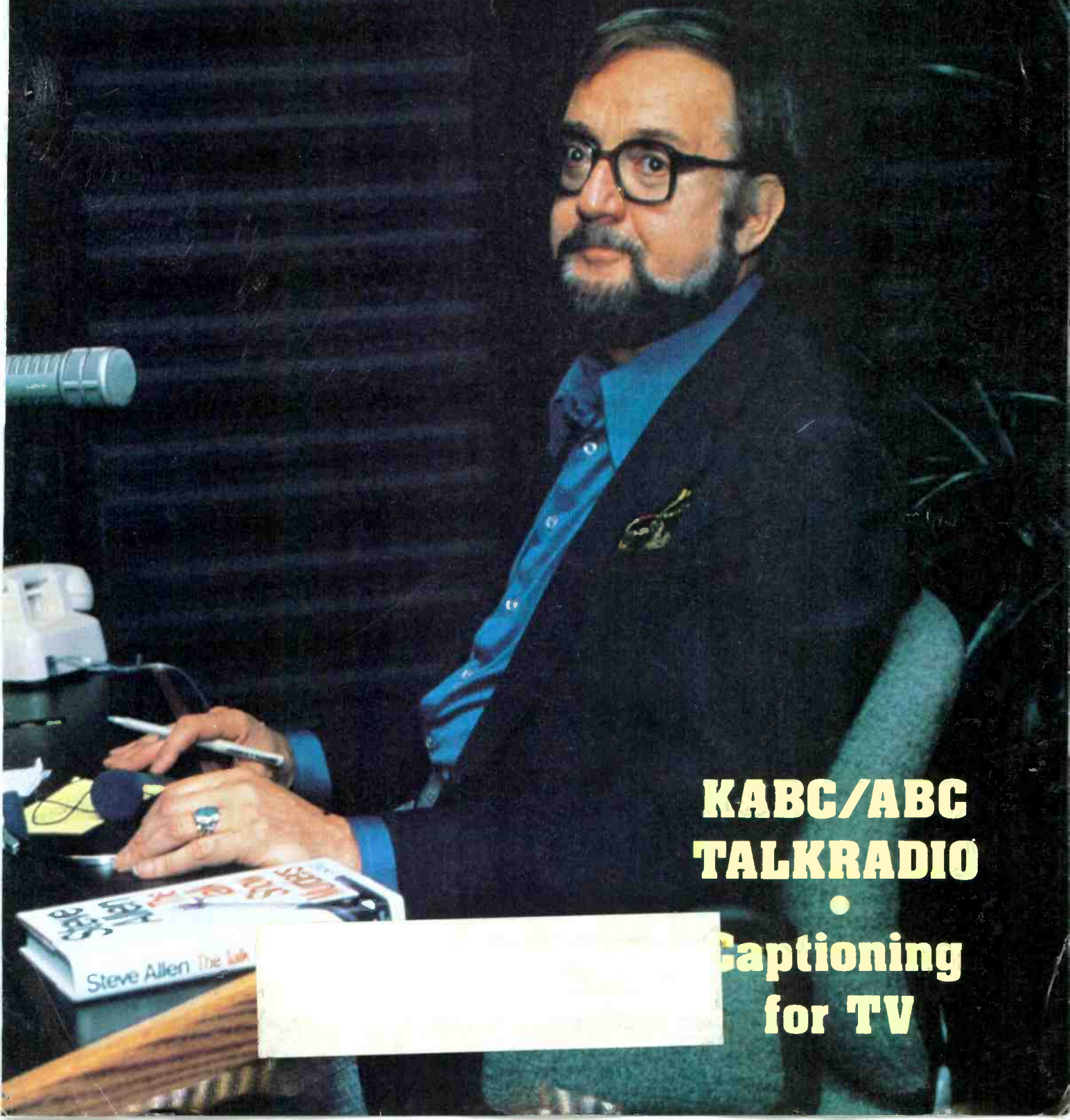


# BROADCAST ENGINEERING

July 1982/\$3



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# BROADCAST engineering

*The journal of broadcast technology*

July 1982 • Volume 24 • No. 7

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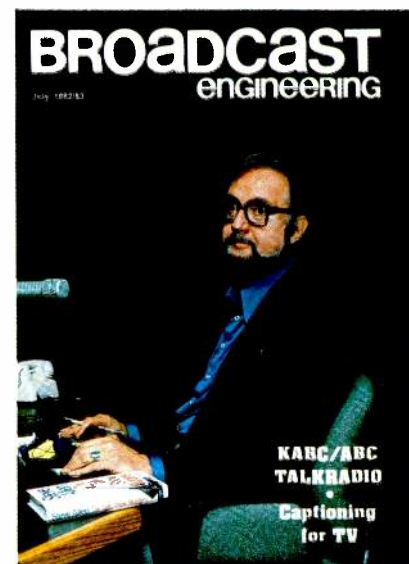
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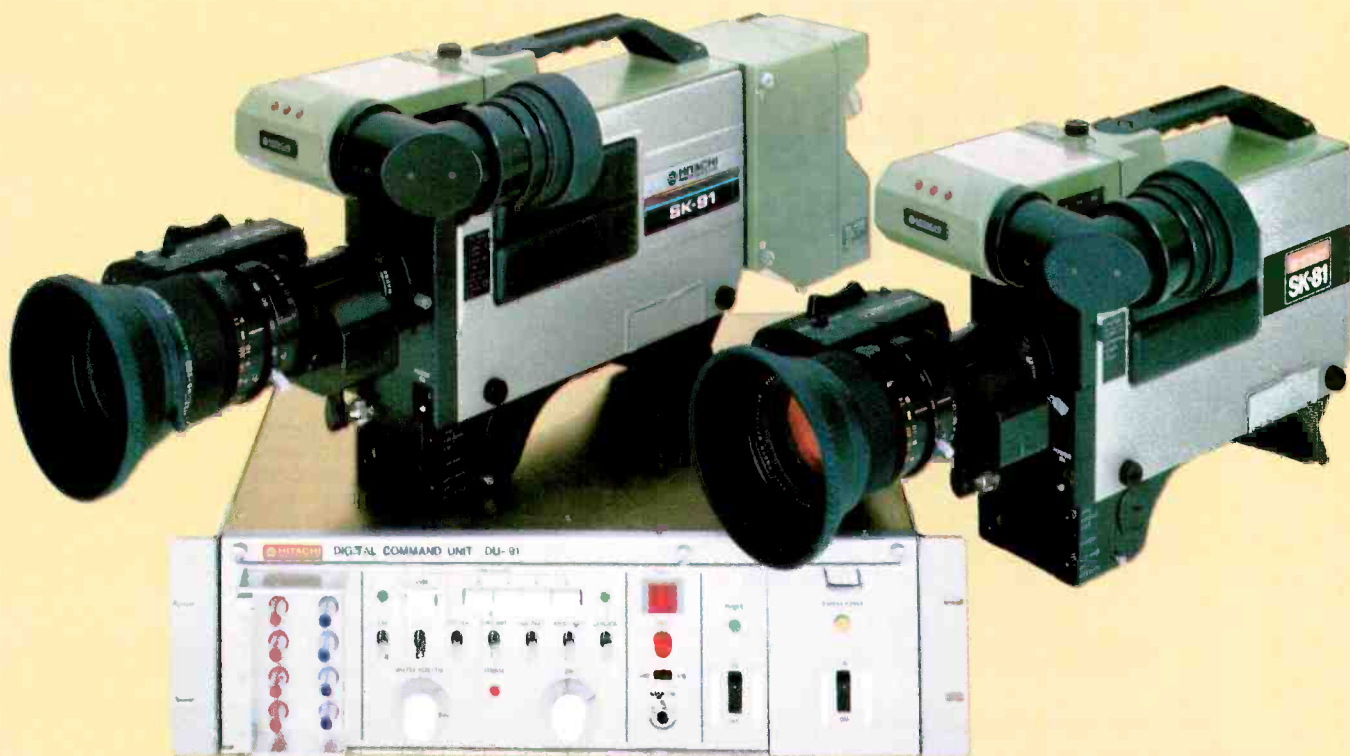


**THE COVER** shows performer Steve Allen at KABC in Los Angeles. "A Look at KABC/ABC TALKRADIO," on page 51, describes this station's design and progressive programming for radio talk shows. Steve Allen and Jane Fonda were among the celebrities appearing as guests at the station soon after its recent remodeling program.

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# FCC update

July 1982



Harry C. Martin, partner  
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## FM allocations standards modified

In a significant deregulatory action on May 20, the commission eliminated most of the policies which previously restricted the assignment of new FM frequencies to particular communities. A summary of the changes includes the following:

- **FM priorities.** In the future, first aural (reception) service will be given highest priority with co-equal status given second aural service and first local (transmission) service.

- **Population criteria.** The commission deleted criteria limiting the number of channels available to a community of a given size.

- **Preclusion.** This refers to the fact that assigning a given channel precluded assigning that channel and adjacent channels in the same general area. If no interest is shown in the community where the preclusion would occur, the proposal will be considered without regard to its preclusive effect.

- **Class of channel to assign.** The commission has deleted the policy calling for making only Class A FM assignments to smaller communities and Class B or C to larger ones.

- **Intermixture.** The commission's policy against assigning two different classes of FM channels to a particular community has been dropped.

- **Berwick issue.** This issue, which concerns whether the party involved really intends to serve the designated community or a larger one nearby, will no longer be used in FM rulemaking.

- **Assigning a channel to avoid a hearing.** The policy of not assigning a channel to avoid a comparative hearing has been dropped.

- **Demographic data.** In cases where the status of a community is not in issue, the commission has eliminated the requirement for demographic data.

## VHF "drop-in" proceeding

The commission has denied petitions to reconsider its 1980 decision assigning new VHF TV channels to Johnstown, PA, Knoxville, TN, Charleston, WV, and Salt Lake City,

UT. Opponents charged that the assignments would cause interference to short-spaced stations and prejudice the commission's pending rulemaking on whether new drop-ins should be permitted if "equivalent protection" can be afforded to short-spaced stations. (In this context, "equivalent protection" means the same degree of interference protection the table of TV channel assignments provides when stations operating with maximum facilities are spaced as close together as the rules permit.)

Many observers said they feel the decision to deny reconsideration in the Johnstown/Knoxville/Charleston/Salt Lake City proceeding is a signal that the FCC will liberalize its TV allocations rules generally to allow for many more VHF drop-ins where "equivalent protection" can be afforded.

## FM-to-Channel 6 interference

The commission has issued a second further rulemaking notice proposing specific rules to define and govern the interference caused by some non-commercial, educational FM stations to the reception of TV stations operating on Channel 6 in the same vicinity.

Specifically, in this action the commission asked for comments on the following proposals:

- limiting the amount of interference allowed to that which would make reception of Channel 6 impossible over a 0.3-square-mile area around the FM station's transmitter site; and

- retaining the current "demand" system for assigning non-commercial, educational FM stations, and not adopting an assignment table for such stations at this time.

The effect of the proposed standards, developed through the use of a computer model, would be to place restrictions on the power and antenna height used by educational FM stations within the Grade B contour of TV Channel 6 stations. These restrictions would become less burdensome as the frequency of the FM station moves from 88.1 to 91.9MHz—away from the Channel 6 spectrum. ( : ( : )))





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A technical tour of China in July 1983 will be sponsored by **Broadcast Engineering**. The 14-day trip will begin in Peking and cover Shanghai and Canton before ending in Hong Kong.

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an exchange of technical information and ideas will be conducted in each city.

Also, time will be allotted for stops at such locations as the Great Wall and the Imperial Palace.

The tour was arranged after discussions held during a China trip taken in February by Cameron Bishop, **BE** publisher, and Bill Rhodes, editorial director. The Chinese expressed special interest in meeting with

representatives of the broadcast industry worldwide and are anxious to show some of their new facilities and equipment.

The tour will be limited to 20 people who are involved in the broadcast industry. A special package fare has been developed along with a reduced rate fare for spouses.

For more information, contact George Roman, Roman Consulting, P.O. Box 1607, Lafayette, CA 94549; 1-415-284-9180 or **Broadcast Engineering**.

**First broadcasting  
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On Feb. 14, 1922, 2MT Writtle, a wireless station set up and manned by members of the development section of the Marconi Company at Chelmsford, England, first went on the air to begin a regular service of information and entertainment that has become the most far-reaching development of the 20th Century—broadcasting.

Following the series of highly successful experimental broadcasts in 1919 and 1920, the post office revoked the Marconi transmitting license on the grounds of interference with legitimate services, despite the loud protests of the growing numbers of amateur enthusiasts who listened avidly for the transmissions. There followed a period of silence while the amateurs, members of wireless clubs that were to form the Radio Society of Great Britain shortly afterwards, gathered their strength. Then, in March 1921 at a conference in London they formally asked the post office to reinstate the license. A further wait followed until the license was restored in January 1922.

Elsewhere, particularly in the United States, broadcasting was becoming established and an infant industry was developing in response to wide interest. But the post office license to Marconi imposed severe restrictions—power limited to 250W and transmission time to no more than 30 minutes per week.

The Marconi Company instructed Captain P.P. Eckersley of the development section to establish a broadcasting station in a hut at Writtle, near Chelmsford. He did, and planned the programs that it would transmit. So, on Feb. 14, 1922, between 8 and 8:30 p.m. the first of the regular Tuesday evening programs began. Eckersley, later to become the first chief engineer of the BBC, was the star performer. Broadcasting was born.

The original hut still stands. It is on the grounds of the Kings Road Junior School at Writtle, Chelmsford, and is used by the boys as a changing room.

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## editorial

# AM stereo: A shot in the arm

One argument in favor of AM stereo is that it will revitalize AM broadcasting. Much has been said about the several schemes from which the marketplace must choose to achieve the AM stereo broadcasts. The fact that the various techniques of AM stereo were developed is evidence of the continuing ingenuity of design engineers.

Yet, there is an inconsistency in this argument in favor of the new radio technology. If we see AM stereo broadcast come about, what will we hear? It is assumed that receiver manufacturers will improve their designs. But will they?

They could easily have incorporated PLL demodulation by now, aiding in selectivity and making possible reductions of transmitter carrier power, transmission costs and interference. They have not done so. They could have produced an automatically

variable bandwidth system, dependent on the strength of the received signal. Such a scheme would improve quality of reception; but that has not been done. They could have made other changes to improve fidelity of the audio, but instead swamping components continue to narrow the audio response. So without receiver improvements, there is a point beyond which transmitted signal improvements fail to show better reception.

And for what will these improvements be made? Talk shows do not need any increased audio bandwidth. Communications equipment is generally limited to a bandpass of 300Hz to 3kHz, because a greater response does not significantly improve intelligibility. Little can be said of increasing fidelity on music formats. The majority of the music comes from phono discs whose groove

modulations already display an overabundance of compression and limiting. By the time a station has taken part in the modulation war, the result is an intelligence impressed on the carrier that lacks dynamic range and generally irritates as many listeners as it pleases. It would seem that we are awaiting AM stereo so we may witness (experience) cacophony in stereo! Somehow that possibility rings of multiplicity in trivia.

We suggest that if AM needs a shot in the arm, then perhaps other points also need to be considered. Let the receiver people know that we are fed up with mediocre designs of equipment. Let them also know that integrated circuits could easily provide such improvements as PLL demodulation and auto-variable IF bandwidths at little added expense to the receiver buyer. Let the recording studios know that musical quality is not dependent upon a consistent loudness of the reproduced recorded sound, and that dynamics in music can be pleasing. And, finally, if the electronics wizards who design our equipment can show imagination and ingenuity, why can't the program producers also display creativity? Some talk and some music is fine, but let's have something else that makes spending the time and money worthwhile. |{:~:)))|

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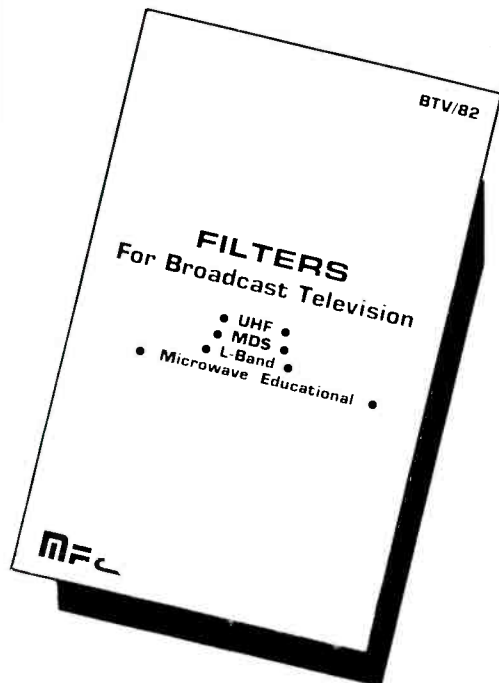
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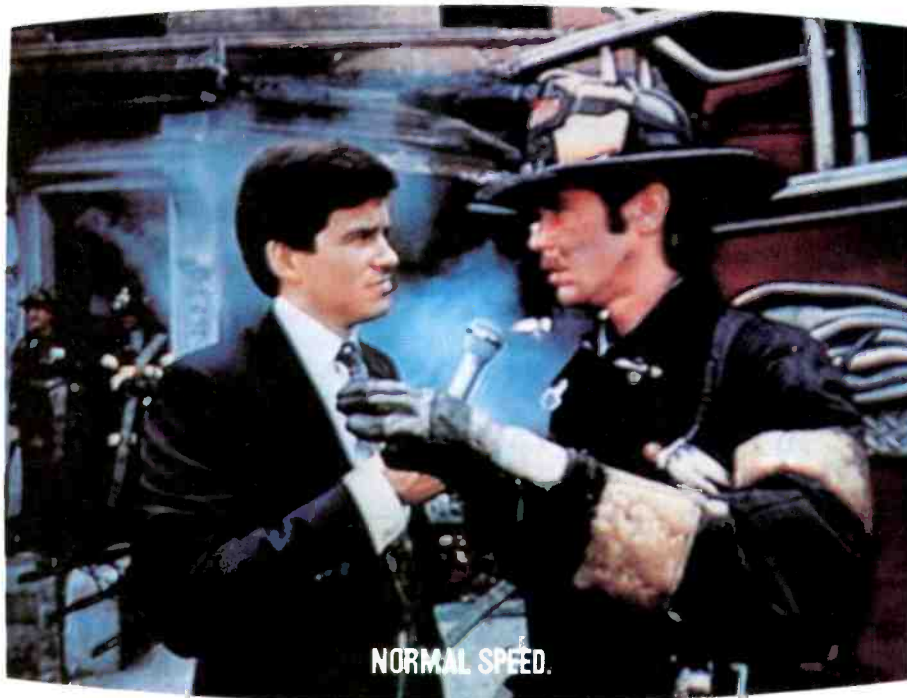
“We have extremely critical clients,” says Rheinlein. “They’re used to the best performance, in terms of picture quality and in terms of flexibility. This new Sony can deliver it.

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"We've always bought a lot of Sony, because we can depend on the company for reliability and innovation," says Rheinstein. "Now, with the BVU-800, Sony makes its competitors look like they're operating in reverse."

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\*When used in conjunction with the BVT-2000 digital time-base corrector.

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# PRC-'82: Progress in radio

By Brad Dick, chief engineer, KANU, Lawrence, KS

- April 18-22, 1982
- Hyatt Regency  
Washington, DC
- 900 attendees



The engineering training panel (left to right): John Battison, WOSU; Roger Karwoski, KBIA; Skip Pizzi, NPR/Washington; Dick Cassidy, NPR/Washington; and Brad Dick, KANU.

The annual Public Radio Conference (NPR) gives public radio stations an opportunity to meet and discuss the areas of concern in public radio. The sessions also allow professionals in the different facets of station operations to discuss techniques that have been successful at other stations. Those attending this year's conference were offered high quality programs for which the conference has become known.

The engineering side of the con-

ference has always been taken seriously by the leadership of the conference, and those sessions aimed at engineers were timely and informative. This year's list of topics included such seminars as: *Laser Communications Systems, FM/SCA Transmission Problems, RPU/STL Systems, Elderly Tape*

*Recorder Maintenance and FM Coverage Prediction.* Panels featured representatives of the FCC, SBE and NPR. Although not strictly directed at maintenance engineers, several sessions were held to provide instruction on stereophonic recording and production techniques.

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# Profitable in-house production starts with the right system.

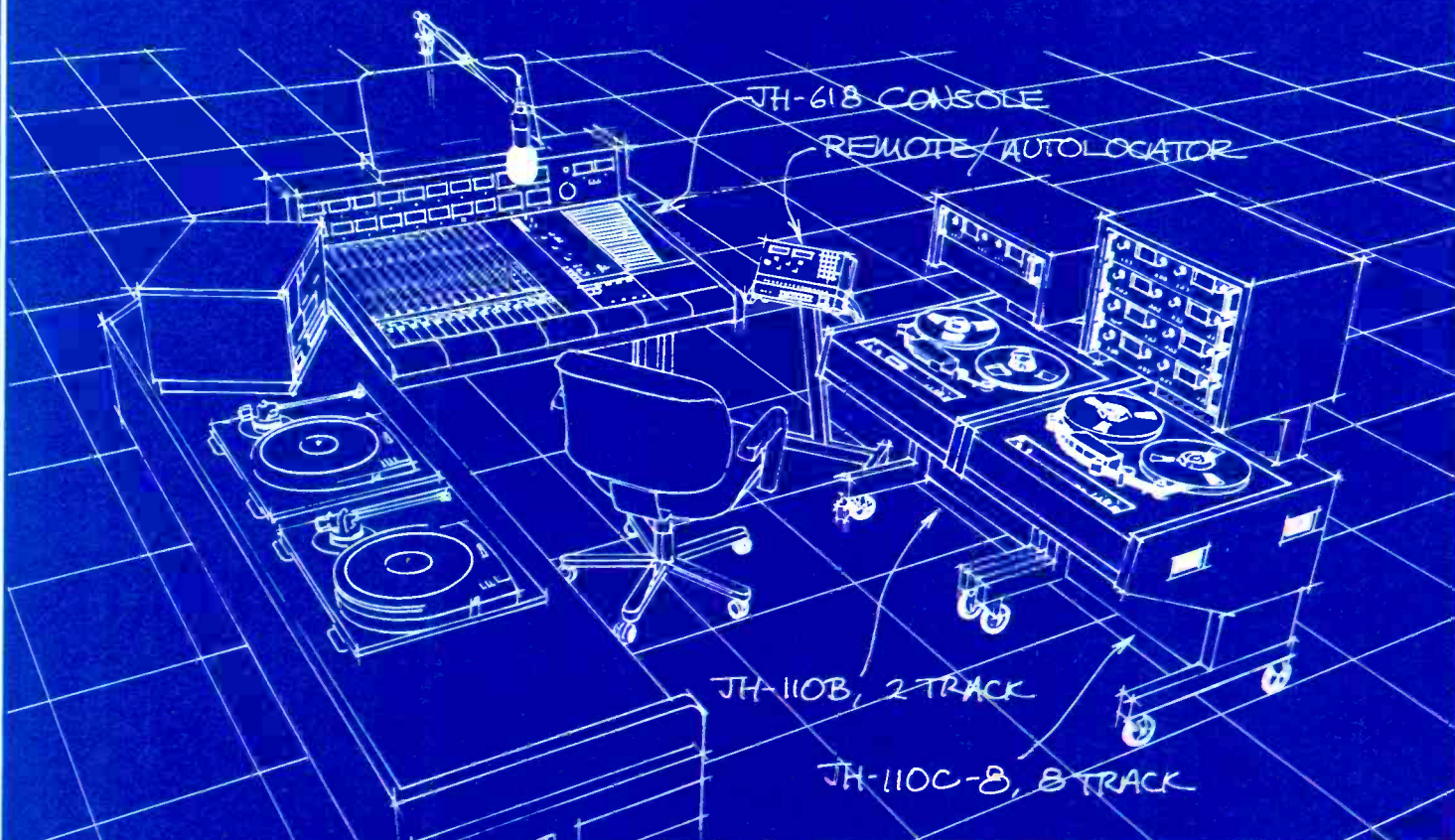
## Designed by MCI.

Time was when you could get by on in-house production with a couple of beat-up tape recorders and a turntable. But audiences and advertisers of today are demanding more. And that means a total production system that allows you to do everything from overdubbing and track bouncing to live multitrack recording. Now the company that has equipped more award winning studios than any other has designed a Total Production Package priced within your budget. You get an 8-track recorder, 2-track recorder and a studio quality console with

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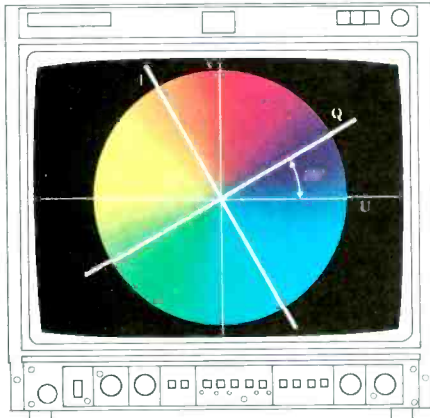
Contact your nearest MCI dealer today about the quality design (and current price advantages) of MCI's new Total Production Package. Your advertisers will love you for it.

