LOCAL COMMERCIAL PRODUCTION
WHAT'S IN IT FOR YOU?

Also in this issue

New Series: Teleproduction Facilities
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SMPTE Preview
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We've got it before you want it.

At ADM Technology we manufacture the most advanced audio consoles available. We incorporate new ideas and quality improvements into every console we build. You can be sure the ADM* console you order today will come through with the latest innovations in audio technology.

Our ADM 1600 Series II is a typical example. It is well equipped to handle a broad range of broadcast, production and post-production requirements and has a full measure of expandability.

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Engineered to exacting standards and manufactured to the most rigid tolerances, all ADM's are backed by our exclusive 5-year warranty.

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Now a color monitor with every feature you’d expect from BARCO joins our CM Production Series.

The respected BARCO CM Series is coming down in size. And our new small surprise, the CM 22, has the same features as the established 13” and 19” CM monitors, and more.

Put them in your remote vans. Use them in those tight spaces where the distance between viewer and monitor is limited, but the need is for the ultimate in color.

The CM 22 can operate on 110V or 220V mains and 12V local supplies and comes equipped with a fine pitch dot, black matrix in-line gun tube. The rack mount version makes it possible to install two 9” monitors in a single 19” rack. The switch mode power supply allows stable performance in areas where the main supply may vary under certain conditions.

Features found in the 9”, 13”, and 15” CM models include: pulse cross pre-set contrast, hue, saturation, brightness; automatic degaussing; scan format switch; set up switch, front accessible RGB cut off and gain controls. Modular construction allows for quick and easy maintenance.

For more information on our small surprise, the CM 22, and the rest of the BARCO video monitor line, call Chris Golson at 201/882-0584.

When your image is everything... turn to BARCO. Available in the U.S. only from ELECTOR.
25 SHOOT-OUTS.
Every television station that has pitted the new Sony BVP-3 camera against the competition has arrived at a singular result. In bright light and low light. In the field and lab. With vectorscopes, wave form monitors, noise meters and the ultimate arbitrator—the naked eye—Sony outshot them all.

The overwhelming factor: the BVP-3 contains the most revolutionary breakthrough in pickup tube technology in the history of broadcast. The exclusive, Sony developed 3½'' mixed field Saticon" tubes.

Sony, unlike many of its competitors, didn't stick with the heavy, bulky 3½'' tube assemblies commonly used. Nor did they switch to inferior ½'' tubes. Instead, they stayed with the ¾'' format, but radically reduced the size and weight and reinvented the electron optical system. Resulting in not just the best resolution, registration and signal-to-noise ratio, but the best balanced camera in the industry.

And it plugs into any recording format, including our superior ¹/₂'' Betacam" system.

ARRANGE YOUR OWN SHOOT-OUT:

If you'd care to see how well this self-contained ENG camera shoots, a camera that has all the features you've been asking for, and at $20,000* easily packs the most bang for the buck, just name the time and place and we'll be there.

In N.Y./N.J. call (201) 368-5085; in the Northeast/Mid-Atlantic (201) 368-5112; in the Midwest (312) 773-6045; in the Southeast (404) 451-7671; in the Southwest (214) 659-3600; in the West (213) 841-8711.

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SONY
Broadcast

*U.S. list price
If you pride yourself in keeping up with Time Code advances, **BOOTH 823 at SMPTE** should be part of your education.

(You’ll find us in good company — nestled among Harris, Hitachi and Panasonic)

Designed around high speed microprocessors, our entire line of Time Code Readers incorporate technical capabilities beyond any currently offered product. Take the Model 710A, for example. Its many "standard" features include: independent front panel and video readouts; tach pulse/control track updating; and simultaneous decoding and display of Time and User data.

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The 710A is just one of many new Cipher Digital products that bring “next generation” code technology into today’s editing environment. Visit us... Booth 823 at SMPTE. It’s an education.
The Tape Behind the Olympics


AMPEX

Ampex Corporation, Magnetic Tape Division, 401 Broadway, Redwood City, CA 94063

Circle 107 on Reader Service Card
SPECIAL REPORT: LOCAL COMMERCIAL PRODUCTION PAYS OFF

A local car dealer is thinking about broadcast advertising for the first time. How does the local radio/TV station get his production business and keep him coming back for more?

MANAGEMENT/ENGINEERING DEBATE—DIGITAL AUDIO:

When will it deliver?

*BM/E* asked audio experts Talmage Ball, Richard Rudman, Thomas Stockham, Eric Small, and Harrison Klein the Big Question.

NEW SERIES—PRODUCTION FACILITIES REPORT: BROADWAY VIDEO

Finding new ways to use the latest equipment is the way Broadway Video has always operated. *BM/E* kicks off a new series with a report on this industry leader.

SMPTE CONFERENCE DEFINES ROLE AS "FALL NAB"

More than 150 companies will spread their wares in the Los Angeles Convention Center this year, and the technical side of the conference will reflect the active role SMPTE is taking in the video industry.

RADIO BROADCASTERS AT NRBA TO EXPLORE NEW OPPORTUNITIES

For radio engineers, the conference has a healthy-looking exhibitors’ list; and the conference goals read like a battle plan for radio broadcasting. There’s change in the air for the NRBA.

PROCESSING AM SOUND TO COMPETE WITH FM

AM radio engineers are beginning to think stereo—and how to compete with stereo FM. Here are some suggestions from two audio pros.

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**COMING IN NOVEMBER: PROBLEMS AT THE DIGITAL INTERFACE SPECIAL REPORT: TEST & MEASUREMENT**
INTRODUCING THE NEW PRIMUS AUDIO COMPONENTS

Powerful performance in the palm of your hand.
PRIMUS (Pree-mils): an array of compact, performance-engineered audio electronics from Ramko Research.

The new PRIMUS components are unlike any professional audio equipment you've ever used. Never before has so much advanced performance been put into such compact and rugged packages. Rarely have you had available so many features and options to help get the job done. Never have you had a three-year warranty that's backed up by factory certified proof-of-performance.

PRIMUS is a comprehensive range of components that give you the flexibility to configure an audio system limited only by your imagination. Whether you choose from tabletop or rack mounting versions, there's hardly an audio job that can't be improved upon.

Here's a partial list of models currently available:
- Lab standard mono or stereo turntable preamplifiers.
- Dual and quad input, gain selectable microphone/line amplifier mixers.
- Audio distribution amps from three (3) stereo/six (6) mono up to eight (8) stereo/sixteen (16) mono outputs. All models feature individual recessed front panel adjustments or optional high resolution, conductive plastic potentiometers.
- Mic/Line equalizer amplifiers with balanced I/O and up to ±15 dB of reciprocal equalization.
- Expandable audio console mixers with cueing, selectable EQ, metering phones and monitor.
- Voicegard™ combination limiter/compressor, noise gate with variable threshold and slope ratio, gain reduction metering.
- Signal processing VCA's with six (6) independently controlled channels. DC remote control with balanced outputs.
- R/P and playback, stereo and mono NAB cart machines.

Whichever combination of precision PRIMUS audio components you choose, you're guaranteed outstanding specifications. For example, our stereo turntable preamplifier measures:
- Signal-to-noise Ratio: -93 dB (A weighted)
- Total Harmonic Distortion: Below .0018%
- Frequency Response: 10 Hz to 20 kHz, ± 25 dB
- Stereo Separation: -70 dB @ 1 kHz
- Output Level: +25 dBm (10 Hz - 20 kHz)

The simplified and modular packaging of PRIMUS allows us to concentrate the quality where it belongs: in state-of-the-art circuitry. High slew-rate integrated circuits and extensive ground planes insure the highest RFI protection.

All IC's plug into gold plated sockets. All models feature quick disconnect I/O connectors and require only 1% inch standard rack height.

We've taken another important step, too.
When you invest in PRIMUS, you receive a Certified Performance Gold Card that instantly puts you in touch with our Technical Assistance Department on a toll-free line. Just call in your registered serial number and you're in touch with the advice you need.

To put PRIMUS audio components to task on a free two week trial, call toll free (800) 821-2545 or contact your nearest Ramko Research sales representative or distributor. Put the powerful performance of PRIMUS in the palm of your hand.

PRIMUS audio components are an array of compact, performance-engineered rack mounting or tabletop packages.

PRIMUS is a division of Ramko Research, Inc. 11355-A Folsom Blvd., Rancho Cordova, California 95670

Circle 108 on Reader Service Card
Comparison. The real test. When you have to make a choice between two superb competitors, it usually comes down to a shoot-out—a side-by-side objective comparison of those features and capabilities that mean the most to you. Harris has made a substantial investment in the TC-90S—because we knew that we could design and manufacture an American camera with features that would make it the new industry standard. We wouldn’t make this offer unless we were sure we had succeeded.

So look over these TC-90S features and read our offer. Then, if you want a shoot-out, let us know. We’re ready.

The Facts

1. **Colorimetry**
   - Mixed-field LOC, half-inch diode gun tubes, and an advanced new beam splitter provide winning colorimetry and better registration than larger tubes.
2. **Smart Package™**
   - Exclusive microprocessor time code generation lets you record SMPTE and VITC time code as you shoot, so editing hassles disappear. Automatic encoder balance, auto registration, diagnostics and camera status (in English) keep your camera out of the shop and in the field where it belongs.
3. **Nimble Autmatics**
   - Auto registration
   - Auto beam control
   - Auto encoder balance
   - Auto iris
   - Auto white balance
   - Auto black balance
   - Auto scan failure protection
4. **Gain Tracking**
   - The TC-90S maintains black level under all conditions to eliminate color shift, even with changes in gain.
5. **Noise**
   - Minimal apparent noise at +18 dB gain for superb low light level performance.
6. **Weight**
   - The TC-90S, with standard lens and battery, and including the viewfinder, weighs less than the HL-79, similarly equipped. No more “sagging shoulder” feeling, and your pictures will show it.
7. **Profile**
   - You can see to the right! Even when you’re shooting, you have an unobstructed view to the right over the top of the camera.
8. **Price**
   - The TC-90S, with microprocessor, tubes, batteries and a 15:1 zoom lens—a top-of-the-line camera—is list priced under $30,000!
9. **24 Hour Service**
   - Call us. 24-hours-a-day, 7 days a week. Our telephones are constantly manned by service engineers, and we’re ready when you need help.

The Challenge

The details of the shoot-out are simple: We must have on file the coupon below filled out by the camera-person at your facility, and a letter signed by your chief engineer or general manager on your organization’s letterhead, requesting the shoot-out and stating that you are in the market for a new ENG camera. Then, if your current model Ikegami HL-79 (or an HL-79 you secure for the shoot-out) meets all, and exceeds one or more, of the TC-90S features given above, we’ll leave without our camera—it’s all yours.

There’s More

To those of you who believe that time is the true test of a product, we’ll make another offer: Forget about filling out coupons and writing letters—call us today and order a TC-90S. Then use it in the field for 30 days. If it doesn’t live up to our specifications, we’ll refund your money. Either way, the TC-90S is a winner. In a shoot-out, or on your shoulder.

OK Harris, prove it!

Mail to: Mark Gray, Director of Marketing, Harris Corporation, Studio Division P.O. Box 4290 Quincy, Illinois 62305

CAMERA PERSON

STATION OR COMPANY

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TELEPHONE

Hurry, our incredible offer expires January 31, 1984. And good luck. Your HL-79’s going to need it.
Advice for the FCC

Responses to the FCC's combined Notice of Proposed Rulemaking and Notice of Inquiry aimed at reviewing the need for many of its technical regulations has generated a worthwhile and sensible recommendation from the National Association of Broadcasters. Fearing that the Commission's deregulation fervor might go overboard on technical matters, the NAB suggested in its comments that the FCC form a joint government-industry advisory group to review and evaluate present technical regulations before a proposed rulemaking.

The idea is to hold off action until the advisory group has a chance to provide input. Considering the seriousness of this action and the overworked (swamped) FCC technical staff, the advisory group approach is sound. And there are numerous precedents. The Commission has formed technical advisory groups for issues relating to DBS and in preparation for WARC meetings, to name just two.

In the Notice of Proposed Rulemaking, the Commission would eliminate rules governing transmission system requirements for AM, FM and TV transmitters on the theory that the marketplace will control picture and sound quality. In the Notice of Inquiry, the FCC asked if technical regulations that are no longer necessary or are overly burdensome could be eliminated or modified.

The NAB's response said that the agency "must continue to play a major role in areas of technical regulation where the marketplace on its own cannot produce desired results such as interference-free and universally available broadcast communications."

Of major concern to the NAB and to the Association of Maximum Service Telecasters is that standards for quality, interoperability and interference control are intertwined. Unless these regulations are studied carefully, elimination in one area may have unexpected and harmful impact on another, thus weakening a communications system that took 50 years to build.

The same statement holds true for radio.

The Commission should recognize that a technical rule often serves more than one of the regulatory goals of quality control, interoperability, interference control and spectrum use efficiency. Moreover, as technologies and industries evolve, the purposes served by a particular standard may change. Before concluding that a specific television broadcasting technical rule should be modified or rescinded, the Commission needs to give careful attention to the policies and purposes the rule actually serves and how modifying or deleting it could change the television broadcasting system.

We support the NAB's recommendation for the government-industry advisory group to tackle the tedious job of reevaluating the regulations. It's a prudent approach that could help the FCC and the industry steer a safe course through the deregulation process. The next move is up to the Commission.

10  BM/E OCTOBER, 1983
HOW WE BECAME THE FRONTRUNNER IN THE ROUTING SWITCHER BUSINESS.

While everyone else was making minor refinements, we went back to the drawing boards. We took the best that modern hybrid technology has to offer and designed it into our Series H Switching Systems.

The result is a new state-of-the-art in every respect. We offer the best performance specs available. Reliability is unquestioned. Maintenance is reduced.

And expansion is easier than ever. There's a 300% increase in crosspoints-per-rack-unit. So what used to fill an entire room can now fit inside a closet.

And the Series H is available in the configuration you need to make the system practical. Best of all, we can offer these advantages at a price that's actually less than the price of conventional switching systems.

If you'd like us to prove how far out in front we are, call us toll-free at 1-800-328-1354. In Minnesota, call toll-free 1-800-792-1072. Outside the continental U.S., call International Operations collect at 1-612-736-2349. We'll give you the best run for your money.

Professional Audio/Video Equipment

3M hears you...
If you're ready to move up to a specialized mixer, you're ready for Ramsa.

The Sound Reinforcement Specialist: Ramsa WR-8716

When your sound says you're professional but your mixer doesn't. When you're wasting your subtlety and style on "make-do" boards. When you're creating compromises instead of clear-cut distinctions. Then you're ready for Ramsa—the mixers that are specialized so you won't have to compromise.

The WR-8716 is a fully modular sound reinforcement console with 16 input modules, 4 group modules, and 2 masters. It features 16 input pre-fader solo buttons, 4 group modules with pre-fader insertion patch points, and lockable post-fader solo buttons. There are 6 illuminated VU meters with peak LED's for easy outdoor reading and a separate stereo variable frequency EQ for monitor sends. Pan pot controls allow panning to the left or right masters while level controls permit 16 x 6 board operation. The left and right direct channel assign function lets you bypass the group modules for individual sources. Portable operation is a snap with easy access connectors.

And the WR-8716 features plastic conductive faders for greater reliability and smooth, low-noise operation; external power supply for lightweight, and switchable 48V DC phantom power for condenser mics.
The WR-8816 recording console includes the same modular construction, input modules, power supplies, and faders as the WR-8716 plus many important recording advantages. Like direct outputs for 4, 8, or 16 track recording and peak-reading LED meters that let you monitor any 4 out of 24 signals with clear, quick response.

You'll command a variable frequency EQ section with 3 frequency settings for the high and low frequencies plus continuously variable midrange. Stereo echo send replaces the separate mono controls you'll find on competitive boards. And you get two independent stereo monitor controls—one for musician's headphones, one for control room monitors—a special feature for any mixer in this class. And there are other important features like low noise electronically balanced mic inputs with high-speed ICs, 16 switchable post-fader solo controls and XLR-type mic connectors.

Ramsa offers a full line of specialty mixers including the more compact WR-8210 recording mixer and WR-130 sound reinforcement mixer. So don't hold down your professional sound, call (201) 348-7470, because you're ready for Ramsa.
TV Subcarrier Proposal Could Bring Stereo Sound

U.S. television could be offering stereo sound in just a few months if a recent FCC proposal to deregulate the TV aural baseband is approved. The proposal, which mirrors the FCC’s recent deregulation of FM subcarriers (see BM/E, June 1983, p. 132), would permit both public and commercial TV stations to use their aural baseband subcarriers for almost any broadcast or nonbroadcast, commercial or noncommercial purpose not otherwise inconsistent with regulations. Permitted uses could range from stereo and/or dual-language broadcasting to paging and electronic mail.

The proposed deregulation could be especially important to noncommercial broadcasters faced with increasing financial difficulties as public funding sources wither. In extending the proposal to public television, the Commission cited a 1981 amendment to the Communication Act that authorized public broadcasters to supplement their incomes through profit-making ventures.

The Commission said it would deal with regulatory classification issues for TV subcarriers as it has for FM SCAs, regarding most as ancillary broadcast services. Services offered on either a common carrier or private carrier basis, however, would fall under the appropriate rules. TV SCA use would be considered a secondary privilege to be conferred upon the primary licensee.

Nets Lose Syndication, Win Financial Interest

The FCC’s recent “tentative decision” eliminating its financial interest rule and easing the restrictions on network involvement in syndication will have a much more limited effect on the nets’ bankrolls than they had hoped. The action—which awaits an additional 30 days of comments before possible adoption—still keeps CBS, ABC, and NBC from the most lucrative aspects of the syndication business.

On the financial interest end, the Commission said it felt the rule had failed in its intention to increase the diversity of network or first-run programming and had not served to encourage diversity of program supply and distribution. Therefore, it saw no reason to maintain the rule on its books.

In the case of syndication, however, the FCC found it necessary to retain some form of insurance against network warehousing of off-network series, a practice that could drive up prices for independent stations, which rely on such shows as a primary advertising draw.

The FCC therefore proposed to allow networks to acquire syndication rights to prime-time entertainment programs, but to require them to transfer those rights to an unaffiliated syndicator within six months after the network run ends. If the series runs on the network more than five years, rights would have to be transferred at the end of the fifth year. The rules do not apply to international syndication or to programming that runs outside of prime time.

A “sunset” clause in the proposal calls for the syndication rules to be deleted entirely seven years after the Commission’s action.

Although FCC chairman Mark Fowler termed the action a "consensus," the commissioners were not completely agreed. One of them, James Quello, issued a separate statement that indicated deep reservations about the proposals. Quello dissented to “the characterization of this document as a tentative decision,” saying the action did not “reflect a decision on my part, tentative or otherwise, that the Commission should adopt this particular proposal.”

The proposal received mixed reviews from the networks, with NBC stating its disappointment up front,

PBS-Cable Connection Profits Both

Public television and cable may seem like strange bedfellows, but in Springfield, MA, the alliance is working to the benefit of all concerned. The local public television station, WGBY-TV, is swelling its coffers by renting facilities to local franchisee Continental Cablevision, and is earning additional money by producing nearly a third of Continental’s local origination programming.

The $125,000 WGBY realized from the deal has allowed the station to hire additional programming staff despite a $60,000 drop in federal funding.

Planning for the PBS-cable connection started long before the franchise was awarded. Back in 1977, when WGBY moved into new downtown facilities, the renovations were made with cable in mind. The station’s involvement and reputation led to the city cable advisory board specifying that potential cable operators work creatively with WGBY.

Continental’s successful bid included a commitment of five percent of gross annual revenues to an Access Endowment Corporation to fund local programming—funds that may well find their way to the public television station, at least in part.

With the relationship now a year old, WGBY feels that the link with Cablevision has brought it more than profits. Says general manager Jerry Franklin, “We saw cable as a significant source of revenue which would allow us to keep our producers, but split their time. The hardcore truth of it is, that was the only way we could stay in the local programming business. And it has worked.”

Cooperative effort: WGBY’s staff tapes the studio portion of a cable arts show.
When the action’s hard-hitting, Midwest and Panasonic Video Systems will put you there!

Panasonic Gives You The Performance And Reliability You Need. Midwest Gives Them To You Fast... And At A Super Price!

You can depend on Panasonic Industrial video equipment to give you the performance you want and to take the hard-hitting action of mobile unit installations. That’s why so many mobile production companies choose them.

If you need a mobile unit that can take in all the action... and take all the punishment on-location shots hand out... you need to talk to Midwest about their complete line of Panasonic-equipped mobile units. Midwest maintains a solid inventory of the complete Panasonic Industrial video line. The new WV-777 Camera shown here is but one of a wide range of components from the Panasonic Video Systems Division.

Let Midwest put you there when the action’s best, with dependable Panasonic equipment in an M1 or M20 mobile unit. For information on the complete line of products at Midwest, call toll-free today. 1-800-543-1584

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calling the rules "severe restrictions on the ability of networks to participate in program syndication." CBS and ABC were more forgiving and sounded thankful for what they'd been given, at least publicly. Both, however, said they'd welcome full repeal.

AES Convention Opens With "D(igital) Day"

Once again, digital techniques will be central among audio engineers' interests at the seventy-fourth Audio Engineering Society Convention, meeting in New York October 8 through 12. The overriding theme of the event, which has been extended to five days, is "exploring the digital and analog domains of today and tomorrow." Opening day is designated AES D (for "digital") Day.

