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For Literature Only Circle (2) on Reply Card
For Salesman Call Circle (3) on Reply Card
6 FCC update
8 News
10 Editorial
  AM stereo: A shot in the arm

CAPTIONING FOR TV
18 Case study: Captioning at WGBH
  By George Harrar, editorial consultant, WGBH Teletext Project, Boston, MA

RADIO
51 A look at KABC/ABC TALKRADIO
  By Art Sterman, manager, radio engineering operations, KABC/KLOS, Los Angeles, CA
60 ABC launches Superadio
  By Harmon M. Shragge, Jr., media consultant, New York, NY
62 WMCA's smooth running talk show
  By L. Scott Hochberg, president, Logitek Electronic Systems, Houston, TX

OTHER FEATURES
14 PRC-'82: Progress in radio
  By Brad Dick, chief engineer, KANU, Lawrence, KS
32 Getting the picture: Video monitor survey
  By Carl Bentz, technical editor

69 Feedback
70 New products
72 Business
75 People
77 Index of advertisers
78 Classified ads

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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Jim Hart
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Hart: "The whole world is watching the World's Fair in Knoxville... much of it through the eyes of our cameras. So we had to be sure we had the best cameras and mobile equipment available."

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For more information on how Midwest can give you that top-of-the-world feeling with quality equipment and mobile units, call toll-free today:

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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 Channel 6 stations. These restrictions would become less burdensome as the frequency of the FM station moves from 88.1 to 91.9 MHz—away from the Channel 6 spectrum.
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Built on the solid reputation of the 1600 Series for reliability and ease of operation
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news

BE to sponsor China technical tour

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.

The technical tour will include major radio and TV facilities as well as a number of broadcast equipment factories. Meetings with key officials and 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 program remembered

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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Circle (6) for literature
Circle (10) for sales contact.
One argument in favor of AM stereo is that it will revitalize AM broad-casting. 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, depend-ent 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 over-abundance 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 equip-ment. Let them also know that integrated circuits could easily provide such improvements as PLL demodula-tion 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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Catalog BTV/82 is 16 pages of filters, traps, diplexers and channel combiners that are currently in use in UHF, MDS, L-band and microwave instructional TV applications. Maximum delivery time for most standard products is 10 days.

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“Finally there’s a 3/4-inch recorder that doesn’t just inch along,” says Fred Rheinstein, president of The Post Group.

A major post-production facility in Hollywood, The Post Group counts among its clients all three networks, PBS, and major cable TV and syndicated production companies. It will edit the new syndicated children’s show “We’re Moving” entirely on the BVU-800.

“The 800 is amazingly fast. To be able to go backward and forward at 40 times play speed means you can search for your edit points—and find them—more than twice as fast as ever before,” continues Rheinstein. “And this machine goes from its highest speed to a still frame. Instantly. Without slewing or breaking up.

“It also has a direct-drive system, which promises greater reliability and accuracy.

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

“It’s the perfect combination of U-matic economy and broadcast quality. It’s a true mastering process; with the BVU-800, there’s no need to transfer to one-inch and lose a generation in order to edit your tape.”
Frederick Rheinstein, THE POST GROUP

Other breakthroughs incorporated in the BVU-800 include its ability to make machine-to-machine cuts without a separate controller; its adjustable, removable edit control panel; and its narrow, front-loading design, which makes rack mounting possible.

"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."

Sony makes a full line of 1-inch and 3/4-inch broadcast equipment, including cameras, recorders, editors and digital time-base correctors.

For more information, write Sony Broadcast, 9 West 57th St., New York, N.Y. 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; or in Atlanta at (404) 451-7671.

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

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July 1982 Broadcast Engineering 13
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 conference 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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- Pulse cross with expanded vertical blanking interval.
- TWO YEAR WARRANTY ON ALL PARTS AND LABOR INCLUDING THE CRT.

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.

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!

You can pay as much as $1,500 or more to get a good long-reach line microphone. Or, you can put the new Audio-Technica AT815 in every production unit for under $230 each, or the phantom-powered AT815R for under $300 each.

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. Our internal-battery AT815 uses a standard AA "penlite" cell available everywhere. And in intermittent use, a premium battery should last about 4,000 hours. That's over a year even if used eight hours every day! Just one less thing to worry about when time is short.

