

MARCH 1974

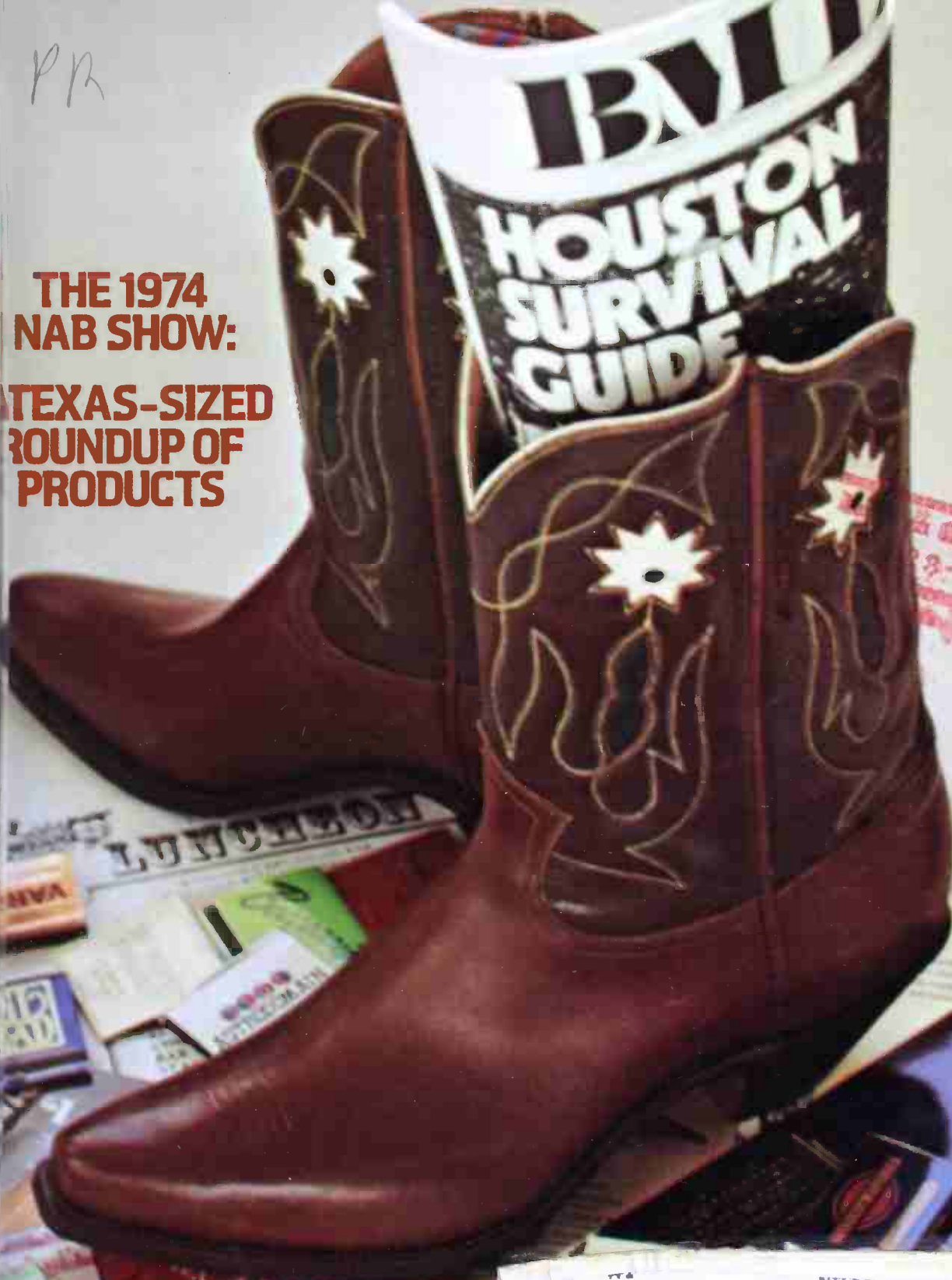
BME

BROADCAST MANAGEMENT ENGINEERING

NO 4
PR

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NAB SHOW:**

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BM/E

BROADCAST MANAGEMENT/ENGINEERING

MARCH 1974/VOLUME 10/NUMBER 3



NAB Convention at Houston this year offers a new stomping ground for broadcasters. Be prepared for Texas-size treats. Detail on Convention on page 33.

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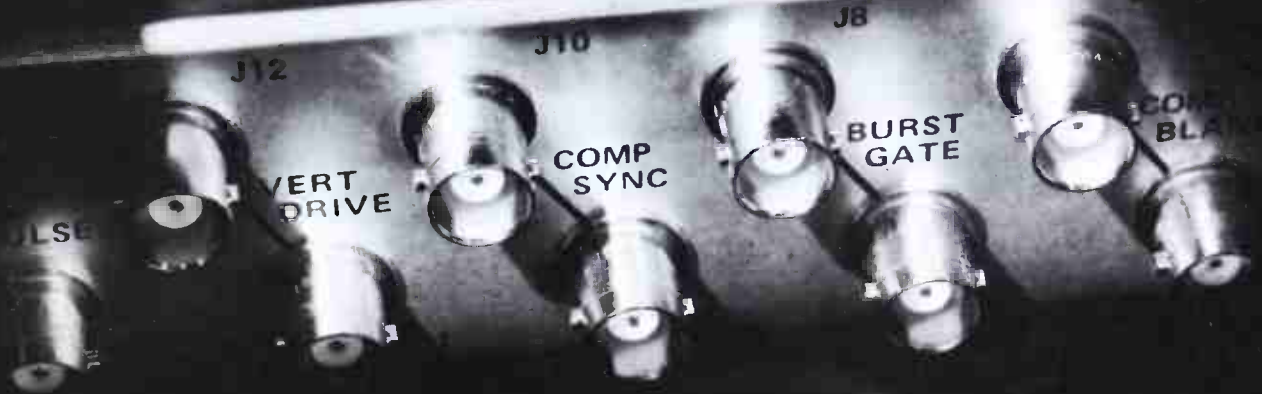
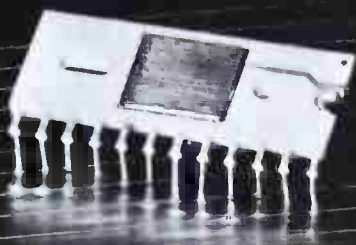
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Useful reading materials


**CM/E: A supplement for those with cable interests:
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BROADCAST INDUSTRY NEWS

NAB To Assist in Campaign To Educate Public On Energy Crisis

The NAB's Board of Directors will campaign to help create public understanding of the energy crisis. Noting that such campaigns are extensive, the board adopted a resolution to help "to coordinate and assist campaigns undertaken by government, industries, advertisers, public service organizations, and other groups so as to minimize confusion and promote understanding of the problem."

The board did not recommend a reduction of broadcast hours to conserve energy. NAB President Vincent T. Wasilewski said that "would not be in the national interest" because it would take a vital service from the public." Additionally, there is not data to support any theory that a reduction of broadcast hours would actually result in any energy savings.

Fourth Network Not Likely

The prospects for a fourth commercial network in the next few years "are not very bright," according to Dr. Rolla Edward Park, an economist for the

Rand Corporation. His conclusions that neither existing technology nor regulatory policy evince favorable signs are disclosed in a Rand report, "New Television Networks," prepared under a grant from The John and Mary Markle Foundation.

Park concludes that not enough data is available to evaluate the potential of a pay-TV cable network; there are too many variables for which there is no adequate measure. But, said Park, "if penetration is sufficiently high and the pay handicap sufficiently low, a pay cable network would be very successful indeed."

The report may be obtained at cost from the Publications Dept., The Rand Corp., 1700 Main Street, Santa Monica, Calif. 90406.

Satellite Study For Cable Television

Cable Satellite Access Entity (CSAE) selected Booz, Allen and Hamilton, Management Consultants, to conduct a study of the feasibility of using satellites in the distribution of programming to CATV systems. (CSAE is an association of 44 CATV system operators formed in summer of 1973.)

The organization is conducting a

study of the technical considerations related to the use of satellites, too under the direction of CSAE's Secretary, Ed Taylor.

Cabinet Report Gives Cable TV a Big Boost

The basic thrust of the long-awaited Report of the Cabinet Committee on Cable Communications, released in mid-January, generated much approval from industry, city spokesmen, academicians and others interested in the development of cable television. Though some aspects of the report did not delight broadcasters, such as the recommendation for lifting barriers on programming restrictions, and especially the sanctioning of pay-TV as desirable, the broadcast industry could find solace in the recommendation that "there should be no restrictions on either cross-media ownership or multiple ownership of cable."

If the report's recommendations were to be made law, CATV would be essentially a common carrier, with a separation of ownership and control over programming—except for what is referred to as the telling Footnote Two: that cable operators could have control over one or two channels.

With the opening up of many diverse channels and the "separation policy," there would be no need, says the report, for governmental regulation of content—including the Fairness Doctrine and the giving of equal time to competing politicians. Rather, cable television should be treated with the same First Amendment guarantees as the print media.

Many of the proposals would take effect when 50 percent of American homes are hooked up to the cable—with a transition period of five years. Most observers anticipate a longer time than that for 50 percent penetration.

The prime call for lessening of governmental regulation of cable and the general favorable reception of the report had the immediate impact of creating a "bullish" market for CATV companies. For example, the day the Cable Report was released, Tele-Prompter gained 75 cents a share to \$5.00, and Vikoa gained 50 cents a share to \$3.00.

continued on page 8



Albert Thomas Convention Center, NAB Show Hall

The scene of the 52nd Annual Convention of the National Association of Broadcasters is this enormous structure in Houston, Texas. Beginning March 17th and running through the 20th, the broadcast equipment products of 150 manufacturers will be on display in booths that cover a total of 67,000 square feet, an all-time record exhibit space for the NAB. For a preview of highlights of the show and exhibitors, turn to page 33.

"MAX?
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IT'S BETTER THAN NEW.
BUT RIGHT, IT IS AN RCA!"



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NEWS

A key recommendation regarding the loosening of federal control over a mass communications medium is that after establishing a national policy, "detailed federal administrative supervision should be limited to setting certain technical standards for cable and applying anti-siphoning restrictions on professional sports programs." Furthermore, "franchising authorities should have the principal responsibility for the regulation of cable systems." Municipalities would be prohibited, however, from granting exclusive franchises, requiring operators to provide "free" channels—governmental, educational, or whatever, and using franchise fees as general revenue-raising devices. A footnote acknowledges the rising interest in "public access" and notes that requiring a free channel for it, (though not funds and equipment) might not be inconsistent with the report's recommendations.

The privacy issue was recognized and a recommendation made that there be "strong legal and technical safeguards to protect individual privacy in cable communications."

Rural dwellers, the poor, and minority groups were given token mention, but no details were provided as guidance for national policy.

The motion picture and television program production centers received a booster with the proposal that program retailers using cable channels "should be subject to full copyright liability for such transmissions." The cable operator would be entitled to blanket copyright license, conferred by statute, for retransmission of broadcast signals.

In order to help cable TV grow into the kind of service the Cabinet Report envisages, the Committee recommends "consideration of a systematic demonstration program involving federal, state, and local government agencies, appropriate public and professional groups, and the cable and electronics manufacturing industries. The experience gained from this program would reduce the lead time needed to develop many desirable public service uses of cable and facilitate their widespread implementation with greater effectiveness and efficiency."

Clay T. Whitehead, OTP director, said that OTP plans to develop a legislative proposal based on the report and present it to Congress this session. Some observers are skeptical that any action will be taken on the report, either by the Administration or by Congress. Interest and public exposure of the Report have been high though, creating a better chance for legislation.

continued on page 10

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Reproduction of Program Records

The FCC has announced a Further Notice of Proposed Rule Making concerning amendment of the rules to provide for public inspection of TV station program logs and copying of some material in them. Under the new rules, the copying privilege does not extend to the composite week logs that are part of the regular public inspection file. Thus, persons can obtain newly public material but not necessarily the material traditionally available.

Proposal is for requirement to read, "material in a television station's public file may be copied, with the costs of such reproduction to be borne by the inspecting party."

The Commission said it will consider comments which are more specific. Comments should be submitted March 7. Reply comments are due by March 18.

Broadcast Of Program-Length Commercials Denied

The Kaiser Broadcasting Company, Oakland, California, was denied its request to broadcast program-length commercials on an experimental basis. In its request, Kaiser cited some economic and programming problems which it said were common to independent non-network UHF stations, particularly with regard to early and mid-morning programming. The company also stated that the FCC's distinction between programming designed to entertain, to inform, and to instruct and programming designed primarily to sell "is by no means precise..."

In its letter of denial to Kaiser, the Commission stated that "there is nothing in our policies to prohibit presentation of instructional programs, travel programs, demonstration programs, auction, or even 'productions and merchandise shows' provided our stated policies are adhered to."

The Commission is also issuing a Public Notice explaining its policies regarding such programming and setting forth some hypothetical examples as guidelines by which licensees can evaluate their existing or contemplated programs.

Optimistic View On Tape Sales

Sales of blank tapes in 1974 should approach the half-billion dollar mark, says A.P. Cunha, president of Audio
continued on page 12

AEL transmitter features: ...five-year warranty ...twenty-year parts availability.

The new AEL FM-25/25KD was designed to provide exceptionally high power FM broadcasting service with a high degree of redundancy and reliability to meet power level requirements of up to 50KW TPO.

To get it, we combined two AEL FM-25KD 25KW FM transmitters, whose combined outputs are connected to the antenna through a true 90° hybrid combiner.

If you're impressed so far, just wait until you see the specs and hear the whole story.

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If you need more convincing send for our new brochure, "On With the Show", or ask to see the VSP-1200's in action. They are operating in most major cities across the country.



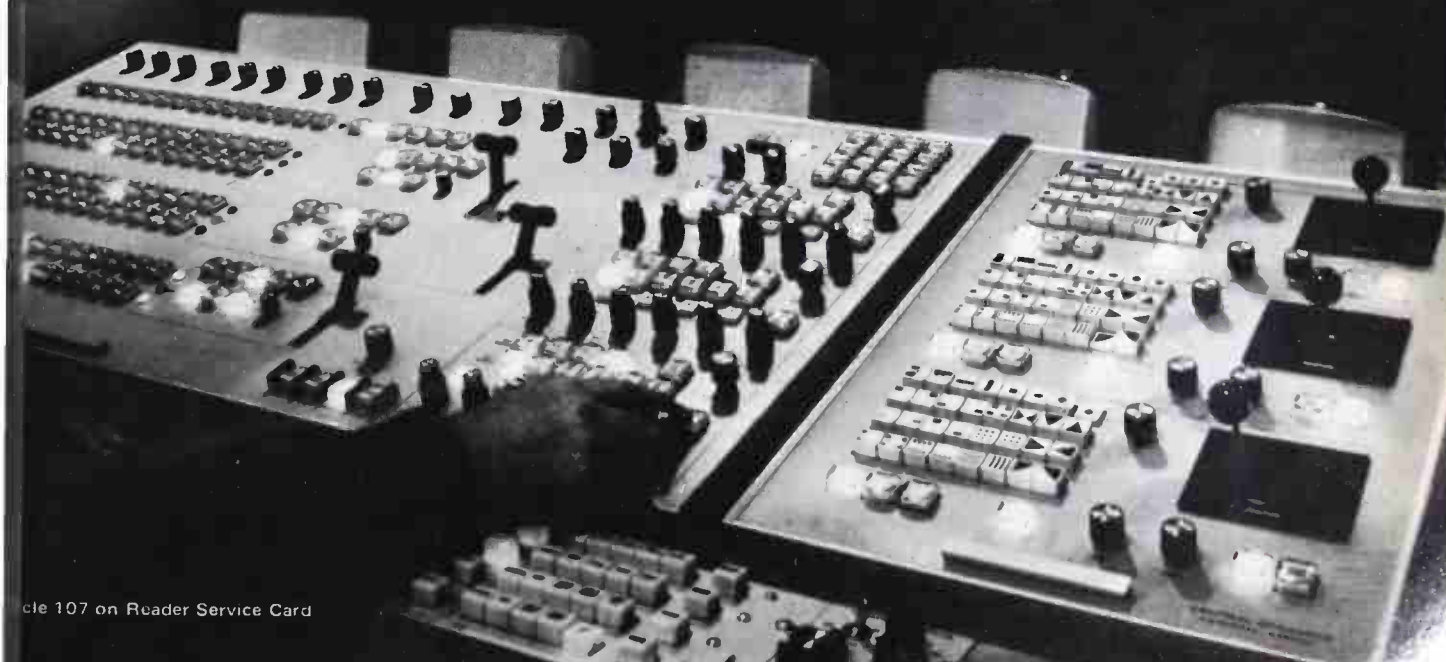
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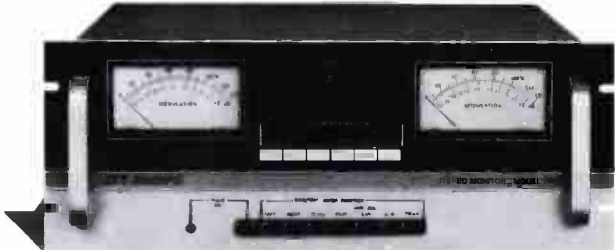
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NEW: Modulation Only



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NEW: Stereo



FCC Type Approval 3-217

For complete monitoring capability choose the Model 723 Frequency and Modulation unit. Or, for modulation only, choose the Model 734. Then add the Model 724 Stereo to either one. It includes a phase lock-loop re-insertion oscillator for stable stereo separation measurements.

No matter which monitor you choose, you get all the advanced TFT features, such as remote monitoring without an RF amplifier.

What's more, the Model 723 lets you calibrate directly against WWV using the TFT Model 735 or any WWV receiver. So, you can save the costs of outside service and a separate frequency counter, and be absolutely certain about your frequency at all times: not just every 30 to 40 days.

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West Hall**

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NEWS

Devices, Inc.—despite the energy crisis, industry shortages, and new conservatism in consumers.

Cunha's optimism, he says, is based on the recent boom in tape hardware sales, especially portable equipment; increased per capita usage of tape; and great improvements in the fidelity of cassettes and cartridges.

TV Network Will Link Canada Coast to Coast

CTV Television Network Ltd. and CN Telecommunications have signed a nine-year microwave contract for CNT to connect CJON-TV St. John's, Newfoundland, to the CTV's affiliate CJBC-TV Sydney, Nova Scotia. The contract includes two-way transmission and is the final link that gives the Network full microwave facilities from Newfoundland to British Columbia.

Dept. Of Communications Established At Adelphi U.

Paul Pitcoff, Asst. Prof. and Dir. of Adelphi U.'s Motion Picture Program since 1970, has been announced as chairman of the university's newly established Department of Communications. The program will offer concentrations in two areas—filmmaking and telecommunications (including radio and TV), with allied courses in other aspects of media.

Prof. Pitcoff has a significant and varied background in video and film.

Fairchild Buys Out WUI In Satellite Corporation

Fairchild Industries is now 100 percent owner of American Satellite Corporation, having purchased for cash Western Union International's interest in the satellite corporation. American Satellite is domestic satellite service between New York, Los Angeles, Dallas, and Chicago, and intends to extend this service to four more locations by 1975.

Language In NAB Radio Code To Improve Image of Women

The NAB Radio Board of Directors passed as recommended by the Code Board a change in the language of the Radio Code to help improve the image of women in advertising and programming. The change, appearing in standard 1, (I), 14, is an addition of the word "sex" in the series of categories to which derisive words may not be applied, except for the purposes of

continued on page 16

so many high-fidelity and consumer publications rated our HD 414 "reference" headphones tops in sound, comfort and value, why would we ever introduce another model?

The reason is perfection. Not that our new HD 424 is perfect. But our engineers — the same engineers who developed our dynamic and condenser microphones for the recording industry — made some significant advances. Enough, we feel, to warrant a new model. Enough, we think, that a certain kind of music lover will appreciate the added fidelity, despite the added cost. The primary difference is response. As linear as our HD 414 is, the HD 424 boasts greater accuracy — particularly at low bass and high treble frequencies. Due to improved transducer assembly and redesigned earpiece geometry. Heard on the HD 424, low organ notes assume an additional, fundamental richness without sacrificing the "snap" of good transient response. While the HD 414 is a classic and other high-overtone



Sennheiser HD 414 "reference" headphones. Rated best by everyone.

elements retain the traditional "transparency" their overtones produce. Equally as important, especially for long listening sessions, is comfort. Maintaining the "unsealed" ear feeling so many enjoyed in the HD 414, the HD 424 provides even less (!) pressure on the ear, distributing it over a wider, thinner acoustically transparent cushion. For this reason — and an improved, cushioned headband — the HD 424 actually seems lighter than the 5 oz. HD 414, even though it is slightly heavier. Now, there are two Sennheiser "open-ear" headphones for you to choose from. The HD 414, rated best for sound and comfort. And a new model offering something more. That's why.

Learn them both at your Sennheiser dealer, or write us for more information. Sennheiser Electronic Corporation, 10 West 37th Street, New York 10018.



WHY?

Manufacturing Plant: Bissendorf, Hannover, West Germany

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Conrac has them all!

Conrac has the most complete product line of quality television monitors and related products in the world. Color, monochrome, high resolution, NTSC, PAL, SECAM, color matched phosphors, negative black-matrix shadow-mask CRT's. We've got them all, with the quality, dependability, and value that you've come to expect from Conrac during its 25 years as the leader in the business.

And now, with our new Primary Distributor network in 16 major market areas you can get immediate delivery on nearly any Conrac product. This means you no longer have to compromise on quality. Conrac has removed the last excuse for not owning the best. Check the listing at the right or contact the distributor near you for full details on the finest television monitors in the market.

1 RHA Professional Color Monitors. Incorporating a 19 inch CRT with color matched phosphors, stable IC coding circuitry, and other advanced features, the RHA meets the most stringent international broadcast requirements. Designed specifically for use in master control and other critical areas, the RHA establishes industry standards for reliability, picture quality, and ease of set up. NTSC, PAL-B, PAL-M, SECAM, or RGB versions. Cabinet, yoke mounting, or rack configurations.

2 & 3 Large screen 25 and 19 inch 5000 Series Color Television Monitors. Feature negative black-matrix shadow-mask CRT's for improved contrast ratio and high brightness without loss of resolution. A moderately priced unit with pre-settable controls, designed for group viewing in auditoriums, classrooms, lecture halls, industrial training areas, preview rooms, and audience participation studios.

4 12 inch 5000 Series Color Monitor. High performance monitor with single gun CRT that avoids the many compromises of converted receivers, yet sells at a modest price. Options include switchable horizontal and vertical delay for professional applications, and a Vector Output Module for external vector display of the Chrominance signal. Available in cabinet, yoke mounting, rack, or chassis versions.

5 RQA High Resolution Monochrome Monitor. Designed for medical X-ray, military applications, and document viewing. Features automatic and independent field-rate and line-rate sensing. Will lock on any field rate from 15 to 60 fields per second or any horizontal line rate between 15 kHz and 37 kHz. Fourteen, 17, and 21 inch CRT's available in cabinet, rack, or chassis (all sizes), or yoke mounting studs (17 and 21 inch only).



6 A Professional Monochrome Monitor. Offers the professional television engineer a dependable performance-stabilized picture plus instrument test features such as horizontal and vertical delay for sync signal analysis. Supplied with a 14 inch CRT in cabinet, chassis, or rack mounted versions.

9 A Series Professional/Industrial Monochrome Monitors. General purpose monitors providing high reliability, ease of maintenance, and superior picture quality. Available with a wide variety of CRT sizes and mounting configurations: 9 inch, dual 9 inch, 14 inch, 17 inch, and 23 inch, in cabinet, rack mount, chassis (all sizes), or yoke mounting (17 and 23 inch only).

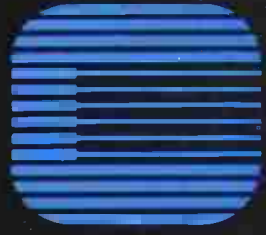
7 A Low Cost Solid State Monochrome Monitor. Designed for rugged continuous use in educational, industrial, and computer applications. Supplied with 9 inch, dual 9 inch, or 14 inch CRT's, in cabinet, rack mount, dual rack mount, or chassis versions.

10 1000 Series Audio/Video Receiver, VHF or VHF/UHF. A solid state receiver that provides professional quality demodulation of aural and visual carriers to use in monitoring, rebroadcast, recording or entertainment. Plug-in modules customize the 1000 Series for applications such as transmitter monitoring, CATV head-end demodulation, ETV or ITV off-the-air distribution, or VTR off-the-air recording. Console cabinet or rack versions are available.

11 1500 Series Speaker Enclosure. Companion unit for the 1000 Series Receiver and 5000 Series Color Monitors.

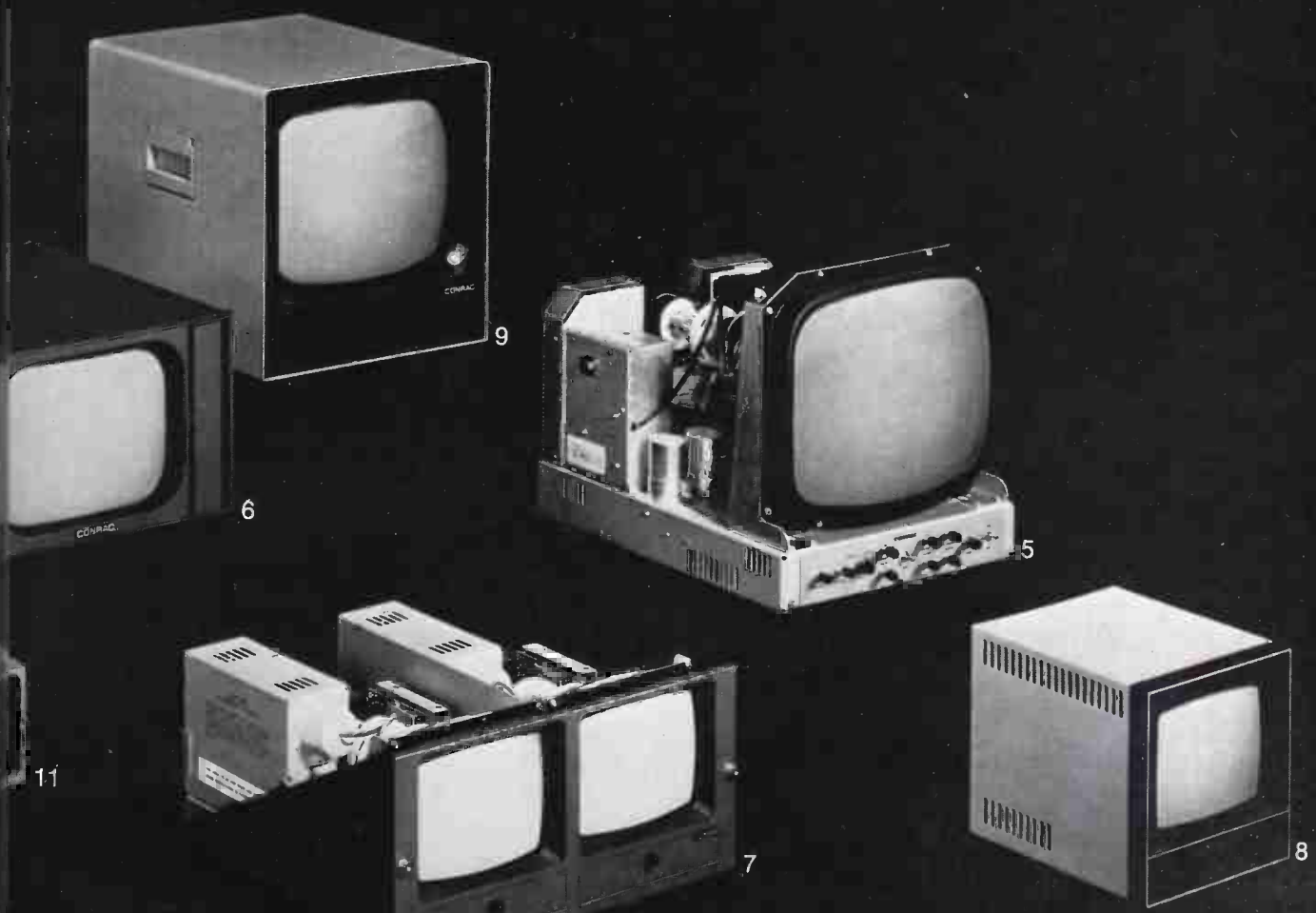


CONRAC

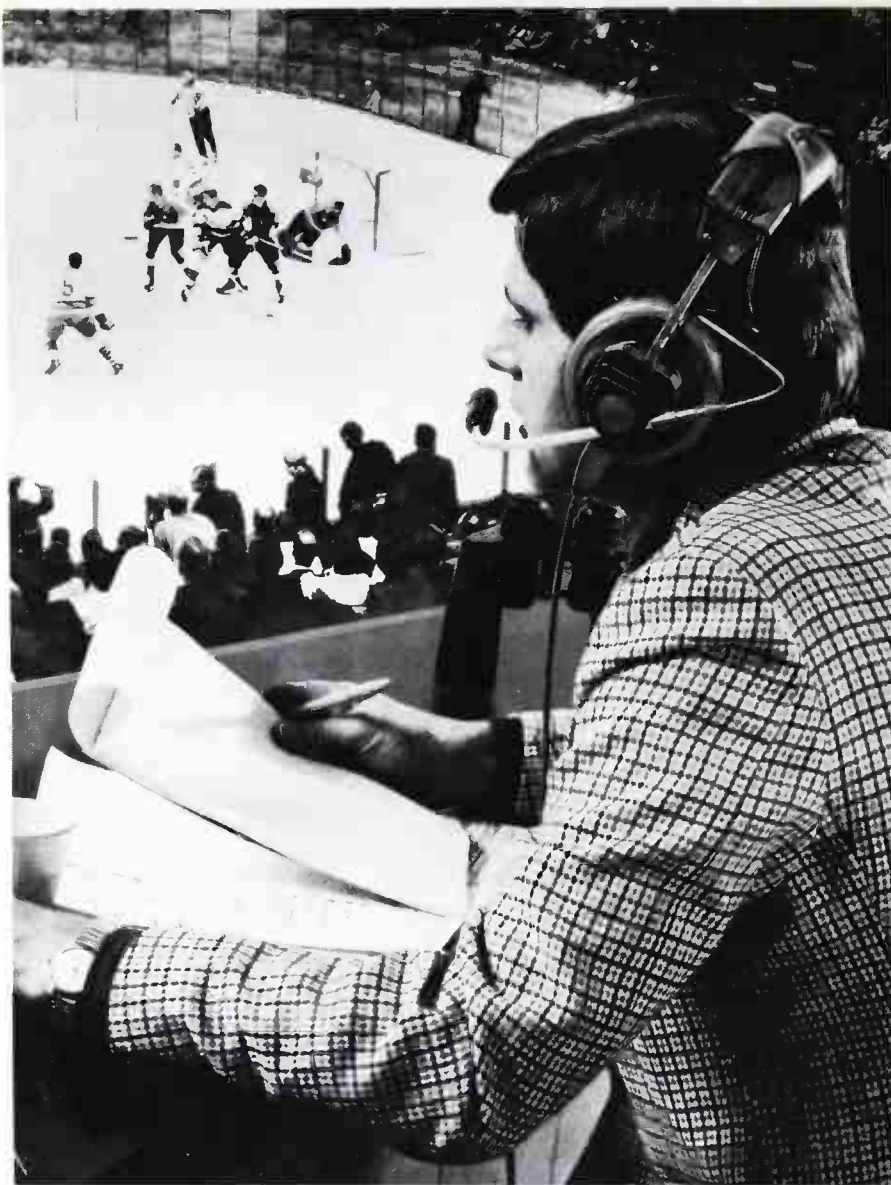


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See the full Conrac product line at NAB, Booth 402.



