

NOVEMBER 1977

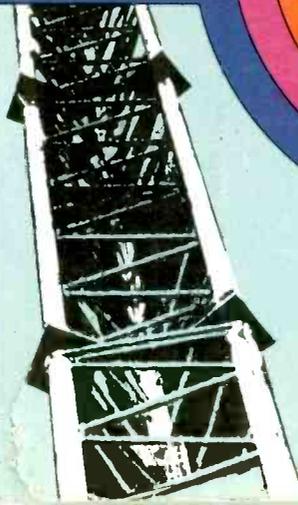
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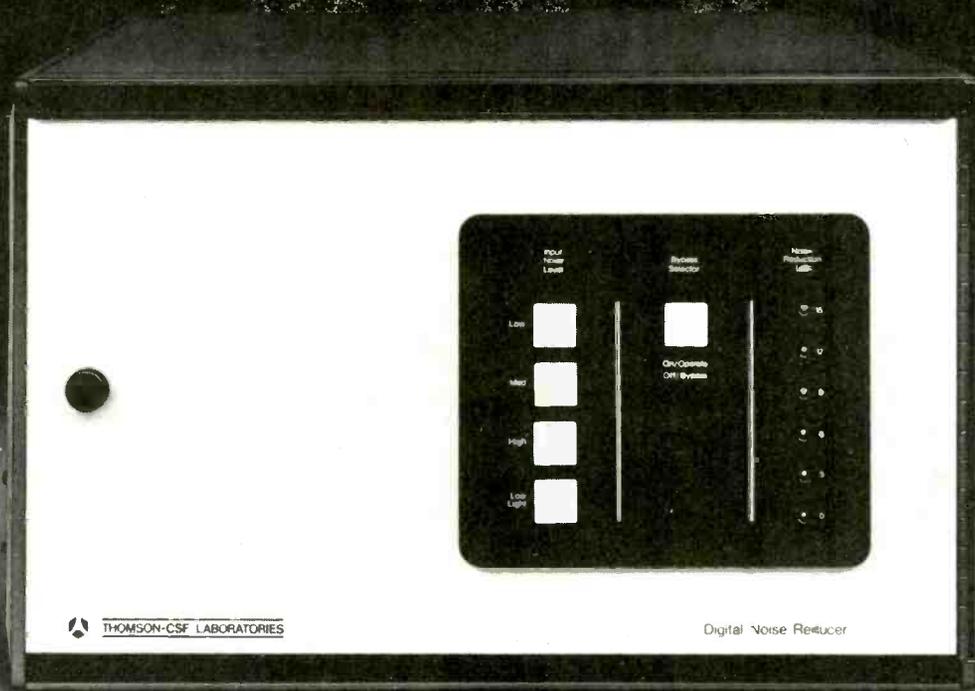
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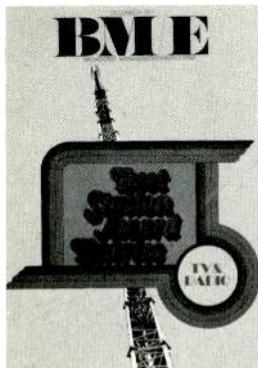
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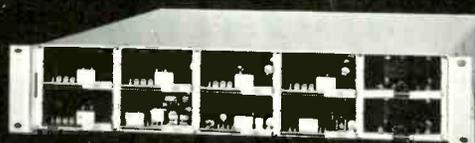
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BROADCAST INDUSTRY NEWS

Amway Buys Mutual Broadcasting

Acquisition of Mutual Broadcasting Corporation by Amway Corporation of Ada, Michigan, has been finalized. Financial details of the purchase will not be disclosed. Both firms are privately held.

Citing future plans, Amway's president, Richard M. DeVos said, "Be-

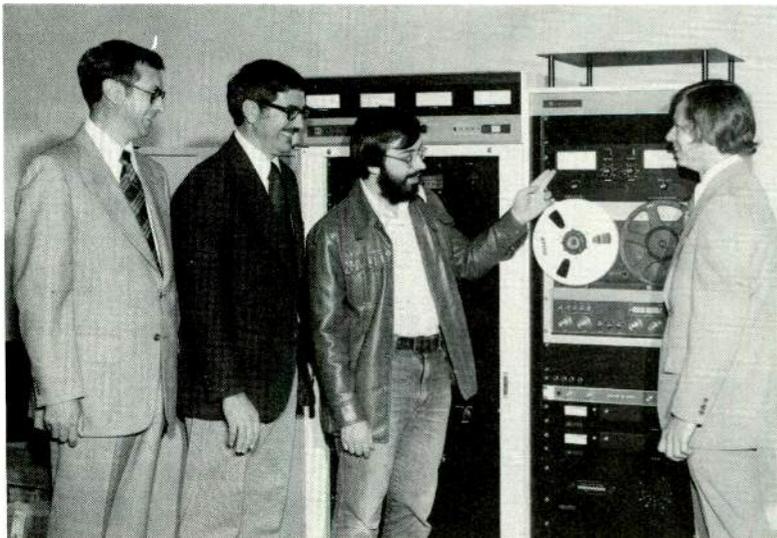
cause of our roots in person-to-person selling, we are people-oriented. We will not be absentee owners."

Mutual is the world's largest radio network and one of the oldest. The Mutual Broadcasting System, principal subsidiary of Mutual Broadcasting Corporation, furnishes news, sports, special and public affairs programming to more than 780 affiliated and over 1100 non-affiliated radio stations

throughout the U.S. and Canada. The Mutual Radio Network provides programs to its affiliates and other radio stations. Mutual Reports, Inc., a company owned by Mutual and Sheridan Broadcasting Network, Inc., operates the Mutual Black Network with more than 90 affiliated stations.

Amway Corp., completing its eighteenth fiscal year, expects to exceed \$350 million in estimated retail sales for fiscal 1976-77, an increase of more than \$50 million for the year. The company manufactures and retails home-care, car-care, personal-care, toiletries, and vitamin and mineral food supplements.

The purchase of Mutual, headquartered in Arlington, Virginia, is Amway's first venture into the communications media sector. Before acquiring Mutual, Amway had been reported interested in other media acquisitions.



The new Harris Compatible Phase Multiplex (CPM) AM stereo system demonstrated with an MW-1A, 1 kilowatt AM transmitter at the NRBA convention.

A Fifth AM Stereo System: Harris Introduces "Compatible Phase Multiplex"

A late but very interesting entry in the competition among AM stereo systems before the FCC was announced in September by the Harris Corporation, and demonstrated at the October NRBA Convention in New Orleans. The system comes too late for comprehensive testing by the National AM Stereo Committee of the EIA, but it is being made the basis of a petition from Harris to the FCC and will thus be considered along with the four other systems—Kahn, Belar, Magnavox, and Motorola—already submitted.

Harris calls it "Compatible Phase Multiplex", and describes it as a modified quadrature system, with the left signal modulating a carrier lagging the total signal by 15 degrees, the right signal on a carrier leading by 15 de-

grees. Harris claims numerous advantages for this "linear additive" system (the only one proposed, says Harris). Among them are the following: no increase in occupied bandwidth or spectral density; no loss of mono coverage; no distortion in stereo receivers under any conditions; good envelope detector compatibility; simple, stable receiver implementation.

In the demonstration, the system performed well with clearly evident stereo separation, low distortion. The initial lesson seems to be that there are many ways to create AM stereo, all at least reasonably efficient. There will be no basic technological hold-up—the FCC must deal mainly with secondary advantages and superiorities in making its choice.

Shooshan Says Communications Rewrite Bill Ready In Early '78

Harry M. "Chip" Shooshan III, staff director and chief counsel for the Communications Subcommittee of the House told a World Future Society Conference on Communications that a new bill replacing the Communications Act of 1934 would be ready for introduction by Congressmen Lionel Van Deerling and Louis Frey "soon after Congress reconvenes next year". The proposed bill will by no means be final "but it will be a beginning," said Shooshan.

Intent, said Shooshan, will be to give more direction to the FCC. Too many decisions are now made by the Court of Appeals in the District of Columbia because of vagueness of the 1934 Act.

Introduction of the bill may lead to the biggest debate in Congress in more than forty years, say some experts. Shooshan said debate over domestic common carriers, for example, will force the real issue. It's not competition versus monopoly but how can we have the benefits of competition and of monopoly at the same time.

Technology has given us an "embarrassment of riches," said Shooshan, which we don't know how to deal with.

continued on page 8



Meet the Picture Catcher. By NEC. For Faster Search.



It's the editor's friend. The NEC NTC-5000 is a wide-window time-base corrector with unique, momentary locking circuitry that captures individual color-locked pictures whether the VTR is in pause, rewind or fast-forward modes. So you can zero-in on exactly the frame you want. Fast.

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News

The result is interminable delay or policy as dictated by the economics of the marketplace. But social goals must take priority over economic efficiency, declared Shooshan, hence the American people need a policy that can deal with new technology.

But whether or not new policy guidelines are issued by Congress, changes will take place. Shooshan outlined six he foresaw happening. More and more mail will be sent electroni-

cally. This will erode the U.S. Postal Service unless it gets into the act. Without planning and a policy, a crisis will develop, said Shooshan. Secondly, he said, CB and mobile radio will grow. Adoption of a cellular system for mobile radio would mean everyone could have a portable phone at low cost.

The demand for video home recorders will expand and pose a threat to the way networks now do programming. Our present leisure-time habits will be changed by a fourth trend: the advent of the home computer, video games and interactive TV. Teletext

services such as British Ceefax and Viewdata, will compete with newspapers, Shooshan declared. Lastly, he said, satellite networks will provide low-cost alternatives to land lines and microwave.

The question is, said Shooshan, "Do we want to be masters of the technological revolution or its servants?"

There were a number of conflicting ideas presented at the WFS Conference but Dennis Bovin, Salomon Bros., telecommunications investment specialist, made one point clear. If you want to achieve a social goal that is not economically sound, subsidize it directly rather than to insist that it be provided in return for a monopoly favor.

Digital Audio Explodes At AES New York Meeting

With five major electronics firms demonstrating equipment for digital audio recording and reproduction at the Audio Engineering Society Convention in New York, November 4 to 7, the meeting took on the character of a curtain-raiser for this new era in audio.

The impact was all the more powerful because the demonstrations were uniformly stunning: the quality of the reproduction was not just "better", but seemed to many considerably beyond any previously put on public display. Observers, including a lot of professionals from the recording and radio industries, were emphatic on this point.

Soundstream Inc., of Salt Lake City, had the digital tape recorder previously described in *BM/E* (Feb.). They played tapes recently made on assignment for the Boston Pops Orchestra: The distortion was non-existent. The dynamic range tremendous. Tom Stockham, president, told *BM/E* that they were getting a large volume of such assignment work from musical organizations and others.

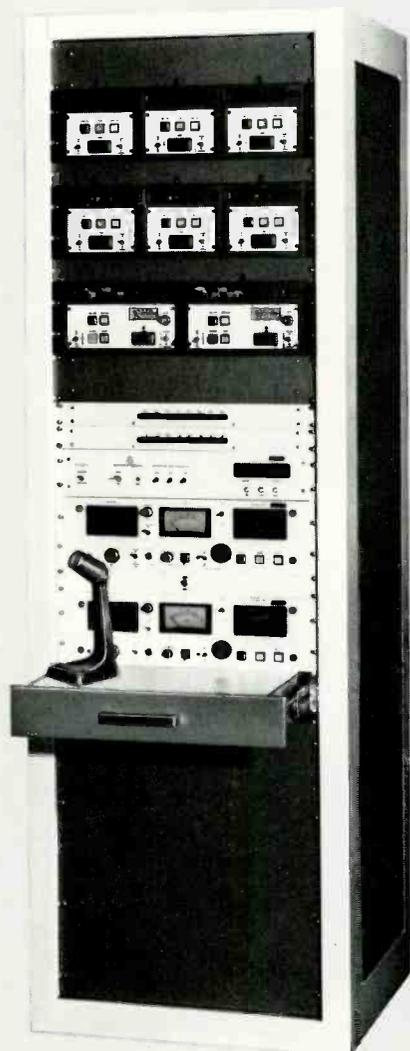
The 3M Company made a most impressive entry with a 32 track digital tape recorder, with elaborate control system designed for easy use in professional recording studios. Like other advanced digital systems, the 3M recorder claimed vanishing distortion, flutter, noise, etc. An extraordinary piano recording left no doubt that the claims were substantially true.

Sony Corporation demonstrated their converters for putting PCM audio onto their videocassette machines. Again, the quality was superb.

Mitsubishi had the most elaborate demonstration, with three different recording formats for the PCM audio. One was a tape recorder with stationary head (like the Soundstream and 3M machines). A second was a video-

continued on page 10

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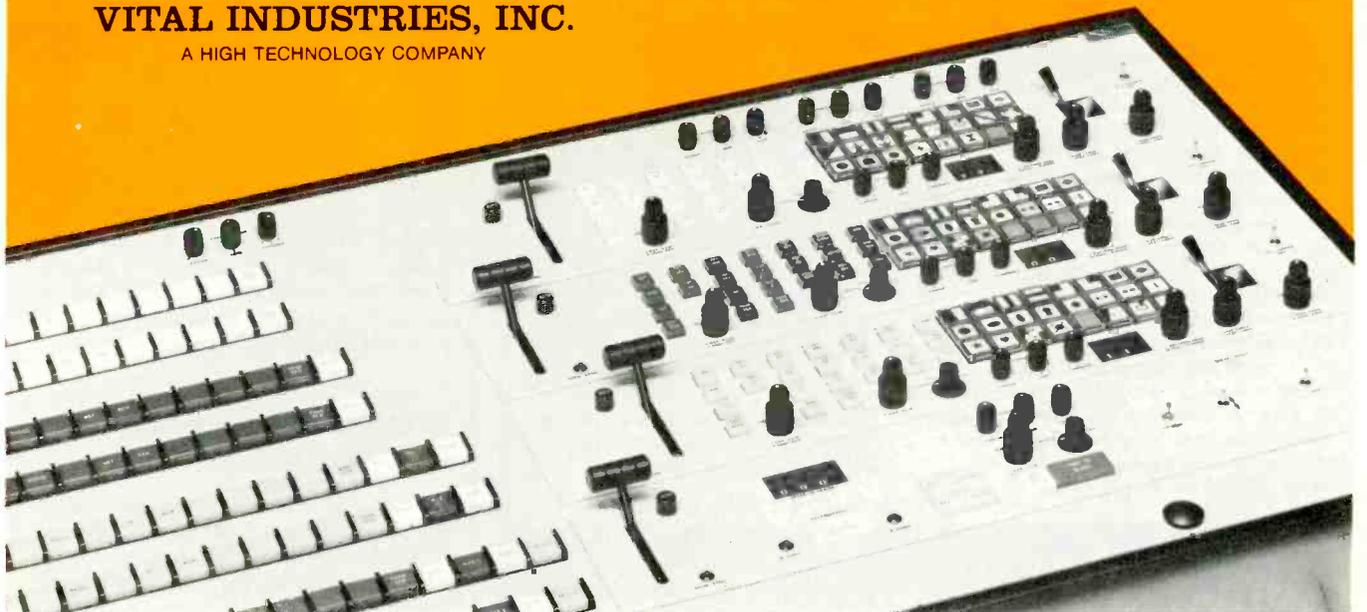
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News

cassette system. And the third was a optical video disc, similar in many ways to the Philips-MCA video disc system.

The Teac Corporation concentrated on this last format, with PCM put onto a "Laser Disc" machine closely molded after the Philips video disc player. The major difference is in the coding: Philips uses FM coding rather than the PCM digital of all the audio machines. The Teac demonstration, given at an extra technical session on Monday afternoon arranged by the AES, may have been the most stunning of all (though all were immensely impressive). Teac emphasized the 98 db S/N radio with a recording of very faint, distant bird calls, clearly audible through the no-noise of the system, followed by the overwhelming sounds of a train passing right in front of the microphones. Through any "holes" in the train sound, the birds were still clearly audible. A virtuoso percussion passage then showed the highest precision of reproduction, in both very soft and very loud passages.

BM/E will describe in more detail some of the digital systems, and their significance for broadcasters in upcoming issues.

Court Says Educators Need Not Record Programs

The U.S. Court of Appeals for the District of Columbia has ruled unconstitutional a provision of the law, and the FCC regulations based on it, which required non-commercial educational broadcast stations that get Federal assistance to keep, and make available on request, recordings of all public affairs programs. The court said that the law and the regulations set up government censorship of specific programs, which was impermissible. The FCC had explained the intent of the regulation as giving "...taxpayers, who provide the bulk of financial support for these stations, a means for reviewing the stations' performance." The FCC had not announced at press time whether or not it would appeal the ruling.

Charles D. Ferris Is New FCC Chairman

Having survived months of leaks to the press naming changing arrays of "favorites" for the job, leading finally to his nomination by President Carter, and his successful fitness test before the

continued on page 12

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"I am most impressed with Cinema Products' approach to the design and manufacture of film equipment, as well as the diversity and dependability of their products. CP-16R and STEADICAM are the prime examples!"



Timothy Wolfe
Chief, Film Production
Maryland Center for Public Broadcasting

"The Maryland Center for Public Broadcasting is the production facility for a network of PBS affiliated stations throughout the state," says Timothy Wolfe, Chief, Film Production.

"Most of our programs are specifically tailored to meet local needs, while others are produced for a national audience. The film production unit provides a wide range of materials for broadcasting, from film inserts which are rolled into live or taped broadcasts, to hour-long dramas and documentaries."

"The CP-16R is the finest production camera of its kind..."

"We are well equipped for all phases of 16mm production. Included in our inventory is a CP-16/A, a CP-16R/A reflex with orientable viewfinder, a Model 6C mixer, and we have just ordered a J-4 zoom control system for several of our lenses.

"The cameras are extremely quiet, well built, and simple to service. Certainly the CP-16R is the finest production camera of its kind, and we use its single/double system sound capability extensively."

Motion picture cameraman Kevin Weber concurs. "I have been using the CP-16R on a daily basis for the past year or so — filming community theatre, dance, and music presentations in the Baltimore-Washington area," says Weber. "After hundreds of location productions, the CP-16R continues to function perfectly. The camera is very professional, yet it retains a simplicity that makes it extremely



Cameraman Kevin Weber (right) and Timothy Wolfe, Chief, Film Production, Maryland Center for Public Broadcasting.

functional.

"I enjoy shooting from the shoulder, so I often utilize a 10mm lens, and jump right into the action on stage. From this vantage point, my camera can become another character who is in close touch with the performers. The CP-16R is one of the finest handheld cameras I have encountered: silent and reliable, capable of handling almost any filming situation."

"Working with STEADICAM means developing a new technique of moving and shooting."

Says Wolfe: "A recent assignment to produce a short film about the sport of Siberian Husky dog racing presented us with an excellent opportunity to explore the unique capabilities of Cinema Products' new STEADICAM camera stabilizing system. Especially since director

Cameraman Steve Dubin with CP-16R and STEADICAM. STEADICAM converts virtually any vehicle into an "instant" camera platform.



Marian Siegel wanted to include both tracking and point-of-view shots of the race itself.

"From Brenner Cine-Sound (Washington, D.C.) we rented a Universal Model STEADICAM and Cinevid system for use with our own CP-16R, allowing cameraman Steve Dubin sufficient lead time to familiarize himself with the unit under the guidance and supervision of Brenner technicians.

"The evening before the shoot, Steve took a feed from the Cinevid and recorded his moves on a video cassette machine. Time well spent, since working with STEADICAM means developing a new technique of moving and shooting.

"Using 7247 color negative for maximum depth of field, Steve shot with an 85N6 on the Angenieux 12-120mm zoom lens at f/16, keeping the focal length between 12-25mm."

"STEADICAM replaces costly and time-consuming methods of shooting."

"Steve moved easily with his STEADICAM, in and around dogs and trainers as the teams were being prepared for a run. He was then strapped to the tailgate of the truck for some tracking shots, leading the teams along little used trails, and ended the day riding in the dog sled on a run through the woods.



"With STEADICAM, Steve was free to make complicated shots on short notice with relative ease — shots which would have been impossible to make had he been limited to a dolly, tracks, and hours of crew rehearsals! And the finished piece has a remarkably fluid and refined quality.

"STEADICAM replaces costly and time-consuming methods of shooting," concludes Wolfe. "The Universal Model is especially attractive, since it can be used interchangeably with 16mm and 35mm motion picture cameras, as well as with video cameras.

"I am most impressed with Cinema Products' approach to the design and manufacture of film equipment, as well as the diversity and dependability of their products. CP-16R and STEADICAM are the prime examples! With products like these, filmmaking remains a viable operation for a television production facility such as ours."

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News

Senate, Charles D. Ferris was sworn in October 17 as chairman of the FCC. Vice President Mondale gave the oath at the White House. Mr. Ferris' term runs through June 30, 1984.

He has professional training in both physics and law. He got an AB degree in physics from Boston University in 1954 and a J.D. degree in 1961. He was president of the 1961 class and editor of the Law Review. He was a research physicist at Sperry Gyroscope 1954-55

and later taught Naval Science and Maritime Engineering at Harvard. He has held a series of legal positions in government in recent years.

Speculation about his stance at the FCC has included note of his generally "liberal" tendency during his legal career. Mr. Ferris must tackle the toughest, most sweeping set of questions and decisions ever to confront an FCC chairman. The whole basis of communications regulation by the Federal government is up for revision, with the Congress seriously considering a rewrite of the Act itself. Mr. Ferris will

be in a position to influence profoundly the structure of telecommunications in this country, which is facing a period of radical change in any case.

Video Expo '77 Biggest Show Yet But Little New Technology

More exhibitors and visitors took part in this year's Madison Square Garden Video Expo than ever before. An estimated 7000 registrants visited the more than 100 exhibitors and attended sessions to discuss non-broadcast television.

Little in the way of radically new hardware was exhibited though many companies showed products especially designed for this market. Microtime showed a Model 1020 time base corrector which is essentially the same as the well known 2020 though without many of the features suitable only to broadcasters. According to the company, the 1020 offers substantial cost savings for educational and industrial users. Cost is \$12,995.

CVS also introduced a new time base corrector, the CVS 516, which is a full featured NTSC broadcast standard digital TBC. The 516 is designed for use with non-segmented helical scan VTRs. Features include one cable genlock, built-in DOC and "gyrocomp." Basic price is \$12,000.

Chyron introduced one of the truly new products (those not previously shown at other exhibitions). Chyron demonstrated a 3/4-in. video-cassette cleaner/evaluator that can process a 1-hour tape in less than six minutes.

Ikegami introduced a new compact ITC-240 color TV camera weighing less than 9 pounds without viewfinder or lens. The camera delivers better than 500 lines resolution and a better than 46 dB S/N ratio. The unit can be shoulder mounted, used on a conventional tripod or used with microscope or fiberscope.

Perhaps the biggest shakeup at the show was the introduction of production recorders and editing systems for the 1/2-in. Beta format by Sony. A spokesman for Sony said that the 1/2-in. Beta systems are probably the logical heir to the 1/2-in. portapaks in the educational and industrial markets. Sony also introduced an improved U-matic machine, the VO-2860. The 2860 is reported to be a faster and more rugged machine than the 2850.

3M Company displayed a Model 812 production switcher capable of 12 effects selected by knob control. The switcher has eight video inputs. One of the inputs is switchable to either internal colorizer or internal color black generator. There is also a "no

continued on page 14

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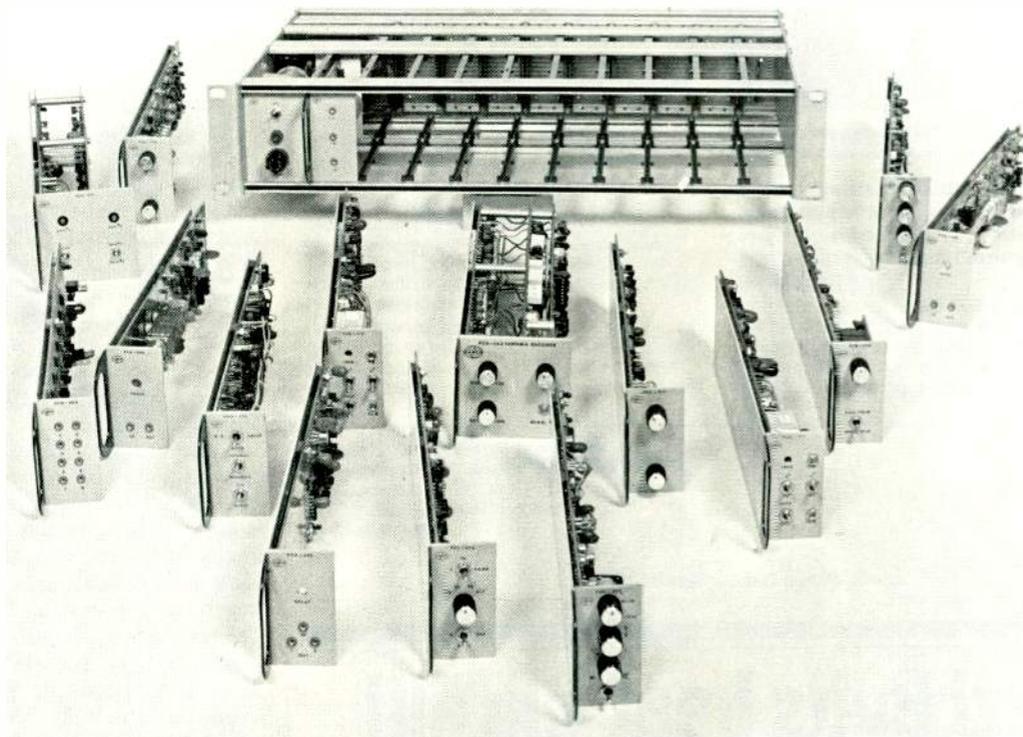
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News

sync" warning system to alert the operator to non-mixable video inputs. The switcher is priced at \$3995.

A new company to the U.S., Field Video, showed a switcher which will be marketed by Adcom Electronics, a Canadian company. The device, exhibited at Video Expo, was a full field production console. The heart of the console is a microprocessor which permits considerable versatility to be extracted from the video switcher and audio board built into this single unit. Also built into the unit are three monitors, one of which is color. For a field production console, this device includes an unusually full list of features. Moreover, the microprocessor provides a real-time clock display in SMPTE format (SMPTE may be added), elapsed time and time remaining display and up to 32 pre-selectable cues with visual countdown and audio warning. A number of other functions are also microprocessor controlled. The console will be priced at approximately \$18,500.

Convergence Corp. introduced a new low-cost editor for this market, the ECS-10. The new model is very similar to the popular ECS-1B though many of the features have been scaled down or eliminated to make the machine appropriate to the needs of the educational/instructional market. The price is \$3,695. Convergence also announced the ECS-1BVU for control of the Sony BVU type cassette machines. The interface can be accomplished with a simple plug-in adapter and in no way affects the other Convergence features. Another addition to the Convergence line is the ADR-8, automatic dialogue replacement. This feature, in conjunction with the PC-3 programmer, permits timed replacement of dialogue with an external microphone. A flubbed word on the original sound track can be timed with the programmer and then for replacement, the time in and time out are automatically controlled to permit replacement of the word or phrase from a microphone, probably in the announce booth.

News Briefs

Automatic Test Equipment Association (ATEA) elected its first slate of officers and moved towards a trade show/technical seminar in the fall of 1978, probably in the Boston area. ATEA will serve the needs of manufacturers and users of automatic test equipment . . .

WNEW-TV received the American
continued on page 16

FREE!

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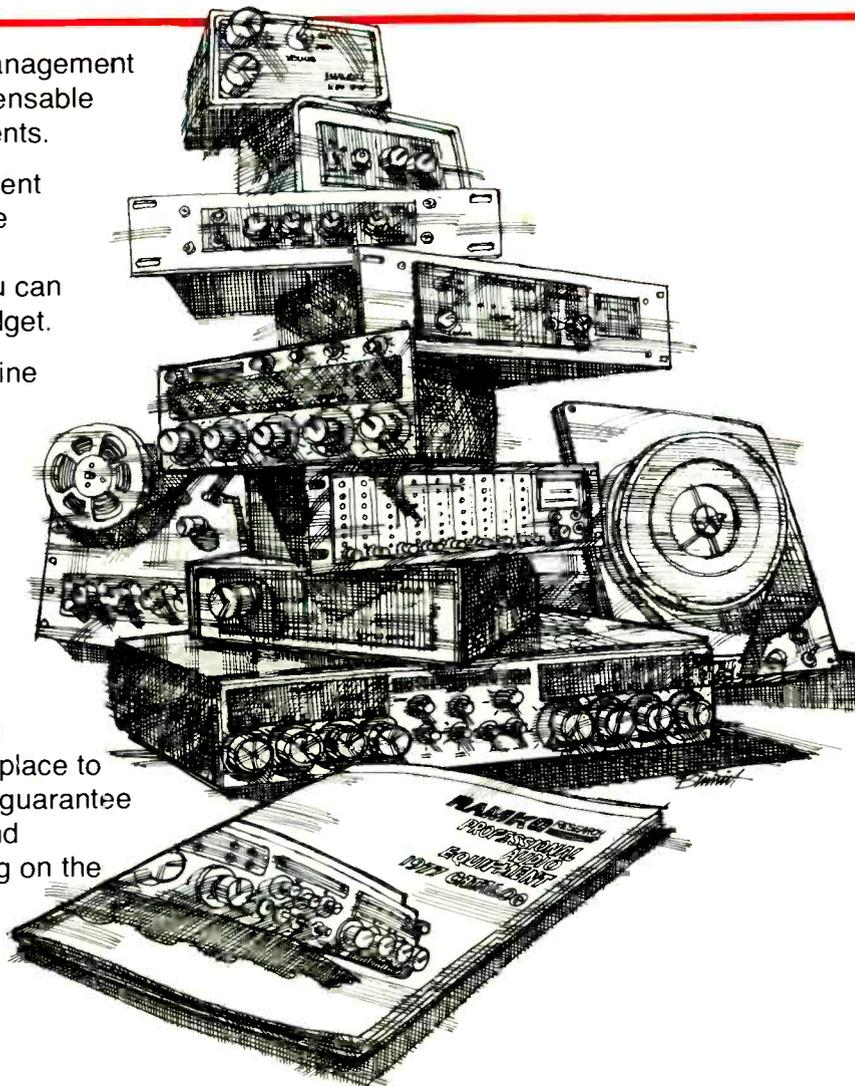
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News Briefs

Society of Television Cameraman's Community Service Award for its series, "The Cost of Crime". This special series analyzed New York City's criminal justice budget and presented ways to make the city safer at no extra cost in tax dollars. . . . **Entries for the Kodak/NPPA "Television News Photography Station of the Year"** award must be postmarked no later than January 31, 1978. The award recognizes a local broadcasting station for

outstanding coverage of events surrounding and affecting the community it services.

ABC Sports used a new **digital framestore device** in telecast of World Series Opener. For the first time in broadcast history a digital effects allowing up to four times picture expansion was used live on the air. The new device is Micro Consultant's Quantel DPE 5000, Digital Production Effects unit.

NCTA called **FCC inaction on movie contracts unjustified**. The National Cable Television Association

expressed disappointment at the failure of the FCC to take positive action to break up the unreasonable movie contract practices of broadcasters against pay cable television. . . . **NCTA reports that over 1400 cable television systems are now members**. The 1405 member systems provide cable service to 7,145,000 subscribers nationwide. More than 240 suppliers of cable TV equipment and products, consultants, financial firms and programmers are associate members of NCTA.

TV engineers and technicians who need to know **more about digital electronics** can bone up at the International Industrial Television Association's conference in Kansas City. The conference, being held from March 27-30, 1978, will feature two day-long workshops dealing with what a digital circuit is and how it works. . . . The National Cable Television Association has called for **technical papers to be presented** at "Cable 78: Thirty Years of Innovation and Service", NCTA's 27th annual convention and exposition being held April 30 - May 3, 1978, at the Rivergate Convention Center in New Orleans, LA. NCTA expects 4,500 people to attend. . . . Imero Fiorentino Associates, consultants to the performing arts, seventh regional **Television Lighting & Staging Seminar/Workshop** is being held January 23-25, 1978 at Loyola-Marymount University, Los Angeles.

Advice to parents regarding children's television viewing will be circulated by U.S. TV stations using a message from Dr. Louis Bates Ames, president of the Gesell Institute of Child Development. The message has been presented by the Television Information Office in two versions suitable for print advertising or mailing. It is being offered to TIO's sponsor stations. . . . The Society of Cable Television Engineers and the Community Antenna Television Association are co-sponsoring a **two-day technical session** in St. Cloud, FL., January 5-6, 1978. It's the first co-sponsored meeting by the two CATV membership groups.

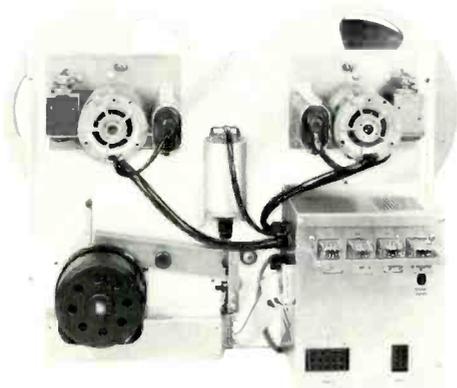
As estimated **1.3 million U.S. families are subscribing to pay TV** services according to a survey by Paul Kagan Associates, Inc., Rockville Centre, NY, publisher of *The Pay TV Newsletter*. . . . Single copies of a new study, "**How to Win a Decertification Election**", are now available from the American Management Association. The study covers a sample of 210 decertification elections among manufacturers of consumer goods, durable goods and capital equipment; public utilities, insurance companies, hospitals, banks and retail food chains. Write to: Dr. Woodruff Imberman, 209 S. LaSalle St., Chicago, IL 60604.

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The new RCA TFS-121 Synchronizer alone is great.

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"Superhighband" video. The TFS-121 Digital Video Synchronizer is designed and manufactured by RCA. It starts with state-of-art sampling and storage technology that positions it ahead of competitive offerings.

The video sampling is at four times subcarrier frequency, resulting in "superhighband" video performance which translates into excellent picture quality.

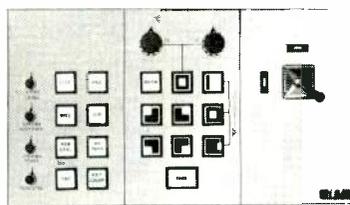
That's only the beginning of the TFS-121's high value/performance rating. It is the most versatile stand-alone synchronizer around, and works beautifully without a switcher. It eliminates the need for genlocking and/or rubidium standards. And switches smoothly between non-synchronous sources without disrupting sync.

Forget the old problems. With the TFS-121, you can accept network feeds, ENG and other remote pickups, or satellite transmissions, without disturbing in-house operations—live programming, production, recording. The TFS-121 accepts and matches those signals to station sync, so you can forget about the old problems of glitches, picture rolls and tears, or drop-outs.

A production tool, too. Freeze frame and picture compression add new performance dimensions. With these options, the TFS-121 is far more than a synchronizer—it's a valuable production aid. Consider freeze frame. With it, you can present a still picture, update it at the push of a button, or create strobe-like effects such as "animation". Stop the action whenever you want, or at a rate you can vary.

Picture compression on the TFS-121 opens a whole new range of production possibilities. The full-size

picture is reduced to 1/4 size and can be positioned in any raster quadrant or in any desired pre-set position on the screen. With joystick control, the compressed picture can be placed in any part of the raster, or can



be made to slide on and off anywhere. (The joystick control can also be used to move the full-size picture on and off the raster in any direction.)

How to be convinced. The TFS-121 Synchronizer is ready now. You can investigate the many benefits of this new RCA-developed product by contacting your RCA representative. Or clip and send the coupon. The facts about the TFS-121 can be convincing.

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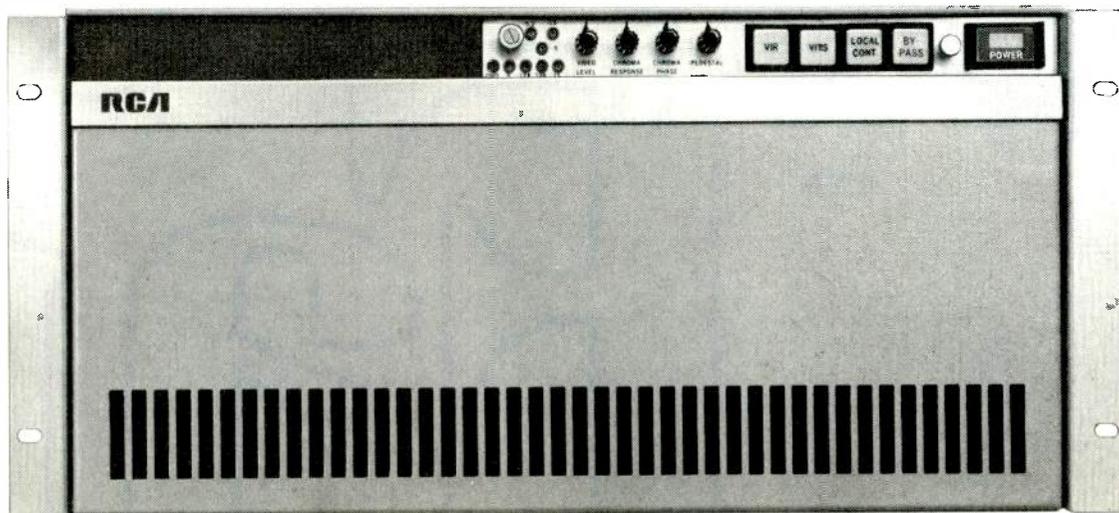
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announces the
lightest 20 watts
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How many times have you wished for more microwave power in a system you could send almost anywhere?

Farinon's new ENG package is the answer. Now you can upgrade with a complete three-element package from a single supplier:

- A 20-watt, 2GHz amplifier, the 60515 — the same one that helped bring you Superbowl XI.
- A 20-watt, 2GHz video transmitter, the FV-2MF, that can operate from two 12V batteries.
- A new high-gain, low-noise preamp, the 60576 for the receiver end.