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 microphone 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!
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-
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 reinvent 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, however, 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, P.I.; The Tuesday Night Movie;
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 decoding 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.

- Currenty, 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."
The DTG-1000N features five identical and independently microprocessor controlled 10-bit test signal data stores with precision D/A converters.

Each data store contains 35 computer generated, standard and new test signals in EPROMs.

Menu style listing of all available test signals on local and remote control panels together with full status indication makes test signal selection easy.

- Internal RS170A sync generator for genlock and accurate system phasing maintains zero SCH at all times.
- Five standard trigger signals can be locked to any test signal selection from data store #5 and retained in memory.
- Auto correlation of auxiliary trigger signals to data store #5.
- Power down memory.
- Remote control up to 1000 feet for each data store.
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 dictionary 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*
Our Agile 24 satellite receiver system makes things perfectly clear.

Standard Communications' new Agile 24M/S satellite receiver system does everything a broadcast studio model does—except cost as much.

The Agile 24M is a highly cost-effective, reliable satellite receiver featuring advanced circuitry like a fully synthesized phase-lock-loop tuning system, a pre-selector tracking filter, and a PLL demodulator. Dual conversion design converts the incoming signal twice for better selectivity and image rejection. The threshold extension circuit reduces noise by as much as 2 dB on dark scenes, delivering a static threshold as low as 5.5 dB carrier-to-noise. That means blacker blacks in dark scenes, with reduced sparkles.

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 the 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 24S 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 turnaround and a loan equipment plan are available to minimize system downtime.

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.

Standard Communications
Standard Communications Corp.
P.O. Box 92151
Los Angeles, California 90009
213/532-5300

In Canada
COMALCO LIMITED
Unit 6, 6325-12 St. SE
Calgary Albert, Canada T2H3K1
403/259-3101

...the TVRO System people

Circle (20) on Reply Card
IF IT WERE YOUR JOB
TO GET THIS ON TAPE,
WHAT TAPE WOULD
YOU GET IT ON?

For the first time, mankind will set foot on a surface other than earth. It's a moment that transcends science and politics. A moment that will be seen and reseen all over the world for as long as mankind exists.

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.

"Scotch" is a registered trademark of 3M. © 3M Company. 1982.
HISTORY IS RECORDED ON SCOTCH VIDEO TAPE.

3M hears you...

Circle (21) on Reply Card

3M
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 20kHz
MEETS 2° REQUIREMENTS

FCC proposes 2° satellite spacing.

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.

And the rugged, all-metal construction for which Andrew is famous.

Our earth station antennas are available now. Join the thousands of satisfied Andrew earth station users. We’re ready for your inquiries, contact us now. Andrew Corporation, 10500 West 153rd Street, Orland Park, IL 60462. Telephone (312) 349-3300. Telex: 25-287.

ANDREW

Our concern is communications.

Circle (23) on Reply Card
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, Vegas$, 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 telemcasts of ABC Afterschool Specials with closed captions starting April 15.

May 26
ABC Televisio 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 telemcasts 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.

Oct. 20
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 National Captioning Institute's closed-captioning of 12 ABC Afterschool Specials, 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 telemcasts of four football bowl games.

Dec. 29

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 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.
STANTRON proudly presents its new "SUPREME" CABINET SERIES . . .

Starting with the STANTRON basic-cabinet module, fully described in the STANTRON catalog "cabinet-style" section, we have developed a new "design appearance," still maintaining the structural integrity required by the electronics industry.

A. Cabinet-frame design.

B. Horizontal trim #66 included (laminate provided for engraving or silk-screening by customer).

C. "Projected" 19" or 24" panels for front, rear or top panel space.

D. Removable vertical, decorative-trim that "hides" the head of the panel screws. It easily "snaps-on" and "snaps-off." Sold in pairs.

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.

F. We offer two new types of casters.

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: 18½", 22½", 25½", 30½" (add 1½" 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.
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 6:30 p.m. feed of that newscast and preparing verbatim closed captions for broadcast at 7 p.m. over Line 21 of ABC's network video feed, under contract with the Department of Education. The goal is genuine real time captioning 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 programming, 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.
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.