Eighty technical papers and 10 workshops on digital technology, including a seminar on the compact disc, will fill the opening Saturday of the convention. (The large number of technical papers necessitated the October 8 start, a day earlier than originally announced.) Saturday will also include a tutorial on digital basics, and special demonstrations of compact disc equipment will continue through Sunday.

A total of 191 exhibitors will show their latest wares at this year's convention, with special areas set aside for audio evaluation.

Papers of relevance to broadcasters will address such topics as studio design, psycho-acoustics, sound reinforcement, and test and measurement techniques. Workshops will examine time code and film/tape synchronization, microphone techniques for digital recording, tape recorder design and its effect on usage, and digital editing techniques.

FCC Clears Program Regulations Underbrush

The FCC has sharpened its deregulatory machete again, slicing through what it calls the regulatory "underbrush" of rules affecting program content. The move follows the Commission's recent deletion of policies on ratings abuse and coverage maps.

The first reason for pruning regulatory deadwood, the Commission said, is to further its goal of reducing excessive regulation and giving the marketplace a freer hand. In addition, it said some of the deleted policies presented First Amendment concerns; some were too broad, some too restrictive, and some outdated.

The 10 policies that fell by the wayside concerned alcoholic beverage advertising; broadcasts of astrology material; foreign language programs; harassing and threatening phone calls resulting from station broadcasts; agreements between music format service companies and broadcasters; musical recordings and repetitious broadcasts; presentation restrictions on off-network programs and feature films; call-in polls on radio and television stations; private interest broadcasts by licensees to annoy and harass others; and sirens and other emergency sound effects in announcements.

Three other policies were proposed for deletion. They cover horse racing information broadcasts and SCA transmissions, and advertising of horse racing, off-track and parimutuel betting.
The Quantel DPE 5000/SP makes digital effects affordable by every broadcaster. Every facility.
Not bad for a unit that’s only 8¾ inches high. Perfectly sized for your studio—or mobile unit.

And more yet! Forty moves instantly selectable at the touch of a button—30 pre-programmed and 10 of your own creation.

And now, with “Multilink,” you can connect up to five SPs into a multi-channel system. Or use an SP to add a second channel to your DPE 5000. That’s flexibility.
On top of all this you get Quantel’s superior picture interpolation for the smoothest moves available.
“SP” stands for “special performance.” Almost an understatement.

Call your local MCI/Quantel office for details. Or get in touch with us directly at 415/856-6226. Micro Consultants, Inc., P.O. Box 50810, Palo Alto California 94303.

MCI/QUANTEL
The digital video people

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Is your AM facility ready for stereo?

This equipment will help answer that question.

RG-3
The Receiver/Generator combines a two-watt RF output and a correlation detector circuit that virtually eliminates interference problems. The RG-3 can be used in conjunction with any conventional impedance bridge for bandwidth measurement.

DIB-3
The Operating Impedance Bridge measures the impedance of networks, radiators, and the like while they operate under signal generator power or full transmitter power. VSWR as well as complex impedances of up to 1,000 ± 900 ohms can be measured.

TCA
The TCA Ammeter Systems provide accurate, modulation-free, temperature stable antenna current measurements without interrupting the RF circuit. The FCC requirements of 2% accuracy is guaranteed over the entire range of broadcast frequencies.

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TELEPHONE: 703-354-3350 TWX: 710-832-0273
Celebrating 20 years as the leader in RF instrumentation.

Engineering Emmies for Four Manufacturers

Recognizing the importance of engineering in the production of TV programming, the New York chapter of the Academy of Television Arts and Sciences gave out several major Emmy awards for technical excellence at its annual banquet September 12 in New York City.

Awards were made in five categories. In Recorder/Camera Combinations, RCA won for Hawkeye. The Academy recognized RCA’s “outstanding achievement in the development of an electronic hand-held recording camera... and the development of a system for newsgathering on videotape using a single integrated unit containing camera, recorder, and battery.”

In the category of Real-Time Digital Effects, Ampex won an award for ADO—“the first transparent-quality, real-time digital effects system with off-axis rotation, true 3D perspective, and ultra-smooth motion which made multiple-pass operation possible without signal deterioration,” in the Academy’s words.

3M was also a big winner, receiving an award in the Audio and Video Magnetic Media category for “outstanding achievement in engineering pioneering for the development of the first industry-accepted videotape.” In addition, Mel Sater of 3M, developer of the first tape formulations, won an award recognizing his “important contribution” to the development.

Since 1983 marks the tenth anniversary of Richard Shoup’s work at the Xerox Advanced Research Center, Palo Alto, on designing a real-time computer graphics system (eventually leading to the formation of Shoup’s Aurora Systems), the Academy presented awards for the development of an electronic graphic creative system to both Xerox and Shoup. The award cited Shoup “for his concept and development of the first electronic graphic creative system which has led to the importance of videographics in television today.”

Finally, the Academy recognized the work of international societies such as the EBU, International Radio Consultative Committee of the ITU (CCIR), and SMPTE for their work on the establishment of an international standard for digital video recording in the studio.
This DIGITAL TIME BASE CORRECTOR is simply the best TBC available for the price thanks to FOR-A technology. No tweaking or calls to the factory. It works that well...right out of the box. Its performance is so transparent you'll probably ask, "Is it turned ON?"

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SEE US AT SMPTE BOOTH 730/631
Nets Shift to Satellites in Radio and Television

Two broadcasting networks have taken major steps in the industry's inexorable move to satellite transmission. The CBS Radio Network and RadioRadio moved to Satcom 1-R in mid-August as planned, although dual transmission via telephone land lines will continue through the end of this year. Gradual dismantling of land line service was scheduled to begin September 29, and by January 1, 1984, the networks will be available by satellite only.

CBS Radio senior vice president Richard M. Brescia called the switch "a very exciting moment for everyone who's been part of the historic conversion of our radio networks to satellite transmission." As affiliates install receiving dishes, Brescia says, they would "begin to benefit from the many advantages of digital transmission, especially distinctively enhanced sound quality."

Although full-scale satellite distribution remains in the future, NBC Television took a big step toward that goal as COMSAT General Corp. ordered Harris earth stations and maintenance services for NBC's planned Ku-Band communications network. In the first phase of the program, Harris will install 23 earth stations at network affiliates, plus two transmit/receive stations and a master station in New York City. The company will also supply NBC three transportable transmit/receive earth stations.

Early next year, following installation of the initial order, the system will be fully tested for several months. After testing is completed, Harris will start supplying and installing the 180 or so additional earth stations—and three more transportable units—needed to fully complete the system. The network hopes to distribute entirely by satellite by 1985.

New Cameras Send NEP Into the Computer Age

Staying competitive in mobile teleduction means keeping up with the latest network requirements, and nobody is more aware of that dictum than the folks at Northeast Productions in Avoca, PA. NEP recently replaced all 11 cameras on its two 40-foot trailers, Supershooters II and III, with state-of-the-art Ikegami HL-357 computer cameras.

Chet Sawicki, NEP's vice president and director of engineering, explains that the company was far from satisfied with its previous roster of Hitachi SK-96s, now up for sale "in mint condition." But for the kinds of network sports production NEP has set its sights on—including the 1984 Olympics, where one of the trucks will be on duty—Sawicki says the networks are insisting on larger-format cameras that can handle larger lenses, such as the 40X Canon lenses with 2X extenders NEP has purchased.

The larger-format tubes of the HL-357s will also pay off in low light level work, according to Sawicki. The higher S/N values available with larger pickups can yield a better-looking final product, especially when post-production takes the image down several generations.

Sawicki also noted that network jobs now require computer-setup cameras.
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Circle 118 on Reader Service Card
Circle 120 on Reader Service Card
The U.S. Department of Justice has approved the merger of Showtime and The Movie Channel, the pay cable services. The government has interfered in several previous proposed pay TV mergers, claiming possible antitrust law violations; it found the Showtime–Movie Channel plan acceptable because it involves only one film distributor, Warner Brothers. The FCC has eliminated its annual financial reporting requirements for cable television systems. Similar requirements for broadcasters were lifted recently. The latest Arbitron estimates show U.S. cable penetration at 35 percent of all homes (29 million households) as of July 1983—a five percent gain over October 1982. The estimate is based on responses from 500,000 households, with weighted averaging applied to responses from four sweep periods between May 1982 and February 1983. Bonneville Satellite claimed a first with its July 20 direct, two-way interactive educational videoconference between the U.S. and the U.S.S.R. The one-hour program linked Gostel Radio, Moscow, with the University of California at San Diego.

The Radio Network Association reports that network radio posted a 24 percent billing increase for the first six months of 1983, compared to the same period last year. NRBA has launched a survey of subcarrier use by its members. Almost 5000 radio stations have been queried about their present and future SCA plans; results will be made public at this month’s NRBA conference. CNN Radio began its own live radio newscasts from its own studios August 1. Until that time, the service had simulcast the audio portion of CNN Headline News.

With increased capital from loans and joint ventures, UPI is looking forward to a profitable 1984. Aiding the turnaround is a large drop in operating expenses, resulting in part from UPI’s switch to satellite distribution. The company recently appointed a new editor-in-chief, Maxwell McCrohon.

The National Federation of Community Broadcasters has endorsed the NPR-CPB loan agreement (BM/E, August 1983, p. 16). NPR has received a $40,000 grant from the Charles Stewart Mott Foundation. The money will be channeled into a series of environmental reports on the Great Lakes. The network’s “Drive to Survive” fundraiser early in August netted $2.15 million.

Spanish International Communications Corp. and SIN, Inc., have filed a civil antitrust suit against the Spanish Radio Broadcasters of America and 28 of its officers and members. SICC and SIN claim that SRBA and the other defendants conspired to restrain and eliminate competition in Spanish-language radio and television broadcasting in the U.S.

NAB has filed a petition for reconsideration of the FCC’s Docket 80-90 decision, saying that reclassification and downgrading of FM stations that do not meet minimum standards would “violate the principles of fundamental fairness and would be contrary to sound communications policy.” The association has also asked the FCC to repeal its regional concentration of control rule, which prohibits ownership of three broadcast stations if any two are within 100 miles of the third and any two have primary service contour overlap.
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Circle 124 on Reader Service Card
WNEW-FM Builds Audience With Progressive Production

By Eva J. Blinder
Senior Associate Editor

CARVING OUT a secure niche in the New York radio ratings monolith is no easy task, especially with intense competition constantly eroding many stations' gains. A unique music format is difficult to achieve, and with the playlists of AOR, CHR and Adult Contemporary stations overlapping so much, a station needs a distinct personality to set it apart from its competitors in listeners' minds.

"As FM and rock and roll grew up, we began to realize that to have an edge we had to pay attention to what happened between the records," says Earl Bailey, production director at WNEW-FM, Metromedia's New York AOR outlet. Bailey recalls that in its early days as an AOR station, WNEW-FM avoided a highly produced sound—felt to be a characteristic of AM Top 40 radio—in favor of an unproduced, "progressive" image.

"Now, the image of what's progressive has changed," Bailey relates. "To have a highly produced sound is not only entertaining and effective, it's also fun for us who work here."

For WNEW-FM, however, "highly produced" does not mean "sounding like a machine," as Bailey puts it. "Just because we preproduce some of our announcements doesn't mean we're any less spontaneous," he emphasizes. "It's just adding a sophisticated element to that spontaneity."

In Bailey's two years at the station, he has seen production increase from almost nothing to a regular part of station activity. The recent appointment of Charles Kendall as program director has given the production department an additional boost. Kendall, who comes to the station with a reputation for cheering up gloomy ratings, describes himself as "very much a hands-on programmer—I'm fiercely competitive." His immediate goal is to raise WNEW-FM's quarter-hour share from 2.1 (as of the spring 1983 book) to a 4 by spring 1984.

Kendall's philosophy calls for liberal use of preproduced material, including station IDs and promos as well as in-house commercials. (According to Bailey, the station produces about 20 percent of the commercials that appear on its air at this time and hopes to increase that percentage.)

As Bailey describes it, the station's commercial production at the time of his arrival got no fancier than reading a commercial over a music bed onto cart. "Now, when we produce our own commercials, if the copy lends itself to it we'll punch it up," Bailey explains. Over the last two years, the station has purchased several sound effects libraries and is constantly upgrading its collection of production music. In addition, the talent has been trained in production and tape editing techniques, adding to the station's more produced sound.

"We have very little live copy on air now," Bailey states; he notes that preproducing commercials also insures the station against over-eloquent talent stretching out a 30-second spot into 45 seconds. All promos are preproduced as well.

Since Kendall's arrival, Bailey says, the station is not taking a new direction in production as much as multiplying its efforts. "Now we have a produced promo or ID at the top of every hour," he explains; previously the station used such preproduced material only every three or four hours. "The idea is to give the station more total personality and to tie all the individual personalities with the station personality," he continues. "That's probably the hardest job a production director can have."

Although the production itself has become more elaborate, the production facility at WNEW-FM is simple. The station's one full-time production room houses two Scully reel-to-reel two-track ATRs, a McCurdy 10-input
a pair of Technics turntables, an Orban 111B dual reverb unit, and a UREI 530 graphic equalizer. A multitrack recorder would be a convenience, Bailey concedes, but it’s not a necessity for the kind of production WNEW-FM does. Expansion plans do exist for the production department, however; the station will almost certainly purchase an Eventide Harmonizer, and possibly a third Scully deck for the production studio. Kendall is sold on the idea of a Harmonizer, which he calls “a wonderful asset for a radio station,” especially for its ability to speed up an over-long commercial without changing the pitch.

Expanding the limits

Working within its hardware limits, the station still manages some creative work with sound effects and editing. According to Bailey, the production department will create its own sound effects or special effects if a particular sound is not in the library. For promos and concert spots, Bailey’s policy is to edit talk and music together so that the announcer is not talking over the lyrics—a practice he finds distracting. Creative editing was also used to create a musical “sounder” for the station’s Five at Five oldies feature, with short sections of different songs cut together to form the opener.

Station-produced IDs are also used to customize the national programming broadcast over WNEW-FM, including NBC’s Source network, Westwood One, London Wavelength’s BBC Rock Hour, and Clayton Webster’s Rock Quiz and Retrorock. Bailey says, “We treat each segment of the shows as a music set,” running station IDs between the segments.

One other change that is coming under Kendall’s leadership is a return to live remotes, which the station had backed off from a few years ago. “There’s nothing like live radio,” Bailey says. “No matter how highly produced a sound you have, you don’t want to sound like a juke box.” The highly produced sound of WNEW-FM is not a highly processed sound, however. According to Kendall, “Too much processing destroys the quality of the music and leads to listener fatigue. We do have some compression because we have to be competitive, but we don’t destroy the signal.”

Kendall’s experience with AOR goes back to the early ’70s, when he worked at WVBF, Framingham, MA. There, he experimented with a format that was “not exactly progressive but not Top 40—we were an album-oriented station before our time.” The format was even more unusual in that “we were one of the few white stations that played a lot of black music.” In 1975, Kendall moved to Malrite’s WMMS, Cleveland, which zoomed from a 1.2 share to a 9.6 in the year and half he was there. He repeated his success at several other stations before landing at Metromedia’s WMMR, Philadelphia, in 1980. Kendall recalls that WMMR had good ratings but the wrong demographics; with his help, the station repositioned itself and tripled its revenues in three and a half years.

Jockeying for position

Positioning is very much the name of the game in ultra-competitive New York City, where WNEW-FM competes with the likes of CBS’s WCBS-FM, ABC’s WPLJ, and others. Kendall believes that WNEW-FM’s success is due to its ability to offer a unique listening experience that cannot be found elsewhere.

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York. One of Kendall’s first moves has been to go after the 18–24 males he says have been “abandoned” by WPLJ-FM, which recently switched from its long-time AOR format to CHR. He is doing that by playing “a little harder-edged music now than a few months ago” —but without abandoning the 25–34 males that have been WNEW’s mainstay.

The station’s other main competitor is Doubleday’s WAPP-FM, which, with a 2.8 share, has a distinct ratings edge. For this match, Kendall is pulling out one of his favorite weapons—the vulnerability study. By closely monitoring the competition for 24-to-48-hour periods, Kendall and his staff determine any programming weaknesses, such as fixed times for commercial breaks. “That way, we can start our commercials one or two minutes before they do,” Kendall explains. “If listeners tune us out after a minute or so of commercials, they find commercials on the other station also—but their commercials have just started. By the time they tune back to us, we’re playing music again.”

Strong? The answer was surely no surprise to Kendall or anyone else at WNEW: 93.5 percent said rock and roll is here to stay. The answer was surely no surprise to Kendall or anyone else at WNEW: 93.5 percent said rock and roll is here to stay. The station is betting on that, and is relying on Kendall to get it a bigger piece of the rock.

How does the production department feel about the new direction? “I look forward to Charlie’s leadership,” Bailey says. “He’s the first program director the station has had who’s not only committed to a highly produced sound, but knows how to get it.”

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Circle 133 on Reader Service Card
LIVE TELEVISION is a rarity these days. It takes a tremendous amount of time-consuming pre-production, a substantial capital investment, and considerable effort to find the proper crew. Even with this effort, there is no guarantee the program will come off well. That is why "The Miss Universe Pageant," which is broadcast annually on the CBS network, is such a rarity—a major live telecast produced on a very reasonable scale.

What it takes to produce a live show of the magnitude of the "Miss Universe Pageant" is a combination of production teams, TV stations, and modern equipment. This successful combination was achieved for the July 11 CBS broadcast of the pageant. The team members consisted of Koplar Communications of St. Louis, Glen-Warren Productions of Toronto, Miss Universe, Inc. of New York, and the CBS Network.

Live TV needs preparation

According to Arthur White, production manager at "Miss Universe," "assembling all the different elements into a cohesive unit is one of the most important considerations in preparing for a live broadcast. That is why the process of putting together a live show like this is complicated by the dwindling supply of quality, live directors."

For the show to take place, demanding the intricate interrelationships of hundreds of people both behind and in front of the cameras, a careful succession of steps had to gradually evolve, with members of the team producing results at just the right time.

The process begins with Miss Universe, Inc. itself which schedules the time for the show. The telecast is sponsored by Proctor & Gamble, which supplies what amounts to an underwriting grant by purchasing the rights to the show from Miss Universe, Inc. The production crew and its expenses are covered under the agreement, and CBS has a guaranteed sponsor for the event. This is a very healthy commitment for Proctor & Gamble, since the ratings over the years have been consistently high. CBS, which has always done the show, has not been reluctant to accept the package for broadcast, given these numbers.

After the financial arrangements have been nailed down, the second leg of the event begins: scheduling the shooting for the few moments of the program which are pre-produced. The location shots, which later appear in edited form between the live portions of the broadcast, are completed by a local crew at some of the area’s main attractions and night spots.

In this instance, the St. Louis Arch was a prominent thematic stage piece during the show, so considerable effort was expended on shots of the Arch, as well as Busch Gardens and some local clubs and restaurants.

While the director and producer, who are under contract to Miss Universe, Inc., were organizing these so-called "fun films," CBS was looking for a way to uplink the program. In St. Louis they found Koplar Communications, which maintains a computerized satellite facility with the capability of uplinking to all U.S. and Canadian satellites. With the feed relayed from Kiel Auditorium to Channel 11 in St. Louis via Koplar’s portable microwave, it is then delivered to the Koplar Center for uplinking to a Comstar transponder through a nine-meter Harris dish. The transponder time and backup telco lines are handled by the traffic department at CBS in New York.

Mobile aids studio work

After the trafficking and leasing arrangements were made and the fun films shot, the next member of the team to take the baton was Glen-Warren Productions, a division of CFTO. Channel 9 in Toronto. Glen-Warren provided both the 44-foot trailer and the in-house team headed by Raymond Carnovale, VP engineering, and Angelo Caldana.
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"We offer a variety of equipment with the truck, depending on the job," explains Caldana. "For the production in St. Louis, the audio demands were too sophisticated for a truck, so we built a studio in the auditorium." Not only was a room modified to make an instant audio studio, but it was cut in half to accommodate a separate videotape room as well, that part of the show being no less complex.

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For the pageant, the truck contained five Ikegami HK-312E cameras and three HL-79Ds, both sets with triax. Lenses for the 312s were three 18x1 and two 25x1 Canons, with the 79s taking two Canon 13x1 lenses and one Angenieux 15x1. Camera positions were split up between a Titan crane, a sports dolly, and a Pee Wee crane, as well as several floor level positions. Other video equipment used for Miss Universe included a CDL 480 switcher.
TELEVISION PROGRAMMING

a Quantel DPE-5000SP single-channel special effects system, and three Sony BVH 1102A VTRs with slow motion controllers.

The audio provided by Glen-Warren was no less extensive, since the musical requirements for the show entail precise timing of a complex series of events—especially during the segments when the orchestra is supposed to be playing. This is because there is no orchestra. All of the music is prerecorded onto an ITC triple-deck cart and edited onto three ITC single-deck cart machines for playback at the right moment. The singers whose voices are heard on the show are also prerecorded and mixed over the music on the carts during the live segments of the pageant and the entertainers’ appearances. The show’s theme song is recorded onto, and played back from, an Ampex 440 four-track machine.