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SPECIFICATION CONTROL DWG.			TITLE		
<b>MCI</b> A division of Sony Corporation of America			BROADCAST AUDIO PRODUCTION SYSTEM		
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## Laser link

Wayne Hetrich, senior NPR engineer, spoke to engineers about a laser audio link he has been working on. The system, which costs about \$10,000, provides two audio-over-video subcarriers. It has several advantages over RF links, according to Hetrich. They include: no FCC license requirement, no telephone company problems, high quality, simple and rapid installation and a secure (private) line. He said the beam width of the system at 2000 feet would be about two feet. On a clear day, he obtained a transmission path of 2000 feet. At night the distance increased to 3500 feet. Fog and snow can be a problem, reducing the path length to as little as 500 feet.

## FM patterns

One particularly interesting session was centered on the prediction of FM

coverage patterns. Ed Williams, from Corporation for Public Broadcasting, outlined a computer program that he uses to predict the coverage for TV stations. This computer data-based program will count the number of people (based on current census data) within two contours of a station. The program also takes into account the terrain surrounding the transmitter. Figure 1 shows the result of plotting the predicted coverage of an FM station while taking into account the surrounding terrain. The computer program required 11 minutes of CPU time just to make the calculations necessary to plot the map. The computer then drives a plotter to actually plot the coverage on a standard map. This type of information would be useful for any station located in mountainous terrain and concerned about knowing exactly where its signal is being received. The cost for this service,

Continued on page 66

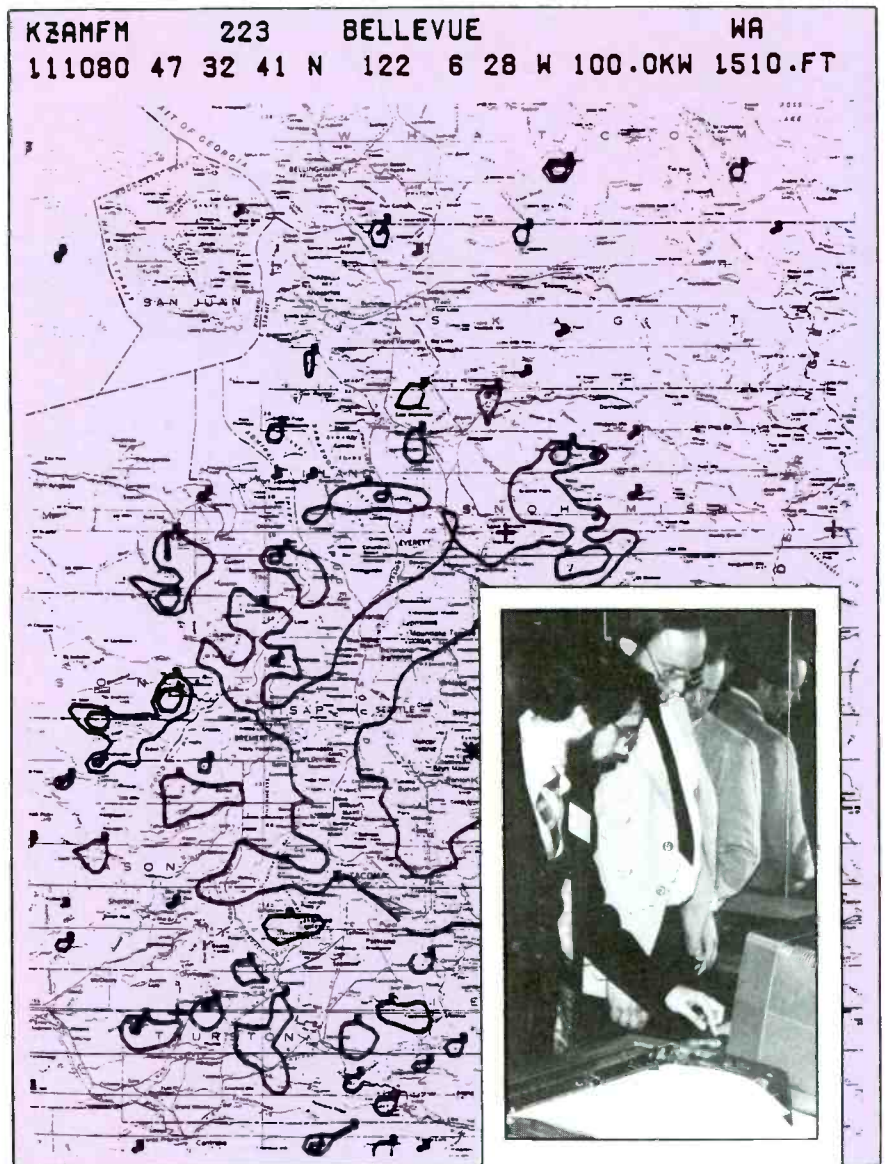


Figure 1. Computer printout predicting FM station coverage

Computers—key to efficient operations

# Now your ENG units can afford the same "line" microphones bought by every major network!

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What you'll hear is performance closely rivalling our more expensive brethren. So close, in fact, that every major network has tried and bought our line microphones. And you'll get some advantages which can be very important in the field.

For instance, the phantom-powered AT815R can interface with supply voltages from 9 to 52 volts without adapters or extra circuits. So you don't have to rebuild present equipment to put it on the air. We also have a neat 2-battery 9V power supply you can use. When one battery is in use, the other is on standby. For your peace of mind.

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The AT815 and AT815R weigh barely over 9 ounces, to make them easy to "fishpole" or hand hold. And each comes with a foam windscreen which slips on in a second. Our optional shock mount can be added as well. And the AT815R has a bass roll-off switch if needed to control rumble.

Both models are designed to take the rough-and-tumble life of an ENG unit or remote film crew, and keep delivering excellent sound. With the narrow directivity which makes line microphones so useful in suppressing noise and "reaching out" beyond normal mike range.

If you thought line microphones were out of reach of your budget, ask your Audio-Technica sound specialist to show you the AT815 or AT815R. We think you'll agree that the networks are onto something great!

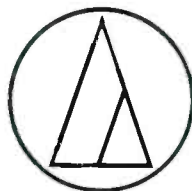
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A still from *Asbury Grove: A Family Album*, a series of reports produced by the *Captioned ABC News* staff and broadcast as part of that program in the summer of 1981.

# Case study: Captioning at WGBH

By George Harrar, editorial consultant, WGBH Teletext Project, Boston, MA

All WGBH photos, except for the last one shown, were taken by Stu Rosner for The Caption Center. Photos are copyright 1982 by the WGBH Education Foundation and used with permission.

The marriage of a Mark II Vidifont to a General Automation computer in 1973 produced the engineering link that made possible the first nationally televised captioned program, *The French Chef, with Julia Child*.

The joining of a court stenographer, minicomputer and teletext should result this fall in another landmark—the real time closed captioning of an unscripted news event.

WGBH-TV, Boston, the PBS af-



Sondra Thorn, teletext project supervisor, experiments with styles for news pages for the WGBH teletext magazine.

filiate, is party to both TV breakthroughs. The Caption Center at WGBH is best known for its late night rebroadcast of ABC's *World News Tonight*. For nine years, the Caption Center has transcribed this newscast's audio and edited it into open captions at a comfortable reading speed. Commercials are replaced with special features geared to the target audience, an estimated 14 million hearing-impaired people nationwide.

### Teletext

The Caption Center has captioned thousands of hours in the open-caption format. Now comes teletext, and WGBH is moving fast to capture some of the new opportunities of this sophisticated system of information delivery.

Carole Osterer, director of the Caption Center, said "WGBH is involved in two experiments with teletext: teletext captioning through our Los Angeles branch in conjunction with CBS, and a teletext magazine, scheduled to go on air July 15, which we are producing ourselves in Boston. The teletext magazine will be the first in the Northeast."

Tom Keller, senior vice president for science and technology at the National Association of Broadcasters, had much to do with preparing the station for teletext during his two decades at WGBH. As WGBH's director of engineering, he brought in equipment and ideas that steered WGBH toward new technologies.

In casting its lot with teletext, the Caption Center is acting on the belief that the medium has far greater flexibility and long-term potential than the current Line 21 closed captioning. The Line 21 system, developed during the 1970s with public funds and some consulting input from WGBH, became operational in 1980 and is now almost exclusively under control of the National Captioning Institute (NCI). The Sears TeleCaption adapter, which costs \$290, decodes the closed captions prepared by NCI.

"NCI claimed sole right to Line 21 technology," Dan Glisson, manager of the Caption Center/Los Angeles, said. "They treated it as an industrial secret and refused to share technology, expertise or experience. So we had to re-invent the wheel."

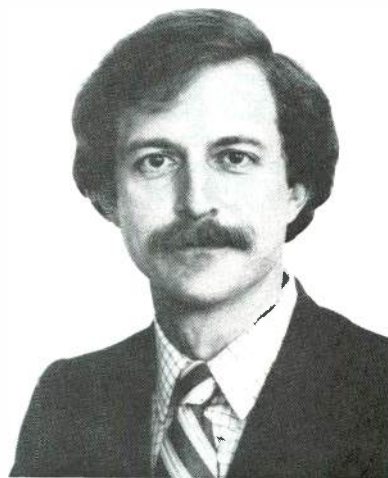
WGBH launched its own Line 21 captioning last year to provide additional programming for the thousands of hearing-impaired people who bought the Sears decoder. The Caption Center hopes soon to caption on Line 21 all WGBH programs—such as *NOVA* and *Masterpiece Theatre*—for air on PBS.

Line 21 captioning shows current usefulness, but Glisson is not optimistic about this system's future. "I'm willing to say Line 21 captioning is obsolete," he said. "If NCI is going to restrict it, there's the unintentional effect of furthering teletext. I'd advise people to hold off buying a Line 21 decoder right now. In a year or so, teletext decoders will be on the market."

Glisson cited several advantages of teletext:

- First and foremost, teletext promises to become the primary means for delivering broadcast digital data into the home. Captioning and subtitling, as an integral part of a network teletext service, therefore, would be available to the widest possible audience.
- Teletext captioning, with its wider range of size, color and positioning options, provides greater design flexibility.
- Teletext captions are transmitted at a much higher data rate, permitting several channels of captions and subtitles to coexist with a rapid access teletext magazine; Line 21's rudimentary text service must be halted every few seconds whenever captions are transmitted. Teletext's higher data rate will also be important in the emerging field of real time captioning, where this time difference is significant.

Line 21 captioning, does, how-

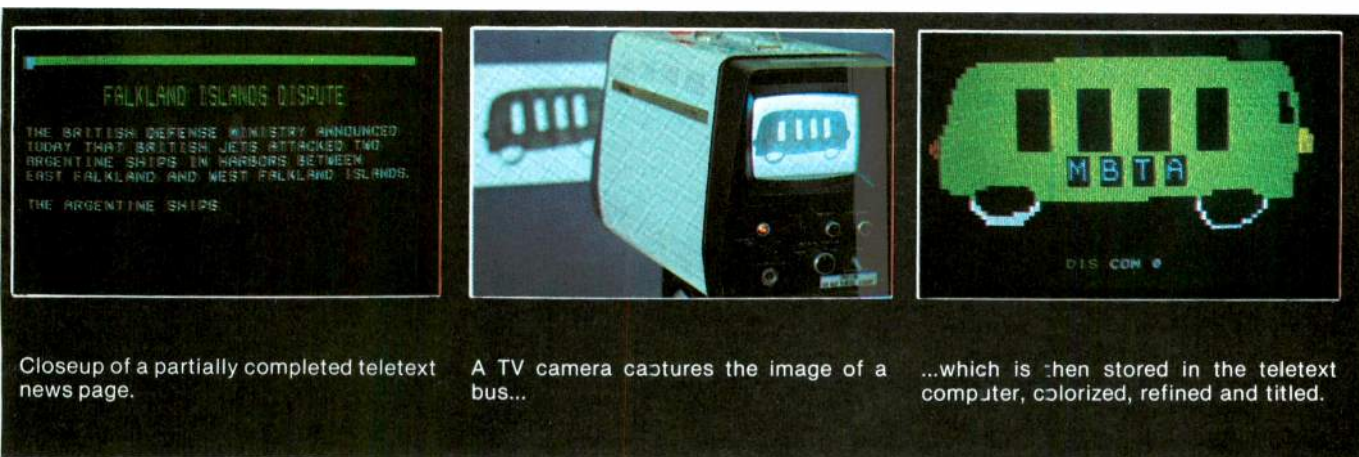


Daniel B. Glisson, Jr., manager, WGBH Caption Center/Los Angeles.

ever, boast some technical advantages. Its low data rate makes it more reliable in network distribution, cable systems and fringe broadcast reception areas. Also, its position in the vertical blanking interval (the 21st line) allows it to be recorded and played back on virtually any videotape machine, including most home VCRs.

Teletext's high data rate presents a technical challenge to much of the video handling equipment now in use. Network and cable systems, as well as broadcasting equipment, may need to be upgraded or augmented. Consumers may need to provide themselves with superior TV reception. And teletext's earlier position in the vertical blanking interval (currently Lines 15 to 18) renders it impossible to record in encoded form on today's home VCRs.

WGBH, through the Caption Center/Los Angeles, is testing teletext captioning jointly with CBS on five hours of shows per week. Current teletext captioned shows include *Dallas*; *Magnum, PI*; *The Tuesday Night Movie*;



Closeup of a partially completed teletext news page.

A TV camera captures the image of a bus...

...which is then stored in the teletext computer, colored, refined and titled.

# Some captioning facts

By the National Captioning Institute (NCI), Falls Church, VA



**Consumer decoders.** Sears, Roebuck and Company sells a set-top adapter to decode and generate captions for display on a standard TV receiver. The Telecaption Adapter has a UHF and VHF tuner, IF and video demodulator board, captioning decoder board, an RF modulator with output on Channel 3 or 4, and a power supply packaged in a cabinet for use on or near a TV receiver.

- Closed captioning is a process by which the audio portion of a TV program is translated into captions (subtitles), which appear on the screen. Hearing-impaired viewers, then, can read what they cannot hear. Closed captions can only be seen on a TV set equipped with a special decoding device. Many viewers without hearing impairments find ordinary subtitles (open captions) distracting. With closed captions, the same program can be viewed by general and hearing-impaired audiences.
- NCI was established in 1979 to caption TV programs. It has captioning centers in Washington, DC, and Los Angeles.
- The size of captions vary proportionately with the size of the TV screen. The captions are easily visible and do not obstruct the picture. To ensure legibility, the area immediately behind the captions is blacked out.

- Usually, captions are centered at the bottom of the screen. They may, however, be placed in other locations to identify the speaker or to avoid blocking the on-screen action.
- In operation, NCI caption editors arrange the program dialogue into captions, which are recorded on a magnetic disc. The disc is sent to the TV broadcaster, where the caption data is inserted into Line 21 of the TV picture. The broadcaster transmits the caption data along with the regular picture and sound portions of the program. Because the captions are in the form of an electronic code, they are not visible to viewers with ordinary sets. However, when a set equipped with a special decoding unit is used, the caption codes on Line 21 appear on the screen as subtitles.
- Sears, Roebuck and Company, under the product name *TeleCaption*, sells two types of de-

- coding units: a captioning adapter that can be attached to any ordinary TV set and a 19-inch portable color set with built-in decoding circuitry, called a captioning TV receiver.
- NCI began closed captioning TV programs in March 1980.
- The American Broadcasting Companies (ABC), the National Broadcasting Company (NBC), and the Public Broadcasting Service (PBS) provide closed-captioned programs. To date, CBS has declined to participate in the closed-captioning service on the grounds that it is experimenting with a teletext system that could provide captioned programs.
- More than 150 major advertisers now have their commercials closed-captioned.
- Currently, more than 35 programs each week are closed-captioned.
- "Live" programs also can be captioned. In January 1981, NCI began to caption "live" programs that had a script, such as all of President Reagan's speeches. NCI also now captions one of the three nightly broadcasts of *ABC World News Tonight*. By mid-1982, NCI expects to have perfected the technology to caption all news broadcasts, as they occur.
- There are 16 million Americans with significant hearing losses, of which about 2 million are profoundly deaf. These hearing-impaired people want access to the world of communications and entertainment that television provides. Even though they may not be able to hear some or all of the soundtrack, hearing-impaired people watch approximately as much television as the general population.
- NCI announced in February that Canada's two major TV networks signed contracts with NCI to begin closed captioning of Canadian programs. Implementation of this service in Canada will significantly increase the amount of closed-captioned programming presently available to Canadian hearing-impaired people. Under the agreement, NCI will caption Canadian Broadcasting Corporation (CBC) and CTV Network English-language programming through March 31, 1983. "Closed captioning has truly become an international service," John E.D. Ball, NCI president, said. "This is a wonderful endorsement of the Line 21 closed-captioning system, and an important step for the many Canadian hearing-impaired people who will benefit from captioned TV."



# DIGITAL TEST GENERATOR

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- The DTG-1000N features five identical and independently microprocessor controlled 10-bit test signal data stores with precision D/A converters.
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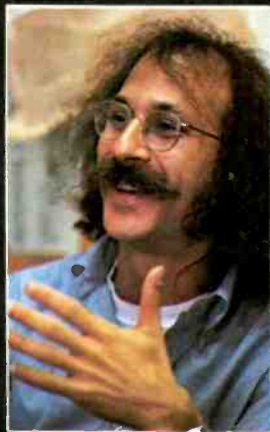
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 TOBIN BRIDGE... BACKED UP 2 MILES  
 RTE 2/FRESH POND PKWY-- NORMAL  
 N. B. T. A. --  
 GREEN LINE--GO  
 BLUE LINE--SLIGHT DELAY @ HAYMARKET  
 ORANGE LINE--GO

Another experiment in designing a traffic report page for the teletext magazine.



Joseph Blatt, producer of the Captioned ABC News.



Blatt programs the Caption Center's microcomputer for use in real time captioning experiments.

and Dukes of Hazzard. Ninety receivers have been placed in homes, and one serves the large population of deaf students at California State University at Northridge.

### Real time captioning

In addition to delayed broadcast teletext captioning, CBS and the East and West Coast branches of the Caption Center are collaborating with Translation Systems, Rockville, MD, on real time captioning.

"We are able now on a sustained basis to real time caption several types of programs with very high accuracy in spelling and with delays of as little as two to three seconds," Joe Blatt,

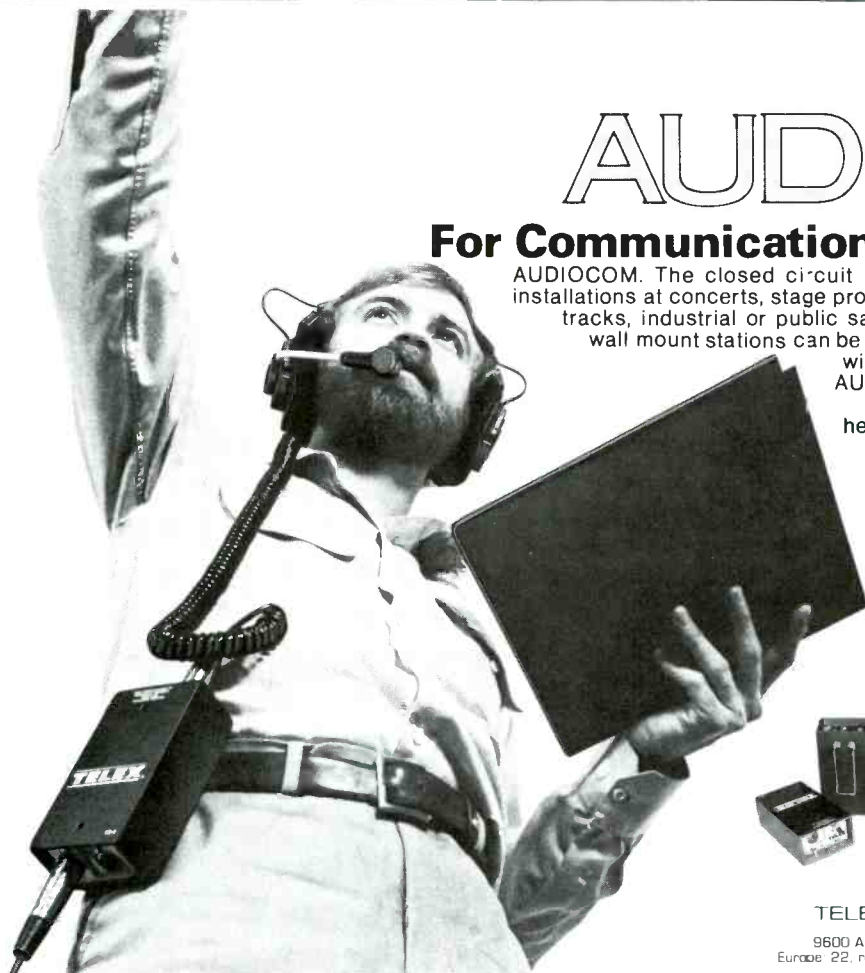
producer of *The Captioned ABC News* at WGBH, said.

Real time captioning in this experiment achieves such speed because of (and not despite) the involvement of human skill. A court stenographer translates the audio to phonetic symbols using a 23-key keyboard. These symbols are processed by a Jacquard J-500 minicomputer (128k memory and 24Mbytes of disc storage).

The translation program and dic-

tionary were developed by Translation Systems. Don Nixon, company president, said, "The dictionary is actually a table of algorithmic expressions for translating stenographic representations into English. The reason algorithms are used is because certain English words can be represented by the stenographer in many different ways. *Banner*, for instance, can be represented three ways, each using two key strokes—as *ban nr*, *ban er* or *ban ner*. The word *duplicate* can be represented 65 different ways, and it gets even more complicated when you add four possible endings."

Continued on page 30



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The Agile 24M is a 24-channel, stand-alone master receiver with sufficient gain to drive as many Agile 24S

slave receivers as required to satisfy any satellite communications system. The unique Agile 24S slave receivers offer all the operating features of the Agile 24M with the exception of the first block down converter. The active amplifier loop-through design of the Agile 24S is cost-effective, eliminating need for redundant passive power dividers.

Nearly all critical adjustments and test functions can be accomplished by accessing the front or rear panel of Agile 24/S receivers. The multi-function front panel meter permits zero tuning as well as carrier-to-noise metering, eliminating the need for special test equipment. Channel indicators display both transponder number and frequency in MHz.

The Agile 24 receiver system carries Standard's full technical support. System installation and alignment is facilitated by enlarged schematic diagrams and an illustrated technical manual. Standard's field engineers offer operator training as well as on-site repairs. Where factory service may be required, 48-hour turn-

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Look to Standard to handle all your TVRO system needs with a complete line of LNAs, down converters, earth station antennas and microwave interference filters



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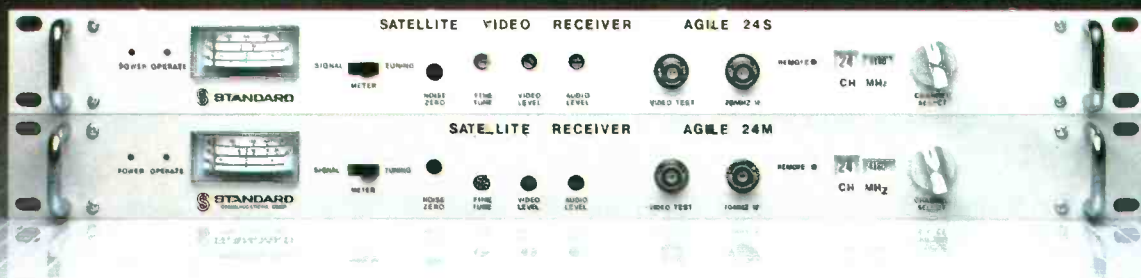
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But there are no guarantees at a moment like this. And the stakes are just as high for failure as they are for success. So nothing is left to chance.

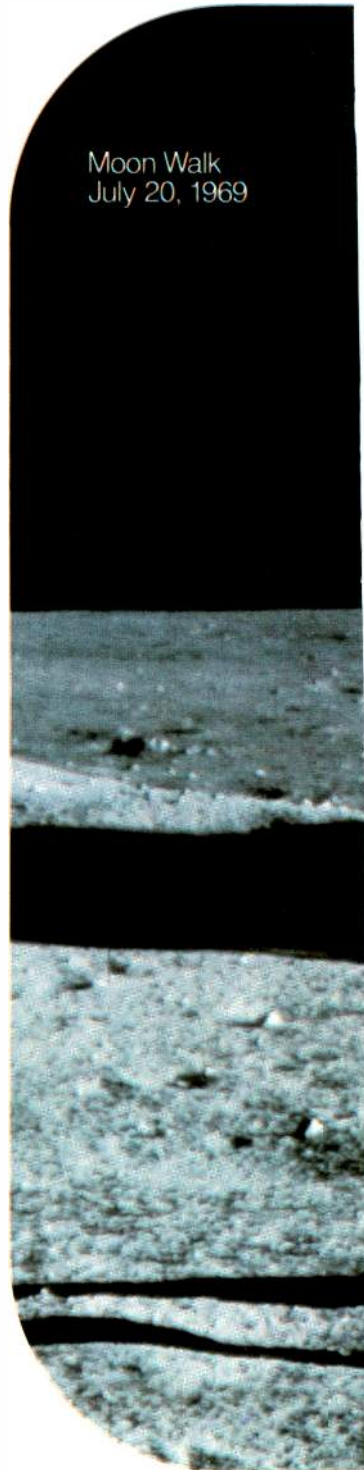
That's why Scotch® Video Tape was there when the Moon Walk was first recorded. And again when the Space Shuttle Landing was first recorded. And again when the U.S.-Russia Hockey Game was first recorded.