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All the color, all the action, with hands free mobility... the Telex Sportscaster Headset.

Combine the absolutely finest wide range, omnidirectional, dynamic boom microphone with an equally high-performance binaural headset, and you have the superior headset for sportscasters... the Telex CS-90.

It is designed for mobile or fixed station live broadcasting cue and program monitoring, all with free hands and head movement convenience.

The audience at home hears every word clearly and crisply, yet still has background crowd noise for atmosphere. Circumaural earcushions screen out sounds in the immediate area, so that special acoustic facilities are unnecessary.

The Telex Sportscaster Headset

is built of high-impact ABS plastic and stainless steel to stand up to constant moving, hard bumps and all kinds of weather. And it's supplied with a convenient inline "push-to-cough" switch which mutes the microphone when pressed. For complete information write Telex Communications, Inc., 9600 Aldrich Avenue, South, Minneapolis, Minnesota 55420.

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INTERNATIONAL: Telex Export Dept., 9600 Aldrich Ave. S.,
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7311

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NEWS

effective dramatization.

In earlier actions, the Code board had revised Radio Code policy regarding references to cholesterol in advertising of such foods as vegetable oils and margarines; and agreed that continued priority attention should be given to non-prescription medication guidelines and alcoholic beverage guidelines set up by the Code Authority.

Extension Of Carrier Current Broadcast Services Opposed

The Radio Board of Directors of the NAB unanimously adopted a resolution opposing any extension of campus radio and other broadcast-like carrier-current systems into other areas.

The Board also voted to support all-channel radio legislation that would require that all radios costing \$15 or more be equipped to receive both AM and FM broadcasts.

Television Code Authority To Remain Within NAB

Proposal had been made that the Television Code Authority be separated from NAB and that non-broadcasters serve on the TV Code Review Board, but the TV Board of NAB voted unanimously to continue the Code Authority and TV Code board as they are. The Board declared that its decision was based on the conviction that the concept of industry self-regulation should be preserved. Board members said that broadcasters are constantly in touch with their communities, and furthermore, that the Code Review Board always welcomes suggestions and comments from all segments of the public.

Alaska PUC Investigates Cable Company

The services, facilities, and management practices of B-C Cable Company (JATV) of Juneau, Alaska, are being investigated by that state's Public Utilities Commission. Serious written complaints and numerous oral ones, too, along with the Commission's personal observation, caused the Commission to institute the investigation. The Commission noted that many of the complaints and allegations against B-C (JATV) have been resolved, but that such a large number of complaints for such a relatively small utility such as B-C (JATV) indicates that its "service and/or facilities may not be entirely reasonable, safe, adequate and sufficient as required by Statute."

continued on page 11



MASTERS OF THE SPOT

The original was a SPOTMASTER — and they continue to set the standard for the future. Now the industry's most comprehensive line of tape cartridge machines, SPOTMASTERS are NAB, IEC and IBA type approved. They are impressive machines with an impressive record — used by more broadcasters than any other cartridge machine.

- Model Ten/70 — the ultimate cartridge machine — features plug-in deck and adjustable precision head bracket. Available in playback, record/play/delay, stereo/record/play, rack mount and remote control configurations.
- Model 500C — the traditional favorite that meets NAB specifications. Features 1, 2, or 3 cue tones, separate heads with adjustable mount, A-B monitoring and biased cue recording. Available in several mono/stereo/delay configurations.
- Model Three/70 — the compact cartridge playback unit. Features direct drive motor, plug-in deck module and control logic switching. Three units rack mount side by side in only seven inches of rack height.
- Mini Series Models 303C and 305C — the latest in multi-channel playback systems. Features include plug-in decks, optional switcher and optional remote control. Ideal for manual operation or for use in programmed automation systems.

Spotmaster®

From BROADCAST ELECTRONICS
A Filmways Company



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Report Prepared On Prime-Time Access

"The Economics of Prime-Time Access" prepared for the FCC, found that the film industry was the only group surveyed which most actively opposed the prime-time ruling; the ruling has resulted in a serious loss of original prime-time TV programming for the major producers of the Hollywood film industry and for some independent producers as well.

Other results of the rule are as follows: increasing number of foreign-produced TV programs shown on American TV; higher network profits contributed to by rule; regularly scheduled network public affairs/documentary programs almost totally disappeared from those hours, with more network-produced children's programming during the prime-time (much to parents' disapproval); only a few increases in locally produced and originated public affairs programming.

The report was prepared by FCC communications economist Alan Pearce, and represents his views and conclusions (not necessarily the

FCC's). Pearce suggested some policy alternatives, including closer support by the FCC of the Justice Dept.'s anti-trust suits against the three networks, increased support of the nation's independent VHF and UHF stations to permit more effective competition with the networks, and encouragement and stimulation of cable and pay TV to establish another competitive broadcasting system.

Copies of the report are available from Information Planning Associates, Inc., 310 Maple Drive, Rockville, Md. 20850. Cost is \$20 plus postage.

Religious Commercials Denied Reconsideration

The FCC denied a petition on behalf of the Rev. Jimmy Lee Swaggart, radio evangelist, seeking "partial reconsideration" of a Notice of Apparent Liability, issued against licensee of WCIR (AM-FM), Beckley, West Virginia, for violation of program logging rules.

The Commission had found that commercial messages during Rev. Swaggart's "Campmeeting Hour" had not been logged for duration. Rev. Swaggart in his broadcasts asked listeners to send him a "gift of \$8.00—and that's below wholesale" for three rec-

ord albums, which he argued are "vehicles for Christian messages . . . religious artifacts, not commercial products, in the usual sense . . ." The Commission said that his argument that the action "abridges his right to the free exercise of religion is without merit." WCIR had not contested any portion of the liability, which had also concerned political advertising and network contract violations.

Banks' Control Of Broadcast Companies And Networks

A Senate study found that many large corporations, among them broadcast companies and networks, are controlled by a few banks. The study was jointly released by two Government Operations subcommittees: Budgeting, Management and Expenditures (Senator Metcalf, chairman), and Intergovernmental Relations (Sen. Muskie, chairman).

According to a Congressional Research Service analysis for the study, Chase Manhattan, Bankers Trust, and Bank of New York together had voting rights to almost one fourth of the stock in both CBS and ABC. The

continued on page 94

\$12,000*
\$12,000
\$12,000
\$12,000
\$12,000
\$12,000
\$12,000

** Approximate price based on 24 inputs and 10 outputs.*

24 inputs-10 outputs AUDIO CONSOLE

Programmable mute allowing up to four different "scenes" to be setup simultaneously on the console. Complete input crossbar switching allowing up to 48 inputs to be selected to any input module. Fail-safe by-pass allowing the console to be used for production while simultaneously using the input crossbar switch as a signal routing device. Total modular construction. Professional type low-noise conductive plastic input level faders. Four group submasters. Three knob equalizer per input channel. Four presettable mutes with master on/off.

Two foldback buses with pre/post fader selector. Stereo Pan Pot with in/out key per input channel. Line/Mic switch with 0-20-40-60 dB of attenuation. Echo send and receive controls. Phase switch on each input. Available in portable carry-case.

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 (213) 875-1900 TWX: 9104992669

One of the very best broadcast color monitors is on the shelf...waiting to brighten your day.

It's known as the TCB-19, from the Miratel Division, Ball Brothers Research Corp. We call it one of the very best because TCB-19 users report a consistently high level of performance.

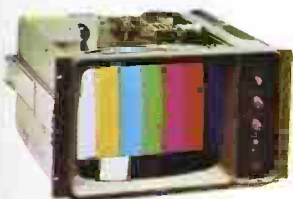
Dual regulated power supplies hold picture stability with wide input voltage variations. Solid-state circuitry insures low maintenance and consistent performance over the long haul. Switchable long or short time-constant AFC adds to monitor usefulness for VTR alignment, and a front panel switch allows for selection of two video inputs. All critical set-up and adjustment controls are front-mounted for convenience.

The TCB-19 performs the way it's built, and it's built well. Check it out!



See our new
"Switched Matrix" monitor
at N.A.B., Booth 806
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The rest of the family is also standing by.



And it's a large one. Color and monochrome monitors from 9 to 25 inches. Rack-mounted, frame-mounted, broadcast or information display. All Miratel monitors feature over-design of critical circuitry for exceptional long-term performance. Each unit is power aged, and subjected to quality control checkout before shipping. Miratel monitors are designed to

serve as your single best check of signal quality.

We also offer a variety of video accessories from special effects generators to waveform monitors to video signal multiplexers. Depend on the Miratel family for your television equipment needs. Call or write for information.

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**CONSOLIDATED VIDEO SYSTEMS TOTALLY
WIPE/ OUT THE LANGUAGE BARRIER
BETWEEN HELICALS AND QUADS.**

**INTRODUCING THE CV/ 504. A SINGLE
"UNIVERSAL" DIGITAL VIDEO SIGNAL
CORRECTOR FOR ALL REASONS.**

We know it sounds wild, but the new CV/ 504 works with 1/4", 1/2", 3/4", 1" and 2" non-segmented helical VTR's. In color, it doesn't matter whether the signal from the tape recorder is direct or heterodyne.



For example, how about taking a Sony automatic tape and dubbing it up to a quad? Easily done with the 504's exclusive "color interlacer" switch. The result when played back on the quad will be phased interlaced color.

How about taking an EIAJ 1/2" recorder and using it as a camera source hooked to house sync. It's easy with the CVS 504 if the recorder has a capstan motor. Even if it doesn't, you can still drive a camera from the internal sync generator in the CVS 504 and do special effects between the recorder and the camera.

Come to think of it, there isn't very much you can't do with the CVS 504. Your CVS Representative is carrying a videotape with him these days that demonstrates most of the 504's features. Why not ask him for a look at the tape? Or, you might ask him for a demonstration. Or, just drop us a line. We'll send you some literature on the CVS 504.

It's some kind of time base corrector.

*TM Sony Corp.

Consolidated Video Systems



Perfomers of Video Signals
 3300 Edward Avenue
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In the heart of Video Valley

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Manual video correction is no longer necessary...



...so why do it?

The TEKTRONIX 1440 Automatic Video Corrector takes the work and the worry out of video signal quality control . . . with FULLY AUTOMATIC CORRECTION of overall video gain, black level, color saturation, burst phase and gain, and sync level.

The quality of your program signal will be stubbornly maintained by the TEKTRONIX 1440 Automatic Video Corrector. And, since signal distortions are automatically

corrected, your engineering people will be freed from the task of continuously readjusting controls.

Attempting to keep up with continuously varying conditions with manual correction is no longer necessary . . . so why do it?

The assurance of signal quality that comes from using the 1440 is something that can't be priced, but the 1440 costs just \$2450.

The VIR Signal is the reference used to assure signal quality.

Your local Tektronix Field Engineer can demonstrate how the 1440 and other VIRsatile products will work for you at incoming network feed, remote feeds, master switcher output, transmitter input and at other key points.

To receive a VIR Signal application note, use the reader service card or write:

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Box 500-A, Beaverton, Oregon
97005.

Circle 109 on Reader Service Card:
For demonstration, Circle 114.

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TELEVISION
PRODUCTS**



committed to
technical excellence

INTERPRETING THE FCC RULES & REGULATIONS

New License Renewal Rules and Procedures— Part II:

Last month's "Interpreting . . ." column discussed several of the Commission's recently revised license renewal rules and procedures. Filing dates for radio and television license renewal applications have been changed from three months to four months prior to the broadcast license expiration date. A new Annual Programming Report (FCC Form 303-A) has been introduced; commercial television stations must file such a report on February 1 of each year (the filing date in 1974 is March 1). Furthermore, commercial television stations with licenses expiring on or after December 1, 1974, must use revised Section IV-B of FCC Form 303 (broadcast license renewal application). Starting in 1974, commercial television stations must maintain in their Public Inspection file an annual listing of "significant problems and needs of the area served by their stations during the preceding 12-month period." Finally, both radio and television stations must include various additional records (enumerated in last month's column) in their Public Inspection file beginning January 16, 1974.

The Commission has instituted further rule and procedure changes involving public notice broadcasts of (1) impending license expiration, and (2) intention to file a license renewal application. Additional announcements are now required concerning the licensee's obligation "to make a continuing effort to determine significant problems and needs of its service area."

Pre-Filing License Renewal Announcements

The Commission has revised §1.580 of its Rules concerning public notice broadcast of the forthcoming filing of a station's license renewal application. The "old" rule required broadcast, and in certain cases, publication in local newspapers, of public notice of renewal filing. The "new" rule eliminates the publication requirement for those stations whose licenses expire on or after December 1, 1974.

Note that the "old" §1.580 announcement requirements apply to all radio and television stations whose licenses expire prior to December 1, 1974. This includes publication in local newspapers in certain cases.¹

¹ See Commission's *Public Notice*, FCC 73-1318, December 17, 1973, for clarification of renewal rules and procedures that apply to licenses renewable prior to December 1, 1974.

The Commission has published a suggested text for the pre-filing announcement:

On *(date of last renewal grant)* *(Station's call letters)* was granted a license by the Federal Communications Commission to serve the public interest as a public trustee until *(expiration date)*.

Our license will expire on *(date)*. We must file an application for license renewal with the FCC *(date four calendar months prior to expiration date)*. When filed, a copy of this application will be available for public inspection during our regular business hours. It contains information concerning this station's performance during the last *(period of time covered by the application)* and projections of our programming during the next three years.

Individuals who wish to advise the FCC of facts relating to our renewal application and to whether this station has operated in the public interest should file comments and petitions with the Commission by *(date first day of last full calendar month prior to the month of expiration)*.

Further information concerning the Commission's broadcast license renewal process is available at *(address of location of the station's public inspection file)* or may be obtained from the FCC, Washington, D.C. 20554.

Although this suggested text complies with all the requirements of §1.580 of the Commission's Rules, it is not mandatory, and the broadcaster may, at his discretion, compose and broadcast his own announcement.²

The pre-filing announcement must be broadcast at least once per day on the *first* and the *sixteenth* of each month (1) "*beginning* on the first day of the sixth full calendar month prior to the station's license expiration date," and (2) "*ending* on the date upon which the renewal application is actually filed.

Example: Station X has a license which expires on December 1, 1974. The pre-filing announcement must therefore be broadcast beginning June 1, 1974, until August 1, 1974, the date on which Station X files its renewal application.

Radio stations must broadcast at least two pre-filing announcements during "drive-time" (7:00 a.m. to 9:00

² A station must submit, in triplicate with its license renewal application, (1) a statement of the date and time broadcast, as well as the text of its pre-filing announcement, and (2) a statement of the "anticipated text and scheduling of broadcast of the station's post-filing announcements."

continued on page 26

**It had to be
Quad.
Small.
Automatic.
Economical.**



Introducing the NEW TECHNOLOGY VTR. We set out to create the Video Tape Recorder that would become the new standard in the broadcast industry.

And there were some things we couldn't—and wouldn't—compromise on.

Quad. It had to be a quadplex VTR for several reasons. Broadcast quality, for one. Reliable interchangeability for another. And standardization was essential.

Small. Space saving is always important. And we wanted a VTR that would lend itself to use in crowded tape rooms or OB vans. So ours is more compact than most other quad VTRs. And lighter. It weighs only half as much as traditional quad machines.

Automatic. We wanted it to be easy to use, so we designed new built-in automatic features.

And we simplified operating functions. Loading and threading are easier than ever—features that your tape operators are sure to appreciate.

Economical. A quad VTR with a performance/cost relationship to please even the most hard-nosed businessman. Features that you might not need, we've made optional. And you probably already know about the long-wearing properties of RCA Alfecon II headwheels.

Our NEW TECHNOLOGY Recorder is power-thrifty, too. Uses only half the power needed to operate bigger, bulkier VTRs.

These are just a few of the reasons why it had to be RCA that brought you new dimensions in recorder technology. For more, write to RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

RCA

It had to be RCA.

See it at the NAB Show.

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Neve introduces an end to air pollution.



It's the new Neve 858 Audio Control Console. And it can help you avoid the "polluted", somewhat muddy and distorted sound that all too often rides the air waves.

With ordinary broadcasting consoles, you get ordinary results. But the Neve 858 is something else. It's designed to help your station produce the purest, richest sound in town, no matter how many rival stations there are in your area.

In this one console Neve combines 26 inputs, 6 stereo outputs, 6 mono outputs, simultaneous stereo/mono output capability, clean-feed input for automated systems, total harmonic distortion guaranteed to be less than 0.075%, and much more.

The sound of Neve is worldwide. Neve Consoles are used in broadcasting, music recording and film production in more than 48 countries. Why not get full details—before a competitive station does?

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Neve

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a.m. or 4:00 p.m. to 6:00 p.m.). All other required pre-filing announcements may be broadcast *anytime* at the station's discretion on the scheduled days.

Television stations must broadcast at least two pre-filing announcements during prime time (6:00 p.m. to 11:00 p.m. Eastern Time, or 5:00 p.m. to 10:00 p.m. Central Time and Mountain Time). Furthermore, television stations must exhibit sign boards or slides with the licensee's address and the Commission's address during the announcement's broadcast.

Post-Filing License Renewal Announcements

As would be logically expected, the post-filing announcement supercedes the pre-filing announcement beginning on the renewal application filing date (the first

Appendix

New License Renewal Rules and Procedures*

Beginning on:

1) January 16, 1974:

You must do the following to comply with the Commission's new renewal rules:

Comply with new Public Information file requirement (Section 1.526). Television stations must additionally include an "Annual Listing of Problems and Needs" (Section 1.526(a) (9)) but this particular date applies in 1974 only (see 3 below).

2) January 16, 1974:

Begin Section 1202(a) licensee obligation announcements (on *first* and *sixteenth* of each month) until six months prior to station's license expiration date.

3) Anniversary date of filing of television licensee's renewal application:

Television stations must place its "Annual Listing of Problems and Needs" (Section 1.526(a) (9)) in its Public Information File on this date in 1975 and subsequent years.

4) First day of sixth month prior to license expiration date:

Begin pre-filing announcement (Section 1.580) on *first* and *sixteenth* of each month until license renewal filing date.

5) First day of fourth month prior to license expiration date:

File license renewal application (FCC Form 303). Commercial television stations should use revised Section IV-B of Form 303.

6) First day of fourth month prior to license expiration date:

Begin post-filing announcements (Section 1.580) on *first* and *sixteenth* of each month until (and including) the sixteenth day of next to last month prior to license renewal expiration date.

7) First day of last full month prior to license expiration date:

Begin 1202(e) licensee obligation announcements (on *first* and *sixteenth* of each month) until you are notified that the Commission has renewed your license.

8) Date on which you receive notification by Commission of license renewal:

Begin entire "cycle" again; that is, begin Section 1202(a) licensee obligation announcements (on *first* and *sixteenth* of each month) until the first day of the sixth month prior to station's license expiration date.

*Applies only to those stations whose licenses expire on or after December 1, 1974. Unless otherwise specified all instructions apply to both radio and television stations. Section numbers refer to the Commission's Rules and Regulations.

It's not a lot of money
for the camera...

it's a lot of camera
for the money



Hitachi Shibaden's FP-1200 Plumbicon*... the broadcast-quality color camera with the down-to-earth price tag.

Excellent color fidelity and sensitivity, plus three-tube efficiency are just two of the many outstanding features that will make the FP-1200 a valuable addition to your studio operation.

Especially for broadcast, cable, medical, training and educational applications.

Consider these features: Broadcast I & Q encoder; improved F.E.T. pre-amplifiers; new dichroic mirror assembly; 6 db gain. The FP-1200 is the only low-cost color camera with bias-light. It produces quality color at 10 foot candles.

Another important plus. Serviceability and stable performance mean minimum maintenance.

Add in the many other features you'd expect from a camera like this: 10-1 zoom lens with automatic iris control, built-in encoder, color bar generator, color temperature compensator, horizontal aperture correction, extended red, solid state design... to name just a few.

For a live demo, specs and pricing, call or write Hitachi Shibaden... "The Image Makers."

We think you'll agree that the FP-1200 is a lot of camera for the money.



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MAINTAIN YOUR ANTENNA SYSTEM AT PEAK EFFICIENCY



Model OIB-1
Operating Impedance Bridge measures in circuit impedance of networks transmission lines and antennas. Accuracy $\pm 2\% \pm 1$ Ohm. Power rating, 5 kW modulated; 10 kW CW — VSWR 3: 1.



Model RG-1
Receiver/Generator combines a high output power signal generator with a shielded receiver for use with Model OIB-1 or any other impedance bridge.



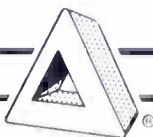
Model CPB-1 Common Point Bridge measures resistance to $\pm 2\% \pm 1$ Ohm and reactance to $\pm 5\% \pm 1$ Ohm at full power.

With Delta's monitoring equipment, you can either "spot check" or continuously and accurately monitor actual "on-the-air" operating impedance of transmission lines, networks and antenna systems to maintain a "clean signal" peak operating efficiency.

If you're operating with a directional antenna, there's real value in being able to keep the radiating system in close adjustment at all times. . . continuously verify common point impedance to insure full power output. . . plus locating and correcting any antenna problems — fast!

Complete details and application data are available without obligation — just write or call Bill Cottles, DELTA ELECTRONICS, INC., Department B, 5534 Port Royal Road, Springfield, Va. 22151 703/321-9845.

DELTA ELECTRONICS



NAB Show—Both 703W

Exporter: DELTA ELECTRONICS, INC.
International Division, 154 E Boston Post Rd.
Mamaroneck, N. Y. 10543, Telex 1 37327, Ari Rocke

Circle 124 on Reader Service Card

day of the fourth full month prior to the station's license expiration date). Such post-filing announcements must be broadcast at least one time per day on the *first* and *sixteenth* of each calendar month until the station's license expiration date.

Example: Station X has a license which expires on December 1, 1974. Station X must broadcast post-filing announcements beginning on August 1, 1974, and continuing on the first and sixteenth of each month until (but *not* including November 1, 1974; i.e., until and including October 16, 1974).

All radio and television stations must broadcast a post-filing announcement similar to the following:

On (date of last renewal grant) (Station's call letters) was granted a license by the Federal Communications Commission to serve the public interest as a public trustee until (expiration date).

Our license will expire on (date of expiration). We have filed an application for license renewal with the FCC.

A copy of this application is available for public inspection during our regular business hours. It contains information concerning this station's performance during the last (period of time covered by the application) and projections of our programming during the next three years.

Individuals who wish to advise the FCC of facts relating to our renewal application and to whether this station has operated in the public interest should file comments and petitions with the Commission by (date first day of last full calendar month prior to the month of expiration).

Further information concerning the Commission's broadcast license renewal process is available at (address of location of the station's public inspection file) or may be obtained from the FCC, Washington, D.C. 20554.

Stations may exercise their discretion in formulating a different version of the above announcement so long as it conforms to the requirements of Section 1.580 of the Commission's rules.

The Commission has specified certain required post-filing announcement broadcast times. Radio stations must broadcast (A) at least *three* of the required announcements in "drive-time" (between 7:00 a.m. and 9:00 a.m. or between 4:00 p.m. and 6:00 p.m.) and (B) at least *one* other announcement in *each* of these time periods: (1) between 9:00 a.m. and Noon, (2) between 12:00 Noon and 4:00 p.m., and (3) between 7:00 p.m. and 12:00 Midnight.

Any radio station which does *not* broadcast during "drive-time" hours must air at least *three* of the required announcements during the first two hours of its broadcast day.

Television stations have somewhat different requirements. Such stations must broadcast (A) at least *three* of the required post-filing announcements during "prime-time" (between 6:00 p.m. and 11:00 p.m., Eastern Time, or between 5:00 p.m. and 10:00 p.m. Central or Mountain Time) and (B) at least *one* other announcement in *each* of these time periods: (1) 9:00 a.m. to 1:00 p.m., (2) 1:00 p.m. to 5:00 p.m., and (3) 5:00 p.m. to 7:00 p.m. As with the broadcast of pre-filing announcements, television stations must exhibit signboards or slides with the licensee's address simultaneously with airing of the post-filing announcement.

Licensee Obligation Announcements

Radio and television licensees, pursuant to Section 1202(a) of the Commission's Rules, must broadcast announcements relating "to the licensee's obligation to make a continuing effort to determine the significant problems and needs of its service area and [to] invite members of the public to file written comments and suggestions concerning the station's operations and the

continued on page 30

Once you've seen the picture



you'll love the book.

You've just seen 3M's Color Dropout Compensator do its job.

It took the video playback on the left and re-created the picture on the right.

It automatically replaced all the quad VTR dropouts with correct color video.

Fill-ins are the exact chroma value required, not 180° out of phase.

Brightness levels match and there are no black, white, gray or off-color flashes.

There are no switching transients, so VTR stability is maintained, even through multi-generation dubs.

But why go on — you've already seen the picture.

To find out how it's done, get the book.

It's free from the MINCOM Division, 3M Company, 3M Center, St. Paul, MN 55101. Telephone (612) 733-9037.



VIDEO PRODUCTS
Mincom Division **3M**
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FCC RULES & REGS

licensee's programming service." The Commission has stated that the *purposes* of these announcements are to insure that:

- (1) The licensee would remain conversant with and attentive to community problems and needs throughout the license period;
- (2) the licensee would make known to the public his responsibility to continually ascertain the most significant problems and needs of his service area and to present programs designed to deal with these problems and needs;
- (3) the public would be continually encouraged by the licensee to make comments, complaints and suggestions regarding the operation of the station;
- (4) any complaints regarding the operation of the station would be communicated to the licensee immediately and every effort would be made during the license period by both the complainant and the licensee to resolve differences and problems through discussion on the local level.

The licensee obligation announcement must be broadcast at least one time per day on the *first* and *sixteenth* of each month throughout the station's license period *except* when the licensee is required to broadcast pre- and post-filing announcements (see above).

Commercial radio stations must broadcast an announcement similar to the following:

On (date of last renewal grant) (Station's call letters) was granted a license by the Federal Communications Commission to serve the public interest as a public trustee until (date of license expiration). We are obligated to make a continuing, diligent effort to determine the significant problems and needs of our service area and to provide programming to help meet those problems and needs.

We invite listeners to send specific suggestions or comments concerning our station operation and programming efforts to

(name and mailing address). Unless otherwise requested, all letters received will be available for public inspection during regular business hours.

On the *first* day of each month during the licensee obligation broadcast period, commercial radio stations must air this announcement either between 7 a.m. and 9 a.m. or between 4 p.m. and 6 p.m. On the *sixteenth* of each month, the required announcement should be broadcast in *rotating* order in the following time periods: (1) 9 a.m. to 1 p.m. (2) 1 p.m. to 4 p.m., and (3) 6 p.m. to 10 p.m.

Commercial television stations must broadcast a slightly different licensee obligation announcement which should be similar to the following:

On (date of last renewal grant) (Stations call letters) was granted a license by the Federal Communications Commission to serve the public interest as a public trustee until (date of license expiration). Each (anniversary date of deadline for filing renewal application) we place in our public inspection file a list of what we consider to have been some of the significant problems and needs of our service area during the preceding twelve months and some of our programming to help meet those problems and needs.

We invite viewers to send specific suggestions or comments concerning our station operation and programming efforts to (name and mailing address). Unless otherwise requested, all letters received will be available for public inspection during regular business hours.

On the *first* of each month during the licensee obligation broadcast period, television stations must broadcast the above announcement between 6 p.m. and 11 p.m. Eastern Time (between 5 p.m. and 10 p.m. Central and Mountain Time). On the *sixteenth* of each month, the required announcement should be broadcast once per day in *rotating* order in the following time periods: (1) 6



At NBC...



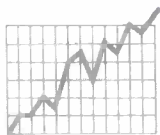
and CBS...

abc

and ABC...



they use more BIW TV broadcast cable



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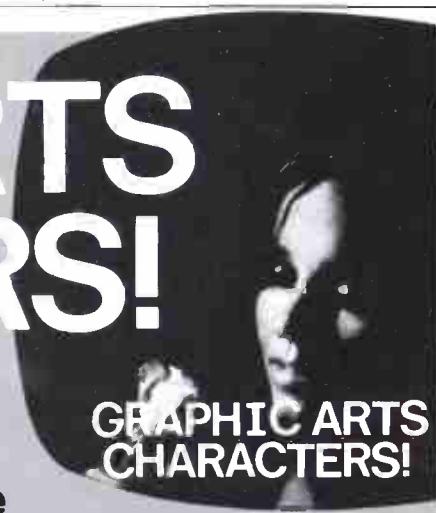
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The NAB Show: Riding The Wave

The 52nd annual NAB Convention will be the get-together of a very healthy industry, with practically every index of prosperity and affluence at the highest point in history. Many firms are showing expanded product lines. Technical advance looks widespread and substantial, though no blockbuster breakthroughs turned up in the advance announcements.

If you are attending the 1974 NAB Convention, look for *BM/E's* Houston Survival Guide. Courtesy copies at all Convention hotels. Make your visit a pleasant one!

The exhibition will be the biggest ever—just as last year's was and the year before—with products spread out through the largest display area the NAB has had.

For many broadcasters, the show will be exciting because widespread expansion in product lines is making certain products available at a range of prices and options, to match a wider range of buyers. If something didn't fit your need last year, take another look this year.

This is beginning to apply, for example, to the device that stirred the greatest excitement last year, the stand-alone time base corrector. The two pioneer producers, Consolidated Video and Television Microtime, have both upgraded and expanded their units, and a number of other firms are coming in, as noted in detail in a moment.