The playback and all other audio is controlled from the temporary studio located within the auditorium. The great sophistication of the other audio needs requires the presence of three 12-channel/two master Ward-Beck consoles and two Nagra recorders, one mono and one stereo. In the truck is another Ward-Beck console which is used, for the Miss Universe pageant, primarily as a distribution point through which the composite mix from the auditorium is directed. This, combined with the video from the adjoining temporary studio, is sent from the truck through the portable microwave to Kopler’s uplink facility and then on to the public in over 50 countries.

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The efforts of this team to produce a live telecast, to produce what is, outside of sports, a rarity for modern television, were rewarded by the number-one spot on the overnight ratings. If ratings mean anything, the quality of the work was reaffirmed by week’s end when the show had logged in with a number-two spot for the entire week. It is with this same formula that Miss Universe, Inc. also successfully broadcasts the Miss U.S.A. and Miss Teen U.S.A. pageants, both of which continue to testify to the viability of live broadcasting.
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SPECIAL REPORT:

For profit-minded radio and television stations, a good commercial production operation is as essential as a good sales staff.

By Eva J. Blinder
Senior Associate Editor

What can happen once a station's sales staff has convinced a formerly air-shy local business of the value of broadcast advertising? The logical next step, of course, is to produce a commercial that brings in customers. In the largest markets, production houses give broadcasters stiff competition for the production needs of advertisers and agencies, particularly since they are often linked to national campaigns. But in most markets, local advertisers—especially those new to the broadcast medium—turn to radio and television stations for audio and video image creation.

A local commercial production operation, therefore, is the logical backup to an active sales staff. For many stations, the nature of the market and competition keep commercial work strictly on the local level. Others, however, find that with excellent facilities and a top-flight staff, they can attract agency and regional work in addition to their own clients—with an attendant boost in station income.

Quality is key factor

One radio station that has taken full advantage of a new, high-tech facility is WAXY-FM, Ft. Lauderdale. WAXY's...
A wealth of production facilities in the Washington, DC area limits the amount of agency work a station can attract, and Whitt says the station’s commercial work is “basically bread and butter.” That hasn’t stopped WAVA from building a quality production room, complete with a custom-built TechnaArts audio board, dbx 140 noise reduction system, Orban paragraphic equalizers, and Technics turntables.

Whitt sometimes augments the station’s sound effects library by going out into the field to find a particular sound. For a recent arcade spot, for example, he recorded ambient sound at an arcade. A quality of believability is essential in spot production, Whitt says. The station also tries for a commercial sound that blends well with its format. “We try not to put on really offensive spots,” Whitt explains. “We don’t like shouting or screaming.” If necessary, the station will try to recut a problem commercial to fit in better.

Fitting commercials to the format is a particular consideration at beautiful music or easy listening stations, where a break in the smooth flow of music can be especially jarring to the listener. KMEZ-AM and FM, Dallas easy listening outlets programmed by Churchill, do a relatively small amount of commercial production—but do it very carefully. Production director Ken Loomis says production houses in the busy Dallas market do most of the area’s commercial work. The station produces perhaps five to 10 percent of the spots that show up on its own air in a sophisticated facility that “can do anything you’d want,” in Loomis’s words. The equipment includes an MCI JH-110B four-track ATR, two JH-110B two-tracks, and an MCI JH-618 18-input audio board with stereo and mono mix outputs and a built-in patch bay. Also in the production room are ITC cart machines, an ADR 760X compressor/expander, and Orban Parasound equalizer, and a Deltagraph equalizer.

Although the station owns a full special effects production library, listeners’ tastes limit the use of effects.
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according to Loomis. "Easy listening people listen for different reasons than listeners to other formats," Loomis says. "Sometimes we have to work with clients to explain, but most are very receptive." Most of the problems come from national commercials produced outside the station.

**Multitrack advantages**

Capitol Broadcasting's Huntington, WV station, WKEE-AM/FM, turns out "quite a bit of local stuff" in its two four-track production rooms, according to production director Dan Monjar. "On several occasions we've had television stations come to us to mix their audio," Monjar relates. "They don't have our facilities." A heritage from the days when the AM and FM sides were completely autonomous are two fully equipped production rooms, each with two two-track machines, a Studer A80, and a Revox B77. The AM room has a Scully 280-four track ATR and Audix AD-101 12-input mixer; the larger FM room has a Studer A80 four-track deck and 32-input Audtronics 110A-4 stereo board.

"Theoretically, anything you can do on a four-track you can do on two two-tracks," Monjar admits. "I can just do it in one-fifth the time." The speed and flexibility of multitrack recorders "are of paramount importance for radio stations," he believes.

The FM room is also fully equipped for special effects with a Fairchild spring reverb, UREI 527A graphic equalizer, Orban 621B stereo parametric EQ, Eventide Harmonizer, and DeltaLab DL-2 acoustic computer. Monjar praises the DeltaLab unit as extremely flexible, saying it can be used for anything from a simple delay line to digital reverb and can even produce mechanical-type voice effects similar to a Vocoder. The room's effects capabilities are rounded out by two Eventide Omnipressor compressors/expanders (Monjar uses the compression function to liven up rock concert spots) and a Carver C-9 sonic hologram generator that "pulls the audio out" for a more three-dimensional sound.

With such an impressive equipment roster, don't all the station-produced commercials have that "space-age" sound? Not so, says Monjar. "We use the effects equipment no more than 30 percent of the time," Monjar states. "People get tired of it." Having the equipment gives the production staff extra flexibility, but even more important is their sensitivity to listeners' tastes.

According to Monjar, the station's Adult Contemporary format (with the FM side approaching Contemporary Hit Radio) gives them a good deal of leeway in programming and producing commercials to appeal to the 25-54 demographic. "With this format and the way the station is presented, I can do a lot of different things, from hard rock concert spots to very laid-back ones. We can run practically any kind of commercial." One no-no is parodying "hillybilly" accents, which Monjar says some stations in the market, at the junction of West Virginia, Kentucky and Ohio, do: "We're high-class radio and we want to sound like it." Making fun of potential listeners is definitely out at WKEE.

The commercial operation is run by Monjar, who comes up with many of the concepts for spots, working with clients' guidelines but suggesting alternatives if he has a better idea. The schedule is busy, with an average of about 15 spots a day, but the station usually manages to finish most spots a day or two before air time to give the client a chance to approve them. "It puts the clients in the process, and they really appreciate it," says Monjar. Spots produced at WKEE are often dubbed off for other stations in the market, and the station also does some production for local agencies. Regional agency work hasn't materialized yet, but Monjar says WKEE is ready to handle it.

**TV spots: going Mobile**

Television commercial production operations are set apart from those at radio stations not only by the medium, but by the amount of field production involved. One station that has made a big investment in field-produced commercials is WKRG-TV, Mobile, AL. The station's production manager, Ed Whatley, claims that WKRG does over 85 percent of all local commercial production in its market. "We caused the
other stations to just abandon it," he says.

WKRG's "secret" is a state-of-the-art facility and extensive, dedicated mobile capability. Two years ago the station spent about $1 million to construct a production vehicle exclusively for commercial work. The truck, with a body by Wolf Coach, carries Sony one-inch VTRs and switcher and two Ikegami HL-79 cameras. Most commercial work is single-camera, but the two-camera capability lets the truck handle other kinds of production assignments on a limited basis. The truck carries everything necessary for a commercial shoot, including lighting and audio gear.

Whatley estimates that about half WKRG's commercial work is done on location. "Using one-inch tape gives us a competitive advantage," he says. "You might as well start off with the best possible." During a single five-day week last summer, Whatley says, the truck travelled to Lafayette, LA, and shot 94 store commercials. "That city has three stations," relates Whatley, "but they couldn't shoot it on one-inch."

According to Whatley, about 90 percent of commercial work at WKRG comes through agencies. "We're competing production-wise with New Orleans, Jacksonville, Atlanta and Tampa," Whatley states. "We get a lot of overrun production out of New Orleans because their rates are higher than ours." Particularly restrictive union situations in New Orleans make production there expensive, Whatley says; WKRG doesn't deal with a union, so its rates stay lower.

Being ahead of the crowd technologically is nothing new to WKRG. The Mobile area was slow to switch to videotape, Whatley recalls, but WKRG was the first in the market to abandon film. The operation now is entirely on tape.

Field production is not the only area where WKRG leads the pack, however. The station has two production/control areas, including one just-constructed room that houses a Grass Valley Group 300/Mk II digital video effects production system and a Vital switcher. Whatley says WKRG was one of the

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Harris Studio Division.
first stations in the country to get an Ultimatte, which greatly improved the station’s chromakeying ability. Digital effects are regularly used for commercial work by the WKRG production staff. "We use effects on the switcher that the switcher wasn’t designed to do," Whatley says, adding, "The capability of a switcher is far beyond what they sell it for." For example, the operators at WKRG have found ways to distort perspective on squeezed frames of video in such a way that "it looks like an ADO thing—not the same, but close." Whatley continues, "We have some TDS who watch a lot of stuff that comes off the satellite and the network and try to duplicate it. As long as you’ve got people like that, it’ll fly. I want people to have a good time while they’re working eight to five.”

**Serving clients creatively**

Stations in smaller markets may have less competition from production houses, but their need to serve their clients is just as great. A good example of a creative commercial production operation is that of WCSH-TV, Portland, ME, which does some agency work, but gets most of its production schedule from local advertisers who deal directly with the station. "It seems like we’re always busy," says Mike Marshall, WCSH’s production manager. About 60 percent of the station’s commercial production is location work—enough to keep two field crews busy every day, either shooting or editing. The crews tape with RCA TK-76 cameras and Sony BVU-110 portable U-Matic recorders. (A Sony BVP-250 is the backup camera.) Both the field crews and the station’s sizeable sales staff have plenty of ground to cover, with the station’s signal reaching into neighboring New Hampshire. The station also has two copy writers "who are kept quite busy," according to Marshall. "It’s part of the total service we offer. If you just sell time, it puts the burden on the clients," many of whom can’t afford an agency and wouldn’t be on television without creative assistance from the station.

WCSH further encourages carroseshy businesses by creating advertising opportunities that are especially appealing to them. Last year for Portland’s three hundred fiftieth anniversary, the station produced a series of 50-second “historical moments” spots about the city, then sold 10-second sponsorships to local businesses, with tags produced on location. A similar project for the town of Lewiston-Auburn, complete with newspaper ads, netted more advertisers from that town.

The production studio at WCSH is shared with the news department, but separate production control and master control rooms allow the staff to work independently. The studio equipment includes a GVG 1600 switcher and Chyron character generator, along with an RCA audio board and RCA TK-44 cameras with Q-TV teleprompters. Recording is on RCA quad machines with editing capabilities, although field material is edited on Sony BVU-800s with a McMartin audio board before dubbing to quad for air. Marshall says the switcher’s effects capability has greatly enhanced the station’s commercial product. “Gone are the days when we used to do four slides a commercial,” he says. “Now we’re doing 10.”

A creative staff augments the capabilities of the equipment. A recent spot for a local computer dealer illustrated the client’s theme of “getting the computer down to size” by showing a giant computer on the right side of the screen and a small person on the left. The computer shrunk as the person grew, and the spot ended with the person sitting down at the computer. The effect was accomplished with two cameras, one on the computer and one on the actor, with a simultaneous timed zoom. It took the crew many zooms to get the effect just right, Marshall says, but the final result was fine.

An interesting wrinkle on field commercial production is found at KICU-TV, a UHF independent in San Jose, CA. The station offers advertisers the opportunity to go live for special occasions such as openings or local events—bringing back the “golden days” of television with the bonus of on-the-spot remotes. For example, a local furniture store recently reopened in a new location. It kept the new address a secret while airing promotions on KICU, then went live from its new location for its opening days. The technique allowed the business to generate more fanfare and excitement than an ordinary, preproduced commercial would have offered. KICU has also
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done live "vignettes" from the Gilroy Garlic Festival for local sponsors and has done live commercials from auto dealers, furniture stores, and groceries.

Jim Evers, the station's operations manager, says that field work is produced with a JVC KY-2000 camera and recorded—except, of course, the live spots—on a Sony BVU-110 U-Matic deck. The station then dubs to one-inch for post-production.

The bulk of commercial work is done in the field, but KICU's year-old facility also hosts its share of production. The new building has a studio just for commercial production, with new Ampex one-inch VTRs acquired at the beginning of 1983. The station is still in the process of acquiring equipment for the production room: at press time it was looking for a switcher (probably CDL or GVG) and planning eventually to buy some form of digital effects and a video editor (right now all editing is done machine-to-machine on the Ampex decks).

"If a client has a special need for digital effects, we may take it to another facility in the Bay area," Evers explains. "But for the most part, we don't use a lot of effects." Perhaps the station's most important "acquisition" so far was the hiring of a creative services director to direct ad spots (right now all editing is done machine-to-machine on the Ampex decks).

Noncommercial commercials

While the idea of a noncommercial station producing commercials may seem contradictory on the surface, it makes perfect sense to Garth Harrington, head of creative services for PBS affiliate KVIE, Sacramento, CA. "Like any other station, we compete for viewers," Harrington explains. "We need good equipment to produce our television signal, and we have to be constantly upgrading our equipment, which takes money. PBS can't afford to generate the same amount of local programming as commercial stations, but we need to originate local programming. That equipment tends to lie about when it's not being used. We want to use it to make money." Like other public stations these days, KVIE sees its sources of public funds dwindling and has its eyes out for alternative revenue sources. In addition to local, regional, and national ads, the station uses its sophisticated production equipment to produce industrial and training films for corporate and independent producers.

Harrington calls KVIE's production equipment "very comparable to any medium-market television station." For location work, the station uses a pair of Ikegami HL-79 cameras, one with a Sony BVU-110 and one with an Ampex VPR-20 one-inch field recorder. Back at the station, an off-line edit booth has two Sony VO-5850s for cuts-only editing with audio playback.

More complex post-production is possible in KVIE's CMX booth, equipped with an Edge editor and three Ampex VPR-2Bs. "We've managed to utilize the general-purpose interfaces on the Edge to control an ATR and the auto transition on our CDL switcher, so we can punch up switcher effects and have the computer on the editor actuate them," says Harrington. The Edge, of course, is capable of dissolves on its own, but with the switcher interface "we have 90 to 95 percent of a 340 for three-quarters the price," according to Harrington. The station also saved money by purchasing a Chyron RGU-2 rather than a more expensive graphics generator.

"We haven't taken the Cadillac route," Harrington admits, "but we
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Professional Video Division

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certainly have a very nicely outfitted Oldsmobile, and it gets us there at the same speed with almost the same comfort and the same efficiency." More equipment purchases are scheduled, particularly some form of digital video effects, but Harrington has reservations about spending top dollar for equipment if something less expensive will do almost the same job.

"Everybody is limited," he points out. "I, for one, think the equipment revolution is growing at a rate 5.15 times faster than people are generating money to buy these toys." Actually, the station has found some benefits in having a studio well-equipped with slightly less than top-of-the-line equipment. "Many clients are looking for less expensive fees," Harrington notes. "Some Los Angeles clients come up here to get away from Los Angeles prices." Some clients, he adds, will do the bulk of their commercial work at KVIE, then go to an expensive facility to add the digital effects they need. "High rates send people to us," he remarks. "They can do 90 percent of it here, then finish it up somewhere else at $350 an hour."

Another benefit of KVIE's studio is that it is less heavily committed than those of area commercial stations, which must do more of their own production. Having more time available for clients saves them time. A local commercial station that purchased a digital effects unit wasn't able to offer enough time to meet the demands of commercial clients; other stations in the market are now thinking of adding effects capability.

For production itself, however, the studio is seldom used. "You can do so much more in the field," Harrington claims. Certain lighting situations that are problematic in the studio become simple outside-and the variety of scenic locations near Sacramento makes outside work especially attractive. "In California we're really lucky," Harrington glows. "If you don't like one setting you can drive 20 minutes and find another." Sacramento-to, he notes, is an hour and a half from San Francisco, two hours from Lake Tahoe, and just five miles from the San Joaquin valley. The station uses its 18-foot van for commercial work, but is considering acquiring something a little larger, "but smaller than a 40-foot truck, which is very expensive and tricky to move around," according to Harrington. "You can now do the same thing in a 26- or 27-foot van that you had to do in a 40-footer 10 years ago."

Once again, the station wants to get the broadest capability possible.

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Digital audio is being widely promoted as the technology of the future. But when will its impact really be felt by the local station? A panel of leading engineering and management experts square off on one of broadcasting’s hottest subjects.

By Tim Wetmore
Associate Editor

Since the earliest days of audio, advances in technology have not often been well received in broadcasting, or any part of the audio industry. Starting with transmission methods, through live recording techniques in the 1940s, and including the 78 versus 33⅓ RPM debate, audio professionals have had to struggle to reconcile economic considerations with the natural impulse to make technological inroads into the future. That tradition continues today with the no less heated discussion over the combined fates of broadcasting and digital audio.

Digital audio is, according to its many supporters, on the proper course, even ahead of schedule: as prices rapidly drop, equipment is being acquired and innovations are flowing into the main digital stream. The skeptics are less sure of these assertions and have many questions. Then, of course, there are those still waiting to decide whether or not digital is really worth its chips.

Talmage Ball, KSL-AM/TV

How, then, are those influential in the radio industry dealing with the pressure of this technology? Talmage Ball, the chief engineer at KSL-AM/TV in Salt Lake City, who designed the advanced audio facilities at the station, explains the reasoning behind the big investment made by KSL to design and build the studios. “Our station is planning for a major revolution in both audio and video, and we designed our new studios to reflect that philosophy and to prepare for the coming of digital technology.”

An example of the extent to which design considerations were made to accommodate ongoing changes in technology is the six-foot space left around studio and control rooms. This was done so engineers could get in and accommodate ongoing changes in technology. “Our studios were conceived totally with the coming of the digital age in mind.”

looking at this possibility, the broadcaster has many factors to take into account. Economics, of course, is a prime concern to anyone in business. Another primary consideration is the ability to produce a quality product with which the company can associate itself in the public’s mind. A third consideration is the acceptance of very sophisticated technology by the general public (the transmitted signal is received in the home on excellent tuners), placing demands on those who produce the product they consume. In fact, many home stereos boast specifications which exceed those of transmitted signals.

Our studios were conceived totally with the coming of the digital age in mind.”

The KSL philosophy, backed up by a solid financial investment, clearly indicates that the station is prepared to go to the all-digital plant, and is indeed committed to it with its purchases and design ideas. The KSL example also illustrates how digital is impacting on other areas of technology, such as analog ATR design, and how it is influencing management’s buying decisions in terms of equipment that will handle higher-quality signals.

When will it deliver?
Richard Rudman, KFWB-AM

Even in the face of such optimism, and given the current legal and administrative atmosphere surrounding broadcasting, especially as it pertains to standards recommendations, an industry-wide debate about the quality of the new digital systems as opposed to high-quality analog systems is brewing. Thus, the current viability of digital technology in practical applications is meeting with a wide variety of different responses, especially the questions of whether or not the all-digital plant is coming; if so, when; and if not, why not?

Richard Rudman, engineering manager of KFWB-AM, on the board of directors of the SBCE and chairman of the National Frequency Coordinating Committee, says of the promise of digital audio: "The timetable on the question is not yet complete. So far, the practice has not borne out the theory that using digital equipment is the best way to produce audio. Right now, the best use of digital is in the network's satellite transmission systems and maybe the use of laser disks in various ways."

Rudman further states the technology has not gone far enough, and that with current analog techniques the audio industry can exceed current transmission specifications. His opinion reflects that commonly expressed by the pragmatic observer who realizes that the broadcast industry is one that is economy-driven, that is, as Rudman expresses it, "Why spend money on something new if what I already have works well and makes me money?"

In addition, the production characteristics of radio broadcasting must be taken into consideration. At all-talk or all-news stations, which are among the top-rated stations in every major market, the cost of digital technology has not proven to be worthwhile. The existing analog systems do the job quite well, considering that many of the differences between analog and digital involve perception that is at the edge or beyond the ability of human recognition, especially in talk or news. Rudman sees the only advantage to digital, in this financially important news/talk format, coming in the future, if mass storage and manipulation of information help to avoid the vast amount of tape cutting now necessary. But that is in the future, and its value will have to be determined at the time it becomes available.

Another claim by those skeptical of the value of digital is the current need for a great deal of specialized test instrumentation to keep an entire digital plant running, along with personnel with specialized training.

Rudman restates the position: "They haven't shown me yet the distinct advantages of an all-digital system when analog is making rapid advances and costs so much less than digital. Nor have they shown me the need for it when analog performs quite well."

The common denominator among those who support staying with an already valuable and completely implemented analog system is money. Since the radio business discovered that it is not recession-proof, many managers and engineers are realizing that if you want to stay alive, you have to pay attention to financial considerations.

What this ultimately means is staying with the good equipment you have, and when you upgrade, getting the most cost-effective product available (usually the cheapest analog equipment that meets the station's demands). No matter which side you take on the value of a given system's reliability, quality control, and maintenance requirements, price will be the determining factor.

For management, the criteria for the existence of the station as a viable business interest is whether or not it can get a decent signal on the air, and whether or not it can accomplish the task with an economic broadcast chain, providing the station with a reasonable return on the investment.