The beauty of the transmitter/amplifier combination is that it lets you take 20 watts almost anywhere. It's not as light as our

mini-portable, of course, but then it has twenty times the output. And you could use the new package as a *relay station* for the mini-portable. (The 60515 amplifier requires only one to two watts drive.)

The two units take up only five mounting spaces in a standard ENG rack (that's just 8³/₄ inches). And because they need only 24 volts, they'll go anywhere you can bring

or find two regular 12V batteries. An important point: the combination accepts either negative or positive ground power, making it adaptable to a wider range of vehicular power systems. (Consider the other way to get 20 watts of power: a big remote unit, interconnecting cable, a big RF head, a big motor generator.) You can also use 110VAC if you have it.

The FV-2MF has other advantages. Like our mini-portable, it's frequency-agile. And when you're transmitting a signal through a tricky downtown path challenged by high-rises, you can move the aural sub-carrier from the top of the baseband to 4.83 MHz, assuring that your audio will arrive at the other end. It's a remote-controlled function.

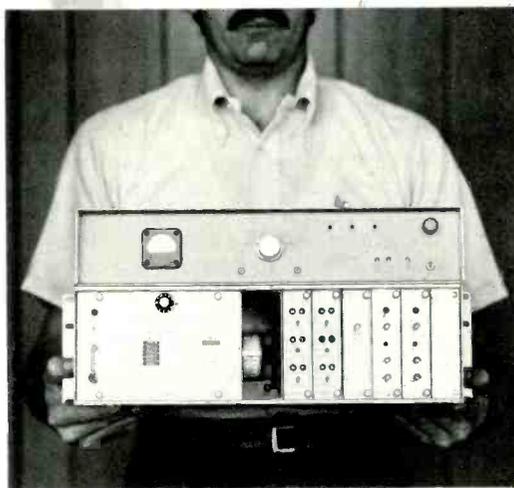
With the audio in the normal position, you get the higher-quality video you need for studio transmission.

The 60515 amplifier, despite its high-power output, needs only low drive power. It's a high-quality bipolar device, with gold-to-gold transistor bonding to prevent metal migration and softening over years of use.

The preamplifier, used at the receiver, is a new high-gain, low-noise device with excellent selectivity (channel filtering). And it can be pressurized — for use at a location remote from the receiver.

The next time you wish you had a high-power system that could go in a car, a van, a fire engine, a power boat, or a helicopter — either with the camera or as a relay station — think of Farinon's *next generation* ENG package. It accepts any audio and video input, is compatible with everybody's existing ENG equipment, and is 25 pounds lighter than Farinon's own FV-2P portable — with the same power output.

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RADIO

PROGRAMMING & PRODUCTION FOR PROFIT

To Keep The Beautiful Music Flowing The Radio Industry Must Help To Pay For Production

SOMETHING LIKE 500 radio stations in the United States make their living by putting Beautiful Music on the air. A high proportion of them are in the large markets so that something between 15% and 20% of all radio listeners in the U.S. are Beautiful Music listeners, according to persuasive estimates. Similar estimates put rock listeners, the largest identifiable group, at 30-35%.

The Beautiful Music stations, moreover, include many that are at, or near, the top in their markets. So if Beautiful Music suddenly stopped it would be a catastrophe for the highly successful stations that depend on it, for millions of listeners, for the radio industry as a whole.

Of course, no sudden disappearance is in sight. But what is happening may be more dangerous because it is coming on us gradually and a lot of people haven't noticed. The sources of Beautiful Music in this country are drying up. The American record industry is not producing it because of a well-known attachment to the quick, high profits in the youth market with its various forms of pop and rock. This has sent a number of syndicators abroad, especially to England, to have music produced for them, as noted in several of the syndicator profiles in this department.

Other syndicators, and many radio stations that do their own Beautiful Music programming, are drawing more and more on the store of older recordings, in many cases searching for them all around the world.

But a few syndicators producing music for themselves can create only a fraction of the music the industry as a whole needs. And inevitably the older records are going to run out, entirely aside from the necessity of getting new music to keep the programming alive. We can't dodge the fact that large-scale production of Beautiful Music has to start again before too long. This situation stirred panelists and audience at one of the programming sessions at the NRBA in New Orleans, which had the on-target title of: "Adult Music—Where Will It Come From?"

Most of the discussion was directed

toward giving the situation its true dark color. A partial consensus emerged, though, that the radio industry, as principally benefiting from the music, should in some way help to stimulate new production. No one was exactly sure how this could be arranged. A consortium of stations? Of syndicators (who are, in a sense, proxies for the stations)?

There are many difficulties, a main one being that each member of such a consortium would want a specific treatment of the music which is not what others want. Assignment of responsibilities among those concerned is also very much up in the air. Does the radio industry ride on the record industry, as one panelist at the NRBA freely charged? Recording representatives point out one reason their industry has given up on beautiful music: radio stations playing it do not help in selling the recordings because many do not even name the numbers and artists as they come on the air. On-air identification, of course, is one of the most powerful selling tools for popular music.

However, things are beyond the point at which the record industry would jump back into beautiful music if a few complaints like this were eliminated. Radio has to take on the burden of creation in some way, plow back some of its take into music production. One secondary advantage would be that the sizeable market for Beautiful Music recordings, now left to wither by the record industry, could be exploited for additional income.

Unless and until that is done on a large scale, Beautiful Music syndicators and stations will have to scramble more and more for material. The scarcity has not heavily affected many stations yet but the beginnings of tightness can't be far off. Meanwhile, a few organizations are helping to keep things going.

Starborne Productions of Van Nuys, California, is one. Created by Jim Schlichting, also head of Disc Location at the same address, Starborne Productions has underwritten a large series of recordings by the Frank Chacksfield Orchestra, and will sell

any of them in disc form to any syndicator or station. Starborne is also acting as the marketing agent for other producers of Beautiful Music, principally in England. Among them are the Sounds of the 80's Orchestra (Sid Dale) and the Carson West Orchestra (Irving Wilson); others will be added. Schlichting says that many station managements are not used to buying custom music, feel that *any* record should cost about as much as the promo records they ordinarily get from the record industry. A large educational campaign is needed to alert broadcasters to the real cost of high-grade music, which is a moderate part of their operation cost in any case.

Schlichting's Disc Location has been a main agent for finding wanted recordings around the world and has built up a very large library of out-of-print recordings. This material has had a vital role for a number of stations and syndicators. But Schlichting agrees that new production is also essential.

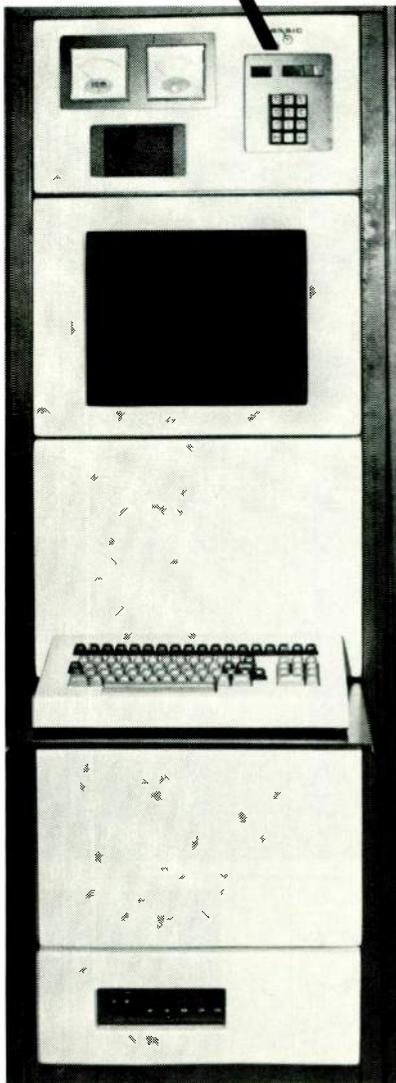
Another producer is Station WGAY, Washington, which went to England to get fresh music, then set up Greater Media of 96 Bayard Street, New Brunswick, N.J., as a syndication operation so that other stations, could use it as well (and carry some of the cost). The format is called "Magic Music" and is in very successful use by a number of stations including WGMK in Philadelphia (whence the name), WESO, Webster, Mass., WQMR, New Brunswick, N.J., WJMC in Detroit, and others. Magic Music now comes in full syndication form, with a starter library of 170 hours of music.

Among old-line Beautiful Music syndicators, Schulke Stereo Productions and Bonneville have been especially active in underwriting custom production, mainly in England and Canada. A number of others are buying from foreign producers, as already noted: among these are Master Broadcast Services and Radio Programming/Management.

That activity has kept the scarcity from becoming a drought for many sta-

continued on page 22

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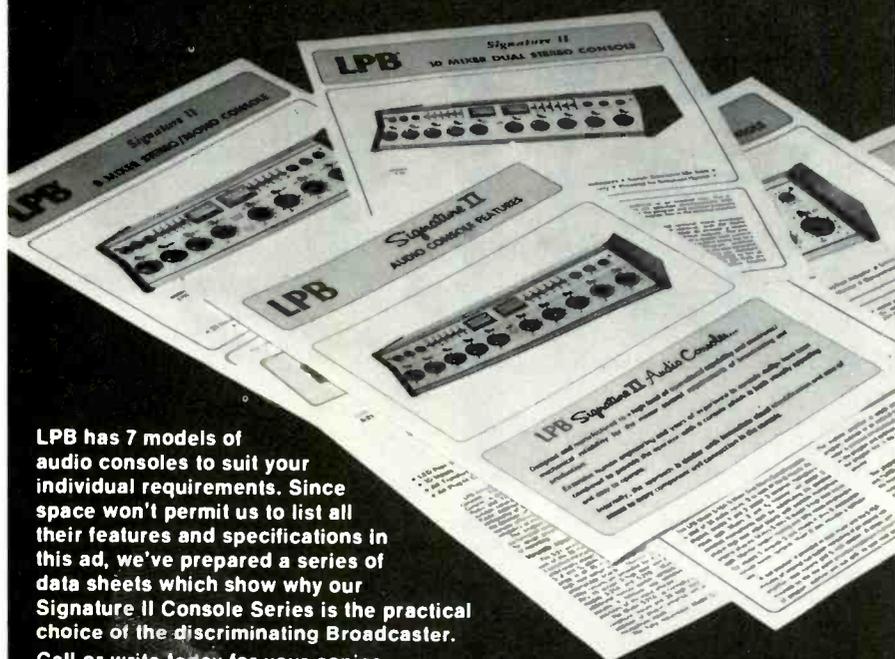


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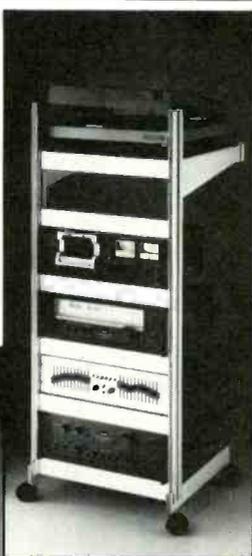
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Radio Programming

tions. A real New Deal is needed though, as sketched in this column, a way for Beautiful Music to become economically valid again. Broadcasters, can you find the way?

BM/E's Program Marketplace

Syndicators For Radio

CaVox Stereo Productions

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THE STATION MANAGER-OWNER who may stop to chat with an advertiser and two or three listeners on his way to the corner for lunch needs a different structure and pacing in his programming from those of the big city manager who can't know the last names, much less the first names, of the smallest fraction of his clients or listeners.

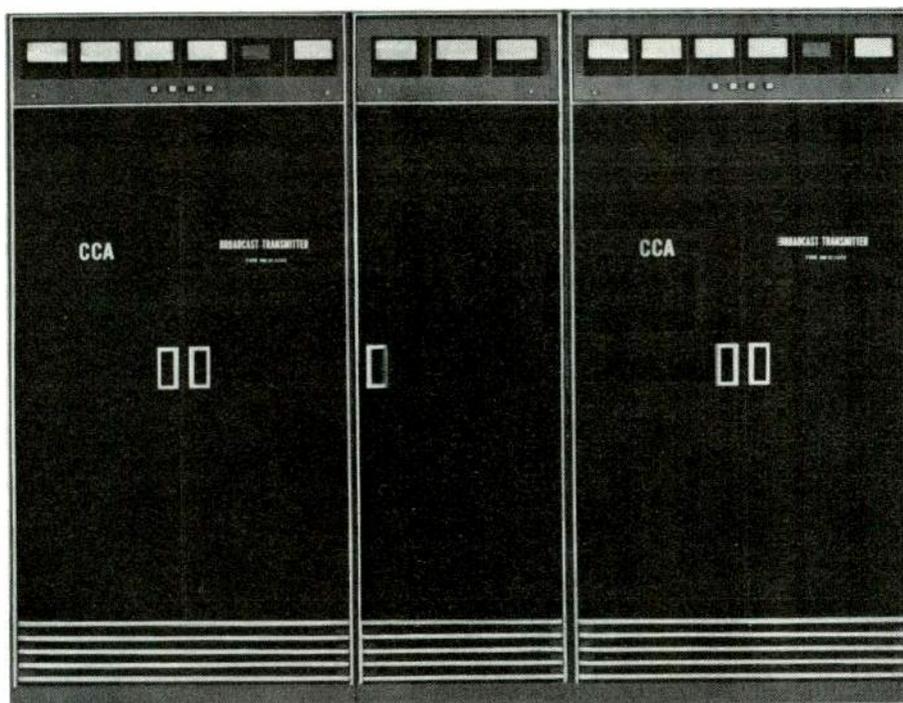
By understanding thoroughly the particular needs of that small-market broadcaster, Cavox Stereo Productions has grown steadily over its roughly six years to become a large success as a syndicator for radio. Lee Tate, president and founder, reports (at the time this was written) a total of 168 subscribers, with an increase of several a month (Cavox picked up about ten new subscribers at the recent NRBA convention described on another page in this issue). Thus there is a good chance that the 200 mark will be passed early next year.

This does *not* mean that Cavox programs anything we could call "small-town music." The material is chosen from the same music that other leading syndicators choose from, the same artists, the same tunes. Cavox puts together packages with emphasis on MOR, Beautiful Music, Easy Listening, Country, but an absence of hard rock. It is probably true that there isn't any such thing as "small-town music" on the commercial market in this country on the scale needed by a radio syndicator. The Cavox programs *are* successfully used by a number of stations in large markets.

What makes them attractive for smaller markets is the particular choice and sequence of numbers, plus a flexibility which allows the station management to tailor the programs exactly to the community tastes and to the sta-

continued on page 24

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The new CCA 55kw combined FM transmitter. FCC type-approved to operate from 25kw to 60kw. Stable grounded-grid design. Inherent durability using two independent parallel amplifiers. Available with optional Dual-Reliable switching.

The new CCA 55kw FM transmitter is everything you want—and nobody offers more. Ultra-reliable. The proven performance of grounded-grid design. Our demonstrated long tube life significantly lowers operating cost per hour.

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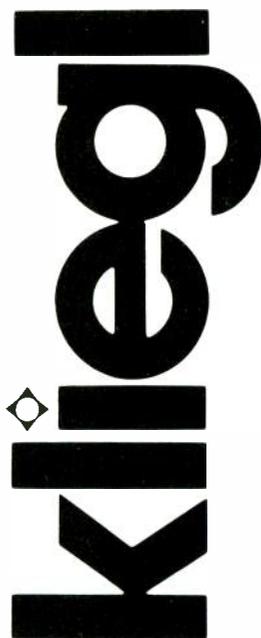
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Your TV Studio may as well be a radio station without the right lighting.

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Five or Eight channels
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Radio Programming

tion's need to do community programming. The small-market management must identify itself deeply with the community in all its aspects. That means there must be plenty of air-space for community programming: the syndicated programming must allow the management to make a "hole" wherever it is needed for these direct talks with neighbors and friends, these reports and studies on topics of community concern.

Moreover, the small-market manager knows better than anyone else what his listeners want to hear because they tell him face to face. So he wants to exercise some hour-to-hour choice rather than having a day's or a week's programs laid out in advance. Cavox programs come in eight formats, as listed below, but each format is divided into blocks of numbers which the station management can use in any order wanted, with any timing.

In fact, a number of stations take "blocks" from different formats, Chinese menu style, and mix them according to local taste. The basic program packages are either 14-in. reels, running 3 hours with 1-mil tape at 7½ ips, or 10½-in. reels running 1½ hours at the same speed. If the playback equipment will accommodate two-direction recordings, six hours can be put on each 14-in. reel, 3 hours on each 10½-in. reel.

The eight formats offered by Cavox have the following titles: Contemporary MOR, Standard Pop, Easy Listening, Conservative Tempo, Good Music, Beautiful Music, Adult MOR Contemporary, Cavox Country.

Although there is in some cases an overlap in artists and titles from one to another of these, the total impact of each is different and specific. The subscriber can choose 60, 75 or 90 hours of music as his original "base library" to which 9, 12 or 15 hours, respectively, are added each month. The 60 + 9 hours package costs from \$170 to \$225 a month, depending on whether it is on 14-in. or 10½-in. reels, and whether one-way or two-way. Similarly, the 75 + 12 hour package is \$185 to \$270; and the 90 + 15 hour package is \$215 to \$325 per month. Charges are the same for all markets.

These packages initially hold less music than a number of syndicators supply as "starter" libraries; many run from 150 to more than 200 hours (and charge \$500 a month as an average fee). Lee Tate points out that his "base library" contains no duplicated numbers nor will the monthly additions bring any duplications. Under his plan, one month's new material is added to the base library when the next month's new

material comes in.

He says this plan has evolved as the best for most of the stations he deals with. It gives them a growing store of programming from which they can choose, deciding if, or when, to repeat any given "block" or part of a block.

Lee Tate had long experience in syndication before he set up Cavox in 1971. He was a principal in Altofonics, the earliest of the important syndicators (early 1960's) after IGM; the latter was in many ways the original of today's kind of syndication. Altofonics grew out of a music service in FM SCA channels, Muzak style, and moved over into radio syndication; some early customers were WNEW, WHK, the Metromedia stations, KPOL in Los Angeles. For a period Altofonics programmed the Bonneville stations; they worked with various networks and network affiliated stations. The business grew sharply in 1966 after the FM split ordered at that time.

Before going to Altofonics, Tate had the experience, which seems to be required for every syndicator: he did programming and managing for various individual stations, among them, KGLA/KLST in Los Angeles, later KIIS (then KRRD). He is, in other words, one of the battle-tested group who carried the flag successfully for individual stations and moved on to their own businesses.

"FM is becoming a major force in smaller markets," he told *BM/E*. "This is happening faster than many people expected. The important factor in FM success is differentiation; with it, the FM management will not necessarily have to split the local advertising dollar with the local AM. If the FM programming is distinctly different, the FM management can develop new advertising, expand the market greatly. We have seen this happen in a lot of cases."

The kind of station-customer relation that many of Tate's subscribers thrive on was well illustrated by an episode a visiting subscriber related with gusto during *BM/E*'s visit to the Cavox suite. This station-owner said that a supermarket operator, a good friend, called him in a reproachful mood to protest an error: a special on a 10-pound bag of potatoes had gone on the air at 69 cents, rather than the correct 89 cents.

It turned out that a stenographer, in typing up the order, had simply made an error that nobody caught before air time. The station-owner kept his business on the track with an immediate agreement to pay the supermarket operator 20 cents for every potato bag he sold. "He kept that special on for a week," the station-owner reported, and his reaction was amusement: that is the quality that "community radio" is made of. **BM/E**

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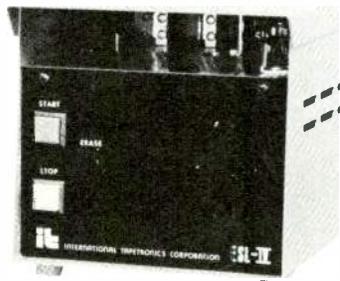
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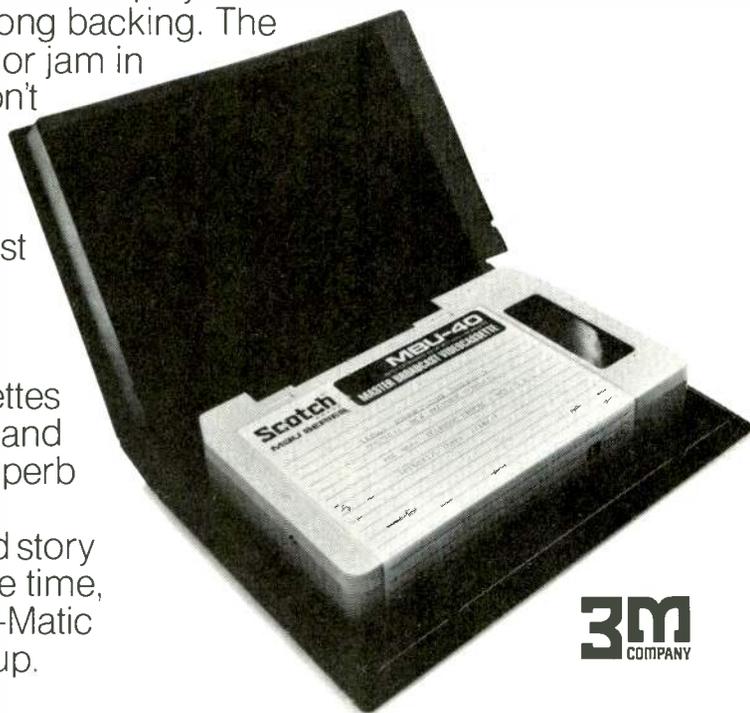
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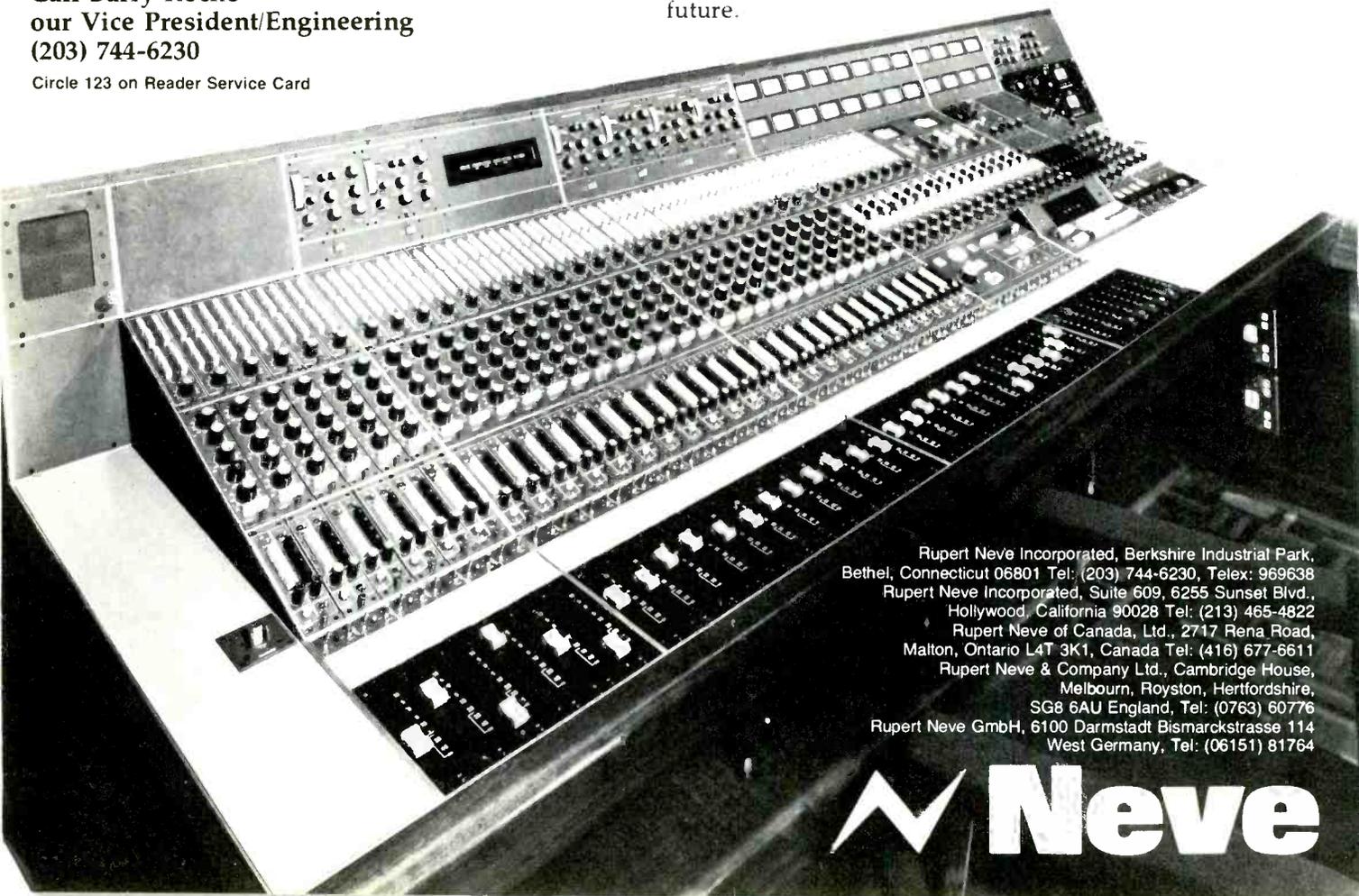
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TELEVISION

PROGRAMMING & PRODUCTION FOR PROFIT

Despite Gains By Video Technology Film Will Be The Medium Of Prime-Time Programming For The Foreseeable Future

Quinn Martin, John Lennox and Les Shorr explain why film will remain the preferred Hollywood medium for a long time to come.

THOUGH A RECENT RTNDA study indicates that nearly two-thirds of all television stations will have at least some ENG capability by the end of 1977 (*BM/E*, p. 10, June) and CBS reports glowing success for its 1-in. videotape stage at Studio Center, we are still a long way off from the much heralded but little seen "End of Film." In fact, Kodak reports a record year for sales of both 16mm and 35mm film stock. The truth is, both media are strong and the figures represent more of a growth for the entire industry than they do a competitive challenge in which one loses as the other gains.

BM/E interviewed three leading Hollywood practitioners of prime-time programming and discovered some interesting things: The reason for the continued reliance on film is its quality. The often talked about below-the-line costs savings may be a short lived myth. And, some producers will continue using film because they believe that a home television projection system is not too far down the road and want to be on the medium with the best resolution when that day arrives.

The people we talked to included Quinn Martin, producer of numerous network action/adventure programs including *Barnaby Jones*, *The Streets of San Francisco*, *Most Wanted*, and many others in his 20 years as a producer; John Lennox, a young producer/director who has worked on many of the most popular situation comedies, including *Laverne & Shirley*, *Happy Days* and *Bustin' Loose*, and Les Shorr, an Emmy award winning cinematographer, currently working on *Eight is Enough* and with a list of feature film and television credits much

too long to mention here.

About the only thing the three agreed on, point-for-point, was the superior quality of film. John Lennox, who points out that the situation comedy is the only true form indigenous to television, gives film the credit for its higher resolution, color saturation, and contrast. "All three are superior in film," said Lennox, "and I feel that makes film an infinitely superior medium." Quinn Martin feels the same way but has reservations about the use of film in multi-camera productions such as situation comedies," said Martin, "but to me, when you're using multi camera, to not take the savings of tape then you're just wasting your money. I think it's silly—that's my opinion."

According to Martin, lighting for three cameras defeats the advantages of film. "You're going to be flat no matter what if you're lighting for three cameras. You have to use fill light all over the place and since the networks transfer to tape, the best you get is maybe 5 percent better resolution. It's not worth it." Both Lennox and Shorr seem to disagree strenuously with that notion.

For Lennox, the role that lighting plays and the role the whole film process plays is most important on a more subtle psychological level. When Lennox took over *Bustin' Loose*, they had been doing the show with five 10K scoops across the front because the previous producer said "he wanted to see the people." Lennox insisted that the show could be made more interesting visually with some changes in the lighting. "We pulled down every light on the set," said Lennox. The five 10Ks were replaced with just two for use as

the key lights. Baby Juniors were hung to "provide nice rim lighting" and the walls were lit less intensely. "Now ambient exposure varies between 150 and 200 footcandles . . . depending on the mood . . . we dropped our key to 125 footcandles, and our walls to 75 footcandles. Now we're talking about 2/3 of a stop less on our walls; automatically somebody that is in front is going to pop out." The result is very good definition and a "look" that heightens the sense of non-reality Lennox feels is important to the show and promotes its style of humor. Les Shorr believes, "in film, there are no limits—we have so much leeway." With force development and the new films like Kodak's 5247, "we can shoot in very low light levels." This gives an increased importance to the lighting director who can now make subtle changes in lighting to enhance the effects of location and mood.

Martin would agree with these notions and, in fact, insists that these ideas are even more important in the type of action/adventure shows that he does, though their importance for multi-camera sitcoms might be disputed.

Perhaps more central to both Shorr's and Lennox's position is a feeling that the craftsmanship traditional in film is not present in the videotape genre. Martin, on the other hand, said, "Creativity follows technology," and he believes that in time video will be as craft-oriented as film.

Shorr said, "people who are involved with film whether they be cameraman or gaffer . . . take a great deal of pride in what they do." Shorr, a

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TV Programming

former president of the American Society of Cinematographers, points out that many of the great creative geniuses of still photography were attracted to film in the early days and that the tradition continues. To some extent, Shorr attributes this to the fact that, "every 8-year old kid in the world has been able to pick up a camera and take a picture. It has been possible to do this as far back as I can remember. It (photography) was something that people could get into and explore—set up their own dark room, get involved. Out of this experience comes the creative people."

Lennox puts the argument even more strongly and looks at the whole creative structure of filmmaking. Said Lennox, "The film technicians love their craft. Every person I work with is creative. On every show I have worked on, either as a producer or director, at least once during the production every member of the crew has come up and said 'I think this would work better if we changed this or that.'" Moreover, Lennox believes in having three people work a camera. Each makes his contribution. The camera operator moves the camera, while the assistant camera operator controls focus, and the grip moves the

dolly—all working to precise marks. Lennox sees tremendous benefits in this method of working. On-air camera moves are precise and smooth. Backgrounds do not change perspective from cut to cut. Visuals are more natural to the eye and each picture is carefully composed along definite terms. "If I'm directing a film show," said Lennox, "I will say I want a 16-foot, 100mm single and I know that it will give me a shot from the middle of the chest to just over the head . . . In tape, that's not true. Working from the booth I ask for a single from two different cameramen and I get two different singles." It could be different, allows Lennox, but that would take time and time is frequently not a luxury afforded to tape. Film is, admittedly, an expensive craft but Lennox points out, "The disadvantage with film is that I have all these men on my set. The advantage of film is that every man on my set is an expert."

The "Economics"

There is no doubt in anyone's mind that tape can be produced less expensively than film, but there the doubt begins. For the Hollywood experts the question is what have you bought with your savings? Lennox believes that there are some shows that belong on tape, especially sports, news, variety

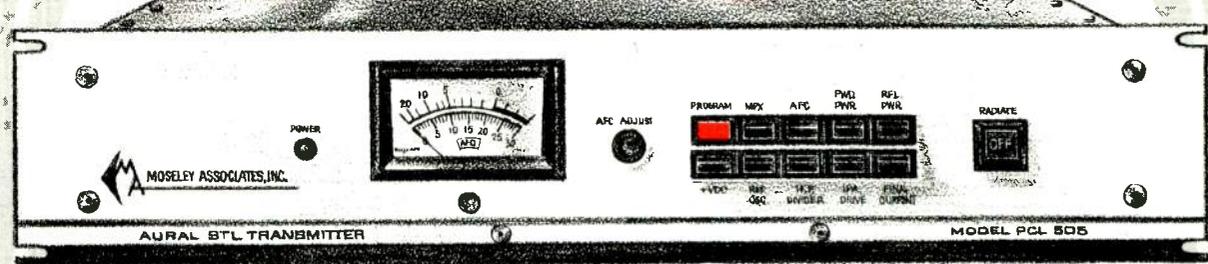
shows and certain kinds of comedies that deal with empathic characterizations, taking place in the here and now.

Martin, on the other hand, draws the line at multi-camera situation comedies. Shows like *M.A.S.H.*, Martin points out, are single camera and probably would not work as well on tape. But Martin gets even more specific; he believes that the show should also be based "interior rather than exterior." On another point though, Martin, unlike Lennox, believes that some drama can be done on tape. Film is fantasy, says Lennox, and dramatic situations work better on it. This, of course, gets into aesthetics and from the interviews it is clear that one man's "real" is another man's "unreal." Martin talks about the "stark reality of a bare bulb hanging in a dark room," while Lennox describes *Laverne & Shirley* as unreal because there are probably no people in the real world quite like them. Martin cites reality as a reason for using film, and Lennox cites unreality as his reason for choosing film. Such aesthetic questions will remain unresolved for the foreseeable future but the question of costs will not rest quietly. If aesthetics are a gray area, costs are clearly the difference between red and black.

"Sure," said Martin, "right now you can save some money on a comedy

continued on page 33

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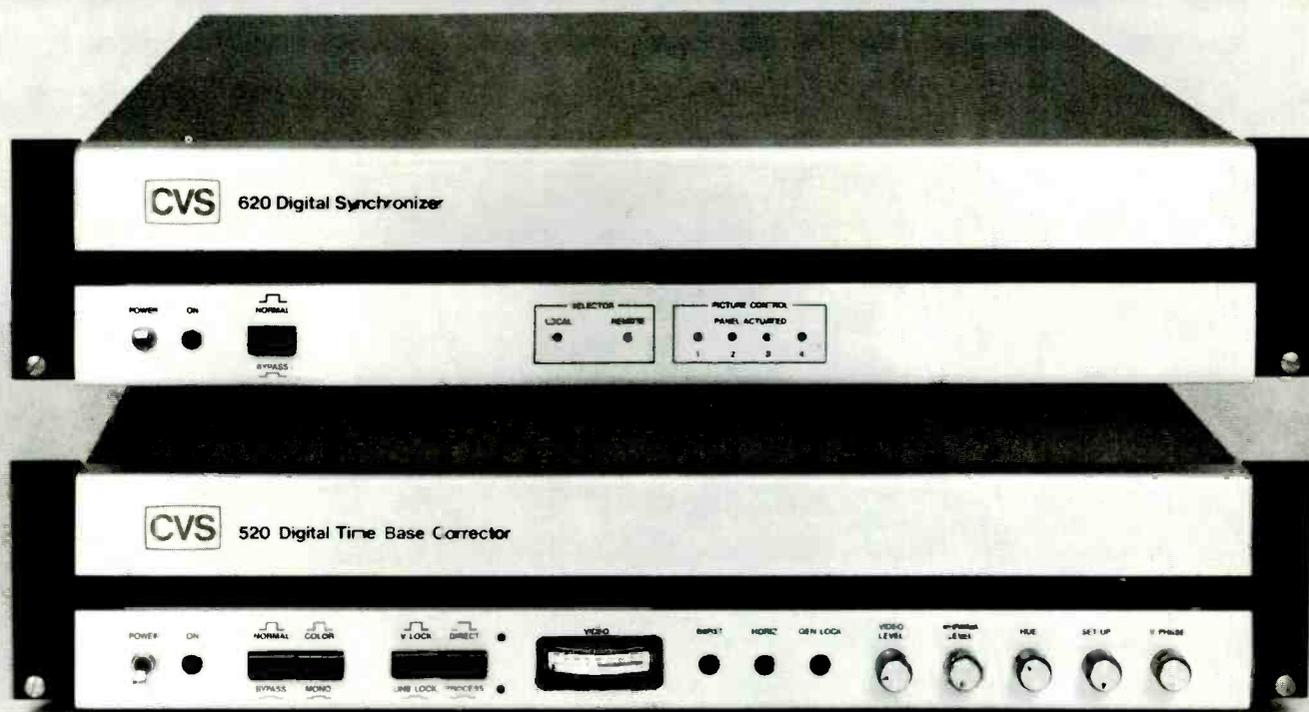
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TV Programming

show." But eventually, if the amount of programming done in tape becomes significant, the same below the line costs that are complained about in film will come about in tape according to Martin. "Most of your savings," said Martin, "are not because you use one form of technology or the other. It's because the wages and other conditions are less expensive in tape." Also, post-production costs are much less. A one-hour comedy show can be cut in just a few hours on tape but with film it may take a few weeks. From the producer's point of view, it isn't just the money spent on the technology but it is also the cash flow problem. "The sooner I deliver a product, the sooner I get paid," said Martin.

As far as the "below the line costs" are concerned, Les Shorr thinks the economy of tape is a myth, because although the below the line costs are trimmed, Shorr sees a comparable upward trend in the above the line costs. "You know what above the line costs are?" asks Shorr, "Director, producer, executive producer, assistant to the producer . . ." Shorr maintains that "Manpower isn't where the money goes below the line. Quality is where it

goes and quality is worth that little difference in cost."

In this respect, the three gentlemen we interviewed agree: "Quality is worth the cost." Even Martin who seems to be a little more willing to consider the use of tape for prime-time programming also believes that tape is not up to film in the challenge of quality. Martin will continue to produce his action/adventure programs or other dramatic material on film. He adds that the choice of film for him is an investment in the future. "The day is not too far off when there will be some sort of home projection system commonly available that will blow up the TV picture. And when that day comes, I want my shows on the medium with the best resolution."