Now we've put our years of experience into a new generation of still store systems. And from the 150C for mobile applications to the large, multiple drive 750C, our microprocessor-controlled, expandable systems have a production versatility that can't be beat.

With a price/performance ratio to match.

The Basic System.

Our ESP 750C Digital Graphics System consists of an Analog/Digital Processor, a Master Control Panel, and standard computer industry disk drives. But the built in flexibility of our system makes it easy to expand. Each Analog/Digital Processor can accommodate up to four drives. You can add up to a total of fifteen remote production panels. And more off-line storage with up to 99 separately identified disk packs.

Our dual channel output and front end synchronization allow you a choice of inputs and a wider range of capabilities.

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 staff alike.

Our standards include:
- A built-in operator prompter
- Single function keys
- A rapid-access sequence and memory system
- Built-in safety features

Great Optional Features.

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 90% 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. Affordable Excellence.

ADDWA CORPORATION
1671 Dell Avenue
Campbell, California 95008
(408) 379-1500

Circle (25) on Reply Card
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 operation. 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 in 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. Horizontal 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-, 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.

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.

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-
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.

Enter OPTIMOD-TV. It's the same second generation OPTIMOD-FM sound that's sweeping the country, with enhancements to adapt it to the specific needs of TV broadcasters. Smooth multiband compression teams up with our patented "Smart Clipper" and FCS overshoot corrector to create a tightly band-limited, peak-controlled output that stays out of the video and is ready for TV stereo. And stereo processing is supple standard.

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.

Orban Associates Inc.
645 Bryant St.
San Francisco, CA
94107
NEVER BEFORE HAS THIS VITAL COMPONENT BEEN SO SUCCESSFULLY INTEGRATED INTO A 1" VIDEO RECORDER.
SONY INTRODUCES A 1" VIDEO RECORDER TAILORED TO THE PEOPLE WHO USE IT:


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

And now, Sony announces wish 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 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" and Betacam" is possible, too. The BVH-2000 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 for recording 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—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 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 ± 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.

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 (212) 860-7800; in Chicago at (312) 537-4300; in Atlanta at (404) 451-7671; or in Dallas at (214) 659-3600.

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Circle (27) on Reply Card

July 1982 Broadcast Engineering 35
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 C094. 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 C094.

For starters, the C094 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 C094 ideal for stereo spaced-omni recording, binaural recording and close miking of high output musical instruments, as well as standard lavalier applications.

The C094 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 C094'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 C094's impedance converter swear it's being powered by an over-priced import supply.

These and many other performance features set the C094 a giant step above the other miniatures you previously had to choose from. The C094 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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in Canada

Electro-Voice, Div of Gulton Industries (Canada) Ltd
345 Herbert St., Gananoque, Ontario K7G 2V1

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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 ±1dB at 12MHz, ±3dB 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 ±2% overall with linearity 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 high resolution delta-gun type with a black mask and US phosphors. 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.

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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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July 1982  Broadcast Engineering  39
The Simplicity and Stability of Grounded Grid and One Tube Design: The Best of Both Worlds in a New, 10,000 Watt FM Transmitter.

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.

Automatic recycling restarts the transmitter should a momentary fault occur. A tally light memory keeps the appropriate fault indicator lamp lit until it is reset locally.

Interfacing to remote control or ATS systems is simple with all of the standard functions accessible 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 I/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.

Circle (258) on Reply Card

JVC CORPORATION
TM-14PSN
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 reliable monochrome display. With horizontal resolution rated in excess of 700 lines, linearity errors are held to less than 2%. The looping input includes an internal terminating switch. Dc restoration may be selected, as with all Hitachi black-and-white monitors.

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No-Cut Editing with The Lexicon Model 1200:
saves time, saves reshooting, preserves program integrity

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The Lexicon Model 1200 audio time compressor/expander automatically controls the speed of record/playback equipment and preserves broadcast quality audio — for film, disc, tape and video tape. To use: enter actual play time, desired play time, press "GO". It's that simple.
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 TM-41 is a 5-inch color monitor featuring portability with powering from an internal battery pack or from household current.

Weighing only 8.4 pounds, the portable TM-41 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.