Another big excitement that was brewing a little off stage last year will come fully into the open at this show: the battle between quads and helicals for the on-line position in broadcast stations. This is a battle of great consequence for broadcasters on a number of fronts—more on that in a moment too.

Product line expansion and technical improvement have made the options more attractive in other areas of sharp interest, including especially portable video cameras, video switching and processing, character generators, audio consoles, test and measurement equipment.

The rundown that follows on these topics will show why any broadcaster, big, medium, or small, is very likely to have a real stake in seeing the 52nd NAB.

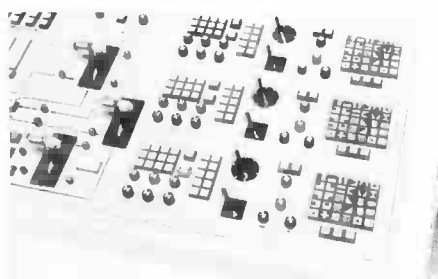
Time base correctors: The broadcasters who crowded the demonstrations of time base correctors last year were responding to a drastic upgrading in the value of the low-cost VTR with a time base corrector added can go directly on the air, a thing unheard of before. The two earliest firms in the field, Consolidated Video and Television Microtime, have both enjoyed very strong demand.

To repeat briefly here: CVS has brought out a single "universal" model, the CVS-504, on display at the show, intended to raise the signal from almost any helical VTR to broadcastable standards. TMI, on the other hand, has developed a family of TBC's, each optimized for a specific class of operations and price requirements. TMI's old and new units are on display at the show, along with a number of accessories.

But at least one firm, Dynasciences, will describe at the show a new TBC that will, hopefully, sell for around \$6000. Dynasciences had not released delivery information as this issue went to press, but no doubt visitors to their booth will get a more complete story, including



New optical multiplexer will be shown by Cohu.



Production switchers, such as the CDL unit shown, will get keen attention.

some idea of how the unit will fit functionally, into the range of TBC's already available.

3M is another firm coming into the field, but they are apparently somewhat further back in development than Dynasciences. The word on their TBC exhibit is "engineering feasibility model" and that probably means there will be several months, at the very least, before we get a marketable unit.

A third entrant of importance is Quantel Ltd. (Micro Consultants). The Company said it was a digital unit, with a wide "window" of 192 microseconds. Again, show visitors are likely to get the first complete story.

Quad vs helical: emerging battle: As related in earlier issues of *BM/E*, the International Video Corp. has issued a tremendous challenge to the quad VTR, standard in broadcasting since the 1950's, with their new IVC-9000 helical. Talked about at the last NAB, shown in full development at the SMPTE meeting in New York in October, the IVC-9000 gets its first NAB showing at the 52nd. The maker's claims of quality equal to, or in some respects even better than, that of the standard quad, coupled with a considerably lower price, cannot be ignored by the broadcast industry, and especially not by the quad makers.

continued on page 36

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...s new camera comes with a built-in sound re-
...and omnidirectional mike for high-quality
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RCA is in fact responding by bringing out a new low-cost quad machine at the show. Visitors will get a chance to compare this machine in detail with the IVC-9000.

Portable video cameras: Another device stirred by rapidly spreading competition is the portable video camera, and at least five firms are introducing new ones at the show. Television broadcasters, of course, would dearly love a very-light weight video camera that produces broadcastable material. The ratio of weight and general cumbersomeness in portable cameras to quality has been dropping in the last few years and the industry is sure to examine the newest batch of portables with a sharp eye for where this ratio stands in each case. Firms with new portables include Asaca (two new models); Bosch-Fernseh (introducing a whole "electronic journalism" system based on their portable camera, as predicted in the January issue); Marconi, with the Mark VIII-X; Norelco with the handheld PCP-70B; and RCA, with the TKP-45.

Video switching and processing: We have had a good complement of video switchers on the market for some time. This year is seeing a substantial further expansion, and the expansion reflects as well as stimulates the healthy market for this item. Some of the firms with new switchers are American Data Corporation using an

integrated-circuit switch point, Central Dynamics Laboratories, Sarkes Tarzian, Visual Electronics, and Vital Industries.

Character generators: Another expansion area is inhabited by the character generator. In this case the price trend has been both up and down, as related in considerable detail in the article by Walter Salm elsewhere in this issue. The flexibility and resourcefulness trends are sharply up: the latest CG's of top bracket will do a lot of amazing things with characters on a video screen. Most of the firms mentioned in the article will have their units on display at the show, including Systems Resources (Chiron), CBS (Vidifont), Datavision, TeleMation, and others.

Audio consoles: The expansion in the number of audio consoles available, the increase in their capacity, the extension of the price range both up and down, all strongly marked in recent years, are continuing at an even swifter pace by the evidence of what we will see at the show. One extreme is represented by, for example, the latest Neve unit, claiming overall audio distortion of .0025% (some others are in the same general area). We also have units of fully professional calibre costing less than \$1000. Very interesting in the low-to-moderate price range are the Fairchild models—but they are just one of several firms producing excellent consoles of moderate cost. Extreme flexibility, multi-channel capacity, great compactness are being combined, are in fact, very nearly the rule now on the more expensive units, as in those of Auditronics. In addition to those mentioned, firms showing consoles include McCurdy, Sparta, McMartin, and LPB.

And more: This is not all of the show by any means. Scan through the complete list of exhibitors and their products that follows to get a more complete idea of what is awaiting you on the floor of the Albert Thomas Convention Center. New audio tape machines are here in force, for example. So is more refined automation equipment. So are transmitters—TV, FM, and AM—and in this area (AM) we have two new firms, McMartin and Sintronic, to add to the pillars of transmitter society of the last decade.

Antennas, data processing, video tape editing equipment, telecine equipment, image enhancement, data processing systems are all just as important as the areas we've mentioned; and they are all covered by new, better, and often better-buy equipment.

Attendance very likely to be lower than '72 and '73

Although NAB-Houston will be the biggest ever from an exhibit area point of view, it is very likely that attendance will be less than in previous years. Only 57% of our "Panel of 100" survey respondents*, representing a cross section of both large and small stations, indicate they'll attend. *BM/E's* similar survey in 1973 indicated 70% would attend, and indeed official attendance figures were the highest ever. In 1972 our survey indicated 66% would attend.

Fewer TV management people are likely to travel to this year's convention (10-12% less) reversing a trend of

*Actually several "Panels of 100" were surveyed. Breakdown of respondents: TV (plus TV with radio interest), 106; radio only, 82. Mix was as follows: in TV sector managers 26, engineers 80; radio respondents included 44 managers and 38 engineers.

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Overall Interest In TV Equipment

	Percent Interested 1974	Percent Interested 1973
Production Switchers	47%	42%
VTRs	47	50
Video Cartridge/Cassette	47	70
Test Equipment	45	33
Picture Monitors	43	30
Videotape Editors	41	45
Character Generators	40	50
TV Cameras (med. price)	40	33
Audio Consoles	38	33
TV Cameras (top-of-line)	36	24
Transmitters	34	27
Waveform Monitors	32	30
Film Chains	30	33
Remote Control Equipment	24	30
Automation	23	30

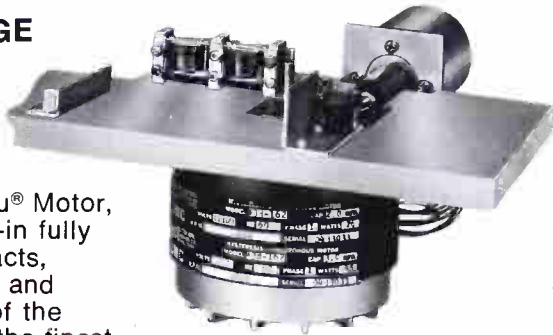
Overall Interest In Radio Equipment

	Percent Interested 1974	Percent Interested 1973
Consoles, Mixers	65%	65%
Cartridge Players	62	61
Tape Recorders/Players	57	52
Automation	42	52
FM Monitoring Equipment	40	28
AM Monitoring Equipment	38	28
Audio Processing	38	42
Microphones	38	33
Turntables	37	33
FM Transmitter	33	30
AM Transmitter	32	17
Remote Pickup & STL	32	35
Speakers	32	—
Headsets	28	35
Audio Controls	28	26
Status & Alarms	25	35
Loggers	25	33
FM Antennas	23	26
Towers	22	11
Transmission Lines	15	24

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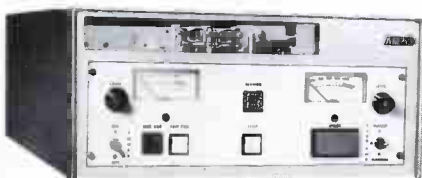
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Look inside and see the heavy-duty $\frac{3}{8}$ " thick machined aluminum head assembly mounted on a precision ground $\frac{1}{2}$ " thick die-cast transport structure. Plus a high torque 4" Beau® Motor, precision air-damped solenoid, plug-in fully shielded electronics with gold contacts, differential amplifier balanced input and transformer outputs . . . just some of the features permitting you to originate the finest possible audio quality! Low prices start at just \$550.00 with 30 models to choose from, all for immediate delivery.



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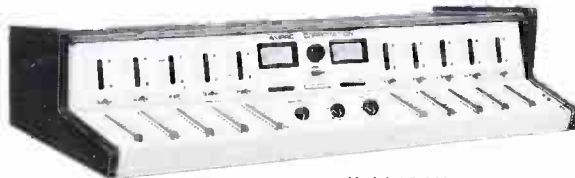


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recent years. Radio management will be there in about the same numbers as last year (55% this year compared to 56% in 1973) but the radio engineering audience will be considerably reduced—only about one in four polled will make the trip.

What equipment will get the most scrutiny this year?

As in previous years *BM/E* asked its "Panel of 100" whether they would be looking at any new equipment. Of those going to Houston, every TV engineer, radio engineer, and TV manager had something specific in mind to investigate. Half of the managers of radio stations were going to look at specific equipment.

In the TV area, production switchers were on the top of the list. Video cartridge equipment is of specific interest to a number but overall interest has slipped from last year—quite possibly those most in need of such equipment have already made a decision. There will be a search for lower-cost VTRs.

Test equipment appears to be of more interest than

usual this year to TV engineers. Picture monitors were singled out more than in recent years. Over a third of those traveling to Houston will look at TV transmitters—which is quite a substantial figure.

In the world of radio, audio consoles are of most interest closely followed by cartridge players as in previous years. But there is revealed a keener interest in signal quality than in years previous. More attendees will show an interest in new AM and FM monitoring equipment, and interest in new AM transmitters is higher than noted in previous years (up to 32% overall compared to 17% last year). While automation equipment is of less interest on the average, it is still of very keen interest to specific attendees. In response to the question of what product is of *greatest* interest to you, automation was most frequently mentioned.

As in previous years there will be more *looking than actual buying* at the show. The vast majority say they will buy later in 1974. And although fewer people will actually be looking than before because of the expected lower attendance, *BM/E* can discern no lesser interest in buying. Most of those responding to our survey indicated their specific and overall product interests regardless of whether they were going to Houston or not.

Exhibitors at NAB

(Numbers 100 through 499 are in the East Hall; 500 and above in the West Hall.)

Acrodyne Industries, Inc. (Booth 717).

A completely new line of TV translators, the T-200 series, will be introduced, in ten models with ratings from 1 watt to 1 kW, and covering both VHF and UHF. New also is the A-140U 1 kW single-tube amplifier for TV transmitter and translator applications. It exceeds FCC requirements.

Alford Manufacturing Co. (Booth 801).

Will be showing TV antenna systems, FM antenna systems, diplexers, coaxial switches, filters, and rf measuring equipment.

Allied Tower Co. (Booth 734).

Various tower models for broadcasting antennas; complete tower service.

Amco Engineering Co. (Booth 715).

Will introduce a new instrument cabinet with vinyl cornered panelling, adjustable to

a wide range of instrument sizes. Also showing: new desk units; and monitoring, audio-video control consoles.

American Astrionics, Division of Technicolor, Inc. (Booth 1104).

Will introduce Chromatech, a video processing unit for superimposing two sources of NTSC color without halos or black outlines.

American Data Corp. (Booth 1006).

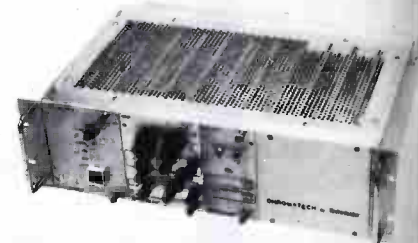
Will show a new generation of video and audio switching units, incorporating an IC crosspoint which discretely switches video, audio and dual tallies in a single integrated circuit. Also new: Model 1290, using a method of adding a quad split to new or existing switchers; an expanded version of the Model 556 switcher; and the Model 1220 Modular test set, introducing the "buy-only-what-you-need" principle to test equipment. Also: an RF test set for satellite and microwave link testing.

American Electronics Inc. (Booth 709)

Featured product is remote pickup microphone amplifier and control unit to work with standard telephones.

American Electronics Laboratories, Inc. (Booth 410).

Will feature the FM-25/25KD dual 25 kW transmitter. Will introduce AM transmitters, AM-5KD and AM-10KD. Also showing: the AM-50KD and FM-2.5KD transmitters.



American Astrionics Chromatech

Ampex Corp. (Booth 202).

Feature exhibits under wraps until show opens.

Ampro Corp. (Booth 1008).

Complete line of mono and stereo audio consoles; also the line of tape cartridge recorder/reproducer and multicartridge units.

Andrew Corp. (Booth 606).

Will exhibit a line of rigid coaxial transmission lines, coaxial switches, semi-flexible transmission lines, microwave waveguides, antenna for S-T-L.

Angenieux Corp. (Booth 800).

Will show a family of lenses for all TV broadcast applications. New will be an 18x27.5E61 remote lens. Also: 15 to 1 lens for studio and production work, 10 to 1 for Plumbicon and vidicon cameras.

Asaca Corp. of America (Booth 912).

Will show three portable color TV cameras, the ACC-3000 (C-Mount), the ACC-5000 (6:1 Zoom), and the ACC-7000 (10:1 Zoom).



Auditornics Model 110 Console

continued on page 40

WHERE ACCURACY COUNTS COUNT ON BELAR **AM FM TV**



FM Monitor, FMM-1



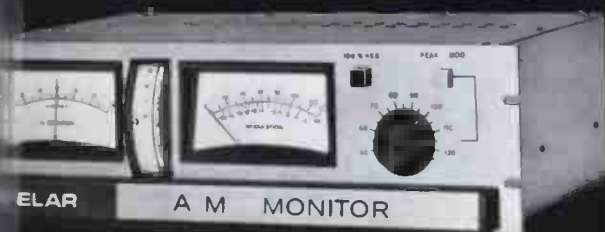
Stereo Monitor, FMS-1



SCA Monitor, SCM-1



TV Amplifier, RFA-1



AM Monitor, AMM-1



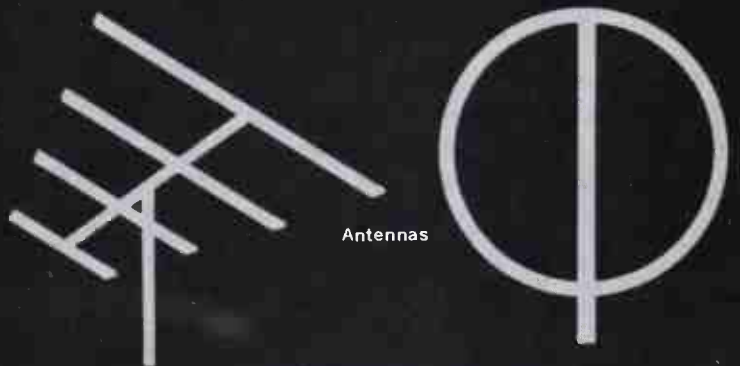
TV Amplifier, RFA-3



TV Frequency Monitor, TVM-2,3



TV Monitor, TVM-1



AM Amplifier, RFA-2

The secure feeling that you have purchased equipment that will accurately do the job you intended it to do is most comforting. When you buy Belar AM, FM, or TV frequency and modulation monitoring systems, you'll know that feeling. You'll know that you have the right equipment that will give you ease

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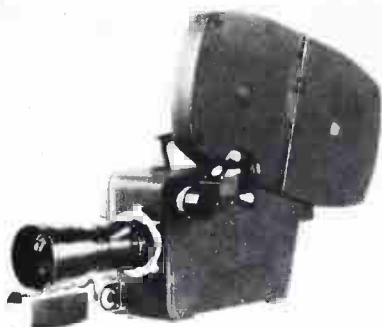
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Cinema Products CP-16R Reflex Camera



Bird Digital Wattmeter

Audio Devices, Inc. (Booth 814).

Highlights will be a new **high-output, low-noise tape**, and a new broadcast **audio cartridge**. The new Audiopak A-2 cartridge has new braking to hold a cue point firmly, a new "guide-by-angle" system for more precise tape position. The tapes, types 2506 and 3607, have a new oxide and binder.

Auditronics, Inc. (Booth 1007).

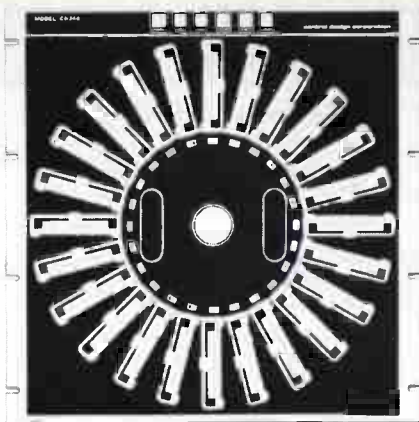
New display is Grandson Model 110, an expandable, completely modular professional **recording/remixing/on-air audio control console** that will accommodate up to 16 track recordings for broadcast production and on-air applications. Three units can be ganged for 54 mixing positions and 162 inputs. Also shown: Son of Grand Model 501 modular recording/remixing console to accommodate 24 track recording and quad remixing; Model PEQ-82 program equalizer for modern signal processing.

Berkey Colortran, Inc. (Booth 803).

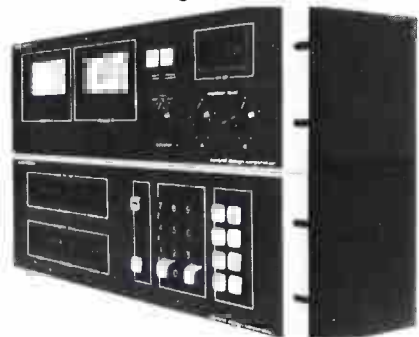
Introducing a new MOS "Memory Assisted Lighting Control Center" with 1000-scene memory and Store Fade Time. Also new: "Far Cyc" **cyclorama lighting unit**. Showing: family of ring focus Fresnel lenses; range of studio and portable **lighting equipment**.

Bird Electronic Corp. (Booth 910).

Will introduce the new Model 4371 directional high-power digital **watt-meter** for coaxial lines, measuring to 520 MHz and 1 kW. Also showing: range of **RF wattmeters, loads, Moduload terminating systems, heat exchangers, power**



Control Design Multicart Player



Control Design Corp. Automation Controller

monitor/alarms, VSWR indicators.

Belar Electronics Lab. (Booth 719).

Full line of AM, TV, FM, FM-stereo, and SCÅ **frequency and modulation monitors**. Live off-air monitoring will be shown.

Robert Bosch Corp. (Booth 408).

Highlight attraction will be the KCR **hand-held portable color TV camera** for full remote operation. Studio color camera systems (KCP) will be operating at all times. Exhibit includes a high-quality film island. Company will also be introducing a **low-cost film island** that uses the low-cost KCP camera.

Boston Insulated Wire and Cable Co. (Booth 811).

Will feature TV camera **cables and connectors**.

Broadcast Automation Associates/Russco Electronics (Booth 617).

Just completed for the show is the new **Monitor/Master 260 dual channel audio amplifier** with 60 watts output per channel at 0.25% distortion; also Models 505 mono and 505-S stereo audio mixer which matches the amplifier in looks and size. Also included is the L.J. Scully Model LJ-10 14" stereo professional tape reproducer.

Broadcast Electronics, Inc. (Booth 104).

Will show a full line of **audio consoles; automation systems; a compressor-limiter-expander; a new turntable**

preamplifier with 54 dB of gain, and 60 dB of signal/noise ratio; telephone message systems; modular amplifiers.

CBS Laboratories (Booth 107).

Top attraction will be the Vidifont **character generator**. New products being introduced will include Model 7010 NTSC Chroma Keyer; SQ encoder/mixer for FM stereo broadcasters. Also shown will be the Image Enhancer; Volumax Model 2300 peak controller; Audimax; FM Volumax; presence equalizer; audio and video distribution amplifiers; Model 5500 color corrector; CLD-1300 processing amplifiers; others.

CCA Electronics Corp. (Booth 112).

Full line of **broadcasting equipment for AM and FM operations** will be shown from studio to transmitter. Also featured will be TV transmitters for UHF and VHF.

CMX Systems (Booth 525).

Will show its **computer controlled editing systems** for quadruplex, and helical video tape recorders, slow motion video disc recorders, and multitrack audio recorders.

Cablewave Systems Inc. (Booth 522).

Line of **transmission lines** and coaxial cables. Both rigid and flexible types will be shown.

Canon U.S.A., Inc. (Booth 1000).

Will introduce a new 60°, wide-angle **8X zoom lens** (11mm to 90mm, f/2.0) for hand-held color cameras; also a new **24X, close-focusing double zoom** (24mm to 300mm, f/2.0) for studio color cameras; and a new **34X, double zoom** (24mm to 800mm, f/1.8) for field and sports applications. Also on display: a new "Scoopic" 16mm hand-held **movie camera** with reflex viewing, zoom lens (12.5mm to 75mm, f/1.8), automatic exposure and semi-auto film loading. Also: extensive line of **other lenses** for video cameras and 16mm cameras.

Central Dynamics Corp. (Booth 412).

Products on view will take TV program from stage to transmitter, including **video production switchers**, post production editing equipment, and technical operations in master control area. Shown for the first time: the PEC-102 computer-controlled **VTR editing system** in an off-line editing configuration using three IVC 960 VTR's; new, small, compact **video production switchers**; new VA-2181 **processing amplifier** with control switching.

Cinema Products Corp. (Booth 1010).

Featured product is a new **16mm reflex camera system**, CP-16R and CP-16R/A, which has a mirror shutter rotating at half speed; standard fixed reflex viewfinder supplied can be replaced with "orientable" reflex viewfinder; camera has crystal controlled 24 or 25 fps speed, and variable 12, 16, 20, 28, 32 and 36 fps; also both automatic and semi-automatic exposure control.

continued on page 42

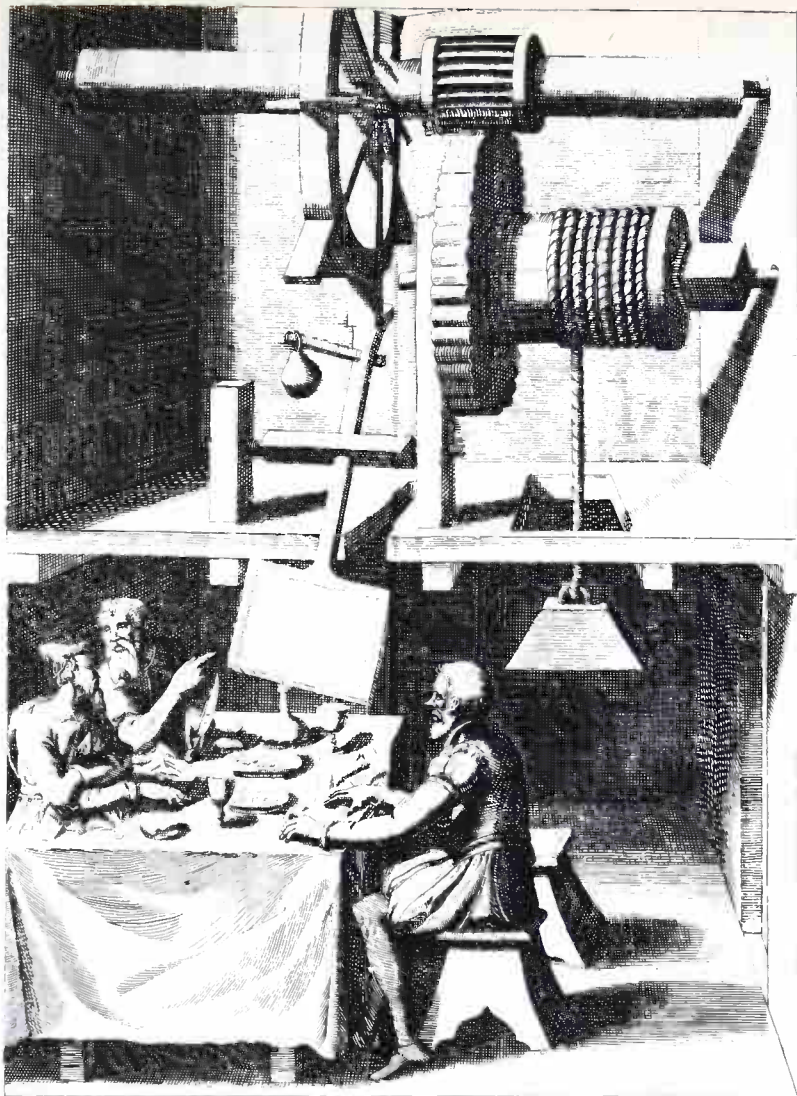
THE PRIME INGREDIENT IN INNOVATIVE EQUIPMENT DESIGN— CREATIVE LISTENING...

TV-newsfilm and documentary camera-
men had been clamoring for years for a
truly lightweight and extremely compact
16mm single/double system sound cam-
era. A camera well balanced for "on-the-
shoulder" filming. A reliable, no nonsense
kind of camera—quick and easy to oper-
ate. Our Cinema Products engineers
listened well. And designed the CP-16
and CP-16/A camera system.

System CP-16 innovative engineering.
Beyond the reduction of overall cam-
era weight, we have pioneered and
introduced a host of innovative fea-
tures that have been enthusiastically
acclaimed the world over. Such as
the compact, extremely effi-
cient, crystal-controlled DC
servo-motor. The built-in Crys-
tal-sound ampli-
fier. The com-
pact, lightweight
plug-in battery
which powers the entire
camera system. The magazine snap latch,
for instant removal or attaching of maga-
zines. And many more!

And speaking of magazines, we have
just introduced our PLC-4 ultra light-
weight 400 ft. magazine—the newest
thing in 16mm magazines in a generation!
Made of glass-filled Lexan®, the PLC-4
eliminates film spotting caused by par-
ticles of magnesium. And the magazine
doors are hinged to provide quick access
for loading and unloading. The PLC-4 is,
of course, interchangeable with all 16mm
Mitchell-type magazines.

See us at NAB Show—Booth 1010W



Creative listening. At Cinema
Products we are mas-
ters of the art. We
never rest on
our laurels. We
still listen. And
we innovate.
We accept
what is
valid in

protective overhang) into all CP-16 and
CP-16/A camera models—even the earli-
est ones. And at no additional charge.

Largest U.S. camera manufacturer.
The resounding success of our CP-16
and CP-16/A cameras has well estab-
lished us as the largest U.S. manufacturer
of professional motion picture cameras.
It also gave rise to a spate of imitations.
Though imitation may be the sincerest
flattery, we are not impressed. Imitation
is not innovation.

Creative listening *and* innovative engi-
neering. The secret of our success in
designing and manufacturing the most
sought-after, rugged and versatile
TV-newsfilm/documentary cameras—
the CP-16 and CP-16/A.

existing
design,
and build
to improve on it. And
we subject everything we design to an on-
going process of evaluation and valida-
tion based on inputs from the field. Metic-
ulously paying attention to every detail.

Insurance against obsolescence. The
excellence of our original System CP-16
design is such that it permits the integra-
tion of most of our latest innovative modi-
fications (such as the magazine snap latch

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Telephone (213) 478-0711 • Telex 69-1339 • Cable: CineDevco

Cohu, Inc. (Booth 900).

Will have a live "show" with a model performing magic tricks to demonstrate the performance of TV **color cameras**, including the Model 1500 color film camera, the Model M-3 **optical multiplexer**; also on view, the Model 1230 studio color cameras, the Model 9501 **production switcher**, and the latest in broadcast **studio processing units**.

Collins Radio Co. (Booth 303).

New products will be the 831-H-1 **FM transmitter**, 45 kW, which has automatic switching to half power and alarm indication, with any serious malfunction; and the 831-FM 10 kW FM transmitter, with guaranteed maximum stereo separation, automatic power output control circuit, and automatic overload recycling. Also showing: Collins' complete line of FM and AM transmitters and audio consoles.

Colorado Video, Inc. (Booth 508).

Principal attractions are **compressed video equipment** and a **color synthesizer**. The video compression equipment will permit

picture transmission over voice grade circuits.

Coltape, Div. of Columbia Pictures Industries (Booth 716).

Emphasizing the Fuji Low Noise H-701 broadcast **videotape**.

Commerical Electronics Inc. (Booth 527).

Feature attraction will be the CEI-280 **broadcast color TV camera** with a Schneider lens. In addition, the company expects to unveil a brand new product.

Compu/Net Inc. (Booth 612).

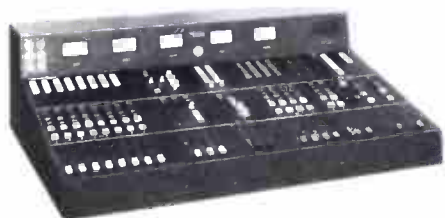
Automation systems which indicate availabilities, inputs for automatic scheduling, and automated billing will be demonstrated. Systems for both radio and TV will be shown.

Computer Image Corp. (Booth 516).

Scanimate and CAESAR **animation/techniques** for producing Emmy-winning graphics and animation with the aid of computers will be described.

Conrac Div. of Conrac Corp. (Booth 402).

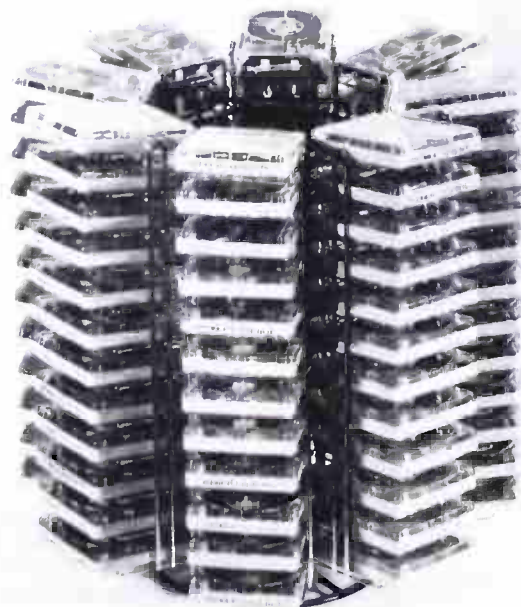
The complete line of **color monitors**.