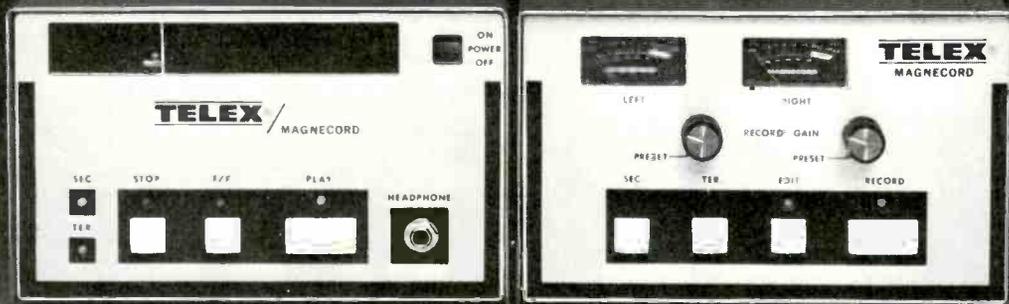
Lennox puts the cost of quality almost on the spiritual level. Lennox says that Hollywood has an obligation as the "Entertainment Capital of The World" to put out the best product possible. "You can't fool people, so why should you try," said Lennox. Lennox is also very concerned about the psychological level. "At a movie," he says, "someone is shot and everybody knows that the person is not actually dead. But tape is too real."

Martin may or may not have agreed with that last point, but he does say that quality is his trademark. "The

networks know that I do only quality shows. I get paid a little more for that." But Martin also believes that a network can't afford to run nothing but Quinn Martin productions and feature films. Part of the economics of Hollywood involves the network's need to save some money someplace. Taped situation comedies are one of the things that permits the networks to go out and buy higher priced programs from independent producers.

Martin has recently reached agreements with the networks whereby he will produce four or more comedy programs next year. He will probably shoot them on tape if they call for multi-camera interior locations. If not, he'll stick with film. He is also currently working on a movie special for one of the networks on which he will probably lose quite a bit of money. But Martin points out, "this is a goodwill gesture on my part toward the network. It is something they want very much, so I'll just have to make my money on it later, but the point is, I wouldn't dream of doing it on tape," at least not at the current state of the art. Martin believes that someday, maybe five years down the road, there will be "a dry process" that will work as well for drama as it does for comedy or for any other type of production. Right now, he says, that dry process is not videotape. **BM/E**

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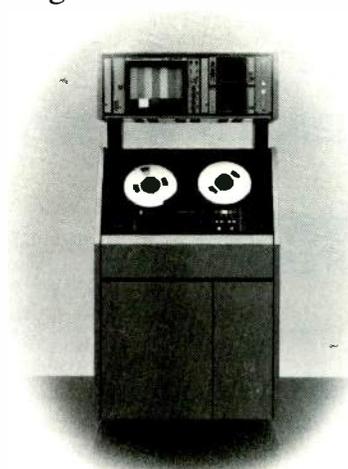
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In the stories that follow, you will find a wide variety of approaches, both technically and philosophically, to the business of radio and television. All are good examples of stations that have looked hard at their resources and responsibilities and then going ahead to create the best possible response. Examine these stories and determine which station in each of the four categories (AM, FM, combo AM & FM, and TV) has done the best job of using its resources to deliver first rate broadcasts to the public. Then, using the Reader Service Card at the back of the magazine, note your choices in the specially marked section of the card. Winners will be announced in March.

KDZA/KZLO: A Lot Of Change In A Short Time Can Still Spell Success

BEST STATION AWARD CONTEST AM/FM RADIO ENTRY 1

*Submitted by Frank Provenza, Program Director,
KDZA/KZLO, Pueblo, Colo.*

IN OCTOBER 1976 when KDZA/KZLO was purchased by Gayberry Broadcasting Company, headed by Michael Galer, president and general manager, we were faced with some big problems and only a few months to solve them. Our on-air target date was April 1, 1977 for KZLO and we had to make extensive alterations to the studios to accommodate the new FM equipment. After much consideration, we found that the required changes would be so extensive that we would be better off moving the entire studio to a new downtown office building. It was an ambitious undertaking but necessary. We began ordering new equipment for both the AM and FM stations and started designing totally new facilities.

Our ideas for the market were clear but we had to keep an eye on the bottom line. KDZA was already established as the dominant station playing contemporary music. There was an apparent need for a good MOR adult station

but because of the rate structure, we knew we had to keep costs down. We decided to go for a "live" sounding automated FM. To accommodate this, we chose a Schafer 903 Automation system using two Audio Files and five reel-to-reel decks. Rather than subscribe to a music service, we decided to use our own large record library to record our programming. The programming is updated weekly with currents and oldies are added monthly. The programs are voiced by AM staff members with music tracks recorded weekly, time tracks are recorded daily so they will sound as topical as possible. In order to create the adult image we were after KZLO (Z100) produces a two hour news block weekday mornings from 6 to 8 am.

To give an idea of the new equipment purchased for our stations: We went with ITC triple stacks in AM productions, AM control and AM news. In FM production we have one single play ITC and one record-reproduce ITC with azimuth adjust. The reel-to-reels in FM production are an Ampex 440-C stereo deck and a Revox A-77 two track stereo deck. In order to continue KDZA's award winning commercial production we knew we had to offer something extra to our FM clients. We decided to provide top quality stereo production, production that moved between the speakers and added life to the client's spots.

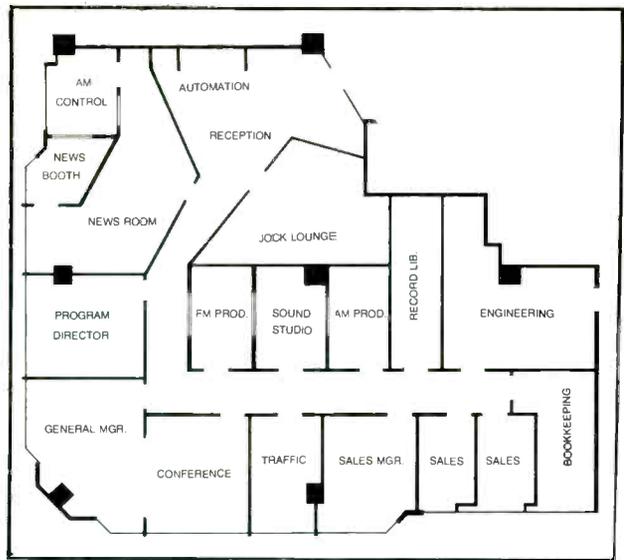
Because of the budget, we chose the Sony MX-20 mixer. With an elaborate patching system the engineers created a very flexible production room. Because of the ITC throughout the station all carts are compatible. Another piece of equipment the AM station installed was a Dorrough limiter. For the FM we're using an Optimod limiter driven by two Dorroughs. It's a loud but very clean sound, we're very happy with it. The FM news block is presented from the news room using two Collins twin tapes and a Shure mixer.

The floor plan depicts the station layout designed to keep the "active areas" as close as possible. The AM jock is responsible for the automation system; he receives a signal from an eight bar light system when the automation is malfunctioning, reel out, etc. Because of the impressive looking equipment and close proximity to AM control the automation is positioned in the front lobby. FM production, sound studio, and AM production, are all near sales' offices.

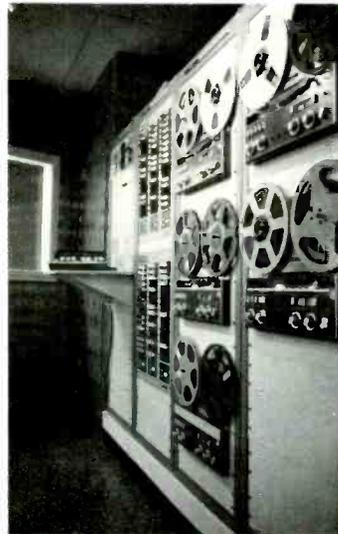
With an on-air target date for the FM of April 1st and not being able to begin the move into the facility until March 1st there were lots of anxieties. Most of the equipment was received and tested at the old studios. With the engineers working day and night wiring the new studios and the rest of the staff keeping the AM on top of the market as it had been, plus recording the FM music library we all kept extremely busy. We made the on-air date of April 1st and even had an open house on the 15th.

Of course, just making the move and getting the station on the air wasn't the end of the story. We needed a year of operation to really see how well things went. Through the course of the year the equipment, wiring, and general set up proved to be excellent, we experienced virtually no down time. As far as billing, the AM and FM by far surpassed our projections. The 1977 April/May sweep showed Z100 the #1 MOR station in adults 18-49. Those figures combined with KDZA's #1 rating for all time periods total twelve plus and adults 18-49 was the final signal that all of the hectic hard work a year earlier had really paid off.

Because proper working conditions are best for staff morale, much time was spent on the decor of the studios. Color coordinated cabinets were used in all the studios with two unique super graphic multi-colored station logos greeting visitors in the lobby. Large silhouettes illustrating the super stars of the station, i.e. Frank Sinatra, Barbara Striesand, John Denver, decorate the walls. If



The layout and design of KDZA/KZLO reflects the dual role played by the AM/FM personnel with production and engineering clustered together.



Schafer 903 automation runs the FM "live sounding" 2100 programming.



AM production features ITC triple stacks as does AM news and AM control.



The conference room promotes a relaxed living room environment conducive to creative instincts.

Murals of the artists that form the bullwark of KDZA's format line the hallway.

Best Station Award Entries

turn-over is any indication of staff morale, I should add, I have been here 10 years, music director 5 years, news

director 4 years, sales manager 8 years. Our former station manager, Jack Carter, had been with KDZA 10 years. After helping us through the on-air date for KZLO, Mr. Carter moved on to become program consultant to Cetec Broadcasting.

KIUP-KRSJ: Serves A Diverse Public With Hard Work, Good Engineering And A Sense Of Self-Sufficiency

BEST STATION AWARD CONTEST AM/FM RADIO ENTRY 2

Submitted by Charles W. Kelly Jr., Chief Engineer,
KIUP/KRSJ, Durango, Colo.

THIS IS THE STORY of two fine radio stations, KIUP and KRSJ. They are located in beautiful Durango, Colorado, a busy tourist town in the summer and challenging ski resort in the winter. Together they serve the "Four Corners" region of Colorado, Arizona, New Mexico, and Utah.

This area encompasses many varied people and lifestyles. Indians and Mexican-Americans, immigrants and natives, locals and tourists, all live and work here.

The diverse demographics represented in the large service area require many things from its broadcasters. The stations must respond to the needs of the many different



"Elwood", the FM Automation, had to be completely documented by station personnel since the original manufacturer had gone out of business.



News and live production are done from this studio for the FM station.



All necessary equipment in Production Room B has been laid out so that easy access is assured.

peoples and languages here. Technically the stations must have a "Major Market Sound" to live up to the tourists' (more than a million annually) expectations. Our goal, then, was to update and upgrade our stations to serve the people.

KIUP is a 5000 watt daytime, 1000 watt directional night time AM station on 930 kHz affiliated with the Mutual Broadcasting Network. The programming is a quality mix of contemporary music, up to the minute investigative news, and exciting sports from high school as well as from college. Public service includes programming from both the Ute Indians and Spanish speaking peoples.

KRSJ is a 100 kW stereo FM station with transmitter atop an 8500 ft. mountain. A 2000 event programmable automation plays Country Lovin', a Peter Productions format, and brings in news from the Intermountain Network, the ABC Information Network, as well as from our own newsroom. Sports is well covered with the Denver Broncos and Colorado Golden Buffalos on the air.

In order to better serve the people of the Four Corners, last May KIUP installed a new Harris MW-5 transmitter and shifted the Gates BC-5E, in use since 1955, to back-up service. This move has resulted in a drastic reduction in down time, a higher percentage of average modulation (more coverage), lower distortion and a flatter frequency response (to 12k).

The Phasor used for directional night time use was custom designed by Oscar Cuellar, a noted consulting engineer in the west. It has given KIUP an exceptionally stable pattern and has resulted in the FCC accepting us under 73.114(a) with regard to relaxed monitoring and logging requirements.

The provisions for reliability are impressive: dual AM transmitters, dual limiters, dual studios, a fallout shelter, and an emergency power generator.

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Best Station Award Entries

KRSJ was built in 1971 and several problems were built in. The transmitter would not achieve licensed power. The inherent poor design and altitude involved placed it at maximums and tubes would not last. The feedline burned up. The tower and power lines were constantly struck by lightning causing serious damage to the transmitter and its peripherals. The company which built the automation went out of business leaving painfully little documentation about its design behind.

Today KRSJ's transmitter has been re-designed with a new driver stage, new power supplies, more accurate metering, and more than ample headroom. A new exciter provides a stereo sound comparable to any—anywhere.

The tower has a new lightning dissipator "hat" mounted on top, and a surge protector system guards against transients. No lightning damage has occurred since the system was installed over a year ago.

KRSJ is in a constant program to do what every station manager has dreamed of—increase its coverage area. This is accomplished with translators. Four are in service so far and four more are in the planning stage.

A back-up transmitter has been procured for KRSJ and installation is being planned for next spring. This will allow the operator at the studio to switch transmitters remotely.

The automation has been documented, spare parts procured, the power supply completely re-designed for better reliability and performance, the automatic logger re-built, and a memory dump and load from paper tape designed.

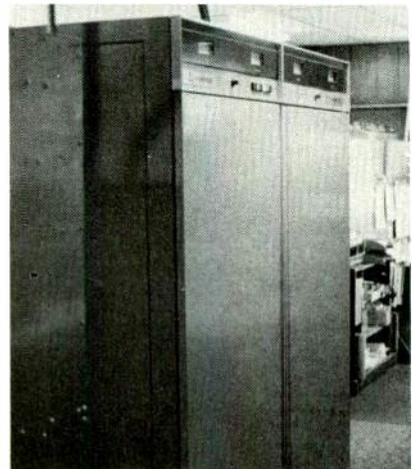
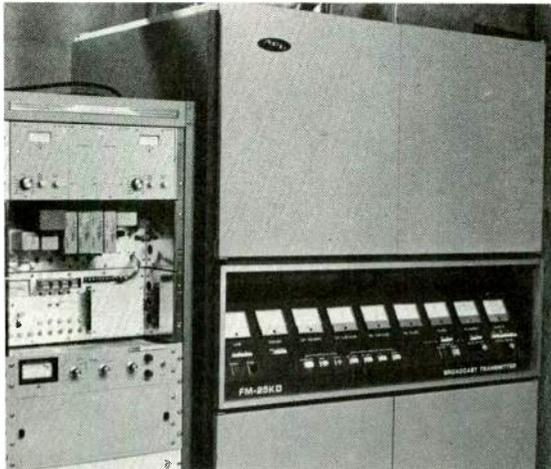
On the workbench, a complete computer system to handle all the program logs, sales records, availabilities, and billing. The cost?—under 7,000 dollars.

The sports play by play crew uses a custom mixer with instant battery back-up, a man on the field interview radio system, as well as a way to cue the interviewer.

The production studios—there are three—have produced 13 awards for production in the last 2 years. They include 5 Revox A-77's, 6 ITC cart machines, 6 turntables and new Sparta boards. A custom automation 25 Hz tone generator and programmable timer aids in the production of tapes.

To be sure, none of this has been easy. For example, due to the mountainous terrain, directional proof takes a year, and snow-shoes are required for access to the FM transmitter in the winter. But then, who's complaining?

New transmitters were installed for both the AM and FM stations. On the left is the AEL FM-25KD. On the right is the new Harris MW-5.



The WROK Story: Active, High Quality Production Inside And Out Keeps This Station On Top



Chief engineer John Shepler at work in FM production.

BEST STATION AWARD CONTEST AM/FM ENTRY 3

Submitted by John E. Shepler, Chief Engineer,
WROK/WZOK, Rockford, Ill.

WROK IS CONSTANTLY striving to maintain the highest standards in radio broadcasting. As a result, the station is not only consistently dominant in listening audience but boasts superior ratings in sales, news, and technical quality as well. Recently, WROK was named "Grand International Radio Station Of The Year" by *Billboard* magazine.

The combined studio and transmitter facilities are both attractive and highly functional. Visitors are greeted in the reception area with a display of vintage broadcast equipment. WROK is one of the nation's pioneer radio stations and has been serving the Northern Illinois area for over

continued on page 42

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Only a demonstration can show you how our anti-comet-tail Plumbicon tubes handle highlights up to 32x normal peak-white level without blooming or streaking—and without loss of our famous color rendition and resolution. 'Live' is the only way to learn what our Color Line-Up Equipment (CLUE) can do for ease of balance... what electronic color temperature control, auto white balance, flexible auto iris and contrast compression mean in use.

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Master control

Most AM programming originates from the Master Control Studio. The console is a Gatesway-80 that has been modified to include provisions for Two-Way, telephone, and remote operations. All music and commercials are played on cartridge by three ITC "triple decks". Auxiliary cue tones are used to indicate when a cart is ending and may serve to reset a digital timer and automatically sequence to the next event.

A second operating position is provided for the morning personality who does not operate his own board. This position provides an air monitor, telephone facilities, and remote start buttons on one of the triple-decks for various "bits" and "drop-ins".

The telephone system in this studio is a hybrid transformer arrangement that allows the announcer to use his microphone and headphones in place of the normal telephone handset.

The AM facility of WROK, Inc. features a twenty-four hour contemporary format transmitting with 5 kW daytime and 500 watts at night.

AM production

Most production work is done in the AM Production



Video coder portion of SMC FM automation is a great help in developing WZOK programming. (Photo by Nic Cipriani.)



Reflecting WROK's long history in radio, a small display of antique radios is kept in the lobby. (Photo by Nic Cipriani.)



FM automation is so attractive that it has been placed in a room off the reception area with a glass divider so visitors can see it. (Photo by Nic Cipriani.)

Studio. This studio is very functionally oriented with remote control of turntables and tape decks located on a panel directly beneath the control board. An "Auto-Dub" circuit is provided which will start any combination of two tape recorders and two cart record/playback units as well as resetting a digital timer.

Facilities are also provided for cassette and variable turntable speed. Audio processing equipment, located on top of the Ampex recorder, can be used as needed for production effects.

FM production

The FM production studio is very similar to AM Production with the exception of a Gates Stereo-80 board and two stereo ITC-850 reel recorders. FM commercials are recorded monophonically and then encoded for cleartext logging on the automation. The information is first typed onto a CRT screen and then coded onto the cartridge cue track.

FM automation

WZOK is the FM facility transmitting in stereo with 50 kW. The programming is automated beautiful music which is controlled by an SMC DP-1 system. The music is received on reels from the syndicator and all commercials and announcements are on cart. There are six carousels and four single-play cart machines. The system also features a tone generator for automated EBS tests, a phase monitor, and a teletype dump/load for ease in changing information in the program memory of the DP-1.

News

Most newscasts originate from the news studio. Facilities are provided for cartridge, reel, and cassette recording. A Gates dual-board was installed to permit such operations as recording the network on one channel while airing a newscast on the other. In addition, a custom telephone panel was installed under the control board with the cooperation of the local phone company.

Other features of the news studio include a tally board

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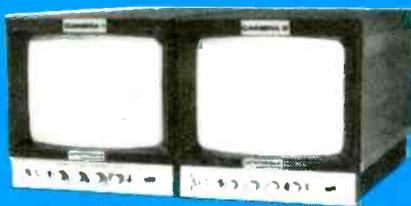
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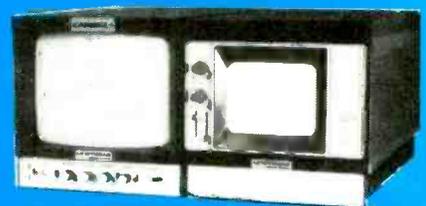
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Best Station Award Entries



WROK mobile van provides excellent OB operation as well as reflecting the contemporary style of station. (Photo by Nic Cipriani.)

with various warning lights, a digital outdoor thermometer, two-way push-to-talk on the board, and separate cassette air-check machine. The newsmen also have recently rebuilt news work areas that includes police and fire scanners and facilities for recording actualities on cart or cassette from the phone lines.

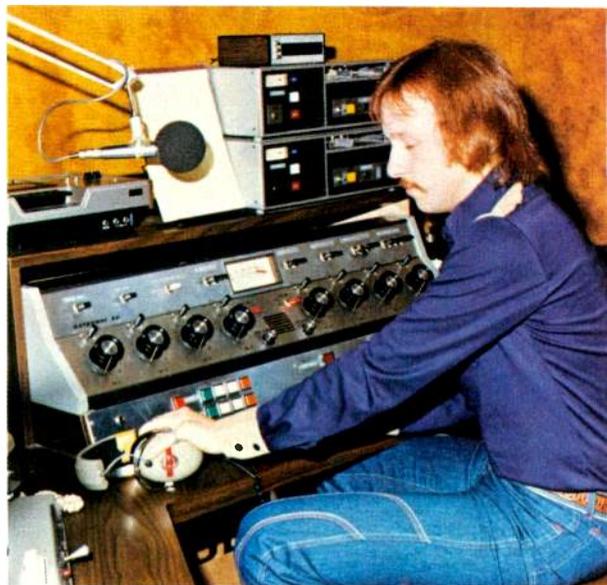
WROK operates two news cars. These vehicles contain remote pickup two way radios and police scanners. Portable cassette recorders are also provided.

An additional *mini-production center* is available to news, continuity, and sales. An amplifier and loudspeaker are provided to audition carts or a spot may be played down the phone line for client approval.

Remotes

This year, WROK has added an elaborate remote broadcast vehicle that can provide almost studio quality from any location in town. The truck is self-powered by a 100 amp alternator and dual battery system. A customized control panel above the driver's seat controls the Marti transmitter and public address system.

A push-to-talk microphone is provided at the front operating position. In the back of the van a studio microphone and control box are provided for normal broadcasts. A unique feature is that the truck's monitor speakers mute when the microphone is activated. Soon to be installed is a repeater system which will allow broadcast



The attractive surroundings are maintained in the action areas of the station as well since a pleasant atmosphere is good for morale. (Photo by Nic Cipriani.)

quality remotes to be aired directly from a client's place of business.

Disco

Much station promotion is done through the WROK Disco Show which is available for hire by school and private parties. Music is on cartridge or record and is amplified and projected through four massive loudspeakers. A wireless microphone is provided for the announcer.

Custom light shows have also been built with floodlights, mirror balls, projectors, and strobe lights. This particular setup was designed and constructed by a WROK engineer.

Engineering

The engineering department is staffed by two full time engineers who not only maintain and repair, but often design and build much of the broadcast facilities.

The transmitter room houses the Collins 5 kW AM and 20 kW FM transmitters along with monitoring and audio processing racks. An auxiliary AM transmitter is available for use at night and during emergencies. The station also maintains a 75 kW generator that is sufficient to run the entire operation for up to two weeks if necessary.

The workshop facilities contain a variety of test equipment and repair supplies. The shop also houses the remote pickup base stations and program loggers.

Form And Substance Are Both Evident At Lake Charles Station

BEST STATION AWARD CONTEST FM RADIO ENTRY 4

Submitted by Randy Schell, Chief Engineer, KGRA,
Lake Charles, La.

KGRA FIRST BEGAN to materialize two years ago in a suite on the sixth floor of an office building in downtown Lake Charles. The goal was to convert these former law offices into a 100 kW FM station that offered the listener the best there was to hear in terms of both programming and audio quality. At the same time, another goal was to make the

operation require as little effort as possible.

Interior design and decorative considerations went on simultaneously with the planning of the technical facility. This assured everyone that the final outcomes would complement each other. Fluorescent light fixtures were removed from the control room and replaced with multi-colored floodlights so that the room mood could be adjusted from the control desk. Two separate dimmer controlled circuits were used. The station was able to achieve what it wanted acoustically and visually by selecting custom-made velour drapes for all four walls. Actual studio and transmitter facility installation was done under the direction of consulting engineer Harv Rees, and performed by Rees and KGRA chief engineer, Randy Schell.

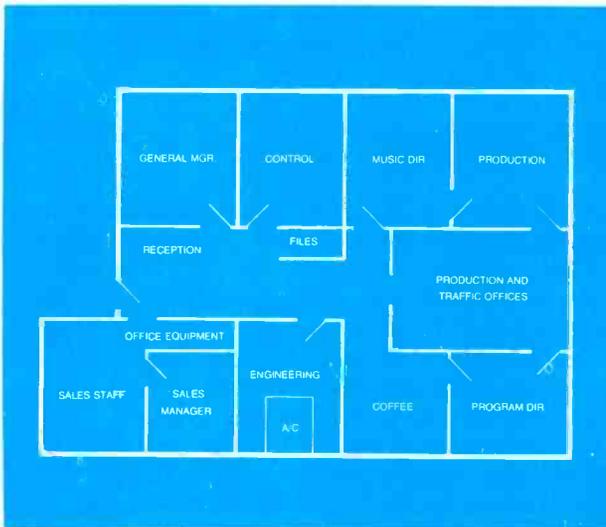
The beauty of KGRA exists in the marriage here between state-of-the art technology and operational simplicity. The control console was custom built using Automated Processes components. Equalization and compression modules were installed on the mic channel to permit optimum flexibility of the Sennheiser 421. The board was also designed and constructed without an audition channel to keep unnecessary confusions to a minimum. All audio inputs are routed through jack strips, both to increase the

console's versatility and to eliminate the need for a battery of predominately unused switches.

Design layout and operating factors were given careful attention and meticulous care went into the installation. The Technics direct drive turntables are "protection mounted" on 600 pounds of concrete blocks, and in no way actually touch the desk itself. The Ampro cartridge playback machines are on a shelf at eye level and all control functions are within easy reach of the operator. A rack just behind the operator houses audio processing, McCurdy parametric equalizers and Pacific Recorder multimeters, monitoring and digital remote control equipment.

Production facilities were designed with the same quality and flexibility requirements in mind. Automated processes components are again used in a custom designed console. Sennheiser mics and Ampro cartridge equipment are also employed here, as in another Technics turntable and block setup. MCI and Lang open reel machines are used for mastering and editing. The system is also equipped with UREI Graphic Equalizers and Eventide Instant Flangers for special audio effects.

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KGRA floor plans shows how an existing office suite can be comfortably adapted.



Reception area reflects the beauty and efficiency built in to KGRA.

Ultra quality and versatility were the guidelines for the attractive production room at Nova 104.

Best Station Award Entries



This control room was designed with three people in mind: the operator, the engineer and the listener.

“There’s not much that can’t be done in this production room,” says manager Tony Reed, “which accounts for some of the best sounding production on the Gulf Coast.”

Audio from the studio is carried to the transmitter via a Moseley composite STL and fed to an AEL 25/25 KE transmitting system. Using the dual transmitter system minimizes down time.

“Difficulties are hardly ever noticed by the listener,” according to Schell. “We can totally lose one transmitter and never break service to our primary coverage area.”

The transmitters are housed in a brick building constructed on a four foot high concrete foundation and cooled with 7½ tons of air conditioning. A Jampro JSCP-6 radiates at 500 feet to reach the southwest third of Louisiana and southwest Texas as far west as Houston.

“This has all been put together to give NOVA 104 the best of three worlds,” says Schell. “We have a work environment that’s attractive and comfortable right down to the station’s self-contained air conditioning system. Our studio and transmitting equipment is engineered for ultra quality yet is simple to operate. Our AOR format is designed to provide our listeners with the best music available.”

Schell says he gets a very clear and crisp signal from his transmitter. He applies only “subtle” compression to his signal so that the music is real and the sound is loud.

Expanding Facilities For Improved Efficiency

BEST STATION AWARD CONTEST FM RADIO ENTRY 5

Submitted by Warren Shulz, Chief Engineer, WFYR, Chicago

RKO GENERAL PURCHASED this facility in March, 1973 as part of a plan to expand its FM holdings and establish itself in the Chicago market. Although there have been a number of previous owners since 1947, the station had never moved and the basic floor plan went unchanged for nearly 30 years.

The existing facility had a major problem—the 50 kW transmitter was located in the studio complex and the antenna height was only 500 feet above street level. In effect, the antenna was in an electrical canyon. Coverage was poor.

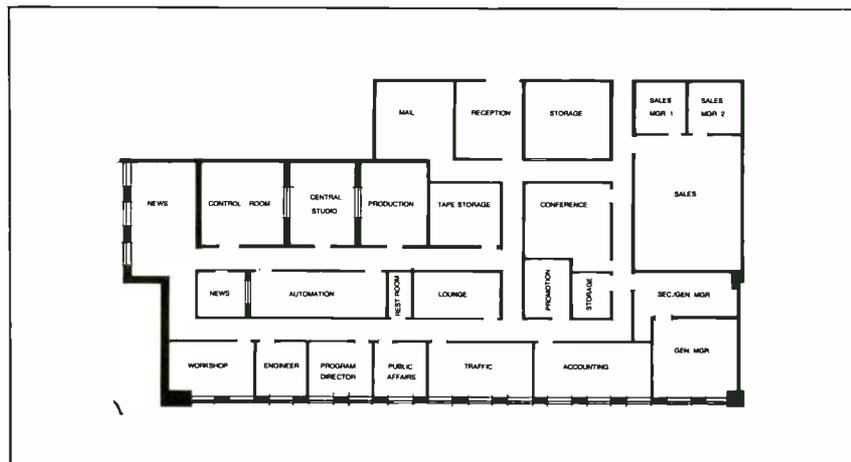
At the beginning of January 1974, negotiations were completed to move the transmitter to the world’s tallest building, the Sears Tower. On April 4, 1974, WFYR began transmitting at an antenna height of 1,553 feet. Needless to say, this gave the station a competitive signal in the Chicago market, and also a full power auxiliary transmitter system at the studio location. The next logical step was to improve the studio/office space.

The problems with the old location were numerous. One elevator handled passengers as well as freight for 10 floors in a total space of only 3500 square feet. This hurt efficiency and morale. There was no room for a needed production room and we could not add a news operation. It also limited the station to an automated format.

A search for a possible studio/office location began about 18 months prior to the expiration of the existing lease. An actual comparison of eight possible buildings

continued on page 50

The entire complex is raised on platform to promote quiet. Marsh Associates of Chicago coordinated the entire plan.



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Some suppliers want you to serve them. You know the type. All they're interested in is getting the order. Don't bother them with any problems. We know because this kind of supplier calls on us, too.

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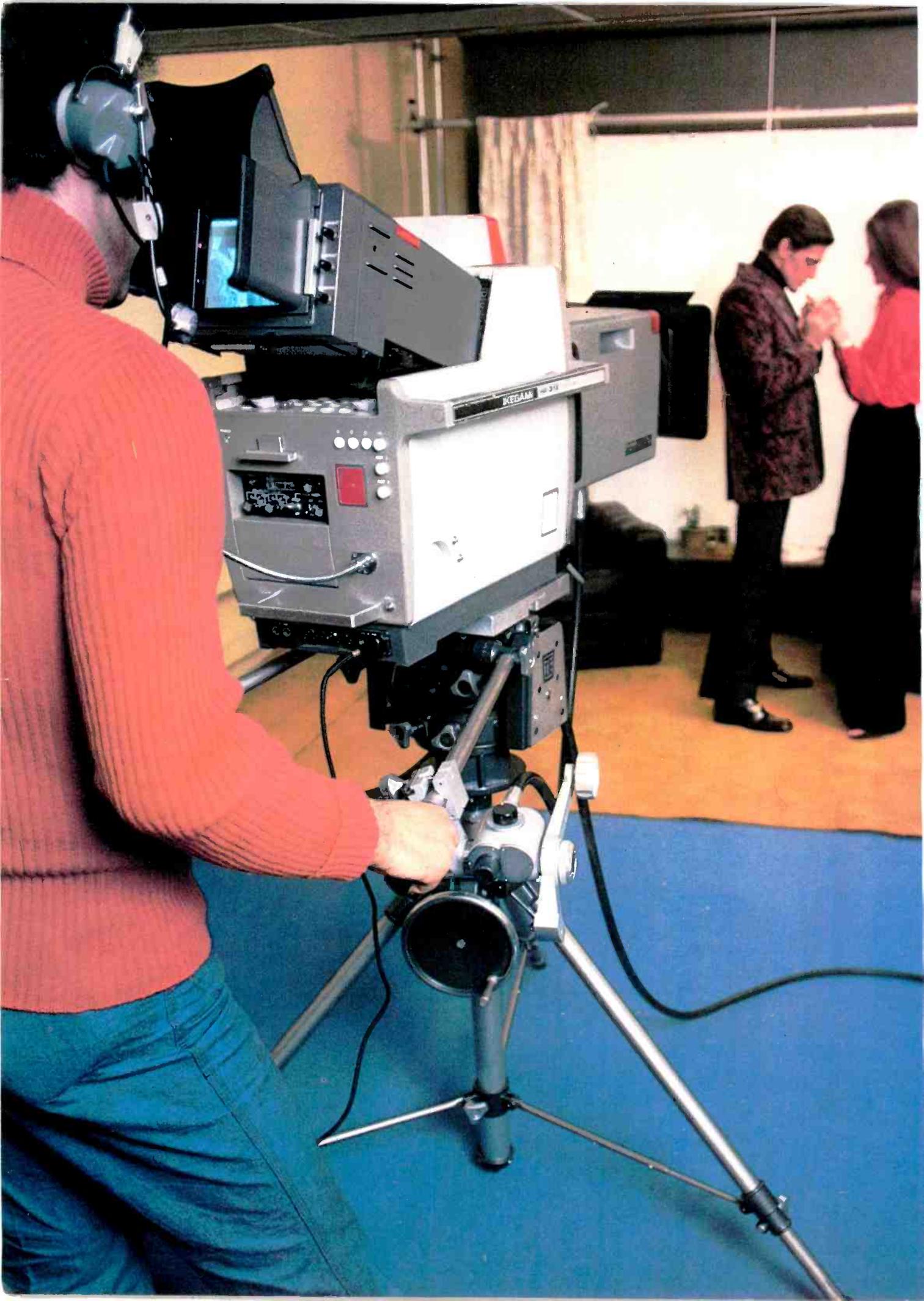
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Wherever there's been news, from natural disasters to national elections to sport events, Ikegami ENG cameras have been there with the news teams. Now Ikegami makes news of its own: the introduction of our new state-of-the-art HK-312 studio and field camera.

We've built ENG cameras so good in the rough-and-tumble of news-gathering that more Ikegami ENG cameras are in use than all others combined.

So imagine how good an Ikegami camera can be in the stable environment of a studio.

Very good indeed.

Ikegami's new HK-312 color-TV camera is like no other. It has a built-in minicomputer that helps trim the daily camera checkout from a one-hour ritual to an automatic run-through that's shorter than a 20-second commercial. With its auxiliary computer, you'll be able to cycle your Ikegami HK-312 (and up to four other Ikegami HK-312 cameras linked to it) through every adjustment parameter in under two minutes: white balance, black balance, flare correction, gamma correction, video gain, beam alignment, and eight registration functions.

All this before you start shooting. The HK-312 gives you three 30-mm Plumbicon tubes for highest picture quality. You frame your shot on a high-intensity, high-resolution, seven-inch tiltable viewfinder. Signal-to-noise ratio is better than 54 dB.

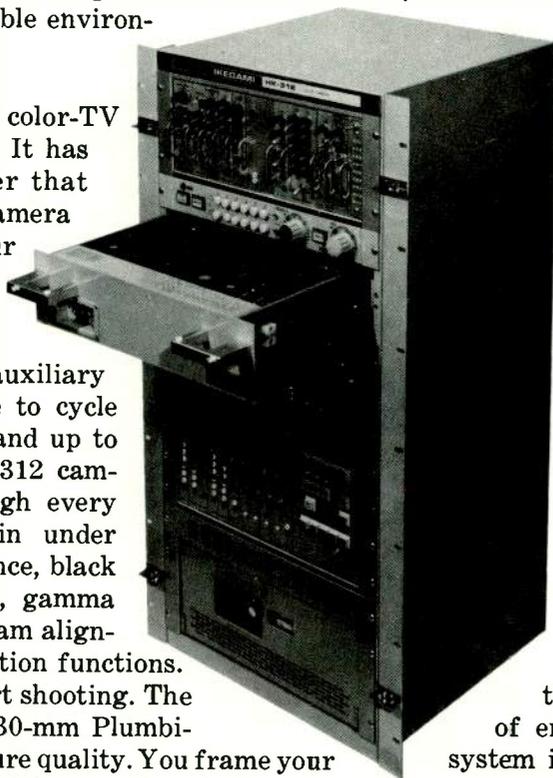
We've combined the zoom lens and camera tube into a single rigid assembly for highest accuracy of the optical axis. Class-A deflection amplifiers assure maximum linearity and best picture quality. Black level balance correction is automatic. Picture quality and brightness are maintained in spite of flare.

A complete two-line image enhancer provides horizontal and vertical detail correction. A special comb filter keeps background noise to a minimum.

All this and a lot more.

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Camera-control unit for the HK-312



The TK-355 uses three 25-mm Plumbicon tubes which are bias-lighted for reduced lag at low lighting levels. This reduces studio lighting and air conditioning power consumption. And the camera is more compact and lighter, a little easier to maneuver. The unique half-rack CCU facilitates multi-camera studio installations.

Both broadcast cameras use TV-81 minicable for ease of handling.

If you need a small, fixed-position camera for announcer booth and news-casting, check out the Ikegami HK-309. It can be operated remotely or simply turned on and left in fixed position.

For movies, the Ikegami TK-950 is a large-image film-chain broadcast camera system for 16-mm or 35-mm film or slides with highest quality color reproduction. Much of its operation is automatic, requiring a minimum of engineering support. Its unique optical system is dust-shielded and unusually compact.

Ikegami has been famous for its ENG cameras for a long time. Now take a look at what we can do with studio cameras. For specs or a demonstration, get in touch with us. We have nation-wide distribution.

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Best Station Award Entries

was made. Some of the factors that entered into the selection process were the need for 6000 square feet of space, 1000 of which would be suitable for acoustical type construction. We also wanted good after-hours access (with good security), a 20 year lease in acceptable terms, a location that could house an auxiliary transmitter and room for expansion.

After a year of working with floor plans and reviewing various locations, suitable space was found on the 23d floor of the Prudential building. We had satisfied ourselves that there were no unusual building noises present by hiring an acoustical consultant to make tests. You would be surprised at how many office buildings have fans, pumps, chillers and elevator equipment located in such a way that it is difficult to isolate the studio from the building noises. At this point we had eight months on our present lease. Immediately we began gutting the space of existing walls.

Robert Hansen, of Hansen Associates, who had done acoustic designs for the company at other locations, was already at work on the studio complex. George Capalbo, corporate vice president for engineering, began making Chicago his second home. George had just completed overseeing a move of the Washington, D.C. station,

WGMS-AM/FM. Many of the concepts that went into the design at WGMS could be used at WFYR. Hansen, Capalbo and myself worked out a studio design based on both current and future needs.