**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 PAL 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 PAL 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 PAL CRT categories. The scan by resolution format produces a 512x483 element display with up to 80 characters on the screen for text applications.

**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 Quintrix 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.

**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.

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.

Circle (263) on Reply Card

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.

Circle (264) on Reply Card

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 includes 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.

Circle (265) on Reply Card

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.

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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.

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SIMULTANEOUS DISPLAY OF SMART TERMINALS AT CONTROL AND REMOTE SITES
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- KEYBOARD CALIBRATION OF TELEMETRY

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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 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.

For further information, please contact our Marketing Department.

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.

Circle (267) on Reply Card

WORLD VIDEO
CDM 13
Available in either a cabinet or open chassis configuration, the CDM 13 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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SIX REASONS WHY MOTOROLA'S AM STEREO SYSTEM IS GETTING SUCH GOOD RECEPTION.

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Circle (43) on Reply Card
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 Fistell, the dean of radio conversationalists, commences a 3-hour stint ranging from trivia to the mundane. Then it's time for Ray Brim, 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.

July 1982 Broadcast Engineering 51
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 telephane 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 9a.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, commentary 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
been going full speed ahead since area. In 1979, George 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 La Cienega 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 1966, the decision was made to move the operation to the transmitting site at La Cienega. 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 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, screening 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 min-plus 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

**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. 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 Wold 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.
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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.

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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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.

THE FACTS: PERFORMANCE.

Overall Signal-to-Noise: 66 dB unweighted @ 520 nWb/m, 30 Hz to 18 kHz.
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Distortion: less than 0.7%, 1 kHz @ 250 nWb/m.
Crosstalk: greater than 55 dB, 1 kHz, adjacent tracks.
Wow and Flutter: less than 0.05% (15 ips).
Rewind Time: 90 seconds for 2500 feet.

THE FACTS: FEATURES.

Three switchable speed pairs: 15/7½ or 7½/3½ ips (automatic equalization).
NAB/IEC selectable equalization. Selectable +4 or -10 dBm output.
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Dr. Irene Kassorla is a leading
psychologist best-known for her recent
book, Nice Girls Do. She is broadcast na-
tionally from 9-11 a.m. PST.

Michael Jackson joined KABC
TALKRADIO in 1966. He is heard na-
tionally 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 national-
ly 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 na-
tionally from 7-9 a.m. PST.

Custom hybrid
phone system

Author Art Sterman readily ad-
mits 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 con-
ference at full level at least four
parties simultaneously, and many
more could be accommodated
with a slight elevation in level.
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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 cartridge 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 company. 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; Francoise Dyrt, 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
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Now there's a worthy low-cost alternative to Eventide's BD955 - the world's best-selling digital obscenity delay. Eventide's new BD931/932 series is priced to be cost-effective even for stations that air only limited talk programming. Available in mono or stereo, with 3.2 or 6.4 seconds of delay, these new units feature specs that far exceed the performance of other economy delays:

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Circle (51) on Reply Card

July 1982 Broadcast Engineering 59
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.

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

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.

Engineers praise Auditronics' 200 Series on-air console because it's built like a military computer with a module/motherboard design that eliminates unreliable point-to-point wiring. They praise the 200 because they can install and maintain it while comfortably seated. They praise its +30 dBm output capability. They praise its Hall-effect/CMOS silent switching that reduces failures to virtually nil. And they praise its drop-in design that makes module replacement a two-minute pleasure. If you'd like to know what else engineers praise about the Auditronics 200 Series on-air console, circle reader number or call
By L. Scott Hochberg, president, Logitech 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

A dramatic character generator in a dramatically inexpensive time code reader

In Will's day $229E would have bought you all of Stratford. Right now it buys you the T6010 from Telcom Research. A Time Code Reader/Character Generator which reads any source recorded to SMPTE/EBU standards. And it's backed with a 5 year warranty!

The T6010 decodes time and user data and displays either on its read-at-a-glance .8" high LED's. Use it to insert data on the monitor as you view the master, and on the working dub for edit selection. 80 times play speed is fast enough for any VTR, and 1/10 play speed plus color framing indicator lets you be very picky!

