on an auxiliary tower at Washington TV station WUSA, was received on an HDTV monitor at the NAB's Science and Technology office.

These experimental broadcasts were sponsored by the NAB and the Association of Maximum Service Telecasters, with equipment supplied by numerous companies, including Micro Communications, ITS, Toshiba, and the Japan Broadcasting Corporation (NHK), developer of the 1,125-line HDTV system.

Following the NAB's preliminary test, HDTV screens were set up at FCC headquarters on January 7, in the commissioners' meeting room (above). These well-attended demonstrations featured HDTV video taken by NHK of the 1984 Summer Olympics, WETA-TV footage shot and edited on Sony equipment, and Rank-Cintel video transfers of excerpts from major motion pictures.

Strong interest in HDTV by broadcasters is based not only on the technology's superior resolution, wide screen, and digital stereo sound, but also because of speculation that the cable, videocassette, and—eventually—DBS portions of the television market may make use of HDTV in the next few years.

HDTV is made possible by an NHK-developed bandwidth compression system, named Muse. Originally invented for use with DBS, Muse converts a 30 MHz-wide analog signal to digital form, compressing it to 8.1 MHz for broadcast. Because NTSC channels are 6 MHz wide, two UHF channels are needed to transmit HDTV. For this reason, the NAB is concerned about an FCC proposal to reallocate part of the UHF-TV spectrum for land mobile radio users. The NAB argues that land mobile spectrum space could be more efficiently used if it employed single sideband, instead of FM.

Further HDTV demonstrations, at the Russell Senate Office Building and other locations in Washington, followed those at the FCC.

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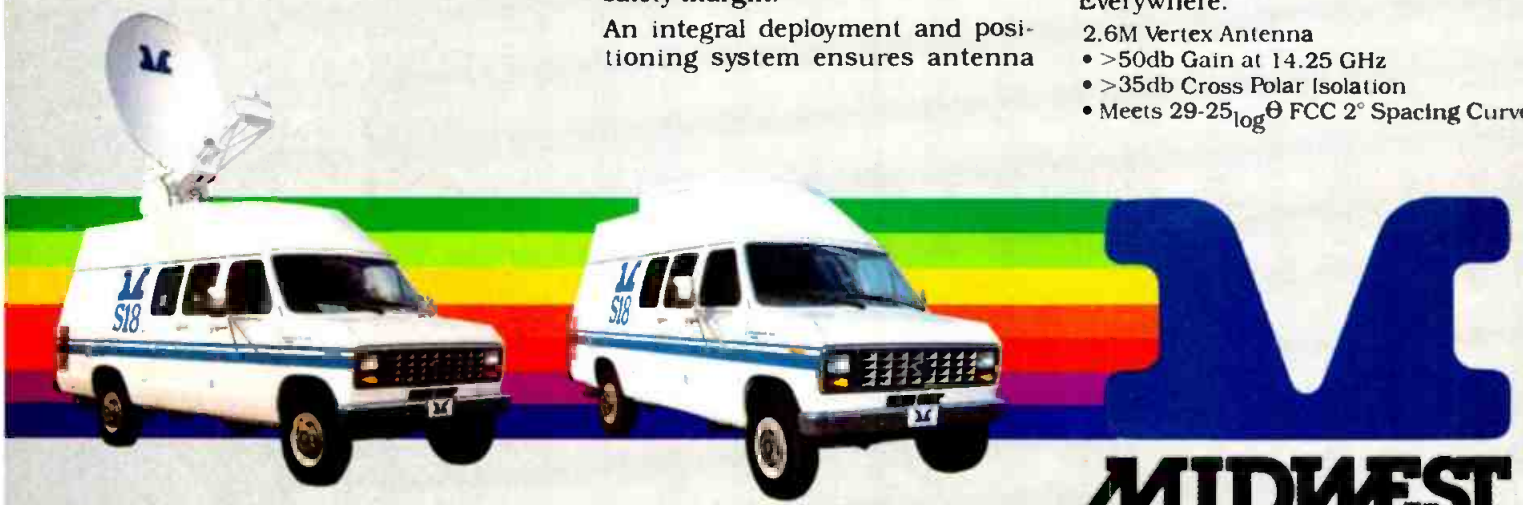

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California as an example, saying that each job lost in the TV and film industries there affects seven other jobs in various economic sectors.

Two Eye NBC Stations

Now that the deal for merging NBC's radio stations with Westinghouse's Group W stations has fallen through, Group W is still one of two companies reportedly interested in buying the NBC radio O&Os outright. In addition to Group W, Westwood One is said to be looking at the NBC stations in a desire to pair another network with the Mutual Network, which Westwood One purchased a few years ago. Westwood One recently purchased the radio trade publication *Radio & Records* from Harte-Hanks.

But Group W may have the edge in this impending purchase. During the merger talks, Westinghouse reportedly developed a good rapport with NBC, even though a final agreement was never reached.

NBC is being forced to sell its radio O&Os in five cities as a result of the GE takeover and prohibitions against cross-ownership. The network is looking for a way to sell the stations without having to dismantle its three radio networks, which the stations have been carrying.

RF Regulations Sought

As part of the NAB's continuing support for the establishment of nationwide regulations for human exposure to broadcast RF energy, the association will present a two-hour workshop on the topic on Sunday, March 29, during its annual convention, in Dallas.

On the following day, Thomas Vaughan, president of Micro Communications, will present a paper titled "Measuring and Managing RF Radiation Exposure on Broadcast Towers." The paper, an updated version of one Mr. Vaughan gave at Radio '86, will be one of several to be presented on the environmental concerns of broadcasters.

"The absence of a federal standard governing RF radiation frequently means that broadcasters must get clearance from local zoning commissions," comments Ralph H. Justus, staff engineer of the NAB's department of science and technology. "These local ordinances are growing at an alarming rate, often without the benefit of scientific studies. One TV station in the Pacific Northwest spent $2.5 million in trying to clear its tower with the local zoning commission. Such cases are being repeated all over the country."

The NAB has called upon the Environmental Protection Agency to adopt federal RF guidelines set by the American National Standards Institute (ANSI). Such guidelines would also be recognized at the state and local level. The FCC has already chosen the ANSI standards as in-

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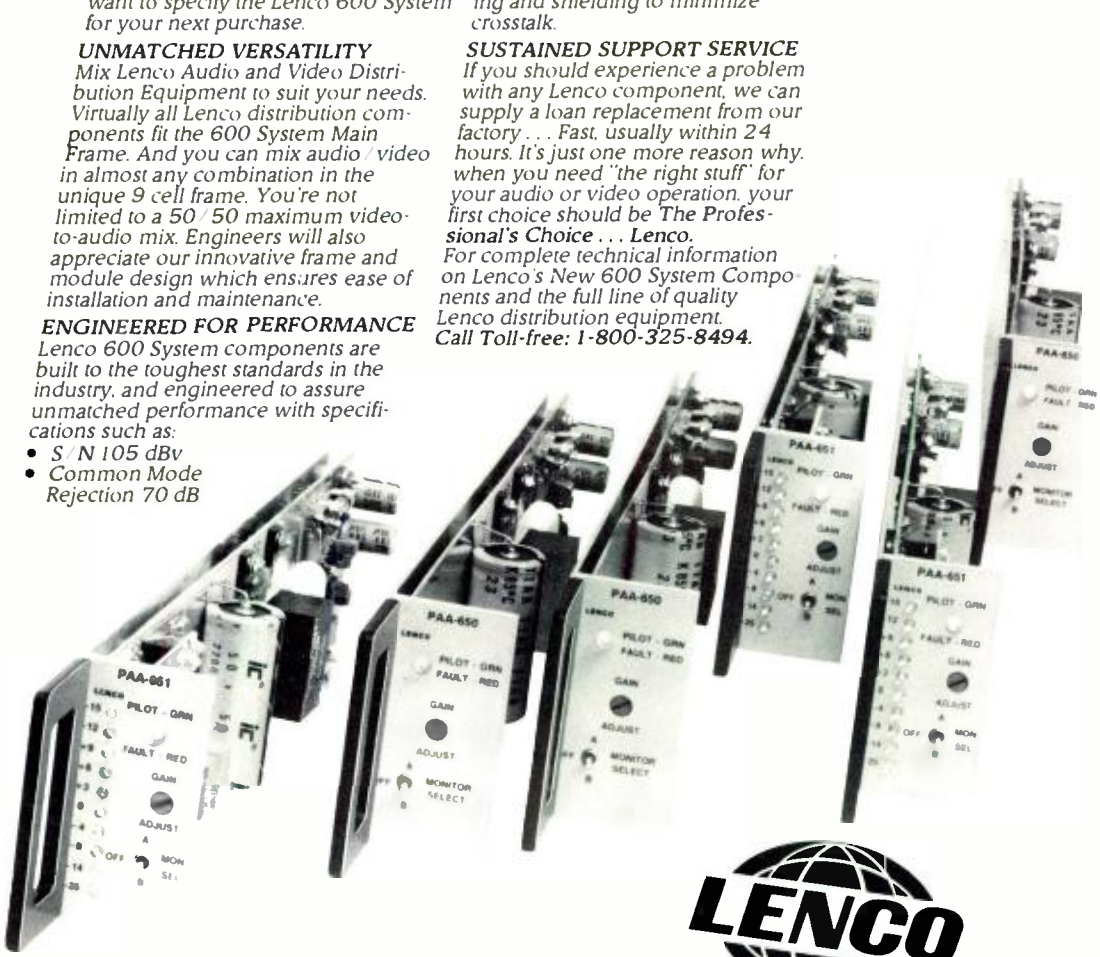

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terim guidelines for RF radiation.

In addition to the paper and workshop at this year's NAB, the association plans to hold regional seminars over the next two years, prior to license renewal dates, to acquaint stations with compliance to RF regulations. It has yet to be decided whether these seminars will be held on-site or conducted as teleconferences.

Dolby SR Passes Listener Test

In what was billed as the first wholly impartial listening test for Dolby SR (spectral recording), Digital Dispatch—a California-based equipment rental house—assembled audio engineers, producers, and technicians at their booth during November's AES convention and played them four recordings of a jazz combo consisting of piano, electric bass, electric guitar, and drums. The recordings had been done live—and simultaneously—onto four two-track machines.

The recorders were: a Mitsubishi X-80 digital, a Sony PCM-3203 digital, a Sony BVU-850SP/PCM 1630 digital processor, and a five-year-old analog Ampex with the new Dolby SR (spectral recording) card.

A total of 162 listeners took the test, and were then polled by Digital Dispatch for their preferences. Of those who participated, 82 identified themselves as audio engineers, 20 as engineer/producers, 13 as artist/engineers or artist/engineer/producers, 8 simply as producers, 8 as working in video facilities, 4 manufacturers, 3 artists, and 24 others.

Of the participants, 72 (44 percent) preferred the sound of the five-year old Ampex recorder with Dolby SR; 29 listeners (18 percent) preferred the Sony DASH; 26 people (16 percent) liked the Sony 1630; and 14 others (nine percent) liked the Mistubishi X-80. The remainder of the listeners preferred some combination of the four, with the greatest chunk—13—choosing the Ampex with SR and one of the digital machines, while six expressed no preference.

Comments on the Dolby SR included "natural sounding," "open sounding," "least harsh on highs," "transparent sound," "best definition of highs," and "more natural lows."

Those who preferred the Sony DASH citied "punchy" sound, clarity of sound, and good transients; the ones who liked the Sony 1630 mentioned clearer transients, cleaness, fuller sound; and those who liked the Mitsubishi cited a clean edge on highs, good overall smoothness, good detail, and less coloration.

The test was by no means scientific, and its conclusions are open to interpretation. Digital Dispatch conducted the listening test without the participation of the manufactuers of the equipment involved.

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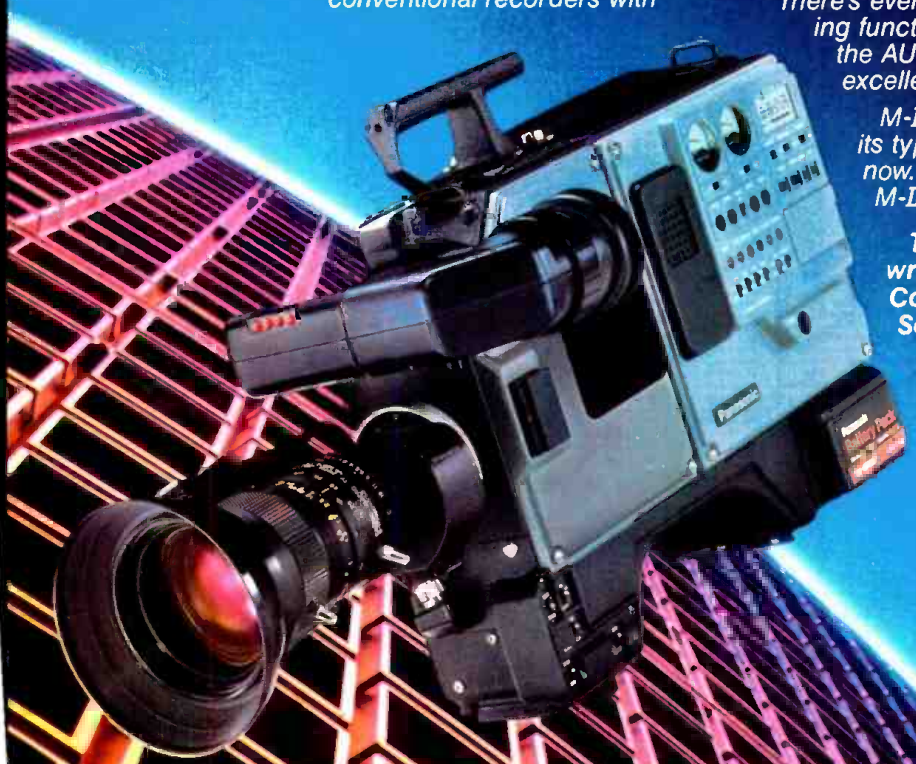

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Basic Tools

By Brian McKernan

Video has never had it so good. An unprecedented variety of sophisticated equipment is available to television stations today to edit, enhance, and embellish the electronic image.