The office design was contracted to Marsh Associates, a Chicago-based space planner/designer. Marsh Associates would coordinate the decor, select furniture, wall treatments, seek bids on furniture and coordinate job site activities on through the punch list phase.

The reconfiguration

A plan for the new facility was set by the program director and the general manager. We were giving up total automation and going back to live radio from morning to midnight. At the same time, we wanted to use as much existing equipment as possible since it was all less than three years old and like new.

We were able to rework the old control room console into a live board by adding several improvements: an overhead cart bridge, additional cart playing capability, an overhead EOM and on-air lamps, a 30 watt headphone amplifier.

By relocating cart start buttons and re-engraving the console to mark faders more clearly, we made the equipment easier to use.

New equipment purchased tended to be more of the

continued on page 55



WFYR reception area. Atmosphere is subdued and relaxed.



Control room was redesigned. The entire console is on wheels and plugs into interconnecting cable.

Production director, David Martin, does a commercial in the production studio which can back up control room.



VIDEOCASSETTE EDITING. MADE FOR SPEED. MADE FOR ACCURACY. MADE FOR QUALITY. MADE by JVC.



JVC INTRODUCES THE CR-8300U FULL EDITING VIDEOCASSETTE RECORDER...

FOR FASTER EDITS

Now you can significantly cut the time you spend editing 3/4U-format tapes, thanks to JVC.

The unique bi-directional search control of the CR-8300U Electronic Editing Recorder lets you fast-forward at 7 times normal speed. Reverse at 10 times normal.

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The unique preview feature lets you pass the signal from a second source through the CR-8300U while it's playing, without erasing the tape. You'll cut down on false starts by knowing what your edit will be like.

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You want still frame and slow motion? You've got them. The forward speed can be adjusted from 0 to 1/15th normal speed. You'll always find the exact frame you want.

And the tape counter doesn't just count. It has a memory. When you know you'll want to find a particular point again you reset the counter to "000". Then when you rewind, it will automatically stop the CR-8300U right there.

No other moderately priced videocassette editor has this combination of features to give you the accuracy you're looking for.

FOR THE HIGHEST QUALITY PICTURE

But speed and accuracy are nothing without quality. And quality is what the JVC CR-8300U has most of. It has everything you need for NTSC-type color video built-in.

Automatic Phase Control and patented Color Dubbing assure generation after generation of duplicates with stable color lock and highest quality.

There's a built-in Dropout Compensator. There's a video S/N ratio

of better than 45dB (unweighted) on the Rode & Schwarz noise meter. An audio S/N ratio of better than 45dB. Independent Audio VU Meters and Controls for both channels (which can be operated either automatically or manually) help you upgrade the quality of low-level audio recordings.

Black & white resolution is better than 320 lines; color, better than 240.

And if "flag-waving" turns you off, all you have to do is turn on the CR-8300U. The frame servo locks on the odd field, so every edit is smooth and clean.

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JVC has worked with broadcasters and producers to give you what you want, what you say you really need. Speed, accuracy, quality. And the features you need to get them.

Features like an external sync input for V-locking other sources. A built-in capstan servo mechanism for jitter-free, stable tape speed. An internal time-lapse meter to make

regular maintenance easier. And a new remote-control system you can learn about by reading the next page.





AND...TO TIE IT ALL TOGETHER... THE JVC RM-83U REMOTE AUTOMATIC EDITING CONTROL UNIT.

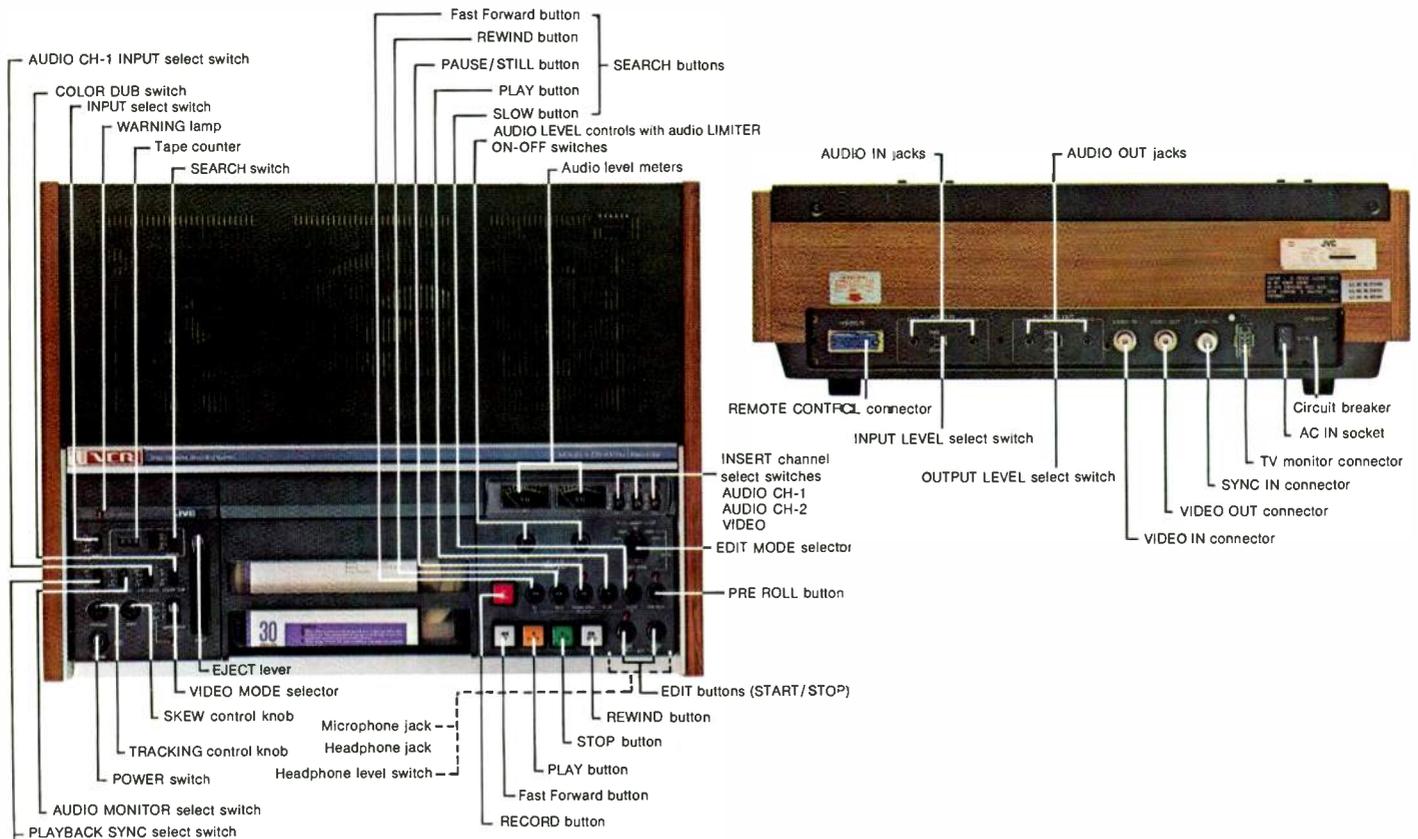
The RM-83U completely controls two JVC CR-8300U recorders for fast and accurate insert and assemble editing.

Its two independent LED timers (indicating minutes, seconds, and tenths of seconds) can be put on "Hold," so you can precisely identify the edit point. They then return to real time. "Hold" again at the end of the edit, and you've timed the length of your insert. Both clocks memorize the edit point—for fast and accurate review, you quickly return to it by touching "Search".

Not only can you *review*, you can *preview*. A unique rehearsal editing feature lets you see your edit without putting a signal on the tape. You can be sure you've got exactly what you want, exactly where you want it. After you've previewed, both machines go back to the edit point automatically. If you like what you saw, just push "Start" and you have it.

There are many more great features, such as the automatic safety device that shuts off both recorders if a tape is left in still-frame for 10 minutes. Get all the details on both the RM-83U and the CR-8300U by writing today to the address listed on the back page.

SPECIFICATIONS OF THE CR-8300U EDITING COLOR VIDEOCASSETTE RECORDER



GENERAL

Video Recording System	: Rotary two-head, helical scan system
Luminance	: FM recording
Color Signal	: Converted subcarrier direct recording
Video Signal System	: NTSC-type color signal
Power Requirement	: 120 V AC, 60 Hz 120 watts
Temperature Operating	: 41°F to 104°F (5°C to 40°C)
Storage	: -4°F to 140°F (-20°C to 60°C)
Operating Position	: Horizontal only
Weight	: 67.5 lbs. (30.6 kg)
Dimensions	: 24-1/16" (W) x 7-11/16" (H) x 17-3/4" (D) (610 mm x 195 mm x 450 mm)

Tape Transport

Tape Speed	: 3-3/4 ips (95.3 mm/s)
Fast Forward Time	: Less than 6 min. for 60 min. tape
Rewind Time	: Less than 5 min. for 60 min. tape
Wow & Flutter	: Less than 0.2% RMS

Video Signals

Input	: 0.5 V to 2.0 Vp-p, 75 ohms unbalanced
Output	: 1 V p-p, 75 ohms unbalanced
Signal-to-Noise Ratio	: More than 45 dBs (Rohde & Schwarz noise meter)
Horizontal Resolution	: Color 240 lines Monochrome 320 lines

Audio Signals

Input	: Mic -70 dBs, 600 ohms unbalanced
	: Line -20/0 dBs, 10k ohms unbalanced
Line Output Level	: -20/0 dBs (600 ohms unbalanced load)
Headphone Output	: -28 dBs/-37 dBs, (8 ohms unbalanced)
Signal-to-Noise Ratio	: More than 45 dBs (@ 3% distortion level)
Frequency Response	: 80 Hz to 15 kHz

Be sure to write today to JVC for more information on the CR-8300U Electronic Editing Color Videocassette Recorder and also for a copy of JVC's new Glossary of Video Terms.

JVC

JVC INDUSTRIES COMPANY, a division of US JVC Corp., 58-75 QUEENS MIDTOWN EXPRESSWAY, MASPETH, N.Y. 11378 (212) 476-8010

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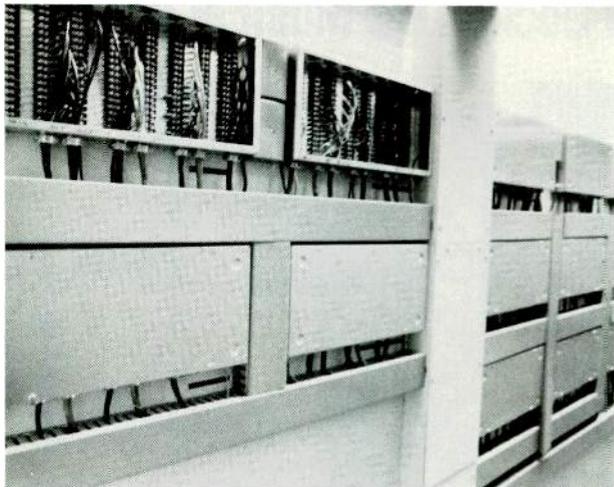
Circle 187 on Reader Service Card for a demonstration.

Best Station Award Entries

same for good reasons. By staying with identical makes, we kept a unified appearance throughout the station. At the same time we did not introduce unfamiliar equipment to operate and we did not add to our maintenance problems. Thus we ordered a duplicate McCurdy console for our production room and we expanded our complement of reel-to-reel machines by adding four more Scullys and several additional ITC cart machines.

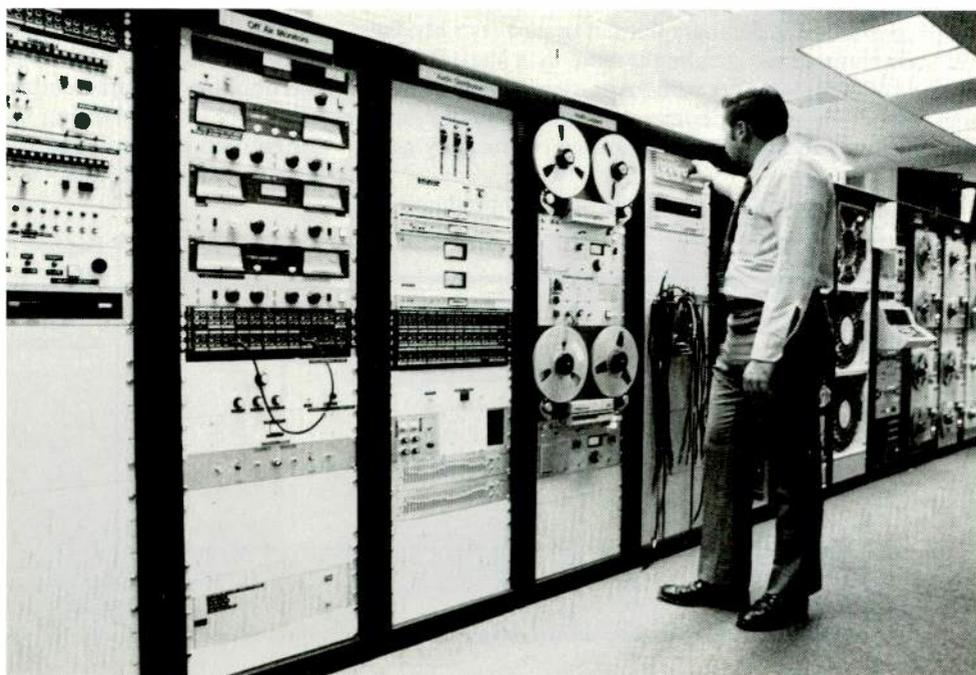
Since the Prudential Building had been the site of a TV station when it was built 21 years ago, there was, in place, a 250 ft. mast suitable for mounting a two bay FM antenna. Thus, as we began to prewire the new studio complex, using metal underfloor relays, we ran our own control cable from the studio to the 40th floor where the transmitter was located.

We had no problem in planning for the eventual transfer of equipment to the new studio. As standard practice we use connectors on everything—consoles, jackfields, reel-to-reel machines and cart machines. I have long used



These chassis pans are on the wall behind the terminal and automation rack cabinets. They are at eye level which makes for easy access.

Warren Shulz, chief engineer, adjusts monitor level. Racks contain (left to right): transmitter control, monitors, audio processing, loggers and automation.



Amphenol blue ribbon connectors to plug jackfields into an audio system. These jackfields are wired to connectors on the rear of distribution rack housings. Thus all of the old jackfields were reused simply by plugging them in at the new location. All of the plugs required for audio use a 6 pair shielded audio cable with end shield being a separate signal ground. This signal ground is carried through the field distribution wiring. Chassis boxes with barrier strips replace the traditional terminal blocks. This takes more wall space but it gives you complete flexibility.

Studio wall construction

The entire complex is on a raised plywood deck with portions isolated from each other. The isolated deck is floating on resilient channels. Interior walls of the sound-proof rooms are floating on the isolated floor, and in turn, the ceiling of the room is supported by the isolated walls—in essence, rooms within rooms. Thus good isolation on the order of STC 60 is obtained. The common sound lock serves as a spine for the complex.

Located above the ceiling are the supply air ducts, duct heaters, and electrical conduits. The air space above the sound lock hall is a common air return for all rooms that are acoustically isolated. The air conditioner system is located about 150 ft. from the studio complex to maximize the isolation. High pressure ducts are used to connect the air handler to the studio unit. The only equipment located near by is a return air blower in the tape storage room. The rest of the system is passive. The 6 ton water-cooled air conditioner is equipped with dampers to pull outside air when the temperature falls below 55 degrees.

All the electrical service is independent of the office space and is further broken down into several sub-panels. A main panel runs studio lighting, studio air conditioning, and utility outlets. Each major room is totally separate and the breakers for that specific area are located within sight of the equipment. To maintain acoustical integrity, all wiring is surface-mounted throughout the studio complex.

All audio wiring is routed through a 3 x 10 inch metal
continued on page 56

Best Station Award Entries

duct. This raceway travels throughout the complex via a cellular floor system. All the studio phones were routed through the cellular floor duct and were kept separate from the station wiring. We even made the warning lights for the sound lock studio doors low-voltage 24 vdc flashing lamps.

We made our own master clock slave stations by fabricating an ESE countdown timer and a 6 digit ESE Numertron display mounted on one rack panel. The automation time of day clock (automation goes on from midnight to 5:30 a.m.) drives the four time display stations with BCD data. The local 60 minute timers serve as countdown timers in each room.

We also combined various signals such as transmitter status alarm, hot line telephone, off air alarm, EBS alarm into a studio status alarm that rings a 6 inch bell and

operates remote stations located in the overhead rack in both control and production rooms. We handled the studio audio routing switcher by designing our own latching relay switch which handles three stereo sources. Finally we used the turret racks over the consoles to hold items such as the remote modulation frequency monitor, oscilloscope phase monitor, studio status tally lights, and countdown timer/time of day readout. This places items in view but not in the way.

We have a well equipped center studio capable of working into either the control room or the production room. It is set up to do a telephone talk show, on delay with a panic feature.

I feel that we have constructed a full service radio facility that can handle any technical requirements in the foreseeable future. The facility started with a net worth of \$40,000 and after the improvements it would take in excess of a half million dollars to replace it. From my personal view, it was truly an opportunity to do it the correct way from the ground floor and up.

WCCO-FM: Uses Technicians And Jocks Like Musical Duo

BEST STATION AWARD CONTEST FM RADIO ENTRY 6

Submitted by Tim Prouty, Chief Engineer,
WCCO-FM Minneapolis

ACCORDING TO STATION manager, Paul Jacobson: "WCCO-FM didn't become a superior facility because of an FCC allocation in the right geographical location or luck. A great measure of the credit should go to our ownership and decision-makers, who, at the onset, had the courage and conviction to expend proper venture capital in order to purchase Cadillac gear, hire extremely talented and dedicated people, et al, right down the line."

Two years ago, WCCO-FM, a Class C FM at 102.9 was ranked 17th in the highly competitive Minneapolis-St. Paul market. Today we are the leading FM and rank 2nd overall in most adult demographics. The past four books have shown us that our standing is more than just a fluke. This kind of progress is not without its lumps and growing pains, especially when it comes to planning studio and office facilities that won't be outgrown before they are finished.

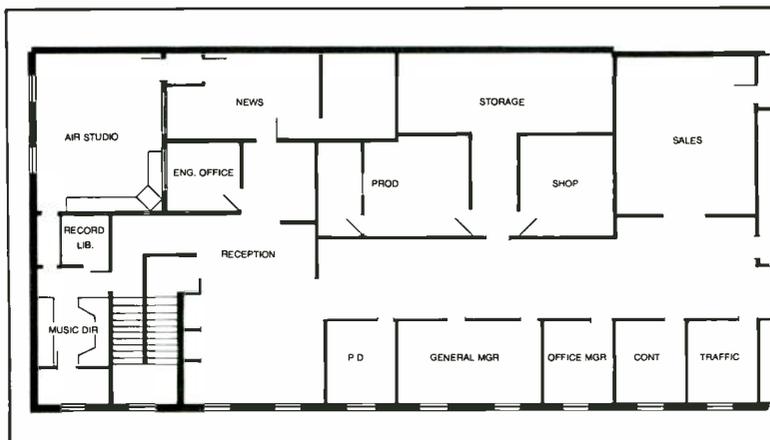
A complete renovation of news, office, and production



Reception area of WCCO. Modern decor reflects upbeat nature of WCCO programming.

facilities has just been finished. We are all quite pleased with the result. All of the planning and most of the work was done by our staff members. This was quite important, especially in the planning stages, because we had more insight into our particular needs than an architect or designer would have had. Most of the work took place

continued on page 58

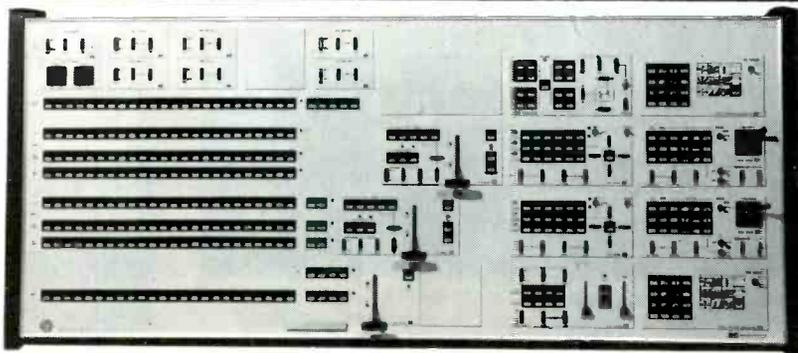


Engineering is located near production, news and air studio for easy access. Offices are located away from the technical plant.



Central Dynamics Creator of "the Smart Switcher"

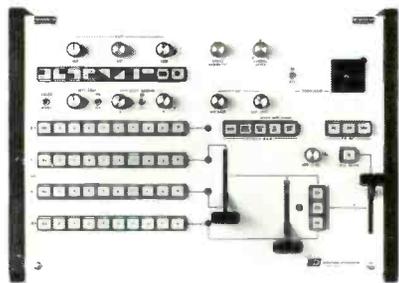
The super powerful CD-480 Video Switcher



Revolutionary modular switchers with unprecedented production power. They outperform the largest conventional switchers, yet are extremely simple to operate. Their power and ease of operation are due to CDL's new Sequential Effects (SFX) Amplifier, which can cut, mix or wipe between background sources and two separate key

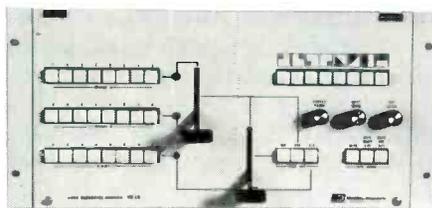
sources either individually or in any combination. Models with one or two SFX Amplifiers provide all the standard and optional features you need. A variety of modular accessories will continue to keep your switchers smarter than the rest as new technology develops.

The sophisticated VS-14



Sophisticated enough for large studio production, yet compact and inexpensive enough for small mobiles. Soft wipes and keys—even a Downstreamer keyer are standard. Self-contained and remote versions available.

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Best Station Award Entries



The absence of separating glass makes for informal working conditions and an honest one-to-one conversational sound.

during a period of rapid growth. Several projects were modified at mid-point to accommodate changing needs and staff expansion. WCCO-FM now employs 28 full-time and 6 part-time people.

Our programming and operations are derived from a blend of tradition and innovation. The end product is a human sound, delivered by people for people, and a quality that has become a standard in this market. Technicians operate all of the on-air and production equipment. Just like the good ole' days? Not quite. There is no glass in the air studio, just a large room with equipment well laid out, and large windows that look out to downtown Minneapolis. Here, the announcer and engineer perform together not unlike musicians doing a duet. An expensive way to operate? Yes, but it's worth it.

There are 8 technicians, 3 of them are women, all hold a 1st phone. Electronics expertise is not the primary qualification for our techs. Instead production skills, timing, and the ability to think fast. With this system properly applied the announcers have time to think and prepare. Their delivery is relaxed. The format is best described as "popular or adult contemporary", 100% live. No simulcasting. No syndicated services. Newscasts are on the hour and half hour. Prepared by our news people, the focus is on localized, "humanized" reporting.

Technically, we've tried to stay as current as possible, which is no easy task these days. On the transmitting side we use RCA equipment. Two 20 kW transmitters feed an 8 bay circularly polarized antenna that is side mounted on a tower 1304 feet above average terrain. The transmitter site is in Shoreview, a suburb north of St. Paul. A crew of highly skilled technicians maintain the transmitters for both WCCO-FM and WCCO television. Phone lines and a composite Moseley microwave system provide the link from the studios in downtown Minneapolis. The only inline audio processing we use is a Optimod 8000. We may be 3 dB lower than our louder competitors, but the brightness of our sound more than compensates for that. We constantly receive inquiries about how we do it.

Part of the answer goes back to our use of technicians with the announcers. If an announcer is busy reading copy



All live programming originates from one large studio. No booths.



Equipment is organized so that everything is at technician's fingertips.

and trying to put some feeling into it he can't pay proper attention to the meters. The technicians can, and since they are chosen for their talent as well as their technical expertise, we achieve a very tight and human sound. Another key has been the development of the interpersonal relationship between the announcer and tech.

We also use discs almost exclusively. We avoid using singles and take most of our music from LPs. Only about fifteen selections are on carts either because we couldn't get the record or it needed to be shortened.

All our cart equipment is ITC and is used for jingles, commercials, and those few musical selections. We also have two ITC-850, and Ampex AC-440s. In production we do use Tapco equalizer and reverb for some special effects or to clean up a dirty tape. We have an RCA-BC-7 stereo console but it has been completely rebuilt. In the production studio which was built by Tim Prouty, chief engineer, we use a Sparta AS-40 console which was part of the station's original equipment. We have added an extender panel and increased the number of inputs by five. The production room is wired so that it can be put on air.

Said station manager, Paul Jacobson, "Even though WCCO-FM is technically better-than-adequate and state of the art in most areas, we are still not satisfied. Tim Prouty, our chief, and I are constantly talking with consultants and picking their brains. Right now, we're undergo-

continued on page 60

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EEV has been in the forefront of photoconductive pick-up tube manufacture for many years and our latest vidicons are the result of applied long experience. Not to mention the skilled knowledge you expect from EEV.

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Best Station Award Entries



Recently completed production room can double as an on-air studio.



News production center is newly designed for efficiency.

ing a range study, which, hopefully, will tell us something about our transmitter site . . . antenna, tower mounting, size of plumbing, audio link, et cetera.

"In essence," said Jacobson, we're working from a base of good attitude, history and common sense. Some of our industry friends in Detroit refer to the WCCOs as "General Motors". I'm terribly proud of that type of unsolicited remark. Nice statement . . . and well-

deserved! The WCCO call letters have been in the vanguard in so many broadcast areas and the fledgling FM-side intends to perpetuate all the good things of the past and help mold better techniques for the future. I know that sounds idealistic and romantic, but broadcasting is a powerful calling and we at WCCO-FM, recognize the responsibility. We don't plan to go to sleep or hitchhike with the norm."

WFTW-AM And FM (Simulcast): We May Be A Small Market But We Take Broadcasting In A Big Market Way

BEST STATION AWARD CONTEST AM RADIO ENTRY 7

Submitted by Carl Shelenberger, Chief Engineer,
WFTW, Ft. Walton Beach, Fla.

WFTW-AM/FM IS A simulcast operation. We are currently a daytime AM and 24 hour FM stereo station but we know that we may soon be required to split those operations. For a small market station that presents certain problems. We need to keep our current operation first rate and yet we have to look down the road to the day when we'll have to have two first rate operations. Our resources are limited but our expectations are not.

We have recently gone to the newly authorized 2500 watt power on AM. Our AM transmitter is Model 703 B Sparta (almost new) feeding into a 210 foot shunt fed tower. We kept our previous transmitter, a Gates BC-1F, for use as an auxiliary. We have installed an antenna switch with status lamps for switching from one transmitter to the other as needed.

Our FM stereo uses a Collins 831D-1B transmitter with a three-bay circularly polarized antenna, side mounted at the top of our tower. FM power is 2250 watts out into a 1 $\frac{1}{2}$ line. Antenna gain is 1.48 for an ERP of 3000 watts. An Onan emergency power generator will handle the entire plant and ensures that we'll be on the air when the public needs us most.

We produce eleven daily newscasts dealing strictly



Technical director, Carl Shelenberger. Weather instruments are in specially designed cabinet overhead. Booth is visible to visitors in the lobby through the glass panel.

with local Gulf Coast news. We also produce an "Outdoors" program daily. All news is produced from one room which saves valuable time unlike our previous method when news was produced in one room and aired

continued on page 63

the AMERICAN DATA

558-1

NEW FOR '77!



The 558-1 is a compact video processor that provides small studio and remote van operators with production capabilities found only in large studio systems. **Four Channel Parallel Video Processing** allows mix, wipe, luminance key, and chroma key functions to be performed *simultaneously* on a single mix/effects amplifier. This *revolutionary approach* to video systems flexibility is a continuation to the fourth generation of production switchers *pioneered by American Data*.

standard features:

- Nine primary inputs, including blackburst, plus five external key inputs.
- 100 soft wipe patterns, including rotational wipes; H and V multipliers; pattern positioner; pattern modulator, soft bordered wipes.
- Spotlight with 0-100% variable attenuation.
- Three independent key processing systems.
- Adjustable rate key blink; key invert.
- Two independent color matte generators.

- Full camera tally.
- Available for NTSC, PAL, PAL-M standards.

options:

- One Bus Quad Split.
- Linear RGB chroma keyer and camera input selector.
- Two key edge generators.
- Third color matte generator.



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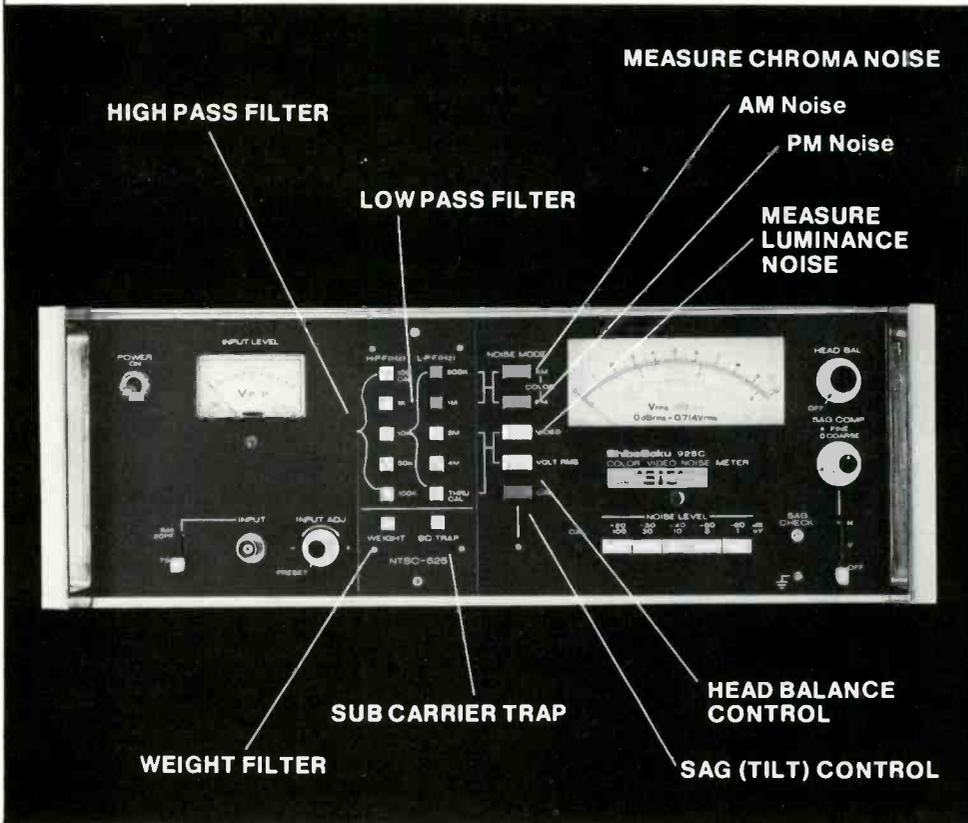
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Measure the value of this unique instrument*, Model 925C Video Noise Meter, and you'll see why it has been purchased by a major USA network. It measures chrome band noise with a single color signal of desired level that contains both a sync signal and a color burst signal. Chroma noise can even be split into AM and PM components which can be measured separately. Unbalanced 2 head of VTR can be corrected for proper measurement.

A must for every station and production house in TV. Write for information.

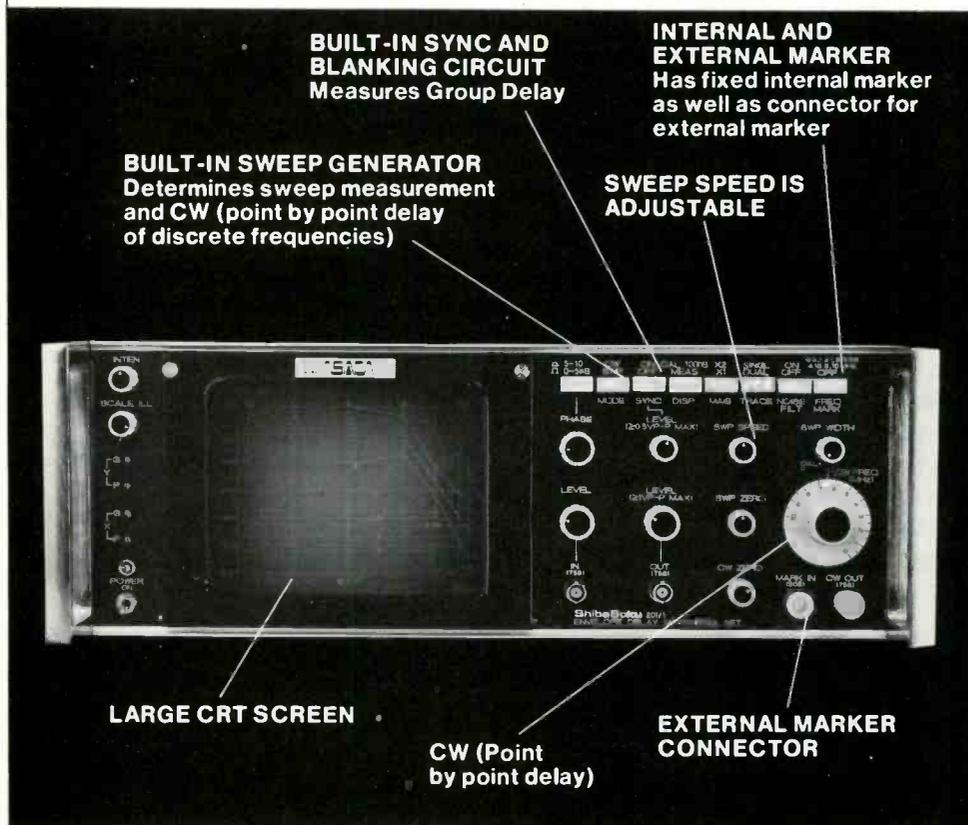
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Best Station Award Entries



Looking from conference room in which panel discussions are held shows view of control room and news room further down the line. Straight line of sight configuration of rooms makes cueing easier.

Carl Shelenberger trains on-air personality, Bill Griffith, at console as program director Mike Bridges looks on. Formica top on console is mounted with "piano hinge" so that it folds up for simple access to console wiring.



from another. The news department is CB equipped to stay in touch with the charter boat fleet in nearby Destin, Fla. This has paid off on numerous occasions involving emergencies at sea.

News also has three multi-channel scanners to cover all law enforcement, ambulance and Coast Guard activity. We have two-way radio and the ability to send or receive telephone feeds. Everything can be taped and carted as required. For the reporters, this means that they can use either the two-way radio or telephone. We use a Marti RPU with Sonar receiver in our recently acquired news van. The van is equipped to seat seven people comfortably, and has ¾-in. pressed wood flooring on top of the regular metal chassis. Nearly all the work was done in-house. In addition, we have four radio equipped cars. Eventually we'll equip the van for remote keying. Since we have a large beach area and are not always able to get close to the action, we have looked into and tested the Comrex wireless units which look promising.

With an eye toward the eventual cessation of simulcast operations, it was necessary to update our control room facilities. After much deliberation, we decided to purchase a Collins IC-10A ten channel board with stereo, mono, and audition feeds. Our turntables are two outstanding SP10-MKII's and we use Ampex PR-10 reel-to-reel machines. We have built a patch panel that gives us the capability to patch virtually anything to anything. Our alarm systems include a bulletin alarm lamp from the AP wire machine, an AM loss of audio/transmitter warning lamp, an FM loss of transmitter lamp, a cue lamp from news to main control, and an EBS alarm lamp, and we have devised an intercom system between news and the control room from "Q" amp. Two spare lines were installed in each level of a newly installed three-level duct system for future needs.

We believe that the ability to see all the various station

areas from the main control room is very important. We have laid out the area so that Studio "A", Studio "C", lobby and the news room are all within eye sight. This feature alone has made the entire project worthwhile. To help with personality identification, each announcer has a name plate which can be inserted into a holder and is visible from outside the booth.

Phone calls can be placed on air by merely pressing the appropriate line button, placing the switch on channel nine or ten to program and throwing the mic switch to audition. The announcer wears a headset for this operation but it is otherwise "handsfree" which is very helpful when doing call-in shows. I know because I do a talk show called "What's On Your Mind?" each weekday at 2 pm.

Shows of this type have not always been as easy for us as they are now. Our local telco, Centel, installed an entirely new phone system for us and cut it over the same night I cut over to the new control room. The new system has cleared up the RFI which used to plague our telephone operation. Listeners now frequently comment about the high quality of our on-air phone conversations.

All on-air audio equipment is remote controlled. Any remote operation, except reel-to-reel, starts a digital clock. We have modified our 3-D cart machine for sequencing. All our music is from disc and before launching the new facility, we bought all new records. The SP-10 tables are equipped with Micro-Trak arms and Stanton cartridges and track at about 1½ grams.

New WX weather equipment is installed just above the operator's eye level in a custom ceiling mounted cabinet. The equipment includes barometer, thermometer, and wind/speed/direction information from Mt. Washington.

All wiring is now enclosed in specially built duct work from one end of the station to the other. We have gone from almost all exposed wiring to virtually zero exposed

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Best Station Award Entries

wiring. The importance of grounding has not been overlooked; in fact it was an education. Everything is now grounded including conduits buried in concrete. This is particularly important in co-located studio-transmitter sites such as ours.

We are honestly convinced that both our AM and FM signal quality is the best in Northwest Florida. It may

sound far out but some of our non-stereo listeners wonder at times whether they're listening to the AM or FM. I use only a UREI model BL-40 limiter in the AM chain. Our FM uses the Audimax and Volumax. I went over the old Gates F-1C transmitter thoroughly after we installed the new Collins and it now provides excellent backup.