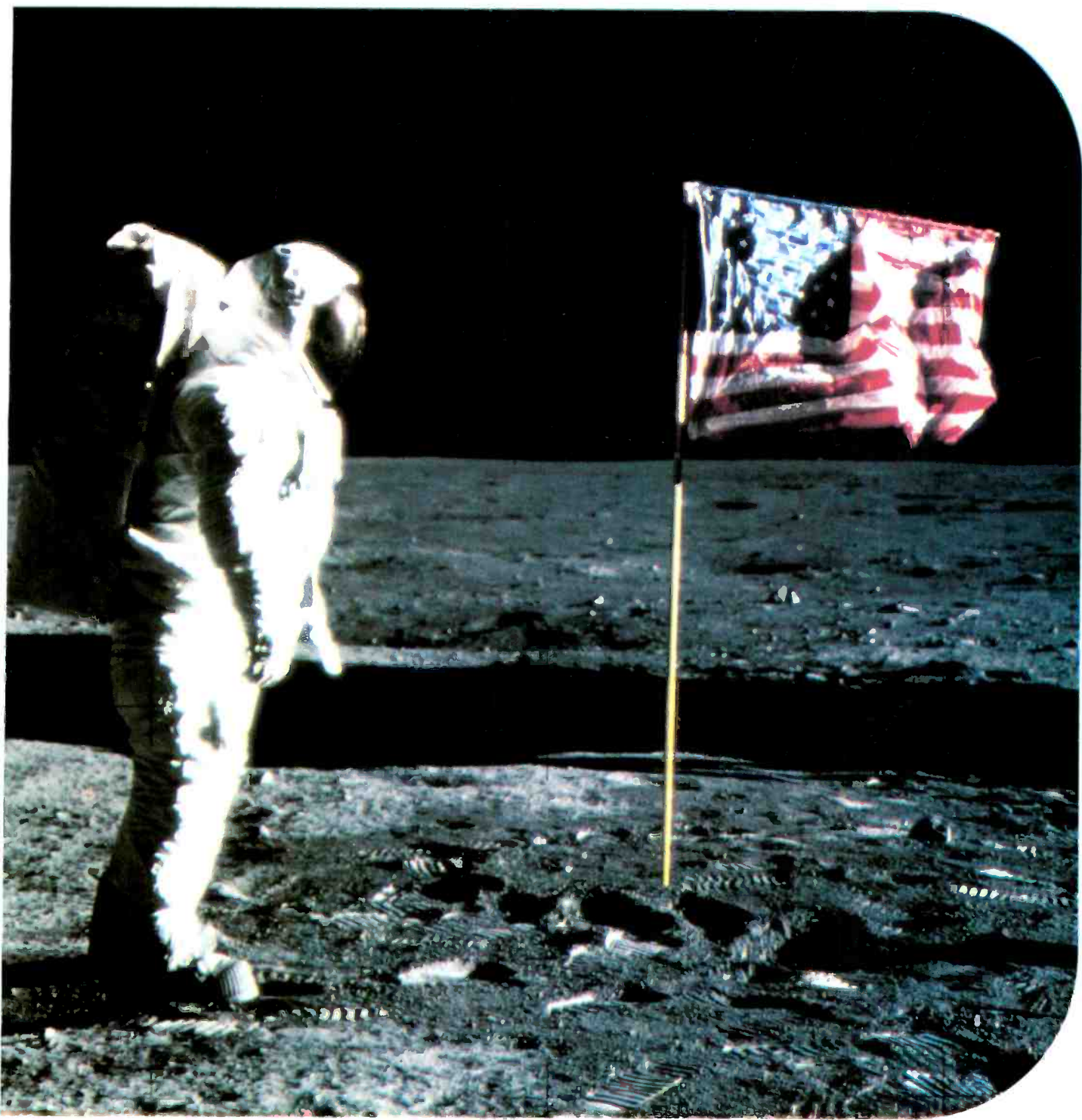
The Papal Tour of America. The Return of the Hostages. The Eruption of Mount St. Helens. Whenever there was one chance to get it, chances are they got it on Scotch Video Tape.

So whether your production is important to the world or just important to you, why take chances? Get it on the one tape you know will get it right.

Magnetic A/V Products Division/3M.

Moon Walk  
July 20, 1969



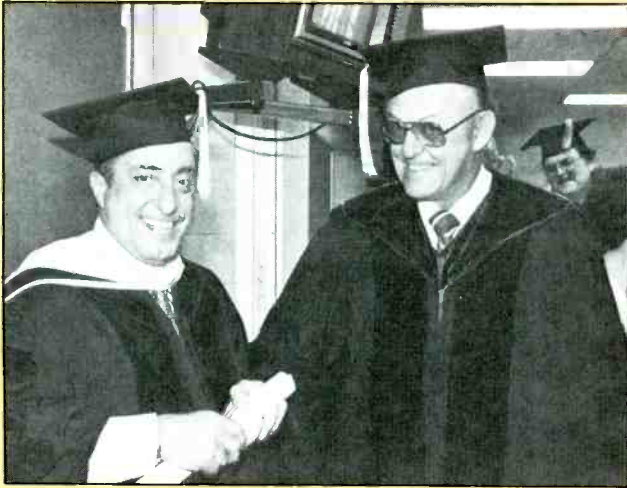


**HISTORY IS RECORDED ON SCOTCH VIDEO TAPE.**

3M hears you...

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**3M**



# Dr. Julius Barnathan

Julius Barnathan (left) president, ABC Broadcast Operations and Engineering, was given an honorary Doctorate of Science degree at the 118th commencement of Gallaudet College in Washington, DC, for his contribution to the development of closed captioning for the hearing impaired.

Shown with Barnathan is Dr. Malcolm J. Norwood, chief, Captioned Films and Media Applications Branch, Special Education Programs, US Department of Education, Washington, DC, who presented the degree.

The citation reads: "Julius Barnathan is an engineer by profession and an executive in one of the nation's largest TV and radio corporations because of his astute management ability. As president of Broadcast Operations and Engineering for ABC, he is the proverbial busy man. He was not too busy, however, to observe the National Bureau of Standards'

new technology which appeared in 1971 for transmitting time and frequency information in hidden fashion on Line 21 of the TV spectrum. He saw immediately the implications of this technology for providing closed captioning for the deaf population of America.

"As the years passed, Julius Barnathan became the leader of a unique coalition of many interests and guided the development of this system through a maze of technical, legal, financial and production landmines until it became a practical reality in the lives of thousands of hearing-impaired people.

"Gallaudet College, by means of this citation, wishes to recognize Julius Barnathan as the *father of closed-captioned television*. It is always good to welcome a genius into the Gallaudet family."

The SPECTRA SOUND  
Model 1500

## Performance You Can't Hear

The SPECTRA SOUND Model 1500 Twenty-Seven Band Graphic Equalizer is the result of nearly two decades of engineering excellence. The Model 1500 represents a significant improvement over current equalizer technology.

### The Lowest Distortion

The Model 1500 has the lowest distortion of any equalizer available. The THD and the IM distortion of the Model 1500 are below .0018%, test equipment residual, 20Hz to 20kHz, +18dBv.

### The Lowest Noise

The Model 1500 is the quietest equalizer available. The signal-to-noise-ratio is 104dB below +4dBv, unweighted, 20Hz to 20 kHz.

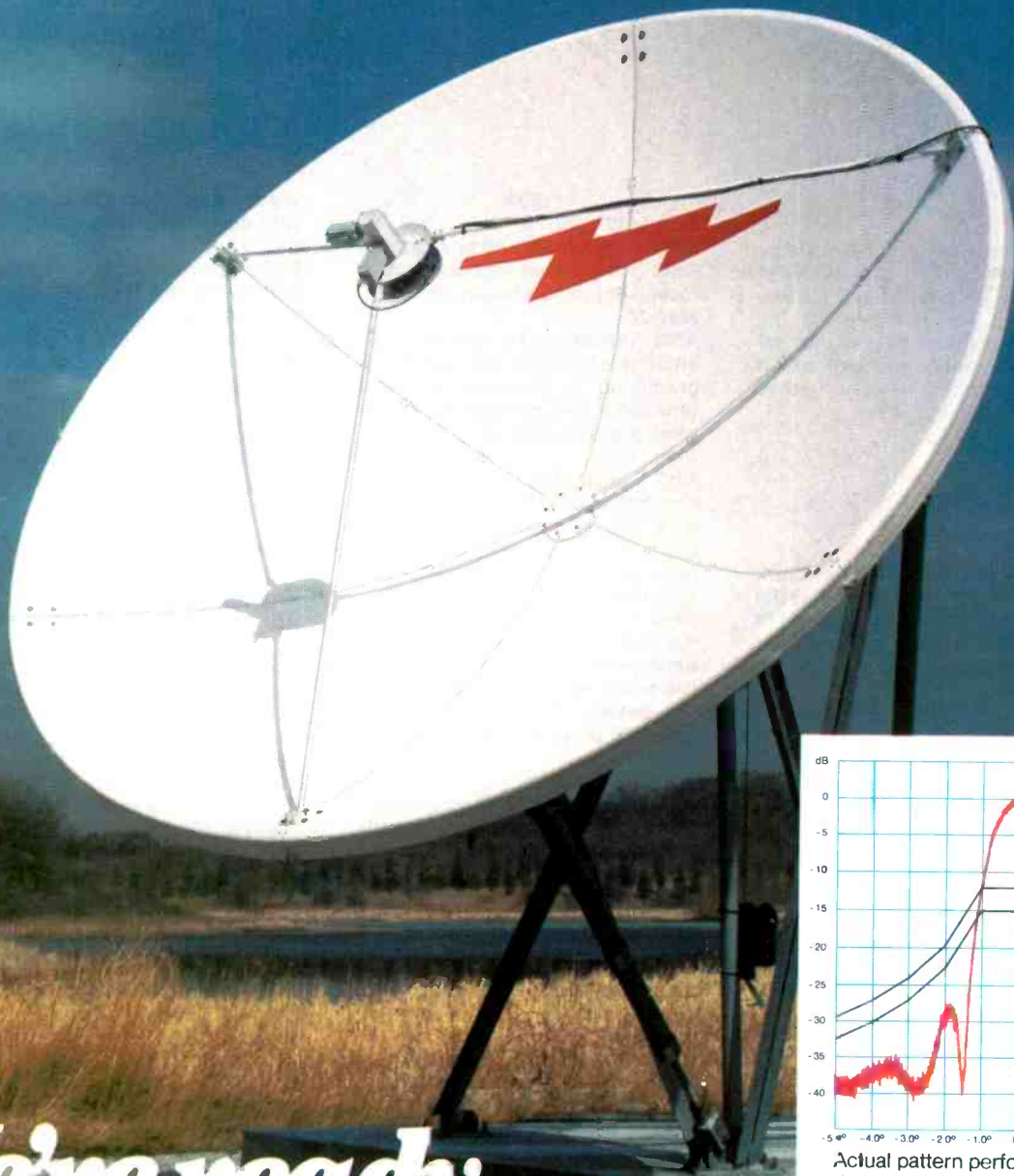


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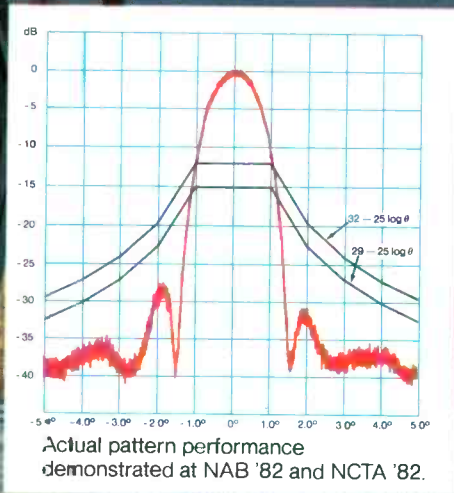
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# MEETS 2° REQUIREMENTS



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The new Andrew 4.5m and 5m earth station antennas already meet proposed FCC regulations which would reduce satellite spacing to 2°. New production techniques on these ESA5 series antennas have resulted in significant savings. The savings will be passed on to you.

Andrew's new antennas offer you the quality and features of our larger earth stations. Segmented reflectors for easier handling and lower shipping costs. R/T or R/O feed systems.

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## ANDREW

Our concern is communications.

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# ABC landmarks in closed captioning

The following chronology shows the growth at ABC Television in emphasis on closed captioning for the hearing impaired. The initial date is that for the formal announcement of an event; the airing date is noted within the descriptions.

## 1977

**March 10**  
Frederick S. Pierce, president, ABC Television, proposes that the government organize forces to develop a system to help the deaf enjoy television.

## 1979

**March 26**  
ABC is cited by Joseph Califano, HEW secretary, for its 8-year effort to develop an industry-wide closed-captioning program for the deaf.

## 1980

**Jan. 23**  
*Eight is Enough*, *Vega\$*, *Barney Miller*, and *The ABC Sunday Night Movie* to be closed-captioned.

**March 10**  
ABC begins its participation in closed captioning with the telecast of *Force 10 from Navarone*, *The ABC Sunday Night Movie* (March 16).

**Aug. 26**  
*The ABC Friday Night Movie*, *Love Boat*, *Barney Miller*, *Three's Company*, and *Eight is Enough* to be closed-captioned for 1980-81.

**Dec. 15**  
ABC Sports' telecast of the Sugar Bowl on Jan. 1 to be the first sports broadcast and *first live program of any kind* to be closed-captioned.

**Dec. 31**  
ABC News' live coverage of the Presidential Inauguration to be closed-captioned (airing Jan. 20, 1981).

## 1981

**March 30**  
ABC to present future telecasts of *ABC Afterschool Specials* with closed captions starting April 15.

**May 26**  
ABC Television to increase the amount of closed-captioned programming it presents in prime time from five to eight hours per week starting June 2.

**Sept. 1**  
ABC Sports' 1981 schedule of NFL Football telecasts to be presented with closed captions beginning Sept. 7. (Schedule: 16 Monday night games and four prime-time specials.)

**Sept. 17**  
Kellogg Company agrees to underwrite closed captioning by the National Captioning Institute of seven *ABC Afterschool Specials* programs in the 1981-82 season.

**Sept. 29**  
ABC adds *The ABC Sunday Night Movie*, and *Benson* to its weekly schedule of closed-captioned entertainment programs for the 1981-82 fall season.

**Oct. 14**  
ABC Sports' live and exclusive coverage of the World Series to be presented with closed captions starting Oct. 20.

**Nov. 17**  
Beginning Monday, Nov. 23, ABC's *World News Tonight* to become the first regularly scheduled newscast to be closed-captioned.

**Dec. 1**  
*Happy Days* and *Bosom Buddies* have been added to ABC's schedule of closed-captioned, prime-time entertainment programs.

**Dec. 3**  
Nabisco Brands agrees to underwrite the closed captioning by the National Captioning Institute of three prime-time holiday specials.

**Dec. 9**  
*The Leprechaun's Christmas Gold* (Dec. 12), *John Denver and the Muppets—A Christmas Together* (Dec. 22), and *Frosty's Winter*

*Wonderland* (Dec. 22) to be aired with closed captions.

**Dec. 15**  
Miller Brewing Company agrees to underwrite the National Captioning Institute's closed-captioning of ABC Sports' live telecasts of four football bowl games.

**Dec. 29**  
*A Matter of Time*, an Emmy-winning drama, to be aired on Jan. 20, 1982 with closed captions in the *ABC Afterschool Specials*.

## 1982

**Jan. 11**  
Nabisco Brands agrees to underwrite closed captioning for six *ABC Afterschool Specials* from Jan. 20-April 14.

**Feb. 22**  
Real time closed captioning announced for telecast of Oscar Awards (March 29).

**Feb. 24**  
American Express agrees to underwrite closed captioning of *Night of 100 Stars* (airing March 8).

**March 10**  
*ABC Weekend Specials* to be closed-captioned (airing March 13 and 20).

**March 11**  
*Joanie Loves Chachi* and *9 to 5* to be closed-captioned (airing March 23 and 25, respectively).

**March 11**  
All-star entertainment extravaganza *I Love Liberty* to be closed-captioned (airing March 21).

(Note: At this time ABC is presenting 8½ hours of closed-captioned programming each week. Also closed-captioned are *ABC Afterschool Specials*, *World News Tonight* and, during the fall, *Monday Night Football*.)

**May 3**  
The 5-hour special *Inside the Third Reich* to be closed-captioned (airing May 9 and 10).

**May 17**  
Julius Barnathan, president, ABC's broadcast operations and engineering, receives honorary doctorate degree from Gallaudet College for his pioneering engineering efforts to provide closed-captioned television for the hearing impaired.

# NEW!

# STANTRON

# "SUPREME" CABINET SERIES



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- NEW!** A. Cabinet-frame design.
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- NEW!** E. Side panel design. Our new side panel is removable from the outside by a "touch/push" of your finger tips. This feature allows you to service your installation through the cabinet-side. There is no visible hardware to detract from the design appearance.
- Circle (24) on Reply Card
- NEW!** F. We offer two new types of casters.
- NEW!** G. As shown above in the above photographs (assembled cabinet and exploded view), our drawer fronts, also, have the projected panel front to conform with the new 19" or 24" projected panels.
- H. Available in four cabinet frame depths: 18 $\frac{5}{8}$ ", 22 $\frac{1}{8}$ ", 25 $\frac{5}{8}$ ", 30 $\frac{7}{8}$ " (add 1 $\frac{3}{4}$ " for the rectangular tubing "add-on" design).
- I. From one to four color combinations are available on one cabinet assembly. With STANTRON'S 17 colors to choose from PLUS 2 laminate colors, you can design your own aesthetically-pleasing cabinet design.
- J. All STANTRON accessories, described in STANTRON'S catalog #104, may be used with the new STANTRON "SUPREME" CABINET SERIES.

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At the Caption Center's Boston office, current captioning/subtitling projects are listed. They include open captioning (visible on all home receivers), close captioning on Line 21 of the vertical blanking interval (visible only on receivers equipped with a decoding device), and subtitling of foreign-language operas and films.

- CURRENT CAPTIONING**
- 1 CAPTIONED ABC NEWS
  - 2 POWERHOUSE
  - 3 KENTUCKY PSA'S
  - 4 ISSA'S TREASURE
  - 5 NOVA:  
STRANGE SLEEP
  - 6 AIDA
- 

Stuart Cleland, associate producer, programs captions into a computer for later display as part of the *Captioned ABC News*.



Rebecca Berwick, production secretary, checks a caption script for spelling errors, timing problems and meaning changes.



A still from the *Captioned ABC News*, open-captioned each weeknight since December 1973 by the Caption Center.



A still from *Jack London: A Personal Perspective*, produced by KOCE-TV, Huntington Beach, CA, and open-captioned by the Caption Center.



A still from *A Piano For Mrs. Cimino*, starring Bette Davis on *The CBS Movie*, closed-captioned using teletext as part of the CBS teletext test in Los Angeles.

The English translation is displayed on a CRT pre-programmed with teletext instructions—such as colors, font size and specific rows to be used. The captions then proceed through the teletext encoding equipment, resulting in a TV signal carrying audio, video and real time captions.

"NCI did the first network real time captioning of the Academy Awards in March," Blatt said, "but much of that show was scripted and the captions prepared beforehand. We expect by fall that the Caption Center with CBS will do real time captioning of a breaking news event, perhaps an upcoming journey of the space shuttle."

After the real time captioning system is in place, Blatt foresees the possibility of using computers to assist every step of the captioning process.

Real time captioning is being phased into the ABC news. By July 1, NCI expected to be taking the 6:30p.m. feed of that newscast and preparing verbatim closed captions for broadcast at 7p.m. over Line 21 of ABC's network video feed, under contract with the Department of Education. The goal is genuine real time cap-

tioning within a year. The plan is for the PBS rebroadcast to become a decoded version of NCI's verbatim real time captions. Commercials will probably still be replaced with six minutes of original features and news. The open-captioned program is planned for phase-out in 1983.

"Even as we develop the next generation, which is real time captioning, we're keeping track of the possibilities for the generation after that, which is voice recognition by computer," Blatt said.

But that immense engineering breakthrough, predicted 20 years ago to be 20 years in the future, still seems today to be two decades away.

Captioning, whether real time or delayed, is one use of teletext. The second major story at the Caption Center today is a teletext magazine, one of only a handful being tested in the country.

This month, WGBH will begin transmitting a 70-page teletext magazine over Channel 2 in Boston. Fifty pages are being devoted to news, weather and community-access information. Sports fill 20 pages. In September, the Caption Center will add another 30

pages of educational material. Karl Renwanz, the station's director of engineering, is responsible for overseeing the technical production of the magazine. "The Los Angeles project taught us a lot," he said. "That was the key to getting us on track so quickly."

It was on Feb. 9 that WGBH and the French company, Antiope and Telematics Corporation, announced the 1-year joint venture. Antiope furnished one keyboard at the head-end, an editing system and floppy discs, multiplexer, diffuser, monitor and 20 receivers with decoders.

"The receivers will be placed so we can test what kind of antenna system works best and what else affects the reception of teletext," Renwanz said.

Shelley Isaacson, teletext project manager, described the reasons that the Caption Center is producing the teletext magazine. "Our objectives in this demonstration will be to further evaluate teletext's potential, to encourage local and national interest, to assess community reaction, and to develop a long-term strategy for WGBH in providing this service," she said.





# ADDA CORPORATION



## ESP Digital Still Store System.

On-line previewing and editing; automatic sequencing; the instant creation of multi-layer graphics.

Today a concept we helped pioneer—the electronic storage and retrieval of video images for graphic production and preprogrammed on-air use—is becoming an industry standard for the technological leaders in television and video production.

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And the 750's second generation digital electronics give you a production-oriented sequence and memory system that lets you perform last minute editing. Add or delete within a sequence. Create multiple generation graphics with virtually no degradation in the quality of your original image.

### Smart Control.

ESP's intelligent controls make the C Series a production tool that goes easy on everyone in your operation: Technical directors, graphic artists, and production staff alike.

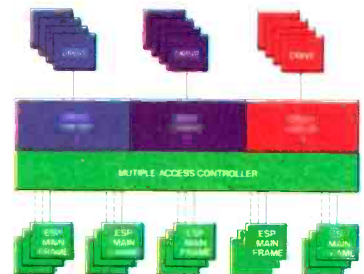


Our standards include:

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- A rapid-access sequence and memory system.
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The ADDA ESP C Series offers you some important optional features, too. Time-saving production tools like our Multipix "electronic storyboard." A Multiple Access Controller for simple modular expansion. A Digital Interface Board with programmable electronic interfaces that permits our system to be linked with station automation systems.



At ADDA Corporation, we pioneered the concept of economical, efficient, electronic graphics generation. And we think we're the best in the business. A lot of other people think so, too. Nearly 80% of the digital still store systems in use today are ours.

But don't take our word for it. Give us a call and let us show you what our years in this industry have produced.

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### ADDA CORPORATION

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# Getting the picture: Video monitor survey

A picture may be worth a thousand words. It may also be worth several vectorscope and waveform monitor displays. For this reason, our survey looks at some established and recently introduced TV video monitors of interest to broadcasters. Color and monochrome composite video models, as well as RGB units, are included.

By Carl Bentz, technical editor

A good portion of Part 73 of the FCC Rules and Regulations deals with specific technical signal limits within which TV stations must operate. Those limits have been determined in part to assure a viewable picture on the properly operating home TV receiver. The TV test equipment survey (BE May 1982) looked at waveform monitor and vectorscope units needed for waveform quality evaluation to remain within those FCC limitations. However, only to the most educated eye does a waveform display tell the whole story. Video monitors find wide use in the broadcast facility to observe the overall picture quality. In short, it's hard to see a picture without a picture monitor.

In today's communications almost everything is in color. Uses are found for some program inserts unavailable in color, special purpose materials in monochrome for impact, and old motion pictures. But the major portion of programming is in living color. For monitoring these programming efforts, a monitor with P22 phosphor materials in the CRT finds varied uses in stations. Budgets may restrict the number of color monitors an operator uses, however, and in those instances monochrome monitors continue to alert engineering and production staffers of picture quality conditions.

There was a time when even the CRT in the camera operator's viewfinder used P22 materials. The additional setup time to maintain such systems was a deterrent, resulting in a reversion to monochrome viewfinders with special switching circuits. Such switching allows individual R, G and B signal observation. Often, special test combinations are also provided for the black-and-

white viewfinder unit.

In the control room, black-and-white monitors have retained an important position. Individual camera chain monitoring, for engineering and directorial positions and previewing requirements, may often be served by the less expensive monochrome models. Final program line monitors and special purpose equipment, such as graphics systems, background generators or character generators, are better served by color models. Editing suites also need to have color capabilities, although some users require only monochrome units.

Picture size is of importance to better get the picture, to see imperfections and to track down pre-RF modulation interferences. Resolution is also of vital consideration, particularly to determine such qualities as camera focus and picture detail. Resolution also plays a large part the many graphic arts imaging systems now available. Fortunately, most of the critical evaluation monitors have provisions allowing them to be multipurpose, with A and B inputs and occasionally RGB inputs. Routing switching also allows greater use of the more expensive systems. Practical needs, then, tend to dictate the monitors used.