How much of this equipment a given station has depends on many factors, chief among them being the size of the market served. There are, however, certain basic tools necessary for video production that are common to all facilities, regardless of how big they are or how much they can spend. Whether a station is a network O&O or a small independent, video production will always involve the acquisition, control, storage, and monitoring of images. State of the art or secondhand, the tools to perform these basic tasks consist of, respec-

Although no two television stations are alike, the essentials of teleproduction are the same everywhere.

tively, the camera, production switcher, VTR, and monitor.

A policy of economy

"I built two other television stations previously, and so have learned from experience," states James U. Lavenstein, president and general manager of KOKI-TV, in Tulsa, OK. "And that experience says that the less money you put into plant and equipment, the sooner you are profitable."

KOKI-TV, channel 23, is a six-year-old independent in a market dominated by three long-established network affiliates. Tulsa (ADI No. 52) also has four other independent stations, and a PBS affiliate. "We went 'Cadillac class' when we bought our transmitter and tower," Lavenstein explains. "It's all state-of-the-art equipment. Building that part of the operation is like getting married; once you do it, it's not so easy to undo. But as for our production and studio equipment, most of that we bought used. That's easier to replace. In terms of that equipment, we're driving Chevrolets and not Cadillacs.

"I know of many newer UHF stations that have gotten themselves in trouble because they've spent more than they can reasonably afford on getting the latest equipment. We buy used, and have searched all over North America to find bargains and quality. As a result we were out of the red in two years."

In search of . . .

The task of locating good, used studio cameras for KOKI meant relying on longstanding relationships with sales representatives of major manufacturers. Production manager Wes Butler explains:

"After a while you develop a network of contacts that you can trust. It's a matter of cultivating good friends in the industry that you respect, and that respect you. They may have sold the used item when it was new, and/or the item that replaced it. Our local Philips representative tipped us off that he had just sold four new studio cameras to the Southern Baptist Convention, in Fort Worth, TX. Chief engineer Robert Hardie and I flew down to inspect their old cameras, and we were given a demonstration.

"The cameras—Philips LDK 25s—were used, literally, once a week by the church group. They were well maintained, with beautiful Canon 18 to 1 lenses, fully servoed with 1.5 and 2 X extenders on them. You always have to ask yourself 'Why is the item up for sale?' If the engineer hedges in his answer you can easily read between the lines. I tested the LDK 25s and saw that there was nothing wrong with them. Then we returned to Tulsa and began Lnegotiatiating to buy them."

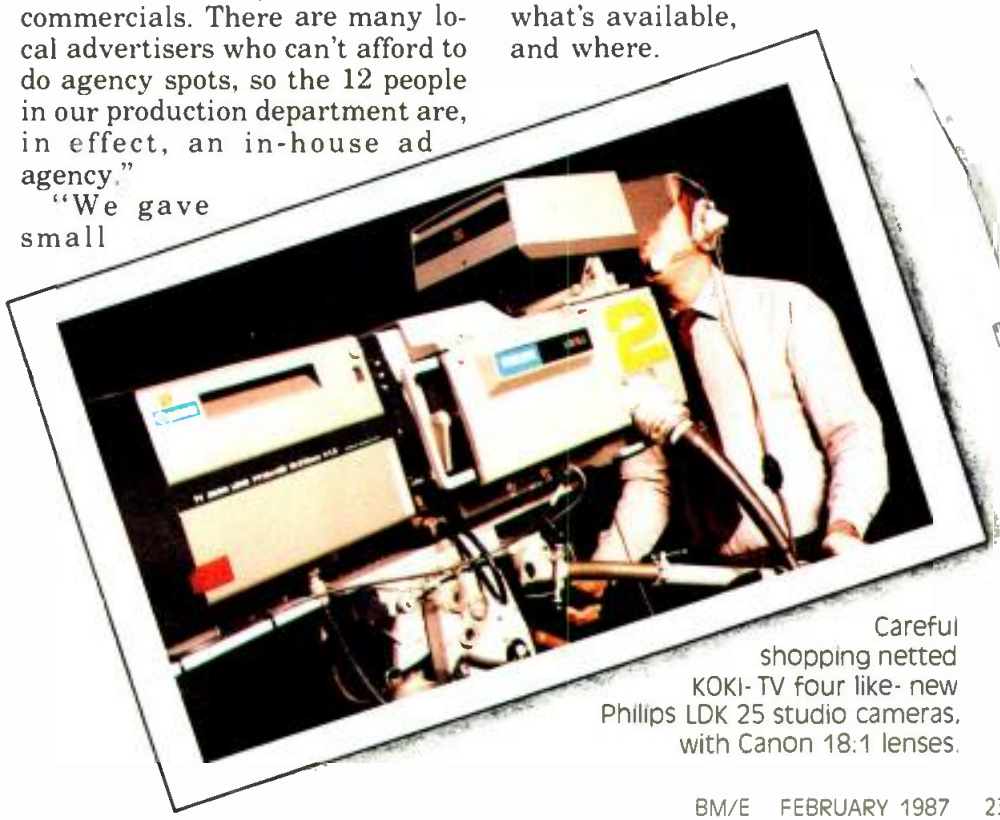
KOKI-TV's purchase of its studio cameras reflect a trend in technology that's beneficial to the buyer of used equipment: advances in what is considered to be the state of the art at any given time are so rapid now that "used" need not mean ancient.

Studio production at KOKI consists of a weekly 30-minute public affairs program and ten 90-second news updates every day. "We don't even attempt to go head-to-head with the network affiliates in terms of news," says Lavenstein. "But what we are involved in heavily is producing commercials. There are many local advertisers who can't afford to do agency spots, so the 12 people in our production department are, in effect, an in-house ad agency."

"We gave small businesses the ability to get on the air, and in that sense compete with the big national accounts," Butler says, adding that KOKI has an Ikegami 79E and a Sony BVU-110 for those times when making a commercial calls for EFP. Back in the studio, ¾-inch is bumped up to one-inch for editing and post-production.

"For this we have two Ampex 2B type C VTRs," Butler explains. "We bought them used from Ampex in Redwood City, CA. We made quite a deal on them. Ampex had used them as trouble machines to try to duplicate problems customers reported. For all practical purposes, they were brand-new. Like the Philips studio cameras, the VTRs were bought through salesmen we've known for years."

Finding the right cameras and VTRs for KOKI when it went on the air six years ago meant extensive travel in the U.S. and Canada by Butler and Hardie. "Most things we found through our own diligence," Butler recalls. Before long these searches gave KOKI the reputation of being one of the many stations looking for quality used equipment. They also relied on companies such as System Associates, in Culver City, CA, which keeps prospective buyers informed with brochures on what's available, and where.



Careful shopping netted KOKI-TV four like-new Philips LDK 25 studio cameras, with Canon 18:1 lenses.

Butler and Hardie's travels also located three two-inch Ampex 2000Bs, which—like the one-inch machines, were purchased from Ampex directly. The quad VTRs are used to record satellite-delivered syndicated programming.

"Preventive maintenance gets greater emphasis when you buy used equipment," comments Butler. "Even new equipment needs to be maintained, but it's especially important in keeping used equipment running."

What's new

Outfitting KOKI with the basics of video production also included the purchase of new equipment. The station bought 15 ¾-inch VCRs for a variety of chores, including commercial and program playback, protection for the two- and one-inch VTRs, and editing. Models include the Sony VP-5000, VO-5800, and VO-5850—all of which are industrial machines.

"A television station must always measure what it can buy in terms of its expenses and income," says Butler. "You learn to survive in different ways. For us this means industrial VCRs, which are adequate for our needs. We bought them new because used industrial machines are usually too beat up.

"Our production switcher is a small, stripped-down model. It's too small to modify, and has no downstream keyer or auto transition. When we're ready to replace it we won't be getting a used model. That's because the switcher market is very competitive today. You can get a great deal on a new production switcher if you shop around. The switcher is a vital part of your work, and it determines your whole on-air look."

Monitors at KOKI were also purchased new. "Everything that goes out of the station is set with an Ikegami high-resolution monitor. You want to get the very best indication you can of what you're putting out." Other monitors at KOKI include models by Panasonic and Videotek.

"There is, of course, an enormous advantage to using brand new equipment," says Butler, concerning KOKI's policy of acquiring new and used tools for production. "It does take us longer to do things with used equipment. But not having everything state of the art makes us use our imagination a little more. You can use the simplest things and still have wonderful communication. If a commercial doesn't work for a client it's still no good, regardless of whether it was produced with the latest equipment or not."

"We do 20 percent of the dollars in our market, according to Broadcast Advertising Reports," comments Lavenstein. "Our equipment acquisition philosophy is—for us—a successful one."

Serving the market

As indicated by the case of KOKI-TV, what and how much any given station has in the way of essential video production equipment—cameras, production switchers, VTRs, and monitors—depends in large measure on the characteristics of the market and the station's situation within it.

Boise, ID, is a mid-size but affluent market (ADI No. 136) and the home of several major corporations, including Boise Cascade, Morrison-Knudsen, and Ore-Ida. KBCI-TV, the CBS affiliate there, reports that it is currently building the largest production facility in the state to see that these and other companies don't have to go to Salt Lake City, Seattle, or Portland for their video production needs.

"Most of them want training films, and the local direct accounts and agencies want glitzy effects," explains Tim Bever, KBCI's general manager. "Production at television stations can sometimes be analogous to paper bags in a grocery store, just something to put the groceries in, a necessity for doing business. But we look at production as a source of income. We want to enhance the paper bag, so to speak, for local direct accounts. Local advertisers occasionally have great expectations about what their ads should look like because of the national ads they've seen on TV. They may have caviar tastes and sardine budgets. But we can do a good job for them, and produce spots the networks would run. And do it cheaply.

"We've found that if you make a commercial for a client, he'll also buy more time from you than he will from anyone else. You develop a deeper relationship with him because you deal with the client in a way that's not entirely sales-oriented."

To serve the mix of large corporations and small advertisers in their area, KBCI-TV has established an autonomous retail production division, which they have named The Production Zone. "We wanted a marketable name, something to set it apart from the station," Bever explains.

The Production Zone concentrates solely on the needs of the client, producing commercials and industrials. The news department has a separate production division, which allows its members to concentrate on news and public affairs exclusively.

Master control at KOKI-TV, in Tulsa, OK. Industrial U-matic VCRs were chosen to handle many of the video requirements of this economy-minded station.

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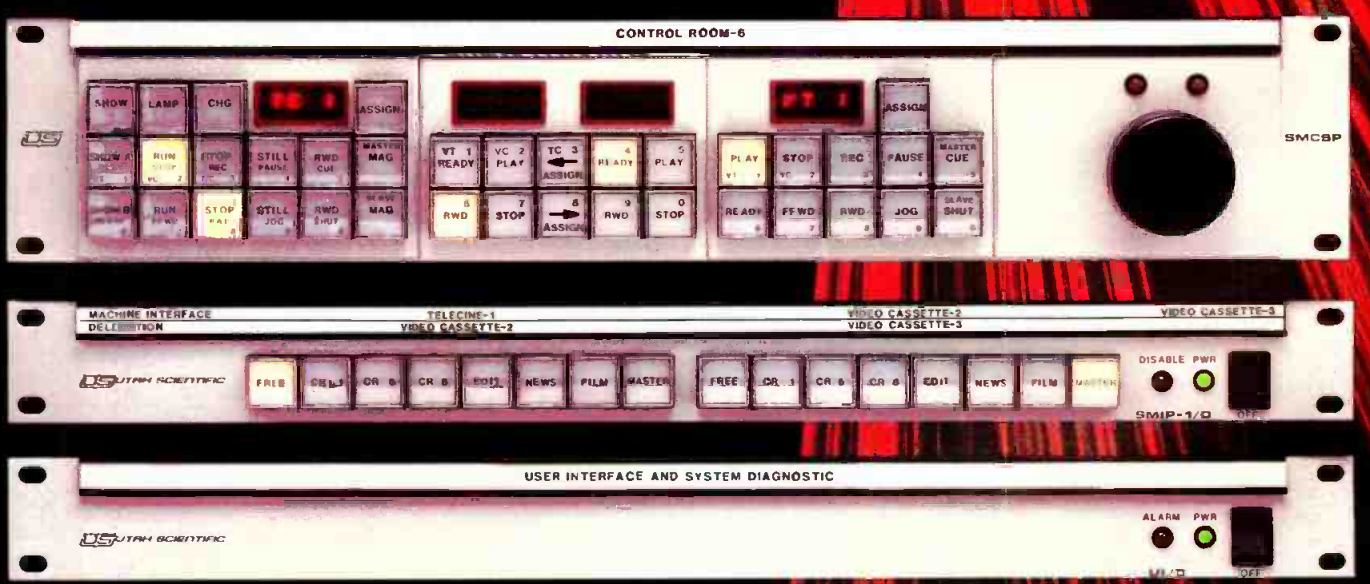

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The Production Zone, at KBCI-TV, in Boise, ID, relies on one-inch VTRs for commercial and industrial teleproduction.