I am currently preparing Studio "A" for the day when we make the switch to split programming on the FM but we have gone a long way towards preparing the foundation of a fine station for our audience.

WWPA: New Management + New Facility + New Equipment + Devastating Fire = "The New Era"

BEST STATION AWARD CONTEST AM RADIO ENTRY 8

Based on information submitted by W. William Ott, general manager, WWPA, Williamsport, Pa.

WILLIAMSPORT, PENNSYLVANIA has four AM and three FM stations with total or partially separated programming. WWPA, a CBS affiliate, has been holding its own since 1949 with principally a very adult MOR, regional and national news, and features. In January 1976, William Ott, a CPA by trade, suddenly found himself general manager of the station after his father's death. He also found that the community of 40,000 people and its suburban and rural area of an additional 60,000 people had changed as had radio in general.

Bill Ott, his chief engineer, Carl Steinbacher, and program director, Ken Sawyer, took a careful look at the plant and facility that had housed WWPA for 28 years and found it ill prepared for 1977 radio. Soon they found a building that would keep WWPA in center city and allow for expansion. The building wasn't perfect; it was half an old office building and half a concrete slab but with careful building, the newly leased property could serve the future of WWPA.

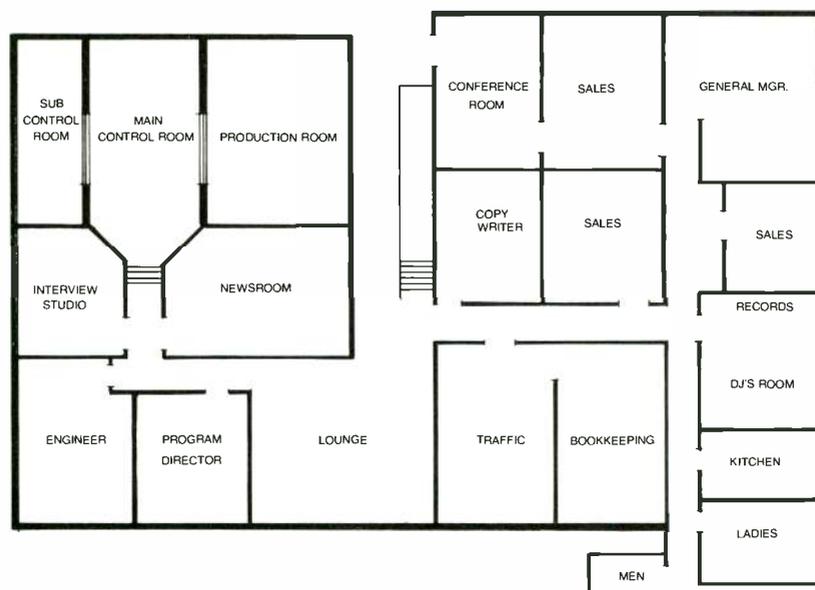
Ott, Steinbacher, and Sawyer, with input from other staff members, spent many hours drafting plans and blueprinting everything, including placement of as yet

unpurchased equipment and internal wiring. The group planned a main control room, sub-control room (primarily for production), production room, news room, and interview studio. Despite limited funds, the *esprit-de-corps* and competency of the staff carried them through top completion, finalization, and implementation of the plans.

While an understanding landlord helped to assemble a work crew and construction began, the staff of WWPA, "The Spirit of Williamsport", began looking at equipment. Relying heavily on the experience of chief engineer Steinbacher, the trio, including Ott, and Sawyer, began selecting equipment with an eye to the future. The three felt that stereo AM "was just around the corner" so they began by selecting a Sparta-Cetec Centurion II Audio Console. The board would increase the speed and efficiency on a switch to stereo. It was felt that the various remote control features of the Centurion II and space to add more mixer modules without changing the basic control room set up was a definite long term advantage.

Steinbacher and his assistant Rodney Smeal, adapted the station's Gates SA-50 dual channel board for use in the new sub-control room. Line 1 amp feeds channel 1 on an Otari and channel 1 of a Magnecord 1022. Line 2 amp feeds channel 2 of both reel-to-reel machines. The sub-control room also has two Gates turntables, one Gates playback cart, one Sparta record-playback cart, one Otari

continued on page 66



Until now you wouldn't consider buying a demod for \$1775.



The remarkable Scientific-Atlanta 6250 falls about \$7,000 short of the price you might normally pay for a comparable high quality demodulator. But it doesn't fall short in engineering and performance. We've sold over 300 6250 Demodulators since its introduction a year ago. In fact one group of station engineers wrote, "we are amazed at your demod's performance," after comparative bench tests against a unit close to the \$10,000 range.

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Consider the features: Zero chopper capable of operation from external as well as internal command. Envelope detector with optional syn-

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Best Station Award Entries

the new location would mean sacrificing much of the new WHPA. Sales and administrative workers moved to hotel rooms for the next four months and the operations staff endured.

The move is now complete and The New Era has

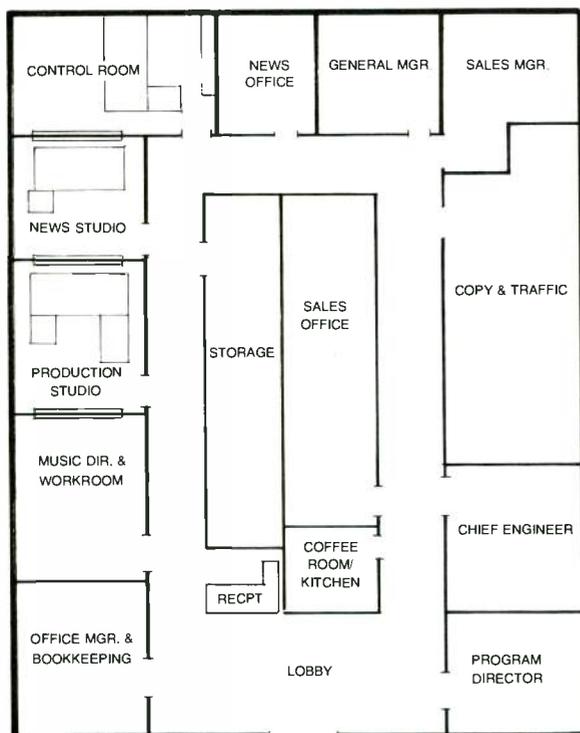
WRJZ: Renovation and Programming Change Leads To Business Success

BEST STATION AWARD CONTEST AM RADIO ENTRY 9

Submitted by Jim Ridings, General Manager,
WRJZ, Knoxville, Tenn.

ON OCTOBER 1, 1976, Basic Media of Asheville, North Carolina, assumed control of WETE Radio in Knoxville, Tennessee. WETE, at 620 kHz, was sixth in the market, financially feeble, delivered a non-descript MOR format and its technical plant was in a state of disrepair. Studio and offices were located in a downtown office building which provided inadequate space but with 5 years remaining on the lease, the decision was made to make the most of a bad situation. A cursory inspection of the facilities by new owner and technical director, Rick Jorgensen, indicated that much needed to be done to turn the station around.

The floor plan shows how the facilities were remodeled into an efficient layout. To improve the appearance of the place, studios and offices were repainted, carpeted, and



Much work went into designing an efficient layout in an area that was far from optimal.

begun. Pleasant working conditions provide us with an environment conducive to efficient and effective productivity. In 1977 we overcame extreme adversity in order to provide our listeners with top-quality programming which is informative and entertaining and to serve our advertisers with timely, well-produced and imaginative ideas. It all goes to show what planning, organization, patience, dedication and teamwork can accomplish.

refurnished. Before and after photos (Fig. 1 and Fig. 2) show the dramatic change wrought in just the studio. Similar improvements were made in the production and news studios.

With new call letters, WRJZ became a 5 kW, fulltime station utilizing a DA-2 antenna system. The transmitter is about 4 miles from the studios and operated by a Moseley PBR-30A remote control system. At the time the station was purchased, the transmitter and antenna system were in a state of disrepair. The transmitter AC wiring and audio wiring was a mess, the auxiliary transmitter was inoperable, and the antenna failsafe switching (required for third phone operators) was unreliable taking a full four seconds to change patterns.

The AC and audio were rewired, the auxiliary transmitter repaired and a new antenna switcher was built. The new antenna switcher changes patterns reliably in about 1/3 of a second. The antenna tuning units dated back to 1940 and were built in steel cabinets. Open wire transmission lines were used in the four tower array, with about 3000 feet between the most distant towers. Extreme instability in the system was traced to the tuning units, tower lightning chokes and open wire transmission. While the lines remain to be dealt with at a later date, the tuning units have been replaced and are housed in masonry "dog houses" located at the base of each tower. The dog houses were built by chief engineer Kevin Douglass with help from Rick Jorgensen. The troublesome lightning chokes were replaced with Austin transformers. With a much improved transmitting system and the rebuilt antenna system, stability problems have virtually disappeared.

The studios, however, were in as much need of renovation as the transmitting and antenna system. The Collins 212 console in the main control room was replaced with one built to our design by ROH Corporation of Atlanta, Georgia. It was customized for the personality Top 40 format planned for the station without any superfluous functions to get in the way of the fast-paced format.

The customized 12 x 2 dual system console uses DC switching and all active circuitry is located in card frames in the equipment rack. It has been in use for over a year now, 24 hours a day, seven days a week, without failure or unscheduled downtime. Since the format calls for heavy listener involvement through taped phone calls, one channel feeds an Ampex recorder while the other channel is on air. The console also has full cue and monitoring facilities plus a built-in digital clock and count up timer. Remote starts and status lights are provided for the six ITC cart decks which are used for all music and commercials. The decks are wired for sequencing and end warnings through the use of secondary and tertiary tones.

WRJZ's audio processing is accomplished by a CBS



The main studio before renovation (left) and after the renovation (right).



440A Audimax, followed by a 15 kHz Telco line, a CBS 4500 Dynamic Presence equalizer, a UREI 527A 1/3 octave graphic equalizer, and a CBS 4000A Volumax. Limiting is held to about 7 dB.

In order to keep cost down, the five Ampex 351 recorders were upgraded using Inovonics 375 electronics rather than replacing them with new units. The news and production studios were outfitted with new ITC cart equipment replacing 15 year old Criterions. A new console was installed in the news studio to allow for its expanded role in the new format. All studio walls and floors were carpeted to dampen ambient noise and reflections.

With a vastly improved plant, WRJZ was now ready, by Nov. 8, 1976, to launch its personality Top 40 format developed by program director Bob Kaghan. A massive multi-media blitz soon made the phrase "Who's Gothcha

Now?" a byword in Eastern Tennessee. The audience began turning to WRJZ in droves, not only for the personality Top 40 format but for the other programming innovations as well. WRJZ launched a two-man morning show, a toll free request line from surrounding communities (a WATTS line for the entire state is now in use), a commercial load limited to 12 minutes, and a full time female air personality.

For the first year, WRJZ gave away at least one prize every hour of every day. Major prizes included brand new cars and an "Around the World" prize package worth in excess of \$9000. Motion picture premieres for films such as "Star Wars" and "One On One" have been very successful. Within 90 days, an overnight ARB found WRJZ dominant in the market. By April 1977, Arbitron showed WRJZ with an 18.1 percent share of total audi-

continued on page 70

Split Second Time Machine

The Telex/Magnecord 1400 recorder. Split second timing with a grid of 524 lines passing a quartz crystal control reference each capstan revolution. This senses, and corrects the speed of the DC servo drive some 4000 times per second*. Speed stability is so accurate the National Weather and the Environmental Satellite Services selected Telex/Magnecord 1400's over all others to record meteorological display data.

Of course, broadcasters also favor the 1400 for the rugged stability of the die cast main frame, DTL logic and exceptionally clean electronics. Compare our speed, specs, and price. We invite you to make a split second decision.

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ence and top rated with adults 18-34 and 18-49 as well as teens.

The format changes won an Award of Excellence from Radio Music Report and the news staff, headed by Ernie Baker, earned awards from the Society of Professional

Journalists and the state Associated Press. WRJZ now reports to all major music trade publications. This rapid rise to success has also affected the bottom line. Sales manager Ron Hamilton reports sales have quadrupled since February and billing is expected to double in the next year. Eighty-five percent of this business is local and regional. No matter how you look at it, it's been a very good year for WRJZ.

WDCN-TV: Seven Years In The Planning—An Unlimited Future

BEST STATION AWARD CONTEST TELEVISION ENTRY 10

Based on information from the staff of WDCN, Nashville, Tenn.

THE SAYING THAT "all good things come to those who wait" is only partially true. You have to wait creatively—that is, thinking all the time about how to take advantage of opportunity if it knocks and you have to plan beyond the moment, well into the future.

WDCN-TV, Channel 8, is licensed to the Metropolitan Board of Education in Nashville, and is Eastern Tennessee's PBS affiliate. For years it operated out of a dingy building with inadequate space for its 49 employees. The studio measured just 750 square feet. Years of tunneling and make-do construction had made the building open to the elements and dirt collected in corners and spread through the facility no matter how frequently it was cleaned. The staff spent a good deal of time daydreaming about a better day ahead.

In 1970, station WSIX, then on channel 8, wanted to improve its signal as part of a revamping plan that eventually included changing its call letters to WNGE-TV. WDCN was on channel 2 and its executive vice president and general manager, Bob Shepherd, opened discussions to swap channels with WSIX. This was the opportunity

and by 1973 the swap was made. The swap involved some desperately needed money and immediate opportunity to upgrade WDCN from monochrome to color.

A master plan was evolved that foresaw an eventual opportunity to build a brand new facility. Rather than leap into a fullscale replacement program, the color capability was built into a 22 foot Ford van to give the station a mobile operations capability. The van was designed to lock into the station for on-air color playback as well. Meanwhile, the entire staff was assigned the task of outlining all needs for the next ten years. This may seem like a difficult task but a lot of those needs were just based on catching up with the state of technology. There was no threat that the staff would come up with a plan filled with frivolous convenience since they already needed so much just to reach a state of adequacy.

The plan evolved and with additional funding from HEW, a \$1.5 million bond issue, and their own fund raising, a \$4 million dollar commitment to public educational broadcasting was made.

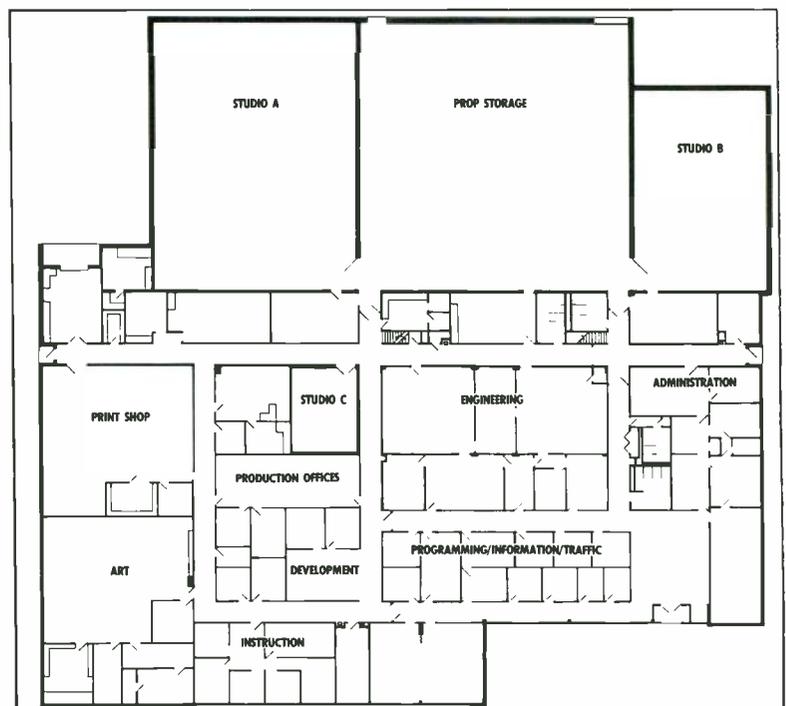
The new building is built for today and tomorrow. The building was designed by Hart-Freeland-Roberts, Inc., engineers and architects of Nashville. Its 54,451 square feet of floor area allots 7,675 square feet to three studios, with room for additional studio expansion when required. All WDCN department heads, after soliciting input from their staffs, worked closely with the designers on the

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The stunning new home of WDCN.

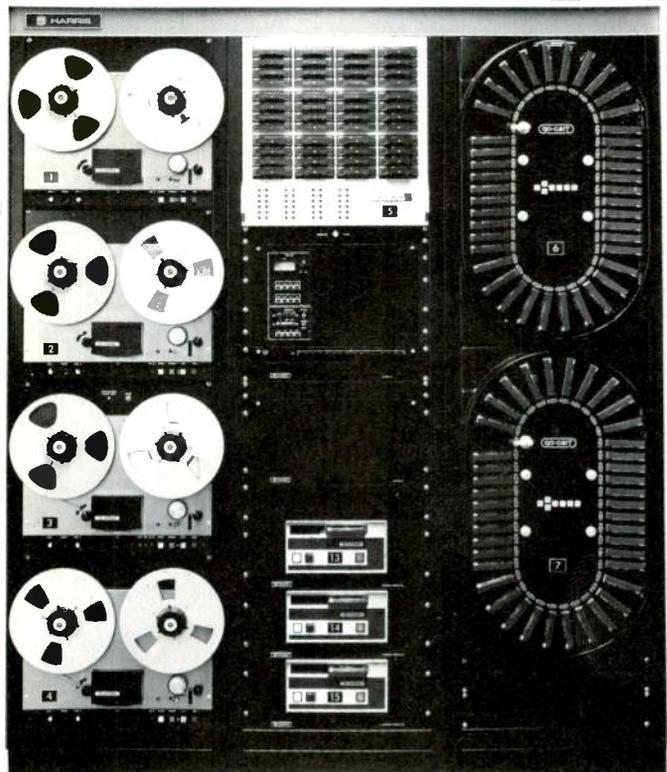
Layout reflects effective location of engineering offices near action stations and attention paid to future needs.



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KSER-FM Searcy	WMRI-FM Marion	WSYR-FM Syracuse
KPAY-FM Chico	KGRS-FM Burlington	WBT-FM Charlotte
KFRY-FM Fresno	WFKY-AM Frankfort	WBIG-AM Greensboro
KFIV-FM Modesto	WKYW-FM Frankfort	WHSL-FM Wilmington
KCTC-FM Sacramento	KEZM-AM Sulphur	WHBC-FM Canton
KGMS-AM Sacramento	KSNS-FM, Lake Charles	KTJS-AM Hobart
KUBC-FM Montrose	WOXO-FM Norway	KFJL-AM Oklahoma City
WFYN-FM Key West	WXIV-AM Norway	WMYB-FM Myrtle Beach
WAJB-FM Pensacola	WMNB-FM North Adams	WASC-AM Spartanburg
WBBQ-FM Augusta	WNCR-AM Worcester	KWMJ-FM Midland
WMAZ-FM Macon	KSUM-AM Fairmont	KCWM-FM Victoria
WGAF-AM Valdosta	KTIS-AM Minneapolis	WWVA-FM Wheeling
WVLD-AM Valdosta	KTIS-FM Minneapolis	WXRO-FM Beaver Dam
WBNQ-FM Bloomington	KWWR-FM Mexico	WPDR-FM Portage
WRMN-AM Elgin	KXEO-AM Mexico	KOVE-AM Lander
WGEM-AM Quincy	KEZO-FM Omaha	KDLY-FM Lander
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WQCY-FM Quincy	KOB-FM Albuquerque	



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Production manager, Mike Kruger, at WDCN production switcher.



Audio Designs custom console reflects WDCN's plans to take advantage of Nashville's talent pool.

layout of the station. A tour by the architects, station management and a member of the board of other facilities helped in determining the allocation of space. For one thing, it was discovered that the need for storage was habitually underestimated. As a result, prop storage at WDCN includes an enormous area for this purpose and each operating area of the station allows for current and future growth of storage space.

The station takes its role of "public television" very seriously. As a result, all operating areas of the station are visible to visitors. Tours by school children and other interested groups are frequent. Liberal use of glass walls provides views of engineering, master control, production, studios; even the print shop. In addition, the public is invited to use the meeting room facilities in the station. During the periodic "Action Auction", nearly all office space is turned over to volunteers. Their space is planned to help them realize a sense of their importance to the station.

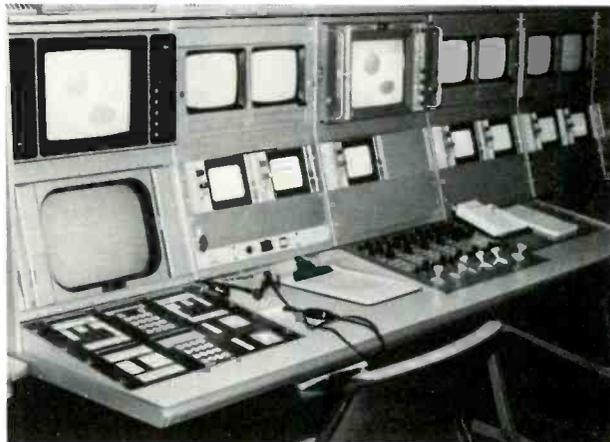
Engineering and production are centrally located so that chief engineer Carl Shirley, assistant chief engineer for broadcast, Ron Seally, and assistant chief engineer for production, Mike Arnold, have instant access to the respective action stations from their offices.

Broadcast operations are separate from production. Playback is handled by RCA TR600 A and TR61 quad machines. A black and white RCA quad machine handles the playback of most of the station's locally produced educational programs. The master control switcher is a Sarkes Tarzian. A monitoring routing switcher permits monitoring of all station equipment from master control. Microwave Associates equipment provides the STL and a microwave remote link to the van for field productions.

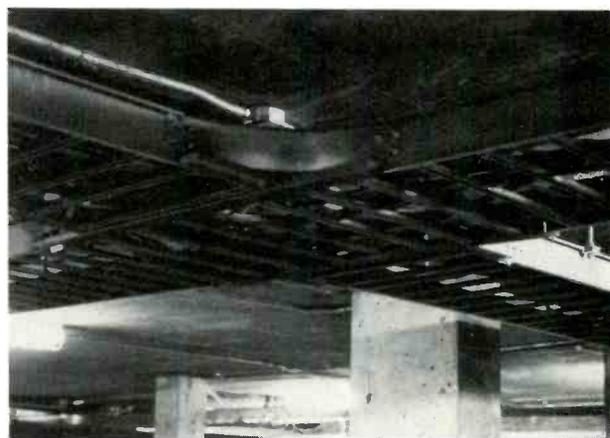
After giving considerable consideration to computer flooring for cable ways, it was decided instead to go ahead with a basement and suspend troughs from the basement ceiling to carry all cables. This has proved to be a very wise decision. Not only is cable access very easy, but the addition of a basement has greatly expanded storage space. Back-up air compressors for the tape machines are housed here as well as the lighting dimmer modules thereby saving considerable space in other parts of the station.

The master control room also remotely controls the RCA TK-28 color film island. A Chyron IIIB character generator is on-line through a remote panel in master control.

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RCA AE-600 editing console. Post-production is of increasing importance at WDCN.



Cable troughs suspended from basement ceiling permit easy maintenance as well as bringing order to the wiring of the station.

TeleMation Announces First-Half Earnings

(SALT LAKE CITY, UTAH)—TeleMation, Inc., reported first-half profit of \$257,000, or 25 cents per share, on revenues of \$4,709,000. This compares to a loss of \$536,000, or 52 cents per share, on revenues of \$4,754,000 for the first half of 1976.

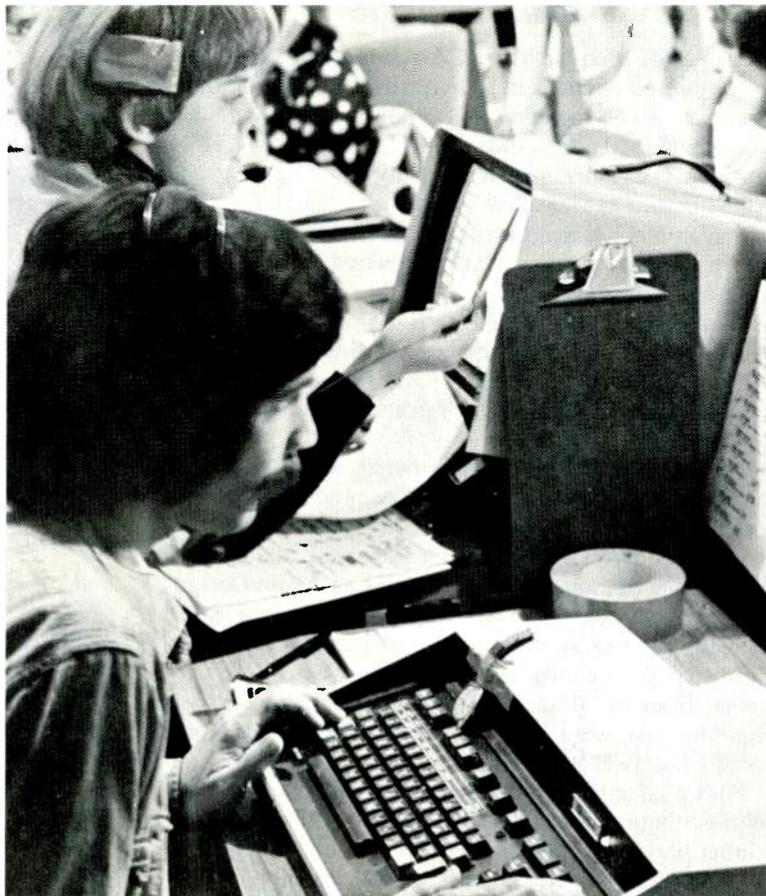
Results for the three-month period ended June 30, 1977 were a net profit of \$213,000, or 21 cents per share, on revenues of \$2,414,000 compared to the loss of \$314,000, or 30 cents per share, on revenues of \$2,339,000 for the three-month period ended June 30, 1976.

The above figures are after extraordinary credits resulting from reduction of taxes by use of a tax loss carry-forward. Profits before the extraordinary credits were \$144,000, or 14 cents per share, for the first half and \$120,000 or 12 cents per share, for the second quarter.

W. Paul Warnock, president of the video equipment manufacturing and television production company, said that the return to profitability in the first half of 1977 was due to the substantially improved performance of the hardware portion of the company's business. "TeleMation Productions, our television production studio in Chicago, continues profitable as in recent years," he stated.

He attributed the improvement in the company's hardware business to a continuing strong demand for the company's principal products and to extensive action taken at year-end 1976 to bring the company's expense level into line with revenues. Mr. Warnock pointed out that backlog at June 30 was \$1.7 million compared to \$2.1 million at December 31, 1976. "The return of our hardware business to profitability has been very gratifying to us at TeleMation. The dedicated efforts of all our employees have made it possible," he said.

TeleMation, Inc. A Salt Lake City based manufacturer of professional television equipment, maintains offices in San Francisco; Minneapolis, Danbury, Connecticut; Washington, D.C.; and London. TeleMation also operates a television commercial production division in Chicago.



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 **TeleMation**

Best Station Award Entries

Post-production has the RCA AE-600 editing system and its own compliment of RCA quad machines. The quad machines can be mounted in the van for remote production. The two major studios use RCA TK-46 and TK-45 cameras. The cameras do double duty in both the van and in the studio. The idea of having the van integrated into the station's plant has been carried on in the new facility. A bay in the prop storage area is prewired for immediate hook-up of the van.

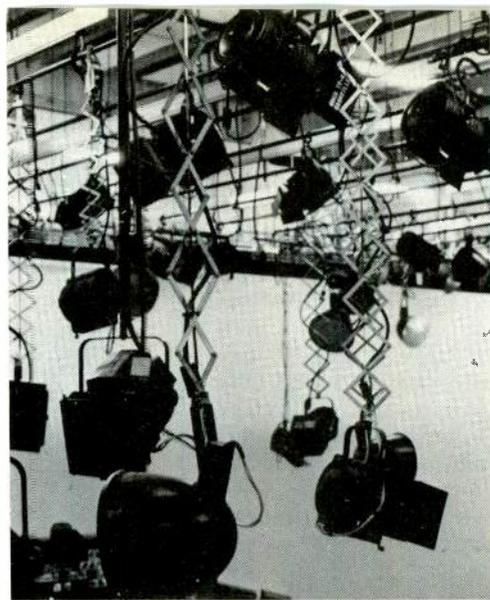
Studio A is the largest of the three studios at 60 x 80 feet. Studio B is slightly smaller and Studio C is essentially an insert stage for use by the film crew. Next to Studio C is a complete double system film audio production room.

The fact that Nashville is the Country Music Capital of the World is not lost on WDCN. The production control room which incorporates a Vital 114-3 production switcher, Chyron IIIB character generator and the full compliment of monitors, also contains an Audio Designs custom audio console. The console is a 24-input model with dbx compressor limiter and UREI graphic equalizer. Currently, productions in either Studio A or B are controlled from the single control room. Construction and planning have been done in such a way that additional control rooms can be added for other studios.

Film production plays a major role in WDCN efforts. Film editing rooms on the second floor contain Moviola editing positions with a flatbed editor soon to be added.

Work areas for the station's producers/directors have been carefully designed as have the work spaces for the station's graphic artist. The environment is open and promotes creativity.

All in all, WDCN is a commitment to excellence. When PBS is ready with its satellite system, WDCN will be too. The site for the earth station has been chosen and examined. Construction will start soon. For today and tomorrow, the new WDCN is ready.



New lighting grid and dimmer system provide ultimate in flexibility.



Console is part of complete double system film sound system. WDCN relies heavily on well produced film.

Christian Broadcasting Network Makes Excellent Conversion Of Boston Warehouse For Top-Grade 2-Megawatt "U" Station

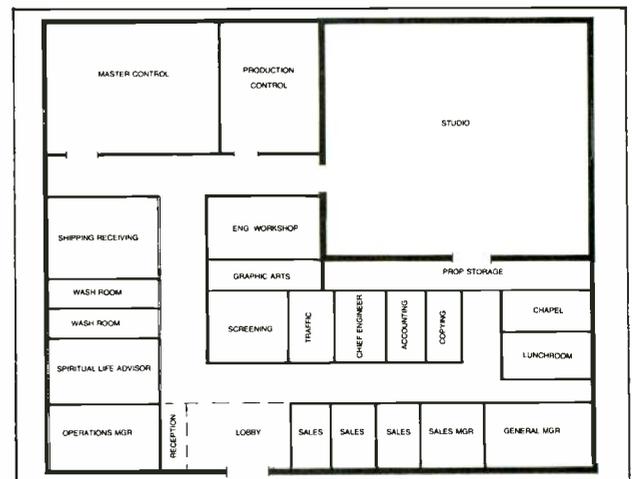
BEST STATION AWARD CONTEST TELEVISION ENTRY 11

Prepared By BM/E, based on material supplied by W.B. Knight, General Manager and William T. Gregory, Chief Engineer, WXNE, Boston.

IT TOOK ABOUT three years to find the right headquarters site, the right building, and to get space on a tower for "U" antennas in Boston. But once the road was cleared, the Christian Broadcasting Network built a 2 megawatt TV station on Channel 25 in about three months that is performing fully up to the management's desires and expectations.

As WXNE, it went on the air October 10. Two weeks later an Arbitron "overnight" indicated that WXNE will be as successful as other stations put up by this rapidly

continued on page 76



Studio, 60 x 60 ft. dominates layout of headquarters for WXNE in Needham Mass. Space for a chapel and spiritual life advisor reflect the religious nature of the station.



Can a 39¢ part ever put the CEI-310 out of action?

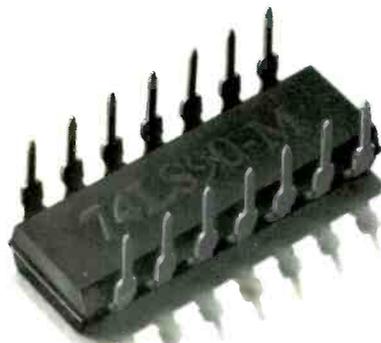
Not for long. If a 39¢ IC does blow, it's nice to know that the CEI-310 is American-made. Electronic components are American. And all readily available—from CEI or from commercial sources all over the country.

They don't have to come from the other side of the Atlantic. Or the Pacific.

And our schematics are American, too. Annotated in English. Probably a little more familiar to you than the ones from Holland or France or Japan.

But we're not just selling serviceability and easy-to-read schematics.

After all, a camera is ultimately judged by the pictures it makes. The CEI-310 gives you uncompromised full broadcast quality video performance, with outstanding signal-to-noise ratio, sensitivity, and resolution. And full production system control features.



Plus total modularity so it can do everything you've ever wanted a camera to do.

So we're not asking you to buy American because we're chauvinists. But because it's your best choice. For serviceability and for picture quality.

And **reliability**. Our customers think the CEI-310 is the most rugged, most reliable production camera on the market. Ask one of them.

Isn't it time you took a new look at CEI? Call your local CEI representative now. Or get in touch with us directly at 880 Maude Avenue, Mountain View, California 94043, (415) 969-1910.

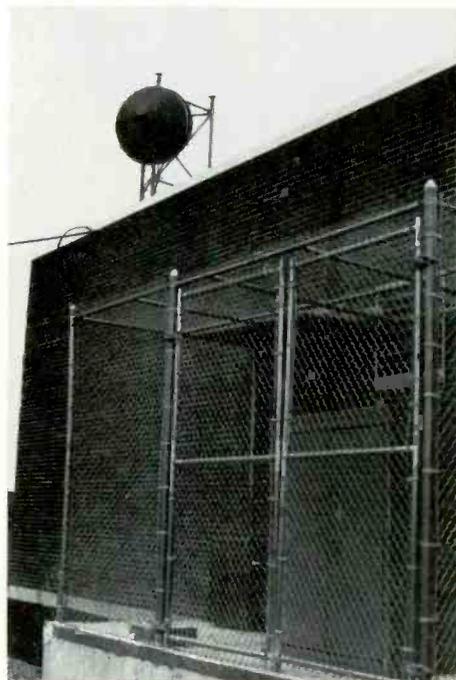
Take a new look.

CEI

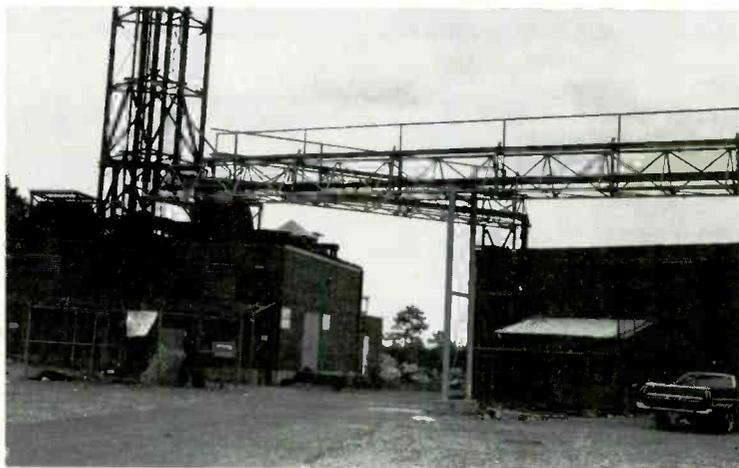
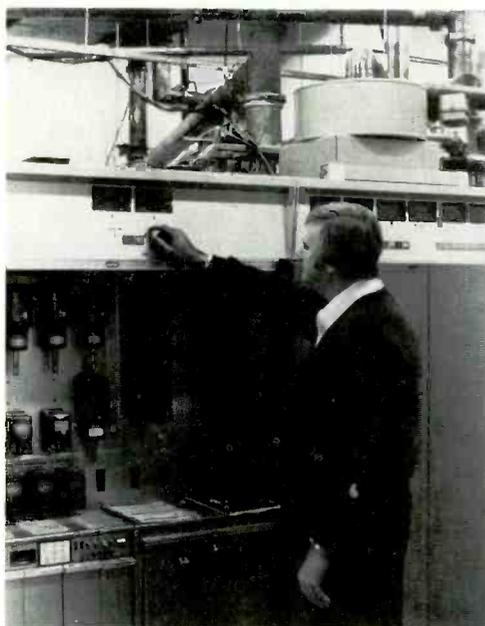
Best Station Award Entries



Master control has switching equipment by Telemet; all videotape units and film/slide equipment are in master control room.



STL sits on roof of transmitter building facing the transmitting antenna, 300 yards away. Lower right: 13.8 kV power transformer (see story).



Catwalk carries transmission line to base of tower (on left). WXNE transmitter building is at right.

(Left) Chief engineer William Gregory shows power switch on the RCA TTU-110B transmitter.

expanding network with a strongly religious orientation. CBN already had TV stations in Portsmouth, Va. (headquarters), Dallas, and Atlanta. The report on WXNE showed the station reaching about 35,000 families in the Greater Boston area, with an average of 2.4 viewers per program watched, considerably higher than per-program number of viewers for commercial stations in the area.