Fairchild Model 1632 Console



Delta Digital Remote Control



Fidelpac CC96 Rack for 96 Carts

Consolidated Video Systems (Booth 727).

Will introduce the CVS 504 **digital video signal correctors**, for time base correction, with almost any helical vtr, raising signal to broadcastable standards.

Continental Electronics (Booth 413).

High power **AM transmitters** will be on display.

Control Design Corp. (Booth 616).

Will be showing for the first time the entire line of **modular-automation equipment**. Booth will have an operating automation system using various types of input equipment and a new type of **multiple cartridge playback equipment**. Focal point will be the CD28 **modular automation controller** for updating present systems or assembling new ones.

Data Communications Corp. (Booth 523).

Will unveil a new **automated information system** for radio stations similar to the firm's TV automated systems; also a new hi-speed Data General Mini-Computer Nova, Model 2/10, which has four to ten times the speed of current models.

Datatek Corp. (Booth 1009).

Feature product will be **D701 transmitter color phase equalizer** and waveform correction system. Compact video-audio switchers will also be shown along with equipment for envelope delay measurements and waveform correction. A full line of distribution amplifiers for audio video, and pulse transmission is on tap.

Datatron, Inc. (Booth 702).

New products at the show include the Model 5120 SMPTE low-cost **time code generator**, with time displayed on front panel; also a low-cost **time code reader**, Model 5250, which accumulates and converts code into parallel format for front panel display. Also on show: the Model 5050 Vidicue **automatic editing system**, using SMPTE code to control two or more quad or helical VTR's or audio recorders.

Datavision, Inc. (Booth 1100).

Will feature the new Model D-3000 **character generator**, which has high-resolution characters and can be had with high-speed random access "floppy-disc" message storage. (See page 00, this issue, for a discussion of this and other character generators). D-3000 has two-speed roll and crawl, word flash, title insert mode, other operating features.

Delta Electronics, Inc. (Booth 703).

Feature attraction is the new Model TMCS-1 **digital antenna/transmitter**

continued on page 44

What you don't see

is also what you get.

When you look into our coaxial cables, the completeness of the line is the first thing that strikes you. It's unique. We're the only manufacturer to offer a coax to meet every need: copper corrugated, smooth aluminum, foam dielectric and air dielectric; both types with a choice of constructions in a wide range of sizes and continuous lengths. A check on the performance of these coaxial cables in the lab or in the field would present convincing evidence of a high degree of mechanical integrity and outstanding electrical characteristics. Request a quotation and a glance at price and delivery will be the clincher.

These qualities are obvious to anyone who cares to look for them but our coax customers get still more not so readily seen. For instance, fast reaction to your RFQ's and prompt, accurate, response to requests for technical data and assistance in system or subsystem design. Perhaps a custom cut length of coax or a special assembly, terminated and ready to slip into place is what you need. No problem. After-sales service is not an empty statement with us. It's an article of faith.

May we tell you more? Write for your copy of our new 64-page catalog today. Cablewave Systems Inc., 60 Dodge Avenue, North Haven, Connecticut 06473. (203) 239-3311.



See us at NAB Show—Booth 522W

Cablewave Systems Inc.

A Corporation owned by Phelps Dodge and Kabelmetal

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NAB 1974

mote control system, shown for the first time. Also showing will be the DAM-1 digital antenna monitor, the OIB-1 operating impedance bridge, and the RG-1 receiver/generator.

Dibol Electronics, Inc.
(Booth 614).

Dielectric Communications, Div. of Sola (Booth 718).

Exhibit will show **strobe lights** for antennas, and a new line of **RF loads**.

Victor Duncon Inc. (Booth 1011).

Dynair Electronics Inc. (Booth 705).

In addition to the featured product, the TX-3A **television modulator**, Dynair will show TX-40A **television exciter**, Series-8100 audio switching system, VS-153A-M vertical-interval production switcher with momentary control.

Dynasciences Corp. (Booth 1101).

Will introduce a new **time base corrector** with a price of about \$6000. Also will show color enhancers, video switchers, and special effects generators.

Eastman Kodak Co. (Booth 110).

For the first time at NAB, will show:

Supermatic 200 **Super-8mm camera**; Supermatic 8 **processor**; Ektachrome SM **film** and chemicals. Also showing: Supermatic film **videoplayer VP-1**; Super 8 videofilm **projector TV-M100A**; 16mm television **projector, CT-500**.

Electro Sound Inc. (Booth 601).

Line of professional **audio open reel recorders/playback units** will be shown.

Electronics, Missiles & Communications, Inc. (Booth 208).

UHF and VHF TV **translators**, 1 watt to 1 kW; TV antennas; ITFS systems.

Elpa Marketing Industries, Inc.
(Booth 732).

Will feature the new Ferroglyph **Studio 8 tape recorder**; also showing the Ferroglyph super 7 recorder, the RTS-1 and RTS-2 **test systems**; Editall **editing equipment**.

F&B/Ceco Industries (Booth 000).

Complete line of **16mm cameras**, lighting equipment, audio recorders, etc. for sale or rent will be displayed. Asaca hand-held color camera will be demonstrated.

Fairchild Sound Equipment Corp.
(Booth 604).

A new product will be the Model 1632 TV **console**. On display will be the 30000 series of **standard consoles**, the ICBM **modular consoles**, and the FPC series, **portable consoles**. Also: distribution amplifiers; the Reverbertron; plug-in modules, 725 and 692 series, including compressors, limiters, equalizers, attenuators, power supplies.

Farinon Electric (Booth 810).

Microwave transmission equipment will be shown.

Fax Net Inc. (Booth 808).

Fidelipac, Div. of Telepro Industries, Inc. (Booth 805).

Automatic tape cartridges, the series 300, 600, and 1200; also cartridge racks and other accessories will be shown. (Among the accessories the new CC48 rack holding 68 cartridges, and the CC96, for 96 carts.)

Fort Worth Tower Co. (Booth 708).

Will feature **towers** and equipment **buildings**.

GTE Sylvania (Booth 1002).

Featuring: **lighting** for all phases of TV station operation. New: a complete line of **tungsten halogen lamps** to upgrade telecine projectors. Also included: **lamps** for studio lighting, news cameramen, and remote production.

Gates Div. of Harris-Intertype Corp.
(Booth 200).

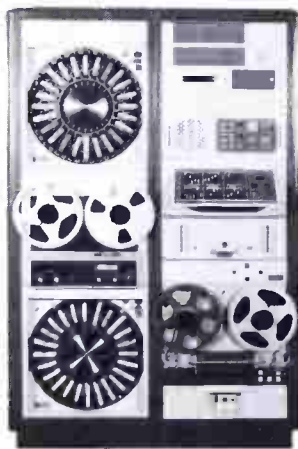
Feature display is the BT-60U kW UHF **color TV transmitter** with intermediate frequency (IF) modulation for superb color
continued on page 46

Automation...

SOUND SOLUTION TO PROFITS

"Live" automation from SMC puts your best sound forward . . . retains your own distinctive air personality . . . and enables you to vary your salary overhead as required. Good sound solution to improve your profit line is this SMC

SEQUENTIAL automated system that automatically handles your "On-Air" functions. Now's the time to take a closer look at the economies of automation by SMC.



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At school or on the job, Scoopic is at home.



Sound Scoopic 200SE

Scoopic 16M

Whether the footage you're shooting is industrial or educational use, there are certain requirements your equipment must meet.

Portability, so you can move about and unhampered. Versatility, so no matter what the assignment, you can handle it. Dependability, so you can count on it to work every time.

One of the many reasons why Scoopic cameras and lenses from Canon should be your choice in 16mm equipment.

Take the Scoopic 16M camera. Compact and quiet, it comes with a built-in high speed zoom lens that's capable of focusing on objects as close as 3 1/2" from its front component. In its bright viewfinder you get all the information you need to shoot by, including TV scale, T-stop scale and over/under exposure warning marks.

Film speeds go from 16 to 64 fps plus 1/2 frame. And the self-contained battery of the 16M powers up to 1600' of film in a single charge — and recharges completely in under three hours.

If you're into sound, check out the Sound Scoopic 200SE. This single system sound camera features automatic volume control so there's never any volume overload. Automatic or manual exposure

control. And reflex viewing through a unique rotating mirror shutter.

The bright built-in 6X zoom lens comes with an external filter slot for fast changing. Registration pin plus the TV reticle cut in the viewfinder let you frame each scene perfectly.



C10x12

If you already have a camera but need a zoom lens, see our C10x12 Macro Zoom. And see what exciting new effects you'll be able to produce.

With the macro ring you can focus as close as 1mm from the front of the lens. You can create multi-point focus effects by combining macro, zoom and focus abilities. And manipulate foreground and background to achieve effects that until now could only be produced in a lab.

Because this 12-120mm lens incorporates manmade fluorite, chromatic aberration is practically eliminated.

You can be assured of the quality and dependability of all Scoopic products because they're backed by our 37 years of experience in the manufacture, research and development of precision optical equipment. And our rigorous quality control methods.

For more information on the Scoopic 16M, the Sound Scoopic 200SE or the C10x12 Macro Zoom lens, see your Canon dealer. Or write us.

Canon[®]
Scoopic Division



EDS 60-Twin Teleslide



EMT 928 Turntable

performance. It offers on-the-air protection through redundancy of the visual amplifiers—two 30 kW visual amplifiers are operated in parallel.

Gotham Audio Corp. (Booth 602).

New equipment features professional turntable EMT 928 with AC-drive motor powered by electronic three-phase generator that has high degree of frequency stability; **reverb foil** EMT 240 with constant resonance density over audible range and minimum dispersion; and **PDM compressor** EMT 156 and 156TV (mono). Other products include Neumann condenser mics, Beyer input transformers, and Lyrec tape timers.

Grass Valley Group Inc. (Booth 406).

Among the highlighted systems to be shown will be the **APC-2000/automation system** which performs automated control of on-air operations. A digital cassette provides 10,000 event storage. Production switchers will also be featured. Many mix/effects (including soft-wipes) will be demonstrated.

Hitachi Shibaden Corp. of Am. (Booth 904).

The **FP-1200 Plumbicon color TV camera** that sells for under \$20,000 will be highlighted. Helical scan VTRs will be shown including cartridge units.

Imero Fiorentino Associates, Inc. (Booth 1105).

Will have design experts on hand for free discussions of TV **studio design** and plan-

ning problems. Will show the **IFA color contrast evaluator kit**.

Ingersoll Products (Booth 911).

Feature attraction will be **modular cabinetry**, in three complete lines. Also shown is a complete new line of **Computer Support Furniture**, including desks and pedestals.

Innovative Television Equipment (Booth 502).

For all sizes of cameras, there will be shown **video camera mounting equipment** including dollies, stands, heads, etc.

International Tapetronics Corp. (Booth 605).

New products shown will be the 850 series of **reel to reel tape machines**, available with 10½" reel and 14" reel capacities. Also showing is the full line of tape cartridges, including the "Encore" economy model, and the line of tape recorders.

International Video Corp. (Booth 105).

Highlight will be the new **segmented-scan helical VTR** for broadcast use, the IVC 9000. Unit offers equal or better performance than quadruplex recorders at a lower cost. Also being announced for the first time is a **quality broadcast color TV camera**, the IVC 7000. Unit is priced at \$50,000 and will outperform "all-but the very best."

Jamieson Film Co. (Booth 907).

Color film processing equipment.

Kaman Sciences Corp. (Booth 704).

The main attraction will be the **BCS System for computerized radio and television traffic and accounting**. Will show for the first time automatic availability updating, on line. Also: **microfilm billing reports**.

Kliegl Brothers (Booth 400).

Will introduce the new **Q-Level Memory Controlled lighting system** for TV applications less sophisticated than those serviced by the Q-File Memory System. Also a new line of **Fresnel spotlights**, scoops, and a new line of **Luminaire raising and lowering devices**. Lighting specialists will be on hand to discuss layouts and specific problems.

LPB, Inc. (Booth 609).

New products being introduced are: **FM-10**, a very-low-price 10-watt FM transmitter; the **50D**, a 50-watt AM transmitter, also low priced; the **S-9B 4-channel production console**; the **S-13B 8-channel stereo console**. The last will be fully operational in a mini-studio with turntables, etc. Also: **mono consoles, distribution amplifiers, compressor/limiter**.

Landy Associates (Booth 512).

Will feature the brand-new **Advent Videobeam projection color television system** which puts images on a 4½' x 5¾' screen, with all-channel tuner, video input, and light levels within SMPTE motion pic-

ture recommendation. Also: new **Porta Pattern** test slides and films for TV film chains; a new modularized audio line b Roh Corporation.

Lenco Electronics (Booth 1103).

A line of **video, pulse and subcarrier distribution equipment** will be shown.

Listec Television Equipment Corp. (Booth 906).

Theme of the show will be "What's new in television mounting and captioning equipment." Among the products: **Instant Caption/Slide Projector**, Model ICM 300, by E.D.S., which uses 3¼" 4¼" Polaroid pictures, with superimposed roller captions; also showing for the first time **Vinten remote camera mounting equipment**, including Model 729, counter balanced for 250-lb loads; others.

Lowel-Light Mfg. Co. (Booth 1102).

Will show the Lowel "Tota System" **portable lights** for television applications a line of studio lighting systems.

Marconi Electronics Inc. (Booth 108)

The world's first **automatic hand-held broadcast color TV camera** is promised. It's called the **Mark VIII-X**. Also shown will be an improved **Mark VIII studio camera**, the **Mark VIII-B**. Another main feature will be the company's broadcaster-designed **telecine**, the **B 3404** first introduced last year at NAB. Marconi Instruments Div. will be displaying an **automatic TV broadcast transmitter monitoring system** which includes an insertion generator and a data monitor which scans each parameter in sequence. **Insertion generator** is called the **Model 2913 Test Line Generator**. Also on display will be a new **non-linear distortion analyzer** with a sampler (model 2910).

Marti Electronics Inc. (Booth 102).

On display: solid state remote pick up **transmitter/receiver**, a 950 MHz **aura SLT** remote control and telemetering system, amplifiers, and accessories.

Memorex Corp. (Booth 113).

Video and audio **magnetic tape**; tape cartridges.

Micro Communications, Inc. (Booth 607).

RD switching combiners, filters, duplexers, switches, loads; TV and FM antennas.

Micro-Trak Corp. (Booth 510).

Overall motif is a **fully operating studio** showing quality tone-arms, turntables pre-amps and furniture. The **L-90** tape cartridge rack will be displayed filled with **Fidelipac** cartridges which will be given away through a drawing. Also to be unveiled is a new **audio spectrum analyzer**.

Microwave Associates (Booth 701).

STL microwave systems including a 1-watt 12-GHz link; also 1 watt intercity and STL system on 7 GHz; low-cost local loop systems; portable B-line microwave links; high

continued on page 4



A production console* for \$325.80!

Eureka! A complete remote and studio production console for a fraction of what you'd expect to pay for a console with comparable features and performance! Simply purchase a new *Shure M675 Broadcast Master* and the extremely popular *Shure M67 Professional Microphone Mixer*. By combining these two units*, you get inputs to handle microphones, turntables, phone lines and tape machines — *with cueing provision on line and magnetic phono inputs*. Result? A versatile low-noise, low-distortion broadcast production console for in-studio, remote, and standby assignments; a complete CATV console; a studio production console. All for \$325.80! For complete technical data, write:

Shure Brothers Inc.
222 Hartrey Ave., Evanston, Illinois 60204
In Canada: A. C. Simmonds & Sons Ltd.



*Each model is also available separately: M67 — \$169.20 net; M675 — \$156.60 net.

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power H-line repeaters for intercity network relay applications.

Mirate! Div., Ball Brothers Research Corp. (Booth 806).

Video production center will be shown which includes switching and special effects for video program control.

Mohawk Wire and Cable Corp. (Booth 505).

The emphasis will be on Slim Line 85 pin connectors for color video camera cable assemblies. Also shown: line of color video camera cables.

Mole-Richardson Co. (Booth 905).

Quartz studio lights, low-power and high-power; stands, many accessories.

Moseley Associates, Inc. (Booth 700).

New will be the Series 8 Subcarrier system, which includes the SCG-8 subcarrier generator and SCD-8 subcarrier demodulator. Also new: a second generation of all solid state remote pickup equipment, including units for the 147-174 MHz and 450-470 MHz bands. On display in addition: the DSC-2 digital remote control system, and a full line of aural STL equipment.

McCurdy Radio Industries (Booth 608).

Feature attraction will be the SS7700 series modular audio production consoles. Up to 20 mixer-channels are readily accommodated. In addition to complete program mixing, monitoring and control the series provides P.A. feeds, a cue system, solo, echo-send/receive, foldback and talkback facilities as well as a full range of options.

McMartin Industries Inc. (Booth 201).

The theme: A "full-choice line." The new product featured will be the BA-1K 1000-watt AM transmitter, which uses a



McCurdy SS7700 Television Console

single tube type Eimac 4-500, a Pi-T output circuit, has built-in cutback to 500 and 250 watts. Also new is the TX-800 digital peak modulation indicator, which reads out the actual percentage of peak modulation. Showing in addition will be the complete line of AM and FM monitors, and line of consoles.

North American Philips Corp. (Booth 205).

To item will be the new AKG C-451E modular condenser microphone systems, which allows for growth flexibility with easily added modular capsules, preamplifiers and accessories. Also on view: the line of AKG microphones, headphones; and the Philips GA-212 electronic turntable.

Nortronics Company, Inc. (Booth 503).

Will show full line of recording heads for broadcast applications; also the line of tape equipment quality maintenance accessories.

Pailard Inc. (Booth 807).

Bolex 16mm cameras, automated for single and double sound filming; Super 8 cameras and projectors; other pro cameras and accessories.

Pape-work Systems Inc. (Booth 109).

Billing, accounting and traffic—BAT—systems will be shown. BAT 2000 which can handle 80,000 availabilities in advance is designed for major market radio and medium and small TV stations. BAT 1000 will accommodate smaller stations. There will be demonstrations at all times.

Paulmar, Inc. (Booth 618).

Will exhibit film inspection and editing equipment.

Pentagon Industries (Booth 1013).

Professional duplicators for cassettes and open reel recorders will be displayed. A new line of high-speed quarter-inch duplicators, the PRO Series, many new features.

Philips Broadcast Equipment Corp. (Booth 101).

Guests will have hands-on access to entire line of Norelco color cameras. New at the show will be the PCP-70B, a hand-held version of the PC-70 camera; it works into PC-70 electronics, can be added as a separate head. Also introduced will be a surprise product in the low-light-level category. Other products: in addition to camera line, the PCF-20 telecine will be demonstrated.

Potomac Industries, Inc. (Booth 908).

Will introduce two new products. The Model FIM-71 VHF field strength meter, a portable covering the range 47 MHz to 225 MHz, has internal calibration oscillator and may be used as a tuned voltmeter or with antenna, as a field strength meter, with switchable bandwidth and demodulators. The SD-31 rf bridge synthesizer and detector provides signals and detection for rf impedance measurements.

Power-Optics Inc. (Booth 103).

Systems for remotely-controlling TV cameras will be shown.

Q-TV Telesync Corp. (Booth 206).

Will show VideoPrompter Systems, VPS-100; Conveyor Transport; fast-load prompter systems; prompter typewriters front-projection systems; horizontal-vertical crawl.

Quick-Set, Inc. (Booth 802).

Camera pedestals, dollies, tilting heads cam-link heads accessories.

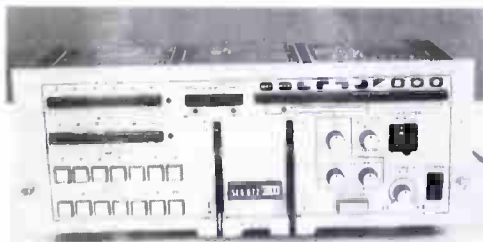
RCA Communications and Components Divisions (Booth 100).

Will feature a new portable 3-tube video camera, the TKP-45, with shoulder attachment; and a new low-cost quadruple video tape recorder. Also showing: line of studio video cameras, broadcast transmitters, consoles, microphones, etc.

Rank Precision Industries (Booth 404).

Featured will be the Varitol 30 and Varitol 20 lenses. A full selection of 10X1 lense will also be shown.

continued on page 5



3M SEG-692 Special Effects Color Generator



McMartin Digital Peak Modulation Monitor

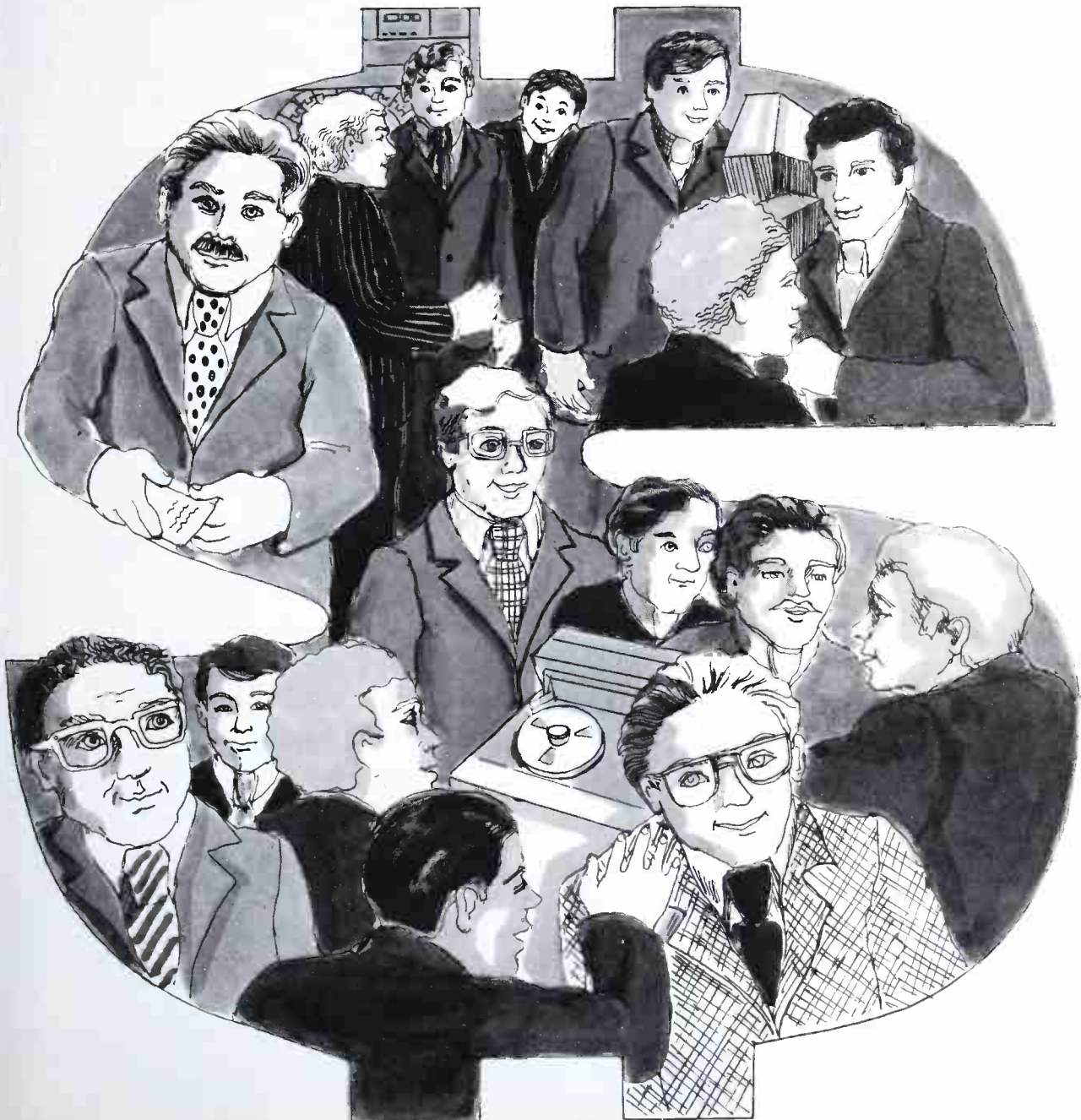
Special NAB Preview Issue

RCA

PrimeTime

The search for profit opportunities: What to look for and where to find it at the NAB Show.

See the world's first all-cart film and tape station break •
First premium portable color camera without a backpack • The
new most cost-effective basic VTR • And more

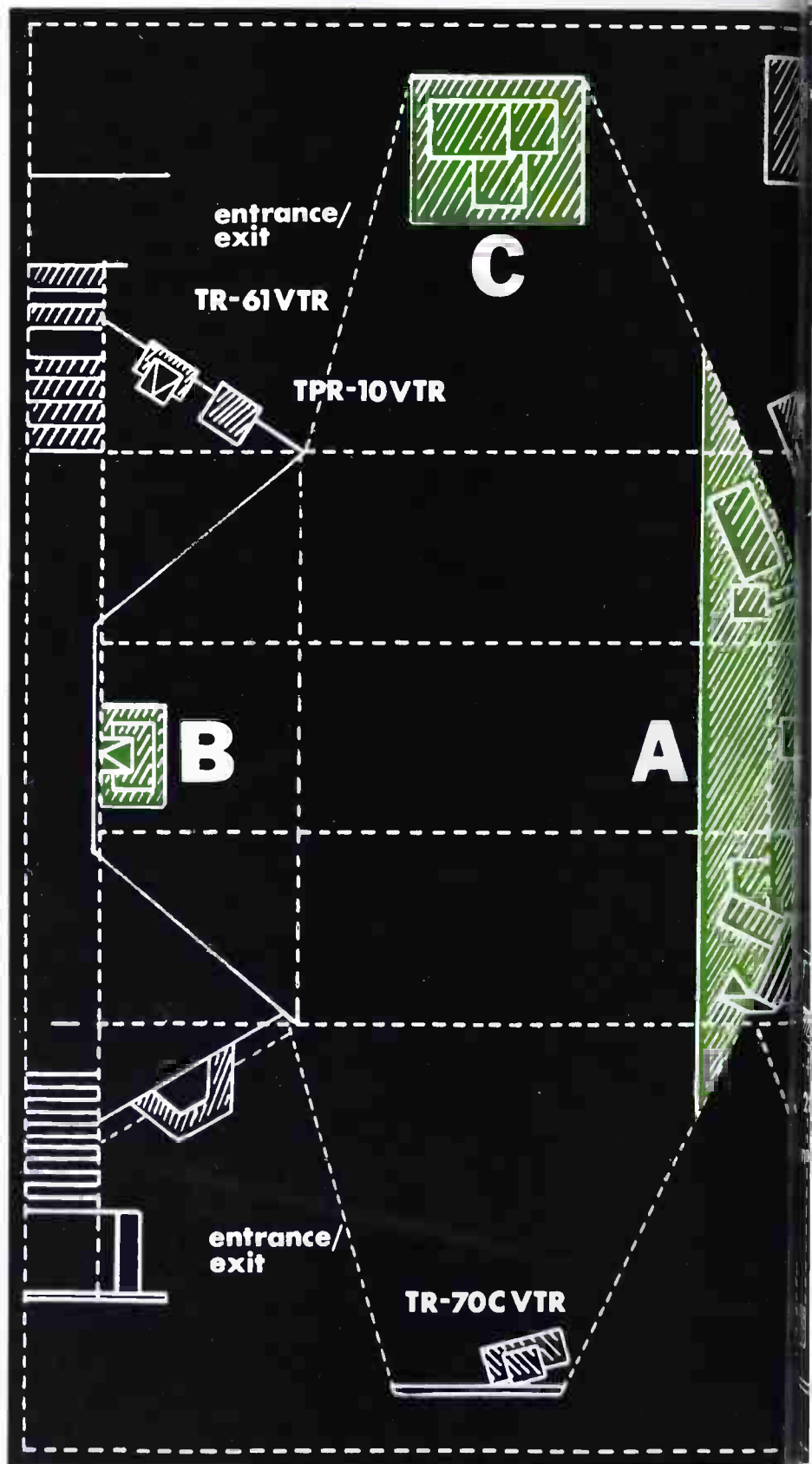


RCA at NAB. Step this way

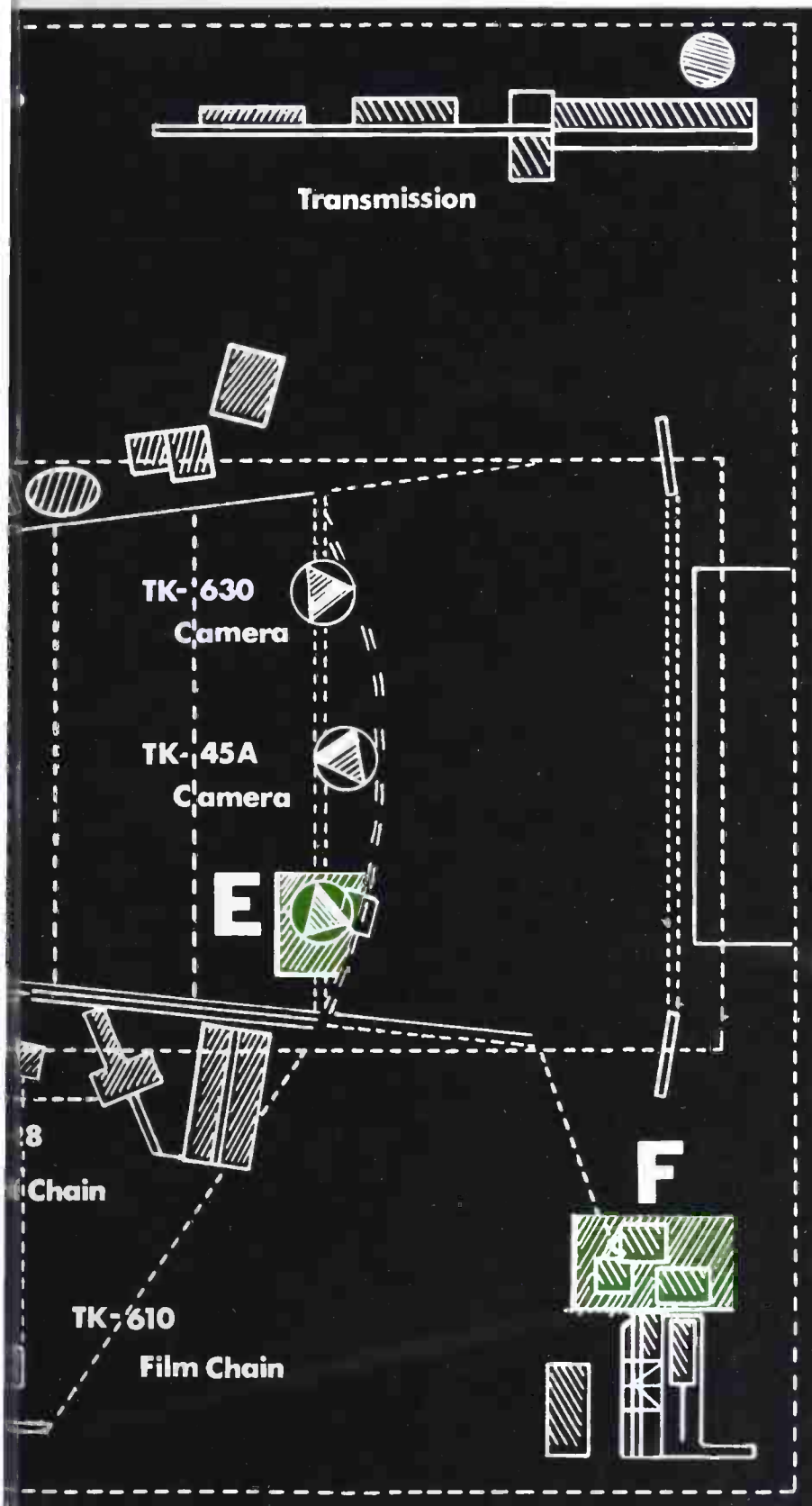
A. The On-Air Profit Center. Site of the all-cartridge station break, film and tape. Features the new TAC-1 Programmer, TCR-100 Cart Machine, TK-28 Film Camera and production model of the TCP-1624 Cartridge Film Projector introduced at last year's NAB.