Choices

KBCI-TV is one of many television stations to establish its own independent production facility, teleproduction being a logical extension of station business. This commitment requires decision making, however, in terms of choosing the basic equipment to do the job.

"We are very happy with one-inch for our production format," Bever explains. "You can store a ton of footage on a reel, it's very clean, durable, and the heads don't wear out. We have seven Sony one-inch machines. Three are dedicated to network delay because CBS doesn't have a Mountain time zone feed. The Sony time code editor is designed for our Type C VTRs, so that works out well, too. Type C has a great future with us for production."

News, however, is another story. "One-inch is fine for EFP because you're not in a hurry like you are in news. But it's no good for chasing an escaped convict through the woods, and you can't lug a 40-pound portable Type C VTR up the stairs to follow a politician on the run," Bever says.

Local news at KBCI airs twice daily for 30 minutes, and there's also a 30-minute public-affairs talk show every Sunday. U-matic is the current format used for ENG at the station, but half-inch Sony Beta looms large on KBCI's horizon.

"Half-inch for news is a competitive thing," says Bever. "The station that's number one in news is usually number one, period. Betacam is great for news because it's lightweight and gives high-quality pictures. The new half-inch editing equipment is faster than what we've been using, and the tapes are cheaper than ¾-inch tapes. We're definitely committed to half-inch for news.

"The CCD cameras turn us on as well. They're light and can take a beating. We've asked other stations that have them how they like them, and CBS has given us guidance, too. Our engineers have about 80 percent of the decision on what brand we'll pick. Their basic questions are always: 'Can you fix it? Is it tough? Will it last?' "

In the interim, the KBCI-TV news department relies on its seven Sony and JVC ENG cameras and Sony VO-6800 recorders. "The equipment is dependable, easy to work on, and you can get parts. Sony and JVC are committed to the Boise area, so service is never a problem," says Bever. "It's workhorse equipment, and we've had it for a while. We'll put extra repair and maintenance into it for another year to keep it all in working order, but next year we will make a capital expenditure of a half-million dollars on the half-inch equipment.

"Right now we're debating whether to go with integrated operation for our cameras. How stable are camcorders on a tripod? If your camcorder dies would you want to take it apart in the field? It's easier to connect a separate recorder if that happens," Bever reflects.

KBCI-TV is also considering using their existing cameras with Beta field recorders in order to delay the changeover to new CCD cameras. "That way we can phase the new cameras in gradually, and it's a financial break," Bever says. Specially adapted umbilicals would be used to connect the existing cameras to new Beta VCRs.

CCD studio cameras also interest KBCI-TV as a possible future replacement for their two existing RCA TK76s. "They were state of the art when we purchased them eight years ago," says Bever. "Now they're obsolete, the pedestals are a little tired, and we just re-tubed them for more money than they're worth." The station also has a Sharp EFP camera for wide shots of the news studio.

Room to grow

As for the other basics of video production—switchers and monitors—KBCI-TV has given careful thought to those choices as well. "We have a Grass Valley Group 1400, which is used for news now. We are happy with its performance and the service we got on it, so last year we bought a GVG 300 for the Production Zone," Bever says.

"We chose the GVG 300 for its flexibility and room to grow. It has many built-in effects and space to accommodate digital video effects. The switcher has inputs for 15 tape machines, three cameras, our ENG van, and other sources, such as our Chyron.

"As for monitors, we use Sony, Ikegami, Conrac, and RCA. Obviously they don't project an on-air image like a switcher, camera, or VTR does. But then again, you do want true color and good resolution to show you what you look like on the air. We chose our color monitors for those reasons."

Group effort

Choosing the right equipment for the job is crucial to the success of any television station, but it's

especially true on the network level. The financial considerations involved in outfitting a network's owned and operated stations with even the basics of teleproduction demand careful study before purchase commitments are made. For WNBC-TV4, in New York, being the flagship station of a major network means having major resources behind you to guide all equipment acquisitions.

"Engineering and purchasing are the two groups involved in NBC's procurement process," explains Len Garrambone, vice president of the NBC purchasing department. "It's a partnership approach, combining technical and business issues. The engineering group's technology development lab determines performance specifications and requirements for the equipment we need. Individual stations, such as WNBC-TV4, will conduct field tests on equipment under consideration. The purchasing group sets requirements for delivery date, cost, warranty provisions, spare parts availability, training programs, and operator manuals.

"We try to combine the requirements of all of NBC: news, sports, and our owned and operated stations. There are instances where we can't combine, but when we can we obtain better pricing. Then we explore the marketplace and see which vendors are interested in meeting our requirements."

In the studio

Serving the public interest, convenience, and necessity in the New York metropolitan area calls for a heavy production schedule for WNBC-TV4. It includes over 15 hours of live news each week, and one daily and five weekly half-hour taped public-affairs programs, news updates, and editorials. This workload makes for hefty demands on studio time. The station has limited studio space, however, as it shares the same 50-year-old building—30 Rockefeller Plaza—that NBC uses for its own New York-based productions.

To save valuable time, the station has four RCA TK47 studio cameras featuring automatic setup. "They've been on-line for a little over a year," says Gary Cooper, technical manager for entertainment operations and services. "The cameras work off a diascope, a component in the lens that introduces the charts needed to set registration, linearity, white balance—anything we once had to do manually. We can do in ten to fifteen minutes what it once took two engineers an hour and a half to do."

WNBC-TV4's production switcher is a Grass Valley Group 300. "It simplifies the technical director's life because each of its three effects buses is computerized," Cooper explains. "The TD can program into the switcher's computer in advance the effects and switching he wants to do. Buses can be set up to do chroma key, for instance. There's unlimited reentry capability for each bus, so the TD can bail out quickly and make changes on the fly. An it gives the TD more access to do different things. It's a complex switcher, but its preset capabilities are worth it.

"It's a post-production board, and we've adapted it for news because our news requires a lot of post-production. Among the equipment hard-wired into the GVG 300 is a three-channel Quantel, a Chyron, an Adda still store, and meteorologist Al Roker's ColorGraphics weather graphics computer."

The bank of monitors that face the TD as he sits at the GVG 300 includes 25 nine-inch Conrac units and four 25-inch color screens made by Ikegami and by Conrac. These serve as program monitor, preset monitor, a downstream key monitor to display effects, and a look-ahead preview monitor to show effects in advance. The configuration leaves little to chance, and it is designed to provide WNBC-TV4 with the flawless transitions and polished look this top-rated station is famous for.

New technologies

Although sharing quarters with the parent network can limit available space, there are advantages of co-location. WNBC-TV4 has access to many of the resources of the network, including its one-inch Ampex and Sony VTRs for studio production. The station has its own ¾-inch equipment for news, a necessity for doing business in the nation's largest market. Ten editing rooms with two Sony BVU-800 series VCRs in each are used to handle the news and feature workload of TV4. The station fields 15 remote crews every day to cover the New York metropolitan area. Each of them uses Sony BVU-110 and 150 VCRs and Ikegami 79 and 79E cameras. But equipment changes in this area are imminent.

NBC's well publicized commitment last year to the Panasonic Broadcast Systems' M-II format for all of its video needs will be especially beneficial to TV4's news operation. "It's going to make life easier for us as a station to be standardized on one tape format," says Rich Servini, director of electronic journalism operations for WNBC-TV4. "M-II provides a tremendous advantage for news. The quality of M-II is better than U-matic in both the initial recording and in dubs. Down the road we look forward to the portable editing packs for M-II, which are very light and compact. When we've wanted that capability with U-matic, the size of the equipment we had to take along made it feel like moving day.

"M-II offers more editing flexibility in the studio as well. The studio recorder has a built-in TBC, four audio channels to lay down different tracks and mixes, slow motion with control of speed, and freeze frame," Servini says.

CCDs at WNBC-TV

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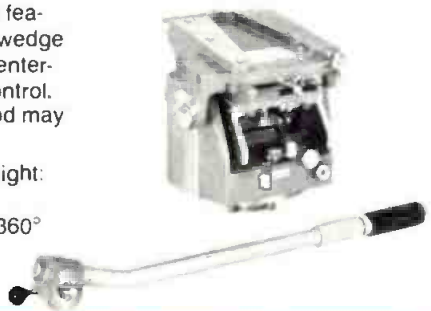

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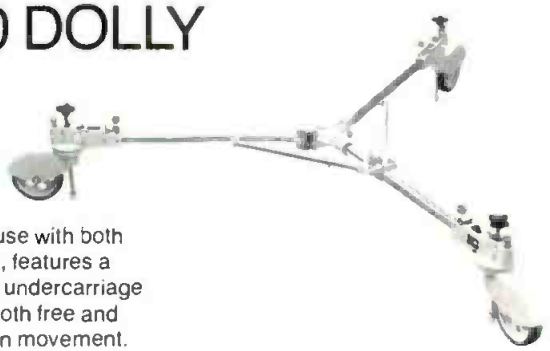

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WNBC-TV4 to meet basic production needs. The network that pioneered the use of multichannel television sound, the Ku-band for network program distribution, and M-II is now committed to CCD camera technology.

"Our decision speaks for itself. We are the first major network to move forward on CCDs; we feel it [the technology] is ready," explains Garrambone. NBC has signed a multiyear contract with NEC to purchase large quantities of its SP-3A CCD camera.

"We've tested the NEC SP-3A cameras in the field, and I have ordered five of them," says Servini. "We'll be using them in both camcorder—with M-II camera recorders—and field recorder configurations. The camcorders will be used more for news, to get 'B roll footage,' for example. In other types of shoots, such as for feature stories, we'll use a field recorder with the SP-3A camera, so the sound person can control the audio levels on the VCR.

"CCD cameras and M-II tape equipment are two new technologies, and I don't expect they'll be perfect out of the box. But NEC and Panasonic are very willing to listen to us. We'll work with the manufacturers to make adjustments if needed."

Another new camera technology that WNBC-TV4 has on order is the Nitecam, a laser-augmented video camera that can shoot in total darkness. Manufactured by International Technologies (Lasers) Ltd., and marketed in the USA by PAG America, Nitecam will enable the news department to shoot video in places once inaccessible.

Whether it be WNBC in New York, KOKI in Tulsa, or KBCI in Boise, equipment for the acquisition, control, storage, and monitoring of video was carefully chosen by each station based on its individual needs and resources. Cameras, production switchers, monitors, and tape machines serve the same essential purposes at the three facilities, despite the different conditions prevailing at each. Occasionally, however, equipment intended for one purpose can suddenly be called upon to fulfill another. WNBC-TV4's Rich Servini explains:

"All of our electronic journalism crews are equipped with five-inch Videotek color monitors, which can be used as monitors or TV tuners. The output of our VCRs plugs into them, and the monitors allow the crews to check color accuracy, tracking, and cueing for remotes.

"At the World Series, one of our crews was parked outside Shea Stadium to report on the crowds that couldn't get in to see the game. After the report, our crew strapped the Videotek monitors to the outside of their truck. Thanks to those monitors, the crowds got to see the game at the stadium after all." **BM/E**

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BASICS for News

Covering the news 'up north' means extreme cold and small budgets.

The Iditarod—an annual 1,049-mile dog sled race from Anchorage to Nome, Alaska—covers some of the most frozen and desolate territory in North America. While the dogs and their human "mushers" are well acclimated to the harsh race conditions, the 50 degree below zero temperatures frequently encountered along the Iditarod Trail can spell trouble for television news crews and their equipment.

Within KIMO-TV's production control room, David Bellamy (left), graphics operator; Mike Southern (center), technical director; and Jerry Floyd, senior post producer, prepare for an evening news broadcast. Bellamy is operating a 3M D-8800 electronic graphics keyboard, while Southern operates a switcher made by The Grass Valley Group, Inc. Floyd is in charge of an ADM 1600 II audio board.

Consider, for example, Jeff Dowd's experiences during the Iditarod. As news and events producer for KTUU, the NBC affiliate in Anchorage, Dowd has covered the race twice.

"It gets so cold on the race trail," he says, "that I've had video camera and tape deck controls freeze solid in operating position. When that happens, you have to pull batteries in order to turn off the equipment. And then, you need to use a hair dryer to warm the equipment back up."

For Rex Arends, KTUU photographer, and fellow photographer Greg Lytle of Anchorage ABC affiliate KIMO-TV, the Iditarod is a constant challenge of keeping camera batteries warm, watching out for tape mistracking and concentrating on image exposure in an almost all-white environment.

"You're always worried about even fully charged batteries failing when the temperature drops to 30 or 40 below zero," Lytle says. "I make it a point to carry a lot of spares, and I store them in an inside pocket to keep them warm."

Says Arends, "When you're out on the Iditarod trail, and especially if you're crossing a flat stretch of ice, sometimes the only picture you'll get is a field of pure white snow and sky. If the sun's out though, you can use whatever

shadows are available to add texture and depth to your shots."

While the Iditarod is unique to Alaska, KTUU and KIMO-TV reporters and photographers regularly cover news events that are considered more "universal:" the fires, accidents, and government activities that influence daily lives. However, because of Alaska's sometimes extreme climate and immense size—yet its low population and small television market status—KTUU-TV and KIMO's news operations must face unusual challenges on small budgets.