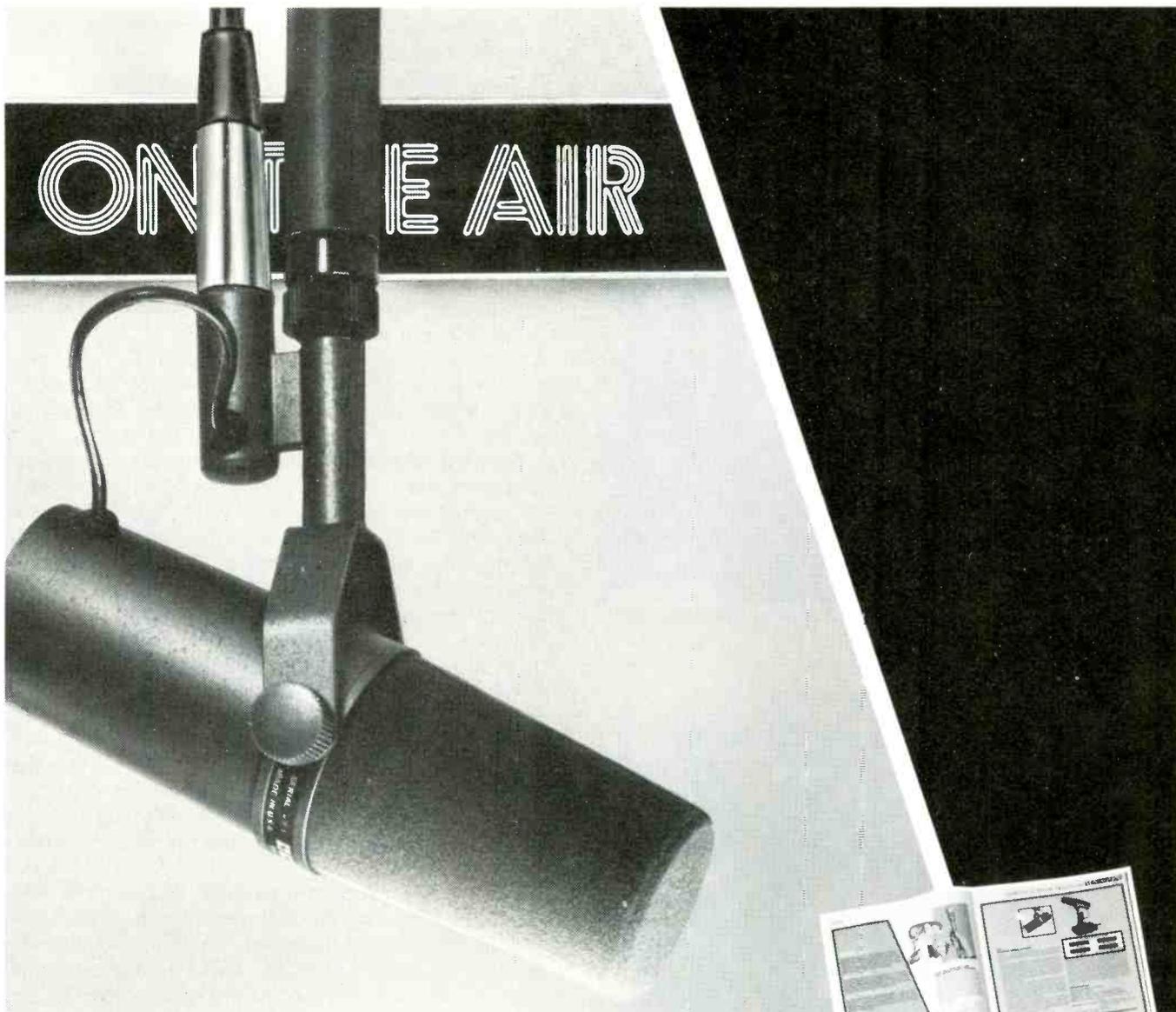
Bill Knight, general manager, came to CBN after about twenty years of broadcast executive positions, with Westinghouse and Storer stations. Bill Gregory, chief engineer, has installed every one of the four CBN television stations and their six FM stations. He laid out the studio and transmitter plant for WXNE, directed construction

and installation. The station was built under the general direction of Paul Robertson, vice president of CBN.

The successful program pattern evolved by CBN for its television stations is about one-third religious programming, with the remainder entertainment, news, public service, etc. Although CBN stations are non-profit, they do sell time to help pay for the operation. Considerable parts of both the capital and the operating costs are covered by donations.

As might be expected, all commercials and entertainment programs are strictly monitored—a large screening room is one of the basic elements of the plant. There are,

continued on page 78



Station Master.

You can virtually drive coast-to-coast without leaving the sound of a radio station using a Shure microphone. In fact, you'll encounter almost as many different models of Shure microphones as you will states.

Case in point: the Shure SM7. It features a wide-range, ultra-smooth frequency response with show 'n' tell switches that allow the user to select any of four microphone response curves: (1) flat response; (2) presence boost; (3) bass rolloff; and (4) presence boost with bass rolloff.

The SM7 also uses an innovative "air suspension" integral shock mount for super-isolation against mechanical and shock noise.

Ask your Shure dealer for a demonstration of the show 'n' tell SM7. It's one Shure "show" worth telling everybody about.

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TECHNICORNER

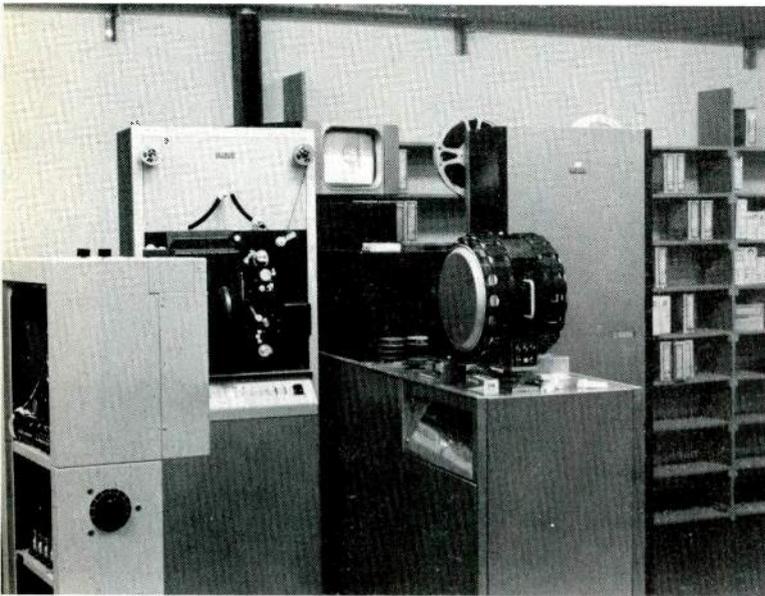
The Shure SM7 is a unidirectional dynamic microphone with a 40 to 16,000 Hz frequency response. Noise reduction systems cut mechanical noises, breath "pop," wind, and electromagnetic hum. "Add-on" filter devices are unnecessary. The SM7's integral foam wind/"pop" filter reduces even difficult close-up breath sounds. Impedance is rated at 150 ohms for microphone inputs rated from 19 to 300 ohms. Output level: -57 dB (0 dB = 1 milliwatt per 10 microbars); open circuit voltage: -79 dB (0 dB = 1 volt per microbar).



MANUFACTURERS OF HIGH FIDELITY COMPONENTS, MICROPHONES, SOUND SYSTEMS AND RELATED CIRCUITRY.

Circle 145 on Reader Service Card

Best Station Award Entries



Telecine equipment in master control room includes RCA TK27 and TK55.



Monitoring, processing and test units are installed in rack adjoining the transmitter.

for example, no liquor ads; all movies must come up to very high standards, certainly higher than the minimum for a "G" rating by the MPPA.

To produce the programming, WXNE needs complete film, tape and slide origination equipment, and a large studio for on-air programming and program production. In addition, WXNE will have direct satellite connection with headquarters in Virginia when an earth terminal has been installed near the Boston plant.

The studio building finally located for WXNE is about 300 yards from the base of the 1100 ft. tower that carries antennas for three "U" stations in Boston; it is literally just across the street from the tower in suburban Needham. It is a one story former warehouse of about 12,000 square feet and WXNE needs all of it. Some of the live programming will consist of "participation" shows with up to 100 people in the studio, all on camera at least part of the time. So Gregory assigned a space 60 ft. x 60 ft. for his studio: it is one of the largest in Boston. Of course, it also allows a show to be put on the air in front of a set in one corner.

About half the warehouse was a large open storage space, which simplified the studio construction. The only

important structural change was the removal of the single upright pillar in the middle of this space, and the addition of another truss at the ceiling to carry the roof weight. Lighting equipment went up close to the ceiling, between the steel trusses. A 20-ton air conditioning system went in the studio (the rotating machinery, of course, is outside). Insulating material was put up against all the walls, for both heat and sound isolation. This was covered with paneling which can be used for "cyclorama" backgrounds.

The ceiling of the studio space is 15 feet from the floor, and this is the one dimension Gregory would have liked to be larger; but it is thoroughly usable.

The rest of the studio plant can be seen on the floor plan. Creation of the office space followed fairly standard interior construction methods, with partitions installed as needed.

Specially related to the WXNE religious orientation are the chapel, which is for religious services for the staff; and the consultation room in which during certain programs there are 10 to 12 advisers who answer phoned questions on any topic that is disturbing a caller—the telephone number is run on the screen by character generator at intervals throughout the program. Also evident is the office for the spiritual adviser, a staff minister who participates in a number of the programs and can supply religious advice whenever called on.

For area-wide coverage on Channel 25, WXNE choose an RCA TTU-110B transmitter, which produces 1.945 megawatts of ERP (antenna is RCA TFV-25G). It is the first RCA transmitter delivered with the power-saving pulser, an integral part of the system. Bill Gregory confirmed the effectiveness of the pulser in reducing power consumption.

Much of the program production equipment is also from RCA, including the studio cameras, the VTRs (TR-40s and 70s, with 70Cs coming). The telecine equipment includes the TK27 and TK55, with Eastman projectors and slide machines. All the film and slide equipment is in the master control room, along with the VTRs and the main switching equipment—this is by Telemet. The production control switcher is an RCA TS-70.

To get the signal across the street to the transmitter building, WXNE uses a microwave system from Microwave Associates. Transmitting and receiving antennas face each other at the 300 yard distance; the signal at the receiver has to be attenuated sharply. Later WXNE will get a telco connection as a backup.

Also planned for later is remote control of the transmitter, with a wire link laid underground. WXNE has applied for authorization for this. At present the transmitter has a crew on duty whenever it is on the air.

The transmitter building went up a few yards from that of Storer's WSBK, Channel 38 and about 30 yards from the base of the tower. During the grading of the site, a buried high-voltage cable was uncovered, and WXNE could not get permission to put their building over it; they had to change the building location about 10 feet.

Gregory put in his own large supply-power transformer so the station could buy low-cost 13.8 KV power. This was another way of holding down the high cost of power for a 2-megawatt transmitter. The transmission line, eight inches in diameter, leaves the transmitter building from just under the roof and is carried by a catwalk over to the tower base (photo). At the tower it has to come down to six inches for the run to the top. It was decided that the

originally planned eight-inch run up the tower would increase the windloading on the tower too much. At the time WXNE first made its plans, there was only one other antenna on the tower; during the three year delay, a second antenna went up, and with three transmission lines, windloading became critical.

Gregory regards the transmission line as the most heavily loaded part of his plant, and uses high pressure Freon inside the tube. He has a monitoring and safety system that

takes power off the line the instant the pressure falls below a critical value. A dummy load, hung at the ceiling near where the transmission line leaves the transmitter building, can take the transmitter output instantly if that is necessary.

CBN had taken over the empty warehouse building in mid-June of 1977. Getting on the air October 10 was certainly a notable performance with a television plant so carefully planned and so high in quality.

KTIV: From a Pool Hall To The Region's Most Modern Telecasting Facility

BEST STATION AWARD CONTEST TELEVISION ENTRY 12

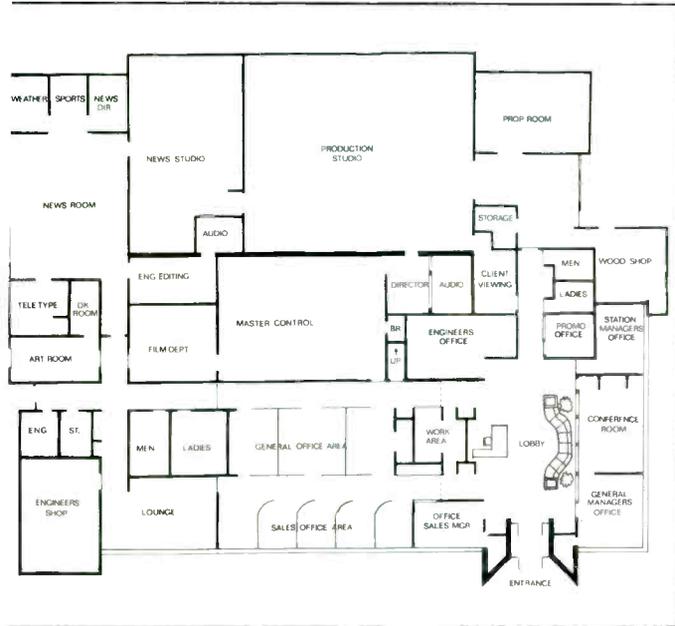
Submitted by KTIV staff, Sioux City, Iowa

AT THE TIME KTIV was purchased in 1974 by the Black Hawk Broadcasting Company, the station was housed near downtown Sioux City, under a pool hall. It was obvious to the new owners that a complete transformation had to be made. So the search started for a site and necessary arrangements were begun to build a new facility.

Three years later, the station moved to its new home on the north edge of the city and named it Signal Hill. The move was smooth and efficient: the station signed-off from the old studio at midnight, Saturday June 4, and signed on from the new studio at 8:00 a.m., Sunday June 5.

The exterior of the building was designed with an eye toward the reflecting imagery of the television business.

continued on page 80



Related operations areas of the station are carefully grouped according to function.

KTIV building's use of mirrored glass plates provides a striking reflection of the surrounding areas.



Best Station Award Entries

The large expanse of mirrored glass allows beautiful reflections of the surrounding valley and hills and serves the functional purpose of letting in plenty of natural light to most of the work areas as well as full picture window views from the inside.

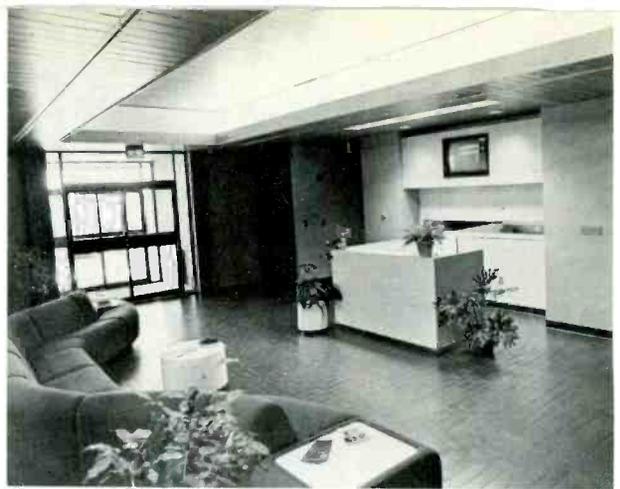
The interior was designed for beauty and efficiency. The central office, adjacent to the master control area, is separated into work areas that include continuity, promotion, production, accounting, sales and traffic. Traffic, with the network TWX and TELEX machines at hand, is only a few steps from the door into master control.



Newsroom is attractively and efficiently designed.



Machine room is spacious and efficient. Computer flooring is used for ease of access to wiring.



Good lighting in this attractive lobby creates a feeling of openness.

The newsroom is in the center of what could be called the news corner of the building. Surrounding the office itself are areas for storage for ENG equipment, ENG editing, audio recording and the news studio. Between the studio and newsroom is a large window allowing for live inserts or updates right from the reporter's desks. Even the parking area at that end of the building is reserved for news.

Technically, the goal was to produce a flexible, efficient system without sacrificing quality or reliability:

Nine routing switchers. One for each VTR, one for a house distribution system, and the remaining for other functions. Each routing switcher can be used for on-air if needed.

Completely redundant STL system which is also used for transmitter remote control.

Dual air compressors for tape machines.

Separate air handling system for technical area with emergency tie-in to studio system in case of failure.

Entire technical area on computer tile floor for maximum flexibility for expansion.

Layout of master control to allow one man to operate entire station during non-live broadcast periods.

Adjacency of production control to master control (separated by sliding glass doors) allows visual contact and still provides sound insulation.

Custom machine and routing switcher control panels were designed and built by station personnel to allow maximum amount of control in a small logically organized area.

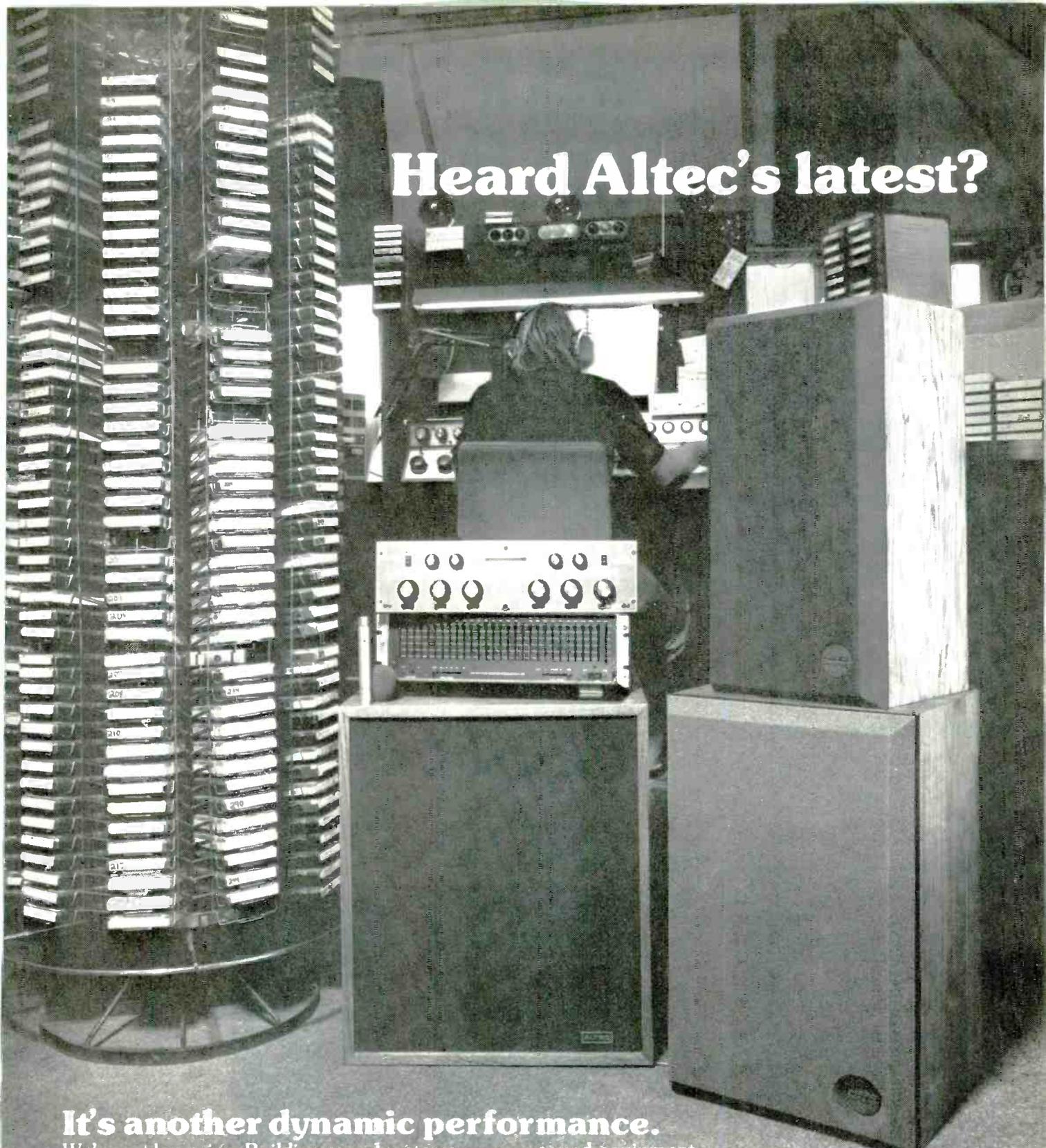
The equipment which fits into the master control and studio areas was also taken into account, and is continuing to be updated. TCR-100 cart machine. TR-60, TR-22 TR-4 reel-to-reel machines. Two Sony VO-2800 for playback of ENG news tapes and programs on cassette. Two Harris TC-50 color studio cameras with two RCA TK-42's as backup. One RCA TK-27 color film island.

Perhaps the biggest change was the complete conversion to ENG for news and production. The station uses 4 Sony DXC 1600 cameras and 2 Sony BVU 200 editors with BVE 500 controllers to get the news to the viewers and commercial production done. This type of conversion has proved to make a great deal of economic sense in this size of market.

Overall, the new KTIV facility is as functional as it is beautiful, providing a pleasant atmosphere in which to work, and a product that viewers have expressed growing pleasure at watching.

BM/E

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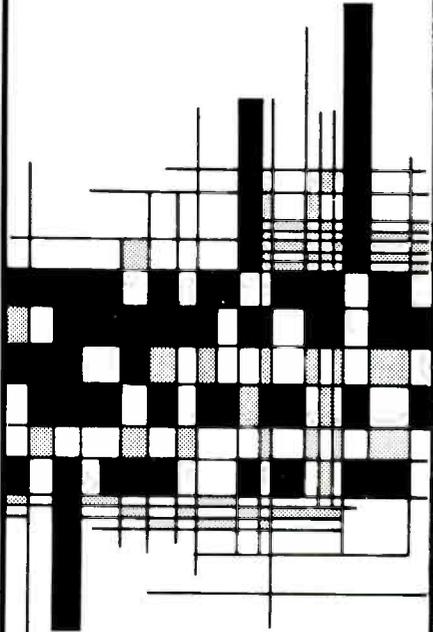
For further information on how Altec can add
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system, write to: Altec Sound Products Division,
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Location photography courtesy of KEZY Radio, Anaheim, Ca.

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Circle 147 on Reader Service Card

NRBA Is A Big, Bouncing Four-Year Old

Its fourth annual convention in New Orleans let the National Radio Broadcasters Association show how big it has grown, how strong its muscles are. Most exhibitors and most attendees were highly pleased, although no large revolutions in technology surfaced at the show.

IT WAS ALL UP-TEMPO for the NRBA's fourth convention, October 9 through 12 at the New Orleans Hilton. Paid attendance hit nearly 1200, up from last year's 850. Exhibitors went to 125 from last year's 95; hospitality suites to 79 from last year's 55. And in tune with this wide support for the show, the membership of NRBA reached about 1200 in October from the 400 on the rolls when NAFMB became NRBA. It is a very healthy young organization.

What about the quality of the show? What did the industry learn from it? With 125 firms on the exhibit floor, virtually the entire radio hardware industry was there and a radio broadcaster could see, touch, probe many competing devices designed for any function he needed to get equipped for. The exhibitors, on their side, were almost uniformly pleased with the efficiency of the show.

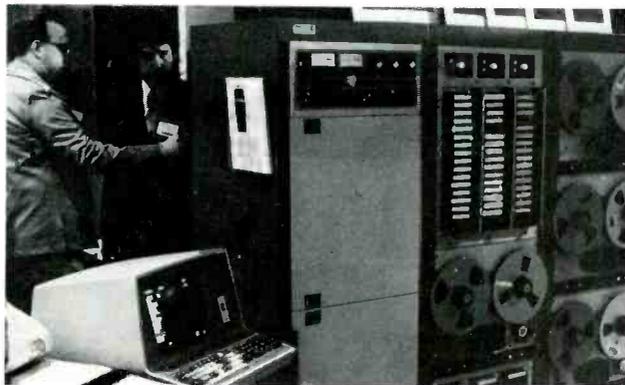
Aside from these basics of the show, there were some highlights, including the *genuine* swan song of

Richard E. Wiley as chairman of the FCC. Mr. Wiley spoke to the convention at lunch on Tuesday, October 11. His successor, Charles Ferris, was sworn in October 17, as described in the news section of this issue. Thus all previous "good-bye" speeches by Mr. Wiley can be regarded as premature if not spurious.

Three topics dominated the engineering sessions, drew capacity crowds, and stirred especially strong reactions among both panelists and audiences: AM stereo, FM quad, audio processing.

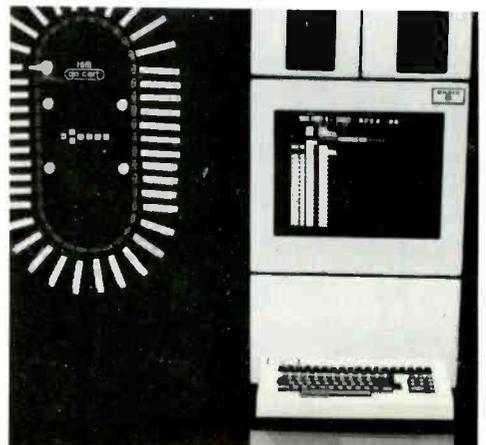
On AM stereo, a proponent of each of the five systems before the FCC described his system briefly. New in public was the Harris system, announced shortly before the show; a brief account of it is given in the accompanying box. The other four—Kahn, Belmar, Motorola, Magnavox—have been described in some detail in earlier issues of *BM/E*.

On FM quad, still stronger feelings emerged, a resentment on the part of

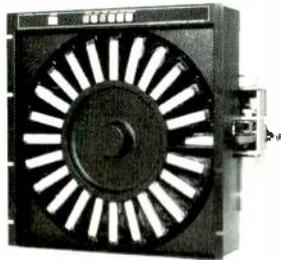


New microprocessor-controlled automation system, Cetec/Schafer 7000, takes plain English entries on keyboard (lower left), shows status on CRT above keys.

IGM's new "BASIC" control system for automation also usss English commands and entries on keyboard, lower right, with CRT readout above entry board.



AM, FM, SW MODULAR PROGRAM AUTOMATION



2400R MULTIPLE CARTRIDGE PLAYER

2400R "Kartel" is the ideal multiple cartridge machine to replace obsolete units or to incorporate into new automation systems. We use a four channel tone detector card, which senses 150 HZ, 1K HZ, 4K HZ, and 8K HZ pre-recorded cue tones. Like all our equipment the 2400R is completely solid state, modular designed printed circuit cards



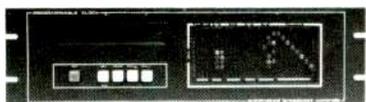
2500S 25 Hz TONE SENSOR

Senses the presence of pre-recorded 25 Hz tones on audio material and provides automation control functions. Features tone removal filter, adjustable stop contacts, and fixed tone alarm for automatic rewind.



2500G 25 Hz TONE GENERATOR

For production studio use to insert the standard 25 Hz automation actuating tone. Starts tape transport and actuates muting to eliminate bias pops and other start-up noises. Tone button supplies 25 Hz tone and stops transport at end of tone.



1200C TIME PROGRAM CONTROLLER

Provides 10 programmable exact time points per hour for real time control of 2800S and 2800APM plus digital clock display. 8 relay function outputs for time announcements, transmitter on/off control and other functions. Crystal time base and battery backup.

automated broadcast controls

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Circle 148 on Reader Service Card

several broadcasters present that, after the enormous effort of nearly two years ago in the NQRC test (*BM/E*, February, 1976), the FCC has not moved farther and faster.

The uncertainty among many broadcasters as to what audio processing to use was the main undercurrent at the session on this topic. Bob Orban described the new Optimod AM (see below); Jim Tonne of Moseley, the TFL-280 processor of that firm; Mike Durrough sketched his Discriminate Processor; Jim Woods of Inovonics, the processors of that firm.

The audience included at least one person (as has every group discussing audio processing in recent years) who was vociferously against using any processing at all. But the sense of the meeting was that *some* audio processing is a practical necessity for almost every broadcast operation.

Among the items on the exhibit floor that were new to the industry were the following (in no particular order). Ampro had production models of the Monomax, shown in prototype at the NAB, the system which removes phase effects in the mono mix from stereo program material by putting L+R on one track of the cart or open reel machines, L-R on the other track. (As reported in *BM/E* in October, WCBS-FM in New York, uses a similar system). Cuerac, the 500 cart multicart machine from Australia introduced at the NAB, is now marketed exclusively in this country by Automation Electronics, who had a model in their booth at the show and who are prepared to make a "stand alone" installation or include Cuerac as part of one of their automation systems.

Cetec-Schafer introduced a new program automation system, Model 7000, with advanced microprocessor control. It has a 1000 event memory (expandable to 10,000) and handles 16 audio sources (expandable to 64). Programming is set up in "plain English". CRT readout above entry keyboard gives comprehensive data on events in memory, upcoming and much other information.

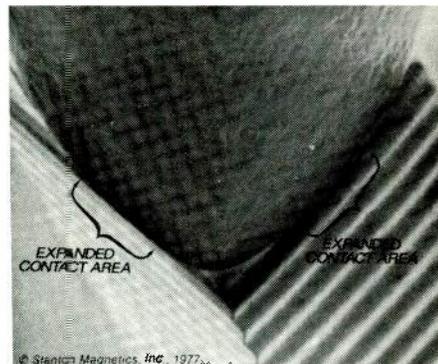
Automated Processes showed a computer-controlled Communication System Series 8300, which can carry out monitoring or intercom functions in a large broadcast plant or a combination of the two.

Collins/Rockwell added to their FM transmitter line, the Model 831G-2C rated at 25 kW; two in parallel are supplied for 50 kW.

New from Comrex was the Low Frequency Extender, a unit that extends the low-frequency limit of material coming in on telco links or from satellites, with improvement in S/N ratio.

continued on page 84

Better stereo records are the result of better playback pick-ups



Scanning Electron Beam Microscope photo of Stereohedron Stylus, 2000 times magnification.

Enter the New Professional Calib- ration Standard, Stanton's 881S

The recording engineer can only produce a product as good as his ability to analyze it. Such analysis is best accomplished through the use of a playback pick-up. Hence, better records are the result of better playback pick-up. Naturally, a calibrated pick-up is essential.

There is an additional dimension to Stanton's new Professional Calibration Standard cartridges. They are designed for maximum record protection. This requires a brand new tip shape, the Stereohedron®, which was developed for not only better sound characteristics but also the gentlest possible treatment of the record groove. This cartridge possesses a revolutionary new magnet made of an exotic rare earth compound which, because of its enormous power, is far smaller than ordinary magnets.

Mike Reese of the famous Mastering Lab in Los Angeles says: "While maintaining the Calibration Standard, the 881S sets new levels for tracking and high frequency response. It's an audible improvement. We use the 881S exclusively for calibration and evaluation in our operation".

Stanton guarantees each 881S to meet the specifications within exacting limits. The most meaningful warranty possible, individual calibration test results, come packed with each unit.

For further information write to
Stanton Magnetics, Terminal Drive,
Plainview, New York 11803.



STANTON

Circle 149 on Reader Service Card

NRBA

Delta had a new series of FM ameters. Edco introduced a cassette system with DBX noise reduction built in, intended to supply very compact pickup, storage and editing of program material. System has very numerous features of typical broadcast production use, such as cue-stop sensing, edit shuttle control (joy stick), standard remote control provision, etc.

Harris Corporation, in addition to demonstrating their new AM stereo

system (see box), brought a new console series, the M-90, completely modular and expandable: 2, 4 or 8 input channels, up to 26 mixing positions and 52 inputs. Also shown were the Criterion tape cartridge machines and the System 90 automation system.

IGM provided one of the significant introductions with their brand-new "BASIC" control system for automation. This microprocessor-based system responds to plain English commands, entered on its 18-key keyboard. A CRT readout shows status. It can be installed with any

existing automation system, replacing only the "master control". Standard memory of Basic "A" is 4,000 schedule entries, expandable to 8,000. It handles 16 audio sources, also expandable in units of 16. Basic "B", a more elaborate system, allows 6,000 schedule entries per day, with entries simultaneously from two or more terminals.

Inovonics introduced their Model 221 Audio Level Optimizer, a processing unit with three functions: a gain-riding AGC to correct long-term variations; a compressor for "gentle" control of program dynamics; and a fast peak limiter to prevent over-modulation. LPB showed a new stereo turntable preamplifier of advanced characteristics. Marti added to their extensive line of remote and STL equipment a new mobile repeater receiver, useful for relaying back to the studio remote pickups with handheld equipment. McCurdy Radio had a new console, Model SS7750, with modular construction, which can be integrated into their studio furniture system.

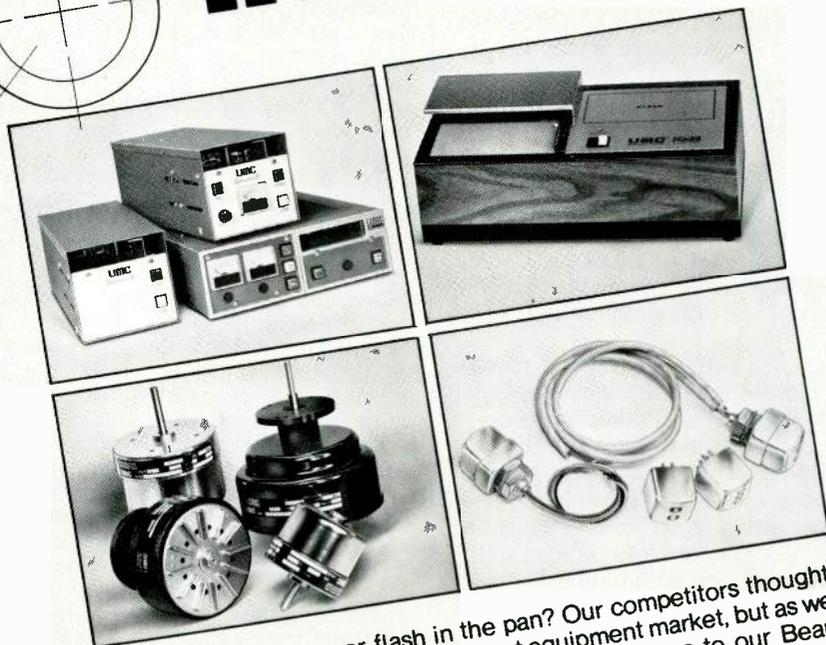
McMartin had new console models and new receivers for FM/SCA service. The consoles, the 1000 Series, were available in 5 channel or 8 channel mono or stereo, with either slide or rotary faders. All inputs are convertible to mic or hi level. There are 10 inputs into the 5-channel models, 18 into the 8-channel models. Monitor, 15 watts, is built in. The new SCA receivers consisted of a portable and a table model, the first running on batteries, factory-tuned to a specific frequency, the table model with crystal-controlled tuning, with a precise-tracking decoder of new design.

Micro Controls made an impressive entry into the field of remote control and STL equipment for radio. Their Digi-Log remote control system uses digital commands, analog returns, for 9 to 39 channels. Their STL systems include a single-channel narrow band, a dual channel narrow band, and a wideband version for FM stereo composites.

Moseley Associates introduced a new telecontrol system, Model TCS-2, with eight telemetry, eight command and eight status channels, each independent of all others. System operates on a single radio or telco link; two systems can operate on one link. Telemetry display is digital LED; accuracy is rated 0.1% of full scale.

The Mutual Broadcasting Company provided one of the highlight demonstrations with satellite transmission on two 15 kHz channels from Mutual's Arlington, Va. headquarters, directly to an earth terminal on

Zeroing in on you.



Tip of the iceberg or flash in the pan? Our competitors thought we were just dabbling in the broadcast equipment market, but as we added Beaucart® Splice Finders and Cart Machines to our Beau Motors and Heads, it became obvious that we were here to stay. And now we've coordinated all these activities into our new Broadcast Products Division to make us more productive and efficient. And there's more to come. A whole lot more. For a look at your future, write today or call (203) 288-7731. We're the Broadcast Products Division, UMC Electronics Co., 460 Sackett Point Road, North Haven, Connecticut 06473.

UMC®

the Hilton Hotel in New Orleans. The program went by land line and microwave to the Western Union uplink station in McLean, Va., up to the Westar I satellite, and down from there to the Hilton. The received quality seemed excellent; the demonstration showed again Mutual's firm planning to institute wideband stereo service to affiliates (reported in *BM/E*, October). The music was supplied by Greater Media of East Brunswick, N.J. (see Programming column in this issue). The Small Aperture Earth Terminal (SAT) at the Hilton (10-ft. antenna) was built by Hughes Aircraft and California Microwave Systems. The demonstration included periods of news reception on Channel 1, music on Channel 2, followed by use of both channels for music in stereo.

A newcomer to NRBA was the Fred A. Nudd Corporation of Ontario, N.Y., who described their facilities for building, erecting, and servicing antenna towers of all heights for AM, FM, and TV.

Orban Associates had in operation their audio processor, Optimod-AM, and promised delivery of the first units in January, 1978. The main features of the design had been described at the NAB in April.

Pacific Recorders and Engineering had a new family of digital clocks and timers, including models with circular LED displays to show second sweeps at a glance. Paperwork Systems Inc. introduced a new business automation system, BAT 1700, designed for radio stations with especially heavy computation needs. BAT 1700 normally uses a high-speed computer, plus multiple storage units. With such a computer, the system can be attached to up to nine remote terminals with simultaneous access. Like other PSI systems, the BAT 1700 is an in-house system; it is designed to provide totally automatic scheduling.

QEI announced that their Model 7775 ATS, in prototype at the NAB, is in full production. Several were being installed at the time of the show. A business announcement made on the floor came from QRK: the firm has been bought from CCA by Robert D. Sidwell, and will be operated by him from the California address, 1568 N. Sierra Vista, Fresno, 93703.

Ramko Research emphasized their new DC-12 and DC-38 console series, introduced at the NAB; and brought a new product, a six-digit clock/timer with memory. RCA also had consoles on view; and showed their new limiters, BA-146A for AM, BA-147A for FM. Studer/Revox, in addition to their line of tape re-

orders, tuners, amplifiers, etc., showed a new quartz-controlled digital FM tuner, the B760, which can store up to 15 station frequencies for instant tuning. James B. Lansing had a new compact monitor speaker, Model 4301, 19-in. high by about a foot square. In a series of demonstrations, the speaker produced a sound much like that of larger Lansing systems.

Saki Magnetics added to its comprehensive line of ferrite heads one for the Recortec Certifier, to bring the extremely long head life of the ferrite construction to this instrument.