In mid-April video monitor manufacturers were contacted to submit short descriptions of their more important models. Limitations were placed on materials to include at most three color models and one monochrome unit from each manufacturer. This survey is based upon materials received from the manufacturers and does not attempt to provide a general roundup of all models available.

## AMTRON CORPORATION Universal Color Display

Precise color registration in this display results from an in-line shadow mask CRT. H-scanning and frame rates are selectable with all digital sync processing and vertical deflection. This series of NTSC monitors includes crosshatch, color bar and gray scale test signals.

### AM series

For NTSC work, the AM series offers 5-, 8-, 12-, 17- and 26-inch models based on Trinitron CRTs. Of the series, the 26-inch unit may be obtained in an RGB design. Dual-video inputs are available with internal/external sync selection. Pulse cross is optional. PAL standard models are available upon request.

### 7800 series

Both 13- and 19-inch models make up the 7800 series of color monitors for high resolution applications. Designed for use in critical signal evaluation of broadcast or production facilities, a bandwidth response to 10MHz results in a minimum resolution of 500 TV lines center screen.

Circle (250) on Reply Card

## ASACA/SHIBASOKU CORPORATION OF AMERICA CMM 20-7

This color monitor features wide-band R-Y/B-Y decoding (1.3MHz), comb filtering and aperture control. All boards are constructed using integrated circuits. A wide range of AFC adjustment covers 0.5 to 7ms in three steps. The monitor comes with a 2-year warranty on all parts and labor, including the 20-inch CRT. A 14-inch model is also available.

### CMM 20-11

This color monitor features I/Q decoding, special comb filtering and front panel selection of multistandard operation. Specially designed feedback circuits keep color variation to a minimum. To reduce temperature change effects, the convergence panel is not located in the pull-out drawer. H and V delay, AFC time constant and aperture correction are included with RGB as an option. A 2-year warranty includes the 20-inch CRT or an available 14-inch model.

Circle (251) on Reply Card

## AUDIOTRONICS 10VM965

The 10VM965 monochrome 10-inch monitor features 100% solid-state circuitry. A bandwidth in excess of 20MHz allows 800-line horizontal resolution. Key controls are accessed from the front. Screwdriver ad-

# INTRODUCING OPTIMOD-TV TV Audio Revolution.

There's a revolution going on. TV broadcasters are competing with VCR, videodisc, premium cable, and other services for the eyes and ears of a mass audience that's becoming more aware of good sound. In this audio war, '60's processing technology doesn't cut it.

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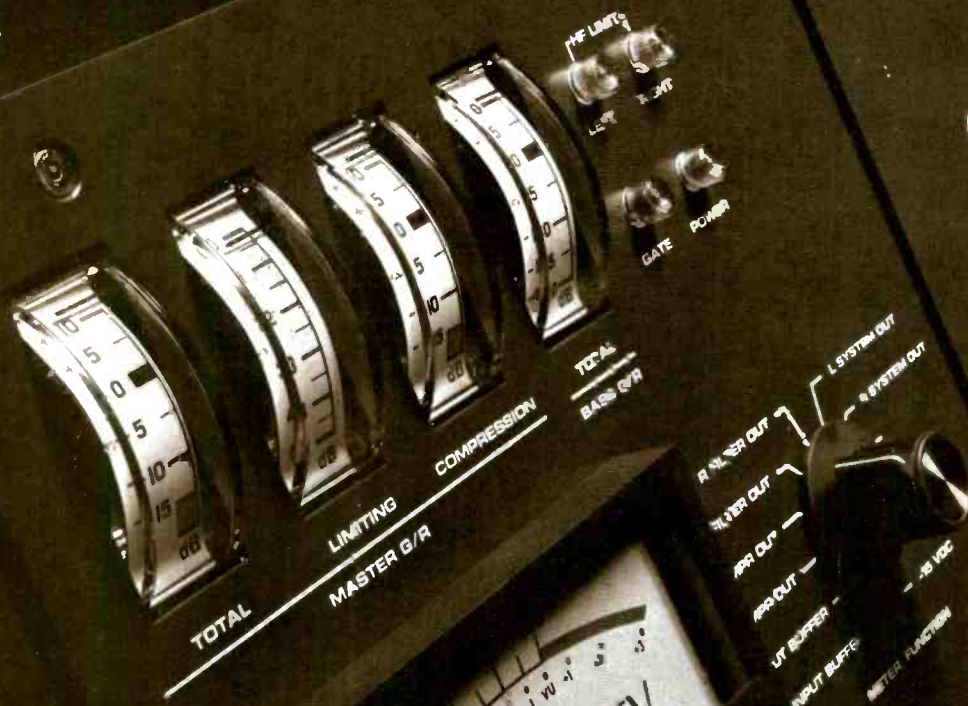
The processor rides gain and peak-limits with remarkable subtlety, achieving superior consistency, openness, and naturalness on the finest master-quality audio or the poorest 16mm optical film.

OPTIMOD-TV gives you the potential to bring your audio up to the same quality as your state-of-the-art picture. Processing is no longer the limiting factor. So plan your audio strategy for the great war of the '80's around OPTIMOD-TV Model 8108A. Your Orban broadcast dealer can tell you more. Or contact us Toll Free (800) 227-4498. In California (415) 957-1067 for more information.

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INTEGRATED INTO A  
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Because Sony probably has more experience selling and servicing 1" VTR's than anyone else, we're in an unequalled position to understand the wishes of 1" video users.

And now, Sony announces with fulfillment for the broadcast industry: the new BVH-2000 1" video recorder.

**WHY "BVH-2000" WILL MEAN DIFFERENT THINGS TO DIFFERENT PEOPLE.**

In broadcast recording, there is no such thing as one typical situation.

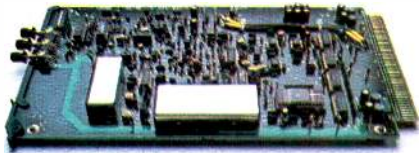
That's why there's no one single BVH-2000.

The BVH-2000 actually allows you to "design" the VTR you need for your own particular applications and budget.

You can choose among three different control panels—ranging from a basic model to one with virtually every possible feature and function.

And the tape transport system, signal system, and control section can either be combined into a single unit, or separated easily and installed in a 19" rack or console.

The BVH-2000 also gives you far greater latitude in setting up your entire recording system. Various remote-control connectors enable you to interface your system in a variety of ways for studio, mobile, and editing configurations. Direct interface with U-matic<sup>®</sup> and Betacam<sup>™</sup> is possible, too. The BVH-2000



A range of plug-in accessories is available. also has an optional plug-in time base corrector.

What's more, the BVH-2000's lighter weight and smaller size (almost 50% less than its predecessor) make it as ideal on the road as it is in the studio.

And because of the ever-increasing number of applications requiring longer program times, the BVH-2000 provides up to 2 hours of tape time.

**A VTR THAT LEADS THE SIMPLE LIFE.**

In the BVH-2000, unlike most other VTR's, microprocessors are used to their full advantage. All data necessary for servo control are channeled into a central processing unit, making the operator's control over all systems and functions simpler and more precise.

Life is made simpler yet by the fact that every necessary function control, metering facility, and electronic module is accessible from the front.

Even the way the tape moves through the recorder has been simplified. One innovation—an extremely precise servo mechanism



The BVH-2000 (shown with Type-III control panel).

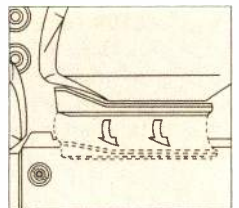
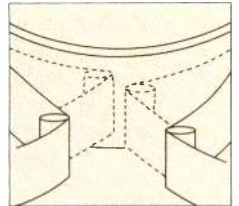
—permits the entrance and exit guide posts to move about 10mm away from the drum during threading. The result is the easiest threading system ever in a 1" video recorder.

**THE MOST ARTICULATE VTR EVER BUILT.**

The BVH-2000 removes much of the mystery from maintenance, too. It literally tells you about malfunctions—usually well before you'd notice them yourself—through a microprocessor-governed self-diagnostic system.

The system includes various alarm functions and numerous checks to confirm that everything is working properly. Most defects can be easily found—allowing for far less complicated maintenance and repairs, and reducing downtime considerably.

And because the best way to simplify maintenance



To simplify threading, guide posts automatically move away from drum, and audio head cover opens.

is by lessening the need for it, the Sony BVH-2000 has been designed to be virtually maintenance-free down to the last detail. For example, only brushless DC motors are used, and all incandescent lamps have been replaced with high-brightness LED's.

Other welcome advances include a greatly expanded dynamic tracking range (from reverse at normal speed to forward at 3 times normal); programmed play (allowing you to vary playback speed across a range of  $\pm 20\%$  of normal speed); and video and audio confidence.

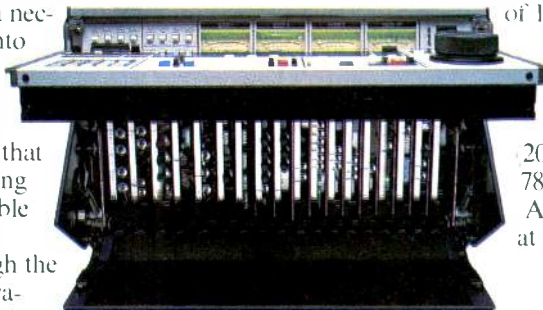
Remarkably, these are only some of the Sony BVH-2000's innovations. All of them add up to form the answer to virtually every need ever expressed by the users of 1" video.



Display board for self-diagnostics and other data-processing functions.

To find out how it can answer yours, write Sony Broadcast, 9 West 57th St., New York, NY 10019. Or call us in New York/New Jersey at (201) 368-5085; in Chicago at (312) 860-7800; in Los Angeles at (213) 537-4300; in Atlanta at (404) 451-7671; or in Dallas at (214) 659-3600.

**SONY**  
Broadcast



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adjustments are available for vertical linearity, height and focus. A regulated power supply is used. The fast AFC circuit is useful for helical scan VTR displays.

#### 9VM967

With a low price, the general purpose 9VM967 monochrome 9-inch monitor features 700-line resolution from a bandwidth in excess of 10MHz. The single heavy-duty chassis construction provides up-front operating controls, simplified service adjustments and time-lapse VTR capability. A dual rack-mount kit is available.

#### 6VM917T

Three 6-inch monochrome monitors sit side-by-side in the Triple-six monitor 6VM917T. Each features 600-line resolution, 100% solid-state circuitry, easily replaced regulation and deflection transistors, readily accessible components and intercompartment shielding to prevent crosstalk. The group is available in either a rack or desk-top metal cabinet.

Circle (252) on Reply Card

### CONRAC CORPORATION

#### 6100 series

The 6142 is one of the master color monitor series. Precise colorimetry, automatic stability of color temperature and switchable comb filtering are highlighted. Beam cur-

rent feedback controls the color temperature, while operational amplifiers provide independent convergence control on the 19-inch Colourmatch CRT. The 6142 service NTSC standards and the 6123 offers PAL, in rack or cabinet models.

#### 5700 series

A 13-inch Colourmatch CRT is used in the 5700 series monitors, designed for VTR over-console, high resolution requirements. A standard subcarrier notch filter is included, with comb filtering optional. The bandwidth extends to 5.5MHz with aperture correction for +6dB boost at 3.2MHz. Both rack and cabinet models are available for NTSC and PAL use.

#### 5300 series

The 5300 series color monitor uses a 19-inch CRT designed for budget-limited applications. Preset controls are included for contrast, brightness, chroma, phase and aperture. NTSC, PAL or SECAM standards may be served. Monochrome frequency response is with  $\pm 1$ dB to 5.5MHz, with 450 minimum vertical definition.

#### DZB series

For professional monochrome requirements the DZB series provides a 14-inch display. Available for EIA and CCIR standards, a linearity rating of 1% of picture height and frequency response of  $\pm 1$ dB to 10MHz are featured. It is compatible with VTR

over-console mounting applications.

Circle (253) on Reply Card

### ELECTOR (Barco)

#### CM 33 HRB

The 14-inch CRT in the CM 33 HRB color monitor yields high contrast and brightness with an in-line medium resolution delta dot shadow mask CRT with a 0.43 pitch. The front panel RG off-switch eases setup, while selectable over/underscan aids in VTR setup. Critical viewing without color softening or hidden noise will be served off the shelf, with a pulse cross option added in the fall of 1982. NTSC and RGB models are provided.

#### CM 51 HRB

A 0.47 pitch in-line delta dot shadow mask tube offers medium resolution in a 19-inch tube of the CM 51 HRB. Color remains crisp and no attempt is made to hide noise for improved critical picture evaluation. Pulse cross will be offered in October 1982. Front panel switching provides RG off and over/underscan controls.

Circle (254) on Reply Card

### ELECTROHOME ELECTRONICS

#### G09 series

The G09 high resolution RGB monitors are designed for data and graphics needs. The 13V CRT is of the self-convergence type with in-line gun and a 0.3mm dot pitch spacing. Up to

**The Affordable, Professional Reverb.**

The Orban 111B has become an industry standard for some very good reasons: it's an affordable, reliable reverb that complements your sound instead of muddying it. Orban's broadcast-quality construction, unique signal processing, flexible equalization, low noise, and extensive RF-proofing make the difference. Unlike cheaper reverbs, the 111B is a unit you'll want to live with long after the honeymoon is over. And you can pay more without getting the 111B's bright, transparent sound.

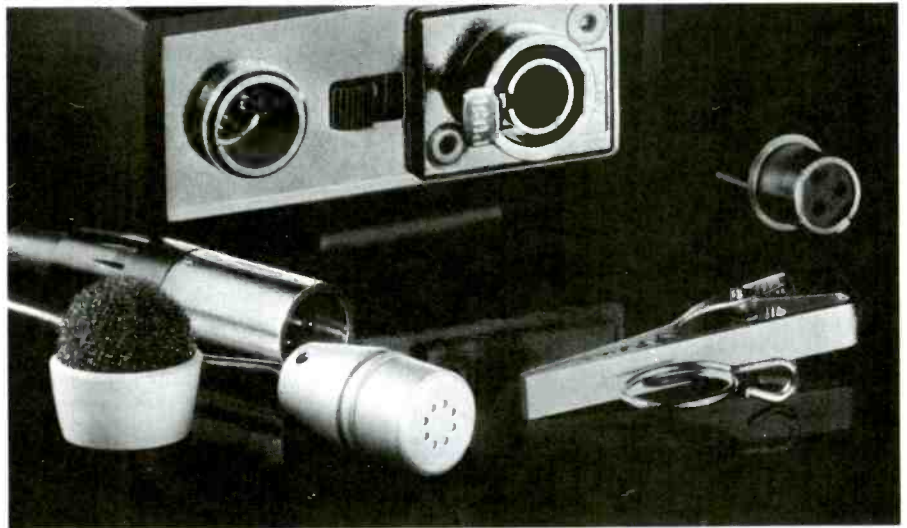
You'll find that sound ideal for both program line enhancement and production use. The Orban 111B is the reverb of choice for the demanding broadcaster—it gives the polished, professional touch to your in-house spots and promos. Call your local Orban dealer today and find out more about the practical, professional 111B.

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# Think of us as your mike expert.



## The CO94. All miniatures are not created equal.

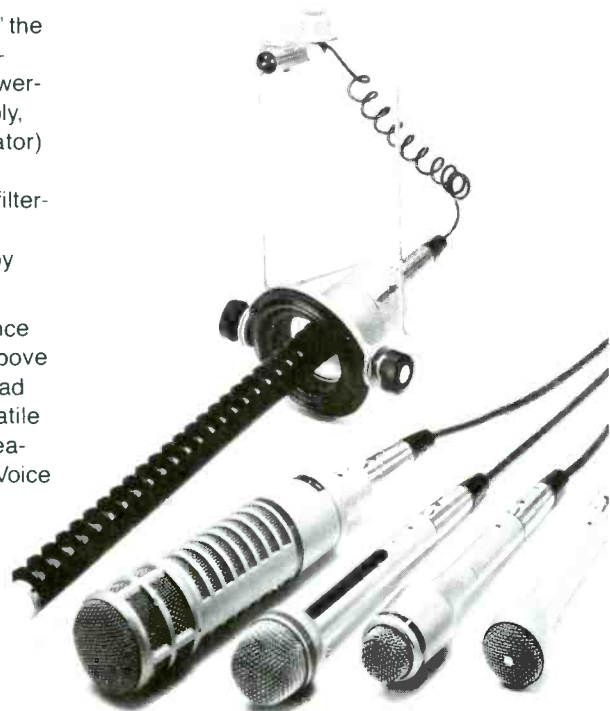
Until now, the engineer faced with selecting a miniature microphone was hard pressed to find any dramatic differences in performance. That is, up until the Electro-Voice CO94.

For starters, the CO94 offers unprecedented dynamic range. It has 10 dB greater sensitivity and 20 dB greater input SPL handling capability than the best known competitor. This high performance in a package so small makes the CO94 ideal for stereo spaced-omni recording, binaural recording and close miking of high output musical instruments, as well as standard lavalier applications.

The CO94 also offers exceptional powering flexibility. It can be powered by a standard 9-volt radio-type battery. Or it can be phantom powered from a mixing board, recorder, or in-line supply. The

9-volt battery can even be used as a redundant power source to "back up" the phantom power. Plus, the CO94's advanced electronic design permits powering from virtually any DC power supply, (even an "el cheapo" battery eliminator) capable of delivering between 8 and 50 volts. The internal regulation and filtering will make the CO94's impedance converter swear it's being powered by an over-priced import supply.

These and many other performance features set the CO94 a giant step above the other miniatures you previously had to choose from. The CO94 is a versatile new kind of tool, and just one more reason why you should think of Electro-Voice as your microphone expert.



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80 characters per line may be displayed, using TTL or RS170 RGB analog inputs. Resolution is 720x512 pixels.

#### ECM1302

The ECM1302 color video monitor is built to perform to international standards. Inputs for the monitor are RGB (TTL) signals, but an optional NTSC interface module is available. Two different CRTs are available, one providing 370x235 pixels resolution, the other offering 580x235 pixels from a 10MHz video bandwidth.

#### EVM series

The EVM monochrome monitor series includes CRT sizes from 9- to 23-inch. Video bandwidth response is  $\pm 1$ dB at 12MHz,  $\pm 3$ dB to 15MHz with a resolution of 800 lines at a 200lx illumination. Front panel control of image size varies from 105% to 80% of full picture. Geometry is held to  $\pm 2\%$  overall with linearities at 2% overall vertical and 2% of picture height.

#### EDM series

EDM models include a 9- and 12-inch format for rack or cabinet mounting. The 10MHz frequency response gives a 750-line resolution. Scan adjustment is available for 85% to 105% of full screen size, with a linearity change of less than 2% with the size change. Geometric distortion

will be less than 2% of screen height.

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#### FERNSEH

##### MC-37BA

The precision color MC-37BA is available for every color standard. All units accept RGB inputs with the specific standard decoder on a plug-in card. Pulse cross, blue gun only, three selectable inputs or a mixture of three inputs may be controlled. Besides displaying the signal on a self-converging 15-inch CRT, the monitor provides R-Y and B-Y axis outputs.

##### MC-37BB

The MC-37BB color monitor is designed for critical evaluation use and may be ordered for RGB, PAL, PAL-M, NTSC and SECAM systems. A 15-inch in-line CRT is used in the small, lightweight package monitor, which may find application as a mobile unit. If precision decoding is requested, decoded video is available for vector displays.

##### MC-51BAB

The MC-51BAB precision color monitor uses a 20-inch CRT. The unit comes with RGB capability and one standard decoder. A second optional decoder may be installed. Underscan, pulse cross and blue gun only controls are included with remote control of many functions optional. The CRT is

a high resolution delta-gun type with a black mask and US phosphors.

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#### HITACHI DENSHI CORPORATION OF AMERICA

##### CM-182

The CM-182 color monitor employs an in-line 18-inch CRT for NTSC display to 370 lines resolution. Three-axes decoding is developed from IC devices for added stability. Aperture correction avoids ringing. For RGB use, request the CM-1822.

##### VM-906A

Monochrome resolution to 700 lines is offered by the VM-906A. Solid-state circuitry ensures reliability. Deflection linearity on the 9-inch screen includes less than 1% error. Models are available for 525- and 625-line standards.

##### VM-129

A 12-inch monochrome CRT provides resolution in excess of 700 lines on the VM-129. IC and transistor circuitry design provides added reliability. The picture remains stable even with VTR playbacks. Deflection linearity errors are rated at less than 1% for use on 525- and 625-line systems.

##### VM-173

Solid-state circuitry drives the 17-inch CRT of the VM-173 for a



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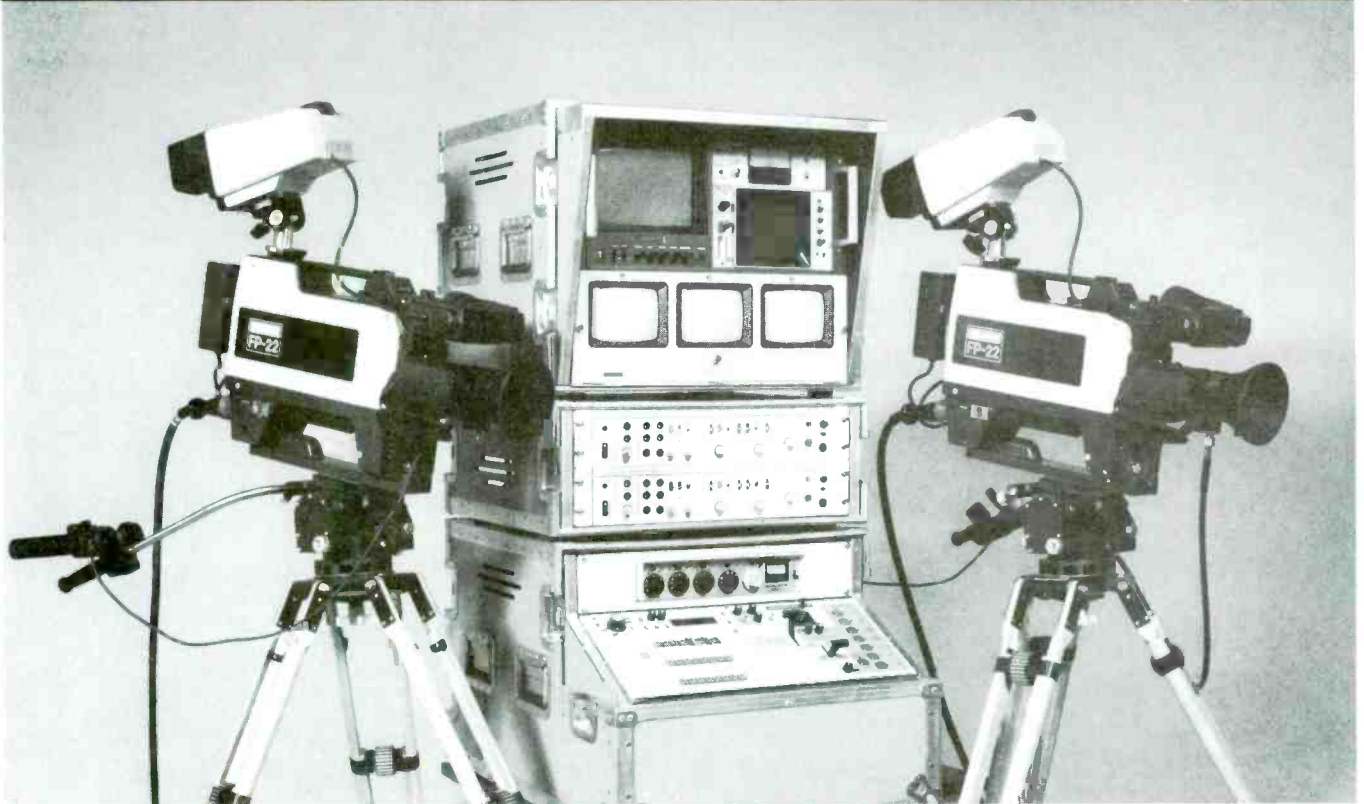
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# HITACHI

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 1-WV 5203 triple 5" monochrome monitors  
 1-M67 audio mixer

1-6142 Crosspoint latch production switcher  
 1-6006 Sync generator  
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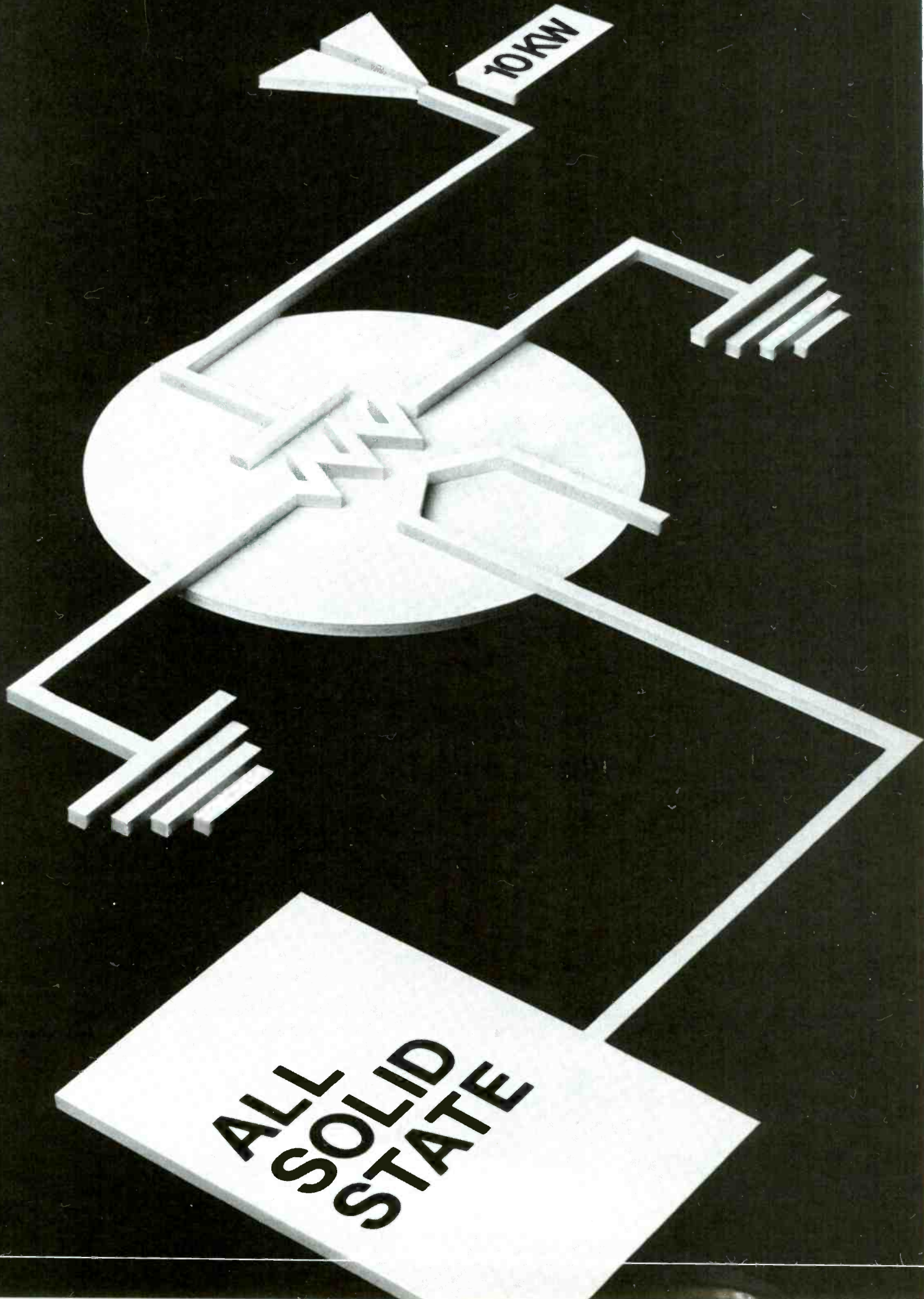
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In a power range from 3kW to 10kW, the broadcast engineer can now have the reliability, efficiency and low maintenance that are inherent in a one tube transmitter design. Combine with this the operational benefits of a grounded grid configuration power amplifier stage that requires no neutralization and you have the best of both engineering worlds.