Big country

"Because of Alaska's size," says B.G. Randlett, senior vice president of Alaska Network Companies, KIMO-TV's parent company, "we're always looking for ways to better cover news within the state. That's the purpose of our network.

"Together with our sister stations KJUD-TV in Juneau and KATN-TV in Fairbanks, we pool our resources to more comprehensively and cost-effectively cover news," Randlett says. "We exchange stories between Anchorage and Fairbanks by contracting use of a microwave system from Alascom, a common carrier. To get stories in and out of Juneau, we use Aurora I."

Cost constraints also play a role in KTUU and KIMO-TV's choice of equipment and videotape. Management at both stations constantly look for ways to "get the most for the money."

For example, explains KTUU's Jeff Dowd, his station standarizes on Ikegami ITC-730 and 730A field cameras and Sony BVU-50 and BVU-110 ¾-inch field decks because of this equipment's high-level performance, yet low cost.

For editing, KTUU utilizes ¾-inch JVC CP-5550 editing players, JVC VE-90A editing controllers and ¾-inch JVC CR-8250U recording decks. Edited ¾-inch masters are then transferred to half-inch Sony Betacam format for broadcast. In the field, KTUU photographers use ¾-inch Eastman professional videotape (20-minute length) and edit onto the same format tape in hour-long lengths.

"Before we spend a penny on equipment or tape, we scrutinize specs to make sure we're getting the best we can afford," says Dowd. "For instance, we went with Ikegami cameras because despite their reasonable price, they possess 600 lines of resolution.

In use, KTUU photographer Arends says the videotape has operated consistently well—even in sub-zero temperatures—with a very low dropout rate and clean audio quality. "Tape audio quality is of special concern to me," he says, "because in today's news photography, there's greater reliance on natural on-location sound. You need good audio qual-

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ity to capture the essence of that sound for viewers."

Lots of shots

At KIMO—TV, equipment selection is based on "quantity over quality," according to Randlett. "Our station philosophy is based partly on the concept that getting the picture—some picture—is vital to news. That means buying enough video equipment of sufficient quality to cover the news well, as opposed to spending money on fewer, more expensive pieces of equipment and maybe missing news coverage."

To minimize costs, KIMO-TV photographers shoot all field footage on half-inch Eastman professional videotape (T-120 broadcast quality), using JVC KY-1900 cameras and JVC BR-6200U recorders. For broadcast, the half-inch tape is edited over to ¾-inch Eastman professional videotape, using JVC BR-640OU editing players, JVC RM-88U editing controllers, and JVC CR-825OU recording decks.

"Though the image quality achievable with half-inch tape is somewhat lower than that of ¾-inch tape," says Randlett, "it's still high overall, and acceptable for broadcast. And, the difference in quality is more than made up for by the lower cost of the half-inch tape. We've also discovered that the Eastman tape can be used four to six times with little dropout."

According to KTUU's Jeff Dowd and Rex Arends, and KIMO-TV's Greg Lytle, their stations place great emphasis on field video—both in variety and quality.

"As a TV news viewer," says Dowd, "I just don't want to hear about news events from anchors, I want to see as much video on these stories as possible. This is what gives the viewer a feeling of immediacy about a story."

In terms of shooting for a story, both Arends and Lytle agree that maintaining a cohesive flow during shooting is a primary key to putting together a well-balanced, accurate piece.

"The best way for viewers to understand a story visually is to present them with a coherent narration of a news event," Arends says. "This means juxtaposing as many different aspects of a situation as you can in a single image."

Looking ahead, both Lytle and Arends say the trend toward miniaturization of video equipment will not only make life easier for television news photographers, but will result in higher quality imaging as well.

"From a 'shooter's' standpoint, smaller and more portable video equipment will always be an improvement," says Arends. "The strength of TV news is its moving image. If you can make it less cumbersome for the photographer, eliminating heavy equipment and its distractions, the resulting images will be stronger." **BM/E**

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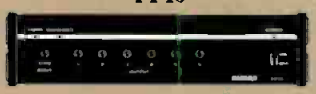

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Basic Equipment Purchase:

Chicago's WLAK-FM's on-air studio feature an Auditronics 218 console and ITC Delta cart machines.

The On-Air Radio Board

By Judith Gross

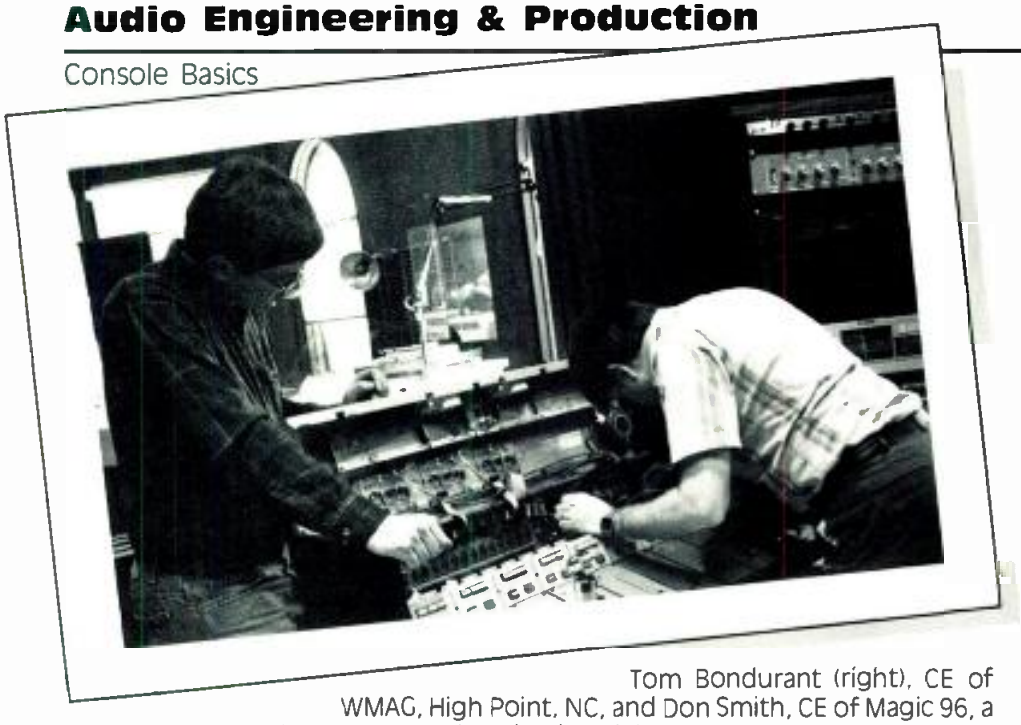
When looking for a new on-air console, radio engineers consider everything from cost, to looks, to changes in the station's format before signing the purchase order.

Ask ten different radio chief engineers what they want when they go shopping for an on-air board, and you will probably get ten very different lists of preferences. Sometimes it's a simple matter of habit: what are they used to working with? Other times it's a reaction against a bad experience with a particular brand. Sometimes it's just plain idiosyncracy.

Nevertheless, since radio is in a highly competitive environment, there are some common considerations that go into the final selection of an on-air console, whether in a brand-new station or to upgrade old equipment. Some of these reflect the current state of radio programming and business.

Disappearing board operators

The days when a station had an engineer operate the on-air board for talent are rapidly coming to an



Tom Bondurant (right), CE of WMAG, High Point, NC, and Don Smith, CE of Magic 96, a Voyager Communications-owned station in Raleigh, NC, work on a Harris Medalist board for the Raleigh station's Production #2.

end. There are some exceptions: morning drive shows in markets with fierce competition still use board operators. But for the most part, on-air personalities are running their own boards. For this reason, engineers cite "user-friendliness" as an important consideration in choosing a console.

"You can't impair your on-air person's ability to do a good show," notes John Rutten, technical director of Shreveport, LA's KWKH-AM/FM. The station uses a Ward Beck R1200 with eight channel dual inputs, which Rutten says is reasonably easy to operate, after some training.

CE Ron Eudaly of Fort Worth-Dallas KPLX-FM goes a step further. He says that changes brought about by deregulation and the popularity of combo shows has meant that the person on the board can't be considered as competent in the mechanics of the console as in the days when engineers set levels and threw the switches and the announcers only talked. Eudaly believes that hardware manufacturers have had to respond by making equipment simpler and more reliable, and that engineers have to incorporate the same philosophy.

"If you start with the point of view that you have a less competent operator, you will build your studio and select equipment accordingly," Eudaly says. KPLX-FM recently bought an 18-input Pacific Recorders BMX-III, which Eudaly says is "very user-friendly."

Most engineers make a point of looking at the way an on-air board is set up, and trying to spot the kinds of things that can cause confusion for the operator.

Pat Carlone, CE at WINE in Brookfield, CT, who also performs engineering tasks for the other eight Home News Stations AMs and FMs recently purchased an Arrakis 5000 with 16 inputs. But before he did, he looked at a few more complex models.

"I looked at some of the newer boards with a lot of options and EQ and all, and the only thing I could think of was what happens when the talent hits the wrong switch?" Carlone observes. The consensus among CEs is to look for an "idiot-proof" console.

Carl Davis, VP of Engineering for Voyager Communications' five stations has bought Auditronics 218 boards for several stations, and he puts it another way.

"An alert rhesus monkey can operate this thing," says Davis, "there's probably a way to make it easier, but I don't see how."

From music to call-ins

One of the other concerns cited most often by engineers looking at new on-air boards is flexibility. Many stations are being more creative than ever, experimenting with new formats or stretching their format to reach a greater audience. A full service adult contemporary FM might air a mostly-talk, news, or something like a "morning zoo" show in the morning, a call-in show with guests in midday, and mostly music in afternoon drive and evening, with occasional remotes or sports on weekends. The console for the on-air room will have to be large enough to accommodate all the different sources of audio and flexible enough to handle different types of shows.

Another kind of versatility might become important in stations that change formats at the drop of a hat — or the arrival of the ratings book. If an engineer buys a console wired to handle certain kinds of equipment, he wants to be able to alter the configuration when the programming changes. The automated format of beautiful music stations of today, for example, might become the all-news station of tomorrow. A console bought with just one kind of format in mind could mean extensive modifications have to be done in the future.

Marvin Collins, CE for KOST-AM/FM had versatility in mind when he went looking for a console.

"We wanted to do some fancy things," he notes. For one thing, the station airs ARI traffic reports, which uses the FM subcarrier to activate special Blaupunkt receivers.

"We wanted a way to turn the system on automatically," Collins says. "Now when we turn on the input for the traffic reports, it automatically turns on ARI. No modifications were needed because the logic inputs were already there."

Collins hooked up the ARI system to the new BMX-III board the station purchased. He says that KOST decided it needed a new board to handle increased capacity, and that's another concern for engineers looking to buy. Will the console be adequate for our future needs? What may seem like an abundance of inputs by today's standards may become obsolete as a station grows, adds remote

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broadcasts, and adds digital or computer technology.

Call-ins and remotes have become increasingly popular in radio, and more stations are looking for a way to incorporate phone equipment into the control room. Many use hybrids, or modify a speaker phone set-up. The ability of the console to interface to phone equipment has become an important consideration. Engineers also say they are looking for a console to provide the mix-minus needed for call-in shows.

Rutten says that KWKH is also responsive to its listeners, meaning that phone-ins are an important part of the format there.

"I look for a console with an alternate program channel, and I feed the phone into it. We use a home-grown hybrid, and record the callers for use on the air later. I can program the on-air into the alternate program channel on the System R1200; it's a button selectable program," Rutten says.

Blane Webster, CE of Chicago's WLAK-FM, says he used to dread modifying the board for phone-ins.

"That's one of the modifications I never enjoyed doing, so I would be hesitant to buy a console without a mix minus bus," Webster says. He recently purchased an Auditronics 218 18-channel board for the control room.

"If I were making consoles, I would come up with the world's greatest phone system in the console, perhaps a Symmetrix or Gentner. A CE would buy it in a minute," says Davis. A custom system of this sort was developed recently for another Chicago station, WGN, using a Gentner system incorporated into a Pacific Recorders BMX board.

Intelligence and performance

While consoles that are being marketed for post-production audio have been developed to stages of advanced logic capability, almost the reverse is true of on-air radio boards. Only the most basic logic capability is sought by engineers. Stations want the console to be able to turn cart machines, turntables, and other audio sources on remotely, and want easy interfaces to all kinds of equipment. But there is not yet much need for automated console setups, although that may change as more versatile computers make greater inroads into the broadcast control room.

Engineers generally don't want to have to make a lot of modifications in the board in order to hook up the station's equipment, but WLAK's Webster notes that even "if there was a really good console without remote start capability, I'd be inclinded to buy it anyway and modify it."

One of the important interface considerations these days concerns CD players and other digital equipment. Stations that opt for professional models such as the one made by Studer usually find it easy to interface to the console, while those who buy consumer CD players may find more modifications are necessary because of the need to go from a high impedance to a balanced output.

"I thought, 'why should I start dealing with products from other manufacturers?'. . . . you want to make sure there's someone there to listen and who will get you the parts . . . "— Marvin Collins, KOST-AM/FM

One of the more unusual concepts that has emerged recently is the idea of being able to use a computer instead of an on-air console. Media Touch Systems recently unveiled a system that uses a touch-screen to start CD players, cart machines, bring in network feeds, and activate the announcer's mic. This led to talk of doing away with consoles, but a switcher is needed in conjunction with the system, and stations that are testing it out usually use it in some combination with their on-air console.