Key data characters anywhere on the screen with or without box. Unique characters, bordered for easy reading, can be reversed or removed from the video. Fingertip control lets you freeze front panel and video readings. Microprocessor design means fewer parts, higher reliability and lower operating temperatures than traditional models. The result? A cool-running thin unit you can mount immediately above or below other equipment. In control room or mobile. Plus features like parallel time output for edit controller and automation interface, or user data output for computer interface to control special effects.

Telcom Research designed these and other state-of-the-art features into the T6010 after 14 years' experience in meeting the hi-tech needs of major TV stations and production houses. Ask your nearest distributor for technical specs and a full list of features or contact us directly. Say Will sent you.

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Its ability to process complex program material, such as speaking voice over ambient noise or singers with accompaniment without intermodulation distortion or the need to band limit the program is unique.

This makes the TDM-8000 the most versatile on the market.

And now with the new TDM-8200 Stereo Slave you can do it all in stereo.

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.

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.
divividually 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 news-person. A small control box in the adjoining producer's booth lets the producer speak to either the host or the news-person through one ear of the host's or news-person'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 components 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 optimized 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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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...
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 stereo 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 problems.

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...
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.

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.

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.
Coaxial line questioned


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

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 ¾-inch videotapes: camera work, lighting, storyboard, 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, 96543.

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new products

Loudspeaker systems
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Power amplifiers
Featuring rugged modular construction, all steel chassis and covers, metal-cased output and driver transistors, and low noise toroidal mains power transformers, the models 150 and 75 power amplifiers from BGW Systems are single-rack systems.

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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.

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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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.

Circle (275) on Reply Card

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.

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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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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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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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References

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- NAVY SYSTEMS, INC. 1145 65th ST. OAKLAND, CA 94608

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July 1982  Broadcast Engineering 71
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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.
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 downloaded 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."
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.

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HELP WANTED (CONT.)

TELEVISION MAINTENANCE ENGINEERS—Repair and maintenance of various television equipment, including RCA and Regai chain and Ampex VTRs. Requirements: First Class FCC license, three to five years applicable experience and an educational background to assure ability to operate and maintain television equipment. Apply to: Director of Finance, WYES-TV/Channel 12, Box 24026, New Orleans, LA 70114. NO CALLS! WYES-TV IS AN EQUAL OPPORTUNITY EMPLOYER.

5-82-41

TELEVISION TRANSMITTER ENGINEERS—Assume total responsibility for the transmitter facility during assigned shift. Closely monitor and maintain quality control of received and transmitted video and audio signal to assure compliance with FCC Rules and Regulations. Requirements: First Class FCC license, three to five years applicable experience and an educational background to assure ability to operate and maintain television transmitter. Apply to: Director of Finance, WYES-TV/Channel 12, Box 24026, New Orleans, LA 70114. NO CALLS! WYES-TV IS AN EQUAL OPPORTUNITY EMPLOYER.

5-82-41

SYSTEM DESIGN ENGINEER—CCTV. Must be able to specify, design, supervise installation and debug top quality industrial CCTV systems. Experience required. SYSTEM ENGINEER—AUDIO VISUAL AND PROFESSIONAL AUDIO. Hands on experience with audio/visual equipment a must. Digital knowledge helpful but not required. Responsibilities include complete job oversee and client interface. Both positions provide paid health, life insurance, vacation, etc. Please call collect 201-288-6130, Stylist Systems, Teterboro, N.J.

9-81-tfn

SYSTEM MANAGER: GENERAL MANAGER for 400 Mhz. Midwest System. Experienced, knowledgeable professional required. Franchising experience a plus. Strong growth position with aggressive, medium-sized MSO. Send resume and salary history to Dept. 569, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212.

7-82-11

ASSISTANT CHIEF WANTED for progressive mid market TV station. Number one station in market. Clean area. Contact Jack Davis, 701-223-0900, Equal Opportunity Employer.

7-82-11

MAINTENANCE ENGINEER: KRV-TV has an opening for a studio maintenance engineer. Minimum of five years experience necessary. FCC license required. Please forward resume or apply at 3205 Westheimer, Houston, Texas 77227, (713) 626-2610 EOE. 7-82-11

HELP WANTED (CONT.)