This perspective leads to questions concerning the inevitability of the digital plant. Says Rudman, "Until a respected company in the broadcast business is willing to display, at the NAB or elsewhere, an all-digital chain, and can do it at the same cost as an analog chain, I don't see an all-digital station as a viable economic solution."

Thomas Stockham, AES

Clearly the incentive for any investment derives from a predominantly businesslike viewpoint. A station has to stay in business. Because of the greater relative expense of digital, at least for now, most network buyers feel the acquisition of digital equipment won't help them bring in any more dollars because of its better sound. This is quite different from the music business, where a high-quality distinctive sound is the stock in trade, and where it pays to invest in the superior equipment which helps to realize a better return because of a better and more distinctive sound.

But if cost is the real factor, why aren't broadcasters who can't afford the large sums required for digital ATRs not buying $2000 converter systems for VCRs (which specifications and over-
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DIGITAL AUDIO

all sound, according to many, are superior to comparably priced analog)?

One who supports the idea of this inexpensive entry into digital sound, and who refutes the claims that advanced analog systems have similar specs, is Thomas Stockham, president of the Audio Engineering Society. "They are in no way comparable," asserts Stockham, "and contrary to what some claim, the difference is audible. Take, for example, modulation noise: a terrible problem in analog, but in digital there is none. The same is true with harmonic distortion and audio print-through: bad in analog, none in digital. Wow and flutter are a big problem in the analog world, but totally unmeasurable in digital."

According to Stockham, there are other time base problems with analog recording technology that do not plague digital, and these are at the very least subliminally transferred to the listener, if not outright obvious.

Stockham, however, is not reluctant to mention the difficulties with digital systems. He recognizes that, beyond the problem of its novelty, it is hard to transfer from one form to another, given the question of lack of standardization. Also—the only serious problem from his point of view—editing in the digital domain is currently inefficient and costly.

The premise of Stockham and other advocates of the very real and present usefulness of digital audio systems is that as the novelty wears off, as the prices come down with improved manufacturing methods in a still infant industry, and as more digital product becomes available, the excuses for avoiding digital will be no more.

Stockham certainly understands the business restrictions that come into play. He allows that a complete changeover from analog to digital is not appropriate in terms of business, but that an evolutionary, and not a revolutionary, change is already at hand. As Stockham notes, "Even in the case of CDs, the title catalog grows every day, the players are relatively cheap, so why not program CDs?"

"In spite of this, I still think digital will find its way into all aspects of the audio industry because it's just plain better to produce audio digitally. Six years ago, I couldn't get a record company to put a digital recorder in a studio. Now you can get a CD in almost any city in the U.S. People have the courage—why aren't they doing it? Are they afraid? Digital is fulfilling its promise and people who say it isn't are sadly misinformed."

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Eric Small, audio consultant

Another supporter of producing audio with digital technology, especially in terms of storage and manipulation of the audio signal, is Eric Small, a well-known broadcast audio consultant. His perspective on the debate is that "digital is already delivering on its promise.
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audio is more cautious than that of strongly supportive advocates. "I don't think that digital will completely replace analog as that [analog] technology also improves, such as right now some analog circuitry is coming out that very nearly approaches digital in specs and is relatively cheap. This is a trend that may continue. Another problem is the sampling rate, and it seems that will remain a problem. I don't see digital reel-to-reel being important for a very long time because of the problems with the tape itself and with the difficulties in editing that now exist. Analog is more than adequate for present radio use."

In Klein's estimation, the major leap of digital technology is currently in satellite delivery of programs. It freed the networks from land lines and provided better quality in the process. Also, digital transmission is becoming almost a commonplace as more and more stations and networks purchase digital processing equipment. Echoing that often-heard sentiment from radio management and from the cautious network engineer, "The only problem that remains is that its admitted superiority does not justify its cost."

All radical predictions and reservations aside, this crucial question, the subjective weighing of digital quality with digital cost, remains at the very center of the disagreement. A subject-by-subject examination of the advantages and drawbacks of digital yields some interesting results.

Digital transmission by satellite seems already to be an accepted form of broadcasting. Heading back through the broadcast chain, much of the processing is digital and seems to be receiving little resistance. In audio production, CDs appear to be accepted by some as a better means of playing music, and is rejected by others as still too expensive, too unreliable, and lacking a useful and sizeable catalog of titles. The digital console, including automation, seems to be increasing its share of the market with each passing NAB convention. Speakers, of course, must remain analog as long as the human ear does. Meeting with the most resistance is the digital ATR. The proponents of the digital system claim it is better and that the cost is justified, while its opponents say it's too expensive and very difficult to edit on or to transfer between systems.

In the history of broadcasting's engineering debates, the digital question will take its place alongside those of the past. Whether or not it will be resolved soon remains to be seen. Strong arguments are being made that digital audio is on the proper course, just as the skeptics regard the technology as lacking economic viability, and some even question its technical superiority while pointing to the improvement and continued market superiority of analog.

The disagreement, of course, will continue until, one day in the future, one of the technologies is accepted as an everyday fact. Until that time, a positive word from Thomas Stockham: "Digital audio is the new standard of excellence, something for people to shoot for in their professional endeavors. Even if stations don't choose to spend their money on digital equipment, they will look to it as the standard of quality for improving analog systems."

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But the "hot" label is also due to a state of mind among those at Broadway—that they are leading the industry (both other production/post-production houses and most station/network operations) when it comes to the innovative use of innovative equipment. Broadway uses VITC time code almost exclusively in both on- and off-line editing. Broadway got the very first MCI/Quantel Mirage system delivered in the U.S. (see BM/E, June, p. 186), adding it to a vast repertory of other graphics systems, including an MCI/Quantel Paint Box (the still frame/animation software package introduced at last NAB will be added shortly), and the Thomson-CSF Vidifont Graphics V with digitizing pad and animation software with which Broadway does most of its titling. And Broadway can tie all these systems together, if necessary, bringing a huge repertory of effects to bear on an image—as it did recently when creating an effects package for ABC's Olympics coverage.

The equipment in turn attracts some of the best engineering and production talent New York has to offer. For these people, whether actually working on a job at Broadway or looking for an assignment, Broadway is a meeting place where people can come together and just visit for a while in a creative environment in which ideas can flow freely. Broadway itself, of course, is the real beneficiary of all the sharing.

"We want to be like a film studio for the video community," says Mike Werner, VP of engineering, research and development, and special projects. Part of the film studio-like approach involves "vertical integration," so that the facility offers a complete range of services from pre-production, production, and post-production to arranging distribution deals.

"Vertical integration means you can get things done generally faster and hopefully better," according to Werner. "It's a tired buzz-word for many industries, but it's a fairly new application for the video production and post-production business."

Besides offering a complete range of services, vertical integration also
means for Werner that the facility is large enough and varied enough so it can attract and hold onto talent, and accommodate itself to the needs of a large group of producers and directors who bring their work to Broadway whenever they can.

Broadway Video was founded around four years ago. President Lorne Michaels, who had the contract to produce and edit a series of prime time specials for NBC, The Best of Saturday Night Live, and editor Randy Cohen decided it would be more advantageous to bring their work to Broadway when ever they can.

Werner was architect and engineer, had brought Werner in from Phoenix (where he had been working in the record and radio business), and set up the company as a post-production facility.

The original editing suite, for which Werner was architect and engineer, had "very limited requirements." It was constructed "almost overnight" by Arnold Ferolito and his staff at A.F. Associates. Equipment consisted of a Sony BVE-5000 editor and BVH-1100 and 1100A one-inch VTRs.

As business grew, a second editing suite was added a year later. And, 15 months after that, Edit Room 3 was constructed, a virtual duplicate of the first two, but with BVH-2000 VTRs and extensive stereo audio post-production capabilities (more later).

Broadway Video Edit, as the post-production facility is officially called, now employs between 40 and 60, depending on how many jobs are in house. Among these are eight full-time engineers and technical personnel and five full-time editors who are more or less permanently teamed with five playback operators.

Production arm founded

As the post-production facility grew, so did the various other parts of the Broadway operation. Today there are three other business units besides the post-production facility: Broadway Productions; Broadway Home Video, which markets software for the home entertainment market; and Broadway Pictures, which is engaged in the development of motion picture properties. Dan Sullivan is the corporate VP who oversees the four allied companies.

Although the post-production services form the lion's share of the business now, Broadway's production services unit is becoming increasingly important, especially as the concept of vertical integration develops. Cohen is currently on the road as a director of technical operations for the Simon & Garfunkel tour where a bank of Eidophor video projectors is being used as part of the stage set, fed by live video cameras on stage. A lot of concert material is also being recorded and will later be edited into a musical special—a job which Broadway Video Edit will naturally be up for.

Prior to the S&G concerts, Werner was the technical supervisor on a major shoot for Showtime at the Odeon Theater—a musical special starring Randy Newman, Linda Ronstadt, and Ry Cooder. Just prior to that, Broadway provided production services for a Neil Young concert in Berlin that was shot for HBO.

Most of the people using Broadway's production services these days are the large pay-cable companies such as HBO and Showtime, although networks are becoming increasingly important customers, as they have been in post-production all along. Broadway has also been working on some of its own material, and has produced a series of tapes, The Authors, in which famous authors are interviewed in their homes. (Four tapes are in the can already, including a talk with Isaac B. Singer shot in Florida.)

Besides the ability to accomplish an entire production under a single roof, one of the advantages Broadway offers producers is New York City itself—what Werner chauvinistically describes as "the world's greatest back lot." As part of its expansion plans, Broadway will also shortly add a fair-sized insert stage to its facility, complete with dressing rooms, makeup areas, production offices, and so forth.

More often than the studio shoot, however, Broadway Productions is involved in field production. Since it does not own production equipment, Werner rents from companies in the New York and Boston areas. The same is true for teleproduction vehicles. "We have had good success with a couple of the local large mobile units here," observes Werner. "My job in production is basically to insure that everything is technically right . . . that the equipment is acceptable . . . that it's well-maintained and that it's in technical alignment." Werner does an extensive check between the rental equipment and Broadway's post-production equipment for interchangeability—to head off all those problems that can come up later such as time code, track straightness, audio recording levels, and so on.

"I think the most important thing is the general appearance of the vehicle," says Werner, "whether it appears to be..."
well-maintained, whether it's clean, whether the equipment that they have is properly kept. It's obvious as soon as you walk into a truck or a studio whether or not they do a good job keeping their stuff up. I've seen a lot of trucks that look like they've had a bomb dropped on them, and they've got perfectly legitimate excuses such as they have been out doing sports remotes and have had all kinds of crews running in and out. But being that it is such a hard task to keep a truck together, the better they're kept the more respect I have for them.

After this initial impression, Werner evaluates what type and how much equipment the truck carries. Then comes a technical checkout to make sure it all works properly—making sure the switcher is balanced and the audio board isn't humming and has the appropriate equalization. Then comes the detailed checkout in which the signals are actually measured and the system aligned to technical specs.

"Invisible" post-production

Despite the recent activity in production, it is post-production, however, which is the key to Broadway's success. Werner's idea in the three on-line and one off-line rooms "was to have the post-production side remain as low-tech to the end user as possible. I didn't want to make it so homey that we would run around putting doilies on everything, but I did want to keep it pretty transparent to the client as to what was going on and where all the hardware was. I really wanted their attention to be able to be focused on the product and the interaction with the editor himself."

Of course, it is almost impossible to hide the switchers (CDL 480-8 in Edit Rooms 1 and 2, and a 480-10 in ER 3, all with CAP automation) and the editors (three Sony BVE-5000s). But all the tape transports, including four Sony BVH VTRs for each room, plus an Otari multitrack ATR, are housed together in a central master control area that services all three edit rooms but keeps the equipment out of sight.

The four-VTR complement is generally dedicated to the particular room, but can be repatched if necessary. "With VTRs and similar equipment," observes Werner, "we try to have a lot of redundancy for every room, because they're subject to failure no matter what brand they are. The idea is to not hold the client up with that kind of problem, and by having four VTRs assigned to every room we have much better odds of not having anything disrupt the session."

A somewhat different philosophy prevails when it comes to Broadway's extensive repertory of digital effects and graphics devices—what Werner describes as "the country's largest used car lot of digital video equipment." These include the MCI/Quantel Paint Box and Mirage, a DPE-5000SP single-channel effects system, a DPE-
And now a message on Yamaha's new RM1608 recording mixer.
SPECIFICATIONS

TOTAL HARMONIC DISTORTION (T.H.D.)
Less than 0.1% at +4dB output, 20Hz to 20kHz (all Faders and controls at nominal)

HUM & NOISE (20Hz to 20kHz) Rs = 150 ohms
(INPUT GAIN "-60")
- 128dB Equivalent Input Noise (E.I.N.)
- 95dB residual output noise: all Faders down.
- 80dB (84dB S/N) PGM Master volume control at maximum and all CH PGM assign switches off.
- 64dB (68dB S/N) PGM Master volume control at maximum and one CH Fader at nominal level.
- 73dB (77dB S/N) STEREO Master Fader at maximum and all CH STEREO level controls at minimum level.
- 64dB (68dB S/N) STEREO Master Fader at maximum and one CH STEREO level control at nominal level.
- 80dB (70dB S/N) ECHO SEND volume at maximum and all CH ECHO volumes at minimum level.
- 75dB (65dB S/N) ECHO SEND volume at maximum and one CH ECHO volume at nominal level.

CROSSTALK
- 70db at 1kHz: adjacent Input.
- 70db at 1kHz: Input to Output.

MAXIMUM VOLTAGE GAIN (INPUT GAIN "-60")

<table>
<thead>
<tr>
<th>Mode</th>
<th>Gain from MIC to PGM</th>
<th>Gain from TAPE IN to PGM</th>
<th>Gain from ECHO RETURN to PGM</th>
<th>Gain from MIC to STEREO</th>
<th>Gain from TAPE IN to STEREO</th>
<th>Gain from ECHO RETURN to STEREO</th>
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<td>24dB</td>
<td>34dB</td>
<td>74dB</td>
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<tr>
<td>STEREO</td>
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<td>34dB</td>
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ECHO
- 70dB: MIC IN to ECHO SEND.
- C/R: 74dB: MIC IN to C/R OUt.
- 24dB: 2 TRK IN to C/R OUt.
- STUDIO
- 74dB: MIC IN to STUDIO OUT.
- 24dB: 2 TRK IN to STUDIO OUT.

CHANNEL EQUALIZATION
± 15 dB maximum
HIGH: from 2kHz to 20kHz PEAKING. MID: from 0.35kHz to 5kHz PEAKING. LOW: from 50Hz to 700Hz PEAKING.

HIGH PASS FILTER - 12dB/octave cut off below 80Hz.
OSCILLATOR Switchable sine wave 100Hz, 1kHz, 10Hz
PHANTOM POWER 48V DC is applied to XLR type connector's 2 pin and 3 pin for powering condenser microphone.

DIMENSION (W x H x D) 37-1/2" x 11" x 30-1/4" (953 mm x 279.6 mm x 769 mm)

Hum and Noise are measured with a -6dB/octave filter at 12.47kHz, equivalent to 20kHz filter with infinite dB/octave attenuation.
Sensitivity is the lowest level that will produce an output of -10dB (245mV), or the nominal output level when the unit is set to maximum gain.
All specifications subject to change without notice.

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5000Plus multichannel system, a single-channel but full-blown Ampex ADO, the Vidifont Graphics V, and CDL switchers, and innumerable framestores and synchronizers. With the larger systems—the ADO, Mirage DPEs, and Graphics V—rather than having the machine dedicated to a particular edit room, control is shared among the rooms by a system Werner himself invented. The control head for each of these machines is mounted on a cart which can be wheeled into any of the rooms and simply plugged into the serial port provided for it. Back in the master control area, the wires from the various edit rooms are fed together into a single data switching network so that an operator, by turning a single three-position switch, automatically connects the device—including all the control cables and key signals—with the appropriate edit room.

"Instead of going around patching and moving cables," Werner explains, "we have it all nicely bundled and neat in one place. And it's fast. Even the nontechnical operational personnel can get in there and do a changeover without having to go find a maintenance engineer." Another advantage is that if a client suddenly discovers that some extra piece of equipment is needed but was not scheduled, it can be placed in the editing suite with an absolute minimum of fanfare and fuss.

**Software interfaces**

As for the interconnection of various pieces of production and post-production equipment within the plant, Werner is like many engineers today wrestling with the interface problem. For the moment, he uses the fairly common General Purpose Interface Bus (GPIB) approach in which the BVE editor acts as the central controller. When the editor hits a predetermined time code number, an electrical spike is generated in the editor's output port and travels to a peripheral device such as a production switcher, which is then activated by relay closure. In the slightly more complex version of this scheme which Werner has evolved, a pulse path extender is used to interface several different peripheral devices to the editor at once, using a 10-key touchtone-like pad to assign peripherals to the editor by means of assignment codes.

Still, the GPIB can only affect a single relay closure at a time; a complex switcher or effects sequence must therefore be set up on the switcher or effects device's automation programmer and the automation program then activated when the GPIB signal is sent.

The problem with this solution, for Werner as well as for most in the business, is that the effects in the edit cannot be easily modified later on, as is the case with the edit decisions themselves. For although the activation of the GPIB pulse is stored as an event, the specific settings on the switcher or effects device are not. And clients want to be able to come in a month or two after a program has been cut, take out a piece of paper, and say they want effect 123—a tumble effect on the DPE extending back into infinity—lengthened by 37 frames.

The answer, of course, is the development of a standard interface for various pieces of equipment in the digital studio—something which SMPTE committees are hard at work defining.

Werner has already begun work on a
system that will allow the interface of all his various pieces of equipment. "We have several possibilities," he notes. "Either we can use a control computer to translate between all the devices and have it talk everybody’s language, or we can try to modify the software that is already in the various devices so it will interface with other people’s systems. At this point, though, it’s all very proprietary and it’s a very difficult task to get the manufacturer to give you any inklings as to what’s going on in there. That’s a situation that’s going to have to change in post-production, because the systems are getting to the point where they’re so expensive that anything that’s held proprietary as far as software is concerned becomes a liability. The manufacturers are just now wrestling with the problem—‘should we give the customer access to the software... what are the legal ramifications?’ It’s making the job of truly having boxes talk with each other very difficult. We’ll interface more and more if we can get the manufacturers to cooperate. I think they want to—I think they’re just a little scared of it.

"Now there are people around who think that the switcher should be the central controller—the device that’s got all the ‘smarts.’ And there are others who think the effects generator should have all the smarts. And so it’s a problem of establishing who’s going to be the control master, and who’s going to be the slaves. The problem is that the editing system has come to be the central pivotal point in any control scheme, because almost every event that happens in an edit has to be indexed to time code and an editor is the only system that manipulates dynamically based on those numbers. An effects generator doesn’t care what the time code says and doesn’t rely on it for anything in its control scheme."

Meanwhile, until the standards are defined, Werner is working with a New York City computer house, which is writing a communications program that should solve many of the interface problems. Known as "Savant," it is under development by Robert London and Associates.

"What I have in mind," says Werner, "is utilizing all of the technology which broadcasters and teleproduction people have at their fingertips to create incredibly powerful systems. If you take a system like the Paint Box with its animation program to create an image, then feed it to a device like the Mirage for manipulation, then use VTRs and the switcher's re-entry and keying for layering effects, you have a tremendously powerful system, of which 70 percent is already in place in the production facility. All we need is the "magic little black box" that will enable us to hook it all together."

In regard to the Mirage, Broadway has employed the services of a programmer to define some new basic shapes for the Mirage system, including the "black hole"—a whirling, funnel-shaped cone which absorbs the raster into itself, then explodes outwards with a new image. By working with the advanced graphics programming of Mirage in the basic shape definition mode, the facility can always provide the client with something brand-new and never seen before. The whole field of computer graphics, in fact, is of special interest to Werner for just this reason.

"Of course," says Werner, "with any computer graphics application you’ve got to look at what’s going to work in the broadcast environment. And that means carefully distinguishing between image synthesis and image manipulation. What the Mirage does, and I think it’s astounding, is to apply the mathematics of image synthesis to the function of manipulation, meaning that I can make the whole video roster into a super-toroid mathematically defined shape. Or do a B-spline with it, or bi-cubic patches. There’s nobody’s image processor that will do that in real time. It’s not a true image synthesizer, in the sense that it won’t create ray tracing images—the kind of work that computer-generated movies do where each frame of the sequence has to be calculated by a complex series of mathematical algorithms. But what the Mirage does in real time is truly astounding."

Stereo audio capability

Werner’s concern with the future trends of technology extends to audio,
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too. In fact, Broadway Video was one of the country's first post-production facilities to install extensive post-production stereo audio capability—in Edit Room 3. This is also the first edit room in New York City built to live end/dead end monitoring specifications yielding an absolutely flat monitoring environment. That room, like the other two, has a large Sound Workshop console (Broadway played a highly active role in the development of the console line several years ago), interfaced into the editing system so it can be controlled, like the video switchers and effects systems, by the BVE.

Says Werner of ER 3, "audio is very important to me, and we've always built our rooms using recording studio quality audio equipment. We knew stereo audio for TV was coming and we were involved with trying to push that technology forward. And so, when I was designing the new edit suite, I decided that I might as well go ahead and put in the stereo capability so it could serve as an impetus for everyone else to get serious."