The actual performance of the on-air console is one factor CEs take into account when purchasing a board, and while it's one important concern, it is not always *the* important concern. In part this is due to the difference in the way the specs are represented. Webster says he had to consider this when he went looking for a console that offered the maximum headroom for WLAK's AC music format. He notes that with CDs, the station needs at least 20 dB headroom.

"Some console makers list their specs as +26 dBm, and that's where they start to clip, while others list it at +15 dBm and clip at 10 dB above this," Webster says. He adds that he would want to measure the headroom spec with a sine wave, but that there are "a lot of specs we haven't figured out how to measure yet."

One recent trend at stations has been the installation of better quality consoles at AM stations. With so many poor quality AM receivers on the market, AM stations may have been able to "get by" with older or less expensive boards. But now, with the push toward AM improvement both on the transmission and receiver ends, CEs of AM stations are having to look more carefully at the performance of the console they buy, and console makers might find a whole new market opening up as AM stations upgrade their sound.

Another way that on-air radio boards differ markedly from post-production audio boards is in the amount of processing they offer. CEs try to stay away from processing on the console because other types of processing are prevalent throughout the rest of the audio chain.

Support and reliability

Besides specific mentions of the particular features each station needs in a board, CEs place a

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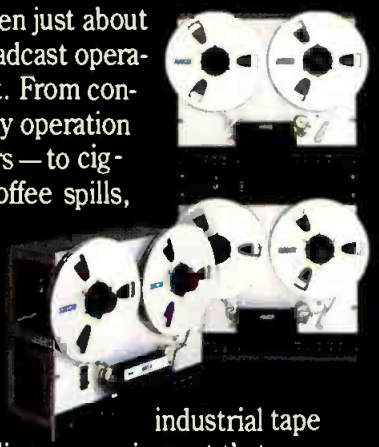

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great deal of emphasis on the reliability of the manufacturer, and on whether they can get the support and parts they need when there is a problem with the equipment.

When Collins went shopping for a new on air-board for KOST, the choice was relatively easy. The station was one of the first turnkey installations done by Pacific Recorders, and the station had been using an early version of the BMX board. KOST's relationship with the manufacturer was the reason he decided to stay with the BMX.

"I thought 'why should I start dealing with products from other manufacturers?' " Collins explains. "When you have problems you want to make sure there's someone there to listen and who will get you the parts you need. You don't want to feel you're out there by yourself."

Voyager's Davis used the same reasoning in buying several Auditronics 218 boards. He had dealt with the company previously and wanted to stay with a board "I wouldn't have to fix every five minutes."

Sometimes concerns about reliability are a result of a bad experience. Home News' Carlone had dealt with one console maker he declined to name who didn't have any test consoles for modules. That made it difficult for him to get problem-free modules, or to repair the ones he had. He says, "After that experience I definitely look for support."

Another kind of reliability centers on the stability of the manufacturer itself. WLAK's Webster says he would think twice about buying a new brand on the market.

"The board should be tried and tested. Also, is the manufacturer going to be here five or ten years from now? Will you still be able to get parts?" Webster asks. Just like a lot of CEs, Webster does quite a bit of "asking around" before buying, and he also takes apart demonstration models at trade shows to see how well the console is made from the inside, where it counts.

"Is it durable quality, or does it look like something from K-Mart? When you hit the side, does it feel like it's going to fall apart? Does it look like something a disc jockey will break in a couple of weeks? Remember that we're going to have it on the air 24 hours, 365 days a year," says Webster. The reliability of the console becomes especially important to a station like WLAK, where a spot runs as high as $400 a minute. A few failures can cost the station a great deal of revenue.

Once all the special features are considered and the durability of the board is assured, stations frequently chose a console based on aesthetics.

Voyager's newest station, WGIC-FM in Charlotte, is to be a

showcase station, says Davis, so the look of the equipment was an important consideration.

"We need to look good for visitors, especially nontechnical visitors," Davis says. Good-looking equipment may be more than just a luxury however. Davis adds that "People on the staff have a tendency to take better care of equipment that looks good." He told of a station he worked at where there were two production rooms with identical equipment, except that one had track lighting, new paint, and better furnishings. Davis says that the talent would "stand in line" to use the better-looking room but wouldn't go near the other one unless they had to.

KOST's Collins agrees that aesthetics are important, especially to nonengineers.

And for stations that hope to attract outside revenue by taking on additional production work, the aesthetics of the equipment becomes a necessity.

"If you start with the point of view that you have a less competent operator, you will build your studio and select equipment accordingly"—Ron Eudaly, KPLX-AM/FM

The great pot debate

At one time all on-air boards had rotary pots, and the engineer knew just how much of a twist of the wrist it would take to get each announcer's level right. But radio has been borrowing more from the recording industry of late, and sliding faders are now more popular than rotary pots. The main reason is economy of space. As consoles needed to interface to more equipment more inputs were needed, and they simply take up less room when slide faders are used. Still, engineers are divided as to which type of control is the more reliable.

"We're never sure whether to buy a rotary pot board that we can spill coffee all over, or one with sliding pots," says Home News' Carlone. "For space considerations I'd rather have the sliding pots, but for durability, I'd take the rotary pots."

Carlone had a series of "nightmares" with slide faders, which began when he replaced rotary faders with some less-than-reliable sliding pots. The inevitable coffee spill into the fader's grooves spelled trouble.

Voyager's Davis, with his concern about equipment's aesthetics, has a decided preference for slide faders. He also says he finds them more reliable and easier to clean and maintain. KWKH's Rutten says that the key is in the quality of fader used: the more expensive, the better the performance and the less the likelihood of problems.

While not a raging controversy, the rotary-slide debate continues, and CE as well as talent preference for both have kept the rotary board from becoming completely obsolete. Carlone suggests a compromise in the use of a type of pot he once saw on a console, which was a sliding pot that actually connected to a rotary pot, where the "sliding" motion twisted the rotary pot inside.

Carlone and some other CEs, especially of small market stations, have one addtional important concern when they go to buy a console, and that is cost.

"I go to the NAB show with the idea that you have to spend over $10,000 on a console, but I look at what's in that price range and the consoles look like somebody's home science project," Carlone complains. "You hate to have to spend up to $15,000 for each of our nine stations," he adds, "the technology is certainly there to make a good console for under that." Carlone says he'd like to see a manufacturer offer a high quality console for a lower cost, and his wish may be the seeds for designing the console of the future.BM/E

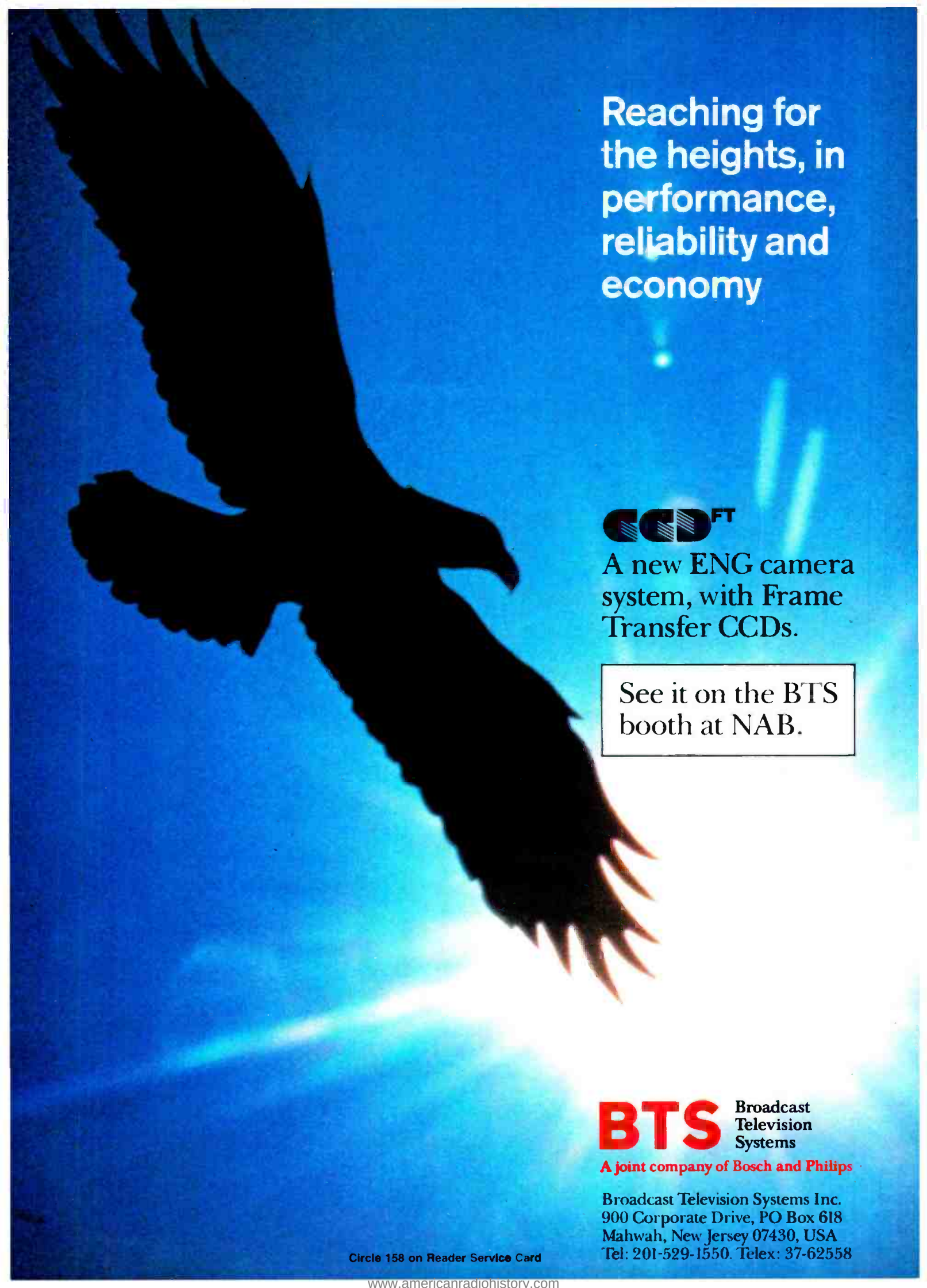
portables, it offers reliable, extended coverage of major events.

"Yes, it's pretty hard to get a C-band truck into the French Quarter of New Orleans, but there's a definite need for both C and Ku," says Wold's Bob Wean. "When we can't get a C-band transportable into an area we'll use Ku, and vice versa. And C-band satellites have more transponders available, which has caused prices to drop."

"There are many locations where the footprints of Ku-band satellites just don't reach," says Dennis Feely, senior vice president of operations and engineering at IDB Communications. "Hawaii is an example. We'll be switching a lot of our day-to-day operations to Ku-band, but there will always be a need to compliment one with the other." IDB is the foremost provider of satellite services for radio, and its C-band transportable fleet consists of five vans and seven trailered 5 meter and 3.8 meter Comtech antennas. The vans contain fully redundant HPAs, upconverters, downconverters, modulators, and complete monitoring gear.

"C-band satellites have a better footprint in the Carribean, and frequency coordination helps to keep the C-band better regulated than Ku currently is," says Aude Franks, controller of Tele-Link, Inc., which operates three tractor-trailer transportables, built by Compact Video and Scientific Atlanta. "We've done 649 events in the last three years, including the 1984 Republican and Democratic national conventions. Our trucks travel all over the United States."

As far as the question of whether C-band transportables will continue to be an important part of mobile satellite uplinking, it can perhaps best be answered by another question. It was asked by the driver of a Tele-Link transportable when he was delayed by a state highway patrolman who had stopped the rig for a routine check. "Why is it important that this truck continue to roll, officer?" the driver said. "Well, you do want to see the game tonight, don't you?" **BM/E**



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Max. Relative Aperture: f1.7 (6-33mm), f1.9 at 48mm
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1987 Survey of Industry Needs

Hardware markets are always difficult to predict. Using data provided by our own exclusive survey of the broadcast industry, we have an analysis: recovery.

By Tim Wetmore

By almost all accounts, 1986 turned out to be less than a banner year for broadcasters. This obviously creates a ripple effect through the equipment industry, having possible long term effects on future technology development. This, in its turn, affects what broadcasters have at their disposal in years to come in creating and broadcasting new and exciting programming. It is for this reason that *BM/E* surveys the industry, looking at its budgets, its decision-making processes, and its outlook on the upcoming year regarding equipment purchases.

This year's survey produced over 600 responses from individuals in radio, television, and teleproduction facilities throughout the country. The report that follows combines charts, graphs, and written information geared toward indicating what kind of year broadcasters expect for 1987, as well as providing hard data to back the various analyses for each sector of the industry.

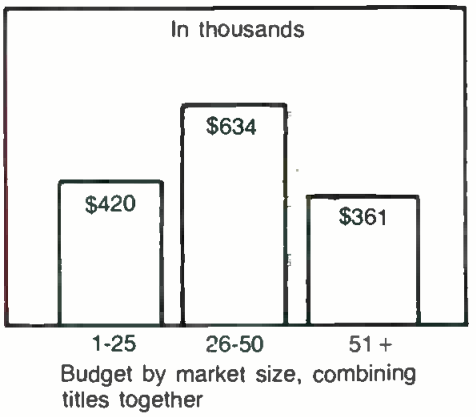
Television Station Tabulation

The television picture for 1987 fits in squarely with our recovery analysis for the industry. The primary indicators, budget increases, size, and the equipment for which those budgets, are targeted, namely new technology, all point the way toward a modest rebound year after the slow down of 1986.