HELP WANTED—TECHNICAL: $40,000 + FIRST YEAR GUARANTEED. Our company has grown so quickly in the past 5 years, we are in desperate need of a very special person who knows broadcast equipment intimately and has aggressive sales ability. We are diversifying into other areas and need someone to take over the equipment sales division. Responsibilities include sales of new and used broadcast equipment and further development of equipment sales as business demands. We are a first rate company and believe in paying top dollar for the right person. Call Bill Kitchen, Quality Media Corp., (800) 241-9716.

9-80-TFN

ENGINEER
San Jose, California

KLOK Radio is a 50,000 watt directional AM radio station located in San Jose, California. We are looking for an experienced RF/maintenance oriented person to join our staff. Call or send resume to: Mr. Allen Waterous KLOK Radio P.O. Box 21248 San Jose, CA 95151 (408) 274-1170 KLOK is an equal opportunity employer.
HELP WANTED (CONT.)

SOUTHEAST MICHIGAN AM-FM is seeking an assis-
tant chief. Applicant must have a minimum of two
years of technical school plus three years of ex-
perience and valid FCC license. SBE certification a
plus. EOE. Send resume & references to: Dept. 570,
Broadcast Engineering, P.O. Box 12901, Overland
Park, KS 66212. 7-62-20

ENGINEERING AND TECHNICAL SALES
POSITIONS
($15,000.00 - $60,000.00)

We specialize in the placement of
TECHNICAL ENGINEERS with TV and
Radio Stations, Groups,
Networks, Satellite Programmers,
Production Facilities, Corporate and
Industrial TV, Mfrs and CATV. All
levels and positions: Director, Chief,
Asst. Chief, Studio Supervisor,
Maintenance and Technical. Our ser-
vice does not include operational
program personnel. All locations
nationwide. Employers pay all fees -
Confidential. Professional. Over
$4,000,000.00 in Salaried Positions
Placed; we also place Technical Sales
People. Employee and Employer
inquiries invited.
Phone/Resume - ALAN KORNISH
(717) 287-9635
Key Systems
106 New Bridge Center-Kingston, Pa. 18704

HELP WANTED (CONT.)

VIDEO TECHNICIAN WANTED: To take charge of a
service department in a Western Massachusetts
Video Sales, Service and Production Company and
make it profitable. Must have experience with 1/2"; 3/4";
and 1" Video equipment, broadcast quality cameras, CCTV Systems, be organized and able to deal with
customers. We offer a highly competitive salary, good
fringe benefits and the ability to grow with a company
on the move. Send replies to: Dept. 567, Broadcast
Engineering, P.O. Box 12901, Overland Park, KS 66212.
7-62-11

ASSISTANT CHIEF NEEDED for growing Pacific
Northwest TV station. Experience required in RF, VTR,
ENG. Studio. Send resume or call D. Balfour, KTVL,
P.O. Box 10, Medford, Oregon, 97501, 503-773-7373.
KTVL is an Equal Opportunity Employer. 7-62-11

TV MAINTENANCE ENGINEER Strong on Sony
E.N.G. equipment, BVU 200, BVU 50, Sony cameras.
Call Chief Engineer in Port Arthur, Texas 713985-5567.
7-62-11

HELP WANTED (CONT.)

UHF TV TRANSMITTER ENGINEER

We are one of the major companies supplying UHF TV Klystrons to the Broadcasting Industry. We presently
have a vacancy for an Applications/Sales Engineer capable of installing, tuning and trouble-shooting UHF
Klystron transmitters at our customers' installations.

Sales/marketing experience would be an advantage. Product training at our factory will be provided.

We offer an excellent salary, bonus, company car, comprehensive benefits and an opportunity to excel with a
company who enjoys 50% annual growth rate.

Please send your resume in confidence to:
An equal opportunity employer M/F

EEV, INC.
7 Westchester Plaza
Elmsford, New York 10523

INTERNATIONAL OPPORTUNITY

Audiovisual

The King Faisal Specialist Hospital and
Research Centre in Riyadh, Saudi Arabia has
current openings in its Audio Visual Depart-
ment. The AV Department is responsible for
the educational and television needs of the
employees and dependents of this 250 bed
acute care referral facility and medical city
complex.