Eric Small and Associates introduced a peak program meter for reading audio program levels, designed to comply with the standard of the British Broadcasting Corporation. In a demonstration, the PPM was fed an audio program side by side with a vu meter reading the same program. The differences, including the low reading of the vu meter on many peaks, were most clear. Also on hand was the production model of the "LiteAlert", shown in prototype at the NAB, which indicates in the studio the lamp status of tower lighting systems, re-

continued on page 86

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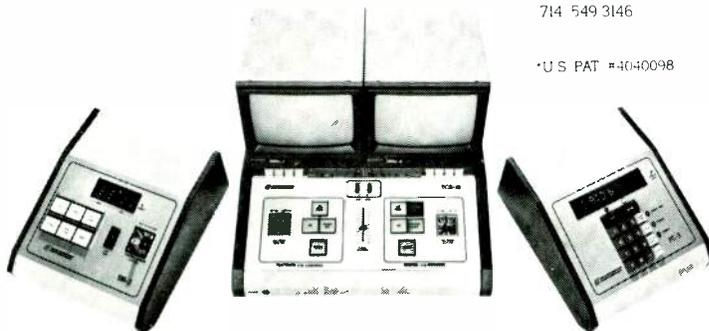
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Circle 151 on Reader Service Card

NRBA

solving the failure of one 116-watt lamp in a 3 kW load. And Eric Small introduced the Denon disc reproducer systems, exclusive marketing agent in the U.S. for these Japanese units. They are built around direct-drive turntables, using AC servo motors, with speed controlled by comparison with a high-precision oscillator. As are other direct-drive turntables now coming into wide use among radio broadcasters, the Denon tables are

rated for extremely low wow and flutter, and low noise. Denon claims the AC servo motor produces much less noise below 40 Hz than typical DC motors. Systems are available with control panels for the turntable which provide very convenient operation in broadcast studios.

Sono-Mag Corporation, source of the SMC automation systems, showed new time control units for their DP-2 automation. The Model PDC-4 has a capacity for 675 time instructions, each giving the day, hour, minute, and second, with any of

10 instruction flags.

Also shown in the SMC booth was the on-line radio business computer system of Groton Computer, Inc., of Groton, Conn. The system is aimed at operation by any non-radio part-time employee, with daily input via telco line, using Groton's keyboard terminals at the station. There is immediate on-site print-out of logs and other data needed for any day, and intra-monthly reports. Complete month end reports are forwarded by parcel delivery or mail.

SMC and Groton have cooperated in developing an interface system so that total automation is available with a Groton-SMC combination.

A firm new to NRBA was Stanart Corporation of Canoga Park, Calif., who specialize in assembling systems for top-grade disc playback in recording and broadcasting. Shown on the floor was their PPS-26 preamp for phono systems, for which they claim outstanding characteristics: 90 dB dynamic range, frequency response of gain module DC to 300 kHz, very low TIM.

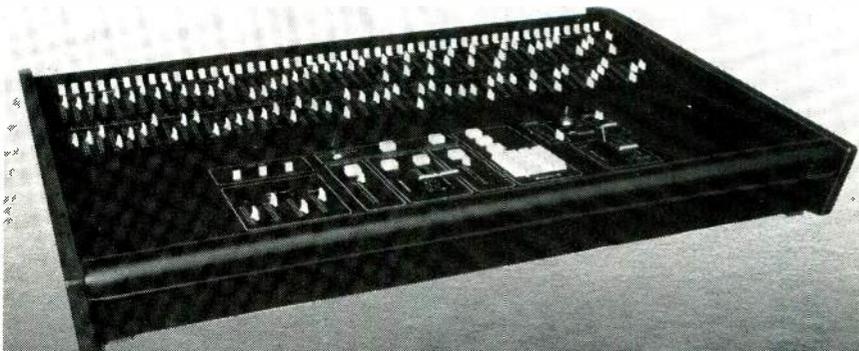
Stanton Magnetics brought a brand-new phono pickup, model 881S, with claims of improved design over earlier models for the protection of records. The pickup is part of the firm's "calibration standard" series, claims flat frequency response from around 10 Hz (depending on arm resonance) to 25 kHz, with each cartridge individually calibrated to 20 kHz. Output is 0.9 mV/cm/sec, recommended tracking force 1 gram. Stanton also introduced their Stereo/Wafers, very light stereo headphones with open-audio design.

Tapecaster had production models of their Mark IV broadcast cartridge, which incorporates a number of new design approaches aimed at stabilizing cartridge performance. Prototypes were shown at earlier meetings; the cartridges are now on the market.

Time and Frequency Technology had their extensive line of monitors and remote control equipment and introduced their new Telescan, a system for monitoring and logging up to 110 remote functions. Telescan can assist the operation of remote control systems (including TFT's Model 7600) or can be used as a stand-alone system for data acquisition, monitoring and logging. Telescan consists of an entry keyboard with CRT readout, a remote scanner, a printing terminal, and a central processing unit with microprocessor control. Up to 30 channels can be called up simultaneously for display on the CRT. Software can include upper and lower limits for all parameters read, with automatic alert if any tolerance is exceeded. System also has automatic or call-up logging.

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Broadcast Products Division of UMC Electronics announced an expanded line of mono and stereo heads for all major broadcast cart tape machines including the Beucart types 10, 11 and 20 and machines of Ampro, ATC, Collins, Garron, Harris, ITC, RCA, Sono-Mag, Sparta, Spotmaster, and others. Models with screw, pin, bracket, and plug-in mountings are available.

United Recording Electronics Industries (UREI) brought three new units. The Model LA-4 is a new compressor/limiter with selectable compression ratios, from 2:1 to 20:1. Gain reduction is RMS responding. The Model 545 is a new parametric equalizer, in which all important filter parameters are continuously variable. Three sections cover overlapping ranges from 24 Hz to 12.5 kHz, a fourth is tunable over the entire 15 Hz to 20 kHz range. Also new is the Model 1122 stereo transcription preamplifier, which has 54 dB of variable gain, matches the RIAA playback curve within 1 dB, is rated for less than 0.5% THD at 20 dBm, 30 Hz to 20 kHz.

Ward-Beck Systems had representative models of a new line of radio programming and production consoles, the R1200 and R2000 series. Borrowing a number of features from the firm's custom consoles for TV audio production, the new series have many modular options and allow custom assembly to a large variety of requirements.

AKG brought their line of new stereo phono cartridges, recently introduced to broadcasters and others. They also showed a new series of stereo headphones. The highlight at the Belar booth was the playing of tape recordings of experimental AM stereo broadcasts, during the NASC tests, from WBZ in Boston to receivers in Washington. The effects of skywave interference on the various systems could be judged: the quality in general survived very well, with no consistent, overall superiority of one system over another.

Kay Industries had improved models of their rotary converters, which transform single-phase power to the three-phase needed by much broadcast equipment. Johnson Electronics introduced a new 5 input mixer, a paging and alarm system, and an antenna director for FM receivers.

Bloomington Broadcasting Corp. of Bloomington, Ill., was a new entry among suppliers of computerized accounting for radio broadcasters. Their systems were developed for, and are in use by, their station and others. The systems are in-house, using a Data General Nova 3 computer. **BM/E**

RCA presents
"The Teleproducers"

TKP-45: studio camera control with portable camera convenience.

The TKP-45 is a top-of-the-line performer on a studio base or on a camera operator's shoulder. Features such as Scene Contrast Compression and 5 foot-candle sensitivity give you control of almost any picture situation.

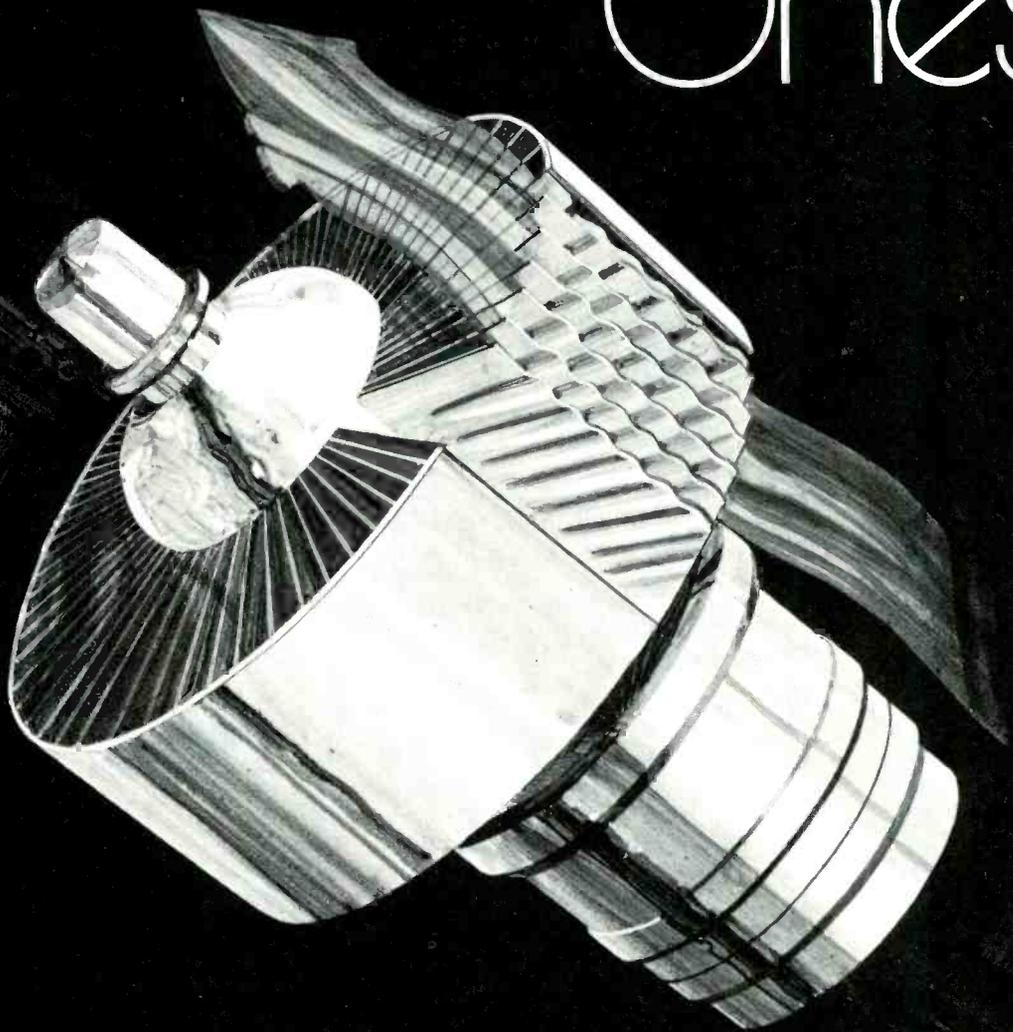
The TKP-45 operates with AC or battery powered "Minipack" CCU with new mini-cable or triax. It adapts to a wide variety of lenses, bases, viewfinders and accessories. In every way, it delivers uncompromising quality.

So do all "The Teleproducers". Ask your RCA Representative how they can improve your production values. Or contact RCA Teleproduction Systems, Bldg. 2, Front & Cooper Sts., Camden, NJ 08102. (609) 963-8000.



REDUCE NOISE AND BLOWER HORSEPOWER WITH

the Quiet Ones



EIMAC's new patented ripple-fin anode tetrodes for FM transmitters are the Quiet Ones because they operate with a drastic reduction in cooling-air-flow acoustical noise emission.

Noise measurements made on the ripple-fin structure in the annoying high frequency range (6000 to 12000 Hz) show a marked noise reduction of 9 dB to 16 dB in sound pressure level over traditional anodes.

In addition, the more efficient wave-like geometry of the new structure allows vastly reduced cooling horsepower—from one-half to one-quarter as much as conventional tubes.

This new concept is the result of EIMAC's continuing upgrading of the popular 3CX and 4CX families of FM power tubes

which have already established an enviable reputation for long life and stability.

The X-2213, first member of this new tube family, also provides sufficient gain to permit the practical use of a solid state driver for a power output level of 25 kilowatts in FM service.

Traditional EIMAC quality and dependability are now available with the latest in anode cooling design and electron ballistics. For complete details on the X-2213, contact Varian, EIMAC Division, 301 Industrial Way, San Carlos, California 94070. Telephone (415) 592-1221. Or contact any of the more than 30 Varian Electron Device Group Sales Offices throughout the world.





The press at SMPTE toured CBS Studio Center. Here Joe Flaherty, CBS vice president of engineering, answers reporters questions about CBS Studio Center video production stage.



SMPTE 119th Technical Conference: It's Hollywood's Show + One-Inch VT

Technical papers concentrated on techniques and technology for Hollywood-style production but 1-in. video stole some limelight. Equipment advances in digital technology were present.

THE MAJOR NEWS COMING out of the conference wasn't on the agenda. The committee on Type C standards for non-segmented helical scan videotape recording apparently met and reached final agreement on the technical standards for the one-inch non-segmented video recording format. All that remains now is official sanction from the SMPTE Committee on Video Recording and Reproduction Technology which is scheduled to meet December 7. Thereafter, administrative details will be worked out and the standards published. Both Sony and Ampex have announced intentions to manufacture machines meeting the Type C standards and expect to have proto-types ready by NAB.

The standards are essentially those detailed in last month's *BM/E* (p. 6). Ampex announced during the conference that they would provide modification of the current VPR system to meet Type C standards at a cost to the user of \$3500. Sony has been promising pur-

chasers of their Omega system that they would meet the Type C standards for \$1000; this remains unchanged.

Bosch-Fernseh, however, is not backing down on its commitment to its BCN. Fernseh is convinced that its system has numerous advantages now and a number of design characteristics that will make the machines more desirable in the future, including the theoretical possibility of recording video information digitally. Though the networks have rumored their preference for the Type C standards and were behind the SMPTE push for this standard, Bosch-Fernseh is renouncing nothing.

The papers highlight prime-time technology

Considering the location of the conference, it is no surprise that most of the papers dealt with topics important to the production of prime-time programming and feature films. Papers with a direct appeal to local broadcast-

continued on page 90

RCA presents
"The Teleproducers"

TR-600A: with specs for great masters, on-line editing for great speed.

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RCA



SMPTE

ters were few and far between. Of the 106 papers delivered, most were related to film applications appropriate to either lab work or feature production. Of the papers directly concerned with television, many of those dealt with Hollywood productions, post-production, corporate uses of television and new technology.

Among the more interesting presentations were papers on the use of videotape for production of prime-time pro-

gramming, both sitcoms and other types. Joe Flaherty, vice president of engineering for CBS, provided an update on the use of "Videotape at Studio Center." Flaherty said that "we've come very close to the 'film look'" without compromising the creative aspect.

In fact, taped portions of the programs produced on the system at the CBS Studio Center did utilize high contract lighting ratios of the style associated with film production and achieved very good results. The production structure used at Studio Center

closely resembles the system common to film. The director works on the floor with the talent and camera people (who are, incidentally, former film people). The skills of the cinematographer and lighting director are maintained. About the only people not on the set who would be present if the show was done in film are assistant camera people and grips.

Four cameras are employed to provide a number of angles and shots. The output of each camera is recorded individually with time code. Audio channel 1 is used to record dialogue while audio channel 2 is used to record dialogue plus audience reaction.

In post-production, which begins on the day following the recording, the output of the four machines (Sony Omegas) are run synchronously with time code. The machines are run simultaneously and kept within one or two frames of synchronization using a CBS designed machine. Each Omega has its own dedicated TBC. Then, using typical "Moviola style" search techniques, the director chooses his shots from the four options available. The signals are edited onto a fifth Sony Omega through a two bus switcher that permits dissolves. All other special effects and audio sweetening are accomplished after the tape is dubbed onto 2-in. tape. A CBS spokesman introduced a new phrase when he described the process as dubbing "down to quad."

Two papers described the cinema technique used for production by the SFP (Societe Francaise de Production), the state owned television and film production monopoly in France.

The SFP method differs substantially from the CBS method in that although it uses a 1-in. videotape system to record the images, it uses just a single camera and recorder. SFP uses the Bosch-Fernseh BCN system and follows all techniques common to film production.

Whereas CBS is able to save some below the line cost using the multiple video camera approach, SFP has aimed to gain its efficiencies in production and post-production time savings. Sound and video are recorded much as they would be in a film production and the sound is later mixed using a 16 track audio recorder as an integral part of the editing system.

A pre-edit or worktape is created on ¾-in. cassette equipment and then the selected portions are dubbed up to 2-in. from the 1-in. master. Once on 2-in., the final editing with special effects is accomplished. Time code is used for both audio and video throughout the process. The economics are essentially based on time saved and the quality is rated high by the SFP spokespersons.

Audio in production & post-production

Several papers were presented on

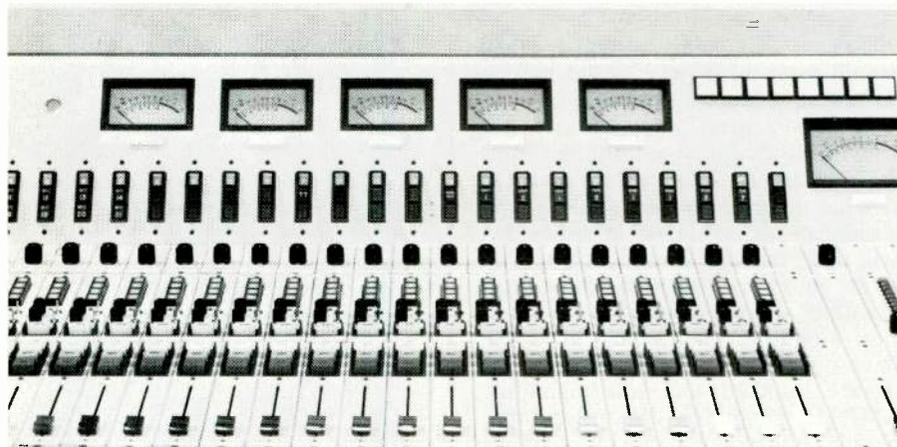
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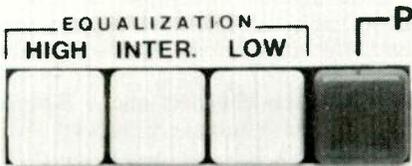
On display, booth 124, NRBA, New Orleans



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DECEMBER, 1977—BM/E

techniques and equipment for use on the audio portions of television programs in post-production. On the West Coast, at least, audio recorders are being used more frequently to record in a double system during production.

In addition, the use of SMPTE time code and synchronizing equipment is making it increasingly attractive to separate audio from video for treatment and re-syncing it with the video later. Several techniques were discussed for doing this. Emery Cohen of Glen Glenn Sound Co., delivered a paper in which he recommended the use of an audio recorder in addition to the video recorder whenever post-production audio work is planned. A paper prepared by Philip Feretti of Sunwest Recording Studios indicated the need for using a 59.4 Hz reference pulse whenever a separate audio recorder was used in production. If such a double system sound approach is to be applied to video production techniques and the 59.4 Hz reference pulse is not used, "fix-it" cost can run in excess of \$30,000 on a major production.

Extensive use of SMPTE time code is employed. Time code is stripped onto multi-track tapes as well as video tapes and synchronizing equipment is utilized at all stages of post-production.

George Swetland of EECO (Electronic Engineering Co. of Calif.) delivered a paper describing these synchronizing devices and their applications. The speed of videotape type editing equipment and the addition of time code has made the transfer of feature film material to video for the purpose of audio processing a popular technique. Scoring from a video transfer with time code can be a very cost effective approach since synchronizing equipment has become extremely reliable.

Some new equipment at SMPTE

More than 5,000 visitors toured the largest SMPTE equipment exhibition ever. More than 130 manufacturers occupied 218 booths loaded with the latest technology for motion pictures and television. Broadcasters, however, took a back seat to the motion picture industry this time. The majority of booths were devoted to large scale film processing and feature film production equipment. Even some of the companies, traditionally supplying the broadcast industry, elected to trot out products for the filmmakers as long as they were this close to Hollywood.

Bosch-Fernseh was undoubtedly the most active exhibitor as it devoted considerable energy to telling "its side" of the 1-in. video story. With all the attention garnered by Ampex and Sony in regards to the establishment of the ANSI Type C standard, Bosch has been hard pressed to get public notice of

continued on page 92

RCA presents "The Teleproducers".

TK-28/FR-35: the transfer system for true colors, real economy.

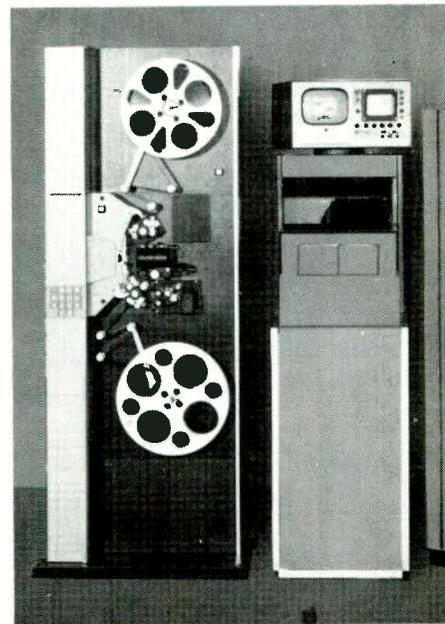
The idea of film-to-tape transfers is to improve color quality, simplify editing and shorten completion time at reasonable cost.

The RCA TK-28 color telecine camera lets you correct film density, poor color saturation and film base errors. The attractively priced TK-28 helps you get high quality even from 16 mm. dailies.

The RCA FR-35 servo-controlled 35 mm. projector speeds production with such features as fast shuttle, instant stop-start, variable speed, 0-48 fps cueing on frame, freeze frame, and more.

To improve your production values, ask your RCA Representative about all "The Teleproducers". Or contact RCA Teleproduction Systems, Bldg. 2, Front & Cooper Sts., Camden, NJ 08102. (609) 963-8000.

RCA



SMPTE

fact that its BCN format has been approved by the SMPTE as ANSI Type B standard.

Despite early announced intentions by the major networks to push for the Type C standard, Bosch-Fernseh is intent on having a shoot-out. In this respect the German company showed up in Los Angeles with all its BCN guns blazing. Bosch demonstrated its BCN-5 cassette 1-in., 20 minute recorder. The production model of this VTR will weigh just 20 lbs. and a special adapter for the BCN studio editing VTR will permit use of either the 20 minute cassette or open reel tapes on the same machine. Using a low-cost Digital Store, the BCN machines can search in fast forward or reverse at up to 12 times normal speed without loss of picture stability.

The Digital Store also permits stop motion pictures and since the still frame is registered in the store the video heads scan the field only once rather than continuously. Bosch is touting this as an important way of reducing head and tape wear. Bosch also employs the Digital Store to permit the use of the system as a still store, in which up to 10,000 stills can be randomly accessed

on one seven minute segment of tape. A special controller permits the addressing and recall of each still. In addition, with the special effects capabilities of the store, new slides can be made up from any combination of previously stored information in combination with new information from a camera or other VTR source. Bosch is also pointing to its capabilities of interface with remote program automation controllers and computerized editing systems. Looking even further down the road, Bosch claims that the lower head mass of the smaller BCN design will make recording video in digital format more practicable on the BCN system.

Both Sony and Ampex exhibited their 1-in. VTR systems although they have held off any major advances until the Type C agreement was completed. The successful completion of those discussions was welcome news to both companies since they have been moving their systems into the field. Ampex announced the beginning of deliveries to ABC of the VPR-1 machines and established a \$3500 price tag for kits to update existing VPRs to meet Type C standards. Ampex will perform the modifications at its three U.S. service centers in Hackensack, N.J., Elk Grove, Ill. and Glendale, Calif. The kits should be ready by this summer. Sony will perform the updates of its

machines for the earlier announced price of \$1000 and its time schedule is about the same as Ampex's.

New equipment exhibited at Sony's booth included a new BVP-200 portable color camera which uses 2 mixed field Trinitron pick-up tubes in the chrominance channels and a Saticon tube in the luminance channel. The camera will sell for about \$18,000. Sony also modified its BVE-500 editor controller adding a knob type device for continuously variable speed control of the tape. The new version is called the BVE-500A and is priced at \$5500; deliverable in 60 days.

The big splash in electronic cameras came from Cinema Products. The camera, designated the MNC-71, is an ENG/EJ portable using 2/3-in. Plumbicons or Saticons. Designed and built from the ground up by NEC, the camera features high-transmittance prism optics (aperture: f1.4) a 2-line image sharpener and an encoder. The camera weighs about 16 1/2 lbs. without lens and is designed with a flat base to provide good shoulder balance or tripod mounting. The MNC-71 also includes external genlock and various automatic circuitry, indicators, microphone amplifier, intercom amplifier, and remote control functions. The base price is \$32,900 with 3 saticons, cables, case and related accessories.

Optimod delivers!

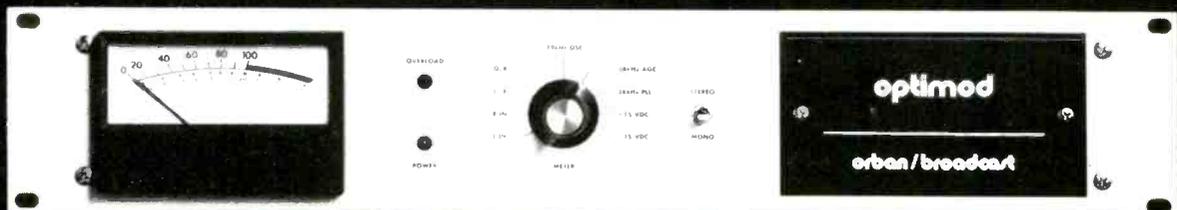
OPTIMOD-FM is an FM signal processing system that delivers a brighter, cleaner, louder sound. And that can deliver lots of things to you: dollars from quality or coverage-conscious advertisers... greater effective coverage because of your louder signal... increases in quarter-hour maintenance because OPTIMOD-FM's clean sound virtually eliminates listener fatigue... and state-of-the-art audio that stands up to the quality of major group and network stations, enough of whom have already bought OPTIMOD-FM to establish it as the new industry standard.

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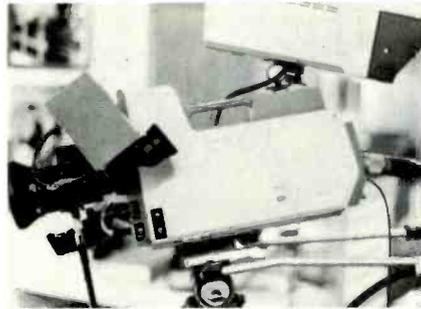
Circle 158 on Reader Service Card

Cinema Products also introduced a new 16mm film camera, the "GSMO." This extremely compact camera has been designed to incorporate all features necessary for professional use but the use of miniature circuitry and mass manufacturing techniques are expected to keep the price well below the higher priced 16mm cameras and somewhat above the lower price non-professional cameras.

Ikegami showed an improved version of its HL-77 color camera, designated the HL-77A. The improved model features a 10 percent improvement in signal-to-noise to 51 dB. Additional remote control features and changes in systems operation simplify and improve serviceability of the camera. The HK-312 studio camera has been modified for operation with Triaxial cable. The microprocessor automatic setup unit functions with either type of cable.

Slow-mos and still stores change

Arvin/Echo demonstrated its long awaited SLO/MO-1. SLO/MO incorporates a TBC, disc recorder and monitor with control panel. The 125-lb. package is transportable by two men. The disc will store up to 20 seconds of Video and play it back in variable speeds from still to real time. Features include high band color, elec-



Cinema Products jumps into the ENG sweepstakes with this new camera manufactured by NEC.

tronic cueing, digital comb filter, digital DOC, chroma invert and a price tag of under \$50,000.

Adda Corp., which entered the market at last year's NAB with its ESP-100 Electronic Still Processor system had new systems on display at SMPTE. ESP-100 had an on-line capacity of 200 frames; now there is ESP-200 with a capacity of 400 frames (or 800 frames with additional memory) and ESP-750 with a capacity of 1500 frames or, with additional memory, up to 3000 frames. The ESP equipment consists of a remote control panel, using microprocessor control of the ESP system, a disc drive controller that will control up to four disc drives, two solid state memories for holding frame A and frame B for display and preview. Adda

Corp. spokesmen report that they will soon deliver their first system to a major broadcaster.

Thomson-CSF displayed their improved Model 900 Digital Noise Reducer for which their president, Renville H. McMann, Jr. received the David Sarnoff Gold Medal at the SMPTE conference. The new model exhibits an improved front control panel for easier operation and now achieves a 15dB S/N improvement in video.

Consolidated Video Systems showed their new CVS-516 TBC for all current heterodyne VTRs. Features include correction of chroma/luminance delay problems, a 3 dB chroma noise reduction, velocity compensation, and color dropout compensation. The base price is \$10,500. NEC also introduced some new digital equipment with its TVS-751 Telephone Video System. This device is a solid state digital pulse code modulation video system which permits the long distance transmission of still video images over ordinary telephone lines.

RCA and Cohu both introduced new telecine equipment and there were a number of product introductions from other companies. The descriptions of these products will be covered in our Broadcast Equipment section in forthcoming issues. **BM/E**

Broadcast/Recording Equipment from MICMIX



TIME WARP
Audio Delay/Effects Generator
Wide ranging variable time translation of audio signals for uniqueness in commercials and special programming.

MASTER AUDIO METER
Panel Instruments
Led-bar displays of both peak and rms (vu) levels for establishing excellence in audio performance.



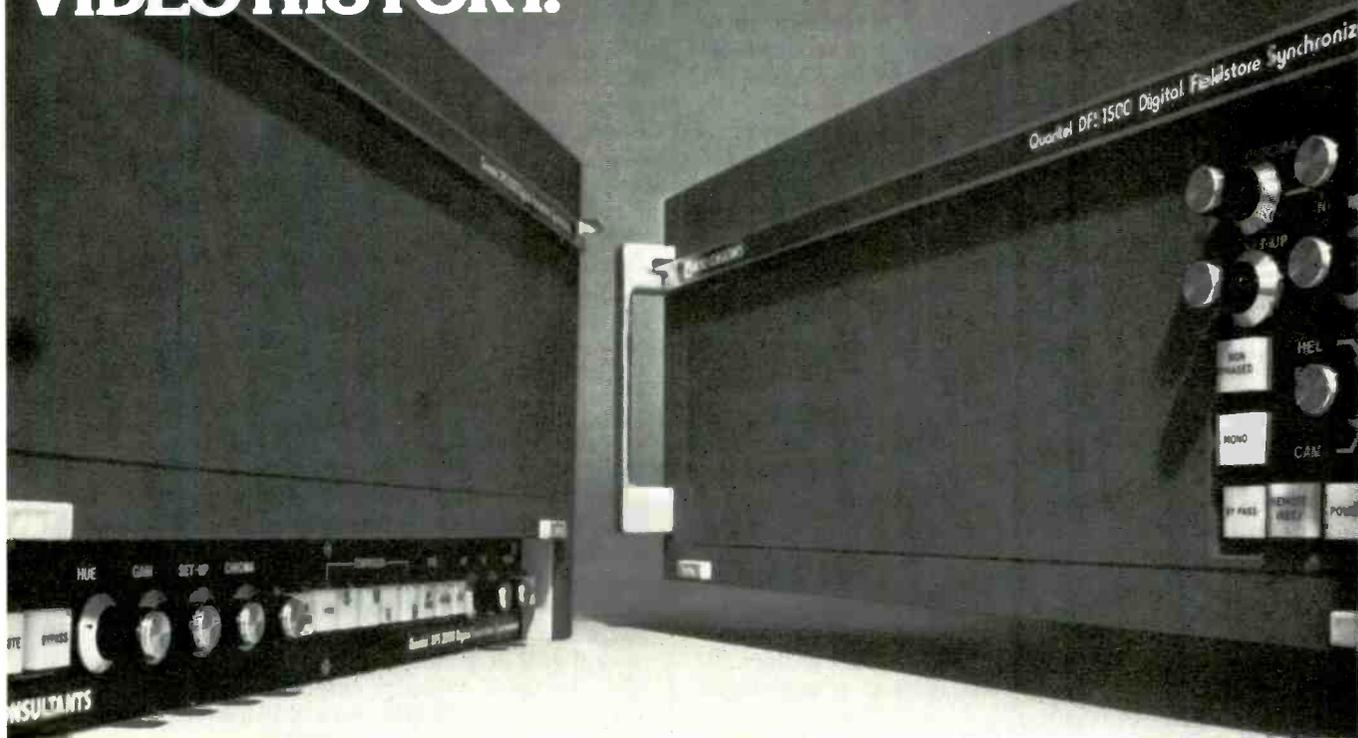
MASTER-ROOM
Reverberation Units
The spring-free sounds of Natural reverberation for quality production work and line application.



MICMIX AUDIO PRODUCTS, INC.
2995 Ladybird Lane, Dallas, Texas 75220 214/352-3811

Circle 159 on Reader Service Card

GREAT MOMENTS IN DIGITAL VIDEO HISTORY.



THE SYNCHRONIZER BECOMES MORE POWERFUL. AND LESS POWERFUL.

AND MICRO CONSULTANTS IS THERE WITH THE QUANTEL DFS 3100 AND DFS 1500.

The new DFS 3100 is the successor to the DFS 3000, the world's most highly acclaimed digital framestore synchronizer. But the microprocessor-controlled DFS 3100 is more powerful. Its production control option puts a wide range of effects at the producer's fingertips. Effects like freeze with automatic updating. Video compression. Joystick control of compressed and full frame pictures. Automatic positioning to predetermined locations. Automatic tracking of chroma key for compressed images.

Automatic fast or slow wipes. Smooth cuts from compressed to full frame video. And more.

But if you need *less*, the new DFS 1500 gives you basic fieldstore synchronization and truly outstanding time base correction. It's ideal for broadcasters who don't need all the power of the 3100, as well as those who have a need to use it in addition to a 3100.

Both synchronizers are portable and rugged. Both dissipate only 250VA. Both are perfect for studio or OB van.

So whether you need more synchronizer—or less synchronizer—get in touch with Micro Consultants, Inc., P.O. Box 10057, Palo Alto, California 94303, (415) 321-0832.



The digital video people



Circle 160 on Reader Service Card

FCC Rules & Regs

- (a) "Stockholders or members who are officers or directors of the corporation or association," or
- (b) "Other stockholders or members who have *one percent or more* of either the voting or non-voting stock of the corporation or voting rights in the association."

A stock broker holding corporate stock (1) in "street name" (in its own name for customers) or (2) for itself need only file a supplementary Ownership Report if it holds such stock for more than 30 days.

3. License Renewal: A broadcast licensee must file an Ownership Report when it files its tri-annual renewal application. (There is one exception to this requirement. A licensee that owns more than one TV, AM or FM station, need only file one Ownership Report every three years. The multiple owner may indicate with its renewal application that a "current" Ownership Report is presently on file with the Commission.)

A copy of the Ownership Report form is reproduced with this article for easy reference.

Except for large corporate licensees with more than 50 stockholders, the information contained in the Ownership Report filed with a licensee's renewal application should contain information *not more than 30 days old*.

The identity of the owners of the licensee must be made plain. This is simple if an individual is the licensee. In the case of a partnership, each partner's name and percentage interest must be listed. In the case of a corporation, or any other legal entity (association, trust, estate, receivership, etc.), the *name, residence, citizenship, and stock held* of each (1) officer, (2) director, and (3) stockholder (or trustee, executor, administrator, receiver or association member) must be listed.

Any cross-interests also must be listed (e.g., two direc-

tors may be brother and sister, or may be involved in a close business association). This must be reported on Form 323.

The Ownership Report also requires a report of capitalization (Paragraph 7a.). The licensee must list each class of stock, whether each class is voting or non-voting, the par or stated value of shares and information concerning the number of *authorized, issued and outstanding treasury and unissued* shares. This gives the Commission a description of "who owns what." To "flush out" the apparent ownership structure, the Commission also requires the licensee to identify persons or corporations having direct, indirect, fiduciary or beneficiary interests. This is important because such "background" owners often exercise a substantial degree of control over the licensee. Section 1.615(a) (3) (iv) gives several examples of indirect ownership positions which must be reported. *First*, when legal title to stock in a licensee is held by someone other than the beneficial owner, the licensee must fill out Form 323 with respect to the beneficial owner, too. Similarly, Form 323 must be filled out for any party which has a right to vote stock in the broadcast licensee. *Second*, when a corporation *controls* a licensee or holds 25 percent or more of the issued and outstanding licensee stock (voting or non-voting) Form 323 must be completed as to this corporation. The information required may be extensive, but the licensee must report it all. *Third*, Form 323 must be filled out for any corporations in a "pyramid" structure if these corporations hold 25 percent of the issued and outstanding shares of the next corporation down the ladder. For instance, assume that a licensee is owned by A corporation. B corporation owns 30 percent of A corporation and C corporation owns 30 percent of B corporation. The same information must be filled out for A, B and C corporations because they all hold 25 percent or greater ownership interest in the entity just below in the corporate pyramid.