A positive indicator, as stated, is the increase of budgets, and this year 43 percent said they would have increases, with over half of those stations allotting an increase of over 25 percent. Decreases, on the other hand, are reported to remain at less than 10 percent.

Budgets, of course, vary according to whether they are being stated by management, engineering, or operations and, further, according to market size. In our study, management budgets came in at close to $450,000 regardless of market, a new occurrance in the survey. Engineering held fairly true to form with markets 1 to 50 averaging at about $750 thousand and markets 51+ reporting approximately $300 thousand. A slight reversal in operations appeared with markets 1 to 25, showing $150 thousand, markets 26 to 50 claiming budgets of $850 thousand, and 51+ stating an average budget of $215,000.

A side effect of recovery is that stations begin to look at newer



Budget by market size, combining titles together

technology in addition to the standard devices in everyday use at the plant. So, aside from specific products and product areas, we were interested in knowing what general directions in new technology the television industry was interested in learning more about in the coming year. The responses indicate an interest and, indeed, an inclination toward operating with that technology. New technology of interest to television is ranked, by percentage of respondents interested, as follows (Note: since more than one answer could be checked, the numbers may add up to over 100%):

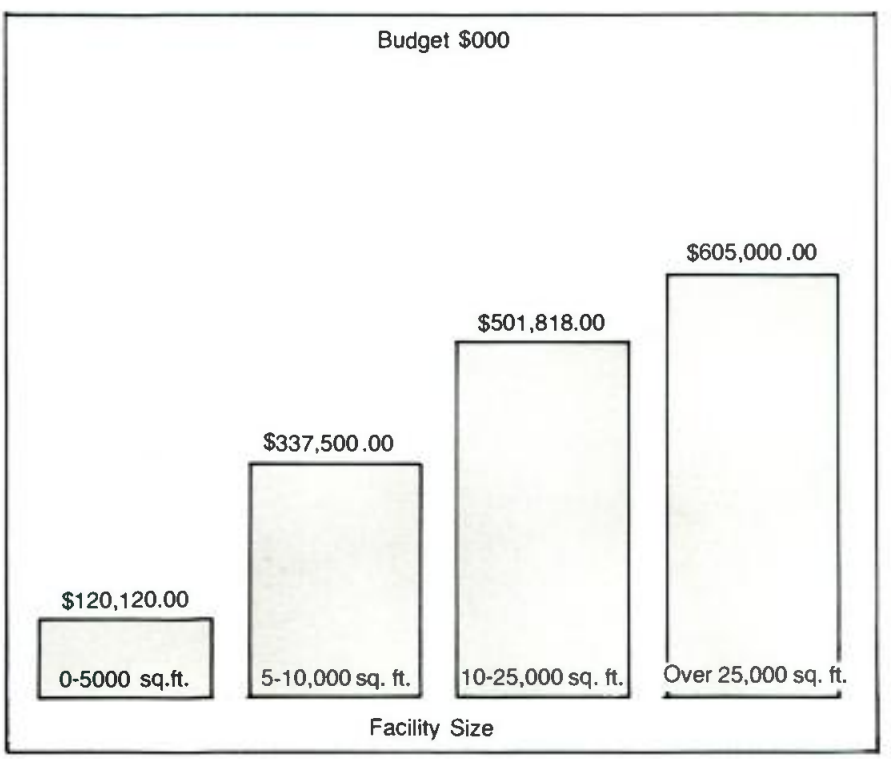
1. Multichannel TV sound.. 49%
2. Digital component video . 28%
3. Newsroom computers 24%
4. Master/machine control .. 21%
5. Digital composite..... 20%
6. Enhanced NTSC 19%
7. Analog component..... 12%
8. Remote diagnostics 11%

Respondents replied yes 70 percent of the time when asked whether or not they would attend the NAB convention. Astonishingly, second place was won by

The accompanying chart indicates the top five product areas of high interest to television broadcasters by market size (This approach provides a unique glimpse of the nature of competition in the various markets):

Product	1-25	26-50	51+
Microphones	1	5	
ENG Cameras	2	2	2
Camcorders	3		
Video test	4	1	4
One-Inch VTR	5		
Digital disc		3	
Lighting		4	
Power			1
¾-inch VCR			3
Digital EFX			5

Teleproduction Responses by Facility Size
Average Budgets for Teleproduction Facilities



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the SBE with 17 percent answering yes and only 13 percent saying yes to attending the SMPTE show, following were NATPE and the RTNDA.

Budget Increase/Decrease

Overall, smaller facilities showed intention of increasing more dramatically their equipment budgets, though all levels of facility showed some increase. Total decrease across the board for all levels of facilities was 20 percent; while increase across the board was 63 percent.

Areas of concern in new technology to teleproduction houses are listed here in rank order of importance. Following are the percentages of respondents who are interested in these technologies in 1987 (Note: since more than one or even all questions could be answered, figures may exceed 100 percent).

1. Digital Component video 35%
2. Digital Composite 24%
3. Analog Component 24%
4. Multichannel Sound 24%
5. Enhanced NTSC 24%
6. Integrated Master Control .. 8%

Significant write-ins were received indicating interest in camcorder formats and HDTV developments.

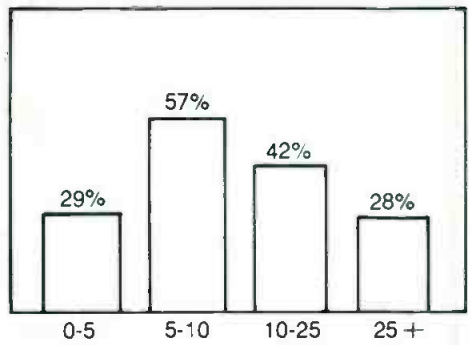
This chart reveals budget increase and decrease by facility size:

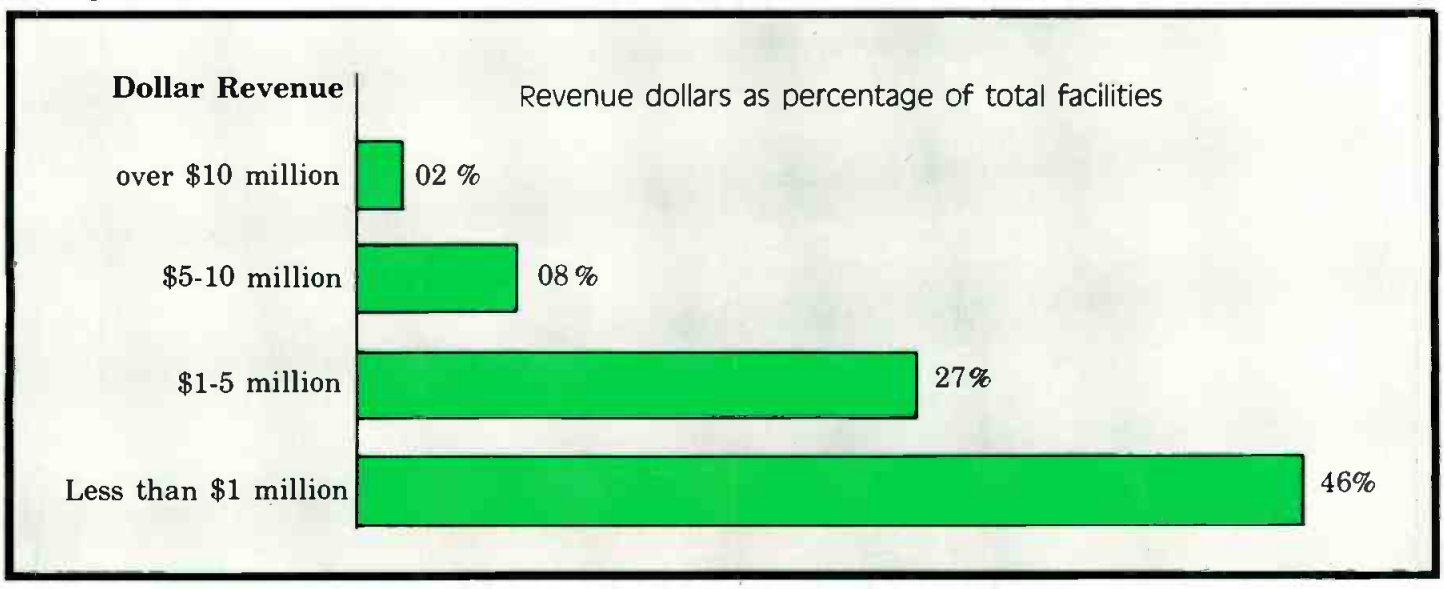
For 0 to 5,000 sq. ft.; when asked whether their budgets would increase or decrease, only 16 percent claimed a decrease, while over 63 percent stated there would be an increase (of the total response in this category size, both increase and decrease counted, 42 percent of the respondents said they would increase their equipment budgets by more than 26 percent.)

Facility size in 1000 sq. ft.	percent increase	percent decrease
0-5	63 %	16 %
5-10	64 %	29%
10-25	67%	17%
25+	57%	28%

These are the percentage of respondents (facilities) either increasing or decreasing their budgets by any dollar amount.

Is your facility making major change or moving? yes 37 percent of all level of facilities will do one or the other. Broken down from yes answers, it reads, in facility size by 1000 sq.ft.:





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The NAB is popular beyond broadcast facilities: 53.5 percent of respondents will attend NAB; SMPTE, according to our survey is virtually equal with NAB convention with 53.5 percent claiming they will attend.

The following indicates the top three products in ranking order of equipment seriously under consideration or with definite intent to purchase, broken out by facility size due to the significant differences in preference.

Size	Priority		
1000 sq. ft.	1	2	3
0-5	microphones	ENG cams ½-inch	video test
6-10	video test char.gen. dig. efx	N/R prod. sw. video proc. compact disc	camcorders multisource ed.
11-25	one-inch VTR	N/R dig.art/paint ½ & ¾-inch	video test camcorders slow motion
25+	½-inch	video test N/R dig.art/paint video proc.	1-inch digital efx

*Of special note here is the appearance of video test equipment in the top three equipment categories at all four levels of teleproduction facility.

RADIO TABULATIONS

The radio sector of the broadcast industry has proved more difficult to analyze through our survey results than has the television and teleproduction arenas. This, we believe, is largely due to the vast difference between an AM operation and an FM operation, both in terms of technical facility and listenership. Therefore, it is possible to receive widely disparate responses from different facilities in the same market. Also, equipment budgets seem not to be dependent so much on market size or job function (eg.management, engineering, or operations) as they are on corporate policy, or where in the purchasing schedule the station lies.

AM radio

There are, however, exceptions to that statement, and those exceptions start right off in our first category of AM radio. Equipment budgets at stations in the larger metropolitan areas of the country showed an average budget of $140,000, while suburban area stations came in at a surprisingly low $36,000, rural stations arrived at a similar $37,000. This might lead one to postulate that the big markets are relatively healthy and the small, rural areas are less so, but caution and internal cycles may be the cause of their reluctance to put some money forth. It is also necessary to look at the history of particular stations.

Increase/decrease

Evidence of this point comes in our result regarding budget fluctuations. A healthy increase seems to be the trend for equipment budgets, with 38 percent claiming an increase, and the largest amount of respondents stating an increase above 26 percent of their previous year's budget. On the other side of the coin, also an indicator of health, is that decreases were to occur in only 13 percent of AM stations.

Technology

What, you may ask, is all this money going for? Well, much of it goes for the newest technology, while the rest, naturally, is spent on maintaining the standard operating devices around the plant. We have information on how AMers look at both these equipment areas.

First, and perhaps foremost, for AM stations discussing new technology must be the issue of AM stereo, tired as some of you may be of hearing about it. In fact, in our survey, it comes across as a rather touchy subject. It appears that, though many are convinced this area of technological change may be good for them and for the industry, the particular method of implementing such change is less clear. Perhaps, too, many are still nervous over the FCC's lack of initiative in this area. At any rate,

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this question received the poorest response of any other question in our survey especially as to whether or not the station responding was already stereo or not. Only 17 percent claimed to be stereo with another 10 percent predicting a change to stereo in 1987.

Another area of new technology of concern to AM stations proved to be satellite transmission, with 29 percent saying their mix of satellite programming would change, and 18 percent of that group will require new equipment to do so.

New technology questions usually yield vast differences between management and engineering and discrepancies between market sizes. This was not the case with the group of technologies involved this year. In addition, particular areas of new technology yielded some interesting results. Even though we had poor response in the area of AM stereo, the technology of other AM improvement methods displayed the widest margin of interest above all other entrants that we've had. Still there were other areas of interest and the results are as follows (results show percentage of interest from all respondents in the AM category; since more than one area could be answered affirmatively, the figures may add up to more than 100 percent):

1. AM improvement 88%
2. Cart alternatives 30
3. Telco alternatives 24
4. All digital radio 13
5. CDs 12

SCA technology was the only one listed in last year's survey that does not appear in the 1987 results listed above. A high concern for AM improvement replaced it this year. In addition to the above mentioned categories of technology, the most significant write-in mentions were laser turntables and developments in DASH (digital audio stationary head) recorders.

One of the biggest markets for new technology, as well as for display of the old workhorses and for learning and information exchange is the trade show. The broadcast industry has many such valuable shows. The accompanying table demonstrates how many AM respondents will attend the various conventions in 1987. Percentage may exceed 100 since more than one show could be attended.