The commitment to quality audio at Broadway extends to the smallest detail. "We have Dolby across the board since Dolby was available in VTRs," notes Werner. Dolby boards are installed internally in the BVH-1100As, but are outboarded on the newer BVH-2000s, since Broadway got some of the first 2000 units delivered, before the Dolby internal boards had been developed.

Broadway also has some very special special effects equipment, including a Synclavier 2 digital synthesizer. One of its features is Sample, a digital sampling system which can take music or sound effects, read them into the system and encode them, then literally pick them apart to analyze and manipulate characteristics such as attack and decay, sustain, fundamental and harmonic frequencies, and so forth. The results are recorded digitally as the equivalent of a 16-track ATR on a hard disk drive, which can be programmed to run in sync with video. At a sampling rate of 25 kHz (software available), 15 minutes of audio can be recorded.

Broadway also has an Otari MTR-90 24-track ATR, plus an Ursa Major

The changeover switch developed by Broadway that allows instant distribution of control and key signals from one edit room to another.

Space Station, Eventide Harmonizer, and various other audio production devices. "Plus some damn knowledgeable people to back it up," notes Werner. "I think producers are really getting very savvy when it comes to sound. Obviously if it comes down to a choice between picture or sound, they

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The future: HDTV

With Broadway's emphasis on state-of-the-art thinking, it is not surprising to find that Werner is excited about the possibility of HDTV, even though it will mean a costly equipment transition—a transition similar to what happened when one-inch tape came along. Werner is an active member of the ATSC (Advanced Television Standards Committee), which is seeking to define HDTV and enhanced NTSC standards. “HDTV is going to do some big things,” claims Werner. “I think it's a foregone conclusion that we will have it.” Unlike many in the industry, however, Werner does not see HDTV coming into either broadcast or cable services. Rather, he feels, “I think that the first place where we'll probably see it is DBS. It's not outlandish to think that it might be distributed terrestrially on an MDS system much like some of the major cable companies distribute their signals in metropolitan areas. I think that you may be able to squeeze a couple of HDTV channels up into that range, and do it locally. I'd like to see it happen.”

In other new developments, Werner is equally optimistic. “We're moving into exciting times,” he concludes. “And Broadway Video is helping to define the shape of the future.”

will make a few concessions when it comes to the audio. But the concessions they make are getting to be fewer and fewer.”

The future of audio, for Werner as for many in the industry, lies in stereo audio for TV. It depends only, of course, on the establishment of standards—which may be as close as three months off. When that happens, according to Werner, “the ball will be in the producers' court, because the hardware is already in place and a lot of people in the industry already know how to work in stereo. A lot of producers have audio people on the production end to insure that stereo information is recorded—even though it needs to be sweetened or remixed later, but it's there. Now it's up to the producers to come up with some original material for it. Music is the most obvious application. But it's going to get interesting when someone on a soap opera can walk from the left to the right side of a set and the audio follows.”

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BME 110 63
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Ikegami has just made it impossible for any quality-minded high resolution color monitor user not to consider looking into an Ikegami monitor. They call it the 9-Series, two new monitors (13V and 19V) with standard features that include a High Resolution Shadow Mask CRT with a Self-Converging In-Line Gun; American Standard Matched Phosphors; a Comb Filter to preserve luminance resolution; pulse cross and R-Y/B-Y outputs. We think you’ll call it just what you’ve been looking for. Along with its streamlined design and easily serviced modules, Ikegami’s new monitors follow in a tradition of excellence. Each offers high stability, exceptional performance and proven reliability. Together with Ikegami’s Delta-Gun Series, the 9-Series provides yet another reason to look into the monitors that more and more video users are spending their time looking into.

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It has taken 125 SMPTE technical conferences and equipment exhibits to do it, but there can be little doubt that the 125th show, October 30 through November 4 at the Los Angeles Convention Center, will once and for all establish the SMPTE conference as second only to the NAB show itself in terms of its importance to the broadcast industry. For while maintaining its role as the prime technical society for the motion picture industry, SMPTE and its standards-setting activities have become critical to broadcasting and production as well, both video and now, to a greater extent than ever, to audio.

Part of the news being made by SMPTE is that the equipment exhibit will, for the first time, be held in a convention center rather than a hotel, enabling manufacturers to spread out and mount the kinds of exhibits familiar to NAB attendees. More than 150 companies (see the breakdown of Audio and Video Equipment Exhibitors below) will occupy some 70,000 square feet of space. The exhibit will be open for four days, with the following schedule:

- **Monday, Oct. 31:** 2:00 pm–8:00 pm
- **Tuesday, Nov. 1:** 10:00 am–6:00 pm
- **Wednesday, Nov. 2:** 10:00 am–6:00 pm
- **Thursday, Nov. 3:** 10:00 am–4:00 pm

As for the technical conference, the theme this year is “Future Sights and Sounds,” and though the program is not completely firmed up yet, the conference topics clearly reflect the active role which SMPTE is playing in the audio and video industries: recording systems; display equipment; new audio technology; HDTV; designing video installations; small-format video recording; tape-to-film transfers; Olympic video systems; microprocessor control systems; post-production practices. Many of these topics, of course, are keyed into the activities of various SMPTE committees considering such topics as analog and digital studio interface standards, quarter-inch recording, HDTV, and so on.

Many will also recognize these themes from continuing BM/E coverage of major technological trends—such as the special reports on post-production in the November 1982 and February 1983 issues, the report on the Olympics in the April 1983 issue, the special series of articles on Facilities Design and Engineering which have been running since May 1982, the story on digital video recorders and the all-digital studio in March 1983, and so forth. A complete report by BM/E on the SMPTE show will appear in the January 1984 issue.

### Audio and Video Equipment Exhibitors at SMPTE, 1983

- **Abekas Video**
  - 1001
  - VSP-42 “video slide projector” electronic still store.

- **Adams-Smith**
  - 839, 841
  - System 2600 time code and control products, including VITC systems.

- **ADC**
  - 1519, 1520
  - Magnetic Controls
    - Prewired audio and video jackfields, including Patch-man system, plus connectors, plugs, etc.

- **ADDA**
  - 138
  - ESPC still store and graphics system with new library control; VIP digital effect system; AC20A dual-channel TBC; VW-2 frame sync/TBC.

- **ADM Technology**
  - 438, 440, 442
  - Audio consoles and components.

- **A.F. Associates**
  - 639
  - B3410 Marconi telecine; AVS 6000 standards converter; MR-2 Marconi

- **Ampex**
  - 130
  - VPR Type C VTRs; mobile teleproduction vehicle construction services.

- **Agfa**
  - 908, 910
  - KCS and KCA videocassettes in standard lengths and bulk packs.

- **Alan Gordon Enterprises**
  - 1011
  - Distributor of lighting, power, and support equipment.

- **Alpha Audio**
  - 1513
  - Sonex soundproofing material.

- **AmpereX**
  - 431
  - Plumbicon pickup tubes ranging from 80XQ half-inch to XQ1410 30 mm and including XQ3500 high-resolution model.

- **Amtel**
  - 1502
  - SMPTE time code products, including ECM VITC/longitudinal readers and generators.

- **Angenieux**
  - 732, 734
  - Zoom lenses.

- **Anton/Bauer**
  - 911, 919
  - Snap-On batteries and full line of camera, VTR, and lighting power supplies; Lifesaver charging system; Black Beauty portable lighting head; Micro Control portable 1.5-lb. CCU; silver battery system.

- **Anvil Cases**
  - 752
  - Custom and standard transit and shipping cases and rackmounts.

- **Apert-Herzog**
  - 1508
  - Model H TBC/frame sync; Model A frame sync; 1x24 video DA; TDAC D/A; VBB-1 hybrid video line driver.

- **Asaca/Shibasoku**
  - 615, 714
  - HR color monitors; audio and video T&M instruments; multi-image view-
ing system for editing displaying 16 frames from each of three sources plus edit preview.

Audico  727
Video cassette and audio cassette and cart loaders, rewinders, wipers, splicers, and labels.

Audio & Design  1117, 1119
Audio signal processing, including compressors, limiters, filters, equalizers, de-essers, mic preamps, and special effects.

Audio Kinetics  331
Q-Lock 3 time-code-based audio synchronizer/editor; multitrack dubs.

Audio Magic  940
WORDFIT digital audio processing system for audio/video synchronization.

Aurora Systems  425
Aurora/100 digital art/paint system with two-plane animation and color table lookup pseudo-animation.

Belden Comunications  539, 638
Lee filters for color correction, special effects, and diffusion; HMI lighting.

Beston Electronics, Inc.  111
(BEI)
Character generators; Marquee graphics system; DataNews newsroom computer/prompting system; McInnis-Skinner Newscan newsroom computer and Weathergraphics weather reporting/graphics system.

Bill Daniels Co.  153
Catalog of broadcast equipment.

Birns & Sawyer  541-543
Distributor of lighting and support equipment.

Bosch  600-604, 501-505
FGS graphic systems; CCD telecine with grain reducer; Quatercam quarterinch recorder/camera; ENG/EFP cameras; studio production equipment; routing switches.

Canare Cable  452
Wire and cable, including new 750 Ohm coax.

Canon  311
Zoom lenses featuring new ultra-wide-angle studio lens.

Centro Corp.  223, 235, 322, 324
Mobile vehicle construction services.

Century  500, 502, 504
Precision Optics
Lenses, including new Century periscope relay system (Snorkel); Tri-Tronics stop-motion video recorder.

Cetec Vega  250
Wireless mic and intercom systems with new built-in noise reduction for 105 dB dynamic range.

Christie Electric  1505
Reflex-20 20-minute “burping” battery charger system; MaxErase bulk deguasser.

Chyron  439
Chyron IV graphics system with Multimode Graphics Module; VP-1 low-cost character generator; new VP-2 stand-alone low-cost character generator.

Cinema Products  247, 249, 251, 346, 348, 350
Stereophonic, wide-screen, and 3D TV systems; Steadicam and other camera support equipment; HMI lighting and Bubblelit; EC-35; Co-Ax digital remote CCU; full line of cine cameras.

Cinemills  103
Distributor of lighting equipment, including Lee filters, Daymax high-intensity bulbs, and HMI lights.

Cine 60  1410, 1411
Lighting and power equipment, including rechargable nicad belts, packs, and snap-on batteries, sun guns, universal maintaining charger, and car charger.

Cipher Digital  823
Time code products, including VITC products and longitudinal-to-VITC converter.

Clear-Com  550
Intercom and IFB system, including single/multichannel, portable/rack/custom-mounted units. Also wireless intercom systems.

CMX  400
3400+, 3400, and The Edge editing systems.

Coherent Communications  555-557
Distributor of time code systems. MX-80 portable production mixer; Artech wireless mics, and subminiature mics.

Colortran  926, 827
Full line of lighting products, including fixtures and automated dimming systems.

Comprehensive Video  547
Computer software for video production automation. New portable audio mixer. Comprehensive production music and efX library; distributor of full line of lighting, power, and support equipment.

Control Video  300-302
Lightfinger video editing system with touch-screen control.

Convergence Corp.  222, 224, 226
Editing systems ranging from ECS-90 cuts-only to multisource ECS Editors, including ECS-200.

Cool Light  532, 534
Portable and studio cool-operating fixtures.

Corporate  1115, 1214
Comm. Consultants
Computer-controlled telecine and dub color correctors.

Crosspoint Latch  838-840
Production switchers, editor interfaces, audio mixers, computer-controlled switchers, including new three M/E 24-input 6139CH and new eight-input 6116 component switcher.

Datatron  947
Vanguard and ST-3 video editing systems; SMPTE time code systems.

Datum  1102
Video data encoders and decoders; SID systems; digital clocks and timers; character generators.

Deselec  650-652
Computerized setup and timing systems; digital synchronizer.

Desisti America  1003-1005
HMI and quartz lighting systems.

Digital Video Systems  931
Satellite transmission systems, including MAC; digital TBCs, framestores, and synchronizers.

Digivision  1000A
NTSC-to-high-resolution digital converter.

Digitrol, Inc.  1007

Dolby  155-157
Complete line of audio noise reduction equipment.

Dubner  301-303
CBG-2 graphics system with character generator, animation, digital painting.

Eastman Kodak  409
Datakod magnetic coating for post-production; telecine analysis film; full line of motion picture film stocks.

Echolab  356
SE/3 special effects generator/switcher with RS232 and 423 editors.

EECO  355-357
SMPTE time code systems; IVES video editing system.

EEV  202-204
Complete line of Leddicon and Vidicon pickup tubes; CCD cameras and chips.

Elector  824-826
Barco monitors; other monitors, including high-resolution, utility, and portable; tuners and demodulators; chroma display phase adjustor for monitor alignment.
ESE 700
Digital clocks, timers, time code systems.

Film/Video Equipment 254
Distributor of lighting and power equipment.

For-A Corp. 631, 730
FA-410 digital TBC; CCS-4200 color corrector; FVV-300 "video writer"; VTW "video typewriters"; CI-10 framestore; TKY-4600 title keyer; TCR-3500 time code reader/generator.

Fortel 607-609, 706-708
Y-688 dub multiprocessor; Digibloc digital signal processing system; synchronizers; heterodyne and direct TBCs; audio synchronizers; color corrector.

Frezzolini 114-116
On-Cam half-inch recorder/camera package; full line of batteries for cameras, VTRs, lighting; rechargers; lighting kits.

Fujinon 128
TV camera lenses for half- through 1.5-inch format cameras.

Fuji Photo Film 123, 125, 127
Complete line of half-, 3/4-, one-, and two-inch videotape and cassettes.

GE, Lighting Group 306-308
Lamps for TV production.

G&M Power 450
Grass Valley Group 231, 233, 235, 330, 332, 334
300/Mk II production switcher; 1680 production switcher; Horizon routing switcher; Wavelink fiber optic transmission system; 3250 sync generators; 10X utility switcher.

Gray Engineering 739-741
Complete time code systems, including longitudinal and VITC units; safe area generators; video-assisted film editing products.
THE 6112 IS BY FAR THE MOST ADVANCED SWITCHER IN ITS CLASS. NOTHING ELSE EVEN COMES CLOSE

Complete a mix or wipe on a 6112 (or any of our switchers for that matter), and there is ABSOLUTELY no COLOR CHANGE or HORIZONTAL SHIFT, we mean just that, absolutely none. That is because the 6112 has a blanking processor which replaces the sync and burst on all incoming video signals with a constant amplitude internally generated signal; completely eliminating the continuous problems caused by small drifts in your cameras and TBC's. You never know the value of a blanking processor until you own a switcher that does not have one.

OPERATE THE 6112 DIRECTLY FROM THE EDITOR KEYBOARD

The 6403 allows the 6112 to interface directly with most editors. No modification to the editor is required.

Under 6403 control the 6112 accepts commands such as duration times, pattern type, bus selection, etc., from the editor keyboard. The 6403 also provides additional capability of accurate start and finish, size and position of pattern transitions.

Audio follow or split audio capability is provided by the 6800 mixer which has separate level controls for each stereo input. The 6803 can be driven either directly by the editor or via the 6403 interface unit.

DELIVERY WITHIN TWO WEEKS

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(201) 688-1510 Telex: 181160

Circle 165 on Reader Service Card

90 BM&E OCTOBER, 1983
Camera Mart and Multidyne.

For High Performance Video Test Equipment.

Multidyne. It’s the name for quality, portable test and production support equipment. Innovative, sophisticated, reliable, it is now considered the standard of performance in the field and studio, and is in use in major broadcast and cable TV stations, and post production facilities.

Camera Mart. It’s the place where professionals provide customized service for every client. Camera Mart, a leading center for broadcast quality video products is the exclusive Multidyne distributor in the USA.

Camera Mart and Multidyne—A combination you can rely on for all your video needs.

VPDA-2: A Multi-Purpose Video Distribution Amplifier. The very fast slewing time, bandwidth and high current capability of the output stage makes the VPDA-2 capable of driving six 75 ohm loads distributing video, pulses, or subcarrier. Equalization of 2000 ft. of cable is accomplished with the use of one control. Gain is variable. The VPDA-2 is operable at 115/230VAC or 12V DC which makes it excellent for EFP and location vehicle applications, especially where large runs are required.

TS-1: A video/audio Test Generator with split-field NTSC bars, 1000Hz audio tone, optional black burst, ovenized crystal, cross hatch. The TS-1 is AC/DC operable which makes it an essential maintenance tool for ENG, vans and in-house editing.

TS-2: A Signal and Sync Generator with split-field NTSC bars, tone, black burst, and a 12-character message. Optional 10-second countdown with tone, a small character generator for video logging, and cross hatch. The TS-2 is ideal for vans, editing, and studio applications.

TS-3: A video/audio source identifier, provides split-field NTSC bars, black burst, 10-second countdown, 16-character message, and audio tones. Two additional messages are held in memory. Messages can be programmed by the key pad. The TS-3 is ideal for vans, editing, head end distribution and audio and video links.

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456 West 55th Street, New York 10019 • (212) 757-6977 Telex: 1-2078
Video Department: 800 Tenth Avenue
Sales • Service • Rental

Circle 166 on Reader Service Card
Audio for video is on a lot of minds these days. Advanced video formats and transmission methods make dramatic improvement possible. Producers' concerns over the initial impact and residual value of their programmes make it desirable. EFP, new competitive arenas and increased consumer awareness make it necessary. And now, the SSL Stereo Video System makes it practical.

The SL 6000 E Series places all of the signal processing, switching and machine control required for live and post-production stereo audio under the control of a single engineer. Fully distributed master logic and extensive local switching accommodate the immediacy of broadcast requirements with the versatility of multi-track technology. Exclusive SSL software and a unique mix bus system combine the creative flexibility of film sound technique with the efficiency and economy of electronic production.

The SL 6000 E Series lets you specify a system which will meet your current needs exactly. As those needs grow and change, SSL fills them with additional hardware and software modules which retrofit in the field. The Stereo Video System is designed and built to last. Your investment is further protected by performance specifications which exceed the challenge of the best 16 bit digital recorders.

And of course, the Solid State Logic Stereo Video System provides you with the ergonomic and sonic attributes which have made our companion SL 4000 E Series the leading choice of the world's great music studios.
Format Flexibility

The Stereo Video System's six bus mix matrix accommodates all audio-for-video formats. Along with standard mono, stereo and multi-track operations, each input may be panned between one of three stereo mix buses. This allows the engineer to freely divide the console into dialogue, music and effects sections as each project requires.

The Dialogue, Music and Effects mixes may be recorded in mono on a 3 stripe or 4 track, or in stereo on an 8 track or the multi-track master. Composite stereo and mono mixes of all 6 buses are derived from the master mix matrix for monitoring, transmission and/or simultaneous (first generation!) layback to the stereo video recorder. Alternatively, the six buses may be used for stereo mix and mix minus feeds during live coverage.

Comprehensive Signal Processing

Each I/O module contains an expander/gate, compressor/limiter, high and low pass filters, four band parametric equalisation, six cue/aux sends and tape electronics remotes. Master logic, push-button signal processor routing, patchfree audio subgrouping, and 8 VCA Group Masters ease complex productions, and always provide the minimum signal path.

Total Recall

Complete details of all I/O module control settings are stored on floppy disc by SSL's Total Recall System, enabling console setups to be restored within .25dB accuracy. Not only does Total Recall save time on each production, it allows greater scheduling flexibility with fewer headaches than ever before possible.

Computer Assistance. Live And In Post.

The SSL Primary Studio Computer is instructed with simple phrases entered via dedicated command keys and an alphanumeric keyboard at the console centre. A small video display advises the engineer of all activity. Above this display, controls for the SSL Video Switcher enable the mixer to call programme, preview or computer displays to the main video monitor.

The computer accepts entries in all timecode and foot/frames standards, and provides complete cue, edit, punch-in and mix list management. In post-production, it links multiple ATRs, VTRs or film chains with the Dynamic Mixing functions, providing fast and familiar rollback and pick-up recording, with every move automatically updated in the computer.

In live production, the SSL Real Time System enables complex sequences of all channel and group fades and cuts to be pre-programmed, and then manually executed with a single set of controls.

The SSL Events Controller provides up to 16 multi-repeatable contact closures under computer control. The SSL Effects Controller adds 40 A/D ports to link the computer with external signal processors.

The Solid State Logic Stereo Video System is available in studio and Outside Broadcast versions from 16 to 56 I/O modules, with up to 112 line and microphone inputs plus four stereo effects returns. Please call or write on your letterhead for complete details and prices.
Lipsner-Smith 809-811
Ultrasound film cleaners; film previewers, editors, and rewinders.

Listec 802
Introducing Chroma color reference monitors. Also Vinten Merlin crane arm with remote control; other Vinten camera supports; Digivision prompting system.

Lowel-Light 433-435
Location lighting kits including Omni, D, Tota, and Softlight; new collapsible frame for lighting control materials.

LTM 1403-1408
HMI lighting from 200 W, including PAR lights; fiber optic lighting system.

L-W Intl. 101
Athena 4500 and 6000 telecines with motion controllers.

3M 100
Type C VTRs; routing switchers, machine control systems. Videotape and videocassettes.

Magnasync/Moviola 611
Videola film-to-tape transfer systems, including new V-400 designed for on-air operation.

Magna-Tech 115, 117, 119
Magnetic film dubbers.