B. Introducing the NEW TECHNOLOGY Video Tape Recorder. RCA's brand-new quad VTR with a performance/cost relationship that will please the most hard-nosed businessman.

C. Hands-on display of the brand-new TCR-100A Cart Machine with several new features including Random Home capability, built-in computer interface.



r profit opportunities!



D. Quadraphonic FM transmission area. New RCA system will go into pilot testing after the Show. It's a discrete system for true quadraphonic transmission and reception.

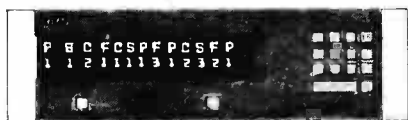
E. Announcing the TKP-45, the color camera the industry has been waiting for. Essentially *everything* from the top-of-the-line TK-45A is yours in a 20-pound portable camera.

F. Video Four Character Generator. New!

RCA

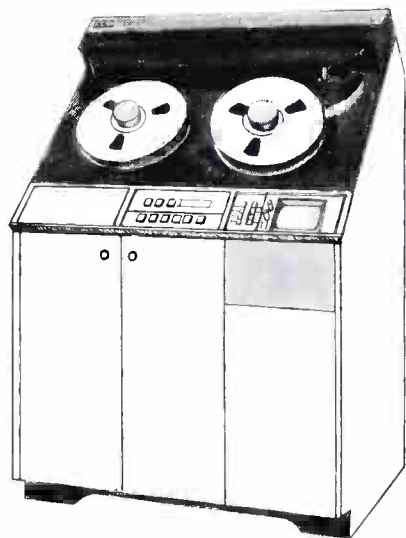
Where the opportunities are: A sneak preview.

As soon as you enter the RCA exhibit at NAB, you'll see some new profit ideas. Probably the first thing to catch your eye will be our **On-Air Profit Center (A)** featuring the first all-cartridge tape and film station break.



Here you'll find the new **TAC-1 Programmer** controlling a **TCR-100 Cart Tape Recorder** and the automated **TCP-1624 Cart Film Projector** incorporated into a **TK-28 Telecine System**. And this is just one of several possible combinations. The RCA man here will be glad to tell you about others.

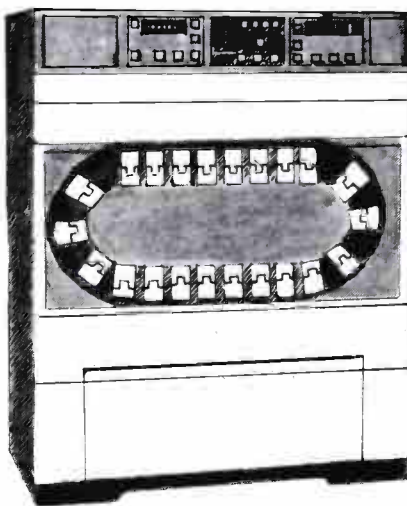
Opposite the Center is the **NEW TECHNOLOGY VTR (B)**. What we've done is to reappraise VTR technology in terms of the most value for the most users. So we've added features that make it easier to operate, like a simplified



threading system, automatic warning of malfunctions, and a number of automated operating features.

Result: a new VTR from RCA that you really have to see to believe!

Don't miss the economical **TR-61 VTR** and the portable **TPR-10**, either. Both introduced during the last year, they're worth noting as you head for the hands-on exhibit of the brand-



new **TCR-100A Cart Machine (C)**. Try out the new **Random Home** feature on the Cart and imagine the possibilities for easier dubbing sessions. Also new: built-in computer interface, prewiring for all accessories.

Not to be missed in the audio/radio/transmission area is the **Quadraphonic FM display (D)**. You'll see RCA's discrete system from record and tape right through to distribution. And hear it in quad, too.

On to the camera area (be sure to see the live show). The **TK-630**, the **TK-45A** and especially the amazing **TKP-45 (E)**. When we say it's portable, we mean portable. The entire camera head, with viewfinder and basic zoom lens, weighs only 20 pounds. Uses the same **CCU** as the **TK-45 Camera** with only one minor module change. All the automatic

features of the **TK-45**. And comparable picture quality.

If you find that hard to believe, judge for yourself at the Show.

On your way to the rest of the exhibit, be sure to note the **Video Four Character Generator (F)** available through RCA. It's new... and worth your attention.

And if any questions come up, be sure to talk to the RCA people. Their purpose there is to serve you.



If you'd like more information after the Show, write **RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102**.

And here's hoping you'll find the Show enjoyable as well as profitable.

If QS matrix 4-channel was expensive, we'd expect you to wait for discrete.

Any FM station can convert to QS 4-channel without spending a fortune on new gear.

In fact, an investment of about US\$900 will do it.

That's all it takes to buy and install the new Sansui QSE-5B 4-channel encoder in any MPX-capable FM operation. It's simple. And very economical.

The QSE-5B encodes discrete 4-channel tapes, demodulated Quadradiscs (CD-4) or any of your own live 4-channel material. It even lets you broadcast 4-channel commercial spots.

QS-encoded 4-channel signals retain all current standards of hi-fi FM stereo. Signal level, S/N, dynamic range, frequency response—all handled and controlled exactly like conventional 2-channel material.

Except that your audience can hear them

in 4-channel on their QS-capable 4-channel home equipment. And there are millions of people who own such equipment today. QS lets them hear the same kind of realism they enjoy at a live performance. And listeners love it.

Advertisers love it, too. Record manufacturers, hi-fi makers and dealers and others in the business have good reasons to buy more FM time in 4-channel. Advertisers in other fields also appreciate the creative and attention-getting sound of 4-channel spots. And the QSE-5B encoder is the most economical, most technically advantageous way of offering this exciting new service to them.

Make the smart 4-channel move today. Contact Sansui for further information on the easy way to go 4-channel in FM—the QS way.



Sansui

QS 4-Channel Stereo. **QS** Are you listening?

SANSUI ELECTRIC CO., LTD. 14-1, 2-Chome, Izumi, Suginami-ku, Tokyo 168 Japan/Telephone: 323-1111 **SANSUI ELECTRONICS CORPORATION NEW YORK:** 300 Queens Blvd., Woodside, New York 11377, U.S.A./Telephone: 212-779-5300 **LOS ANGELES:** 333 W. Alondra Blvd., Gardena, Calif. 90247/Telephone: 213-321-1111 **SANSUI AUDIO EUROPE S.A.** ANTWERP: Diacem Building, Vestingstraat 53-55, 2000 Antwerp, Belgium/Telephone: 3-315663~5 **LONDON:** 39-41 Tottenham Court Road, London, W1P, 5FU, England/Telephone: 580-5353 **FRANKFURT:** Reuterweg 93, 6 Frankfurt/Main, West Germany/Telephone: 590-700

Circle 147 on Reader Service Card



Russco Model 250 MonitorMaster



Reynolds/Letron TV Titrer

Recortec, Inc. (Booth 711).

Will show for the first time a new **videotape timer** and **videotape addressor**. Also: videotape **conditioner** and videotape **evaluator**; others.

Revox Corp. (Booth 514).

The feature attraction will be the new Revox A700 **stereo tape deck** with crystal reference speed control, full logic transport control, etc. Also showing: the Revox A77 tape deck, Beyer dynamic ribbon microphones, and other dynamic mikes and headphones.

Reynolds/Letron Co. (Booth 507).

Will feature the Letron TV Titrer.

Richmond Hill Laboratories (Booth 411).

A full line of flexible production switchers

will be shown. A **master control production switcher** will be highlighted. Routing equipment and editing equipment will also be shown.

Rodelco Electronics Corp. (Booth 509).

Exhibiting new **VHF and UHF translators**, from 1 watt to 1000 watts.

Rohde and Schwarz Sales Co. (Booth 809).

Will demonstrate **dynamic transmitter performance measurements**, including full field swept frequency response simultaneous with program transmission. Also VTR performance measurement; a new tracking unit for VTR and RF-link frequency response; TV demodulator for transmitter and remote control; video sweep generator; video noise meter; VHF-UHF-CATV portable field strength meters; VSB TV signal generator.

Rupert Neve, Inc. (Booth 511).

Will emphasize audio **control consoles** for broadcast stations. Will present full data on a new radio continuity and DJ console with 4 mike inputs, 6 lines, telephone input, and new layout for efficient DJ operation. Showing: 16(16)4, **8-track production and music console**.

Rust Corp. (Booth 813).

Will introduce an **automatic logger** for phase and current readings from Potomac Instrument AM-19.

Sarkes Tarzian, Inc. (Booth 203).

Will introduce a new line of **packaged switching systems** using the new concept in linear mix/effects/key electronics, providing digital effects and control, at low cost, for broadcast and educational applications. Also: series of **"ADD-ON" electronic**

units to lift older switchers (of any manufacturer) to state-of-the-art production flexibility. All the foregoing are shown for the first time at NAB. Also: **digital rotary effects**, chromakey keyers, **mix/key electronics**, audio systems, STARCOM data processing equipment, switching systems.

Schafer Electronics Corp. (Booth 500).

Will display both the 902 and the 903 **automation systems**. New will be the Audiofile **multicartridge playback system**, with instant spot availability, which will be used as audio source for 902 and 903 systems. Also showing: Model PB-702-2 reel-to-reel playback deck; and Verified Encoded Logger with English printout, for all automation systems.

Scully/Metrotech, Div. of Dictaphone (Booth 521).

The line of **reel to reel tape recorders** for broadcasting.

Shure Brothers, Inc. (Booth 706).

On display: line of **professional microphones**, mixers, disc reproducers, tone arms, microphone accessories, preamplifiers, etc.

Sintronics Corp. Booth 613).

Here's a new source for transmitters. The company will show a 1 kW **AM transmitter** (AM-1K-A) and a 1 kW **FM transmitter** (DFM-1K-A). The PA stage of the AM unit uses the long-life 4-400 C tubes and features vacuum capacitor tuning and continuously adjustable harmonic traps. Exciter has a crystal. The FM units use a DFM exciter and a grounded-grid final amplifier.

Soll, Inc. (Booth 513).

Engineering and consultation on design and installation of all broadcast facilities; station planning; design, construction and installation of RF switching systems.

Sono-Mag., Systems Marketing Corp. (Booth 111).

Feature will be a line of **automation systems for AM and FM broadcasters**. Details of various sequencer systems will be shown. The "Caroussel" automatic cart system will be demonstrated along with other cart players.

Sparta Electronic Corp.—Includes Jampro Antenna Co. and Cetec, Inc. (Booth 211).

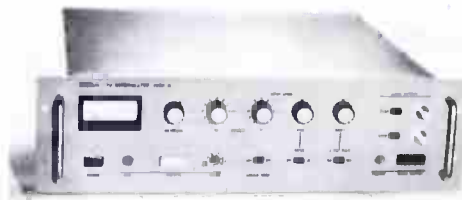
On exhibit will be the Centurion series of consoles (which have gone through further development). New at the show will be a **12-mixer monaural version**, a **6-mixer stereo**. Also showing: extender panels for the Centurion series, raising capacity to 18 mixers in one system. Two surprises include developments in audio and transmitter.

In addition to TV and FM antennas, Jampro will feature a **circularly polarized TV**

continued on page 56



Sparta Centurion Console



Nera TV Demodulator



McBee D-144 Digital Remote Control

MICROTIME!

A great group with more great cures for TV jitters.

Introducing the MICROTIME™ family of video signal processing systems and accessories. They eliminate picture rolls, tearing, flag waving, hue shift, skew error or color streaking. Developed and built by a great group of people... who developed and built our successful Delta Series Time Base Correctors.

Since no one product can solve all problems, we have an entire family of TBCs and accessories:

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- 100 Series LU-MATIC Monochrome TBCs
- 200 Series CHRO-MATIC NTSC Direct Color TBCs
- 300 Series NTSC HETROCOLOR Universal Color TBCs
- 400 Series PAL-M HETROCOLOR Universal Color TBCs
- 600 Series DIGI-MATIC Wide Aperture NTSC Color TBCs
- 700 Series VELCOR Velocity Error Correctors

For handling those wild and wiggly signals from low cost VTRs with large tension error, we've added the DIGI-MATIC™ Wide Aperture TBC.

To integrate low cost VTRs... dubbing up to broadcast, and sophisticated post-production processing... we're offering this bushel of new accessories: VSD-30 Input Sync Gen/Switcher Accessory to TBC DVP-40 Output Switcher/Fader Accessory to TBC SL Series SYNC-LOC Servo Accessories for VTRs

When you stack us up against our competition, we will be the apple of your eye. Because we are the leaders in video signal processing systems, a step ahead of everyone else. Get all the facts. Write for our brochure, today.



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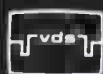
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with maximum system versatility and performance at a price you can afford!

The ONLY modular plug-in system available . . . ideal for broadcast, educational and CCTV studio on-the-air titling.

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- Character blink
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- Plug-in module options to increase flexibility and versatility including up to 10 page memory, two speed crawl and roll, color backgrounds, internal RS-170 synch and tape storage
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Call today for a demo and complete descriptive literature.



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NAB 1974

broadcasting antenna for channel 10, the only one available to the industry, which has excellent VSWR for any one TV channel from 2 to 80.

Nera A/S, Oslo, Norway, will show TV **demodulators** and **IF exciters**.

Stanton Magnetics, Inc. (Booth 610).

Will show standard broadcast line of **stereo pickups** available with a variety of styles, tip sizes, and compliance values; stereo headphone; preamp equalizer for feeding a magnetic stereo phono pickup into console input circuits.

Storeel Corp. (Booth 710).

Major new product is a **mobile storage system** for RCA cartridges and Ampex cassettes. In addition there are storage systems for VTR reels and 16 mm film.

Strand Century Co. (Booth 812).

Will show **special cycle lighting**, a new 10' Fresnel, and a new packaged **dimming system**.

Willi Studer America, Inc. (Booth 514).

Introducing a line of new **condenser microphones**, a quad audio mixer, and a new professional tape machine, the A67, at the lower end of the price range. Also showing the complete line of professional tape machines and accessories.

Systems Resources Corp. (Booth 517).

Latest in **Chiron titling equipment** will be shown. The Graphics II unit will be highlighted. Fonts and symbols can be created and scanned by a video camera and stored in the system for recall. The symbols are digitalized for easy storage and retrieval simply by pressing a key.

Taber Mfg. and Eng. Co., and McBee Laboratories (Booth 515).

Taber's introduction includes new **replacement heads** for RCA VTR's and also the line of professional audio heads. McBee has first simple digital high-stability **transmitter remote control system** incorporat-

ing state-of-the-art C-MOS integrated circuitry.

Tapecaster TCM, Inc. (Booth 707).

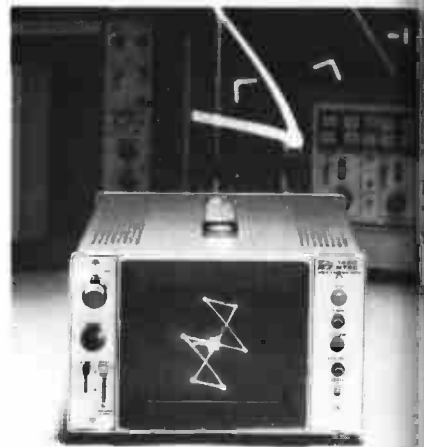
On display: line of **audio cartridges**.

Technology Inc., HF Photo Systems Div. (Booth 519).

Will show a line of **color processors** including Super 8 and 35mm film. Units hold all processing functions in compact form.

Tektronix, Inc. (Booth 406).

Introduced at the show will be the Model 1420 **Vectorscope**, designed to display vectors of chrominance and burst components of a color signal. Also on display will be the



Tektronix Model 1420 Vectorscope

600 series of **monochrome and color picture monitors**, the 1440 **automatic video corrector**, the 1441 **VIRS deleter** and inserter, the 7L12 **spectrulanalyzer**, and a line of TV **oscilloscopes**.

Tele-Cine, Inc. (Booth 1004).

Zoom lenses, line of camera support equipment, and videotape editing programmer.

Teledyne Camera Systems (Booth 717).

TV tape-to-film **transfer equipment** for color and monochrome.

continued on page 69

"FIVE" MIXER AUDIO CONTROL

B-500 series the new leader in audio console design—a plug-in modular system lets YOU choose your inputs—models for every operating mode . . . monaural, stereo and dual channel

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consoles



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Scully Shows You How To Be Perfect Without Paying The Price.

As a professional, you want the finest in a professional recorder. The best sound reproduction possible. Simplicity of operation. Reliability coupled with ease of maintenance. And, you don't want to pay a fortune to get it. In short, you want perfection at a perfect price. You want the new 280-B Recorder/Reproducer.

Unmatched Performance.

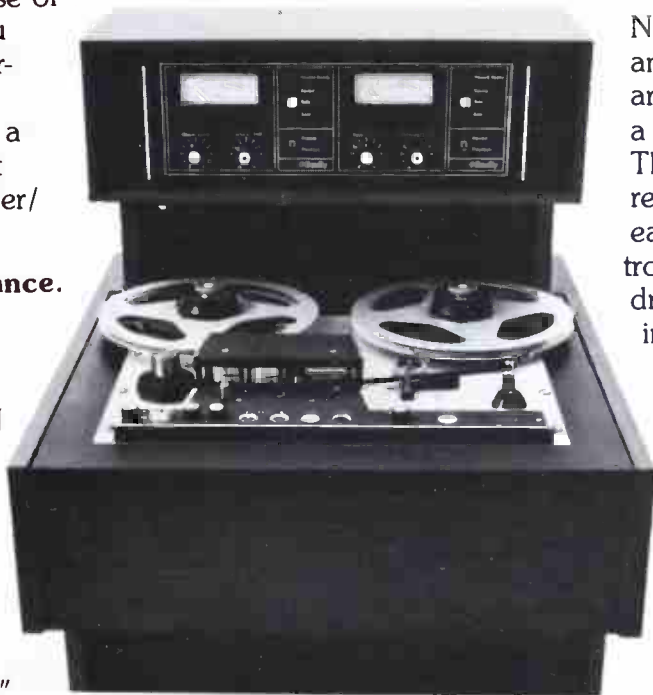
By designing the 280-B electronics around the new high-energy tapes. The S/N ratio is perhaps the best available in any recorder at a comparable price. Up to 72 dB on full track .25" tape at mastering speed. A sharp 68 dB on two-track .25" and four track .50."

The 280-B also features more head room and an increased record level for maximum signal utilizing the high output tapes. And bandwidths are a very flat ± 2 dB, 30Hz to 18 KHz. It all adds up to greater performance

than you've ever been used to.

Quick, Simple Operation.

The more sophisticated we've made the 280-B, the simpler we've made it for



you to operate. Our new **Optac**™ motion sensing system gets a new standard of efficiency in tape motion control. Now you can go from one transport mode to another without touching the Stop button. And enter and leave Record while the

transports in Play. **Optac**™ and the 280-B's new logic circuitry make the exact moves for you at the right time.

Easy Maintenance.

New solid state circuitry and mother-daughter board architecture give the 280-B a greater reliability factor. They also make testing, repair and replacement easier. All signal electronics are in slide-out drawers. No more bending down and reaching around. Individual channel modules go in and out easily, too.

If the 280-B sounds too good to be true, wait till you hear it. And wait till you find out the price. We've made it very easy for you to get the best.

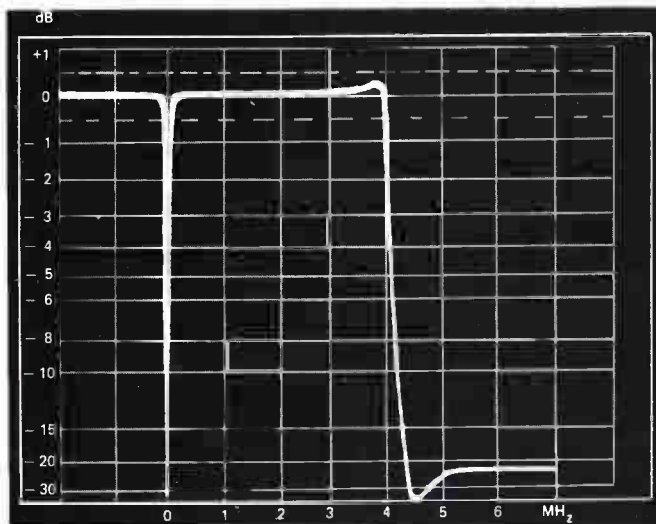
For more detailed information and prices on the 280-B, call or write: Scully/Metrotech, 475 Ellis Street, Mountain View, California 94040. (415) 968-8389. TLX 345524.

► **Scully|Metrotech**
Recording Divisions of Dictaphone

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Can Your Demod Meet This Challenge?



Our's Does!

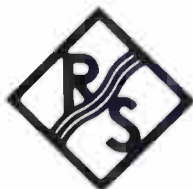
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- Present demodulator standards will be tightened as the public demands better performance.
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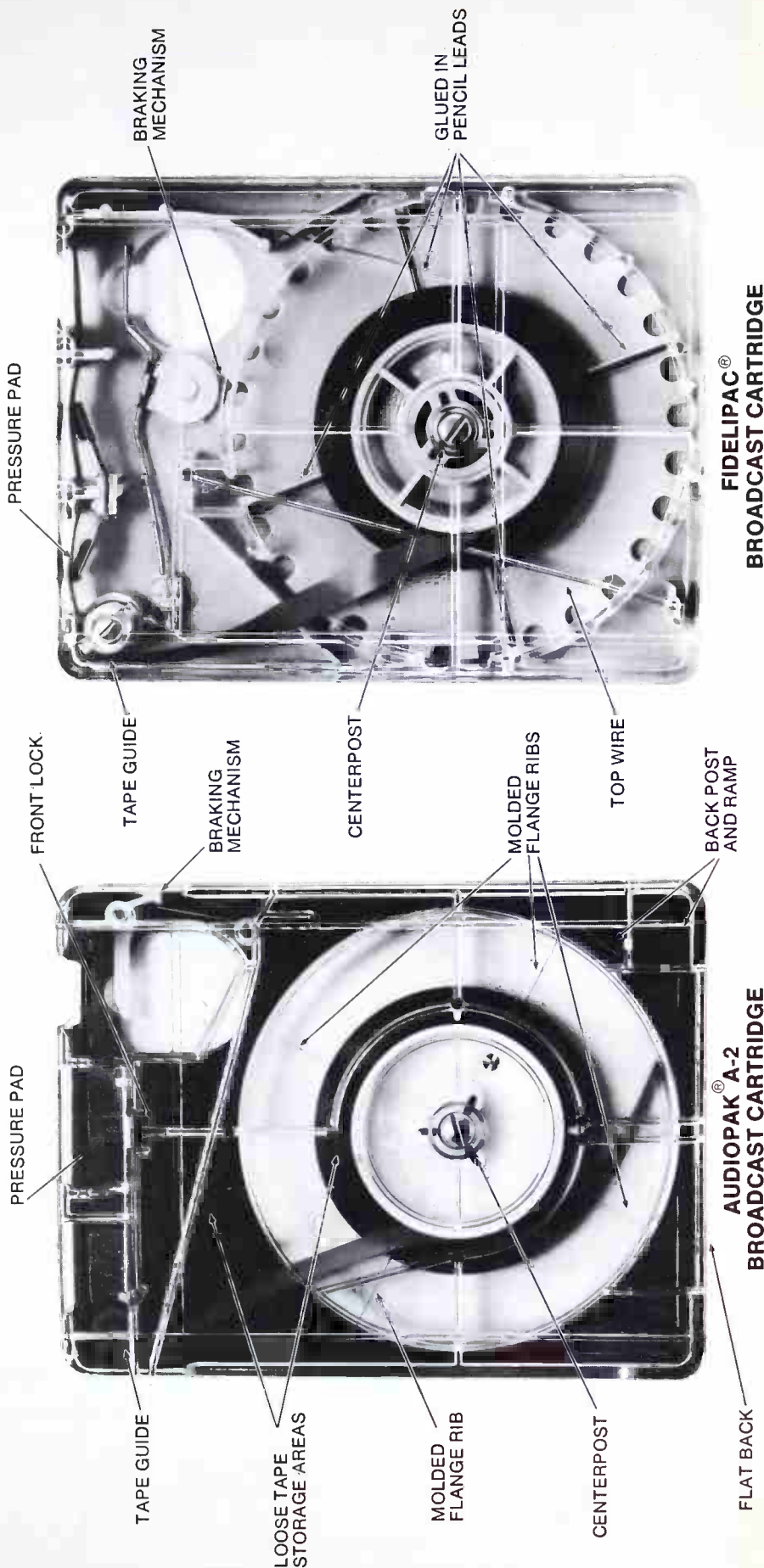
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See us at NAB Booth 809 West Hall

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Now we'll help you be the judge.

There are at least 10 reasons why the Audiopak A-2 is beating out the competition. Here is Reason No. 1. How many times have you had broken or missing pencil leads in a cartridge flange? Can't happen on the Audiopak. There aren't any! We mold the tape support ribs as an integral part of the flange. There are 9 other reasons: write for our literature and free cartridge.



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SEE US AT BOOTH 814

accurate measurement of the fourth dimension

Standard Electric Time has developed and manufactured units for the precise measurement of elapsed time since 1932. These panel mounted or portable units are available in several models with accuracies to plus or minus one millisecond. They can be connected to electrical or electronic circuits for remote start, stop and reset.

For full details request catalog 261.



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PORTABLE

Model	Scale Divisions	Totalizes	Accuracy
S-100	1/5 sec.	6000 sec.	±.1 sec.
S-60	1/5 sec.	60 min.	±.1 sec.
SM-60	1/100 min.	60 min.	±.002 min.
S-10	1/10 sec.	1000 sec.	±.02 sec.
S-6	1/1000 min.	10 min.	±.0002 min.
S-1	1/100 sec.	60 sec.	±.01 sec.
MST-100	1/1000 sec.	6 sec.	±.001 sec.
MST-500	1/1000 sec.	30 sec.	±.002 sec.

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PORTA-PATTERN Optical Test Generator products designed to provide the finest television industry standards in Test Charts, Slides and Films.

Precision 9" x 12" test charts recessed in high-impact Acrylic, designed for long life; provided in lightweight aluminum frame for use free-standing, on mic or light stand. Full line of B&W and color charts for complete flexibility.



Full line of geometric and color transmission test slides in 2" x 2" or 3 1/4" x 4" format. B&W slides available positive or negative. Advanced photo-chemistry assures 1/10 of 1% accuracy. Available individually or in full sets.

Super 8mm & 16mm alignment films, for projector stability and image accuracy. Color Reference films provide standardization of subjective reference throughout system. Slides and films produced to meet or exceed industry standards.



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NAB 1974

TeleMation, Inc. (Booth 414).

Introducing an extensive line of video and audio electronic units designed for card-frame plug in, in two sizes—5 1/4-in. rack space and 8 3/4-in. space. For the smaller card rack there will be **sync systems** ranging up to one with dual generators, **color genlock**, and **automatic sync changeover**; **video, audio, subcarrier** and **pulse distribution amplifiers**; a remotely-controlled **5x1 video switcher**; **black burst generator**; and other units. For the larger frame, a new **video distribution switcher**, expandable up to 100-in., 100-out. Also showing: the TCF **telecine**, digital **color encoders**, the line of **character generators**, other units. Theme: "Discovery, 1974."

Telemet, Div. of Geotel, Inc. (Booth 902).

New product featured will be the Model 3706A1 **TV transmitter sideband analyser**, with crystal controlled converter, 50 dB display, 7 crystal frequency markers, built-in sweep with sync. Also new is an



A/V routing switch with audio follow, Model 7932-A1, with maximum 12 x 3 capacity. Other products: EECO electronic editing systems, VDS titling systems, video test generators, production switchers, broadcast demodulators, chroma keys.

Telestrator Industries Inc. (Booth 207).

Will show **electronic graphics systems** including automatic symbol generators.

Television Equipment Associates (Booth 204).

A feature will be the Magnetek Video Tape **Evaluator**, VC/E-1000. Also shown will be the Matthey **video trimmer** ("rubber coax"), the Matthey **Chroma Corrector**, Matthey **pulse delays** and the Annunciator **Headset** for sports commentators.

Television Microtime, Inc. (Booth 611).