	Show	Will Attend
1.	State B'cast Show	41%
2.	NAB	38%
3.	Radio 87	11%
4.	SBE National	07%
5.	AES	04%

None of the above mentioned shows demonstrated any predominance of market or title. All market sizes and management, engineering, and operations came out very close to equal in intent regarding attendance at conventions.

Equipment survey

Aside from new technologies looming on the horizon, there are many products that make a facility hum along at top notch efficiency. These products often tend to be overlooked by those on the outside, while those working at the stations know what keeps them on the air. In our survey of radio station management and engineering we received many responses to the specific equipment concerns in today's market.

A not so surprising result of our tabulations yeilded a high status for microphones, consoles, CDs, turntables, and cart decks, all appearing in the top six of intent to buy or very high interest for all three of our radio station categories (AM, FM, AM/FM). Specific equipment yielded the following answers with products listed in order according to highest interest (#1). This ranking combines all market sizes and job titles. In the 1986 survey, the identical products were mentioned in only a slightly different order.

1.	Microphones
2.	Cart Decks
3.	Consoles
4.	CDs
5.	Turntables
6.	Business Automation
7.	Reverb
8.	Noise Reduction
9.	Satellite Earth Stations
10.	STLs

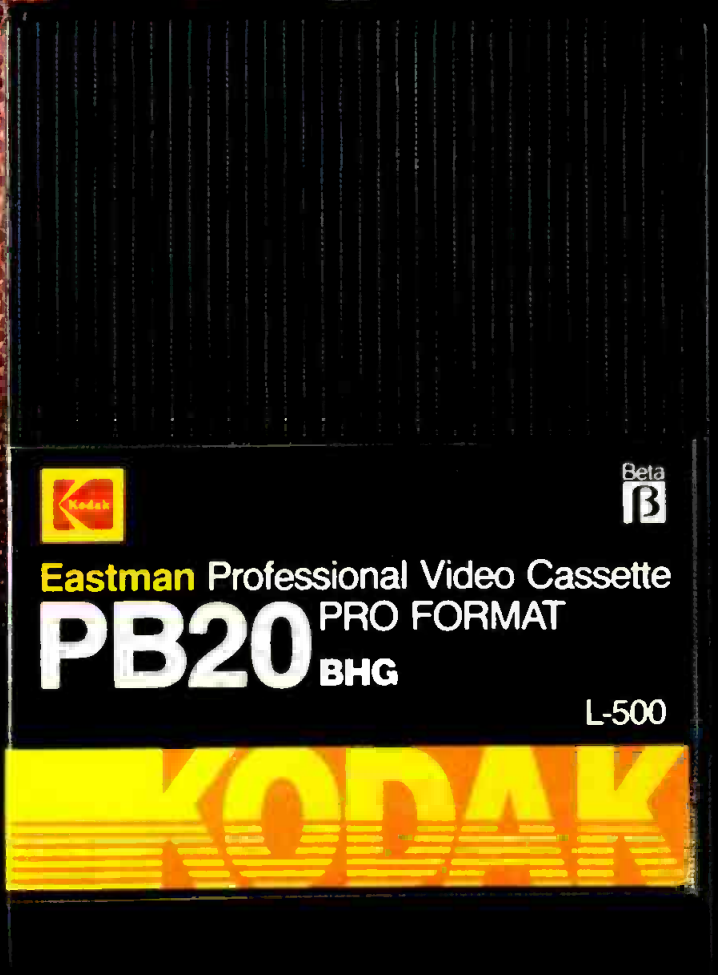
FM radio

FM budgets, while slightly above those reported last year, are a step behind those reported for AM in 1987. Metro markets are resting $67,000 per station, with suburban stations yielding an average of $38,500, and rural areas showing at $35,000. Unlike all the other radio catgories, FM management predicted as much as ten percent larger budgets than did either engineering or operations. If for no other reason, this statistic truly indicates a recovery year, however modest.

Increase/decrease

No matter what the actual numbers are, if increases in budgets are the norm, then a resurgence of an industry is surely indicated. Once again, 54 percent of respondents claimed an increase, with over 31 percent of those indicating an increase larger than 26 percent. Decreases came in at 19.7 percent of respondents looking to spend less in 1987.

When stations are looking to increase their revenue, which ultimately increases their other budgets, programming changes are often the first thing that come to mind. Such a development, of course, can lead to endless cycles of second-guessing and may cost the station in terms of loyal listenership. An alternative is the use of different kinds of technology as alternate sources of revenue. SCAs seem to have a firm but



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ill-defined place in the FM radio industry as technology continues to be developed and used to a certain extent by stations; still this unusually good revenue opportunity remains unexploited, at least to its full potential.

Accordingly, only 20 percent of FM respondents will add SCA as a service in 1987. Another service that may help, if not in direct revenue then in listener satisfaction, is FMX. Despite reports of its demise, and the cessation of experimentation by some stations, 11 percent will investigate the service this coming year.

Technology

Beyond services, listenership, and programming concerns lies the area of new technology. This has become increasingly important as the radio broadcast world accelerates the competition for listener time. To improve their numbers, broadcasters often look to new devices searching for an edge in the market. Therefore, pursuing areas of new technology in 1987 will be high on the list for most broadcasters after a year of almost complete dormancy. FM will not be different in this regard and the ranking of interest in new technology follows. (The total figures may add up to more than 100 percent since more than one answer was permitted.):

1. Cart alternatives	46%
2. CDs	35
3. Telco alternatives	24
4. All-digital radio	22
5. Extended SCAs	13

It is interesting to note that cart machine alternatives had very similar, high numbers in both the AM and FM categories as did Telco alternatives. All-digital radio was also important on both lists, but high in FM.

Where do you find out about new technology? Well, after reading *BM/E*, you go to trade shows since many new product introductions occur at these gala affairs. Thus, conventions of highest interest to FM broadcasters, in percentage of respondents saying yes to attending that convention:

(The SBE regional show did not show up on the AM list, while the AES convention did not show up here, otherwise the lists are very close.)

1. NAB	42%
2. State Broadcast	24
3. Radio 87	19
4. SBE Regional	16
5. SBE National	14

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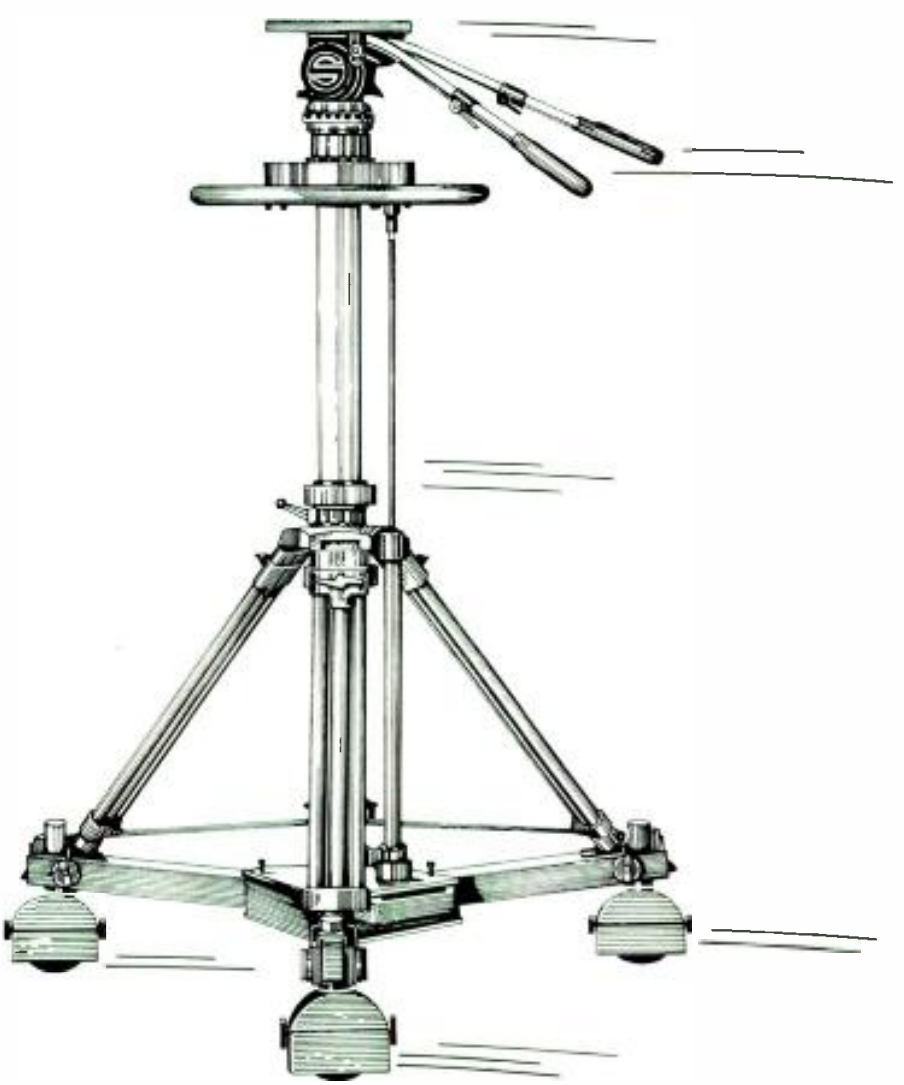

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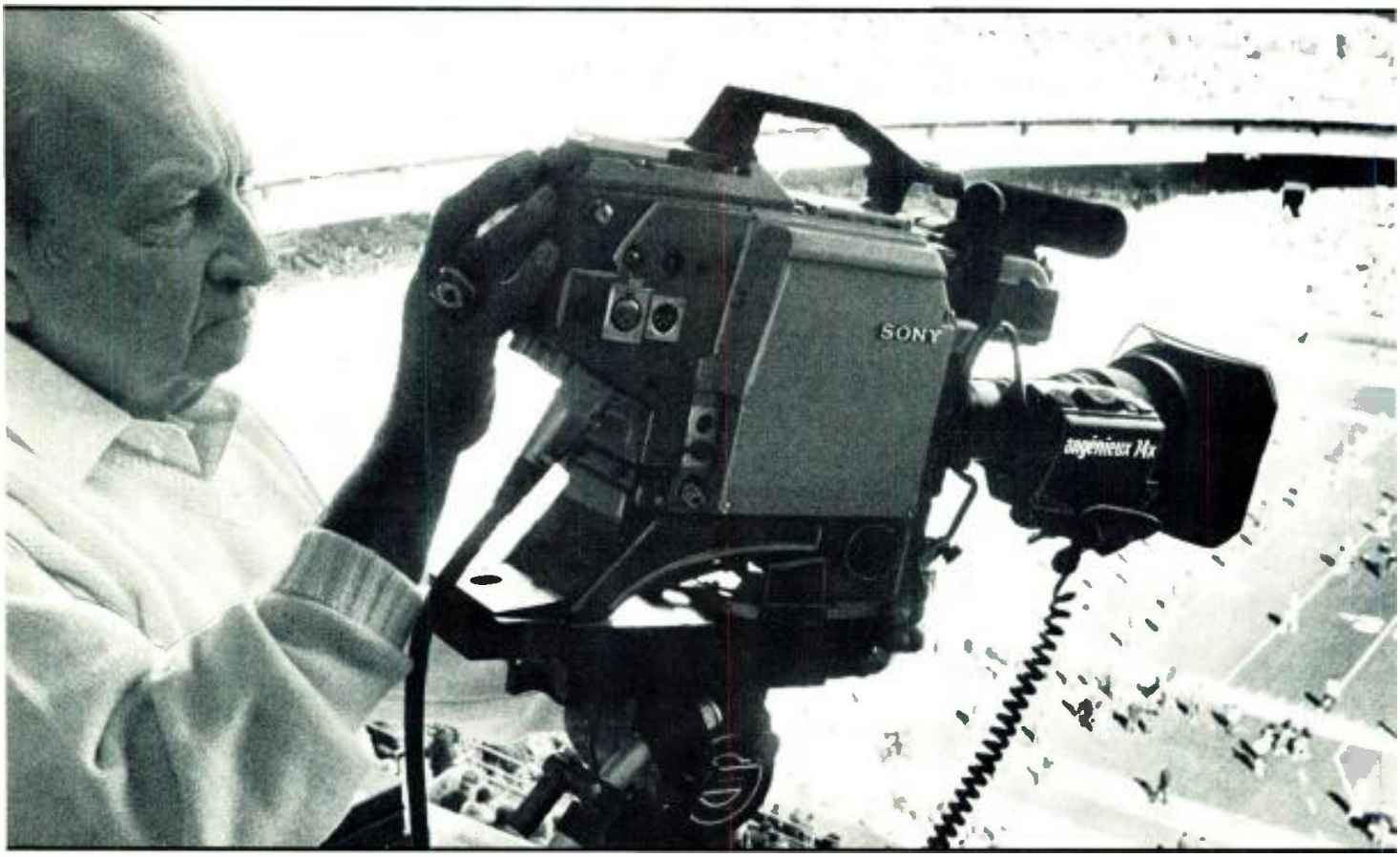

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Industry Needs Survey

Equipment survey

Before new products come the basic tools of the trade, the items that are always of interest to those in every part of the industry since they represent the guts of the engine that drives the machine.

1.	Microphones
2.	CDs
3.	Cart Decks
4.	ATRs
5.	Turntables
6.	Consoles
7.	Noise Reduction
8.	Reverb
9.	Loudspeakers
10.	Telco

AM/FM radio

Looking at budgets for the combo shops turned up figures more in keeping with the turnaround year expected for 1987. Metropolitan markets listed at $113,735 per station. Meanwhile, suburban dollars were $52,442 and the rural stations have $40,932.