Matthews 40, 44, 48
Studio Equip.
Sky-Cam support head remote control; other lighting and grip equipment.

Maxell 126
Complete line of audio and video tape and cassettes, including new line of tape for Betacam and M-format.

MCI/Quintel 347
DFS digital TBCs and frame syncs; DPE digital special effects systems; DLS digital still store and library; DPB-7000 digital "paint box" art and graphic system; Mirage 3D graphics system.

Merlin Engineering 716-718
ME-238 long-play VTR conversion; ME-288 standards converter; ME-258 ultra-wideband VTR.

Micron Audio 1503
Wireless mic systems, including new handheld transmitters and diversity receivers.

Microtime 246-248
Digital video processing equipment including T/E digital effects system, T-120D TBC and S-230 TBC/frame sync.

Midwest Corp. 150
Mobile production and broadcast vehicle design.

Minolta 1413
Lenses and SLR cameras.

Mole-Richardson 711
Complete line of lighting products.

Multi-Track 139, 141-143
Magnetics
Magnetic film dubbers; AVEC mixing console; new VITC time code synchronizer.

Nagra 702
ATRs.

N.A. Philips Lighting 654-656
Stage and studio lighting.

NEC America 401, 403, 405
E-Flex digital effects system with perspective and rotation; three-chip CCD camera; FS-16 frame sync.

Nova Systems 1523
O’Connor Engineering 601-603
Camera support systems, including Hydro-Ped and Model 50; new Model 55 aluminum tripod and new camera dolly.

Looking for a Distortion Measurement System?

The Amber model 3501 is quite simply the highest performance, most featured, yet lowest cost audio distortion and noise measurement system available.

It offers state-of-the-art performance with THD measurements to below 0.0008% ( -102dB), maximum output level to +30dBm and noise measurements to below -120dBm.

It has features like automatic operation, optional balanced input/output and powerful IMD measurement capability. It includes comprehensive noise weighting with four user-changeable filters. Unique features like manual spectrum analysis and selectable bandwidth signal-to-noise measurements.

The 3501 is fast, easy to use and its light weight and small size make it very portable. It can even be battery powered.

And the best part is that it is 20% to 50% below what you would pay elsewhere for less performance. The Amber 3501 starts at $2100. Send for full technical details.
Panasonic invites you to see the next generation of Video Cart Machines at the 1983 SMPTE show.

Introducing the MVP-100 Multi-Function Video Player.

It's the MVP-100 Multi-Function Video Player and it will revolutionize broadcast automation. The big story behind the MVP-100 is its computer-controlled broadcast programming capability. Commercials, station IDs, and promos can all be programmed with time code accuracy. The MVP-100 is more than a spot sequencer. It can also function as your complete program player. And because it's modular, up to 24 video cassette transports can be loaded in advance. The MVP-100 also features M-format for multi-generation picture quality that goes far beyond 3/4".

Panasonic®
Audio-Video Systems Division

If you're not attending SMPTE but would like more information on the MVP-100, complete and send the coupon below.

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Visit Panasonic at SMPTE Booth Nos. 715 & 815

Circle 169 on Reader Service Card
**1983 CONFERENCE**

### Omicron Video
1009
Video DAs, sync generator, edit controller/switcher.

### Otari
1211
ATRs, including 5050 Mk-III-2 two-track quarter-inch; MTR-12 quarter-/half-inch 2-4-track; CB-116 auto locator accessory; MTR-90 multitrack; MTR-10 master recorder; plus full 5050 Series.

### Oxberry
158
Video animation equipment.

### Panasonic
715, 815
ReCam recorder/camera and editing system; high-performance monitors; new MVP-100 multifunction M-format VCR.

### PEP
147, 149
VHS recorder/camera system.

### Perrott Engineering
748
Nicad and silver/zinc batteries; chargers; portable lighting equipment.

### Phillips TV Systems
121, 218
LDK-6 triax and other studio, EFP and ENG cameras.

### Plastic Reel Corp.
122, 124
Storage racks; tape and cassette shipping cases.

### Precision Echo
454-456
Budget Squeezer digital video compressor/decoder; EFS video disk recorders.

### Quanta Corp.
339, 341, 343
Quantafont character generators, including Q-8 font-loadable titler; Select 7 graphic titler; Nicrogen low-cost titler.

### Q-TV
1515
Teleprompters.

### Rank Cintel
515
Telecine systems with FerRit magnetic sound follower, Slide File digital picture store, Amigo scene-by-scene color corrector.

### RCA
211
TK studio and ENG/EFP cameras, including TK-47 and TK-47P; Hawk-eye recorder/camera system with editor; Type C VTRs; telecine systems.

### R-Columbia
640
Wireless intercom headphones; other headphones, including new UL-85 ultra-lightweight 1 oz. model; wireless/wired intercom interface.

### Research Technology
809-811
Int'l. (RTI) Videotape/cassette cleaner/evaluators.

### Riviera Bdcst. Leasing
256
Equipment financing and leasing.

### Rosco Labs
254-256
Lighting control media.

### RTS Systems
531
Intercom and IFB equipment, including both conference and dedicated-channel systems; audio DAs, line amps, etc.

### Sachter Corp.
338
Camera supports, including new Video 20 and 25.

### Sennheiser
750
Full line of microphones and headphones, including MKE-2 ultra-miniature lavalier; shotgun mics.

### Sharp
1025
New XC-900D diode gun camera priced under $20,000 and XC-800 color camera; XC-803TX triax adaptor; other accessories for Sharp video systems.

### Shintron
1125
Production switchers, including new component video switcher; character generators; DAs; routing switchers; SMPTE time code equipment.

---

**Listec Television Equipment Corporation**
39 Cain Drive / Plainview, New York 11803 / (516) 694-8963 / Telex: 640470

**Listec (West) Corp.**
1619 Cosmic Way / Glendale, California 91201 / (213) 247-9247 / Telex: 182686

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See us at SMPTE Booth No. 802
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<th>Company</th>
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<tr>
<td>Shure Bros.</td>
<td>305, 307</td>
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<tr>
<td>Microphones and audio products, including AMS automatic mic/mixer system; SM-6 3L omni mic.</td>
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<tr>
<td>Sigma Electronics</td>
<td>649</td>
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<tr>
<td>Terminal equipment for TV studios with sync generators, proc amps, DAs, system timing.</td>
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<td>Skotel</td>
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<td>SMPTE time code systems.</td>
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<td>Solid State Logic</td>
<td>451, 453, 455</td>
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<tr>
<td>SL-6000E automated stereo audio mixing system for TV applications; SL-4000 master studio console; SSL automation system for live and post-production applications.</td>
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<td>Sony</td>
<td>315</td>
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<tr>
<td>Betacam recorder/camera system with editor; full line of BVP cameras; BVH Type C VTRs; BVU VCRs; BVE editing systems. Pro Audio products will include the Sony CD player and RF microphones.</td>
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<tr>
<td>Soundcraft</td>
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<td>Audio mixing consoles and multitrack ATRs.</td>
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<td>Sound Technology</td>
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<tr>
<td>Audio test equipment, including 1510A ATR test system and 1710A distortion measurement system.</td>
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<td>Studer Revox</td>
<td>1127, 1226</td>
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<td>ATRs, including A810 stereo broadcast recorder with center channel time code; A-800 Mk. III 24-track ATR; A-710 cassette deck; ECS-6000 automation system.</td>
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<td>TEAC</td>
<td>939, 1038</td>
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<td>Tascam audio products, including M-50 mixer, M-52 half-inch two-track ATR, M-58 half-inch eight-track ATR; system enhancement products.</td>
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<td>Tektronix</td>
<td>801</td>
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<tr>
<td>New waveform monitor/vectorscope unit; new 10-bit frame sync; complete line of test and measurement equipment.</td>
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<td>Tele-Cine</td>
<td>1417</td>
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<td>Schneider TV lenses, including 14x ENG/EFP.</td>
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<td>Telemeter</td>
<td>1106</td>
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<td>Computer-controlled routing switcher; system timing modules; demodulators, iso amps; fiber optics systems.</td>
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<td>Thompson-CSF</td>
<td>617-619</td>
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<td>Vidifont Graphics V character generator/graphics system with new software for weather and elections. Also Thom-C.A.T. computer-aided testing system.</td>
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<td>Telescript</td>
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<td>Equipment Assoc. (TEA)</td>
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<tr>
<td>Video delay lines and filters; headsets; teletext systems.</td>
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<td>Tentel</td>
<td>242</td>
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<tr>
<td>Tape alignment gauges, including Tentelometer tape tension gauge, spindle height gauges.</td>
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<tr>
<td>Ursa Major</td>
<td>1507</td>
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<tr>
<td>Audio processing equipment, including digital reverb.</td>
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</tbody>
</table>

Affordable Random Access Video Cart Systems

Cost effective, modular, and expandable

Any Tape Format
Choose from 1" Type C, ¾" U-Matic, ½" Type M, or any combination.

1000 EVENTS
Or more with 68K Multi-Event Programmer and Disc Drive.

The computer identifies, searches out, and activates tape segments to be cued and aired in the order scheduled.

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LA-KART™
LAKE SYSTEMS CORPORATION

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Circle 171 on Reader Service Card
Utah Scientific 1409
Station automation centered around new MC switchers; routing switchers and audio/video DAs.

VEAM (Div. Litton) 1400
Connectors.

Videomedia 335
Z6000 and Eagle video editing systems; Q-Star serial transport automation system.

Videotek 743
Monitors, including portable digital waveform monitor; rack-mount waveform monitor/vectorscope; AFV routing switchers; video audio, and sc DAs; picture monitors.

Vital Industries 530
New DEMC data entry machine control panel for SMPTE-based inputs for station automation; 250 P/N digital production switcher; SqueeZoom digital effects.

Weaver Steadman 942
Camera cranes.

West Coast Audio 1521, 1522

Westrex (Div. Litton) 152-154
Magnetic film dubbers.

Wide Range Electronic 304
Magnetic film dubbers.

Winsted 703
Modular editing consoles for all tape formats; production consoles; tape storage systems; equipment racks.

Zellan Enterprises 109, 111, 113
Distributor of Stellavox ATRs; Aaton cine cameras; Cooke lenses; HTL filters.

SMPTE 1983 FUTURE SIGHTS AND SOUNDS

Sunday, October 30
Morning Registration
Evening Registrants’ reception

Monday, October 31
Morning Papers: Future Sights and Sounds—Back to Basics
Afternoon Papers: Exhibition Audio — Realizing the Possibilities in Film and TV

Tuesday, November 1
Morning Papers: Audio Production and Post-Production
Afternoon Papers: New Image Display Technology

Wednesday, November 2
Morning Papers: Video Systems and Installations
Afternoon Papers: Scientific and Industrial Video Systems

Thursday, November 3
Morning Papers: Post-Production Practices I
Afternoon Papers: HDTV I

Friday, November 4
Morning Papers: HDTV II
Afternoon Papers: Microprocessor Control Systems

THE MOST FAMOUS PICTURE IN HISTORY
WAS SHOT WITH AN ANGENIEUX TV LENS

On July 20, 1969 over 600 million people watched as man first set foot on the moon. The lens which brought the excitement back to earth was an ANGENIEUX.

More recently, the most watched TV spectacular ever, “The Winds of War,” was shot with an Angenieux lens.

Now you may ask, what makes Angenieux so special. Perhaps it’s our reliability. We’re dependable enough to have been selected by NASA for all its space to earth transmissions. We even give NASA a 50 mission guarantee on every Angenieux lens. Or maybe it’s our innovation. After all, we pioneered the retro-focus lens and the world’s first 10 to 1 zoom lens.

Or maybe it’s our wide selection of lenses that broadcasters and production houses count on for top performance.

Before you buy your next broadcast lens, look at Angenieux. We’ll make you famous, too.

angénieux

FOR MORE INFORMATION ON OUR WIDE RANGE OF PRODUCTS CONTACT THE FOLLOWING ANGENIEUX BROADCAST SALES OFFICES

North/South Americas
12901 SW 74th St
Miami, Florida 33183
Tel (305) 366-1740
Telex 80-8045 Intelac-Mia.

Canada
190 Don Park Road
Markham, Ontario L3R-2V8
Tel (416) 485-5454

Remainder of World
Opticam S.A., Case Postale 91
1211 Geneva 17, Switzerland
Tel (22) 362266
Telex 27670-Opti-CH

Circle 172 on Reader Service Card
MAGNA-TECH
THE SOUND
HEARD AROUND THE WORLD
Magnetic Film
Recorders and Reproducers
for Television and Film
Sound Post-Production

HIGH SPEED
Telecine Magnetic Followers
Video Tape-Film Interlock
Electronic Looping
Dubbing Systems
16 and 35mm Electronic Projectors
Total Facility Engineering

WORLDWIDE SALES OFFICES

Paris
Hi-Fidelity Services
4 Rue Semard
75009 Paris, France

Sydney
Magna-Techtronics (Aust.)
PO Box 150
Crows Nest NSW 2064
Australia — Telex 24655

Johannesburg
General Optical Co., Ltd.
15 Hulbert Road
Johannesburg 2001,
South Africa

Rome
Alberto Sciaretta
Via Siria 24
Rome 00179
Telephone 7943618

Brussels
A.R.C.
Rue de Bolsde Linthout 45
1200 Brussels Belgium

Hong Kong
Paul Yang and Associates
901 Star House
3 Salisbury Road
Kowloon, Hong Kong

Bombay
Capt. P.K. Vishwanath
234/4 Rama Baug,
Deodhar Road
Bombay 400 019, India

Kehl West Germany
Zenon GMBH
Postfach 1743
Hauptstrasse 128
Kehl am Rhein
Tel: 07851/2991
Telex: 753537

London
Branch & Appleby
42 High Street
Harrow-on-the-Hill
Middlesex HA1 3LL,
England

Kuala Lumpur
Kinematronika Sdn. Bhd.
2852, Jalan Selangor/
Persekutuan,
Federal Hill
Kuala Lumpur, Malaysia

Caracas
Cine Materiales srl
Apartado Postal 61 098
Caracas 106 Venezuela

MAGNA-TECH ELECTRONIC CO., INC.
630 Ninth Avenue, New York, N.Y. 10036
Telephone (212) 586-7240
Telex 126191 Cables "Magtech"

Circle 173 on Reader Service Card
29 broadcasters bought the new Harris Medalist™ in its very first week! Here’s why.
Wide input switching flexibility. Transparent audio performance. Choice of attenuators. Adaptability to any application. Excellent cost/benefit ratio. Broadcasters across the country cite these as major reasons for choosing the new Medalist dual stereo audio console over all others.

Switching Flexibility

Input selectors switch after the mic preamp, allowing intermix of mic and other types of sources on any channel. The Medalist also gives you six selector positions each for headphone and speaker monitoring.

Superb Audio Quality

Harris engineering makes the Medalist remarkably transparent. The Signal-to-Noise ratio of 95 dB beats the competition by 10 to 20 dB, and is typical of the Medalist's outstanding performance.

Linear Or Rotary: Take Your Pick

Harris gives you a choice—two styles of linear and two styles of rotary attenuators. Intermix rotary with linear if you like, to suit your station's particular needs.

Easy To Install... Easy To Maintain

The barrel terminals on the input and output circuits connect quickly and surely. Additional preamps and program amp interconnect with plug-in ribbon cables. Also, you can change attenuator modules—even while you're on the air—in about the time it takes to cue up a record.

Versatility In A Variety Of Applications

The Medalist is equally well suited for AM/FM/TV on-air and production applications. Take your choice of two models—8 or 10 channels.

Learn more about the Harris Medalist family of audio consoles. Write Harris Corporation, Broadcast Group, Studio Division, P.O. Box 4290, Quincy, Illinois 62305-4290. 217-222-8200.
It was driving Arthur out of his tree.

Fidelipac builds the broadcast industry's most rugged, most reliable audio cartridge, by far. Now, you know, we load those cartridges with tape from manufacturers whose tape meets our specifications. And we're very picky about those specs.

Every time we discover a hub with uneven oxide coating; poor surface bonding; ragged edges or spotty lubrication, Arthur Constantine, our VP Sales, goes out of his tree. He'll ship miles of the stuff back to where it came from, before he'll send twenty five feet of it out to you.

That's the way he is. That's the way we all are.
And that's why seven out of ten radio stations around the world use Fidelipac Tape Cartridges.
There's simply no way we'll compromise the quality of our product.
Radio Broadcasters at NRBA to Explore New Opportunities

The annual meeting of the National Radio Broadcasters Association in New Orleans, set to run Sunday, October 2 through Wednesday, October 5, will present attendees with perhaps the most aggressive approach to radio broadcasting seen in years. The conference goals—"Identify the Opportunities, Define the Problems, and Present the Solutions"—read, in fact, like a battle plan for a medium that is going to come out fighting—and win!

Two of the seminars are slated to draw attention from anxious broadcasters concerned about recent legislative developments. There will be an SCA seminar, including a half-day workshop dealing with the opportunities and realities in the new world of SCAs, providing business and technical information on this important new challenge.

The second topic requiring a special session will examine one of the most far-reaching radio actions of recent times: Docket 80-90. The questions under consideration will be how 80-90 affects all radio broadcasters, not just FMs, and what those in the radio industry can and should do about what promises to be radical changes in the business.

Other topics of interest will be seminars on both digital transmission and redundancy systems. Also of note will be sessions on new tech/new profit opportunities and how radio broadcasters can get the most return on their investment in new technology equipment.

Claiming that the seminars will be packed with actionable information regarding the challenges of the day, the NRBA has also set aside a specific time period each day when attendees can visit the numerous exhibits of hardware and program services. This equipment will be on display in the exhibit hall opening on Sunday at noon.

Engineers may want to attend the informal "rap" session intended to allow engineers to air their important views on the technology and business of radio. There will be many seminars and a great number of speakers, among the most notable of whom are Mark Fowler, Walter Cronkite, and Mary Kay Ash, who will discuss sales techniques, at the Tuesday luncheon.

CONVENTION PROGRAM HIGHLIGHTS

Sunday, October 2
10:00 am Convention Registration Opens
Noon Exhibit Hall Opens
6:30 pm Opening Reception

Monday, October 3
7:30 am Registration Opens
9:30 am Opening Session: Keynote address by Mark Fowler, Chairman FCC
10:30 am Engineering Workshop: FCC-Engineering Dialogue
Harold Kassens, NRBA Engineering Counsel
Bob Greenberg, Mass Media Bureau
James Gabbert, KTZO-TV
Ogden Prestholdt, A.D.
continued on next page

CONVENTION EXHIBITORS

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Partial list as supplied by NRBA, 7/15/83.
* In addition to the above companies, many programming services will have hospitality suites, the locations of which will be listed at the convention.
Our Intercom System Brings It All Together

THE 8-CHANNEL DLC SERIES
Provides up to 8 intercom and 8 IFB channels or can be configured for a point-to-point communications system with up to 9 stations. Features include Stage Announce; ISO; selective program input; visual signalling; separate "listen" and "talk" controls.

PARTY-LINE INTERCOM SYSTEMS
Our 1-, 2-, and 4-channel intercom system line contains more than 40 different components and accessories, providing for countless configurations. Features include: up to 100 stations on a mile of wire; no-fail power supplies; carbon/dynamic headset operation; remote paging; visual signalling; 12v battery operation.

SYSTEM INTERFACES
A complete series of devices to interconnect Clear-Com with virtually any communications system. Interfaces include: AC-10K (for 2-, 3-, or 4-wire systems such as ROH, RCA), AC-10H (telephone line interface), IF4-4 (for TV camera intercoms), and TW-12 (RTS System interface).

WIRELESS INTERCOMS/INTERFACES
The freedom of wireless technology and the ability to interface with Clear-Com make our Wireless System an indispensable tool. Features include: up to 1/4 mile range; audible tone "call" function; can operate as stand-alone system. Simplex and Duplex systems available.
### Wednesday, October 5

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<td>9:00 am</td>
<td>Engineering: International Broadcasting—a visit to WRNO, a worldwide short-wave radio station</td>
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<td></td>
<td>Concurrent Workshops Continue</td>
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<td>11:00 am</td>
<td>Noon Convention Closes</td>
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**Exhibitor**

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<td>AM Stereo</td>
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<td>Radio Systems</td>
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<td>United Press International</td>
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**The unequalled equalizer.**

Not all equalizers are created equal. You know that from experience. So do we. Our years of parametric design experience let us build so much performance and versatility into our 672A (mono) and 674A (stereo) graphic/parametric equalizers that *Modern Recording & Music* (October, 1981) described the 674A as "...the most powerful equalizing tool for pro audio work that I have yet to come across". They clearly appreciated the versatility and functionality of eight bands of EQ with fully adjustable center frequency and bandwidth, plus the availability of 12dB/octave highpass and lowpass filters to limit signal bandwidth or to serve as a full electronic crossover.

No matter what your application—production, program shaping, room tuning, reinforcement work, or clean-up chores—you can count on Orban's heavy-duty professional construction and equally professional documentation and service. Find out why the Orban 672A/674A's are truly the "un-equalled equalizers".