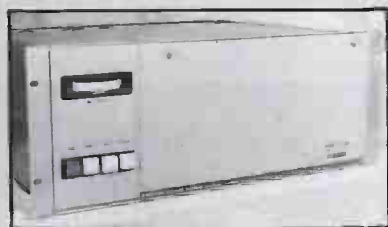
Will show the new Model 388 **time base corrector**, and the new VSD-30 **video sync director**, which includes a subcarrier reference module and genlock sync generator, to make a complete color sync generator and vertical input switcher for time base correctors. Also: the 200 and 600 series time base correctors; SL-14D head servo accessory; SL-15 capstan servo accessory; complete line of other accessories.

continued on page 62

TV INDUSTRY REPORT

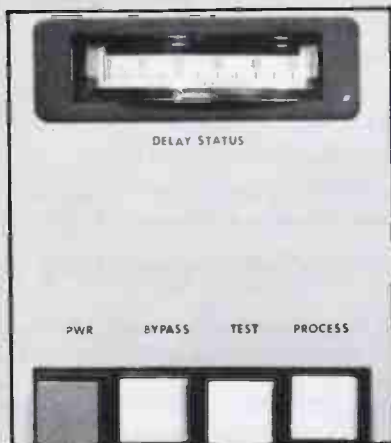
ABOUT A LOW COST TIME BASE CORRECTOR FOR THE WHOLE SPECTRUM OF VTR'S

NEW MODEL 5000 TIME BASE CORRECTOR



Now a Time Base Corrector that gives you the best VTR stabilization performance for the lowest price.

The Model 5000 TBC is used with any monochrome or color VTR from 1/2" to 2" including helical, quadruplex, and cassette. Whether you have a VTR that is power line-locked, capstan servo'd/V-locked, or H-locked, the Model 5000 provides the best performance for signals; NTSC direct color, heterodyne 'color under', RS-170 monochrome or RS-330 industrial sync monochrome.



MAXIMUM PERFORMANCE MINIMUM PRICE

As you can see from our report, the Dynasciences Model 5000 combines both high performance and low cost.

The front panel provides a delay status meter to show the average time base error.

EASY SELECTION OF OPERATING MODES

The Model 5000 TBC uses binary related delay lines that are switched in or out of the signal path at line rate to eliminate the time base error generated by all VTR's. That's why the Model 5000 offers top output performance when considering the critical specifications of signal to noise ratio, bandwidth, differential phase and gain. Except for color processing, the Model 5000 does not affect the video information in the picture. In 'NTSC type' and 'color under' playbacks from 1/2", 3/4", and 1" VTR's, the TBC corrects color universally regardless of the wide variety of color recording and recovery techniques.

The Dynasciences TBC has a built-in proc amp for video gain, set-up, chroma gain, and burst phase. Provision is made for selecting either external reference sync (for H-locked machines) or internal reference for VTR's without H-lock capability. Model 5000's color processor is capable of being locked to either internal or external subcarrier.

DYNASCIENCES
video products

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TFT 724 Stereo Monitor

Telex Communications, Inc. (Booth 201).

Featured product is the new TV cameraman's **headset**; also showing the Sportscaster headset, professional broadcasting headsets, **tape equipment**.

3M Company—Mincom and Magnetics Products Divisions (Booth 300).

Will emphasize the new SEG 672 **color special effects generator** and the Time Base Corrector. Also showing will be the DP 100 series, bridging switcher, quad drop-compensator and NTSC color encoder.

Time and Frequency Technology, Inc. (Booth 520).

New product to be displayed is the Model 724 **phase-locked-loop stereo monitor**. Featured will be the complete line of **frequency and modulation monitors** for TV, AM, and FM; also a **master clock, remote clock/bi-directional timer, digital remote display**. WWV/WWVH standard time and frequency receiver, a one-second impulse clock.

United Press Int'l. (Booth 501).

News services for radio and TV described.

Utility Tower Co. (Booth 518).

Antenna towers for radio, TV, and microwave will be shown.

Varian Associates (Booth 302).

Latest in **power tubes** including triodes, tetrodes, penodes, and klystrons will be shown.

Vega Electronics (Booth 211).

Highlight will be **wireless microphone systems**.

Videomax Corp. (Booth 620).

Refurbished quad heads with 500-hour warranties will be highlighted.

The Video Tape Company (Booth 725).

Will show **reprocessed 3M and Memorex 2-in. quadruplex tape**, the first exhibit of

reprocessed tape at the NAB. Also showing equipment for cleaning and testing videotape.

Visual Electronics Laboratories (Booth 209).

Will feature full line of **Rapid-Q cartridge tape equipment** with emphasis on the RQ-3232 dual record/play. In addition there will be teak-finished cabinet for the Rapid-Q machines, operating display for the STE-100 stereo phase enhancer, and a Basic-8 cartridge system.

Vital Industries, Inc. (Booth 304).

Will show for the first time a new **all-digital-controlled video switching system**. Also on display: **routing switchers, automation** of station breaks, one-line sync systems, and various **distribution units**.

Wilkinson Electronics (Booth 1004).

AM and FM transmitters will be featured along with audio consoles, processing amplifiers, exciters for FM, etc.

World Video, Inc. (Booth 615).

New is the CP5002 **color video monitor** which is portable and operable from a rechargeable battery pack or from ac power. Also on view: the 6210 series professional **color video monitors**; a new large-screen CCTV color monitor, model RV3901.

When you buy a Jampro FM Antenna, you don't get another brand in disguise!

Jampro antennas are made by Jampro Antenna Company, in Sacramento, California. They're not someone else's with our label on it. We make them from start to finish, inspect every part to see that it is made to specifications.

You get better service, too, because we don't pass the buck.

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 A DIVISION OF COMPUTER EQUIPMENT CORPORATION
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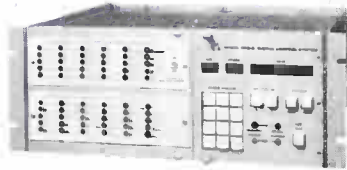


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THE ULTIMATE IN DIGITAL TV ~ FM ~ AM TRANSMITTER REMOTE CONTROL



- Fully Digital
 - Telemetry
 - Control
 - Status
- Computer-Assisted
- Totally Automated Operation



Model DCS-2
Digital Control System

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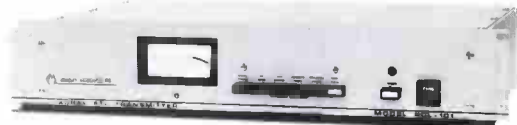


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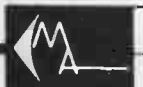


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The Video Disc: Count on it

Potentially high precision, high packing density, low cost and ease of use assure a future for the vid disc.

Urgent note to everybody concerned with the production, sale, use, distribution of recorded visual programming: if you haven't already, make a substantial place for the video disc in your conceptions of the future.

Last month we examined the comparative standing of motion picture film and videotape in broadcasting and found both very strong, but with tape looking stronger for the long haul. In this article, we scan the status of the video disc because we believe the disc is going to have an important place in broadcasting alongside videotape, extending the use of recorded visuals into areas that tape is not so well equipped to handle.

One outcome is now generally expected: the video disc will take over the consumer playback-in-the-home market. It was the vision of a \$2-billion-and-up consumer market that lured the electronics industry into all-out work for the video cassette, starting a decade or so ago. The successful video cassette is here, but only as a professional tool: so far it's priced out of the mass market.

The video disc, though later than the tape cassette in the march to technical maturity, is far ahead in inherent adaptability to the consumer market. Making copies by several of the proposed systems will cost the producer as little as 40-50 cents apiece (plus software costs), and the video disc will thus resemble closely the phono disc, not only in size, shape, and general character, but also in price.

The playback equipment, too, promises to be considerably cheaper than good quality cassette playing equipment. The latter is now generally in the \$750 to \$1200 range. Video disc playing equipment, according to some estimates, will be in the \$200 to \$500 range. If we allow for some optimism in these estimates, we still have a distinct price advantage in the disc systems.

So far, none of the disc makers is promising that the consumer will be able to *record* at home; on this point, the cassette still has an unchallenged advantage. But developers of a couple of the proposed systems, as noted in the detailed accounts, say that further development could bring home recording. On that point, the future is still much less clear than on straight playback in the home.

In the following we give a brief rundown of video disc systems that have been made public. Apparently only two are market-ready (or approximately), but each one teaches us something about the character of the video disc. The story as a whole leads to a surprising conclusion: we must not think, because the video disc is cheaper to make and to play than the magnetic-tape

cassette, that the disc springs from an inferior technology. The technology of the disc, as it is now emerging, is inherently and potentially as precise and sophisticated as that of magnetic tape, and in fact has some advantages over it.

The potential refinement of video disc recording is a revolutionary fact that has taken a little longer to become clear than did the favorable economics of the disc. Several of the proposed systems bring together developments of the last decade in photography, integrated circuit technology, in laser optics, particularly taking advantage of the high precision that comes with integrated circuitry at very little cost. In some systems the film-electronic confrontation ends in a synthesis of the two. These systems put to use advanced capabilities of both photography and electronics to make a new kind of thing, one almost certain to play a big role in professional areas, as well as in the home.

Here are the major vid disc systems about which information was available up to press time, with the details that are giving us high respect for the potentials of the video disc. Each one of them seems, in the most general terms, at least plausible as a successful product. Which ones are likely to become dominant in the market is thus an unanswerable question at this time. No doubt the marketing reach and power of individual developers will be important in the answer to this. Among those described, the I/O Metrics disc is probably the least known. *BM/E* was able to get a number of previously unpublished details on this system and publishes them exclusively here.

The Teldec disc

A joint development of English Decca and German Telefunken, this system surfaced some three years ago was demonstrated in prototype in this country and abroad, and started the whole rush to the video disc. Late last summer the developers promised full marketing in Europe by the turn of the year; a little later they joined the hallowed protocol of developers of video recording for the home and called a postponement, said to be for a "short" period. Recent demonstrations in Europe have suggested that the system is in fact ready to go: spokesmen for the makers say they are simply waiting for more software to accumulate, on the now widely accepted theory that no video recording system for the home can succeed without a big initial supply of programming.

The Teldec system, as described many times in the press in the last couple of years, is the only announced

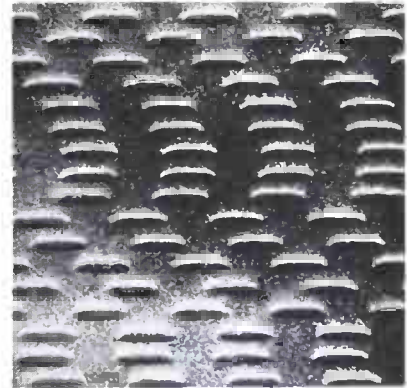
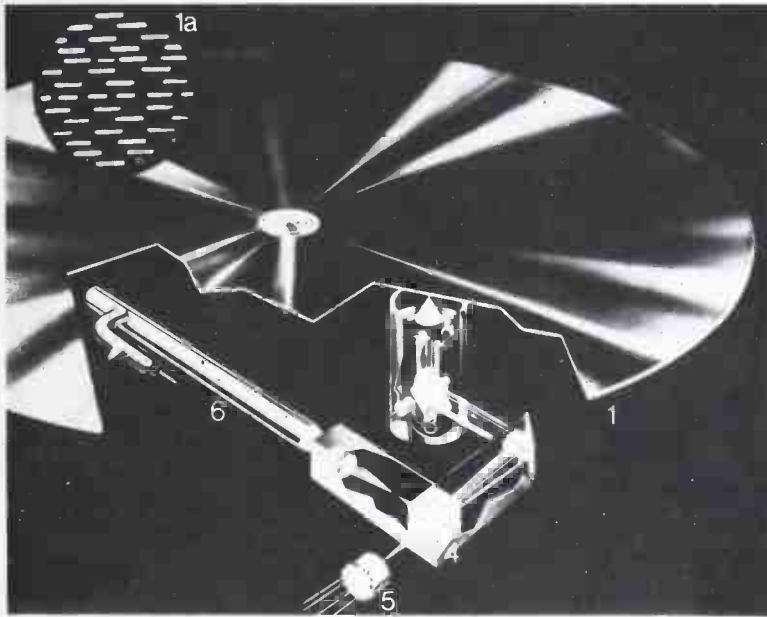
system using *mechanical* contact between disc and playback system. The modulation on the disc is represented by microscopic projections that trigger a pressure-sensitive pickup. Whatever else the system does, it accomplishes a radical revision in our concepts of the packing density feasible on a disc surface. Maximum density of the system is on the order of several times that of magnetic tape.

At present it seems highly probable that the Teldec disc will be the first actually on the market. A number of European software producers have discs ready and are planning more.

Philips VLP disc system

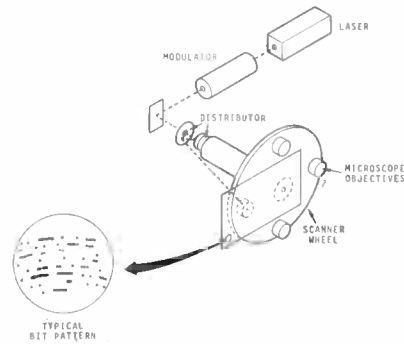
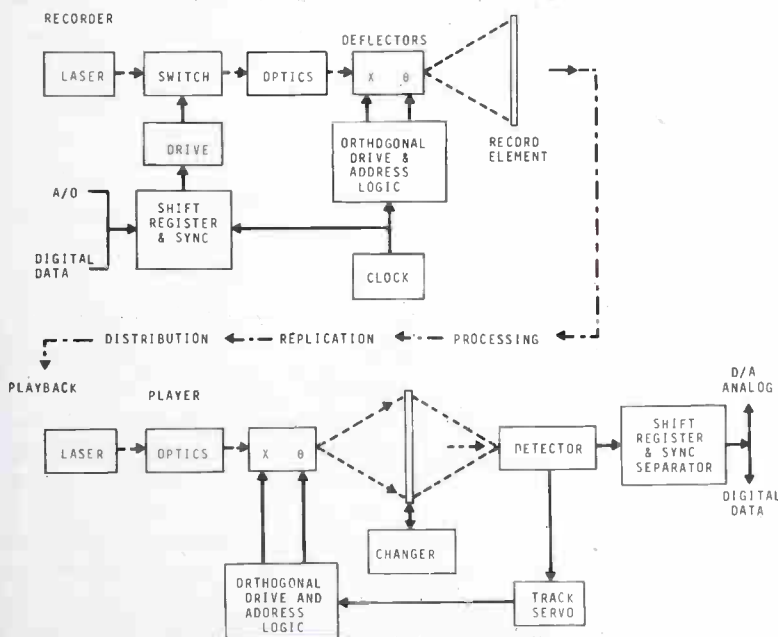
This system demonstrates (as do also some of the others to be discussed) the enormous packing density with fully available techniques in laser optics and high-resolution photography, in what look like *production models*, not laboratory experiments.

In recording, the signal is converted to digital form and turns a laser on and off. The beam is focussed on a sensitized aluminum surface, spinning at 1500 rpm. After recording the surface is etched and the points where the beam hits become tiny pits (see photo).



Philips VLP playback system—light from laser (6) goes through beam split prism (4) and mirrors to lens with servo focus (2), is reflected back to photodiode (5). Servo on mirror (3) keeps beam on track.

(Above) Magnified photo of Philips track shows "pits" which represent digitized signal. Pits are on the order of 1 micron wide, allow 40 minutes of color on disc.



Physical layout of recording system includes laser, modulator, and "distributor" that switches beam from one lens in scanner to the next. Recording medium is rectangular photo film in front of scanner. Track produced is "arcuate" (circular inset).

Block diagram of Digital Recording's record and playback system shows (above) laser light modulated by digital signal, carried across stationary photo film by scanning wheel with lenses in rim. Playback (below) uses laser to "read" track on film, with scanner wheel and servo keeping beam on track. Electronic control of beam position gives high precision.

Philips says some 60,000 frames, or about 40 minutes of color programming, will go on one side of a disc. We can estimate that the tracks are roughly a micron wide, and the recording pitch on the order of 15,000 lines per inch.

Copies are made by a stamping-molding process. In playback a laser beam is reflected from the recorded track onto a photodiode. The beam is kept on the track by an electronic servo system, driving a pivoted mirror in the laser beam (much like a galvanometer mirror: see photo). This same servo system, plus a "counter" and a little more electronics, can provide an astounding random access capability. Any frame on the disc can be found in a few seconds, and it can be held on screen as long as is wanted. There is no wear because there is no contact between playback device and disc.

The importance of the electronic servo for beam tracking needs emphasis: it makes possible a comparatively inexpensive *mechanical* drive system. This configura-

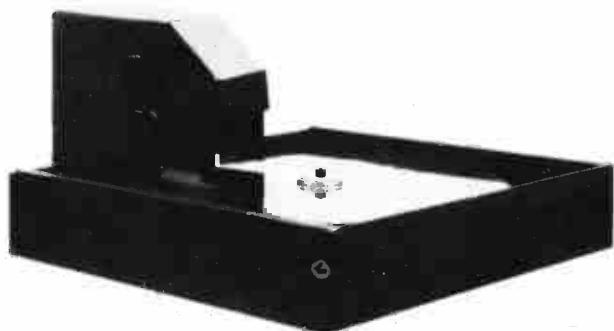
tion is applicable to several of the other systems too.

Philips' plans for marketing their system, which has been extensively demonstrated in Europe, are reported to include a target date in early 1975.

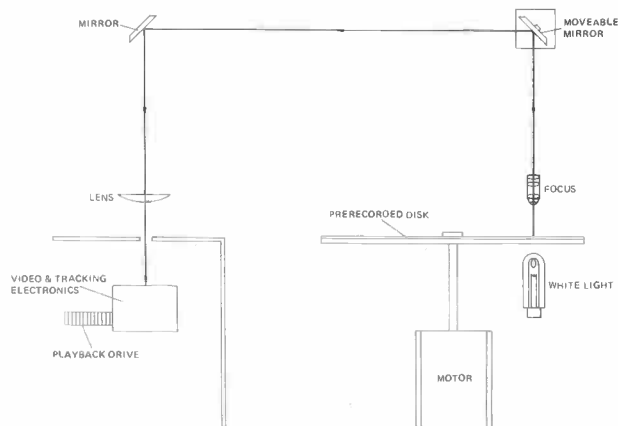
It is also important to note here that the recording system for the Philips disc, though well outside any feasibility for the home, could apparently eventually be available to professional users like program producers and broadcast stations. Again the same applies to several of the other systems.

RCA electrocapacitive system

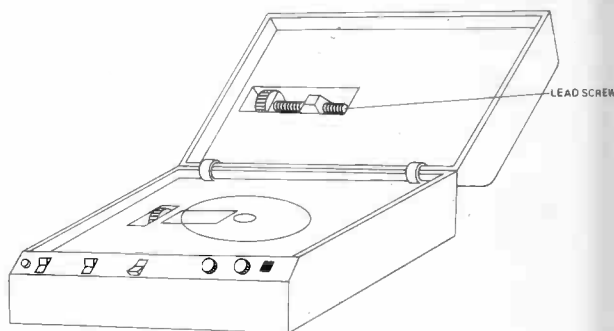
This vid disc system has reached the point of successful demonstrations of prototypes to outside observers, but is still in the lab. Modulation is represented on the disc surface by microscopic elements of *capacity*, which obviously can be recorded and played back without any mechanical contact with the disc. There seems to be no basic reason why such a system could not succeed: what



Home-style playback system projected by I/O Metrics uses white light for reading disc, keeps beam on track with servo-controlled movable mirror (upper right). Maker claims bandwidth of 3.6 MHz with this method, says higher precision would be available with laser beam and more expensive optics.

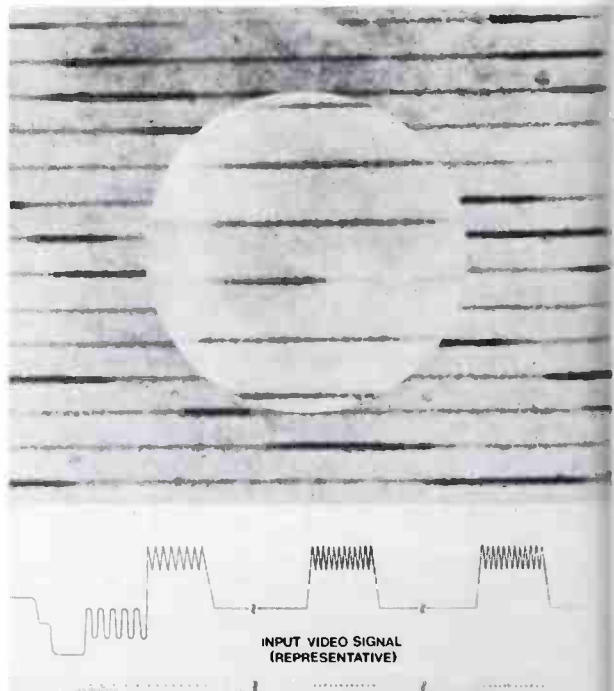


I/O Metrics' record unit has servo-controlled lens system in upright housing, carried across revolving disc of photo film by lead-screw system. Recording laser lies horizontally in base of unit; light beam reaches recording head through a mirror system. Analog modulation is applied to beam.



VIDEO DISK PLAYBACK UNIT

Exterior of projected playback unit shows simplicity and compactness. Virtues claimed for the photo-film disc are extreme lightness and ease of handling, near indestructibility, ease of cleaning.



Micro-photo of I/O Metrics' recorded track on film shows successive scanning lines of video frame, with sync signals between. Disc turns at 1800 rpm, and maker claims about 10^{10} bits of information, or roughly an hour of programming.

the basic problems of recording, duplication, and playback have not been made clear up to this point.

Zenith

This firm has been reported, first, as working out a mechanical system somewhat like the Teldec disc, and lately to be working on laser-beam methods, somewhat like the systems of Philips, Thomson-CSF, Digital, and I/O Metrics. Zenith's officials are said to be strongly on the side of the video disc as the consumer video recording method, and actively evaluating all the likely systems, as well as their own versions. No announcement on marketing plans.

I/O Metrics

First shown in Hollywood just about a year ago (see *BM/E*, February 1973), this system also uses laser readout, with servo beam control, and has packing density and random access capability somewhat like those of the Philips systems. As *BM/E* reported, the first demo showed a system still imperfect technically, admitted to be so by its developers. Later demos have indicated good progress in solving technical problems. Marketing plans are not yet public.

Thomson-CSF

This system, demonstrated privately late last year in Europe to manufacturers from a number of countries, uses a transparent disc with the scanning laser beam going through. The company apparently believes all the main technical problems have been solved. Marketing at the time last year was set for early 1974, but latest word has it "later," with no definite date.

I/O Metrics

As noted above, this California firm has supplied *BM/E* with some pictures and technical details on its system on an exclusive basis—this will be the first published account of this interesting system at such a depth. This is another laser-beam system, but using photographic film as the recording medium. Photo film has a number of qualities that make it extremely attractive as a video recording medium. The packing density, on an operating—not laboratory—basis, is fantastic, up to 10^{11} to 10^{12} bits/sq ft. I/O Metrics uses analog recording of the composite video signal, with a laser beam going through a transparent recording disc (see photos). The disc turns at 1800 rpm; about one hour of program, or 10^{10} bits, are recorded on a disc.

For playback, I/O Metrics has developed a very inexpensive unit using white light and simple microscopic optics, plus a servo-controlled mirror in the light path which keeps the beam on the track being read (see diagram). As an I/O Metrics spokesman said to *BM/E*, this allows the mechanical drive to be "sloppy"—in fact, it must have enough "slop" to allow the servo system to control the beam. That means a very low-cost playback drive can be built, with the precision supplied by low-cost integrated electronics units. Automatic focussing is also included, driven by a second servo system.

The playback prototype designed along these lines has a bandwidth of 3.6 MHz, according to I/O Metrics, which is, by deliberate choice, far less than the system is capable of in the interest of the lowest possible cost. By spending a bit more for optical precision, the performance can be at higher levels, if that is required.

Among the advantages of photographic film are standardized processing, fast duplication by simple photo printing, and near-indestructibility of the record, which can have a thin plastic coating that makes it impervious to scars, dents, etc., as well as very easily cleaned—all dirt wipes off with a rag.

I/O Metrics see their recorder as available for many professional or even amateur uses. Cost, they estimate, will be in the \$15,000-\$20,000 range, and operation simple for anyone with experience in standard film processing. Duplication will be comparably easy: ten copies will be as easy as 1000.

Cost of this playback system is estimated to be in the low hundreds, highly attractive for the consumer market.

I/O Metrics believes that their playback system, with minor modifications, could handle almost any disc that operates by modulating a light beam, whether reflected or transmitted through the disc.

Whether the exact configuration this system presents is the best and final one is not the significant thing, in *BM/E*'s view: it is rather that the unit clearly gives the general outlines of a system using light beams, with electronic control, which is a highly persuasive candidate. It is hard to avoid the conclusion that some version of such a system can do the job, and do it extremely well.

Digital Recording Corporation

The advance details on this system, still in prototype form at press time, strongly reinforce the general conclusion we have drawn from the I/O Metrics system: the relevance and feasibility of video disc recording with laser beams, simple mechanics, and electronic servo control. Digital's system differs from all the others described in holding the photo medium still and scanning it with the light beam. Beam motion is produced by a revolving disc with lenses in the circumference (drawing). The video signal is digitized, turns a laser beam on and off (as in the Philips system). Recording is on film, with an arcuate track (see drawing).

Playback uses a low-power laser and revolving disc with lenses to scan the recording: there is electronic control of the beam direction for precision. The whole revolving mechanism is in a sealed box, and the user merely has to put a recording (a flat piece of film) in a slot and turn on the mechanism.

Digital Recording Corp. claims very much the same general advantages as I/O Metrics: the film record is nearly indestructible, easy and cheap to duplicate, easily cleaned, and holds an enormous amount of information. Selling prices of equipment would be very low—estimate for the player is \$200. The recorder would be easily absorbed by many professional users, or eventually even by the home user. Digital's Sarason Liebler sees many uses for his system besides straight video programming: archival storage, long term memory for computers (up to 10^{14} bits on a series of films, with random access of two to three seconds to any bit); and, at the other extreme, very inexpensive 60-second TV spots, handled by a simple quick-change mechanism.

We emphasize that these last two systems are not just smart talk, but have both reached the successful prototype stage. Taken together with the others, they seem to give us a gilt-edged promise that the video disc is going to make it big.

BM/E

A Community Program Series That Works

by Andersen Rapp

At Delta University's WUCM-TV, University Center, Michigan, volunteer program coordinators, under direction of an executive producer, have made the "Day By Day" series a solid viewer success that has deep roots in the community.

Too often we have to write off as exaggerated, or just patently untrue, the claim of a TV operation, whether cable, commercial broadcast, or public broadcast, that they put on one or more programs really meeting the community's needs, or giving direct public access to the channel.

A small public station has shown one way to make it true: with volunteer program coordinators to develop topics, round up guests, do background research, under general direction of an executive producer at the station.

It all happened at WUCM-TV, Channel 19, at Delta Community College in Michigan. The management decided that the best service it could provide its viewers in the Tri-Cities (Bay City, Saginaw, Midland) would be to produce a *daily* program. This was seen as the only viable way to keep up with a multitude of continually changing events and personality visitations to our area. Since Channel 19 is a public television station, its philosophy has always been "alternative" rather than "repetitive" programming. Although the three commercial network-affiliated stations in our locale have their problems, as in most markets, their single major effort of community service is in the area of hard news. Therefore, it was deemed unnecessarily redundant to establish a fourth daily newscast. Besides, the newscast devotes perhaps 30 seconds, or a minute at the very most, to a particular subject and we felt this was not always enough time.

The talk show idea was, of course, available, but so many local efforts of this type tend to be dull, superficial, and almost always the same. No, we needed something a little different; a more flexible and vigorous format. After considerable investigation, including a survey of our community needs and remembering we are a small station with a modest budget, a series was developed entitled "Day by Day." It would be a daily live half hour with an eclectic format and content—Channel 19's major local programming effort. It was subsequently discovered that the concept was easy; the implementation would be more difficult.

At the time "Day By Day" was conceived, Channel 19 had a full time production staff of three and numerous other commitments for both public and instructional programming. The question was how to produce five half-hour programs a week and make the final result appear to be the work of a large professional organization. (Channel 19 felt it was important and expedient to

have a staff member as the series host/producer especially to maintain continuity.)

Volunteers were sought, not to lick stamps or make phone calls, but individuals interested in actually *producing* on-air programs. Educational, economic, geographic, and sexual factors were taken into consideration in the selection of these persons. We were looking for men and women who had journalistic/production type skills, whether learned or innate, and were willing to devote numerous hours each week to this effort; and rather immodestly we asked them to do it for free.

This was no small request. A typical "Day By Day" volunteer spends an average of 60 hours per season working on the series. The 1972-73 (seven months) total volunteer hours for "Day By Day" was 1030. Over three seasons to date. "Day By Day" has produced 360 different programs encompassing approximately 1000 mostly-local, guests. Usually our station runs each program twice—once in the afternoon (3 p.m.) as an alternative to the soap operas and game shows, and once in the evening (7:30 p.m.) as an option to the syndicated paper.

From year to year some of our volunteer program coordinators have changed, a few remain, new ones have been added. With this successful volunteer utilization last year Channel 19 elected to hire a full time volunteer coordinator. Accurate records are maintained on a guests and follow-up "thank you" forms are sent out after each appearance. We use approximately 20 volunteers per season for "Day By Day" (18 for the 1973-74 season). Some "Day By Day" volunteers work as teams; others work individually.

Their assignment is to seek a topic or topics, obtain the guests, conduct a pre-telecast interview, and serve as greeters at the station on the day of the broadcast. They also supply the host with interviewee background and pertinent questions when needed. Since WUCM-TV serves a Tri-County Community, the program coordinators are distributed more or less equally over our whole viewing area and each community is adequately covered. Because of "Day By Day," volunteers are currently being used by our station in production or talent capacities on other local series such as "Thursday Night at Ten" (live, monthly call-in panel discussion), and "The Fourth Estate" (weekly one half hour area journalist discussion of local issues).

Procedurally, the typical "Day By Day" week begins with a telephone conversation between the four volunteer program coordinator captains and the series executive producer/host. There is a team captain representing each of the Tri-Counties and one from Flint which

Mr. Rapp is Executive Producer, Station WUCM-TV, University Center, Michigan, 48710.