Increase/decrease

Rounding out the radio analysis with the AM/FM category reinforces the prediction for a strong year since all three of the radio station types indicate healthy budget increases and minimal decreases.

Part of the increase, no doubt, will go toward updating the hardware and increasing the station's competitiveness in its market. As a slightly different animal from the single-format shops, the AM/FM requires different kinds of equipment setup, facilities, and planning for updates and services. This is refelcted in the differences in response between this and the two previous categories. Of these plants, 25 percent are already AM stereo and of those who said they were not, contrasted against the AM only, 14 percent will convert in 1987. On the FM side of the station, 24 percent will be adding SCAs to their services in the coming year.

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Industry Needs Survey

Technology

Of importance to all broadcasters in recent years when viewing those areas of technology that will affect their future has been satellite transmission and reception. The satellite picture will change in the next 12 months with a full 35 percent increasing the mix of satellite receptions. Of that number, 72 percent will require new satellite equipment to achieve their programming and technical goals.

New technology is of interest to the combo shops as well, and their biggest concern, by far, is improving the AM side of the facility. Following are the percentages of total repondents affirming interest in a given area of technology.

1. AM improvement	57%
2. Cart alternatives	37
3. CDs	39
4. Telco alternatives	31
5. All-digital radio	16

Differences between the AM/FMs and others notwithstanding, the individual devices in use at the stations are the same. This is borne out most evidently in our survey of products in which the stations have a very high interest or intend seriously to buy. Note that the top five products are almost in identical order and that some of the others in the top ten show up in both of the other lists. One notable difference is the first appearance in our survey of newsroom computers. Herewith, the top ten ranking of specific equipment types:

1.	CDs
2.	Cart Decks
3.	Consoles
4.	Microphones
5.	Test Equipment
6.	AM Transmission
7.	Business Automation
8.	STLs
9.	Studio ATRs
10.	Newsroom Computers

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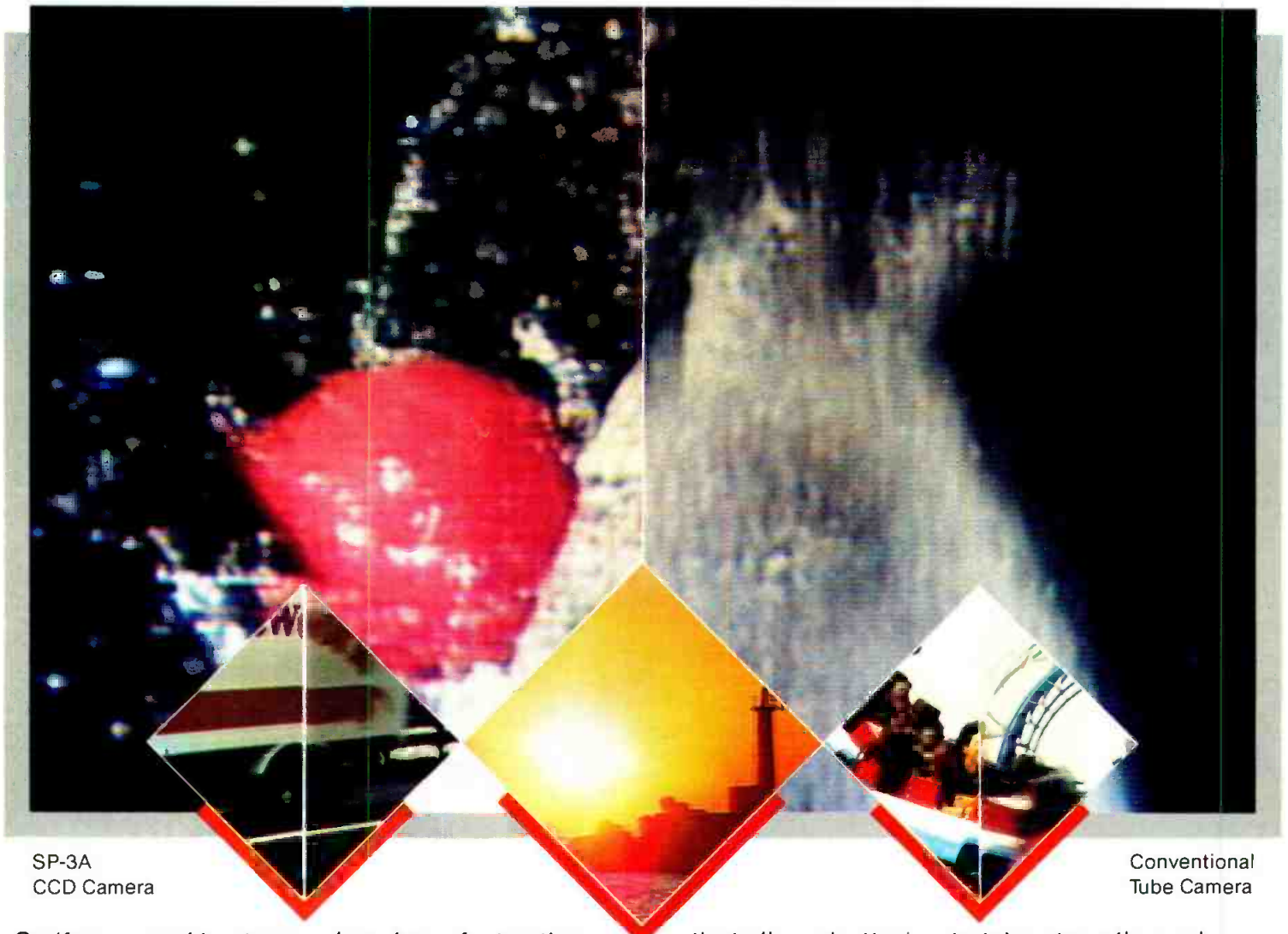

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(such as remote pickups). While such services are licensed by the Commission, they are in many instances also subject at the local level to frequency coordination by voluntary coordinating committees that promote licensee interaction and cooperation. The Commission is happy with this system, as it relieves the FCC of the burden of dealing with vexatious coordination problems. In fact, the FCC is so happy with this system that it is proposing to eliminate the licensing of specific frequencies; instead, it would issue to mobile (or portable) auxiliary service users a blanket authority to operate on any frequency in the band they are permitted to use. The Commission's proposal obviously places great emphasis on the availability, and the efficacy, of local coordinating groups.

The Commission's past experience with such groups indicates that such reliance is not unwise, although presumably the FCC will be alert to any dissenting comments that might be filed on that point. The interesting aspect of this is that, even in its most deregulatory rhetoric, the Commission has always asserted that the Commission was intended to serve as a traffic cop of the airwaves, determining who could use what frequencies on what conditions. Thus, the FCC's increasing willingness to trust at least some frequency coordination—albeit low-power, auxiliary frequencies—could be seen as a step toward delegating that traffic cop role to others at the local level.

Transmitter modifications

Finally, also on the deregulatory front is an item of interest to chief operators everywhere. The Commission has relaxed the requirements relative to modifications that can be made to transmitters without prior FCC approval. Under the old rules, changes in transmitter circuitry could be made only after an appropriate application was filed with the Commission and granted. This created a variety of problems. For example, some television stations wishing to broadcast in stereo found it necessary to make minor electrical changes to their aural transmitters to facilitate the installation. Even though such changes were among the most simple to perform, FCC approval was required—a process that added weeks or more to what should have been an uncomplicated, nearly instantaneous process.

To ease this burden, last July the Commission proposed to eliminate the need to obtain prior authorization for electrical or mechanical transmitter modifications. That change was adopted in November and became effective in December.

Before modifying any transmitters, however, you should realize that there are still some steps that will have to be taken. First, upon completion of the modification, standard equipment performance measurements will have to be made, to assure the absence of spurious or harmonic emissions. The results of those measurements will have to be recorded, and the records retained for a period of two years. **BM/E**

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3M's "Panther" Generator Bows

A new graphics generator, designed to combine the features of both character generators and paint systems, has been introduced by 3M Corp. The D-6000 "Panther" generator features 35 n/second resolution, accepts b/w input from copy cameras, allows colorizing of logos, provides basic paint and free-hand drawing fuctions, and it can be pugged into a terminal and function as a standalone PC as well.

The DOS-compatible, single-channel generator can utilize full software-controlled editing. Three downloadable fonts can be loaded to the system memory, and a built-in downstream keyer allows the painted images to be keyed directly into studio program in either RGB or NTSC modes.

Other features include proportional spacing, multispeed roll and crawl, timed sequencing, animations, and several encoded graphics primitives.

Circle 260 on Reader Service Card

Marconi Debuts Sat Feed

A new six-port satellite feed, from British Marconi Radar Systems, Ltd., has recently been introduced. Designed to improve antenna signal capacity without loss of quality, the feed system allows for simultaneous transmission and reception in the 14 GHz transmit band and on the 11 and 12 GHz receive bands.

A pair of triplexers, an orthogonal mode juction, and a feed horn are the only required RF elements for the system. In addition, the triplexer utilizes an offset cruciform E-plane junction that provides optimal VSWR across its operational frequency band.

The six-port feed is designed to replace existing four-port feeds.

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Otari's Latest Cart

Reportedly a "new technology" cart recorder/reproducer, Otari's CTM-10 unit features many cutting-edge capabilities. The machine boasts record phase compensation, HX-Pro bias modulation, and A and AA compatibility.

The HX-Pro circuitry, a Dolby-developed proprietary design, optimizes the amount of bias during recording by monitoring the amount of high-frequency signals; thus, minimizing distortion products.

In addition, a built-in ac power supply and CISC (complex instruction set computer) architecture round out the units capabilites.

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Michael Dahle
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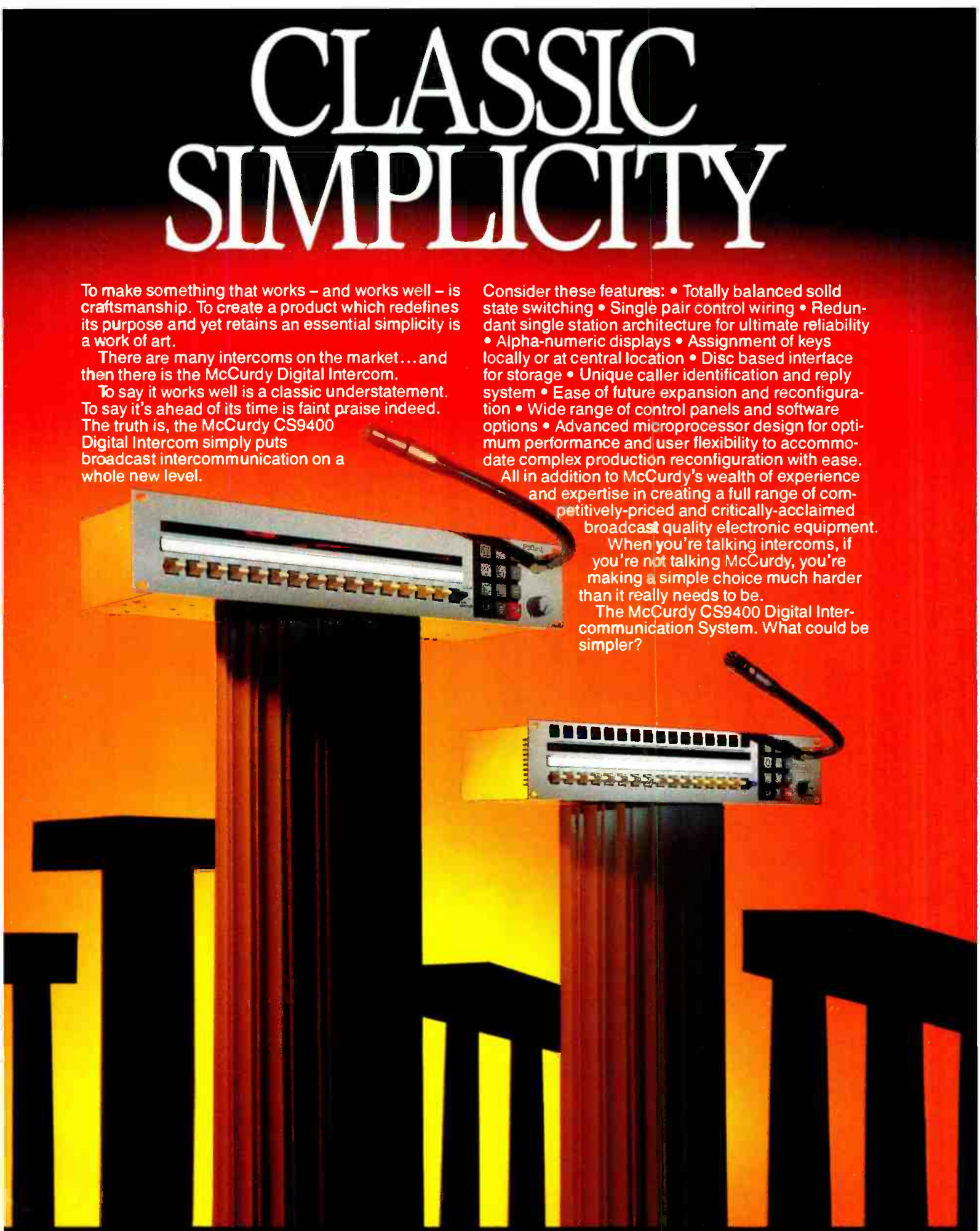

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