#### **Add to This a New Exciter, Solid-State IPA and Exclusive Broadband, Low-Loss Ferrite Combining**

The new 690A Exciter is the heart of all Elcom/Bauer FM transmitters. Its advanced solid-state engineering delivers great frequency stability while assuring you an exceptionally clean signal for further amplification.

Our solid-state IPA consists of four power amplifier modules (2 amplifiers per module) when combined produce 1,000 watts of drive power, with plenty of power in reserve. All of these modules are identical and loss of one of the four driver amplifier modules will not result in an off-air condition. All modules are broadbanded and require no individual tuning over the entire 88-108 MHz FM band. The modular design gives you back-up capability for more reliability in addition to an overall reduction of transmitter tuning requirements.

The exclusive Elcom/Bauer ferrite combiner is also broadband to take full advantage of the new solid-state IPA.

#### **Easy Access and Spacious Cabinets for Engineering Maintenance**

Every component in an Elcom/Bauer transmitter is readily accessible; full-length, non-interlocked front doors and side panels, which may be removed if necessary, are provided along with interlocked rear doors. High voltage grounding switches and grounded shorting sticks are provided. In addition to roominess and ease for the engineer, every safety precaution has been re-examined and no compromises made in assurance of operator safety.

#### **Extensive Features That Guarantee Performance/Reliability**

All important operating parameters are metered including operating elapsed time and AC line voltage. Solid-state rectification is used exclusively in all power supplies that are conservatively rated and easily accessible. Rugged variable inductors of solid brass (silver plated) are used to provide simple, stable tuning adjustments.

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via terminal strips. Interface for telemetry control equipment is standard, too.

Every transmitter also includes VSWR protection, automatic power output control, AFC status indication, solid-state timing diode logic and relays, tuning controls with counter indicators, multimeter readout on secondary operating parameters and front panel circuit breakers and fusing.

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**IKEGAMI ELECTRONICS (USA)  
Series 9**

A black-matrix screen displays high contrast pictures on either a 14- or 20-inch screen in the series 9 color monitors. Close-spaced phosphor dots result in 600-line resolution. Switchable comb filtering preserves definition, with 1/Q demodulation used for accurate color reproduction.

**Series 8**

Three CRT sizes, 14-, 20- and 25-inch, are available in series 8. Designed for professional application in television, the modular approach reduces maintenance time. NTSC inputs are standard with optional RGB provisions. Pulse cross and underscan are standard. For rack-mounting, specify "R," with 14- and 20-inch models.

**Series RH**

The TM14-2RHA and TM20-8RH provide video bandwidths to 8MHz for improved high resolution. Comb filtering, pulse cross, underscan and remote control capable models may also include optional RGB inputs, optional NTSC/RGB switching or R-Y/B-Y outputs for a vector display (in the 14-inch TM14-2RHA only).

**Series 3**

The series 3 monitors include 9- and 14-inch units with modular electronics. Either may be obtained in cabinet or 19-inch rack-mounting configurations. H and V delays, underscan switching and operation with EIA or CCIR scan standards are standard features.

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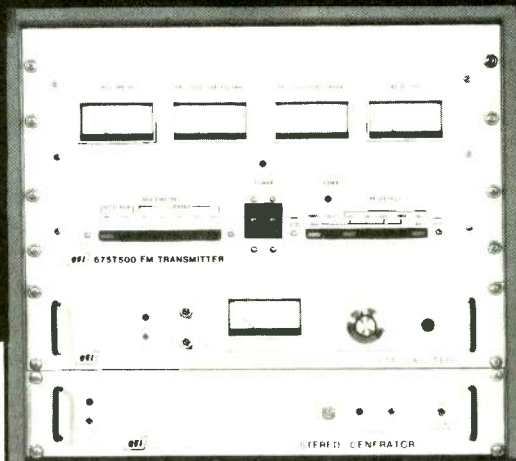
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The unique circuitry of the TM-14PSN allows manual selection of NTSC-3.58, NTSC-4.43, PAL or SECAM (CCIR/French), as well as automatic selection of the proper standard. Two UHF/phono connectors offer A and B line inputs along with an 8-pin EIAJ connector for VCR input/output. A tuner is required for off-air monitoring.

**C-2082UM**

Electronic soft-touch controls regulate volume, tone and speaker balance of the C-2082UM stereo receiver/monitor. A, B and VTR video inputs may be shown on the 19-inch CRT with 330 lines color resolution in monitor mode and 350 lines in RF mode. Dual 5W audio amplifiers and

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speakers present stereo audio. Electronic tuning is included in automatic or manual V/U channel searching with memory.

#### TM-41AU

The 5-inch color TM-41 color monitor features portability with powering from an internal battery pack or from household current. Weighing only 8.4 pounds, the portable monitor may be used in the studio or in the field with equally high picture quality from an in-line black-stripe picture tube. A built-in speaker is offered for audio monitoring along with video.

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#### LENCO

##### PCM-514

NTSC and RGB signals may be used with the PCM-514 series. CRT choices include 0.61 slot, 0.41 dot and 0.31 dot mask PIL displays. These 14-inch monitors include comb filtering, blue gun only, pulse cross and underscan features. The PCM-514-3 (0.31 dot mask) model is considered high resolution. All are designed for evaluation applications.

##### PCM-519

Using a 19-inch CRT, the PCM-519 series offers the same basic features as the 514 group with a larger picture area. Request a -6 for 0.61 slot mask,

-4 for 0.41 dot mask or a -3 for the 0.31 dot mask high resolution CRT for either NTSC or RGB signal evaluation applications.

##### PCM-523

All features of the PCM-523 are identical to the 519 series with the exception of the CRT size. The PCM-523 uses a 23-inch tube and is available only with the 0.61 slotmask PIL CRT.

##### PCM-520

The 520 series of monitors uses RGB signals only. Both 20- and 22-inch tubes are available in the 0.61 slot, 0.41 dot and 0.31 dot mask PIL CRT categories. The scan by resolution format produces a 512x483 element display with up to 80 characters on the screen for text applications.

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#### PANASONIC INDUSTRIAL COMPANY

##### Video Systems Division

##### CT-2000M

The CT-2000M is a 4-system color monitor for PAL, SECAM, NTSC-3.58 and NTSC-4.43. The switchover is automatic and manual. The ac auto feature adjusts the monitor to the power source, from 80 to 290V automatically. A full array of inputs and outputs with loop-through capability permits use in almost any application when a 19-inch CRT is useful.

##### CT-1920M

The 19-inch Quinrix II in-line CRT delivers 300-line resolution for finer picture detail. Comb filtering improves resolution and color definition by reducing color noise. The monitor is equipped with BNC connectors for video input and output, an 8-pin VTR connector and RCA-type audio connectors. It is commercial UL listed.

##### CT-1350MG

Specifically engineered to satisfy industrial, professional and educational demands, the 13-inch CT-1350MG color monitor fits into computer as well as VTR/VCR applications. NTSC composite and RGB video inputs are provided for the professional studio or RGB computer applications.

##### WV-5360

The deluxe WV-5360 monochrome monitor in underscan can display the entire image from the camera or VTR, including edges normally cut off by standard monitors. Pulse cross shifts the picture both horizontally and vertically to display the blanking signals, revealing out-of-sync edits in post-production.

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#### PHILIPS PYE TVT LTD.

##### LDH 6200 series

Referred to as a Grade 2 monitor, the LDH 6200 series uses a 14-inch in-

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line "Hi-Bri" self-converging CRT. Pigmented phosphors increase brightness by 70% and contrast by 20% over conventional tubes. Two encoded inputs. NTSC, PAL or SECAM and RGB signals may be displayed separately or with an A/B split screen. Pulse cross and underscan are available.

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### ROHDE & SCHWARZ SALES COMPANY (Barco)

#### CTVM 3 series

The two CRT sizes of the CTVM 3 series are 14 and 20 inches. Both may be ordered with a delta-gun shadow mask or a slot mask. Also, EBU or American Standard phosphors may be requested. Decoders are available for NTSC, PAL B/M/N and SECAM H and V standards. H and V delay, split-screen and notch filtering are provided on -A versions.

#### TVM 3 series

Screen sizes of the TVM 3 series of monochrome monitors offer 14- and 20-inch displays. Either of two composite inputs may be selected into a video bandwidth circuit greater than 10MHz. Notch filtering for NTSC, PAL or SECAM color subcarriers are switched in from the front panel. AFC constant switching, pulse cross and remote control capability are featured.

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### SHARP ELECTRONICS CORPORATION

#### XR-3019

A 19-inch Linytron Plus CRT is used in the XR-3019 receiver/monitor. The ACS-5 auto color system, auto degaussing, rapid-on and a long-life tuner offer standard TV viewing of any U/V channel. UHF and phono connectors or an 8-pin VTR connector allow monitoring functions. Both video and audio outputs are available to drive other monitors or a recorder.

#### XR-3013

The jet-black stripe Linytron Plus 13-inch tube displays RF or video signals. From the tuner, from UHF and phono connectors or from the 8-pin VTR connector, signals are routed through the ACS-5 auto color system. Separate A/V outputs or the 8-pin system may drive other monitors or a video recorder.

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### SONY BROADCAST PRODUCTS COMPANY

#### BVM-1900

The BVM-1900 broadcast evaluation color monitor provides NTSC and RGB signal observation on a 19-inch CRT. Comb filtering increases picture crispness to a suggested resolution of 900 lines. A full range of functions in-

cludes pulse cross and underscan selections.

#### BVM-4050

Portability is offered in the BVM-4050 color monitor. The small size and powering permits use in field confidence applications. A high definition 3.7-inch Trinitron displays pulse cross and blue only functions for setup and observation of noise and video signals.

#### BVM-1201

The 12-inch Trinitron of the BVM-1201 offers a horizontal resolution of 600 TV lines at center, typically. NTSC and RGB inputs are standard with controls for variable AFC time constant, pulse cross and remote control functions. Aperture adjustment allows an 8dB boost at 4.5MHz.

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### TEKTRONIX

#### 650HR series

A 12-inch high resolution Trinitron with 50% more phosphor stripes is used in the 650HR monitors for improved resolution. The 1.2MHz decoder bandwidth and variable aperture correction aid picture sharpness. Two video channels, each with individual external sync, are standard. Decoder outputs offer R-Y and B-Y (or U and V) signals for an X-Y monitor from RGB, NTSC and PAL units.

# Success Story

The Ross RVS 514 video production switcher has made quite a name for itself in TV stations, production houses and in editing suites across the U.S.A., Canada and around the world.

In Australia alone, ten 514's are being used to help provide coverage of this October's British Commonwealth Games.

The reasons for success are obvious —

- \* simple operation
  - \* compact size
  - \* affordable price
- and the tremendous production capability of the Ross MLE Multi-Level Effects unit.

The Ross Multi-Effects system and Transition Preview offer production capability usually found only in larger switchers. The compact and easy-to-operate layout of the 514 control panel makes it a favourite with operators. The addition of options such as quad split, rotary and matrix wipes, auto transitions, analog key borders and interfaces for editors and digital effects units allows the 514 to be tailored to any situation. The Ross Scene Store offers the added dimension of memory at a reasonable price.

Let us tell you more about the Ross 514 or the other members of the Ross family of production switchers.

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Ross Video Inc.  
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# MAIN CONTROL



## MRC-1

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User-tailored system set-up of the MRC-1 assures each broadcaster of filling his exact command, status, and telemetry requirements. Telemetry channels may be keyboard calibrated for linear, indirect power or direct power scaling. Upper and lower telemetry limits may be set with automatic muting if desired. All status inputs from any site can be displayed simultaneously on a set of 32 LEDs at the control terminal. Command line outputs may be assigned to function as the raise or

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  - 32 STATUS CHANNELS
  - 32 TELEMETRY CHANNELS

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lower output of any specified telemetry channel. In short, the broadcaster customizes his system to his plant.

To further enhance the flexibility and convenience of the MRC-1, several options are available. The multiple direct command option provides 10 pre-selected command functions for quick control of key parameters at any site. In case of an extended shutdown, the Moseley Memory option stores data for up to ten years. Optionally available automatic loggers print a record of status and telemetry operations at time intervals selected by the user. The CRT option duplicates all the functions of the control terminal and displays all 32 channels of status and telemetry data at one time from any site.

With over 500 units in the field, the MRC-1 has proven itself to be the preferred remote control system for radio, television, earth satellite stations, and a multitude of supervisory control requirements.



Circle (41) on Reply Card

## 690SR

A 19-inch high resolution delta-gun, dot-shadow mask CRT with a 0.31mm dot pitch is standard for critical evaluation applications in the 690SR monitor. Scan delay, pulse cross and underscan features are included with a design concept for extra stability. NTSC or RGB interfaces are available as well as medium resolution CRT.

Circle (266) on Reply Card

## VIDEOTEK

### RGB/VM series

CRTs for the RGB/VM19 and RGB/VM25 are 19- and 25-inch displays. Both RGB and NTSC inputs are allowed with 350-line resolution. Standard features include comb filtering, switchable underscan, A/B inputs, external sync and blue gun only. Video may be derived from a VTR on an 8-pin plug as well, and sync can be positive or negative.

### Studio 12

The 12-inch Trinitron display in the Studio 12 (NTSC) and Studio 12/P (PAL) provides a critical evaluation picture. In addition to pulse cross and underscan functions, the A/B inputs may be down in an A-B split screen and A-B mix format for signal matching applications. The AFC time constant is selectable.

### VM-26P

On the 26-inch Trinitron of the VM-26P professional color monitor resolution is improved by the use of velocity beam modulation. A sharpness control also increases available picture detail. Ideal for newsroom, boardroom and classroom uses, the large screen monitor may also find application in engineering and is available with optional pulse cross and underscan features.

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## WORLD VIDEO

### CDM 13

Available in either a cabinet or open chassis configuration, the CDM 13 uses a 13-inch CRT for RGB color displays of an 80x24 character resolution. When ordered, the unit may be requested to accept analog, TTL and TTL with intensity inputs. Sync is selectable from an external input or from the green channel input.

### RV 1301

The RV 1301 is one of a series of color receiver/monitors available from 5-to 26-inch. All are fully power line isolated with isolation transformers. Demod outputs, an 8-pin VTR connector and E-to-E features are included. Available options include underscan, pulse cross and a built-in color bar and tone generator.

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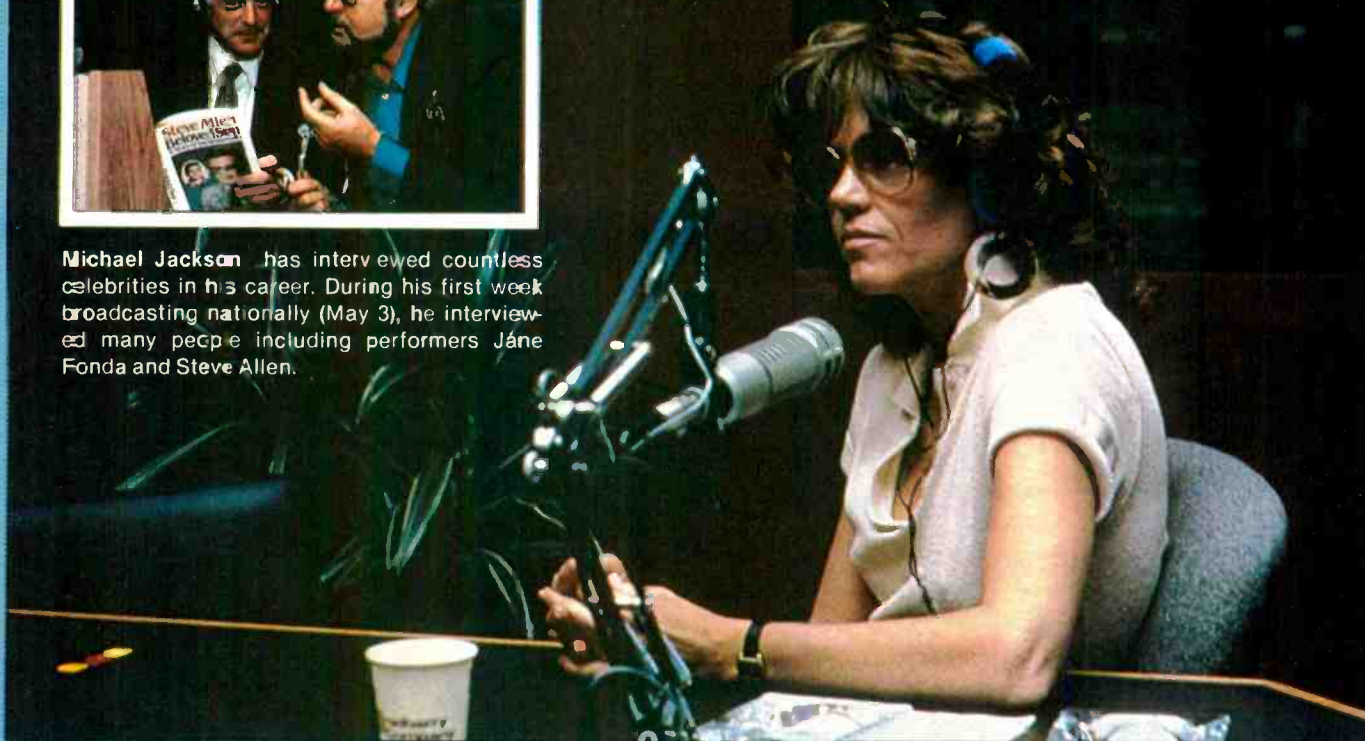
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Michael Jackson has interviewed countless celebrities in his career. During his first week broadcasting nationally (May 3), he interviewed many people including performers Jane Fonda and Steve Allen.



# A look at KABC/ABC TALKRADIO

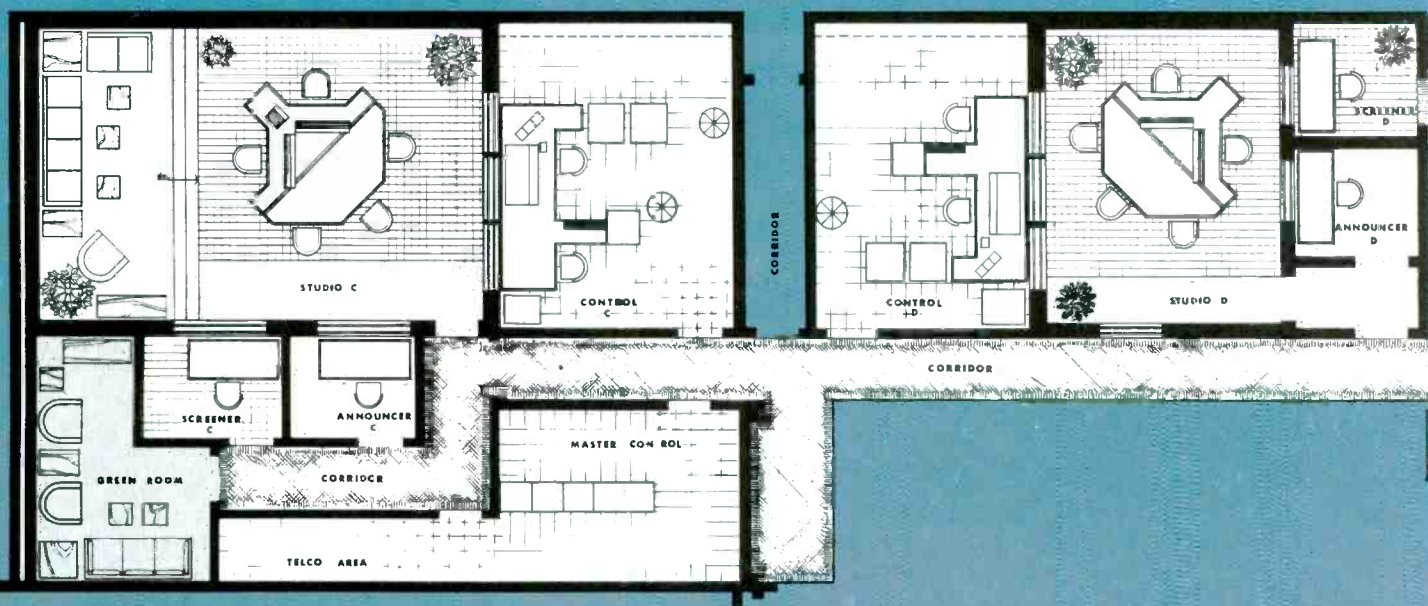
By Art Sterman, manager, radio engineering operations, KABC/KLOS, Los Angeles, CA

There is an air of excitement that pervades the studios of KABC in Los Angeles. It starts with the lively infectiousness of Ken Minyard and Bob Arthur during their 5-9 a.m. show. The constant procession of nationally recognized celebrities visiting with veteran radio journalist Michael Jackson arouses the staff's curiosity. And Dr. Toni Grant, the perceptive radio psychologist, brings another dimension to the studios as she discusses personal problems via *calls*. In the late afternoon, the focus changes to sports: Bud Furillo's *Sportstalk* is followed by Dodger baseball or, in the off-season, the Carole Hemingway show. Afterwards, Ira Fstell, the dean of radio conversationalists, commences a 3-hour stint ranging from trivia to the mundane. Then it's time for Ray Briem, whose midnight-to-5 a.m. program rounds out a 24-hour span of humor, insight and action.

To the listeners, KABC is a multifaceted magazine of entertainment, sports, discussion and news. To the staff, it is a pulsating entity that absorbs their thoughts and draws them into each program.

Behind the scenes, the author, a 21-year KABC veteran, and Rex Newcombe, assistant chief engineer, are responsible for maintaining the station at peak operating efficiency. The author recounts here some of the moves that have made KABC one of the nation's leading stations.

## KABC new wing



## Existing building

We believe that KABC is one of the most successful radio stations in the United States. We are not bragging. We are proud of that fact, but it wasn't always that way.

In 1960, we were floundering with a rock format. The ratings were low and something had to be done. ABC decided to send the then vice president and general manager of WABC, New York, Ben Hoberman, to Los Angeles to try out a new format. Hoberman decided to go talk radio 24 hours a day. At that time we were playing electrical transcriptions on 16-inch turntables. We installed cartridge machines and a hybrid telephone system and away we went.