Orban Associates Inc. 645 Bryant Street San Francisco, CA 94107 (415) 957-1067 TLX: 17-1450

Circle 176 on Reader Service Card
In the past ten years, computers have gotten smarter, cameras have gotten simpler, ovens have gotten quicker, beer has gotten lighter, bodies have gotten leaner, athletes have gotten richer, hi-fi has gotten higher, radio has gotten stronger, studios have gotten smaller, towers have gotten taller, movies have gotten longer, cars have gotten shorter, film has gotten faster, outerspace has gotten closer and blue jeans have gotten classier.
Now it's our turn.

In the past 10 years, the Premium Line from ITC has seen refinements, but no major changes. Frankly, it hasn’t needed any. The Premium Line has been a dependable workhorse that’s found its way into more studios than its next two competitors combined.

But we couldn’t leave well enough alone. So this year, the Premium Line gives way to the Delta Series, a new generation of cartridge machines that offers you more than ten years worth of improvements.

It’s mechanically better. The cart guides are improved. There’s a crystal-referenced servo capstan motor with a vapor-honed non-magnetic shaft. Modular construction makes alignment and service convenient. High-speed recovery is standard. And the Delta III gives you three independently removable decks.

It’s electronically better. There are new, high performance components, including NE5500 Series amplifiers. There’s an exclusive ITC/3M playback head for smooth frequency response and improved signal-to-noise. We’ve added a toroidal power transformer with fully regulated and protected power supplies. And a digital cue tone detector controlled by a powerful microprocessor.

And it’s physically better because it’s smaller. The whole unit is only one-third rack width (5¾”). The enclosure is made of ¼-inch milled or cast aluminum, for stability. And the panel inserts are made of Lexan®.

Of course, we left in all the good things that made the Premium Line so popular. The ½-inch tool plate aluminum deck. Duractile, high quality switches. A solenoid-actuated, chain-and-sprocket pressure roller assembly. All backed by our famous two-year warranty on parts and factory labor, plus a 30-day guarantee of satisfaction. If, for any reason, you’re not completely satisfied, you can return the unit within 30 days of purchase and we’ll refund your money in full.

The good things are still there. But what you’ll notice are the improvements. We think they were worth the wait.

For more information, or to place an order, call us collect from Alaska, Hawaii or Illinois, at 1-309-828-1361. From the rest of the U.S., call the toll-free number: 1-800-447-0414.

1983

1973

INTERNATIONAL TAPETRONICS CORPORATION

3M hears you...
Cost-Performance to Oki Doesn’t Mean Less Performance for Lower Cost. Performance Takes Priority!

LT1210 Digital Television Standards Converter

Professionals demand an uncommon level of picture quality in TV standards conversion. And production on the road requires a compact, reliable unit. Oki Electric built the LT1210 to deliver. It’s the world’s smallest converter able to handle NTSC, PAL, and SECAM, with PAL-M conversion as an option. Yet it incorporates every function and feature needed for producing studio-quality programming. The image enhancement function, for example, ensures a high-definition picture with outstanding image clarity. This converter is also a totally integral unit so no adaptor or changing of encoder/decoder modules is required for conversion between NTSC, PAL and SECAM.

The cost-performance of the LT1210 is nothing less than outstanding. Oki Electric’s proven expertise in standards conversion combined with the latest in LSI technology results in a highly reliable, easy-to-use converter. The LT1210. Check it out. Anywhere.

Oki also produces the high-end LT1015Σ Digital TV Standards Converter.
THERE IS HOPE for AM music programming despite the perception by consumers that AM is a low-quality, monophonic medium compared to FM. This perception is reinforced by narrowband receivers that provide muffled sound. It can be further aggravated by inappropriate audio processing at the transmitter.

What is the way out? In this article we propose a practically proven standard preemphasis and deemphasis characteristic that can produce subjectively high-fidelity AM reproduction. An alternate route—decreasing preemphasis and widening receiver bandwidths—was rejected for the following reasons:

- Reduction of preemphasis would be unacceptable to most radio stations because it would make their sound noncompetitive on typical existing narrowband mono radios.

- Conversely, new wideband radios would sound strident and screechy when reproducing preemphasized signals required by stations.

- Wideband radios would have to have sharp transitions between IF passband and stopband to achieve marginally acceptable selectivity. Such an IF characteristic causes unpleasant coloration and ringing, and sounds very dissimilar to FM. In addition, steep-slope filters cannot be successfully equalized with any amount of practical preemphasis.

- Wideband radios would cause static, impulse noise, and SCR buzz to sound unacceptably edgy and irritating.

The millions of such radios in use today will not vanish in a puff of smoke (as attractive as the idea may sound). Indeed, consumers may be inclined to keep their radios longer, especially those in automobiles.

The proposed deemphasis is similar to the characteristics presently found in the better-sounding radios. Combined with AM stereo, the correct preemphasis, creative programming and a strong consumer education campaign, such receivers could revive music on AM.

Of course designing an appropriate preemphasis/deemphasis characteristic presents a number of problems that must be considered. These include frequency allocations and occupied bandwidth, receiver bandwidths and IF shape, and inappropriate audio processing.

Car radios the key

It is improbable that any amount of improvement to the AM transmission/reception system will significantly alter home listening habits. Not only does FM stereo have intrinsically wider bandwidth, but it also offers superior rejection of many common types of noise that plague AM, such as static, impulse noise, SCR dimmer buzz, and the like. The most important factor,
however, is consumer conditioning. Consumers believe that FM stereo sound is better. If AM became better than FM tomorrow, it would take years to reverse this conditioning.

However, the automobile radio is different. There are many locations where FM stereo just does not work well. Bursts of severe multipath distortion, picket-fencing, and signal dropouts degrade the signal to well below "entertainment quality." AM is essentially immune to these effects. Moreover, AM stereo promises to deliver better, more consistent reception in the mobile automobile environment than FM stereo currently does. In fact, considerable audio processing of AM stereo in the car environment is desirable to make listening enjoyable despite the high acoustic noise level in the vehicle.

**Matched preemphasis**

A look at the mean measured response of typical AM radios (circa 1980) shows that despite the allocation of 15 kHz audio bandwidth to the AM channel, actual bandwidth of the radio is more like 2 kHz at -3dB (see Figure 1). This highly rolled-off response apparently was a reaction by manufacturers to consumer complaints about interference and static from impulse noise, but in taking such a severe design step manufacturers sacrificed quality.

Our proposed preemphasis curve shown in Figure 2 is the reciprocal of the "average" AM radio depicted in Figure 1 up to approximately 5 kHz, where slightly less than 18 dB preemphasis occurs. Above 5 kHz, it plateaus. If the boost continued, the extreme high-frequency boost would make manually tuned radios difficult to tune, might cause audio processors to misbehave, and would cause loudness loss. When this curve is applied to the average radio, the effective 3 dB-down bandwidth of the radio is extended from 2 kHz to 5 kHz—more than one octave—without midrange coloration.

---

**Fig. 1: Mean Measured Response Of Typical AM Radios (circa 1980)**

---

**The best sounding, most reliable audio cart. The Audiopak AA-4.**

Come, hear and see for yourself at NRBA Booth 605 and Demo Room located in the New Orleans Hilton, Suite 2329.
The only digital stills store that's right for every studio

The new Rank Cintel Slide File is so flexible that it's tailor-made for every studio — and every budget.

With Slide File in your studios you will have all the benefits of advanced electronic stills storage without losing any of the flexibility associated with 35mm transparencies.

How is this possible? Simple. Slide File is the first stills store to use streaming cartridge technology. Each cartridge stores up to 20 pictures which can conveniently go with you — anywhere, any time. Or, be tucked away for long-term storage.

Can you think of a stills store more flexible, or for that matter, better suited to the needs of your studios?

Slide File uses the latest EBU component encoding techniques and has a storage capacity of 80 frames, which is more than enough for any programme.

Slide File also incorporates numbered index pages that can show multi-picture composite displays; an image-enhancing electronic clean-up mode; frame grab with automatic synchronisation, pre-programmed still sequence selection; and a full preview facility.

Finally, cut, cross fade and dissolve facilities complete the studio capabilities of this unique new stills store.

If you would like to know more about Slide File, contact us now at the address below and we'll put you in the picture.

Rank Cintel
The world's finest broadcasting technology
Rank Cintel Limited, Watton Road, Ware, Hertfordshire, SG12 0AE, England.
Telephone: Ware (0920) 3939
Telex: 81415, Cables: Rank Ware.

Circle 179 on Reader Service Card
In order to control occupied bandwidth to meet FCC rules, this curve must be used in conjunction with a steep low-pass filter following the process. A fifth- or higher-order elliptical function filter with a ripple bandwidth of 12 kHz is appropriate.

This preemphasis curve is commercially proven and is already in use in several hundred radio stations. It is a practical way to improve the sound of existing radios without compromising the desired qualities of loudness, coverage, and receiver tuning ease. And with the use of a 12 kHz filter and appropriate audio processing, occupied bandwidth requirements are met.

Receivers that are slightly mistuned or whose IF bandpass is asymmetrical can produce objectionable distortion if excessive high-frequency energy is received. Such energy can also occupy excessive bandwidth. To control these potential problems, our recommended curve should be followed by a high-frequency limiter. This means that the transmission frequency response is identical to Figure 2 only when the program material contains a relatively small amount of high-frequency energy. When a large amount of high-frequency energy is present, the processing dynamically reduces the high-frequency response as necessary. With pink noise applied to the processing, the curve is typically up 10 dB instead of 18 dB. To achieve minimum perceived HF loss, we recommend dividing the pre-emphasized frequencies into several bands with relatively steep slopes, and processing each band separately.

**Matched deemphasis**

At first thought, a curve exactly reciprocal to Figure 2 might seem necessary at the receiver to restore flat response. But there are some problems:

- When a commercially desirable amount of multiband audio processing is used, there is typically a very slight midrange “suck-out” on current pop records due to the dynamic frequency response of the processing, which effectively changes the preemphasis response.
The shelf above 5 kHz tends to exaggerate distortion caused by aggressive audio processing.

The reciprocal of the Figure 2 curve stops rolling off exactly where the most selectivity is required.

Accordingly, we performed listening tests with a parametric lowpass filter in an attempt to obtain a receiver frequency response which would sound FM-like, but which would respect the practical limitations of the AM channel and the economics of manufacturing. The curve in Figure 3 was eventually accepted as the best compromise, yielding a "quasi-hi-fi" sound on both

### You would expect to pay $1,000.00 for a signal processor that's this good!

The Dyna-Mite™ multi-function dynamics processor performs several variations of 18 specific operating modes, including limiting, expansion, noise-gating, keying, FM limiting, de-essing and "voice-over". But, it doesn't just do a lot of things. That's easy! Dyna-Mite was created to outperform the very best "dedicated-purpose" equipment.

For instance, while most limiters employ peak or rms detection schemes that respond to arbitrary voltage or power levels, the Dyna-Mite's exclusive Linear Integration Detector offers variable response, dependent upon the degree of waveform complexity. Thus, a wide range of material can be processed to deliver sonic naturalness with complete freedom from the "squashed" or "strained" sound associated with the use of conventional limiters.

Another example of effective proprietary circuitry is Dyna-Mite's Anticipatory Release Computer, which delivers desirably short release times without excessive pumping or modulation distortion. And, Anticipatory Release reduces fast modulation distortion effects by a factor of 10 to 1, without subjectively lengthening the release or causing other audible disorders.

Even Dyna-Mite's output control is special! It's coupled with the threshold control, so that a predetermined output level is maintained regardless of the amount of limiting. There's no need for the operator to compute "make-up" gain.

Equal design consideration has been given to the circuitry for all of Dyna-Mite's operating modes to ensure that unexcelled performance is delivered without regard to cost.

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small speakers and large studio monitors. We believe that the average consumer would be unable to distinguish this sound from FM and that the audiophile would find it listenable and preferable to FM in an automobile environment.

Figure 4 shows the overall response of the recommended preemphasis curve cascaded with the recommended de-emphasis curve. This response is not flat, exhibiting a substantial peak at about 5 kHz, and gently rolling off thereafter. The peak compensates psychoacoustically for the rolloff above 8 kHz, and also tends to equalize the dynamic frequency response changes typically introduced by multiband audio processing. The high-frequency rolloff reduces the effects of monkey chatter and whatever high-frequency distortion might be induced by aggressive audio processing. Yet this HF rolloff is so gentle that the subjectively perceived bandwidth still extends 12 kHz.

Impact on AM stereo

While the recommended curve can probably be used with any AM stereo system, receiver design strategy in the linear stereo systems should be different from the nonlinear stereo systems.

The linear system developed by Harris will exhibit no problems with preemphasis and deemphasis. Provided that synchronous detection is used for stereo decoding, the recommended rolloff can be incorporated either in the IF or after the detector with essentially no change in system distortion characteristics. There must be enough IF selectivity to avoid potential cross modulation due to unavoidable nonlinearities in IF amplifiers and synchronous detectors. The IF bandwidth can be made arbitrarily small with no degradation other than frequency response rolloff. Envelope detector reception in mono will exhibit some even-order distortion. Deemphasis after the envelope detector would tend to emphasize any difference-frequency IM, and the deemphasis should therefore be realized in the IF. Fortunately, this is where it is realized in current mono radios, and field experience suggests that the envelope-detector distortion is quite innocuous, mainly adding brightness.

The situation with the other, nonlinear systems developed by Káhn-Hazeltine, Magnavox, and Motorola is more complex. Here, IF filtering and audio filtering are not interchangeable because of nonlinear detection. Ideally, the nonlinear detection is the inverse of the stereo encoding, yielding a linear transfer curve from transmitter input to receiver output. Simultaneously, compatibility with envelope detectors is assured.

However, this assumes an infinite bandwidth between transmitter and detector, and limiting this bandwidth can introduce problems. For example, with 9 kHz and 10 kHz applied simultaneously to a nonlinear system, in addition to tones ± 9 kHz and ± 10 kHz from the carrier, the RF spectrum will also contain sum and difference tones ± 19 kHz and ± 1 kHz from the carrier. If such a signal were to be passed through an IF realizing our recommended rolloff, the 9 kHz and 10 kHz tones would be attenuated more than 20 dB, while the 1 kHz difference-frequency...
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The Beyer M 260 has its own custom-designed ribbon element to optimize the mic's performance based on its Broadcast applications.

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When presented to the stereo decoder, the phase and amplitude relationship between the 1 kHz, 9 kHz, and 10 kHz tones would not be the same as they were at the transmitter. The 1 kHz difference-tone would thus not be cancelled by the receiver, and would be heard instead as IM distortion.

As a result, the preemphasis and deemphasis should be realized in a very specific way to alleviate potential problems. First, the separation should be limited to 5 kHz by placing a sharp-cutoff 5 kHz lowpass filter in the L-R audio path before the stereo exciter, and placing in the L+R audio path an allpass filter whose phase response matches the phase response of the 5 kHz lowpass filter. This way, most of the extremely boosted high-frequency energy will be broadcast in mono and will not introduce difference frequencies into the RF spectrum.

Second, the IF bandwidth of the receiver should be flat and approximately phase-linear throughout the frequency range in which separation is transmitted, ± 5 kHz. This way, correct reconstruction of the audio can occur in the stereo decoder and difference frequencies will be properly cancelled. The IF can roll off beyond ± 5 kHz and can be shaped to realize the part of the recommended deemphasis located between 5 kHz and 12 kHz.

Finally, the audio section after the stereo decoder should contain filters that realize the part of the recommended deemphasis that is contained between 0 and 5 kHz, and which realize the 10 kHz notch as well. Figure 5 shows a possible audio response curve.

While different nonlinear AM stereo systems have different sensitivities to the problem of distortion induced by limited bandwidth before the decoder, the above strategy should result in cleanest sound with any of them. This strategy’s only significant limitation is that it is probably impossible to use it economically to create a variable-bandwidth receiver for the mass market.
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PERFORMANCE IN SATELLITE DISTRIBUTED DIGITAL RADIO NETWORKS

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However, a reasonable compromise might be made by use of variable audio rolloff instead of variable IF rolloff. Use of these preemphasis and de-emphasis characteristics will permit the manufacture of economical AM stereo auto radios that perform notably better than FM stereo in the mobile environment. While we will not go so far as to predict a significant change in home FM listening habits, the improved sound in the automobile environment should return a substantial portion of the large drive-time audience to AM, reviving the sagging economic viability of AM music broadcasting. The experience of hearing high-fidelity AM stereo in the car may just change consumer listening habits in fixed environments as well.

We hope that, just as we have cooperated in the development of this proposal in the hope that all the industry will benefit, others will realize that a standard can only lead to improved economic health for all. Since these curves are not protected by patent rights and are readily duplicated, nothing about them can be construed as anti-competitive. They are meant to achieve an AM service that is competitive with FM stereo in the ears and minds of the mass audience.

To receive a copy of the original paper, which provides more detail on receiver design and the specific mathematical characteristics of the preemphasis and deemphasis filters, please circle 250 on the Reader Service Card. —Ed.
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When Deregulation Is Not a Boon

By Harry Cole, FCC Counsel

IN THE 50 YEARS SINCE THE ESTABLISHMENT of the FCC, the Commission has never shown any inclination toward abandoning its basic role as a technical "traffic cop" to govern users of the electromagnetic spectrum. Never, that is, until now. Apparently deregulatory fervor is overriding the FCC's historical concern for technical compliance and, by extension, interference-free broadcast service. In three separate actions the Commission eliminated most of its routine operating and maintenance log requirements, eliminated its modulation monitor requirements, and requested comments on the notion of permitting applicants for FM construction permits simply to certify that their proposals comply with applicable rules and policies.

Historically, the FCC has required broadcasters to maintain detailed logs of their technical, day-to-day operations. These included records, in a station's operating log, of the station's operating parameters, tower light observations, Emergency Broadcast System tests, and the like. Additionally, licensees were required to keep a maintenance log in which equipment inspections and repairs could be regularly recorded. One of the purposes, of course, was to assure that the Commission would have some means of reconstructing, after the fact, the otherwise ephemeral nature of a station's technical performance, in order to determine the extent of the station's compliance with the FCC's rules. Also, the fact that there is an ongoing record of a station's operations provided the broadcaster with an incentive to monitor performance and assure conformity with the rules.

Now, however, the Commission has decided simply to throw out most of its technical logging requirements so that licensees may fashion the "most cost-effective operating and maintenance policies appropriate" for their stations. While the "fundamental responsibilities" of complying with the Commission's rules and the terms of their licenses still apply to broadcasters, virtually all broadcast services—AM, FM, TV, LPTV and auxiliary stations—are now free of detailed technical logging obligations. In eliminating those rules, the FCC acknowledged that some potential for abuse will exist among, for example, licensees willing to compete by use of technical means which could cause interference to others. Nevertheless, the Commission decided that a deregulatory measure intended to benefit many should not be "virtually converted by the potential for abuse by a few." Having said that, though, it went on to threaten the reimposition, across the board, of logging rules if abuses surface or if interstation interference increases. The Commission also noted that, in some instances, it might require individual licensees to complete technical logs in order to correct interference or "severely deficient" operations.

Despite the deregulatory thrust of the FCC's action, several technical logging requirements were nonetheless retained. AM licensees with directional antennas will still have to make periodic antenna-related observations and log entries, unless they have FCC-approved sampling systems. Experimental broadcast stations will still be subject to logging requirements. And all broadcasters will still need to log the results of Emergency Broadcast System tests. They will also still have to make periodic observations and inspections of their towers, and, if the tower lights go out, they will have to make appropriate log entries.

No more modulation monitors

Meanwhile, in a separate proceeding, the Commission decided that its general requirements concerning modulation monitors are not all that necessary, either. Accordingly, it announced that it is no longer requiring that monitors be type-approved or that they even be available to the operator on duty on a continuous basis. Instead, the FCC has left it up to each individual licensee to determine how best to measure and control its station's modulation levels to keep them in compliance with the limits set by the Commission. The underlying limits on maximum and minimum modulation have not been changed; the only rules that have been deleted are the "procedural details," as the Commission describes them, of having to have a type-approved modulation monitor available continuously to the station operator.

Finally, in yet another proceeding, the Commission has asked for comments on the possibility of having applicants for new or improved FM stations merely "certify" that the engineering information in their applications is accurate and consistent with all relevant rules and policies. In other words, the FCC's engineering staff would not analyze and evaluate each application independently. Rather, the staff would take each applicant's word that everything in the application was all right. The staff
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FCC RULES & REGULATIONS

would involve itself only if, say, a petition to deny raised engineering questions. This “certification” proposal is based on a report, prepared by the FCC’s Office of Plans and Policies, which concluded that certification might work and that it might be worth experimenting with it in FM applications. The proposal is in a “Notice of Inquiry,” rather than a “Notice of Proposed Rulemaking,” which means that, even if the FCC decides the certification concept is sound, it will have to undertake a further rulemaking proceeding before it will be able to implement the process. For now, the Commission is simply soliciting comments from the public on whether certification is feasible, i.e., can the Commission count on applicants to be so careful with their technical data that no further review by the FCC is necessary? And the real question flowing from that is whether the Commission can get away with such a certification process without thereby generating widespread interference. Comments on the proposals are due to be filed with the Commission by November 7, 1983, and reply comments by December 12, 1983.

Empty benefits?