The following positions are available:

CHIEF TV ENGINEER: BSEE. 8 years
related experience (2 as supervisor) in the
design and maintenance of CCTV systems
and other AV equipment.

TV TECHNICIAN: A.A. Electronics or 2 years
teach school or military equivalent plus
5 years relevant experience—at least 2 of
those years maintaining and repairing TV
and video systems. (Tech positions are
single status.)

Benefit package includes attractive salary, 30
day annual leave, free transportation, furnish-
ed lodging, free medical care, bonus pay and
bonus leave. Two year contract.

For further information, please send resume to:
Kathleen Langan, Personnel Consultant,
Hospital Corporation of America-International
Division, P.O. Box 550, Nashville, TN 37202

HCA International Division
AN EQUAL OPPORTUNITY EMPLOYER

July 1982  Broadcast Engineering  79

SUPERVISOR/CHIEF ENGINEER—A leader in the
videocassette duplication field is looking for a well organized hands on chief technician able to supervise
the maintenance activity of large duplication facility.
Position requires experience with Beta, VHS, and
U-matic cassette formats as well as "state of the art"
master playback VTR's. Supervising skills desired but
not required. Salary commensurate with experience.
Send resume to: Broadcast Engineering, Dept. 566,
P.O. Box 12901, Overland Park, KS 66212. 7-62-11

MAINTENANCE TECHNICIAN—A leader in video-
cassette duplication is looking for a well qualified in-
dividual responsible for the maintenance, trouble-
shooting and repair of video recorders. Candidate
should possess strong electronic background and
confidence with electromechanical devices. Video
knowledge helpful but not required. Excellent oppor-
tunity to broaden one's skills in a diverse profession.
Send resume to: Broadcast Engineering, Dept. 569,
P.O. Box 12901, Overland Park, KS 66212. 7-62-11

EXPANDING CHRISTIAN TELEPRODUCTION
facility is in the need for an experienced maintenance
engineer. Work with new "state of the art" equipment,
GV switchers, Chyron, one and two inch VTR's, audio
boards and multitrack ATR's, DVE and editing
systems. Depending on experience, position would
develop into supervision of present maintenance
staff. Participate in ground floor construction of a
current modern teleproduction facility. Send resume or con-
tact Gridley Quihuis, Technical Operations Manager,
P.O. Box 2550, Baton Rouge, LA 70821.(504) 926-6239.
We are an Equal Opportunity Employer. 6-82-21

CHRISTIAN TELEPRODUCTION FACILITY is
in the need for an experienced video tape editor. Experience
should include system timing, and time code editing.
Work with GV-300 switchers, Datascrip/Sony one
inch editing system and Chyron IV. Participate in the
ground floor development of a modern television
teleproduction facility. Send resume or contact Gridley Quihuis,
Technical Operations Manager, P.O. Box 2550, Baton Rouge,
LA 70821. (504) 926-6239. We are an Equal Opportunity
Employer. 6-82-21

CONSULTING ENGINEERING FIRM based in San
Francisco and specializing in AM-FM-TV broad-
casting, CATV, and microwave systems needs com-
pe tent, personable, self-assured associate. BS in engi-
neering essential, higher degrees desirable. Systems
design, FCC applications, forensic engineering, some
field work and travel. P.E. registration essential but
may be obtained later. Salary commensurate with
qualifications and experience. Future share of owner-
ship possible. Enjoy the benefits of a small special-
ized professional firm with an established nationwide
practice. All replies confidential. Send resume to
Hammett & Edison, Inc., Box 68, International Division,
San Francisco, California 94128. 6-82-21

CHIEF ENGINEER—FIRST INDEPENDENT in 63rd
Market seeking production oriented Chief. To be in-
volved with all equipment purchases and to put sta-
tion on air from ground up. Will consider experienced
2nd man ready to move up. INDEPENDENCE BROAD-
CASTING COMPANY, 111 3rd St., Des Moines, IA 50309.
(515)244-3197. 7-82-11

TECHNICAL SALESPERSON needed for growing radio
cable television broadcasting equipment company. Send resume
and salary requirements to: P.O. Box 356, Edgerton,
PA 19629. 7-62-11
MISCELLANEOUS FOR SALE

VIDEO T-SHIRTS. TV DESIGNED. Our designs include: "ENG" with Reg. Chart, "GLITCH," "RESOLUTION," "VIDEO PEOPLE DO IT IN SYNC," and many new designs! Send for free catalog to: AARLO ENTERPRISES, 109 MINNA ST., SUITE 254, SAN FRANCISCO, CA 94105.