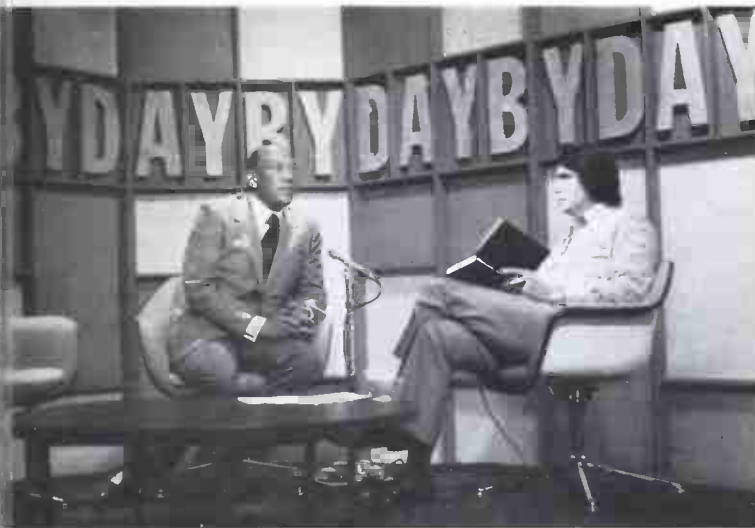
channel 19 serves via cable. The team captains have already been in contact with the volunteer coordinators in their specific geographical region. Through them the coordinators suggest potential guests and program ideas for the executive producer's reaction. It is his responsibility to coordinate their efforts, maintain production quality control, prevent unnecessary duplications, and also offer ideas he may have for their reaction. Once the executive producer okays a particular program, the individual coordinators confirm the guests' upcoming appearance, either over the telephone or in person, conduct an interview with them and submit their background material to the staff executive producer.

Usually programs are set up two weeks in advance of air time and the host receives his information from the coordinators approximately one week before the actual interview. If necessary, this allows time for additional research. The program coordinator attends the actual broadcast and then critiques the production. The process then repeats itself again and again. Each "Day By Day" program coordinator is permitted a great deal of latitude in producing his or her particular program. Certain guidelines are, however, followed and the coordinators must

work to establish guest chemistry within a given program and blend their individual efforts into the series as a whole (as outlined in a "Day By Day" Manual). Since their activities entail much more than mere busy-work, there is a sense of accomplishment and most coordinators view their endeavor as the creative experience which it is.

Program ideas are obtained from numerous sources including newspapers, magazines, radio and television newscasts, and even over-the-fence gossip. Since the volunteers *are* the community, "Day By Day's" roots go deep. Most volunteers, although possessing the potential, obviously know little or nothing about television when they begin; but through a very carefully prepared step-by-step production manual and several yearly work shops it is not long before a "Day By Day" volunteer becomes a fairly competent TV producer.

The volunteer program coordinators act as an unofficial board of directors for the series. Although the executive producer is ultimately in charge, the volunteers critically evaluate his performance at least twice a year, plus when needed, and make strong recommendations concerning policy alternatives, format variations,



Lasse Owens, the star of the 1936 Olympics in Berlin, is a guest on the Day by Day program of WUCM; he is interviewed by Andersen Rapp, executive producer of the series.



Another visual demonstration program was devoted to the care and feeding of house plants and the principles of flower arrangement with a local expert in charge.



Viewer requests led to the production of this program on dog obedience, on which a professional in the field demonstrated the basic methods of teaching dogs to follow the owner's commands.



In this interview, host Rapp of the Day by Day program, finds out about new fashions from two young people who are concerned with fashion developments in the station's coverage area.

and even personnel changes if necessary.

Any station that utilizes volunteers in this capacity soon realizes that the volunteer owes nothing to the station but that the station must do everything it can for the volunteer. In this regard, the series executive producer takes on a more important public relations role than would ordinarily be the case. Whether by phone or mail, the station and the volunteers must continually keep in touch. Correspondence is crucial when your workers are not physically on hand.

It was our experience that if we expected volunteers to be professional broadcasters, we had to treat them more like colleagues than volunteers. Those few volunteers that performed unreliably were, of course, eased out and schedules had to be continually adjusted as babies were born, jobs obtained, and degrees sought. A station must make a fundamental philosophical, organizational commitment before embarking on such a plan as this. The producer of "Day By Day" must understand and learn to accept the personal reason(s) that compels volunteers to donate their services, and then help them fulfill individual psychological needs.

The "Day By Day" experience taught our station that volunteers are neither a worry-free slave labor panacea, nor an irritant below the dignity of "real broadcasters." A producer charged with a volunteer staff must continually "service the account." But, on the other hand, the contributions made by volunteers are genuine.

Occasionally "Day By Day" devotes a whole half hour to the exploration of one subject or one celebrity (alcoholism, the handicapped, drugs, Dick Gregory, Vincent Price, Judith Crist, Hugh Downs, Jesse Owens, Senator Hugh Scott, Pierre Salinger, Reverend William

Sloan Coffin, etc.), but often a single program encompasses two or three different topics (homemaker of the year, stop smoking crusade, sky diving etc.). Several times a year, a whole week is set aside for a thorough in depth examination of a vital issue. We have done weeks on "Busing to Achieve Integration," "Pollution," "Energy Crisis," "Dieting," "Birth-Birth Control-Abortion," and a yearly week for black and Chicano appreciation. "Day By Day" can be instructional (Yogi, decoupage, antiques etc.), purely informative (the open school concept, art appreciation, Saginaw Valley History, etc.), or controversial (pornography, sex education, acupuncture etc.). Whenever possible, "authentic" guests are obtained rather than spokesmen (actual alcoholics—their faces not shown, the deaf using a sign language interpreter, or a child abuser called "Mrs. X" etc.).

The minimum time ever given an interview is ten minutes and there is a concern—always for visualization whether it be slides, film or instudio demonstration. In an attempt to always deepen the conversation, a former newspaper reporter (B.A. in Journalism) volunteers her time each day as our researcher.

No two "Day By Day" programs are ever the same—and this is good. Rarely, except by design, do we repeat guests or topics. This series has even made news itself. It is not uncommon to have local newspaper reporters in our studio. For instance, "Day By Day" was the first to bring both sides together in the discussion of a newly-proposed Bay City fire house. Public television has been accused of "taking itself too seriously," so the light, humorous, and off-beat is also presented (flying saucer witness, the complete gamut of musical groups, balloonist, etc.). But one thing "Day By Day" is not—it is never trivial or a public relations outlet. There are no pitches for funds, no matter how worthy the cause, or discussions of upcoming bake sales.

Public acceptance has been rewarding. From barely registering on a local telephone survey, after its first year of existence, "Day By Day" has now become the fifth most watched program on our whole station, being preceded only by network offerings such as "Electric Company," "Sesame Street," and "Masterpiece Theater." "Day By Day" has become a community institution and is actively employed by newsmakers. A commercial station has recently begun a similar series with our assistance, although their emphasis on hard news differs from ours.

In addition to the unique use of volunteers, "Day By Day" has also been fortunate in receiving financial support from the Junior League of Saginaw, providing us with a yearly stipend of \$3000 to defray the cost of such things as set pieces, guest accommodations, and promotion. The real significance of "Day By Day," however, is not so much in the type of series it is, but in the way it is produced. It truly is community oriented, not only in its content focus but through the efforts of its volunteer staff. Starting last Fall, to even further increase viewer involvement in "Day By Day," we opened our telephone lines to the public. Callers can now ask guests questions whether it be a request for a secret recipe or an argumentative challenge. We are even presently exploring the possibility of producing our program full-year-round. "Day By Day" belies the excuse that a small-staffed, low-budget operation should not attempt ambitious undertakings. **BM/E**

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roducing the Ampex AG-440C. Latest model in an un-
broken line of the world's most respected professional audio
recorders. From the company that produced the very first
professional audio tape recorder and has always been the
standard of excellence against which all others are measured.

Ever since we produced our first AG-440 unit, delighted
users have been kind enough to share with us their ideas to
make a great machine even better. It was user suggestions
that helped us design the AG-440B, and it was user sug-
gestions again that inspired the new AG-440C.

Users requested **improved tape handling**, so we installed
sapphire tape guides for less skew, tighter phase stability, and
improved high frequency/high amplitude performance.

Users requested **easier editing**, so we redesigned the trans-
port to allow tape spilling without going through the tension
roll.

Users requested **motion sensing**, to allow them freedom
to push any transport command button at any time, without
risk of breaking the tape or
slipping a gear. We installed
the extra circuits and controls
to make this possible.

Users requested **automatic monitoring in Sel-Sync mode**,
so we made the switchover from output to input channel au-
tomatic whenever the Sel-Sync command is "record."

Users requested **more linearity at the high end**, so we ex-
tended the high frequency response as far as we could. Now
the AG-440C is the world's flattest machine — from 30 to
25,000 Hz.

Users requested **pushbutton record/playback selection**
for each channel. The knobs are gone, the buttons are in
their place. And you can read the indicators all the way
across a studio.

Users requested **stationary capstan mode**. Now you can
cue up for a fast start almost as well as with a disk turntable.

Users requested **detent channel setup** for quick, positive
return to preset levels following calibration. We complied.

There are a lot more than the eight improvements we
listed above, and a few of the new wrinkles came from our
labs as the result of continuing research programs. The
overall result is the very best professional tape recorder
available for broadcast, production, mixdown, or
general utility soundwork.

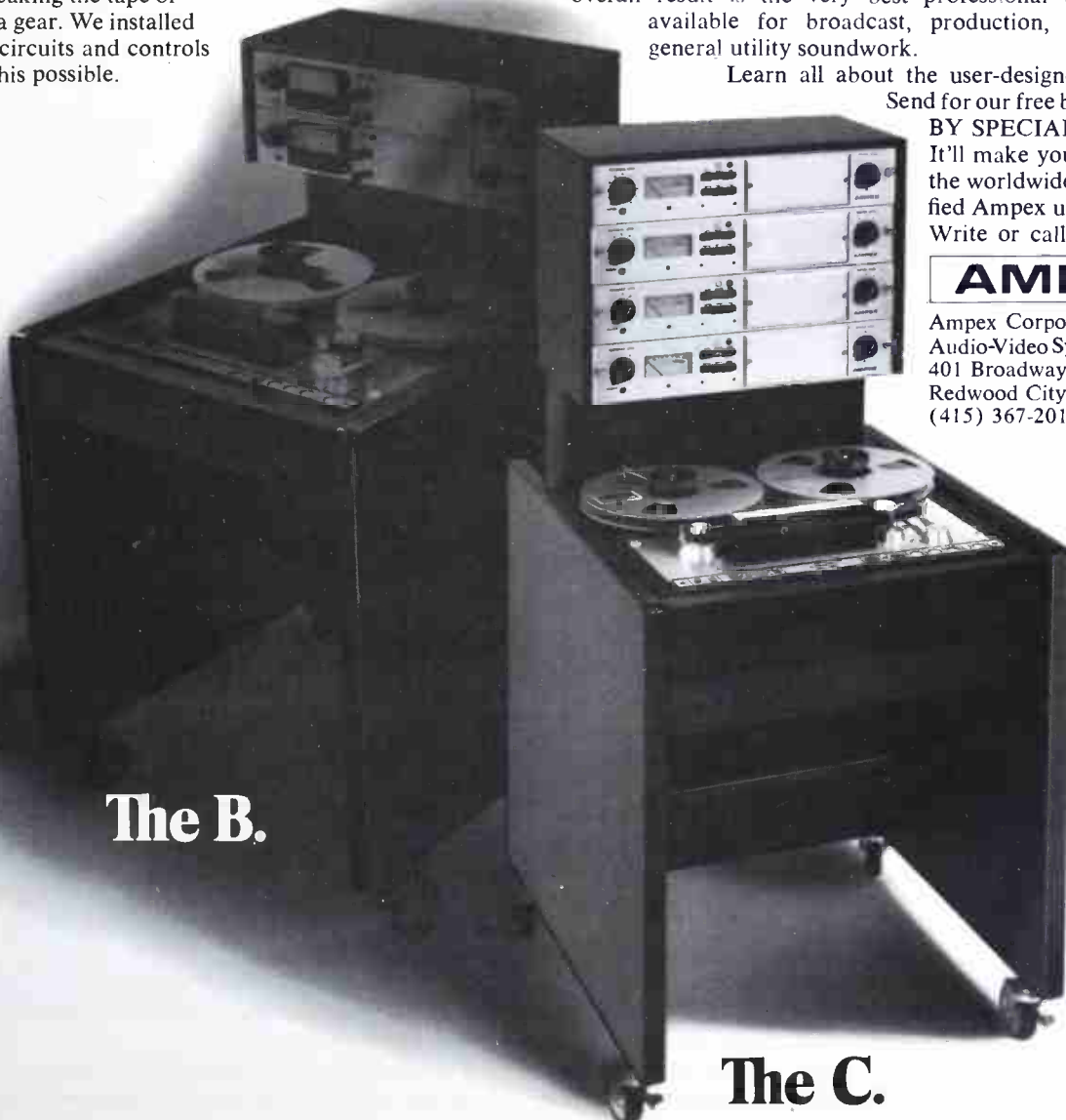
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The B.

The C.

Circle 105 on Reader Service Card

Character Generators: Flexible, Automatic

by Walter G. Salm

The newest generation of character generators puts smoother, sharper characters on screen in almost any font style wanted, has instant-recall memory for a movie-length set of titles, will do just about everything but powder your receptionist's nose.

Almost every TV station has one these days, and many of the tight-budgeted cable operators as well. Character generators are illuminating TV screens alphanumerically in millions of American homes. Today's advanced CGs have reached a high level of flexibility and resourcefulness, will do almost anything you can think of, and some you probably didn't, with letters and numbers (and in some cases logos, symbols, trademarks, etc.) on a video screen.

How much a CG does, how well, and how fast, depends on design sophistication and, of course, price. With prices running from under \$1,000 to over \$50,000, the broadcaster needs to know what he gets at each level before he can make his own decisions on trade-offs. This article outlines the main choices briefly.

Where it started

A little history first: broadcast CG technology, originally an adaptation of computer display techniques, went through some early stages in the 1960s with the A.B. Dick Company and engineer Newland Smith, who first made a commercial unit, the "Redifile," with storage for composing a "page" and holding it for use. Later came "Telefile," using a tape loop memory with 800 different addresses. Later still, Smith, Frank D'Ascenzo and others, then of Visual Electronics, further improved the system with "Masterfile," able to store 20,000 messages on a disc system, and put a message on the air. It sold to more than 100 TV stations.

In 1970, CBS Laboratories came in with ideas for improvements and developed new CG units jointly with Visual Electronics who did the selling. Later, when Visual ran into a brief spell of financial trouble, this association broke up. Various firms and individuals concerned with CG development dispersed in several directions: CBS went on its own, soon making a success of Vidifont; Visual Electronics developed its own equipment; Gene Leonard, originally of A.B. Dick, brought his ideas to Systems Resources Corp. and came up with Chiron. D'Ascenzo went to Datavision.

Today all the major suppliers of CG are selling their units well. For example, more than 100 Vidifonts have been sold around the world. Datavision has sold about 100 units to broadcast stations and about 500 to CCTV, educational institutions, and cable operators.

Character "character"— dot, stroke, speed

Two important criteria of choice are the character of the character, and the amount of high-speed random access memory available. Taking up the first of these

first: we note that characters range from a stylized, stair-stepped-diagonal sort, used on the early CGs and still produced on many inexpensive units, up to a smoothly curved, sharp character in many selectable standard fonts.

The stair-step stylized character can be perfectly legible (although limited in variation) and usually goes with units you will buy on a very tight budget. When you pay more, you get what you may consider a more attractive character; at top prices (as the following will specify) you also get enormous *variety* of characters.

Two methods are used for generating characters: the dot matrix and the stroke. The dot matrix generally produces the stiffer characters. The stroke method, now used in the more advanced units from CBS, Chiron, and Datavision, gives scan-line-by-line vertical definition, can make much smoother curved characters than the dot matrix. Horizontal resolution will depend on "clock speed," and differs somewhat from the resolution in the usual television sense, as explained by Gene Leonard, president of Systems Resources (Chiron): "Key to character generator quality . . . is something we've been calling 'starting point resolution.' This refers to how accurately you can define the place on the TV scan where the spot will start and where it will stop. Usually resolution means how narrow a spot can be made on the scan; here, we're more interested in the degree of precision with which the scan can be started and stopped."

Clock speed, by determining this kind of resolution, determines the following classes of systems, according to Mr. Leonard: "Character generators"—fixed characters, with 100-nanosecond or slower clocks; "titling generators"—variable characters and logos, with 50 to 70 nanosecond clocks; "graphics generators"—characters, logos and symbols with extensive variability, using clocks of 30 nanoseconds or even faster.

Chiron claims the Chiron II is the fastest on the market now with a 28-nanosecond clock.

To produce the font, symbol, or logo, a sophisticated method is used by CBS and Chiron: pasted-down artwork is scanned by a video camera and the signals recorded in digital form on tape. The tape is then read into a built-in core memory. Several fonts can be available for instant use, and any one can be changed at any time by running a new tape through. The font wanted is selected by pushbutton and the message "typed" on the keyboard. It appears on the unit's screen: it can then be stored for future use (see below on message storage) or sent off for transmission.

Tapes with several standard graphics-produced type faces are available from Chiron (and some from CBS on

cial order). Or special fonts can be prepared by the manufacturer or the broadcaster. The material can include not only alphanumeric characters but, as already suggested, logos, trade marks, foreign symbols—in fact, just about anything that can be drawn on paper. Creating one's own type faces is appealing, but most

broadcasters do settle for buying tapes with fonts already prepared by CBS or Chiron.

Message storage

Message storage is essential because messages must be created during a "rehearsal" time, and then stored for



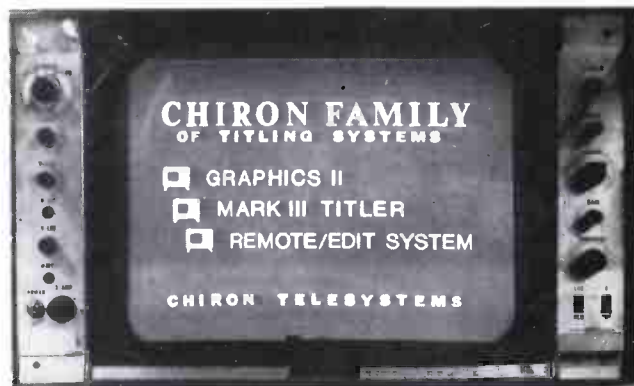
CBS Vidifont system has two screens, one on which message can be assembled, the other to monitor video with message coded. Standard typewriter keyboard allows message to be entered; as on most character generators, message is held in memory until needed.



Keyboards of Vidifont system are, left, the message entry and control board and, right, board with keys for addressing the font memory and long-term message memory. Other controls provide for crawls, rolls, and other manipulations of on-screen characters.



Chiron Graphics II system has, like Vidifont, digital storage of variety font styles, can reproduce logos, symbols, almost any graphic material. Long-term message storage is on "floppy discs," which hold up to 2000 lines of characters at one time.



Screen of Graphics II shows the size flexibility of the latest character generators and the ability of the digital camera-scan font system to reproduce symbols as well as letters and numbers.

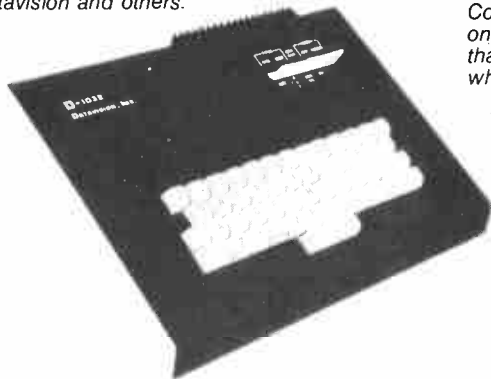


Smoothness of characters with very-high-speed scan-line reproduction is most evident in this picture of characters blown up almost to full-screen size, on Chiron Graphics II system.

THE LADIES AUX. FOR DEPAS-
 QUALE WILL HOLD A COFFEE
 CLOTCH EVERY MON. NIGHT
 AT 7:30PM AT THE UNION CLUB
 EVERYONE IS WELCOME

THE JAMES J. FARINA LADIES
 AUX. WILL HOLD A COCKTAIL
 PARTY AT THE LAMP POST FRI.
 APRIL 27 AT 8PM DONATION \$5
 FOR FURTHER INFO CALL MRS.
 ANNA PIGNOTTI 659-8719

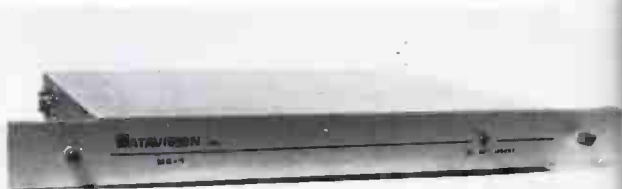
Datavision Community News System produces characters like those shown above, highly legible though not as smoothed off as characters on the more expensive models of Datavision and others.



Video titler, Datavision 1032, costs less than \$2000, can put single line of characters on video in three sizes and on top or bottom of screen.



Complete Community News System includes Datavision D-1500, the keyboard unit on right; and a tape machine with endless loop for 15 to 30 minutes of information that will repeat automatically for as long as the operator wants, or can be changed whenever wanted.



One-line programmable CG, like the MG-1 Datavision above, can be set for a single line of characters, which can be called up on the video whenever wanted.

fast recall when needed. "Rehearsal time" can be anything from the interval between batters in a baseball game, to the week between preparation of a foreign movie with subtitles and its broadcast or cablecast.

The methods in use for storing the messages range from audio-tape "data tone" systems to random-access "hard-disc" systems. Audio-tape storage is the system in units of TeleMation, Datavision, and Video Data Systems. CBS has an automatic high-speed reel-to-reel magnetic tape unit called the Vidicord. Chiron uses the tape loop device, the Vidiloop, in some models. TeleMation has available a hard-disc system as an option.

Storage capacity is related quite closely to cost. The Vidiloop used on Chiron I and II, for example, has a capacity of 60,000 bytes with a .75 second access time. The digital recording used can break down almost any kind of graphics material into a form suitable for a computer-like storage. Much of the storage space is devoted to serial addresses—number designations to locate called-for material, as tapped out on an auxiliary keyboard control. Chiron I's Vidiloop stores 800 rows of 24 characters each, and Chiron II stores 500 rows of 31 characters each.

The potential for different memory storage systems in CGs is still open. Coming in just now is the "floppy disc" which can hold 2.2 megabits of data, about ten times the storage capacity of the Vidiloop. Chiron has announced delivery of floppy disc systems about the time this sees print (to be on display at the NAB—see page 38). Datavision also has announced a floppy disc memory as an option on its more expensive units. The magnetic hard-disc memory is still available as an option

for some systems, such as TeleMation's TCG-1425. It has a storage capacity of 2000 lines of characters, for instantaneous retrieval of single or multi-line displays, and is controllable from the keyboard or a remote panel.

However, the floppy disc can hold as much, or more—capacity is up to 2000 lines of characters (Chiron)—and the future of the floppies in video storage systems looks good.

How much memory do you need? The "one-liners" described below obviously need very limited memory. But if your CG will put subtitles on a foreign film, or do any job of similar length, you will be happy with a 2000-line memory, like that of the Chiron floppy disc. You can do the job with less, but it will be harder. For many jobs, of course, the smaller capacity, and cost, or one of the other memory systems may optimize the labor/cost ratio.

Resourcefulness: The super gens

In addition to large memory and a smooth graphic quality, what you pay for in the more expensive machines is capacity for variations in message handling. For example: black edging can be put on characters to keep them from disappearing on light backgrounds; message can crawl from one side of the screen to the other, at the speed you want; the crawl can be a single line (excellent for news bulletins that don't interrupt the program) or whole screen full; messages can "roll" from top to bottom (or visa versa), a new line appearing as an old one disappears.

Or you can put in colored backgrounds, or the mes

can be colored. Letters, or words, or any combination of letters, words, or segments of the message can be made to blink.

Instructions for such "specials" can be programmed into memory and any part of it called up instantly as wanted.

Idle ground

Obviously only a minority of broadcasters want to pay the price for extreme flexibility and very large memory. Even fewer CCTV and cable operators will go that high. (Chiron II, for example, runs \$45,000 to \$60,000, depending on options.) In the price range from \$10,000 to \$11,000 are the CGs of Datavision. There are over 100 Datavision D-2400 character generators in use in broadcast stations, and well over 500 in other various closed-circuit, cable, industrial, and education applications, as noted above. In addition to low-cost floppy storage capability, Datavision also offers a high speed "floppy disc" random-access memory for its equipment.

While not having all the features of the CBS or Chiron character generators, Datavision's new D-3000 Character Generator with floppy disc storage has high-resolution, computer-generated characters and random-access storage, among other features. Datavision Vice President of Marketing, Frank D'Ascenzo, claims that Datavision has the broadest range of video titling character generator products available.

The less expensive Datavision units, with audio-tape memory (but complete entry keyboards), are usable in any video application, but may be particularly attractive to the CATV operator as "user programmed devices."

For local pickups such as a basketball game or town meeting, the CG becomes a titling device.

In situations where not so much local origination is involved, but the cable system wants to present edited and formatted presentations to the viewers, a unit like Datavision's D-1500 is most appropriate. Most provide an interface with any standard audio machine. In addition to conventional messages and memory, an endless-loop tape can be used on open-reel machines or an endless-loop cassette (such as the TDK) will hold from 15 to 30 minutes of material—ideal for community news and other similar types of presentation. The unit can be turned on and played all day, constantly repeating. Or the message can be changed as wanted.



Datavision's new Model 1432 CG has a built-in color sync generator, provides character edge shadowing, can be used as a single free-standing character generator, or built into a computer-controlled multi-channel system.



Theta-Com Series 100 systems can take information from news, weather, and financial wire systems, and from local and remote-access keyboards. The remote keyboards can be used by public officials, educators, advertisers to put messages directly onto "local" cable channels.

The system is ideal if the user is interested in producing his own material without having to depend on national news services, or wants to crank in local material on a continuous basis.

Datavision also supplies "one line" CGs for special purpose displays (the MS-1). This device allows programming of a single 16-character-line, such as a cable system logo. Other one-liners include a time/temperature display and date/time display. The information can be placed anywhere on the TV screen and the modules are driven by standard sync signals.

CATV displays

At the bottom of the cost spectrum are systems primarily intended for CATV use. One example of such equipment is Video Data Systems' CG-100 Series. A \$995 package provides a bare-bones interface between the CATV line and the AP or UPI newswire. Options such as color background and split-screen (split-message) capability can hike the price to \$1295. Down the line, for \$595 (to OEM), Video Data provides three printed-circuit boards as a "starter set" to incorporate within other equipment. These three boards make up a basic character generator.

A variation on this newswire CG is provided with a keyboard for creating locally-generated copy. This system is tagged at \$3550 and its combined features include the color and split screen for tag lines and IDs. William Leventer, president of Video Data, sees four major markets for CGs: commercial broadcasting, including CATV; industrial CCTV uses; education; and the military. Included in the industrial segment are such applications as airline schedule displays and stock brokerage reports.

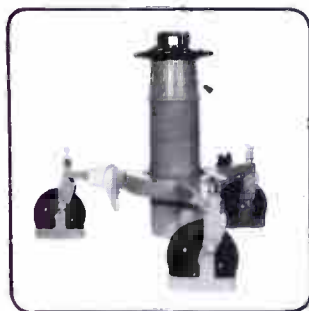
LISTEC REMOTE PEDESTALS GO TO YOUR HEAD



Here are two new TV Camera Pedestals* that will end traditional tripod problems forever. What tripod can set up in less than a minute, be sturdy enough for up to 250 lb. loads, and even cost less than your present tripod? These new remote, lightweight pedestals do! Take them anywhere. Set the common folding skid down, put in the interchangeable center unit in one easy push-lock motion and you're ready to mount the head. Isn't it time you looked into how Listec remote TV camera pedestals can go to your head?



Model 730 Geared, elevator pedestal/dolly combination complete with cable guards. Provides 24" cranked lift of load on sturdy column with separate folding dolly featuring 10" diameter wheels for both castoring and straight-line tracking. Units together weigh 90 lbs. Capacity load is 200 lbs. **\$1245.**



Model 729 Air counterbalanced pedestal/dolly combination complete with cable guards. Provides 22" counterbalanced lift of load on sturdy column with separate folding dolly featuring 10" diameter wheels for both castoring and straight-line tracking. Units together weigh 105 lbs. Capacity load is 250 lbs. **\$1990.**

*Manufactured for Listec by Vinten, Ltd.

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Circle 161 on Reader Service Card

CHARACTER GENERATORS

New uses

Sports fans are familiar with the continually updated statistical information flashed on the screen as each baseball player comes to bat. This is made possible by having a CG with memory right at the ball park, so the statistician can work up new batting averages and enter them for instant recall after each player's turn at bat. Many stations don't bother with this nicety and just show the player's name in a super-taken from a menu-board-created slide. (Chiron offers a telephone-line-connected keyboard console to control a studio-based Chiron II or Chiron III from the remote stadium.)

But there are far more sophisticated applications—many of them still in the development and planning stages. One such is a program with subtitles for the deaf. An experimental project, funded by HEW's Office of Education, is expected to get on the air this year. These programs are being produced at Boston's educational TV station, WGBH, which is using CBS Vidifonts for the titling.

In production work—especially for advertisements—some stations equipped with CBS or Chiron CGs find that an entire logo or trademark can be scanned and stored in the Vidiloop. This trademark can then be read into the system's magnetic core storage for instant recall when needed. The artwork can appear in color or against a colored background. It can be reduced in size for a super, and it can be made to flash at any rate of speed. It can be used in conjunction with any printed material—either from original artwork or reproduced from the system's store of type faces. And it can all be flashed on the screen instantly at the touch of a button or a signal from a program control computer.

Another specialized use is keeping instant track of election returns, with a computer doing the tallying. The Danish television authority used a Chiron CG this way in its recent national election.

Time/weather specialist

Typical of medium-priced systems, MSI Television's DW-11 is geared for time-weather sensors with analog digital converters, an electronic clock, internal color sync generator, three-way split-screen (colorized), external video input circuits, local message keyboard input terminal, character edging, and NTSC color output drives. A similar unit is TeleMation's TCG-1432 (photo).

Why digital?

Finally, the fact that CGs convert information to digital form for storage may raise the question, why the added expense of the A/D (analog to digital) converter? The simple answer: it more than pays its way with accuracy, retrievability, and repeatability. Digital systems have had years of trial and successful use in U.S. broadcasting and they will be used more and more. Some British companies have introduced analog CG systems but, by American standards, the results have been disappointing. This equipment has made little headway here. U.S. digital systems, in contrast, have been sold around the world.

And digital storage gives the CG another area of compatibility with computer control—increasingly the rule in U.S. broadcasting.

BM/

The mike for all reasons.

If you ever wanted one microphone that could record anything and still meet tough professional standards, you want the AKG C-451. It's the only modular condenser microphone system in the audio world. You buy exactly the specialized components you need, without investing in microphone parts that aren't really necessary.

The C-451 offers you a range of six interchangeable capsules that twist-mount directly on the basic preamplifier module. This lets you meet the demands of just about any recording situation using only components from your C-451 System. In the hectic moments between sessions you can customize your set-up to give the in-coming Mozart string quartet the same quality attention you gave the outgoing rock superstar.