Now all these changes and proposed changes might lead one to think that the broadcast industry has taken and is taking substantial strides toward the day when it will be free of FCC regulation. That, unfortunately, is a wrong conclusion, for no matter how many of the “procedural details” the FCC may choose to strip from its rules, the Commission is still retaining its underlying substantive rules and regulations. It is only ridding itself and its licensees of certain requirements which it apparently feels are nonessential. But how nonessential are these items really? Even though the modulation monitoring rules have been deleted, licensees must still maintain their modulation within certain limits. Thus, they must still have some means of determining what their modulation level is at any given time. . . . that is, they need some monitoring capacity. The Commission acknowledges this, stating that licensees “must of necessity have equipment installed and operating to ensure [modulation] limits are not exceeded.” It also emphasizes that licensees will be held “strictly accountable for their broadcast operations and will be subject to FCC monitoring and inspections as always.” In view of that, how many stations can realistically be expected to throw out their modulation monitors in celebration of the deregulation of the monitoring requirement?

The technical logging rules are similarly far from nonessential. Operating and maintenance logs provide the history of a station’s operation. They can thus be very helpful, particularly to the Commission, in determining a licensee’s compliance with the various technical rules and requirements. Elimination of these logs will make it more difficult, for instance, to figure out whether an interference problem is being caused by the willful misconduct of a licensee or simply by its negligence. Again, the Commission has focused on this, but only to the extent of saying that licensees who cannot demonstrate that they are taking “reasonable measures to ensure proper operation” will be deemed “willful” violators subject to forfeitures. The trouble is that, with no logging requirement, there is no performance “trail” to follow. The Commission’s overall enforcement effort could thus be hampered and,

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with it, the Commission's ability to assure compliance.

The certification matter also raises questions. That proposal is based on the Commission's view that not many mistakes (intentional or otherwise) are made by applicants in the technical portions of their applications. And, reasons the Commission, even if a station here or there is granted based on an incorrect initial engineering showing, the applicant will have to bear the cost of correcting the problem if and when it surfaces. This, in the FCC's views, is a big incentive for applicants to make sure their engineering is accurate. In both of these assumptions it seems that the Commission may be over-optimistic. With respect to the ability of applicants to file correct applications, it is readily apparent to anyone who has filed applications that, no matter how careful one may try to be, mistakes can happen. Further, reports in the trade press have indicated that at least one consultant has admitted to filing data he knew to be inaccurate, in order to derive some kind of strategic advantage in comparative proceedings. The FCC's confidence in the accuracy of technical information supplied by its applicants is not particularly realistic.

**Deregulation's burden**

With respect to the threat of having to correct a problem after the station has been built, it must be noted that, to make good on that threat, the FCC must first learn of the problem and then institute a "show cause" proceeding against the licensee to force it to change. All of this would take time, time during which interferences might be occurring. The process of "unscrambling the egg"—i.e., of correcting an interference-generating situation caused by an application granted by mistake—could also run into significant administrative expenses for the Commission. And the authorization of noncompliant stations—even if only "temporary"—could create additional problems if other allocation decisions are made using a data base which includes, even for just a short time, such stations. The potential for long-term, serious problems looms large. And, ironically, even the Commission acknowledges that the benefits which it would derive from a certification system would be slight.

Deregulation is not, in and of itself, a bad thing. What is unfortunate is the Commission's effort to invoke the term "deregulation" in connection with actions or proposals which do little but add to a broadcaster's burdens by adding to the uncertainty of his or her ability to comply with the FCC's rules. In the three areas described above, the Commission is, in effect, leaving the maze of its substantive rules and regulations intact, but taking away from broadcasters the maps, the "procedural details," needed to get through the maze. In that respect it is somewhat like a game of Super Pac-Man, when the maze disappears from the screen but continues, invisibly, to block the player's way. If the player has a detailed familiarity with the maze, he or she can still survive (albeit with some difficulty). If the player does not know how to navigate the maze, the lack of guidance can be fatal. Without Commission guidance relative to how best to satisfy the FCC's substantive requirements, broadcasters might find themselves in a similar position. And, if that happens, deregulation can hardly be said to be a boon for broadcasters or the public.
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Here's a chance to share your own personal solutions to some of broadcasting's most vexing engineering needs.

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We will pay $10 for each entry printed. In addition, the solution in each month's competition receiving the most votes on our Reader Service Card will win $50.00. So put on your thinking cap and submit an answer to either of the problems outlined below . . . and be sure to watch this section for the solutions.

Problem 23: Moisture Detector

Moisture is probably the worst enemy of electronics equipment, in both large devices such as transmitters and in smaller units such as cameras and recorders. Design either a macro or a micro moisture detector/alarm that can run on dc current in case of emergencies. Describe its applications and give its dimensions and mounting procedure if designed to be placed inside another device.

Solutions to Problem 23 must be received by October 24, 1983 and will be printed in the December 1983 issue.

COMING IN JANUARY . . .

Great Idea Notebook

Readers are invited to submit their great ideas and engineering notes for a new monthly series: Great Idea Notebook. Ideas should be legibly typed, double-spaced, approximately two to three pages long. Diagrams should accompany the idea and should be clearly drawn and labeled. For each idea printed in the notebook series, we will pay $50.00. Address submission to The Editor, BM/E, 295 Madison Avenue, New York, NY 10017.

CONTEST RULES

1. How to Enter: Submit your ideas on how to solve the problems, together with any schematic diagrams, photographs, or other supporting material. Entries should be roughly 500 words long. Mail the entries to BM/E's Great Ideas Contest, 295 Madison Avenue, New York, NY 10017. Use the official entry form or a separate piece of paper with your name, station or facility, address, and telephone number.

2. Voting and Prizes: BM/E's editors will read all entries and select some for publication; the decision of the editors is final. Those selected for publication will receive a $10 honorarium. Each month, readers will have an opportunity to vote for the solution they consider the best by using the Reader Service Card. BM/E will announce the solution receiving the most votes and will award the winner of each month's competition a $50.00 check.

3. Eligibility: All station and production facility personnel are eligible to enter solutions based on equipment already built or on ideas of how the problem should be solved. Consultants are welcome to submit ideas if they indicate at which facility the idea is in use. Manufacturers of equipment are not eligible to enter. Those submitting solutions are urged to think through their ideas carefully to be certain ideas conform to FCC specs and are in line with manufacturers' warranty guidelines.

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Solution to Problem #
Your Name: ____________________________
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Telephone: (_______)

I assert that, to the best of my knowledge, the idea submitted is original with this station or facility, and I hereby give BM/E permission to publish the material.

Signed ____________________________
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SOLUTIONS
to problem 21: Impedance Matcher

Readers were asked to design a low-cost, lightweight system to allow matching of recorder and input impedances in the field.

SOLUTION A
Allen D. Kass, CE
WISP/WQGDW Radio, Kinston, NC

My idea has an input for both balanced low-impedance microphones and line level inputs, allowing either to be used to feed a recorder input. This circuit will work well with microphone impedances from 200 to 600 ohms and the line input will accommodate either low or high impedance inputs. S1 selects the loading on the line input and the potentiometer adjusts for varying input levels.

The microphone input has a gain of approximately 40 dB and the line input has a maximum gain of approximately 20 dB. The VU meter is included so the output can be monitored if the unit is not located near the equipment it is feeding. The output will feed 600 ohms at approximately -24 dBm maximum with a power supply of 15 Vdc.

The cost of this circuit should be low, since most of the parts can be found in your spare parts or obtained inexpensively from a parts house. The VU meter could be eliminated if not needed. If high output levels are not required, this circuit could be powered by a pair of 9 Vdc batteries in remote applications.
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Designed to serve as the primary audio monitoring system in small-to-mid-sized control rooms, the new Studer 2706 audio monitor is suitable for radio studios and television post-production suites.

The 2706 is a three-way system incorporating a 12.5-inch woofer, a two-inch dome midrange, and a one-inch dome tweeter in a bass reflex enclosure. The crossover frequencies are 720 Hz and 2500 Hz. Anechoic chamber frequency response is 42 Hz to 20 kHz ± 3 dB (90 dB SPL at 1 kHz, sine wave sweep). The studio monitor comes with threaded holes on the bottom to accommodate free-space installation on floor stands or suspension brackets.

The unit’s woofer is designed so that the magnetic field remains constant over the entire excursion range of the voice coil, ensuring high linearity to just below the clip point, reducing distortion. Midrange and high frequencies are handled by new high-power dome transducers with specially designed polar patterns. The filter slopes of the crossover network were selected to match the corresponding mechanical properties of the three transducers.

Nominal impedance of the 2706 is four ohms with a maximum output level measured at 104 dB SPL. Dimensions are 24x15x13.5 inches. Available options include a wall-mount bracket and a floor stand that is adjustable from four to 6.5 feet. The monitors sell for $690 each.

Thomson Develops DBS Klystron

A new 1500 W klystron for DBS uplink transmitters has been introduced by Thomson-CSF Electron Tube Division. The TH 2445 klystron amplifier is designed to equip the uplink transmitters of DBS system earth stations for operation at a given point in the 17.3 to 18.1 GHz frequency range.

Precise tuning of the klystron is accomplished at the factory before shipment. The unit can deliver at least 1500 W carrier power at saturation, and has performance characteristics at an output level of 150 W as good as those obtained at full power. It can also be used at any intermediate power level.

In the TH 2445, the electron beam is confined by permanent magnets, and cooling is by forced air. In addition, the klystron amplifier has been designed for quick installation and easy operation.

Hitachi Debuts New Scopes

A new series of four portable 40 and 20 MHz oscilloscopes has been announced by Hitachi. These models offer a magnify function that allows the user to observe the standard waveform and a X10 swept waveform simultaneously on the CRT.

Also featured in the new series is a dc offset function that enables the user to measure the dc component of any waveform with an external voltmeter. The special TV sync separation circuit lens designed with the cameraman in mind.

The Schneider 14X ENG/EFP lens is economical, lightweight, and has all the features it should have. It brings out the best in the best cameras available today.

This lens is packed with conveniences that help the cameraman get the most out of every situation. It has a pistol-grip with built-in iris control that has all controls available within a thumb’s touch. It has a generously sized rocker control that makes it easier to control the zoom. And because the iris and zoom electronics are in a weather-resistant housing, there are no shorts from moisture in the field.

The lens can power zoom from 9mm to 126mm. Or with the 2X built-in extender from 18 to 252mm. With the low distortion 6.3mm, to 9mm aspheric lens attachment, it can power zoom on the super wide angle shots. Schneider broadcast lenses are available throughout the United States and Canada from:

Tele-Cine Corp.
400 Crossways Park Drive
Woodbury, NY 11797
(516) 496-8500

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- DC-63 Variable Pattern:
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- DC-21 Cardioid:
  - Small, rugged, lightweight. For podium, PA use, and as choir/orchestra pick up in close to long range. Good definition for strings and brass.

- VM-41 Cardioid:
  - For acoustic instruments, overhead percussion, cymbals, snare and brass. Close to medium range PA and ENG work.

- DC-96B Studio Cardioid:
  - For all studio and line recording use. Low noise, high output. For instruments, narration or choir. Close or distant work.

- XY-82 Coincident Stereo Cardioid:
  - Top of the line dual cardioid stereo/mono with separate outputs. Two single membrane condenser capsules, smooth on and off-axis frequency response, two separate preamps, two separate output signals. Unmatched fidelity and versatility.

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allows quick measurement of video signals and the use of a 150 mm rectangular CRT. The CRT is equipped with an internal graticule that eliminates parallax errors and maintains the inherent high performance and accuracy of the scope.

All four of the new models measure approximately 12.2 inches wide by 14.6 inches deep, and weigh about 13.2 lbs. Additional features include 1 mV/div vertical input sensitivity, autofocus circuit, and scale illumination. Two model prices are: V-422, $895, and V-222, $695.

Nady Announces 256 RF Intercom

The PRC-3X is the company's top-of-the-line duplex model radio communicator, enabling simultaneous two-way conversation. Two people separated by up to a half-mile line of sight can communicate without pushing buttons to talk, offering hands-free operation.

The unit consists of a lightweight headset with adjustable boom-mounted microphone and a small body-pack transceiver with belt clip.

Other features are a noise-cancelling microphone, a call beeper which alerts the user to switch to full duplex from receive-only operation, low battery light indicator, and optional external battery pack. The PRC-3X can be powered by an internal 9 V battery or by an optional external battery pack. The communicator operates at 49 MHz and is FCC-approved.

Applied Digital Technology Develops Digital Storage

Applied Digital Technology has introduced its new disk storage system for list management with the Sony BVE-3000. The new system, the ADT-MD2-3000, is a Z80 microprocessor-based dual 5¼-inch floppy disk system.
Specifications for the storage system are 64 kbytes of random access memory and resident PROM memory. The system allows the Sony to operate all functions at 1200 baud except the TT function. Including floppy disk copy and file maintenance capability, the ADT-MD2-3000 is priced at $4900.

UMC Unveils Splice Finder/Bulk Eraser
The new Beaucart SFE-100 automatic splice finder contains an all-new optomechanical sensing system. The resultant features include automatic location of splices, controlled stop beyond capstan window, and automatic cartridge ejector when a splice is found.

Additional features include a built-in bulk eraser that allows tape to be erased directly on the splice finder, and separate splice finding and eraser functions. The unit will accept cart sizes from A to CC with tape thicknesses of 0.5 mil to 1.6 mils, and splice thickness of 0.5 mil to 1.5 mils. Tape speed of the machine is rated at 15 ips. The Model SF-100 is also available as a splice finder only.

B&K Precision Announces New Scope
A new 20 MHz dual trace oscilloscope has been introduced by B&K Precision, a division of Dynascan Corp. The Model 1522 has a 2 mV/div vertical sensitivity to 20 MHz, selectable to 1 mV/div sensitivity to 10 MHz.

The new unit is a low-cost scope featuring a five-inch rectangular CRT with internal graticule and scale illumination. Also featured are five trigger sources, CH1, CH2, line (50/60 Hz), external, and V-mode for viewing two signals unrelated in frequency. The user can select from 20 calibrated sweep time ranges: -0.5 s/div to 0.2 µs/div. Each sweep time range is adjustable between calibrated ranges.

Incorporated into the 1522 is an auto sweep that provides sweep without trigger input and automatically reverts to triggered sweep operation when adequate trigger is applied. An X10 sweep magnification is provided to allow closer examination of waveforms.

INTRODUCING SYSTEM R
Our newest stereo audio console features Penny & Giles’ newest fader, a remarkable rotary which you’ll have to feel to believe. Measuring a compact 32 inches wide, SYSTEM R combines conventional controls with the advanced audio technology and superb styling you’d expect from Broadcast Audio Corporation. If you need rotary faders, compact size, superb audio quality, and a modest price - we’ve just designed your audio console - SYSTEM R!

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Other features include front panel x-y operation, z axis input (ITL compatible), channel 1 output on rear panel for...
driving frequency counter or other instruments, and sum and difference capability of channels 1 and 2 waveforms displayed as a single trace. In addition, video sync selectable frame or line triggering is standard for observing composite waveforms. Model 1522 is priced at $695.

Broadcast Electronics 260 Reveals Transmitters

Three new FM transmitters with power output of 1500 W, 3500 W, and 5 kW have just been made available by Broadcast Electronics. Each model operates with a single tube and uses the FX-30 exciter found in the company's FM-30 transmitter.

Other features of the new series of FM transmitters are a patented, folded half-wave output cavity, a broadband input matching network, and automatic power control with proportional VSWR foldback. In addition, the transmitters provide a digital control system with optional microprocessor diagnostics.

Goose Releases Waterproof Camera Cover

A complete line of waterproof camera covers has been developed by Goose Enterprises for almost every ENG/EFP camera model. The covers are made of Cordura.

Some of the features provided by the covers are easy-handle access with cover intact, plastic window for viewing of lens setting, velcro closures for easy access to all controls, and covering of lens except for front element. Other standard provisions are hand access to lens from either side, cable closures, and mic port.

All covers are custom-designed for each specific camera and will also allow the camera to be put on the tripod without removal of the cover. Prices for the line of waterproof covers range from $130 to $170.

BTX Announces Multi-Transport Controller

A multi-transport controller/editing system has been announced by BTX. Known as Softouch, the system directly controls and synchronizes any combination of up to four multitrack audio or video transports while supporting additional transports in phase-lock synchronization.

The system consists of three distributed intelligence modules: the Softouch.

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controller/editor, the Shadow II synchronizer, and the Cypher time code system, all networked via RS232 interface.

Features of the advanced system include what the company calls Softkeys, which permit execution of repetitive pre- and post-production editing routines with one keystroke. The user can define, edit, and store as many as 16 Softkeys at a time. Two full, eight-digit time code displays are functional, as well as a real-time status matrix providing transport control and location, servo mode, and record status information simultaneously for four transports. In addition, an alphanumeric command display prompts the user throughout the editing process.

Time code applications include generating or reading SMPTE, EBU, VITC, or 24 frame code; regenerating code; or jam-syncing code. The ability to trigger events via time code is also facilitated, as is the conversion of feet (meters) and frames to time code for film applications.

The system contains a memory sufficient to contain all pre- and post-rolls plus beep tone trim, mark in/out, and record in/out data for up to 100 loops. Softouch also allows separate record assigns for each transport plus master record enable; the ability to auto-locate any transport independently of other activity; and the ability to control the record window during looping.

Battery backup for off-line Softkey entry, protection, and transportation considerations are also provided. An RS232 computer interface accepts over 50 multitrack audio and/or video transports.

FOR MORE INFORMATION

Comprehensive

Offers Mic Mixer

Comprehensive Video Supply has introduced a new portable mic mixer, the MX-1002, weighing only two pounds, six ounces. The unit measures 2½x4½x4½ inches.

The three-channel mixer contains a VU meter and headphone monitor jack.
and clips easily on a belt, making it suitable for ENG and remote production applications. Powered by three 9 V batteries, which are included, the mixer provides three balanced, low-impedance inputs with phantom powering and individual master gain controls.

Also featured are power source and low cut switches and low pass filters that eliminate low-frequency ambient noise. The MX-1002 is now available for $249.95.

Kodak Unveils CRT Imaging Outfit

Kodak has introduced the Instagraphic CRT imaging system for photographing computer-generated images from a video display terminal.

With this new system, consisting of the CRT cone and an Instagraphic camera (with adapter brackets to accept a 35 mm SLR camera in case slides are wanted), users can produce instant color photographs of static 12- or 13-inch color video screens. The print film has the same aspect ratio as color monitors and can be reproduced on most copier/duplicators to create black-and-white images.

The Instagraphic camera comes with close-up lens attached. Other accessories in the kit include color print film, carrying strap, bumpers, spacers, and foam strips for mounting the cone to the screen. In addition, a cable release, tripod screws, and a Kodak Wratten gelatin filter are included.

FOR MORE INFORMATION

circle bold face numbers on reader service card

Leader Combines 265 Functions in Calibrator

The new LOC-7005 oscilloscope calibrator combines functions needed to test, repair, and calibrate scopes. Three outputs are provided: an amplitude output to calibrate the vertical attenuator of a scope; a time marker output to calibrate the time base (sweep speed); and a fast rise time square wave to check the pulse response and rise time.

The calibrators are designed to be small in size for ease of use in service and calibration tasks. The LOC-7005 is priced at $1395, and backed by a two-year warranty.
Delta Electronics has been selected to manufacture and market AM stereo broadcasting equipment under license to Motorola.

General Electric Video recently endorsed the North American Broadcast Teletext System (NABTS), and will introduce decoders and teletext products some time after 1983.

Mitsubishi Electric has acquired Digital Entertainment Corp. (DEC). DEC will provide all marketing and sales responsibilities of the Mitsubishi pro audio products, including its digital recorders.

Five new orders for the Aurora 100 videographic system, valued at over $700,000, have been received by Aurora from WJZ-TV, Baltimore; KSL, Salt Lake City; Universal Images, Detroit; and NAMCO, a Japanese game manufacturer. ADDA has recently shipped ESP-C still store systems and video graphics systems to KOA-TV, Denver; WCCO-TV, Minneapolis; WPDS, Indianapolis; CBC, Montreal, and several others.

Control Data and ADR/Cadre have announced the formation of a partnership to provide computer-based services to the cable and broadcast industries. The new firm, Magnicom Systems, is 60 percent owned by Control Data.

Data Communications and Minipak (MPI), two major computer service vendors, have agreed to merge, with MPI remaining a separate corporation as an affiliate of DCC. ADDA has signed with United Satellite Communications, Inc. for the BIAS traffic system beginning in September. Microwave Filter Company has split its stock two-for-one to the 400 stockholders as of July 18, 1983, bringing authorized and issued shares outstanding to approximately 2.2 million.

Audio + Design has reached an agreement with C.N. Rood of Holland for the U.S. distribution of the Rood line of digital stereo generators.

The A. F. Associates Products division has been named as sales representative for the Abekas A42 digital slide store and retrieval system for southern California, eastern Pennsylvania, Maryland, Virginia, and Washington, DC.

Studer has selected its first U.S. dealers authorized to carry the complete Studer line. Allen and Heath Brenell has appointed Secon Systems of Chamblee, GA to represent its products throughout the southeast. Allsport has established a new southern California office for public relations and promotions.

Digital Entertainment Corp. has tapped Bill Van Doren as a sales manager, operating out of Hollywood, CA.

M/A-Com recently announced its entry into the home DBS market with a four-foot Prodelin receiving antenna. Available for immediate delivery, the molded fiberglass dishes conform to the two-degree Ku-band spacing.

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