COLOR-BAR T-SHIRTS, all sizes — $9.95 PPD. Specify large or pocket size bars — Also sweatshirts, windbreakers and B4 hats with bars — PMACO, Box 441, Massapequa, NY 11768.

Razor blades, Single Edge. Raltec, 25864 Highland, Cleveland, OH 44143. 12-61-12.

EQUIPMENT FOR SALE

USED TRANSMITTER BARGAINS: GE-transmitter package on Ch. 8, 35kw excellent condition, serving as operating standby now, with TD53B antenna and 3 1/4" transmission line; GE TT-520 VHF, Hi Band 25kw working condition; GE UHF transmitter 30kw (Low Band), operating with good used klystrons; RCA TU-500C, 50kw UHF, Low Band; RCA 10kw Ch. 42, excellent condition; RCA 30kw, UHF, Hi Band, line feed, transistorized, from Ch. 14 up. What do you need? Most of the above can be returned! (4) Variants 30kw 4KLM, good life remaining (Ch. 34-52), 6 1/2" and 3 1/4" transmission line with feeders and hangers. Call Ray LaRue, Quality Media Corp., (800) 241-7876. In GA (404) 324-1271.

VTR's: RCA TR70 — (3) RCA TR60 Record Units 1000 hrs. total time each; Ampex 1200B; Ampex VR 3000 with metering and changer. Call Ray LaRue, Quality Media Corp., (800) 241-7876. In GA (404) 324-1271.

COLOR CAMERAS — USED: GE and RCA Film Chains, excellent condition; one (1) Norelco LDH-1, 50' Cable; (1) GE PE-350; (3) GE TE-201 Good Operating Condition; Ikegami HL-33-HL-35; Toshiba/BGC CTC-7X, Micainco, plaintiffs. Call Ray LaRue, Quality Media Corp., (800) 241-7876. In GA (404) 324-1271.

AMPERA 400A with X/Y Option, super excellent condition, great price $2500. (206) 654-1004, 27106 48th Avenue South, Kent, Washington 98031.

TWO GHZ, TV MICROWAVE, UNUSED. One year old. Teracom TCM 610B 5 watt, video and audio. Aico, 4725, and 50 of 1 1/2" heliax 5 6" and 10 solid dishes. Sid Shumate, WTVR-TV, (804) 677-7082.

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. (They 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.
If jammed U-Matics ever make you yearn for the days of live television something is wrong with the brand of U-Matics you’re using. A lot of things are very right with Maxell U-Matic cassettes.

They’re built to stand up to the toughest handling and editing conditions you can dish out. The unique Maxell Epitaxial™ tape formulation gives you an extremely dense magnetic coating that yields superior chroma and luminance. The proprietary Maxell binder system makes sure the formulation, and everything you record on it, stays up to your standards, indefinitely.

That’s why every one of the networks, hundreds of independent television stations and just about every major producer, director and cameraman in the business who tries Maxell U-Matic cassettes, buys Maxell.

Your Maxell supplier can make sure your programming isn’t interrupted. Ask him for Maxell U-Matic cassettes. Or ask us for more information.

(Translation: The cassette broke.)
(Solution: Maxell U-Matic cassettes.)
Elegance by design!

Ward-Beck has created the R1000...a unique masterpiece of technical efficiency and elegant simplicity.
In this exceptional radio console legendary Ward-Beck quality is available at a price one would expect to pay for much less distinguished company!
The R1000—ideally suited to smaller studios or news applications—is an excellent way to experience the finest engineering on a modest budget.

Ward-Beck Systems Ltd., 841 Progress Avenue, Scarborough, Ontario, Canada M1H 2X4.
Tel:(416)438-6550.
Ward-Beck Systems Inc., 6900 East Camelback Road, Suite 1010, Scottsdale, Arizona 85251.