FCC Form 323					Page 2			
7(a) Capitalization:								
Class of stock (preferred, common or other)	Voting or non-voting	If par, show par value	If no par, show stated value or value assigned	Number of shares				Number of stockholders MORE THAN 50 HOLDERS OF VOTING STOCK NO YES [] [] MORE THAN 50 HOLDERS OF NON-VOTING STOCK NO YES [] []
				Authorized	Issued and outstanding	Treasury	Unissued	

7(b) Officers, directors and stock held by each: (See Instructions 3, 4, 5, 6, 7 and 8.)								
Name and residence of officers and directors	Citizenship	Office or directorship		Number and class of stock			Percentage of voting stock held	Name of person replaced if any
		Office held and date elected	Director - date elected	Common	Preferred	Other		

FCC Form 323														Page 3		
<p>NOTE: If no transactions concerning the ownership of stock (if transaction includes more than one class of stock, the following should be answered with respect to each class.)</p> <p>NOTE: If <i>total ownership</i> is reported, the numbered items below refer to line numbers in the following table. Lines 1 thru 17 should be filled out completely when this form is filed in report stock transactions pursuant to Instruction 11a. Lines 1 thru 8, inclusive, should be filled out when the form is used to report ownership after receipt of original construction permit or continuation, pursuant to Commission consent, of a transfer of control or assignment of license, pursuant to Instruction 11(b). Lines 1 thru 8, inclusive, should be filled out when the form is used to report pursuant to Instruction 11a. Use one column per stockholder. (Attach additional pages if necessary.)</p>																
Line 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 - Name and residence of transferee, purchaser, or stockholder (if other than an individual also show name, address, and citizenship of natural person authorized to vote the stock acquired)	2 - Citizenship	3 - Number of shares	4 - Number of votes	5 - Class of stock (Common, C/P, Preferred, P/F, Other)	6 - Par or stated value	7 - Total consideration paid (if other than cash, describe fully)	8 - Date of acquisition	9 - Number of shares of stock held by purchaser or transferee pursuant to this transaction	10 - Percentage of issued stock in corporation held by purchaser or transferee pursuant to this transaction	11 - Total number of shares of stock held by purchaser or transferee subsequent to this transaction	12 - Percentage of issued stock in corporation held by purchaser or transferee subsequent to this transaction	13 - From whom stock acquired	14 - Number of years of stock held by seller or transferee prior to this transaction	15 - Percentage of issued stock held by seller or transferee subsequent to this transaction	16 - Number of shares of stock held by seller or transferee subsequent to this transaction	17 - Percentage of issued stock held by seller or transferee subsequent to this transaction
1	(a)	(b)	(c)													
Remarks concerning family relationship, etc.																
2																
3																
4																
5																
6																
7																
8																
9																

Finally, a licensee must list at Paragraph 6 of Form 323 all contracts required by Section 1.613 of the Rules, including the data of *execution* and *expiration* of each contract. These contracts include the following:

- (1) Contracts relating to network service (e.g., network affiliation contracts, agreements and understandings for television and contracts, agreements and understandings for AM and FM radio stations and a network where programming is supplied five days each week for eight or more months per year);
- (2) Contracts relating to ownership or control (*present* or *future* control of ownership of a broadcast licensee or a construction permit holder; this includes changes in the Articles of Incorporation or a partnership, the By-Laws, stock voting rights, options, and numerous other agreements which modify or limit present of future control of a broadcast licensee¹;
- (3) Contracts relating to personnel (e.g., management consulting agreements, certain profit sharing agreements, etc.).

A licensee which owns one or more additional broadcast stations must list its interest in each of these stations in the Form 323 report.

Annual Reporting and One Percent Benchmark Exceptions: As noted at the beginning of this article, the Commission foresaw the great difficulties that large corporate licensees would have in reporting all ownership changes. Thus, corporations, partnerships or other associations with more than 50 stockholders or members need only file Form 323 once per year. The price for this exemption is an annual filing, while other broadcast licensees need only file Form 323 once every three years (unless there are changes in the ownership structure). This annual Ownership Report must be filed by a licensee with more than 50 stockholders or members "within 60 days from the anniversary of the record date selected in the first annual report for stockholdings." (On October 1, 1976, each widely held licensee had to file Form 323 with information as of a record date any time within the period October 1, 1975 to October 1, 1976. The record date chosen governs all future Form 323 filings.) Widely held licensees are *not* required to file supplemental Ownership Reports because of their annual Form 323 filing.

Public Inspection File: Each licensee must maintain a copy of all Form 323 Ownership and Supplemental Ownership Reports (together with related material) available for inspection by the public locally as required by Section 1.526 of the Rules.

Transfer of Control: A major stumbling block for licensees is the requirement that prior Commission consent must be secured before a transfer of control takes place. *Filing of Form 323 does not constitute Commission consent to transfer of control.* Rather, a licensee must secure Commission consent by filing an FCC Form 314, 315 or 316 application. (Transfer of control takes place when "an individual or group in privity, gains or loses affirmative or negative (50%) control".) Then, within 30 days after the actual transfer of control has taken place, the licensee must submit its Form 323 report.

Sanctions: The Commission views failure to file an initial or supplemental Ownership Report as a serious violation of the Commission's Rules. In some cases, the Commission has imposed forfeitures of \$1,000 and more.² In other cases more serious consequences have attended, such as designation of a licensee's renewal application for hearing, or designation of a revocation hearing.³

Licensees should take some time to review Section 1.615 of the Rules *now* so that they will be especially aware of ownership changes that trigger the Ownership Report filing requirement. **BM/E**

¹For a detailed listing of contracts to be filed, see Section 1.613 of the Commission's Rules.

²Baron Radio, Inc., 25 RR 2d 1035 (1972).

³BHA Enterprises, Inc., 31 RR 2d 1373 (1974).

PHILLYSTRAN®

The Tough Guys



Far surpassing steel guys in strength and durability, PHILLYSTRAN is manufactured from impregnated KEVLAR* and polyurethane. Completely non-metallic, PHILLYSTRAN eliminates electrical problems and the usual problems of RFI.

- **Non-interference**
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- **Minimum Stretch**
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Outstanding insulation properties

PHILLYSTRAN . . . The Tough Guys in more ways than one.

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manufacturers of Chockfast®, Phillystran®, Phillybond®, Wearex™



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Circle 161 on Reader Service Card

GREAT IDEA CONTEST

Here are the last of the entries eligible for the 1977 Great Idea Contest. After the votes have been tallied for this month's entries, the monthly tallies for 1977 will be totaled. Winners will be announced for each of three categories (AM, FM, TV) and an engineering calculator will be awarded. Secondary winners in the sub-categories will also be announced and prizes awarded. In case of ties, duplicate prizes will be awarded.

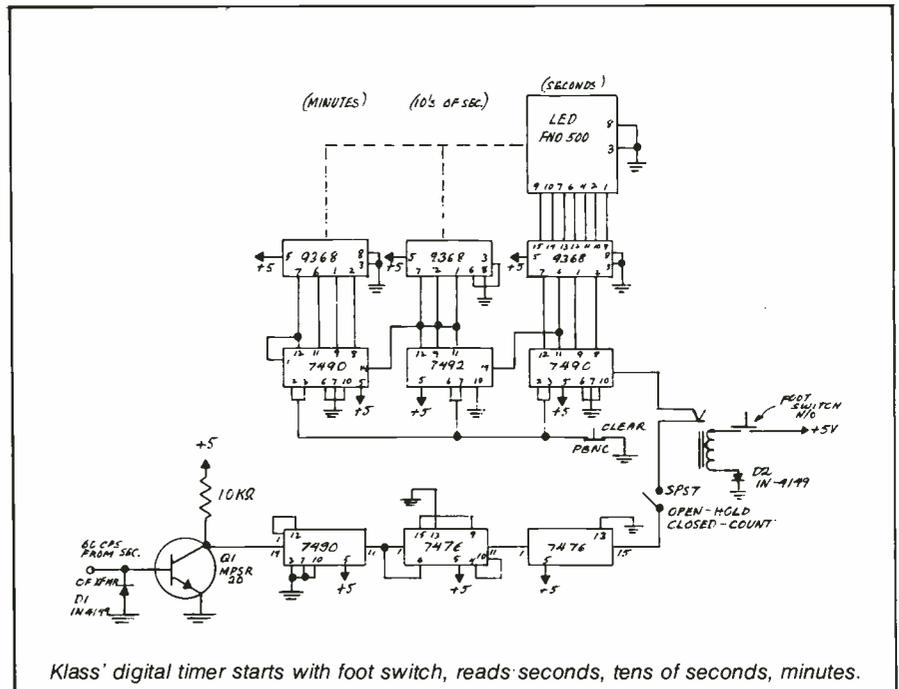
VOTE NOW!
GREAT IDEA CONTEST BALLOT
ON READER SERVICE CARD

36. Timing A 3-Minute Newscast.

Kelly Klaas, Chief Engineer, KEEP/KEZJ, Twin Falls, ID

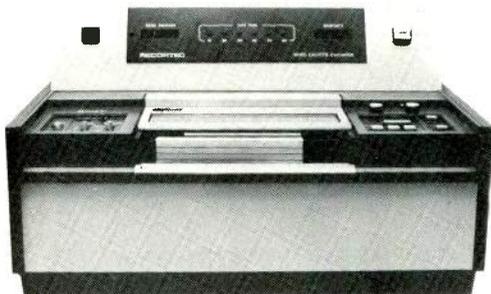
Problem: It was found to be very difficult to time a 3-minute newscast for our automated FM on a regular watch with a second hand, or a conventional stop-watch. A commercially available digital stop-watch would have sufficed, except for the size of the numbers, and no remote control.

Solution: The FND 500 LED's used in the timer are large enough to see from several feet away, and the foot switch lets you start the timer when both your hands are busy. The timer also has a switch on the unit itself for "HOLD," for the operators convenience. Additional stages can be added



Still the industry's MOST NEEDED

VIDEO CASSETTE EVALUATOR



- High speed cassette tester
- Edge damage counter
- Gross error counter
- Measures cassette length
- Still useful as recorder

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

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Great Ideas

39. Low Cost Clock Takes Advantage of Automation System Accuracy.

Leslie P. LeBlanc, Chief Eng., WKXL AM/FM, Concord, NH

Problem: For many years we had thought the synchronous-motor-driven electric clock was ideal for radio station control-room use. We had equipped our entire building with fifteen inch General Electric timekeepers. The accuracy of these units is fine when averaged over many days but they do drift a few seconds slow and fast during the day as the power system corrects for varying loads.

Then we automated the FM. The system we chose was the Harris SC-90. The accuracy with which this system joins network on time is phenomenal. The budget would not allow an automation control console in AM control as well as FM. Unfortunately at present Harris does not offer a clock-only accessory.

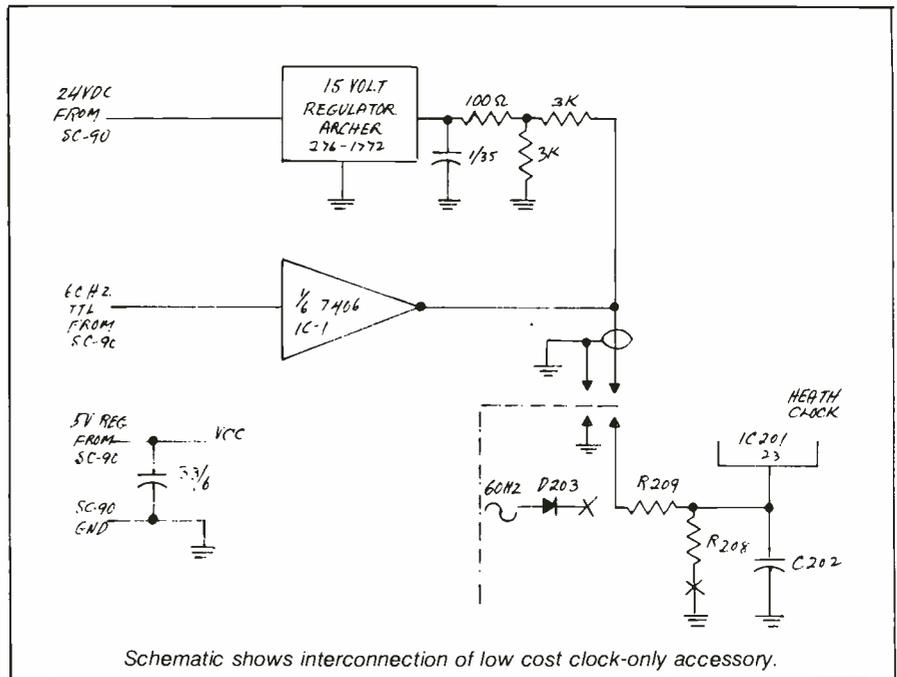
Solution: In its latest catalog, The Heath Co. offers the Model GC-1094

Electronic Clock Kit for \$49.95. The six-digit display is large enough to read at a fair distance, and being a kit, it is easy to service. The concept was to build the Heathkit clock, and then substitute its AC line timebase with a sample taken from the automation system. The project proceeded as follows:

We obtained a GC-1094 clock and

built it. While we allowed it to run for several days as a smoke test, we looked for our time-base sample in the System-90.

The crystal, in its oven, is located, along with a divider chain, on a circuit board that plugs into the larger board designated as 'Control Logic 1'. A TTL level signal at 60 Hz appears at pin 3C



HITACHI FP3030

"The Affordable Portable"

A Lightweight, Easy to Use, Completely Self-Contained Color TV Camera.

The Hitachi FP3030 is currently satisfying the many programming needs of corporate communications centers, hospitals, schools, and broadcasters.

And no wonder, when you consider its sharp images, true colors, featherweight portability, and equally light price tag. But best of all, the FP3030 is so easy to use that all you do is point and shoot, without complicated adjustments.

- Weighs only 8½ lbs. complete.
- Rugged, heavy duty shipping case.
- Single Tri-Electrode Vidicon tube for registration-free color.
- Internal NTSC or external sync for system use.
- C-Mount lens—wide variety of auxiliary lenses.
- 3-way power — AC line, battery, or external DC (12V).
- Use with any video tape recorder from cartridge to quad. VTR control on camera, and playback on viewfinder.

Ask for the FP3030 at your Hitachi dealer.

HITACHI
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of this plug. For isolation precautions, we routed this signal through an unused gate and on to connection #86 where this board plugs into the 'mother-board/back-plane assembly. The spare gate was found at IC-2 pins #1 and #2. This gate is a 7404 inverter, so we will invert again before we apply the signal to the clock. Point-to-point wiring was used. We then had an accurate, 60 Hz, TTL level signal available to the outside world.

The GC-1094 clock utilizes a Mostek chip of type number MK5017PAA. Heath feeds a 60 Hz signal to the chip which is derived from a half-wave rectifier and voltage divider. The level at the chip is 14.5 volts, zero to peak.

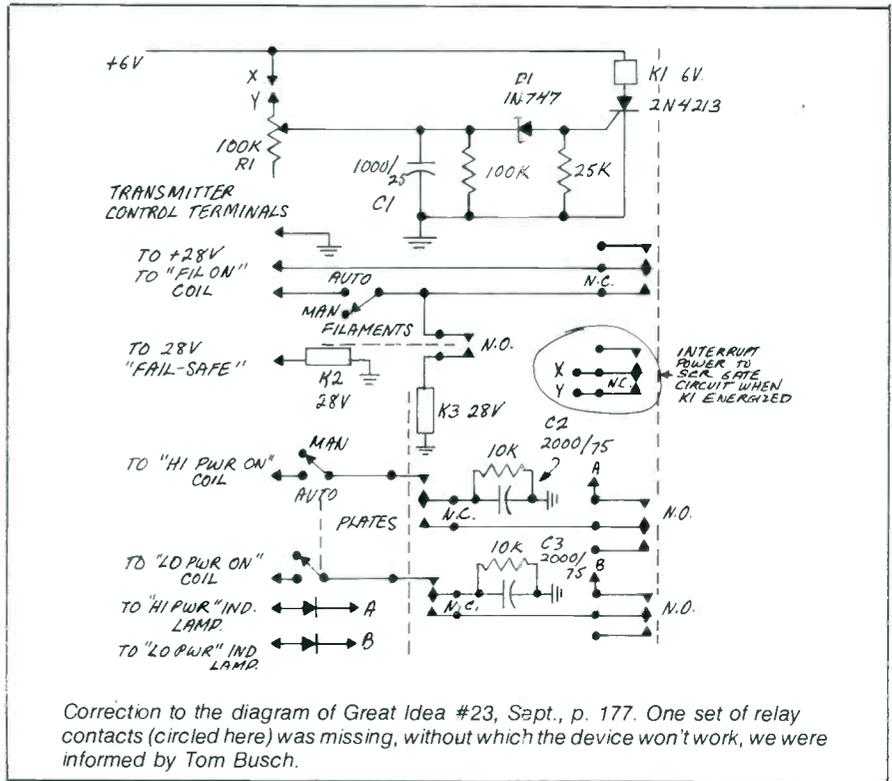
To increase our TTL level signal to this value, the circuit shown was built on a small piece of perf board and mounted in the rear of the automation cabinet. Power was borrowed from the SC-90 supply, and the output is a replica of the crystal divider chain raised to a level of just under 15 volts.

In the Heath clock, the internal time-base is disabled by breaking the connection between D203 and R209. Our new signal is inserted at R209 and the voltage divider is disabled by lifting the grounded end of R208. The 30 foot run to the AM control-room is made with shielded pair; the shield is

grounded at the SC-90 end only.

Probably the enterprising technician can adapt this idea to most any clock and/or automation systems. Anyway, it is a delight to watch this inexpensive

little clock as it tracks the SC-90 second for second. The line-driver has five more circuits, so perhaps we can add clocks in several locations about the building.



STOP TAPE DELAY ENDS HERE



THE TIME TUNNEL

The Time Tunnel digital audio delay system is here. A professional broadcast quality six second audio delay that is virtually maintenance free.

The Time Tunnel utilizes a digital memory system to provide consistent high quality audio reproduction month after month—year after year. Unlike tape delay systems, the Time Tunnel has no moving parts to wear, no preventative maintenance is necessary and the performance does not degrade with time.

The Time Tunnel is offered in two models, TDG-1 with a 15Khz bandwidth and the TDG-2 with a 7.5Khz bandwidth. Both models have a frequency response flat within $\pm .25$ db and a total harmonic distortion of less than .5%.

The Time Tunnel also offers a wide dynamic operating range of greater than 66db with a clip-level of +12db and a system signal to noise ratio of greater than -80db.

COMEX SYSTEMS, INC.

"The Innovators"

End your broadcast delay problems forever.
Call or write:

COMEX SYSTEMS INC.
Executive Drive
Hudson, NH 03051
603-889-8564

How to get a three-motor, direct-drive, isolated-loop deck. And save \$5,500.



"Ingenuity of design can be fascinating for its own sake, but when it results in a product of demonstrable excellence, as with this tape recorder, one can only applaud..."

The review is from *Modern Recording*. The tape deck is Technics RS-1500US. And the ingenuity of design that *Modern Recording and Audio* have praised in recent issues is Technics' advanced "Isolated Loop" tape transport with a quartz-locked, phase-control, direct-drive capstan.

By isolating the tape from external influences, Technics has minimized tape tension to an unprecedented 80gms. Eliminating virtually all signal dropout. While reducing modulation and wow and flutter to a point where conventional laboratory measurement is seriously challenged. A considerable achievement when you realize Technics RS-1500US is priced substantially below its professional counterpart, \$5,500 below.

Electronically, too, Technics has provided the ultimate in professional control and performance. A separate microphone amplifier. Record amplifier. Mixing amplifier. And three-way bias/equalization. While IC full-logic function controls permit absolute freedom in switching modes.

Compare specifications and prices. Then you'll realize there's no comparison. TRACK SYSTEM: 2-track, 2-channel recording, playback and erase; 4-track, 2-channel playback. FREQ. RESPONSE: 30-30,000Hz, ± 3 dB (-10dB rec. level) at 15ips. WOW & FLUTTER: 0.013% WRMS at 15ips. S/N RATIO: 60dB (NAB weighted) at 15ips. SEPARATION: Greater than 50dB. RISE TIME: 0.7 secs. SPEED DEVIATION: $\pm 0.1\%$ with 1.0 or 1.5mil tape at 15ips. SPEED FLUCTUATION: 0.05% with 1.0 or 1.5mil tape at 15ips. PITCH CONTROL: $\pm 6\%$. SUGGESTED RETAIL PRICE: \$1,500*.

Technics RS-1500US. A rare combination of audio technology. A new standard of audio excellence.

*Technics recommended price, but actual retail price will be set by dealers.

Technics Professional Series
by Panasonic

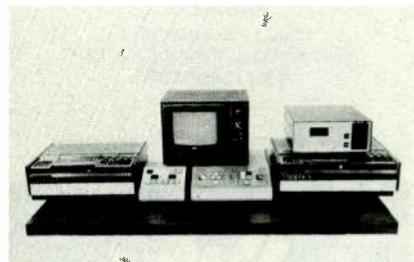
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BROADCAST EQUIPMENT

For more information
circle bold face numbers
on reader service card.

Videotape Editing System 300

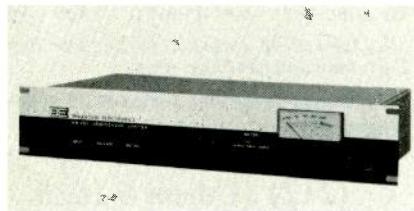
Editing system enables producer or director of a program to easily prepare a rough cut or video work print of a program. The Videola also automatically generates the edit decision list needed to complete the final edit on two-inch tape. Videola's portability (250 lbs.) permits use in almost any location. Two joystick controllers enable selection of



proper in and out points for edits and immediate previewing and execution of the edit. Its logger uses a microprocessor to store the edit data on a small 'floppy' magnetic disc which stores up to 1600 edits. A special computer system is used to retrieve all information on the disc needed to prepare a CMX compatible edit decision list. VIDTRONICS.

AM Compressor/Limiter 301

Unit provides smooth noise-free control of transmitter levels, and protects against over-modulation while maintaining average modulation at optimum

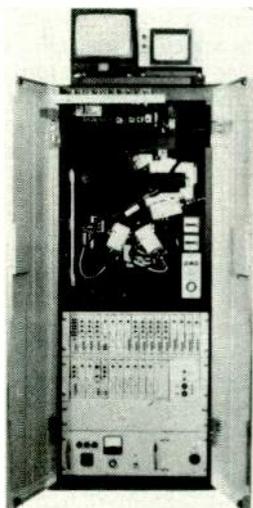


levels. Model AM-400 has an adjustable compression release time of 5 to 40 seconds for 20 dB release, symmetrical/asymmetrical processing, 1 microsecond attack time and a +20 dBm

output. Switch selectable modes include: compression and limiting, compression only or fixed gain conventional amplifier. BROADCAST ELECTRONICS.

Film-Chain Color-TV Camera 302

Broadcast film-chain color-TV camera solves dust on picture problem. The problem seemed insoluble because the image from a projector was normally



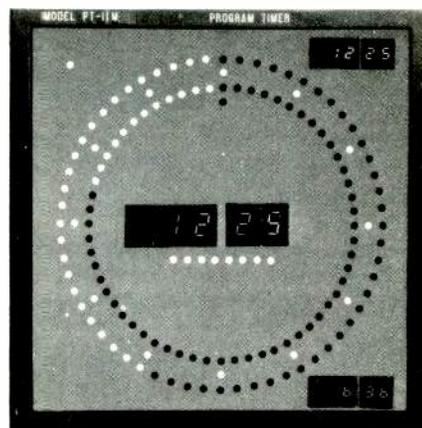
focused on field lens of the film-chain camera so that any dust on the field lens was also in focus for the TV pickup tubes. In the TKC-950B the image from the projector is an aerial image. It is focused in space 44mm in front of the field lens. Therefore dust is never in focus even if it adheres to the surface of the field lens. External multiplexer can be installed on either the left or right side of the new unit. It is interchangeable with the RCA TK-28/27 and compatible with most 3 and 4-input multiplexers. IKEGAMI ELECTRONICS (USA) INC.

Joystick Editing Control System 303

Joystick editing control operation is now available on the Sony BVU-200 Broadcast Video Cassette Recorder. The ECS-1BVU provides the same selection of plug-in, add-on accessories available with the ECS-1B Joystick Editor. The ECS-1BVU also permits the use of other lower cost Sony and Panasonic VCRs. Optional accessories

continued on page 104

NTI MODEL PT-10, PT-11, PT-12 PROGRAM TIMER



MODEL PT-11M



PATENT PENDING MODEL PT-11C ONE GLANCE, OK! THE ULTIMATE PROGRAM TIMER

- MODEL PT-12 with cue has a cue display at the top of the main time display. "SLOWER", "FASTER", "START", "STANDBY" and "REPEAT" are displayed in an easy-to-understand manner.
- Rap time, remaining time or elapsed time can be output.
- Since the effect is the same as that of a clock, misreading of the time doesn't occur.
- The performers can read the time in this semicircular state.
- Designed to be applicable to all items in broadcasting work.
- May also be used instead of a stopwatch.
- Master/slave possible. Up to 10 units can be driven by one output. Since it has two outputs, a total of 20 units can be operated.
- Master and slave can be connected with one coaxial cable.
- Since signals are transferred at a low level through coaxial cable, there is no fear of induction or noise effecting other equipment.
- Since timing is performed electronically, there is no mechanical noise such as that of conventional clocks.
- Other devices can also be considered by means of code output.
- Other devices and optional interface meet all requirements.
- Combination with a control panel, etc. is recommended. Special mounting dimensions are also available.

NTI America, Inc.
1680 North Vine Street LOS ANGELES, California 90028
Phone 213-462-8945
Circle 167 on Reader Service Card

Spotmaster®

A BIG SELECTION FOR A SMALL BUDGET

If you are trying to fit a cartridge machine into a budget, you may think you have a limited choice of machines.

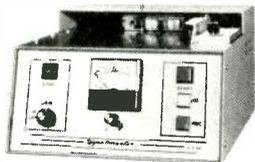
With Spotmaster this isn't true. We have many models of economy-priced machines: mono and stereo, record and record/playback, for A, B and C cartridges, delay machines, and a wide choice of options.

The New 2000 Series



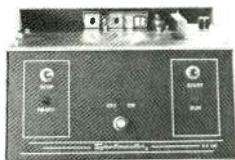
MODEL 2000 RPS — A stereo record/playback machine for only \$1,025.00. Stereo playback \$695.00. Mono record/playback \$795.00. Mono playback \$575.00.

Traditional Favorite



MODEL 500D — Record/Playback Unit. One of twelve 500 Series models, a traditional favorite still in use and still in demand \$975.00. Playback only \$695.00.

Old Faithful



MODEL 405B — Mono Playback Unit. Every time we reduce inventory on the 400 Series, the orders roll in. And why not — at \$550.00 it's an outstanding value.

NEW LOCATION

BROADCAST ELECTRONICS, INC.
4100 North 24th St., Quincy, Illinois 62301
Telephone (217) 224-9600

PRODUCERS OF
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Broadcast Equipment

include a plug-in TT-6 Program Computer, an LL-7 Liplock Audio Pitch Control microprocessor for rapid selection of exact audio edit points and the ADR-8 Automatic Dialogue Replacement to automatically replace precise words or sentences with a live microphone. \$6700. CONVERGENCE CORP.

Dual-Channel Power Amplifier 304

Power amplifier with solid state dual-channel circuitry for applications requiring precision quality audio and continuous operation. The TCB-S320 supplies 160W (rms) continuous power per channel or less than 0.1% total harmonic or intermodulation distortion from 10-20 kHz into 8 ohms with a frequency of ± 0.2 dB. It produces 320W into a single 16-ohm load with identical specifications. Residual hum and noise is 95 dB below full-rated power and output regulation is better than 0.2 dB 10-20 kHz from rated load to no load. BOGEN DIV./LEAR SIEGLER, INC.

Video Cassette Changer 305

Video cassette changer for stand-alone pay TV installations handles a full week's pay TV programming. System 19 automatically switches and changes up to 19 different cassettes at any time, in any order. The system, in a single six-foot rack, includes two Sony U-Matic video tape players, monitor, time base corrector and 19 cassette trays, time clock and stand-by battery with charger. PROGRAMMABLE SYSTEMS, INC.

Film Projector Synchronizer 306

Synchronizer for electronically interlocking two 35mm film projectors during post production editing operations to produce a video tape from two 35mm films. The ServoLock Synchronizer precisely interlocks two RCA FR-35 projectors, one master, one the slave. Two interlocked projectors can be used to compose and record a composite video tape directly from two similar or dissimilar films. Unit has potential applications in animation where one projector plays the background scene, while the other projects the animation sequence. RCA BROADCAST SYSTEMS.

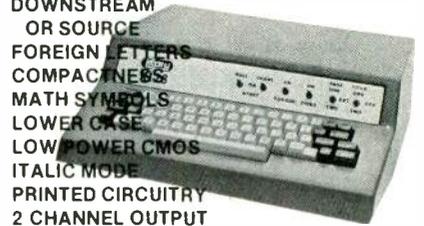
High Power Amplifiers 307

New line of 1 kW CW high power amplifier systems operating as linear



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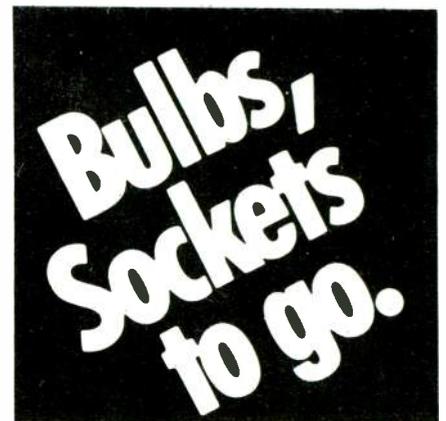


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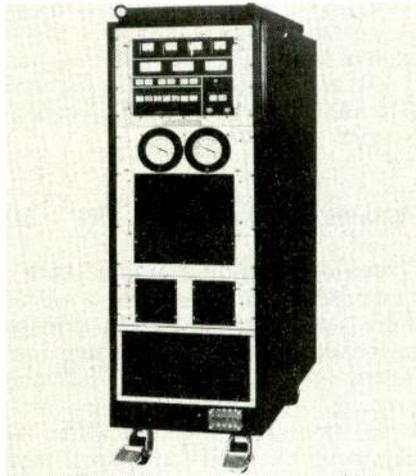
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DECEMBER, 1977—BM/E

Broadcast Equipment

amplifiers over the 200 MHz to 10.0 GHz frequency range, in 7 bands, pro-

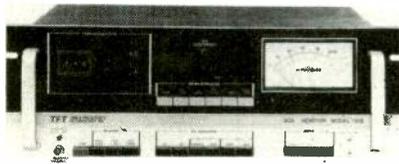


vides over 1000 W CW. Solid state amps are used in the 200-400 MHz and 400-500 bands. Upper frequency ranges use high power TWTs. Normal bandwidths are provided except for the 8.0 and 10.0 GHz range. All controls, indicators and cable connectors are mounted on the front panel except RF output. \$150,000 per band. LOGIMETRICS, INC.

TV SCA Monitor

308

Monitor provides SCA channel monitoring and proof-of-performance measurements on SCA carriers. When used in conjunction with Model 701 or 702 TV Modulation Monitors, the new Model 730B enables off-the-air monitoring of SCA channels. It also provides the basis for measuring



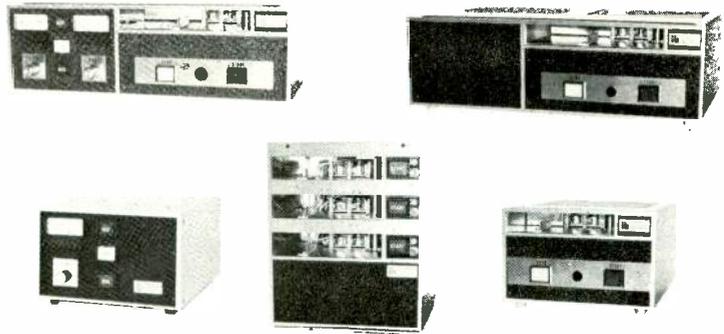
proof-of-performance on either the 39 kHz or 67 kHz subcarrier channel. Proof-of-performance measurements include injection level, S/N ratio, modulation and crosstalk. A 50 dB pushbottom meter attenuator and a wideband input is provided to allow unrestricted distortion and response measurements at the transmitter. TIME & FREQUENCY TECHNOLOGY INC.

Video/Sound UHF Tetrode

309

A UHF tetrode developed specifically for common video and sound carrier
continued on page 106

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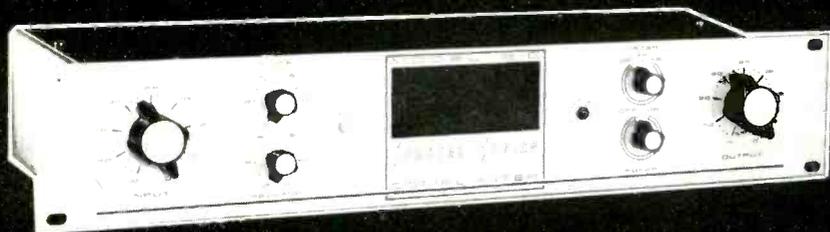
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amplification in UHF television transmitters and translators, the TH 393 provides highly linear performance in class A operation with a minimum power gain of 16 dB. The peak video output is 1 kW and no precorrector is required. The 393 is cooled by a simple forced air system. THOMSON—CSF

Portable Audio and Video DAs 310

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Tape Splicer 311

Tape splicer for splicing of film or sprocketed magnetic tape without the loss of a single frame. The SP Series of tape slicers permits the editor to splice sequences together on a frame-to-frame basis without losing continuity. The film or sprocketed magnetic tape is butt-spliced with Mylar perforated splicing tape. Precision cutting blades and registration pins assure accurate splices with each operation. The snag-free splices eliminate the possibility of the splice sequence causing film damage when run through an editing machine. Available in 35mm or 16mm versions at the same cost. \$150. MAGNASYNC/MOVIOLA CORP.

Monolithic FM-IF IC 312

Monolithic integrated circuit providing all the functions of a comprehensive FM-IF system for communications applications. The linear circuit CA3089 includes a 3 stage FM-IF amplifier/limiter with level detectors for each stage, a doubly-balanced quadrature FM detector, and an audio amplifier with optional use of a squelch circuit for interchannel muting. Cost per 100: \$1.90. SIGNETICS.

Miniature Lavalier Microphone 313

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camera use. The C090 comes with a tie bar mount, windscreen, storable pouch and six feet of cable for connecting the microphone to its belt clip battery/transformer housing. A similar model, the C090E can be powered directly from wireless transmitters. Frequency response is 40-15,000 Hz with an output level of -57 dB into a low-impedance input. ELECTRO-VOICE.

Production Cassette Rack 314

Production cassette rack for improved production line efficiency. The rack enables a production line worker to organize, retrieve and store cassettes quickly and easily. It is a vinyl clad unit with a 150 cassette storage capacity. PENTAGON INDUSTRIES.

Status Light Display 315

Tally device monitors the TVS/TAS-1000 video/audio distribution switcher party line. It identifies the output users through the use of LEDs. Identification on front panel allows the operator to label the appropriate lights for identification of users. Unit can be modified to display 40, 80 or 100 outputs by changing front panel. It interfaces with the party line by a BNC connector with a standard piece of RG-59 coax. It con-

tains an internal dip switch enabling it to be programmed to monitor any source in the system. TELEMATION, INC.

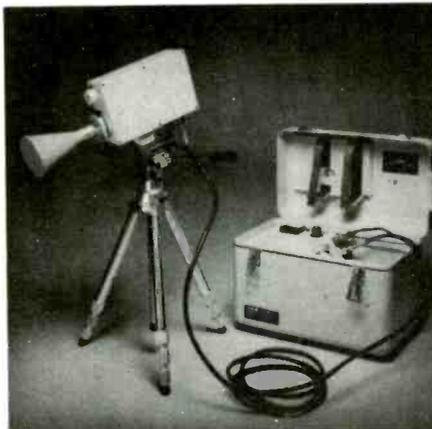
CATV Transformer 316

30/60 volt transformer enables CATV operators to extend their present 30 volt or replace outmoded equipment on an on-going basis. It eliminates the need to order special 30 volt only equipment to extend existing systems and later purchasing additional equipment when updating to 60 volt operation. Improved reliability and ease of installation is cited by the manufacturer. SCIENTIFIC-ATLANTA, INC.

Camera Tripods 317

Camera tripod for still and movie cameras with synchro-lock lifting mechanism permits one hand operation. Closed height is 30-in., extends to 70-in. Model D-26 panhead tilts in all directions for 360 degree panning. Weight is under 6 lbs. Model D-27 Pro Pod is machined from solid aluminum and uses no castings. 3-in. diameter panhead cannot slip or move. Closed height is 28 in., extended is 62 in. Weight is 2 lbs. \$27.50. STAR-D MFG. CO., INC.

continued on page 108



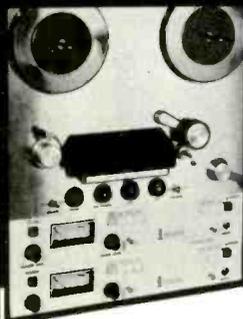
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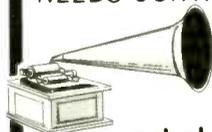
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The Sound Dynamics Model SD-100 is an updated version of an old reliable tape transport. Features include sealed motor capacitors, automatic equalization switching and edit features (Optional). The SD-100 is compatible with Inovonics, MCI or Ampex 350-440 electronics. In addition, parts are interchangeable with most Ampex 350/351 in use today. Thirty days is normal delivery time.

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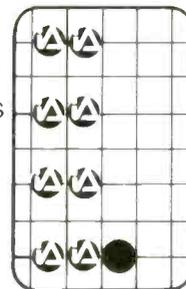
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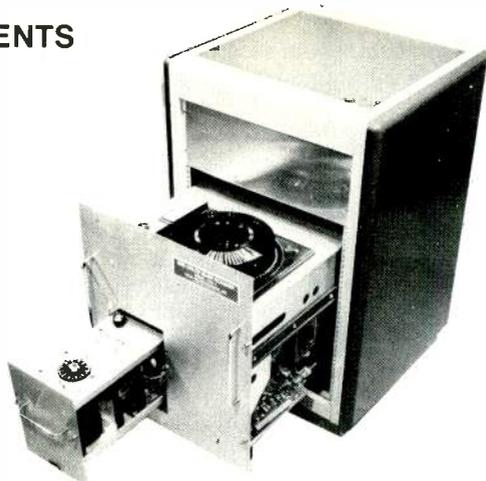
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TELE-MEASUREMENTS

MODEL CSS-1

COLOR SLIDE

SCANNER

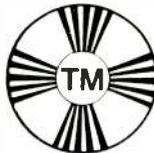


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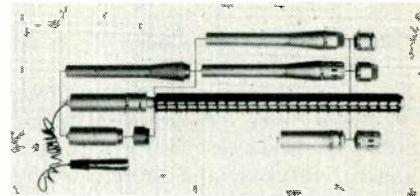
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Broadcast Equipment

Condensor Microphone System 321

New modular condensor microphone system, System C, consists of a number of elements which can be interchanged to fit specific applications. Elements in the system include 2 electronic



preamplifiers: one for handheld applications and one for boom use. The boom preamplifier operates from either phantom or AB remote power. Four interchangeable capsules are available: omnidirectional, cardioid, hypercardioid and Cardiline* shotgun. A complete line of accessories including windscreens and shock mounts are also available. ELECTRO-VOIDE, INC.

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