The original talk show hosts were politically oriented, both conservative and liberal. They would argue with the listeners and sometimes some of our more radical hosts, such as Joe Pine, would tell them they were stupid and then hang up. On Saturdays, for a change of pace, we would have comedian-type hosts, Dick Whittington and others, who would make a joke of everything, make funny long distance calls and anything else that would entertain listeners.

This was followed by a general benign ear where we had talk show hosts (such as Superfan) who represented the fans at baseball

games, etc. He did not sit in the press box with other reporters. Instead, he sat in the stands with the fans, and represented them. We had another talk show host, Bill Balance, who spoke to the ladies about their marriages and love life.

We then followed with the present format, which is informative and educational. A listener who was tuned to KABC continuously could receive a well-rounded, broad education about world affairs, sex and sports. For example, talk host Michael Jackson has had as in-studio guests hundreds of stars of motion pictures, sports and politics. A listener to his show alone would receive a broad education and also be entertained. Jackson is followed by Dr. Toni Grant, a psychologist, who attempts to solve the listener's personal problems in the time allowed.

The *Ken and Bob Show* is the morning drive program that is aired from 5 to 9 a.m. daily. They believe that because most of the news is bad, they should spoon-feed the listener hard news in between features such as *Lust News* and report way-out news items.

We also have 5kHz equalized broadcast circuits from various talent's homes so that they may feed their reports, live and in good quality. They report the financial news, commen-

tary on world happenings, and lifestyle. For promotional stunts, we have broadcast live from the Rose Parade and other major events, locally and from around the globe.

There is generally a humorous gimmick in each place. For example, at the Rose Parade, staff members were set up *beyond* the parade route. At Harmony, CA, the town was one block long. At the mission at San Juan Capistrano, where everyone publicizes the swallows returning, KABC was there when the swallows were leaving. When they went to London to throw a shower party for Lady Diana, she didn't attend. The latest escapade is broadcasting from Dublin, Ireland, during the St. Patrick's Day week.

We have many more talented talk show hosts, too numerous to mention at this writing. In fact, at times we have famous people as guest talk hosts. The listener gets a new insight into the thoughts, views and articulations of their favorite stars. We recently had Governor Brown of California, as guest host, and people who would not normally have had an opportunity to talk to him could do so on the air.

Also, in 1974, KABC agreed to broadcast the Dodgers baseball games. This, in connection with the other popular programming, made

# Satellite radio network is born

In deciding to become all-talk with open lines and call-ins, KABC not only revolutionized its original format, but also created a new concept: live satellite broadcasting.

Mike Hauptman, president, ABC Radio Enterprises, appointed Dennis Feely to be director of Radio Engineering Operations for the nationwide TALKRADIO, with offices in New York. In preparation, Art Sterman, Rex Newcombe and the KABC engineers were ready for that challenge in Los Angeles. The New York-based ABC group was headed by John Hidle, vice president of Radio Engineering Operations; John Gable, director of audio design; John Studwell, director of construction and plant services; and Studwell's assistant, Bill Murphy.

The decision to take the TALKRADIO format national was an outgrowth of KABC's local success. However, the concept to go live with such a wide variety of programs seemed impossible. A myriad of questions were raised for the programmers and technicians. *How would they handle calls from the East Coast? What about the time differentials? What about signal delays? Would there be feedback?*

Technically it seemed overly complex, but Radio Enterprises and KABC were capable of handling the problems because the long-range operational plan and capital budget had foreseen the station's growth. Sterman was ready for live national programming as KABC's projections included the construction of two new studios, control rooms, and the purchase of the latest state-of-the-art equipment. With the budget allocation approved, Sterman and his team embarked on a construction program that would bring the KABC creative talents into radios across the country.

Thus, the satellite radio network was born.

In conjunction with World Communications, KABC originates and uplinks programs from its new studios to a Weststar III transponder, and then downlinks them to target markets. The two full-time 15kHz single carrier channels are being implemented immediately, and a third held in reserve for future use.

simulcasting the FM station, whose call letters had been changed to KLOS. We installed a Schafer automation system and played the love format. At that time, we were feeding 22 newscasts a day to the ABC Radio Network, as we were the western distribution and feed point.

We later added offices for KLOS at the south end of the building, thereby making the total radio building area 22,000 square feet. (I would like to mention that the preceding changes, as well as the following designs and installations of equipment, went smoothly with the expertise of Rex Newcombe, assistant chief engineer for KABC and KLOS.)

## Program/facility expansion

In addition to sending an engineer to all Dodger games and broadcasting them via satellite and simulcasting live and taped satellite stereo shows on our FM station, we have expanded into a new area. The Radio Enterprises division of ABC began to broadcast a TALKRADIO syndicated show via satellite to those stations wishing to purchase the service.

To accommodate this syndicated programming, we have added 2500 square feet of studios, increasing the total plant area to 24,500 square feet. The new addition includes a 30-foot studio, a 20-foot studio, control rooms, screeners' and announcers' booths, a central control and a green room for guests. One area is used for TALKRADIO syndication, and the other area is used for KABC. We now plan to rebuild the existing broadcasting areas.

We made the decision to go with Pacific Recorders equipment because their president, Jack Williams, impressed us as being an exceptionally bright engineer with the ability to solve most problems in a straightforward, logical manner. He was willing to work with us in building custom broadcasting tables and in other specialized work. His consoles incorporate the latest state-of-the-art circuitry, and he willingly considered our special requirements such as the use of mix-minus buses needed for our many satellite talk shows. We are using the Pacific BMX-26 Series II consoles, Technics MKII turntables, MCI reel-to-reel tape recorders, Eventide solid-state delay units, Crown power amplifiers, JBL audio monitors and Tomcat cartridge machines. The goodies include digital timers, Electro-Voice RE-20 microphones and custom intercoms.

The on-the-air telephone system is a custom 4-wire hybrid system. It has 40-line capability: 20 for KABC and 20 for TALKRADIO syndication. The KABC lines include Los Angeles numbers with Orange County, San

FUTURE

This floor plan shows the new studios, control rooms, screening and announcer rooms, telco area and master control facilities. The Green Room provides a comfortable, elegant waiting room for guests, many of whom are stars and dignitaries.

KABC the number one station in the area. In 1979, George Green became the vice president and general manager of KABC, taking the reigns from Ben Hoberman, and we have been going full speed ahead since then.

## Past, present and future

Our present broadcasting site in Los Angeles on LaCienega Boulevard was the original transmitter location of KECA (Earl C. Anthony). When ABC purchased the station, the call letters were changed to KABC. The studios at that time were the old audience participation studios at Vine Street in Hollywood.

In 1960, the decision was made to move the operation to the transmitting site at LaCienega. This was a crowded situation, because the ABC Radio Network, KABC studios and the KABC transmitter were all located in one small area. What was then KABC-FM was being simulcast with KABC, and the FM station had no studios.

In 1967, KABC expanded to new, larger quarters at the north end of the existing building and installed a custom Gates system. We had network studios, control rooms and newsroom, KABC studios, recording room, control rooms and newsroom. At that time, it was decided to stop

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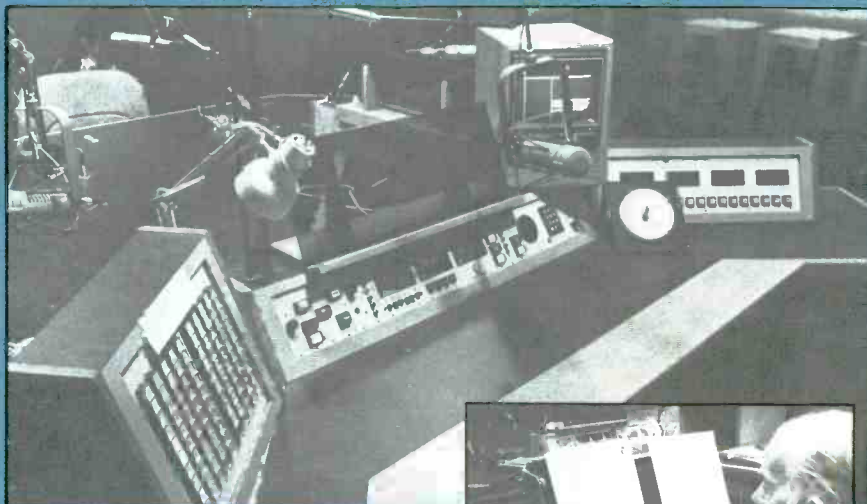
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Everything is at the talent's finger tips: the talent control board consists of the telephone, computer system and network signaling system. The on-air personalities have easy viewing of engineers, announcer, program coordinators and guests.



Lou Cook, KABC radio announcer, is positioned in the announcer's booth that overlooks the studio. Various controls include digital clock, down-timer, cartridge timer and intercom system, which allows communication to many areas within the station.

Photos: Andrew Vogel



ABC's network studio C, housed within KABC TALKRADIO in Los Angeles, is highlighted by the large broadcast table that includes a low profile console and CRT viewer. In the rear, a sofa and chairs were installed to provide an alternate informal broadcast area so that talent may interview their guests in a relaxed, at-home atmosphere. Dr. Toni Grant is seen preparing for the broadcast.



Cecilia Hugo, engineer, is seen at the network control room, which features a Pacific Recorders Console, Tomcat cartridge machine, input switcher and a birds-eye view of Studio C from which Dr. Toni Grant is broadcasting.



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The CETEC Spiral CPTV antenna was patented in 1975 by Dr. Raymond DuHamel after three years of extensive developmental research at our factory and antenna range in Sacramento, California. The WLS Spiral CP utilizes a series of tapered, spiral-wrapped radiators which yield extremely uniform coverage as well as excellent axial ratio. And this is precisely what ABC station WLS needed. They've been recognized by the broadcast industry as the pioneers in CP broadcasting since their first regular schedule of full-time CP transmission in 1974. Cetec Antennas too, has been pioneering right along with ABC.

Once testing was completed on the WLS Spiral, it was transported fully-assembled to Chicago and then placed on the world's tallest building—by helicopter.

Installed on February 20, 1982, our delivery was right on schedule with our client's requirements. This delivery made WLS-TV the fifth forward-thinking broadcaster who has recognized Cetec's substantial lead in CP antenna engineering.

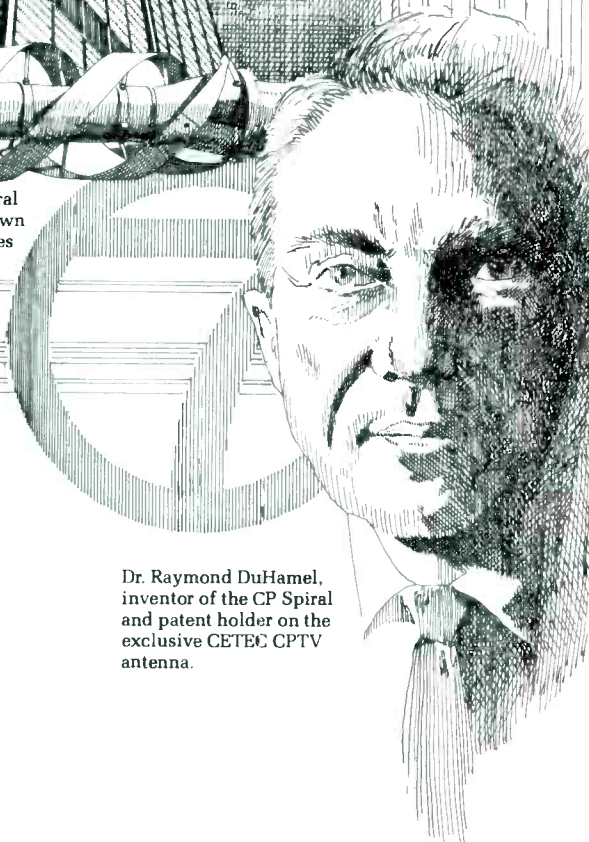
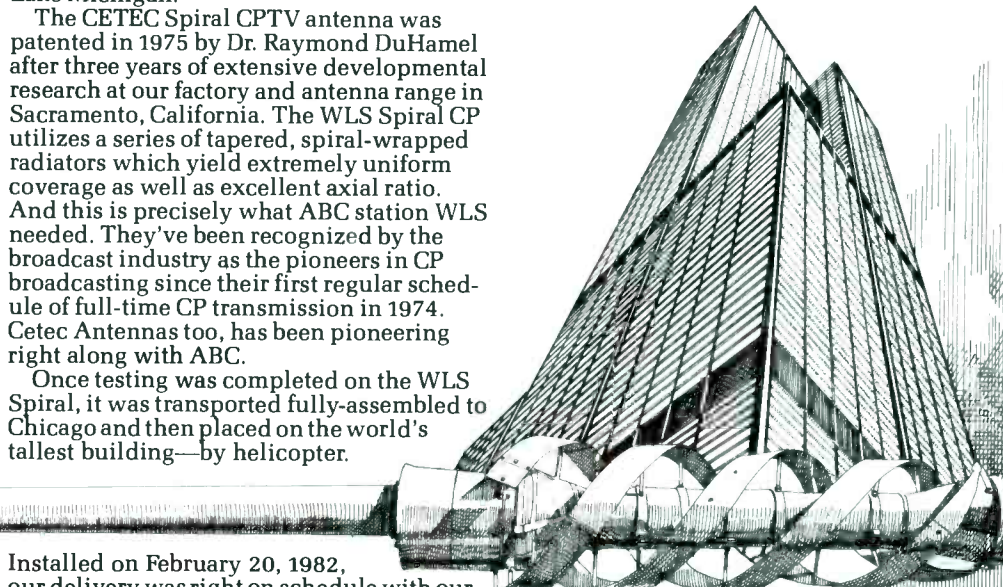
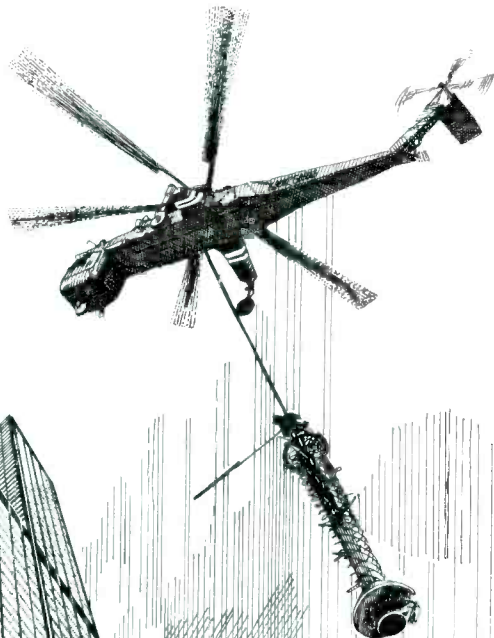
Our track record is more than two decades of critical performance and progress in broadcast transmission. Whether your needs are in Radio or T.V., advanced CP or conventional design, you can be totally confident that antennas which are engineered, critically tested and often installed by CETEC will give your station the edge in performance and coverage.

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The CETEC CPTV Spiral Antenna-radiators shown with full-panel radomes removed.



Dr. Raymond DuHamel, inventor of the CP Spiral and patent holder on the exclusive CETEC CPTV antenna.

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To experience the full potential, and thus the value of any product you purposely put it to the test. After a few hours in the studio or on location, you can become painfully aware of the differences between a professional machine and those with a Hi-Fi heritage. Because Otari's only business is to serve the dedicated audio professional, you won't find cosmetic facelifts every couple of years; or, dredged-up product from another era that's labeled "Pro." At Otari we improve each product by subtle engineering refinements that make the basic product that much better—without fanfare and expensive model changes that you end up paying for. And the "B" is the embodiment of this philosophy. It's been around for three years (5050 Series, 6 years) and we plan you'll keep it around a lot longer. If you're a knowledgeable audio person who already owns an Otari you'll know what we're talking about. If you're not, then it is well worth your time to review the Performance and Feature facts we've

detailed in this ad. If you're in the market for a fully professional, super-reliable two-track, the time you spend to acquaint yourself with the "B" just might mean the difference between spending your money on a machine that will do for now—or deciding to make the investment in a basic creative tool that will pay you back handsomely in the years to come.



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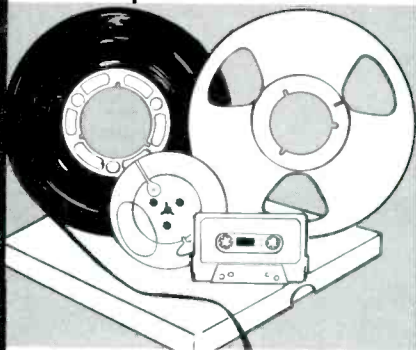
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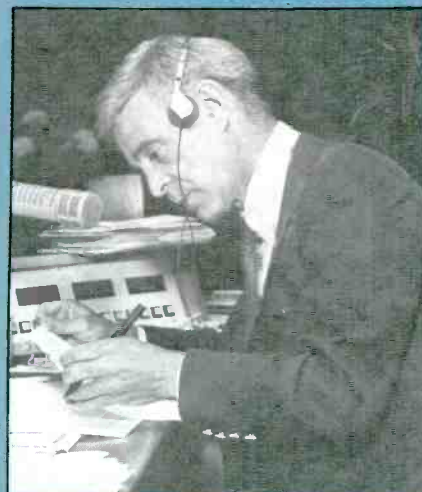
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Dr. Irene Kassorla is a leading psychologist best-known for her recent book, *Nice Girls Do*. She is broadcast nationally from 9-11 a.m. PST.



Michael Jackson joined KABC TALKRADIO in 1966. He is heard nationally from 11 a.m.-1 p.m. PST.

## Some of the talent



Dr. Toni Grant pioneered on-air psychology seven years ago on KABC TALKRADIO. She is broadcast nationally from 1-4 p.m. PST.



Owen Spann has been heard locally on KABC's sister station, KGO-AM, San Francisco, for 19 years. He is heard nationally from 7-9 a.m. PST.

# Custom hybrid phone system

Author Art Sterman readily admits that the KABC custom hybrid phone system is the most exciting technical achievement in his new operation. But he also notes that it is beyond the budget of most stations. Custom-designed, it is a 4-wire system that lets KABC conference at full level at least four parties simultaneously, and many

more could be accommodated with a slight elevation in level.

Coupled with technical achievement is KABC's hard-working air talent that thrives on challenge. The combination has spelled out good ratings and overall success.

All this is achieved with a 5kW transmitter in a 50kW competitive environment.



The program coordinator booth, overlooking Studio C, includes an on-the-air telephone system and a computer, which provides information such as name and call origination to the on-air talent. Michael Setsuda, program coordinator, is seen setting up calls for on-air broadcast.

Fernando Valley, South Bay and other numbers, so that the greatest practical number of listeners may call us toll-free. The syndication telco lines are 800 numbers, so that we may be called toll-free by listeners across the United States.

The syndication area also has a computer. Calls are answered and the computer is operated by a call screener. The screener inputs the computer with information such as the name of the listener, the age and city of the caller and the subject. This appears on a CRT in the control rooms and studios. Also, a control signal is transmitted to the satellite network that controls various cart-

ridge machines in each contract station. This means that we can individually control IDs, promos or local commercials from Los Angeles. The computer is a customized Apple computer coupled with a customized Torpey clock system.

#### Acknowledgements

When a broadcast studio is remodeled and interfaced with old studios, the transmitter transmission line is built over and all conduits are laid in concrete to meet special cabinetry, there must be expertise and cooperation between building contractors, station engineers and the phone com-

pany. I want to recognize the expertise of the New York ABC Broadcast Operations and Engineering group, including John Hidle and John Gable; John Studwell, director of Construction and Plant Services, with his assistant, Bill Murphy, and their staff; and all the contractors and subcontractors. In connection with the telephone system, Steve Rowland, director, and Charles Williams, manager of Corporate Special Services; Françoise Dytrt, Jeff Weddle and C.E. Woodward of PT&T; and Jack Williams of Pacific Recorders. All deserve special recognition and thanks.

||:~:~)))))

## Eventide's BD955 Broadcast Audio Delay Finally Has Some Serious Low-Priced Competition . . .



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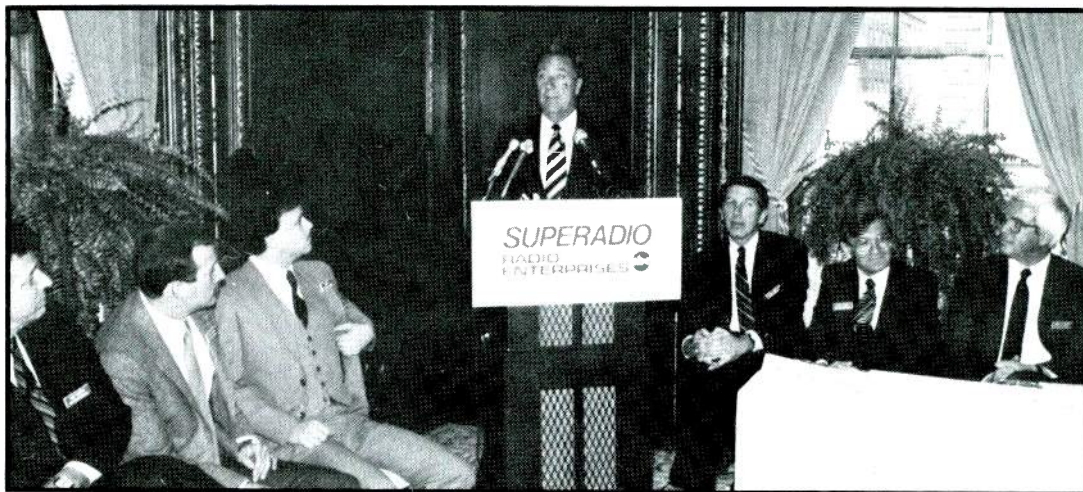
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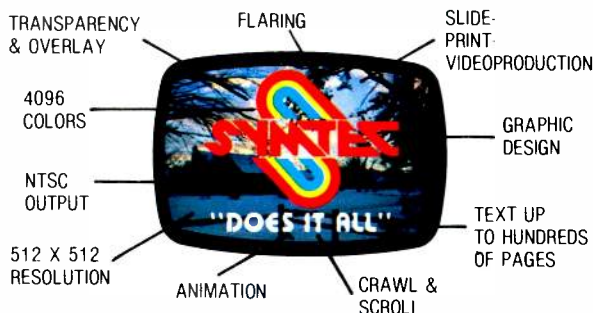


Elton Rule, president of ABC, confirms ABC's commitment to the success of Superadio. On each side of the podium are members of ABC Radio Enterprises and the Marschalk Company and DJs for Superadio.

# ABC launches Superadio

At press time, BE received word from the *NRBA Monday Morning Memo* disclosing that ABC Radio had canceled Superadio because of poor economic climate and lack of advertising. However, our sources at ABC report that the program has only been delayed and further details will be forthcoming. Superadio was tentatively scheduled to begin broadcast July 1.

By Harmon M. Schragge, Jr., media consultant, New York, NY



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ABC Radio Enterprises launched a satellite-delivered radio service on July 1, 1982. Called Superadio, the service transmits a total programming and marketing package to radio stations paying a monthly fee based on market size. Designed to improve local stations' profitability by generating audiences and advertising revenues, Superadio should limit station expenditures and maximize the return on expenditures made.

Originating from New York City, Superadio is available 24 hours a day, but stations are encouraged to program locally where they think this is appropriate. Generally speaking, local origination will probably occur during morning and evening drive time.

Targeted to adults from 21 to 49 years of age, Superadio features music, news, nationally produced on- and off-air promotions and advertising support. Off-air promotion, handled by ABC Radio Enterprises and the Marschalk Company (a member of the Interpublic Advertising Group) creates, produces and places customized TV and print advertising campaigns in each licensee's market. ABC Radio Enterprises provides and coordinates all

Continued on page 74

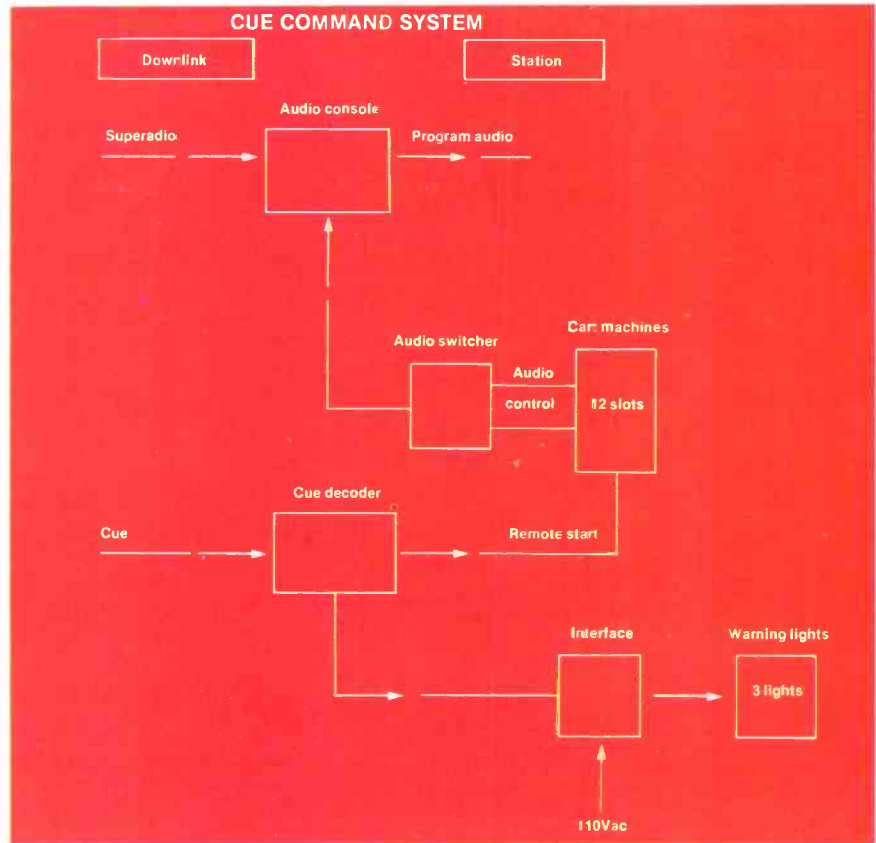
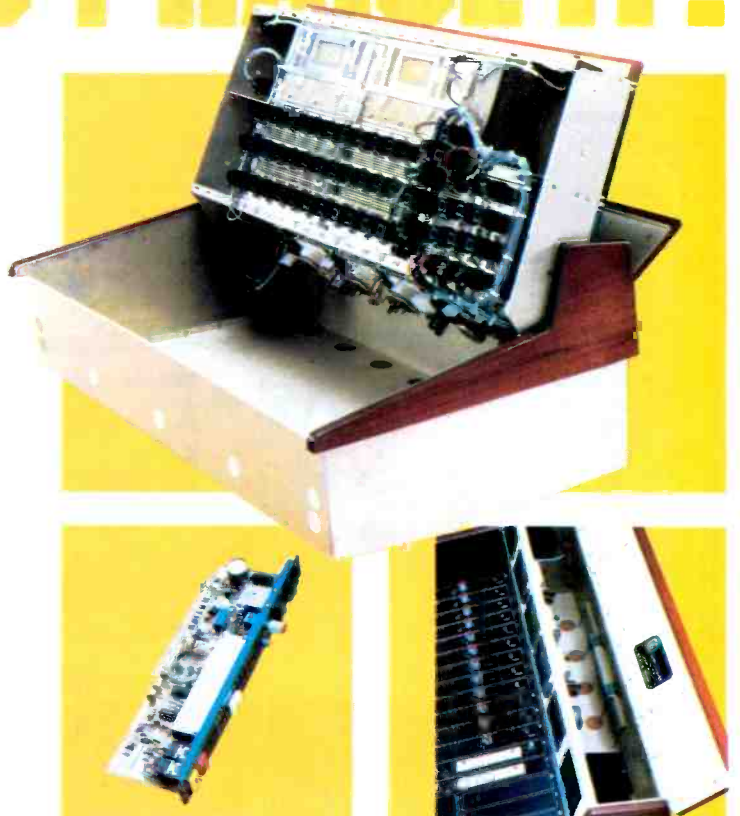


Figure 1. Cue decoder provides discrete play closure 24V/0.1A.

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# WM smooth talk

By L. Scott Hochberg, president,  
Logitek Electronic Systems,  
Houston, TX

WMCA's new talk studio is an example of the use of standard technology to simplify operation of an all-talk station. Through careful planning and substantial consultation between talent and engineers, WMCA's talk-show hosts control almost all aspects of their programs with simple, 1-button operations. The electronics take care of maintaining levels, cycling through spot breaks, compensating for voice-overs and properly routing telephone and talkback signals.

WMCA has long been the prominent AM talk station in New York City. As with many major market stations, WMCA's labor contracts prevented the station's air talent from directly operating studio equipment. Last year, the station and the unions negotiated new agreements, allowing WMCA to "go combo," reducing the use of operating engineers. This left the station with a crew of host/operators, many of whom had not, in recent memory, set their hands on a control board, much less tried to run one while attentively interviewing guests and handling phone calls on a station in the nation's number one market.

John Shadle, then chief engineer at WMCA, was particularly concerned that the hosts would not pay attention to levels, a concern well-understood by all broadcast engineers. To Shadle, the answer to the level problem was straightforward: if the talent will not set levels, then don't give them levels to set. He proposed custom designing a *totally potless* console, with all levels controlled by a bank of individual compressors and noise gates, with parameters set to optimize performance for the particular sources being



# CA's running show

controlled. Besides automatically setting levels, Shadle's custom console would use special logic circuits to reduce manual switching operations to an absolute minimum.

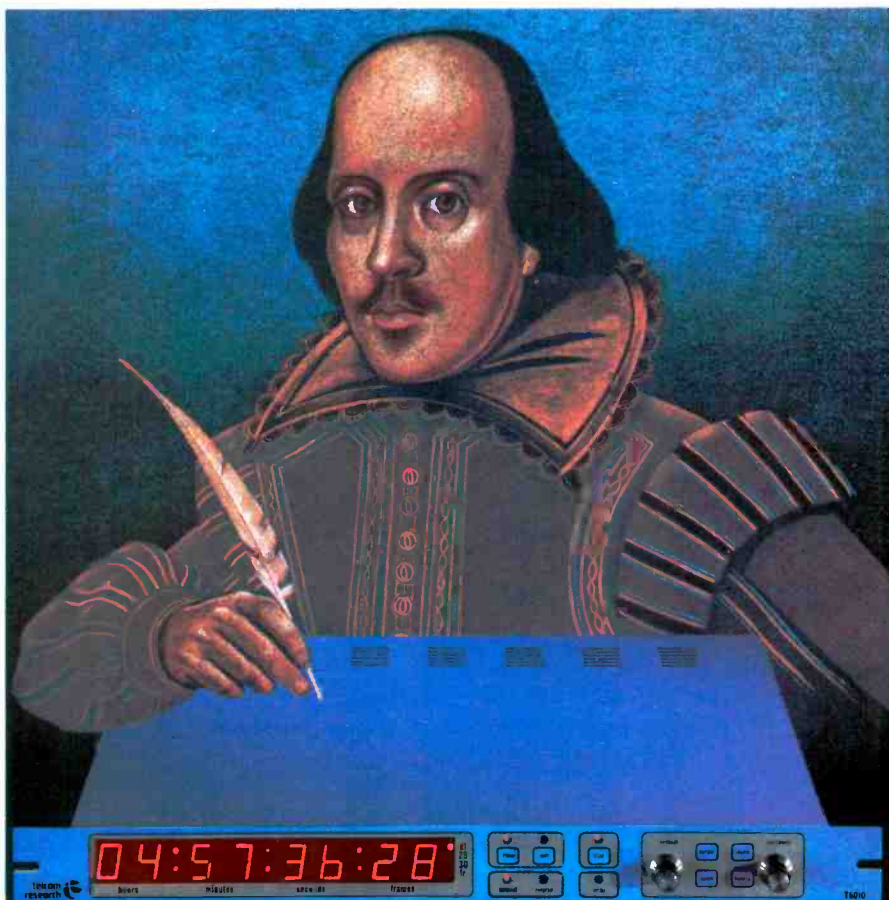


WMCA makes the most of limited space. Its all-talk custom console automatically controls levels, leaving the operator free to run his show. Switching is interconnected to reduce most operations to a single button.

## Custom modification

Shadle worked with engineers at Logitek to convert his block diagrams into a functional custom console. Logitek modified its Custom Audio Series console design to accommodate additional inputs and to incorporate potless operation and special switching circuits. On Shadle's recommendation, Logitek used dbx Model 903 compressors and Model 904 noise gates to control audio levels. Logitek then added mic preamp cards to the dbx rack cabinets to allow direct connection of studio mics to the compressor system. The console was built with appropriate input and output impedances and levels to interface directly with corresponding sections of the dbx equipment.

The system was installed in December 1981. WMCA added three



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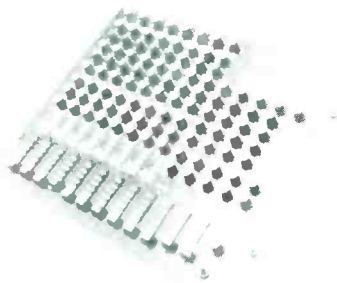


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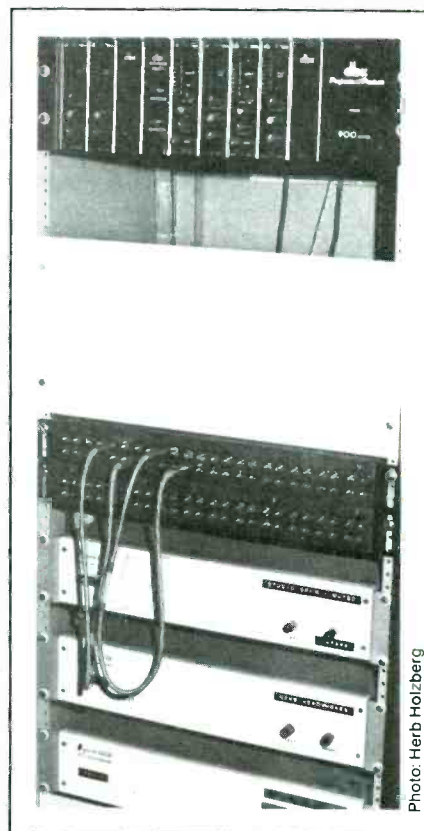
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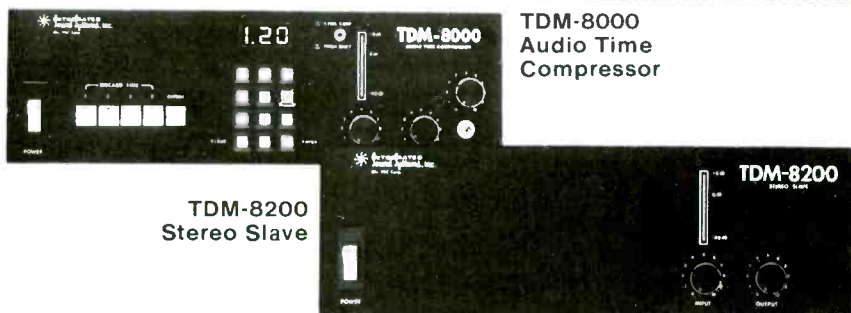
Two banks of support equipment contain dbx compressors and noise gates to control the levels of audio sources. The control rack, located in WMCA's engineering room, also houses the studio's monitor amplifiers.

ITC 3D cart players and two Telemix\* telephone interface units to round out the studio, which is currently on the air 14 hours daily.

The talk-show hosts operate a console consisting primarily of a bank of Hall-effect lighted push-buttons for switching audio sources. All sources except mics can also be fed to a cue system, using similar push-buttons. Other controls are limited to a 12-push-button remote selector; speaker selector and volume; head-phone selector and volume; cue volume; intercom talk push-buttons; and local/on-air push-buttons. A real time clock and a switch-interfaced up-timer are also mounted on the console. And, as a last minute concession to operator peace of mind, a single program VU meter is included.

Each of four studio mics are fed through individual noise gates and compressors before going to the audio switching circuitry in the console. Similarly, a telephone output feed from the Telemix units has its own dedicated noise gate and compressor. All nine cart outputs are run in-

**\*Editor's note:** Our information is that the Telemix system is one that was developed by Mark Durenberger and Steve Church, manufactured by Gregg Labs, and solely marketed/distributed by Allied Broadcast Equipment.



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dividually to the audio switching circuitry, then bused to a single compressor. Only one compressor is used here, rather than using nine separate units because it is assumed that all carts will be recorded at similar levels. Likewise, auxiliary inputs along with the output of the remote selector are bused after the switching circuitry and share one compressor. The compressor outputs feed four separate submaster buffers (for mics, phones, carts and auxiliary inputs), which are then mixed and fed to the master program amplifier.

The console's switching logic is designed to allow 1-button control of multiple audio sources. Turning off the host's mic or turning on any cart or auxiliary input generates a logic signal that turns off all four mics. This provides a 1-button transition to a commercial break or to a remote. Each cart-on push-button on the console starts its associated cart machine, and the cart machine's primary and secondary cue signals turn the audio channel off after the spot. If the host's mic is turned on after a cart has been started, the presence of audio from the host's mic drops the cart level by approximately 12dB to allow the host to do a voice-over or donut spot automatically.

A custom-designed intercom system links the host, producer and newscaster. A small control box in the adjoining producer's booth lets the producer speak to either the host or the newscaster through one ear of the host's or newscaster's headphones. Then, both can talk back to the producer through their studio microphones without putting their mics on the air. Appropriate muting is provided to prevent unwanted intercom signals from invading a live studio.

#### Further modifications

Since installing the console, several features have been added by WMCA's current chief engineer. He has pulled out a mix-minus feed for the Telemix units and installed a special talk-back feature for off-air telephone discussions. When the host puts the telephone feed in cue, the cue bus is fed to one ear of the host's headphones, and the host's mic is fed down the telephone line, allowing the host to talk to phone callers off-mic during breaks. WMCA has also mounted the Telemixes into the console to make operation of the system even more straightforward.

WMCA's custom equipment was kept as simple as possible. The logic uses standard CMOS circuits, rather than a microprocessor or programmable array, to eliminate the need to re-program a PROM for each change in the switching system. All com-

ponents in the system are standard distributor parts and bear original manufacturers' part numbers, thus avoiding expensive custom components.

WMCA's combination of automatic level controls plus customized logic helps achieve error-free operation. By relieving the host of most operating details, WMCA has survived the change to combo operation without hurting technical quality of programming content. Its particular system is designed for the demands of talk radio, but the equipment could be op-

timized to achieve similar results with any format.

From a philosophical point of view, the best equipment in the world is only as good as the performance of the operators who run it. Thus, the less the operators have to do, the better the station can sound. Along these guidelines, WMCA's audio signal quality has continued to increase without requiring a corresponding increase in the technical capability of its operators, an approach to operational simplicity that makes sense. [ :?~))]]

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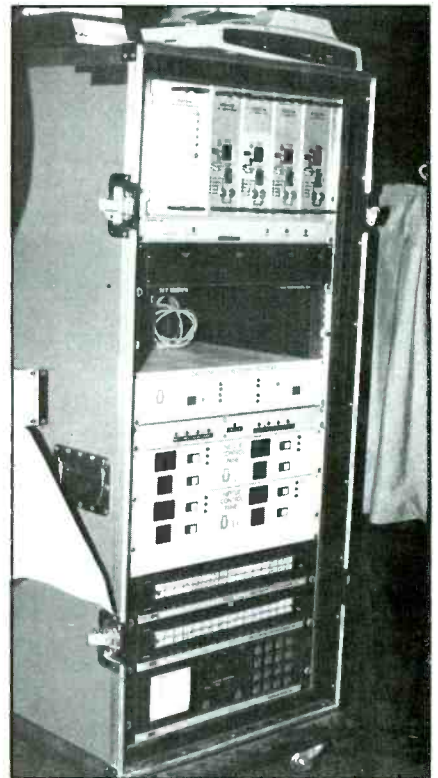


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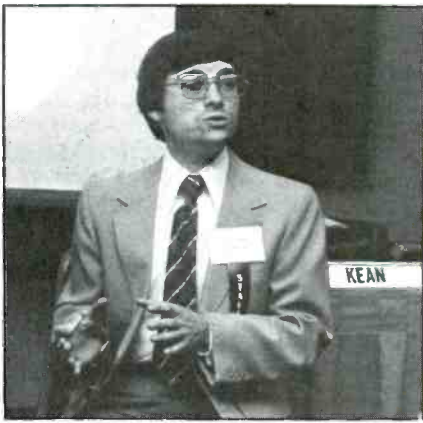
## PRC-'82

*Continued from page 16*

including contours and demographics of the area, is less than \$500.

### NPR/SOSS

An item of special interest to the public radio engineer is that of NPR's SOSS (Satellite Operating Support System). The system provides many unique control and operating features required at public radio stations. Because the total system is not yet fully implemented, engineers were naturally curious about the status of the system. The first phase of the system was implemented on June 1. This allows printed (OACS) messages to be transmitted to stations at a much faster rate than had been previously possible. The heart of the system is a small computer that controls a data stream from Washington, DC. The data is routed to the correct area for control-DACS, software load or tape control. The system allows stations to program control panels to record particular programs from the NPR satellite system automatically. The control system automatically switches demodulators to the correct satellite channels, switches the audio control panel to mono or stereo depending upon the program being transmitted, and starts the recorder in the record mode. The system can start cartridges for automatic inserts, update clock systems, and perform other



**John Kean** of NPR/Washington discusses FM/SCA transmitter performance.

functions as well. The full system is scheduled for implementation this month.

#### FM/SCA

An area of concern for many public radio stations is the seeming incompatibility of stereo FM and SCA. John Kean, engineer, NPR/Washington, directed one session to the problems encountered by adding SCA to are problems, and Kean tried to show engineers where the problems might lie and what might be done about them.

He pointed out that the tuning of the transmitter is always important. He suggested that tuning for minimum AM noise might produce the best results and minimum SCA crosstalk. For example, if a transmitter has a bandwidth of more than 2MHz, then there will be no substantial problem with adding SCA. If, however, the bandwidth of the transmission system is less than 0.5MHz, serious SCA problems can result. Kean pointed out that narrow bandwidths will also increase distortion and reduce separation. He warned that old antenna systems, especially multiple bay installations, can be particularly bad for SCA performance. One good way to measure the performance of the total system is to use a spectrum analyzer coupled to the output of the VSWR bridge (without the detector). You can then check return loss and not have to worry about other stations' signals hiding some of your system's problems.

Multipath can also cause poor crosstalk performance. One graph displayed showed the different levels of crosstalk vs. the time delay between two signals. Kean pointed out that time delays resulting from paths of one-half and one mile were typically the ones that cause most of the problem.

#### Remote programs

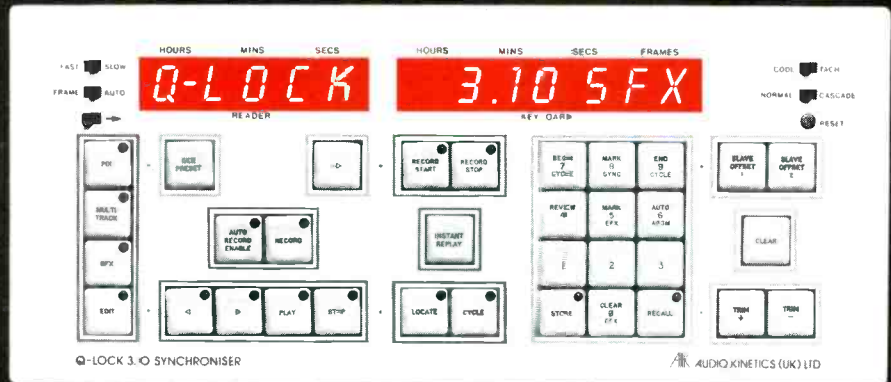
A panel of engineers familiar with

RPU and STL systems was assembled to discuss the various methods of broadcasting remote programs. Many of the users were using dbx noise reduction to extend the performance and range of their equipment. One engineer said he thought that a major manufacturer of remote pickup equipment had a serious flaw in that the receiver required a quiet environment, otherwise, excessive IM problems developed. He outlined the type of problems he had encountered in attempting to use this receiver in a location with multiple transmitter sites. He also noted that a weak RF signal

compounded problems if the dbx noise reduction was used. However, when adequate receive signal was available, the noise reduction system performed well. Typical ranges with this type of equipment were five to 30 miles with 58-60dB signal-to-noise ratios.

Engineers were encouraged to develop and participate in local frequency coordinating committees. Steve Lynn from the FCC said, "I don't frequency coordinate; you do." This position seemed to be confirmed by engineers from major cities. Most were either a part of some frequency

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coordinating effort or were at least familiar with it.

One engineer suggested that those stations with joint TV/radio licenses could use the TV band and a TV remote pickup link to transmit digital data back to the radio station. The station could use a PCM system feeding the TV link and obtain high quality audio at the studio with the digital transmission scheme. It was noted by a member of the panel that this practice might be considered illegal because radio stations are not permitted to use TV frequencies for program transmission.



Neal Muncy: Maintaining the aging tape recorder.

#### ATR repair

One of the most beneficial sessions conducted at the conference was directed to the repair and maintenance of older tape recorders. The panel was headed by Neal Muncy of Muncy Associates. He used the 1-hour period to present enough useful information to fill a magazine.

Although most engineers would prefer to simply replace old recorders, Muncy pointed out that even the old Ampex 350 series and Scully 260-280 series recorders can be made to perform with good results.

Muncy pointed out that there were two primary areas of concern with when dealing with old tape recorders—electrical and mechanical. The electrical problems can be further broken down into those troubles associated with vacuum tubes, early solid-state devices or bias problems. The mechanical problems are broken down into four areas—head and tape path wear, motor and electromechanical problems.

Muncy began by requiring a minimum amount of equipment to be available to the engineer. He said that failure to have the basic pieces of test equipment would condemn the performance of the tape recorder to less than what could be expected.

In order to make his point, Muncy misaligned and aligned a recorder for the audience, showing the results on TV screens. He pointed out how the record heads and playback heads can be misaligned, how poor reel tension affects performance and what steps must be taken in a particular sequence to eliminate the difficulties.

#### Final notes

The 1982 Public Radio Conference was a success as usual. Those engineers attending the PRC found that the sessions were directly applicable to their needs, which is not always the case at other conventions catering to commercial radio. Thus, the need for a conference directed toward the needs of broadcast engineers from public radio stations is met each year by the PRC. It offers the only opportunity for many engineers to meet with others involved in the same business. It also provides a chance for the engineers and broadcasters in the public radio field to have an input at the network level and influence the decisions made there. As funding for public radio becomes even more critical, these types of meetings provide the opportunity for engineers and other broadcast personnel to discuss many of the problems of public radio.

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## Coaxial line questioned

Your February 1982 issue of **Broadcast Engineering** contains an interesting article on page 82 titled "Waveguide Improves Transmission Line Efficiency," by Richard E. Fiore.

In the comparison made of attenuation factors for 8-3/16-inch diameter 75Ω coaxial line and waveguide, a rather impractical choice seems to have been made in selecting Channel 63 (767MHz) for the comparison. To my knowledge no manufacturer of 8-3/16-inch diameter 75Ω coaxial line recommends such coaxial line for use at this frequency. If this is incorrect, perhaps you or the author could share the name of this manufacturer with your readers.

Your assistance in clarifying this point will be appreciated.

D. G. Hymas  
Antenna Engineering  
RCA Broadcast Systems  
Gibbsboro, NJ

## Author's response

The point of the entire article appears to have been missed. The article treated only the use of waveguide and 8-3/16-inch Dia., 75Ω line for tall tower UHF straight (vertical) transmission line systems. Further attention was brought to the fact that symmetrical (physical construction) components should only be considered to avoid undesirable moding problems.

Considering the fact that the transmission line system under discussion contained no asymmetrical components of any type and the frequency of comparison selected was well within the 8% accuracy commonly associated with the formula for determining higher order moding frequencies,\* I did not feel that my comparison calculations were abnormally out of line.

The intent of the article is *not* to use coaxial line for vertical UHF transmission line systems, but only as a last resort. The reason for this is that the only advantage of coaxial line is its reduced tower wind load factor. With the advent of circular waveguide and less costly tall tower structures to accommodate waveguide systems, even this advantage is rapidly becoming a minor consideration in designing efficient UHF TV transmission line systems.

Richard E. Fiore

\*Microwave Transmission Design Data, T. Moreno, Page 69, Para. 8.

## Job connection

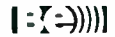
I am an instructor for the Video Workshop at our high school in Japan. Students in this workshop are involved in the production of 3/4-inch videotapes: camera work, lighting, storyboarding, scripting, filming, editing and producing/directing.

I would like to explore the possibility of forming a relationship with a

stateside station with an ultimate goal of future employment for some of our students upon graduation.

Joel Dames  
ZHSTV

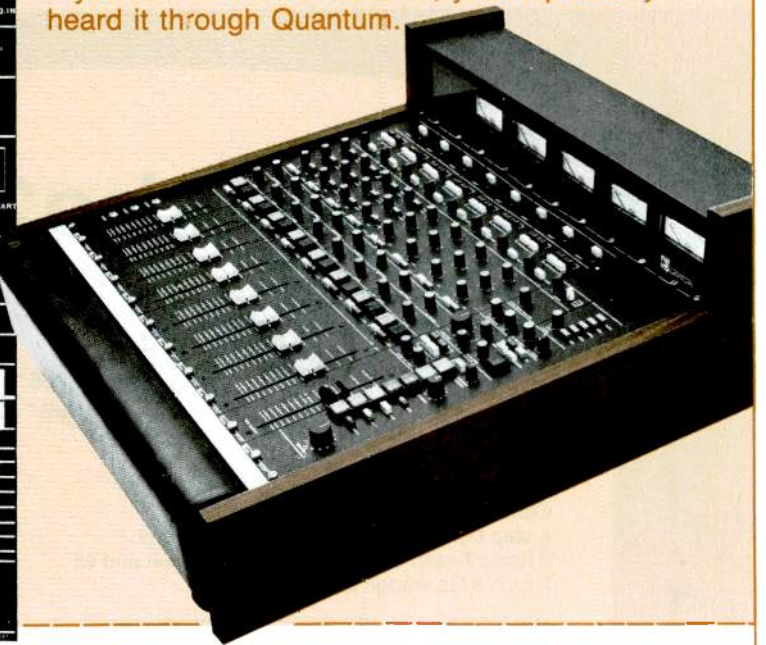
**Editor's note:** Interested organizations may respond to Dames at the Department of Defense, Dependents Schools, Zama American High School, APO, San Francisco, CA, 96343.



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## Sequencer

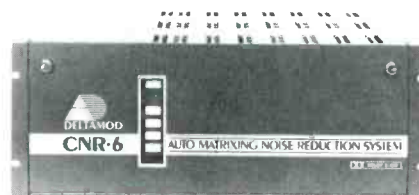
Great American Market's Quik-Chase sequencer features 16 pre-programmed sequences with four output channels. Options include an auxiliary 30A solid-state slave pack and a

custom-programmed sequence.  
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## Automation system

The model 2000 computer and the MC1200 from Interface Data Systems combine to form a machine control/station automation system. The MC1200 machine control series may be used independently on any specific computer system or may be operated manually without the use of a computer.

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tion offers Dolby C-type noise reduction, sum-and-difference matrixing and fully automatic operation. FET switching offers remote control. The system is modular.

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#### Talk show interface

The Generic Talk Show interface from High Country Engineering measures 4"x6"x2½". Installation requires four connections. Interface features two mic channel inputs.

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#### Video, audio reel clocks

Video Retrofits transforms retired reels (supplied by the purchaser) into clocks with Quartz step secondhand movement. Movements are accurate to within one minute per year. Clock hubs are finished hardwood. Price is \$20 (includes postage on returned clock). For information write: Video Retrofits, 2011 Ross Ave., Schofield, WI 54476.

#### Tripod

O'Connor Engineering Laboratories' Pro Video Tripod is suited for professional video environments. It interfaces with the O'Connor models 30

and 50 fluid camera heads and is recommended for camera loads up to 100 pounds.

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#### Record care

The Discwasher DiscKit includes the Discwasher D4 Record Cleaning System, Zerostat Anti-static Instrument, SC-2 Stylus Care System and the Discorganizer.

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#### Reference line generator

The RLG reference line generator from Maric Industries Ltd. features remote control up to 100 meters and built-in H delay adjustment. Reference lines may be added to any of eight independent video circuits.

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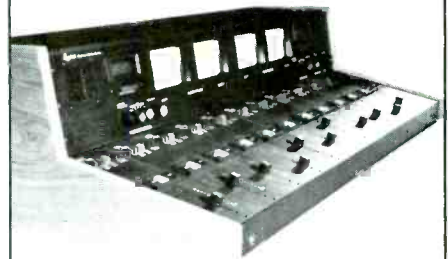
#### Color monitor

The Philips LDH 6200 color monitor is suitable for OB vehicles, production houses, broadcasting networks, facilities companies, educational and training studios, for use with VTRs, telecine, camera, production monitoring and other TV uses.

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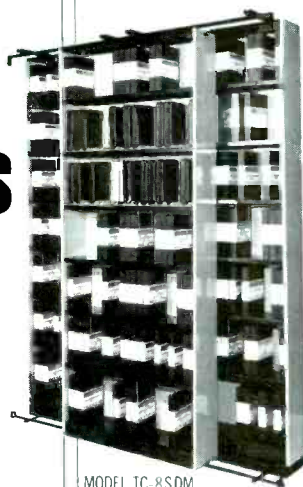
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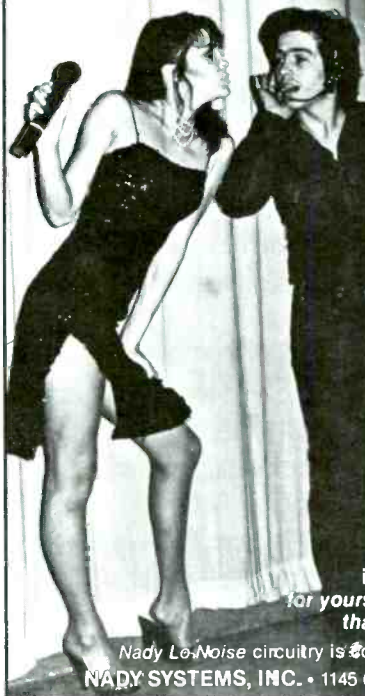
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## business

### Audio + Design to distribute Calrec Microphones

Audio + Design Recording will be the exclusive distributor of the full range of Calrec Condenser Microphones in the United States, it was announced recently.

Calrec Microphones, renowned for their superb audio performance, are industry standards throughout the broadcast and recording industries of Britain and Northern Europe.

Apart from the standard range of Condenser Microphones, Calrec also manufactures the Soundfield ambisonic microphone as used by the BBC to record the Royal Wedding. The Soundfield microphone allows the audio engineer/producer unprecedented freedom and flexibility of microphone technique—in particular enabling the effective polar pattern of the microphone as well as its direction-of-pointing, both in pan and tilt, to be adjusted at a live recording session as well as in post-session processing of master tape.

### BBC orders LDK 14S cameras

Pye TVT Ltd., the Broadcast Company of Philips, has announced the sale of five TV cameras to the BBC. The five LDK 14S EFP cameras will be supplied to the BBC's outside broadcast division, and some will form part of the camera complement to be shipped to Spain to provide coverage of the World Cup this month.

The BBC's outside broadcast division will now have a total of 14 LDK 14S cameras as compatible portable companions to the 60 Philips LDK 5 triax production cameras, which make up the core of the BBC's refitted OB fleet.

The LDK 14S EFP camera, while producing broadcast quality pictures, is one of the lightest portable cameras available in its class.

In Spain, the high mobility of the LDK 14S will be used to provide touch-line shots, interviews and dressing room shots to bring the immediacy of live sports coverage to the World Cup production.

### Taft TV stations order Harris antennas

Two Taft Broadcasting Company TV stations have recently ordered satellite antenna systems valued at \$961,000 from the broadcast division of Harris Corporation.

WDAF-TV, Kansas City, MO, will install a 9m uplink antenna system. The station already employs a Harris 8.8m receive-only dish.

Station WBRC-TV, Birmingham, AL, will install a similar 9m uplink dish. WBRC-TV now uses a Harris receive-only 9m satellite antenna.

Both stations have also purchased a Harris 9165 earth station facilities control system, which provides up to 24 pre-programmed antenna positions and earth station configurations. WDAF-TV plans to use its 9165 to remotely control the station's new uplink antenna. WBRC-TV will use its Harris 9165 to remotely control its receive-only and uplink antennas.

### RFM develops SAW technology

Dallas-based RF Monolithics (RFM) is on the leading edge of a new technology that will dramatically improve the quality and cost of most products using radio frequencies. Called surface acoustic wave (SAW), the technology is already improving the reception of commercial radios and televisions and may open public access to additional

radio frequencies in the next few years.

RFM was formed in 1979 by four members of the Texas Instruments central research team who wanted to develop SAW technology for the commercial market. According to Lawrence Ragan, RFM president and co-founder, simple SAW devices had been used by the military for some time, but the sophisticated manufacturing equipment necessary for volume fabrication of ultra-high frequency (UHF) SAW components had never been developed.

RFM landed contracts from the Federal Communications Commission and the Naval Research Laboratory, as well as a research grant from the National Science Foundation to design the components.

RFM is developing SAW components for two broad applications. One is radio frequency selectivity or the ability to completely isolate a single frequency from neighboring frequencies. Of the various filtering methods now in use for frequency selection, each has disadvantages. Some filters perform well only at low frequencies. Others function throughout the radio spectrum, but are bulky and often permit distortion from neighboring frequencies. RFM's SAW bandpass filter combines the best of all methods. It is small, operates over a wide frequency range and selects only the desired frequency, preventing signal overlap.

The other application is frequency control or maintaining and manipulating the signal. Again, current methods are either not stable enough or are only suitable for narrow sections of the frequency band. The SAW resonator has excellent stability throughout the frequency spectrum.

Last year, RFM was awarded a \$1 million contract from Scientific-Atlanta for SAW resonators, the first large volume application of SAW devices in the cable TV industry. Recently the company introduced a SAW filter for cable TV systems that eliminates interference from adjacent channels.

### Rainbow plans Ku-band satellite system

Rainbow Satellite has announced plans to construct, launch and operate a new Ku-band domestic satellite system that will serve business and institutional users with a wide variety of video and data services. Rainbow filed its application with the Federal Communications Commission on April 23, 1982, and anticipates launching its first satellite in the last quarter of 1985.

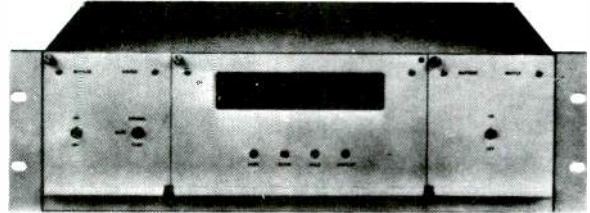
Rainbow proposes a 3-satellite system. Two of the satellites will be in geosynchronous orbit at 85° and 131° West Longitude. The third satellite will be used as a ground spare. Rainbow's selection of 85° and 131° is intended to take advantage of the many satellite receive antennae already positioned to receive C-band traffic from the 131° orbital position and to counter rain attenuation problems that are unique to Ku-band systems.

The Rainbow business satellite ground system relies heavily on the institutional cable, or "B" cable, that cable TV franchise holders are installing in many cities. The B-cable ties businesses and institutions into local cable TV systems, thus making business-to-business communications possible via the cable system. To date, however, the B-cable has been in limited use. By joining cable systems via Rainbow satellite, local businesses and institutions will be linked with other businesses and institutions across the country. The Rainbow satellite cable interconnection will provide users with the ability to do videoconferencing, high speed data exchange and other video and data communications and computing functions. Users not served by B-cable will have the same communications and computing services available to them through other terrestrial distribution systems.

[ : 7 ~ ) ) ) ]

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## Superadio

Continued from page 61

on-air station promotions and contests.

Superadio's signal is transmitted via 15kHz stereo channels by World Communications, New York, for uplinking to Westar III's Transponder I. The Associated Press downlink nearest the local station receives the program and delivers it by landlines to the local stations.

The transmission system, according to Dennis Feely, director of technical operations, ABC Radio Enterprises, employs a new microprocessor-controlled device called a *cue command* system. This system was designed and built especially for Superadio by Century Video, Ontario, Canada, under the direction of Feely. The system is essentially a large computer based at Superadio transmission origination that talks to a cue command decoder at each station.

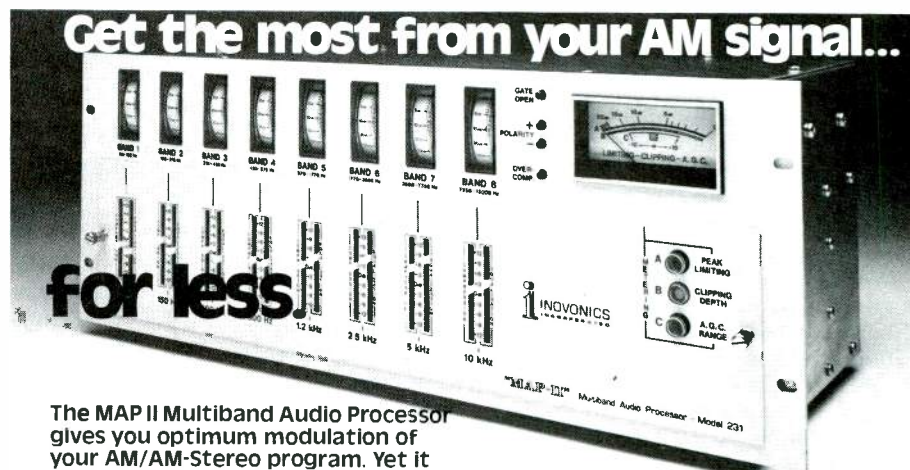
The cue command decoder has three primary functions. The first is to provide a relay closure that allows a direct interface to the remote start of 12 individual stereo cartridge machines. Cue commands 1-12 connect to the respective cartridge slots. The carts are then automatically down-

loaded from Superadio with music, news or advertisements. The audio outputs of each of the 12 cartridge machines are connected to an audio switcher, ultimately controlled by Superadio through the cue command system. Other commands are available that allow the use of warning lights for 10-second rejoin cues or *Top of the Hour* commands to synchronize the station clock system to Superadio.

Second, the cue command decoder provides a real time program log of each song played through the use of an attached hard copy printer at each local station. Preceding each song is a silent computer command signaling the cue command decoder to record the song title and any other information that goes along with it onto the printer.

Third, by use of the same process used to provide a program log, the cue command decoder serves as an electronic mail system, allowing written messages to be received by the local station from Superadio.

The cue command system allows up to 99 different cue commands to be executed from Superadio. "These additional commands have not yet been defined," Feely said, "but the system is capable of a lot more than I can relate to you now." [-(=)))]



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## people

Vlahos Gottschalk Research Corporation has announced the resignation of **Petro Vlahos**, president. He was subsequently named board chairman of the company. **Paul Vlahos**, formerly vice president, advanced to president, and **Pat Smith**, formerly sales manager, moved to vice president.

James B. Lansing Sound has announced the appointment of **James S. Twerdahl** to the position of executive vice president and general manager. Before joining JBL, for six years Twerdahl held upper management posts with Jensen Sound Laboratories, including vice president of marketing and sales, general manager of the car stereo division, and most recently, chief executive officer.

Modulation Associates has announced that **Warren Bacigalup** has joined the company as production manager. In this capacity, Bacigalup is responsible for overall plant operations.

**Richard V. Lunnis** has joined AF Associates as national sales manager. Before joining AFA, Lunnis was African regional manager for Marconi Electronics.

**Stanley W. Faught**, general manager of the Magnetic Tape Division (MTD) of Ampex, has been elected vice president by the corporation's board of directors. Faught was named general manager of MTD in March 1981 after a 6-year career at Ampex's Colorado Springs, CO, facility. During the last four years, he was responsible for the manufacture of audio-video products in Juarez, Taiwan, and Cupertino, CA.

**Ernest P. Hodur** was named president of Andersen Laboratories. Hodur most recently served as general manager of Andersen Laboratories, assuming that position in March 1981. He joined the company in September 1976 as a salesman, was appointed director of sales in November 1977 and director of marketing in March 1979, before becoming general manager.

Video Data Systems has announced the appointment of **Bob Hall** as sales specialist. In his new position, Hall will develop new products and integrate them into the sales department.

**William W. Weston** has been named Eastern area sales supervisor for 3M's professional audio-video equipment line. Weston will supervise sales activities of five East Coast account representatives for the company's digital audio systems, graphics generators and videotape recorders. Previously, he was senior account representative for the video line in the mid-Atlantic states region.

**Ed Stamm**, Victor Duncan, has been promoted to rental manager, Film and Video, for the Dallas branch operation. Stamm started with the company in the film rental department of the Chicago office in 1977 and has been with the Dallas film rental department for three years.

Data Communications Corporation (DCC) has announced the promotion of **Jamie L. McMahan** to director of marketing for the Broadcast Division, a new position. McMahan is responsible for all marketing/communications of the division and will report to Scott Pierce, Broadcast Division president. **I:Z(=))))))**

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**POST PRODUCTION EQUIPMENT COMPLETE**, with every option, one Ikegami ITC-240S, H & V Detail corrector, AC adapter, VFM 15C 1 1/2" viewfinder, VFM56C 5" viewfinder and mount, J10 x 10B 10:1 servo zoom lens, rear controls, rack adapter and shoulder mount. One innovative Television Equipment H5 hydro head with dual handles, Listec 56 PortaPed, 71 PortaSkid. One Videotek RMS color 8" receiver/monitor gun. One Sony BVU-100 broadcast recorder/reproducer with CLP-500 color pack and AC-5000 power pack. One Hitachi V-059B portable waveform monitor. **Editing System:** Sony microphones. Two Sony BVU-200A broadcast recorder/reproducer. One Sony BVU-500A Broadcast professional editing console. Two Videotek VM-12 color monitor. **Audio System:** One Tascam Model 3 audio board. One Teac 33005X. One Crown D-75 amplifier. Two JBL 430L monitor speakers. **Post Production Equipment:** One Shintron 373 NU. One Grass Valley 3274. One CVS 516 digital timebase corrector. One Videotek VSMRPD, dual 8" color monitors. One Shintron 350 encoded chroma keyer. One Shintron 300 console and more. Call (203) 633-3516 or 633-0143. 7-82-1t

## EQUIPMENT FOR SALE (CONT.)

**INCREDIBLE CAMERA BUY!** New Thomson MC-301 Eng Camera includes 14:1 Fuji, Servo/Zoom Lens, 1.5" Viewfinder, (3) Satcons, AC Supply, Carrying Case, Factory Warranty, your price \$6,950! Call while they last. Ray LaRue, Quality Media Corp., (800) 241-7878. In GA (404) 324-1271. 7-82-1t

**VTR's: RCA TR-70—(3) RCA TR-60** Record Units 1000 hrs. total time each; Ampex 1200B; Ampex VR 3000 with metering and charger. Call Ray LaRue, Quality Media Corp., (800) 241-7878. In GA (404) 324-1271. 7-82-1t

**COLOR CAMERAS — USED:** GE and RCA Film Chains, excellent condition; (1) Norelco LDH-1, 50' Cable; (1) GE PE-350; (3) GE TE-201 Good Operating Condition; Ikegami HL-33, HL-35; Toshiba/GBC CTC-7X, Minicam, plumbs. Call Ray LaRue, Quality Media Corp., (800) 241-7878. In GA (404) 324-1271. 7-82-1t

**AMBER 4400A WITH X-Y OPTION**, super excellent condition, great price \$2500. (206) 854-1004, 27106 46th Avenue South, Kent, Washington 98031. 7-82-1t

**2 GHZ, TV MICROWAVE, UNUSED.** One year old. Terracom TCM 6108 5 watt, video and audio. Also, 475' and 50' of 1 1/2" heliax, 6' grid and 10' solid dishes. Sid Shumate, WVIR-TV, (804) 977-7082. 7-82-1t

**WAREHOUSE SALE: WE ARE IN THE SALVAGE BUSINESS** and have in the warehouse a "HCC 300-50" coaxial cable. It was manufactured by Cablewave Systems Inc and supposedly got damaged in transit. We ended up with it and the boss says "sell it." We believe the value to be approximately \$10,000.00. Call or write for specs and then make an offer. Geo. M. Ruddy & Co., 161 Prescott Street, Boston, Mass. 02128, 617-569-7050. Mike Mentuck or Pam Feather. 7-82-1t

**EQUIPMENT FOR SALE: DIGITAL VIDEO SYSTEMS** DPS-1 TBC; Hitachi FP-40SS ENG/EFP/STUDIO camera; Hitachi HR-200/HST 1" Type C w/SLO-MO; Hitachi SK-91 ENG camera; Panasonic AU-700 edit system; Conrac 7641 Hi-Rez monitor; Ikegami TM-142RHA Hi-Rez monitor; Ikegami ITC-350 ENG camera; 3M Chroma Keyer for #6114 SEG; 3M #5130 Matrix Wipe Generator; Jatec USEC-42T editor; Sony VP-3000 3/4" portable player; Cinema Products 5P001 camera-prompter; Ampex ATR-700-2; 3M #210 color bar/sync generator; Quanta Q-VII character generator. Call Ted or Terry at 518-449-7213. 7-1-82

**AMPEX 351 RECORDERS:** several, completely rebuilt, new heads, bearings, etc. with original electronics \$995, with Inonovics electronics \$1495. 419-435-7170. 7-82-2t

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**REMOTE PRODUCTION UNIT**, (4) RCA TK-760, (2) SONY BVH-1100, VITAL 114-2A, NEC DVE, complete audio, intercom, RTS IFB, Vidifont MK IV-A. Unit is complete and ready to roll. Includes all monitors, test equip., cables, microphones etc. Cedar paneling and carpeted inside a 28ft. Ford 800, with 6 ton A.C. Will consider lease. Call (813) 689-3327 or Telex #52802 ATLANTIC TPA. 7-82-1t

**TWO (2) HITACHI SK-96 CAMERAS:** Studio/Portable; Triax; Plumbicon tubes with extended reds; 17:1 Fujinon lenses; Remote controls. Used only six months. Call Russ Manning, AVT Television, (615) 584-2166. 7-82-1t

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## WANTED TO BUY

**WANTED:** Pre-1928 radio equipment and tubes. August J. Link, Surcom Associates, 305 Wisconsin Ave., Oceanside, CA 92054, (714) 722-6162. 3-76-tf

**HIGHEST PRICES PAID** for 112 Phase Monitors and for clean, 12 year old or less, 1 KW and 10 KW AM Transmitters. All duty and transportation paid. Surplus Equipment Sales, 2 Thorncliffe Park Dr., Unit 28, Toronto, Canada M4H 1H2, 416-421-5631. 2-79-tfn

**INSTANT CASH FOR TV EQUIPMENT:** Urgently need transmitters, antennas, towers, cameras, vtrs, color studio equipment. Call toll free 800-241-7878. Bill Kitchen, Quality Media Corporation (in Georgia call 404-324-1271). 6-79-tfn

**WANTED: STATION LIBRARIES OF MUSIC**, 16" ET's, 12" Transcriptions, 45's, 78's, LP's. Boyd Robeson, 2425 W. Maple, Wichita, KS 67213, (316) 942-3673, 722-7765. 5-82-tfn

**USED BROADCAST TELEVISION EQUIPMENT.** Hundreds of pieces wanted and for sale. Please call System Associates to receive our free flyer of equipment listings. (213) 641-2042. 1-82-12t

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**INSTANT CASH FOR BROADCAST EQUIPMENT:** Urgently Need Good Used; Transmitters, AM-FM-TV, Film Chains, Audio Consoles, Audio-Video Recorders, Microwave, Towers, WX Radar, Color Studio Equipment. Ray LaRue or Bill Kitchen, Quality Media Corp., (800) 241-7878. In GA (404) 324-1271. 7-82-1t

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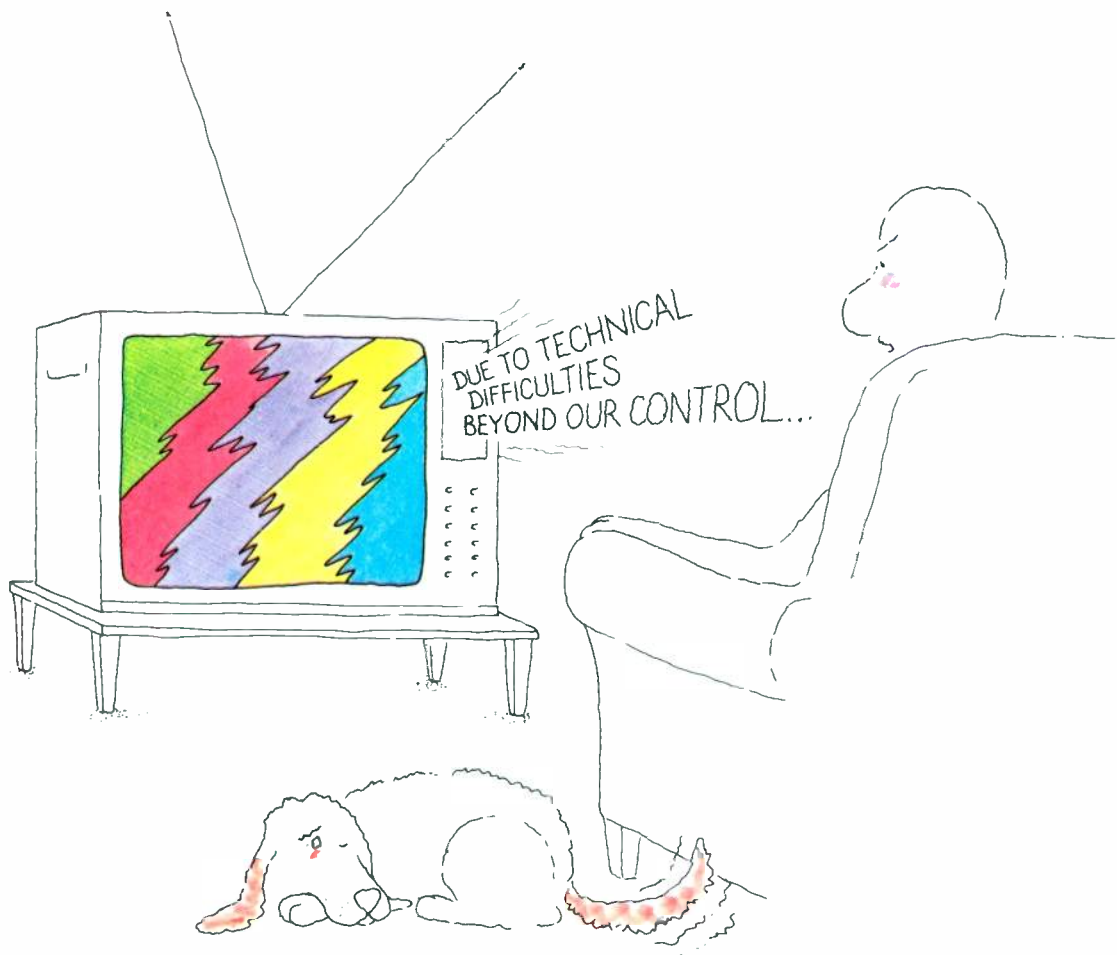
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