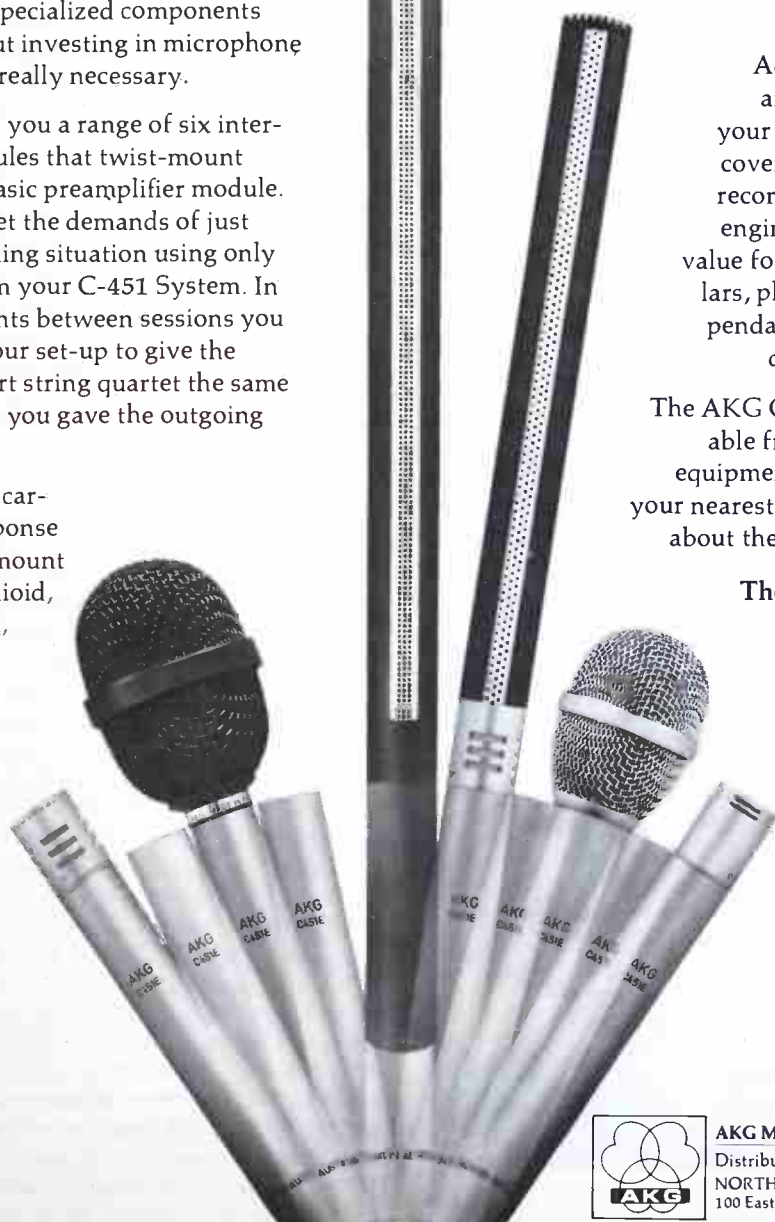
There are C-451 cardioid, rising-response cardioid, shock mount wind screen cardioid, and omnidirectional,

shotgun and short shotgun condenser components. All work with phantom powering, AC, or battery power supply. And there are currently 27 back-up components for unlimited versatility and convenience.

Add extra preamplifiers and you further extend your system's capability to cover any session, concert, recording or broadcast you engineer. You get the most value for your equipment dollars, plus the quality and dependability of an AKG condenser microphone.

The AKG C-451 System is available from your professional equipment dealer. Or write for your nearest dealer and details about the C-451 System.

The AKG C-451 System



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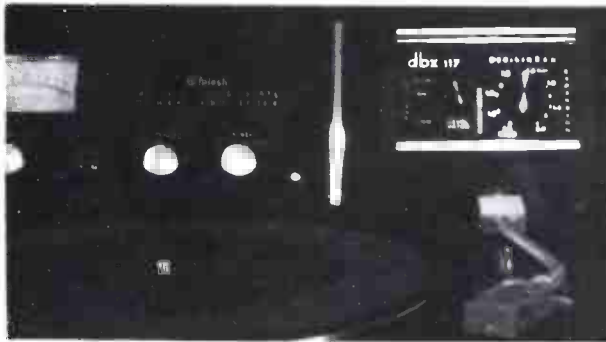
Circle 162 on Reader Service Card

Increasing Listener Awareness Through Better FM Quality

by Ned Soseman, Jr.

If listening to your station is more unpleasant than listening to records, who needs you? Mr. Soseman includes here some suggestions on outperforming the home system. They're his own ideas and do not necessarily reflect the practices of the station he works for.

It wasn't long ago when an over-sized handcarved walnut veneer box with two eight-inch speakers (one at each end) and a ten-watt amplifier was considered by consumers to be the state-of-the-art in high fidelity stereophonic reproduction. Today, such a console is referred to as a "coffin with a radio." The national buying trend swung away from consoles to components several years ago and recently the trend is from moderate components to expensive systems. The increasing popularity and availability of high quality audio equipment for home use places the FM broadcaster in a competitive market with eight-track tape cartridges, cassettes, records, and other FM broadcasters in a different way from ever before. Equipment on today's market has lower harmonic and intermodulation distortion, better signal-to-noise ratios, and a wider usable frequency response at the output of the loudspeakers than your station probably has in your production or on air studios.



Dynamic range expanders are finding their way into more and more homes. DBX 117 model is shown here.



High fidelity enthusiasts take care of their records. Station personnel should show equal concern.

What does this mean to the FM broadcaster? With the wide selection of stations playing similar formats and the low cost of high quality recordings, the consumer is going to listen to what sounds best technically—the same as the person who watches a lousy television program just because it is in color although a better program may be on in black and white on another channel.

Therefore, a top-quality audio signal at the output of your transmitter will mean more listeners. It will mean higher exposure in public places because the salesperson will tune in your station to show off the quality of the stereo he is selling.

Unfortunately there is no one thing that you can do to improve your sound overnight. Many broadcasters seem to believe that running a 20:1 compression ratio and using overpowering graphic equalization is the answer. They could not be more wrong. There is a myriad of projects one could complete that will improve the sound of the station, and for top fidelity, one should keep both eyes and ears open for problems with any piece of equipment in the station. Since the nucleus of your station's programming is probably music, played directly off the disc or dubbed to tape, the disc is the heart of your programming. It is assumed at the outset that your board and amplifiers are low in noise and distortion, and your transmitter is capable of passing a proof of performance. Let's examine the source.

The Phono Cartridge

The majority of the time your transmitter is on the air, it is being modulated in one way or another by the phono cartridge. This little device is most often the weakest link in the chain of equipment between the record and the receiver. Most stations settle for a medium-priced cartridge, and it is replaced only when it fails to function. Since cartridges seldom wear out, it makes more sense to install a top-of-the-line cartridge from a reputable company. A good way to minimize wear and abuse is to issue each announcer or disc jockey his own personal styli. Good replacement styli for even the most expensive cartridges are relatively cheap, and by making each announcer responsible for his own styluses, you can put a stop down on the continual misuse and abuse of styli, cartridges, and records. Many excellent cartridges are available.

Mr. Soreman is a staff engineer with WDAF AM-FM-TV, Kansas City, Mo.



The listening audience, using a living room system such as that shown here, may well be able to hear "problems" at your station of which you may be unaware.

...le in the \$70 to \$80 range, and the difference between
...m and the \$40 to \$50 variety is like night and day.
...remember if signal doesn't sound better than what the
...owner can do on his own turntable, he isn't going to
...ren for long.

The Turntable

Turntables intended for broadcast use have a tough
...the matching the performance of good consumer-type
...ntables. There are a few broadcast turntables on the
...arket that are excellent, but the majority are 5-10
...ars behind the times. There are two important points
...bear in mind when selecting new turntables for FM
... or when setting up your present turntables. Natural-
...y wow and flutter play an important role on both AM
... FM; but in FM, rumble is playing an increasing part
...the overall performance. It has been stated that fre-
...quencies below 50 Hz cannot be heard and therefore
...ould be ignored by the FM broadcaster. I violently
...agree. 50 Hz cannot only be heard but can be felt as
...wl. Today's consumer systems are flat if not boosted in
...the 50 Hz and below range. Many of the more expensive
...systems are capable of reproducing flat distortionless,
...most subsonic earthshaking frequencies to 20 Hz. The
...siltest rumble detected on today's new speaker sys-
...ems is a definite reason to switch stations. The turn-
...table must not only be free from internal rumble but
...must be isolated from external thuds, booms, and build-
...ing vibrations. An excellent method of isolation is by
...mounting the turntable in sand.

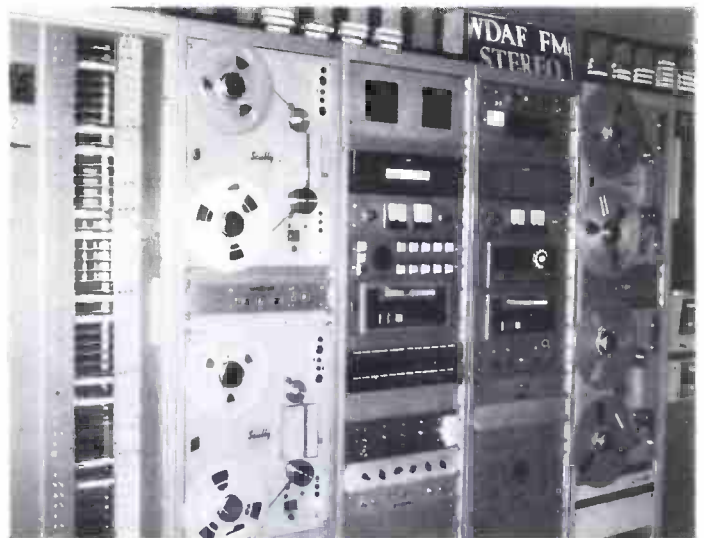
...the proper tonearm must be used and set up properly.
...the recommended stylus force must be followed. Once
...the turntable is isolated as mentioned in the above
...paragraph, the need for heavier tracking force is elimi-
...nated. Most stations resort to heavy force to keep the
...needle in the groove. This heavy pressure will not only
...wear out your styli and your records but your listeners
...as well, as each time a record is tracked, it is more
...morted and noisy than before.

Records—The Heart Of The System

Obviously, the record is the single most important
...ity in the chain. Announcers are undoubtedly famil-
...with how to handle records and should be reminded
...of the same. Records are highly abused in the broadcast
...tion, and this is a mistake. Without them, where
...ould we be? In addition to proper handling of the



Using a device such as the Watts Disc Preener is probably the quickest and most effective way to add 10 dB to the dynamic range. It should be included as a part of the record cuing process.



The value of a station's automation system can be enhanced when proper attention is paid to frequency response, dynamic range, and signal to noise ratio on the pre-recorded music reels.

transcription, it should be cleaned frequently. This will
...maintain the original signal to noise ratio and increase
...record life and styli life. I recommend a Watts Disc
...Preener or a Watts Parastat be used as often as possible
...to clean records before they are tracked. A physically
...clean record makes a noticeably clean electronic signal.
...Without the cleanliness, all other efforts will be mini-

LISTENER AWARENESS

mized, if not lost.

Compression And Equalization

Standard equalization curves should be strictly adhered to. If a listener wants more bass, midrange, or treble, let him turn his own knobs. Any gain over flat bass response will cause an overload in most amplifier power supplies. Any treble boost or added pre-emphasis will result in sibilance on most receivers. Added midrange may be desirable to increase "talk power" but is not recommended to be used on music. Leave graphic equalization only for AM. Over compression is perhaps your worst enemy.

Ideally, there should be no compression, limiting, or gain riding. The practical dynamic range of FM is about 40 dB and efforts should be directed to maintain this range. If serious music listening is intended, there is no need to keep the modulation average between 95 and 100%. Record producers and manufacturers spend a lot of time and money achieving a proper dynamic range to achieve maximum effectiveness; it should not be ruined by the broadcaster. The old idea of having the loudest signal on the band is no longer logical with FM. Now that frequency response in the home system generally ranges from subsonics to supersonics, manufacturers are beginning to place more emphasis on dynamic range. Expanders and noise reduction systems are beginning to pop up just as separate bass and treble controls did a few years ago. You may have noticed an increase in the

number of commercially-available noise reduction systems for broadcast use to enhance dynamic range.

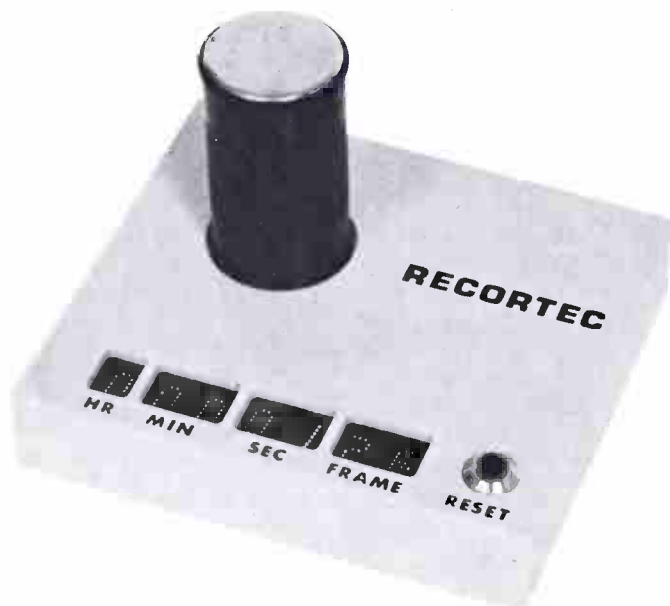
Loudness contour controls on home equipment are standard; so if the listener wants more loudness and compression, let him put it in himself. Supply the listener with precisely the signal that was recorded, and let him have a chance to play engineer. He paid extra for all those knobs and gadgets. Let him tailor the sound to his own taste.

If one follows the suggestions outlined in this article, he should be able to get a signal to noise ratio of at least 40 dB, distortion of less than 1.5%, and a smooth frequency response from 20 Hz to 18 KHz from the test record measured at the output of his transmitter. There are a multitude of other topics that should be examined to improve the sound of your FM station, but at least this will improve your sound as far as music is concerned. You will surely note an increased listening awareness of your audience and have a signal on the dial that you can be proud of.

A final suggestion is to install a good high fidelity stereo system in the station for monitoring and airchecking. It can provide invaluable information on how your station measures up with others, and it is an excellent tool in discovering and troubleshooting your own problems on a day-to-day basis.

The time of precision reproduction is upon us; and if the FM stations can't keep up with the sound the audience can get from its own records, then once again, FM will end up being a nice accessory for a car—but the television and record player will dominate homes. **BM/E**

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GREAT IDEA CONTEST

With entries streaming in, it is evident that BM/E's Great Idea Contest will achieve overwhelmingly its main objective: the making available of a great reservoir of front-line engineering experience—the circuits, devices, and systems that operating engineers in broadcasting have created to meet their day-to-day and long-range problems. Each month, we will share as many of the entries with our readers as we have space for.

To get the most out of this unprecedented assembly of successful reports on engineering practice in broadcasting, first read all the entries in this issue (and in subsequent issues) carefully: There may be something you can use. Then vote on the entries, marking the ballot on page 92 or a separate sheet of paper. Finally, send us your own ideas, if you haven't done so already, remembering that there is no limit on the number of ideas that one contestant can submit. See the full contest rules on page 88.

Share your ideas—and get a chance to win the prizes!

The Great Idea balloting is under way

A sizeable number of votes have come in already on the first three entries in the Great Idea contest, published in the January issue. So far, Idea No. 3, the inexpensive film processor, is leading with an average vote of about 7; No. 2, use of waste transmit-

ter heat to heat a building, is second with an average of a little under 5; and No. 1, the use of FM receivers in buses, is at the bottom, with an average rating around 2. The low rating of the FM-bus idea reflects a number of votes of "zero," from voters who complain that the scheme is an invasion of the listener's privacy.

15. Replacing the Harmonic Shunt on an AM Antenna Feed.

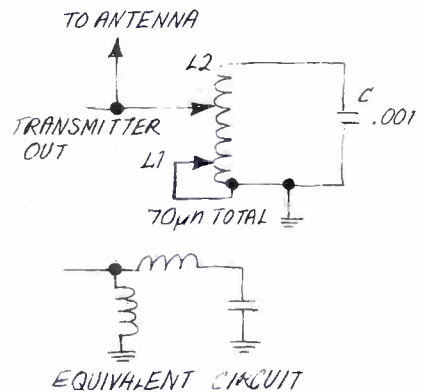
Manuel Taitz, Transmitter Supervisor, WSB-AM, Atlanta, Ga.

Problem: To replace a 4" coaxial line, used as a harmonic shunt, with compact components at the transmitter.

Solution: When informed that due to road widening our harmonic shunt, a 4" coaxial (1/4) wave shorted line buried along the front of the lot, would have to be removed, we at first panicked and then got busy planning. We were advised to assemble a pi network with the usual two capacitors and series coil, but space behind the transmitter was too limited to accommodate the three components. So I decided to use a tapped inductance for the first two elements and a nitrogen-filled adjustable capacitor, which we had on hand.

Adjustments were made using a

General Radio RF Bridge and a VTVM. The network, either pi or 1/4 wave shorted line, should appear as an open circuit at the fundamental frequency and a short at the 2nd harmonic. With a 70 microhenry coil and .001 capacitor across it, the tap was set so that the input showed a short (upper turns series-resonant to ground) at the 2nd harmonic. Then the bottom tap was adjusted to anti-resonate at the fundamental: i.e., the net reactance of L2C should measure very nearly equal but opposite to XL of the lower portion of coil.



Engineer Taitz's antenna shunt was set so that upper turns (L2) plus C was series resonant (a short) at the 2nd harmonic, and lower part of coil anti-resonant at fundamental.

Fine adjustment was made by using the bridge oscillator, calibrated against the carrier and 2nd harmonic of the transmitter, and carefully adjusting taps for peaking VTVM at fundamental and a null at the 2nd harmonic.

After installing and readjusting, the LC arrangement worked better than the original shunt, with a noticeable increase in plate efficiency.

16. Quick Clean-up of Tape Cartridges.

Ken Courtright, Assistant News Director, WJW, Cleveland, Ohio.

Problem: To save time in the removal of unwanted material leading into or out of a wanted section on a tape cartridge.

continued on page 84

GREAT IDEAS

Solution: Here is a clean-up technique that with a little practice becomes a big timesaver, primarily in radio newsroom operations.

Rather than transcribing to a reel-to-reel machine and editing, you can use the standard-strength tape eraser (desk type). Cue up the cartridge to the offending sound, hold it vertically, and pass it slowly over the eraser field. You will eliminate approximately 1/2 second of sound or one word of normal speed speech.

Example: The cartridge says, "The newspaper said, and I agree, talk is cheap!" You wish to eliminate reference to the newspaper. Cue immediately past the STOP cue. Pass cartridge vertically (pressure pads down) across the face of eraser. You've now erased "The." Now put cart back in player, press "start," then "stop." Repeat pass over eraser. You've now erased the word "newspaper." Repeat process four more times. On the last one, when placing the tape cartridge in the cart machine, turn down record volume all the way, put machine in the record mode, and then start the cartridge.

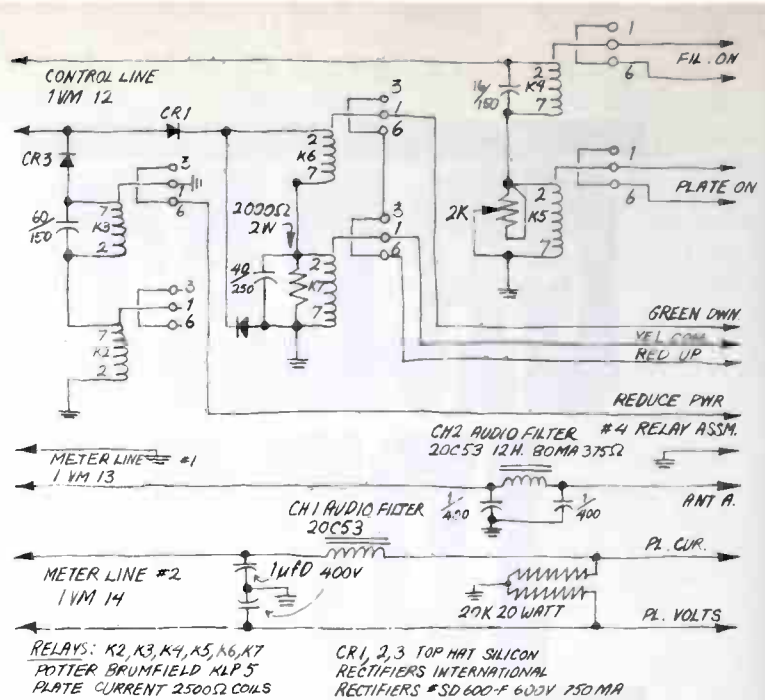
After about a second, press "stop," then restart to play through. If you can monitor playback while recording, you know by this time whether your tape now starts in the proper place. If it is now correct, play it through until it cues up at the original stop cue and erase that cue. If it isn't correct, the original stop cue can serve as a time base for another go at it. Even simpler, of course, is eliminating material from the end of the cart. This blanking procedure can also be used in an emergency to eliminate a foul word, if time is very tight.

17. A Stepperless Transmitter Remote Control and Metering System.

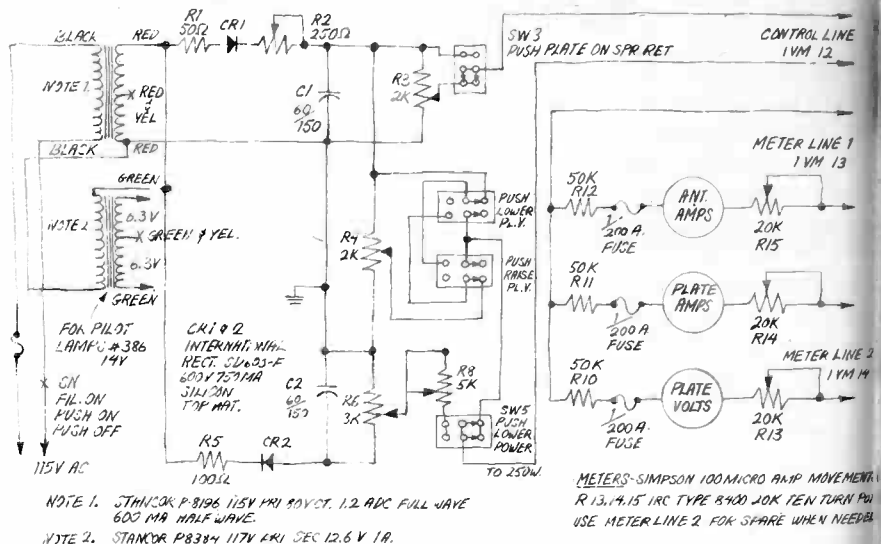
Don M. Lidenton, Owner-Chief Engineer, KLID, Poplar Bluff, Mo.

Problem: To revise a transmitter remote control and metering system to eliminate a troublesome stepper and to have all meters reading at the same time.

Solution: The original remote control was a composite-built model, a copy of the Gates RDC-10 with slight



Relay system at transmitter in Engineer Lidenton's revised remote control system, which eliminated a stepping relay and made all meters readable at the same time.



Power and switching section of the remote control system includes rectifier for dc voltages, meters, control switches. System uses a spare program line, which can be switched back to program use if needed.

modifications. It was completely rebuilt and uses the spare telephone line for an additional metering line. The line is still available to use as a spare should trouble develop in the program line or the regular control line. Since the spare is always in use, we have a constant check on its condition. Many parts were removed from both the studio and transmitter units. Steppers from both the studio and transmitter were removed as were the stepper power supplies. Additionally the two relays and selector switches from the studio unit were removed. Since no 115V ac power was required by the new transmitter unit, the ac switch, fuse, pilot, light, and miscellaneous wiring were removed.

There are four telephone pairs from

the KLID studio to the transmitter:
1PT121—Program Line
1VM12—Control Line
1VM13—Metering Line 1, ant. amp
(one wire common to other meters)
1VM14—Metering Line 2, +plate V
+plate amps. Metering line 2 can be used as a spare line in case of trouble with the program line or control line as already indicated.

The studio unit schematic now includes two power supplies for the control system. One supply consists of T1, CR1, and C1, and provides voltages for the following operations:

The power reduction power supply consists of T1, CR2, and C2, and provides voltage to reduce power when SW5 is pushed. Voltage is approx

continued on page 1

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GREAT IDEAS

mately -75 V.D.C. to ground and is adjusted by R6. A filament transformer is used to light the pilot lights.

Control functions are obtained by applying a dc voltage to one side of control line to ground. Different voltages are applied to obtain more than one function on each leg of the telephone control line. On one leg of the line, 26v is applied for Fil. On operation, and this voltage is increased momentarily to 80v for Plate On.

The plate-On relay, K5, is shunted with a 2K ohm resistor to prevent it from operating at the lower voltage. The fil. hold relay is shunted with a 16 Mfd. capacitor to prevent it from dropping out as SW3 on the studio unit is returned to fil. on (hold) position. The contacts on this switch break before making, which assures the dropping out of relay K5.

On the other leg of the control line, +38 v is applied to energize the lower relay K6, and +80 v is applied to energize the raise relay K7.

Relay K7 has a 2000 ohm resistor in parallel with it to prevent it from operating at the lower voltage. The voltage being applied to the raise-lower relays is polarized by CR1 to prevent the relays from energizing with a negative voltage. Rectifier CR2 is shunted across K6 and K7 to short inductive pulses from other relays in opposite polarity.

When a negative voltage of approximately -75 V.D.C. is applied to this

same line (when SW5 of studio unit is pressed), it will pass through CR3 of the transmitter unit and operate relays K2 and K3 to turn off plate voltage if relay K2 contacts are connected to operate this function. To reduce power, relay K3 is connected to operate the power reduction function.

Metering is done continuously on all three meters. Metering line 1 will operate to show antenna current and will operate the ant. amps meter. One wire of this pair is common to all meters.

Metering line 2 will carry the + lead to operate the plate voltage meter and the + lead to operate the plate current meter along with the common wire of meter line 1.

18. Meter for Relay Contact Resistance.

Lawrence R. Henle, WKRG, Mobile, Ala.

Problem: When using relay contacts, I have run into three particular problems. One is when the contacts are used to carry small error signals (approximately 0 volts DC): the changing contact resistance will cause variations in the error signal which, in the case of the VTR, results in either recording or playback instabilities. A second problem arises when relay contacts are used to ground signals. When grounding pulse information, small contact resistance will develop spikes during the transition period of the pulse sometimes sufficient to cause triggering of the next stage. When grounding error

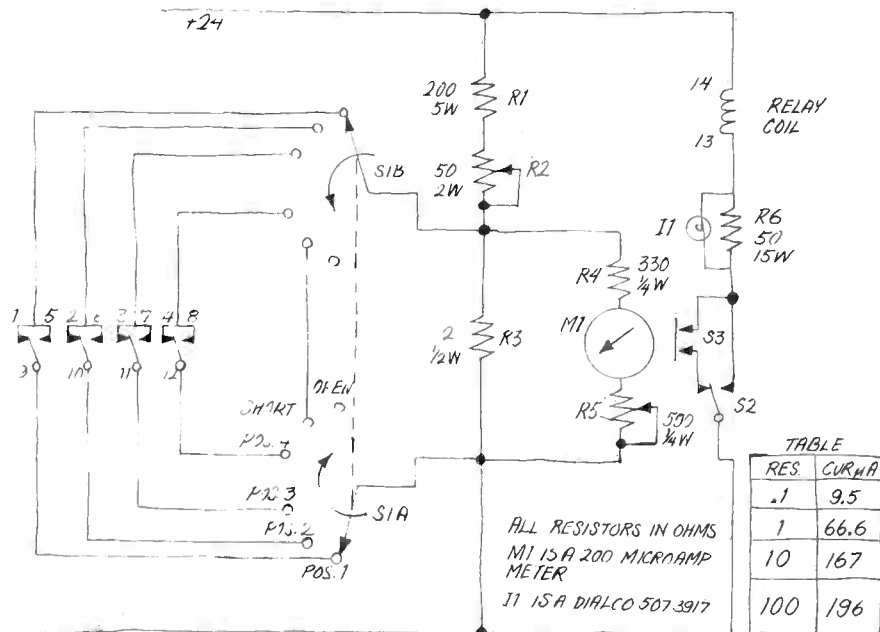
signals through a capacitor, small contact resistance results in the development of at least part of the error signal again in the case of the VTR, resulting in instabilities. The third problem arises when the contact resistance results in varying audio levels, with audio on the relays.

Solution: The following circuit is a meter I have designed to test the resistance of a relay contact. The meter will give discernible readings from .1 to 100 ohms. This unit uses an external power supply of +24VDC at 1.5 A. to energize the relay and supply voltage to the test circuit. Resistors R-1, R-2 and R-3 are a voltage divider with R-2 (coarse adjustment of meter set) being used to set a current of approximately .1 amps through the divider network with S-1 in the open position. When a relay is under test, this will be the current through its contacts. The actual metering circuit, consisting of the meter movement and R-4 and R-5, is used to measure the voltage dropped across the paralleled combination of the relay contacts and R-3. The effective resistance of the total metering circuit is 1000 ohms with R-5 (fine adjustment) being used to set full scale deflection of the meter. When S-1 is set to the short position, the meter will indicate a minimum resistance. This will be the smallest resistance the meter will indicate. Resistance as a function of meter current is given in Table 1.

The second leg of the circuit is used to energize the relay in two manners. With S-2 connected to S-3 the relay may be energized by the push-button S-3 up to 30 times a minute making positive check of the mechanical make of the contacts. When S-2 is connected to the relay coil, a rapid check of the sets of contacts can be made. Resistor R-6 and I-1 in the second leg are protection circuit: in case a relay with a shorted coil is placed in the tester the power supply will not have a direct short on it. Lamp I-1 will light if short exists.

A cost estimate based on a local distributor is \$35 with a calibrated meter movement or approximately \$22 with a "Go-No Go" meter movement.

One closing comment: attempts to clean relay contacts have met with low degree of success, due apparently to the mechanical seating of the contact. So if stability is the aim, replacement would be recommended.



Circuit of system devised by Engineer Henle for reading very low resistance of relay contacts uses external power supply of 24 volts dc, to energize relay and provide current through contacts for resistance reading. Table shows resistance as a function of meter current, with component values as given.

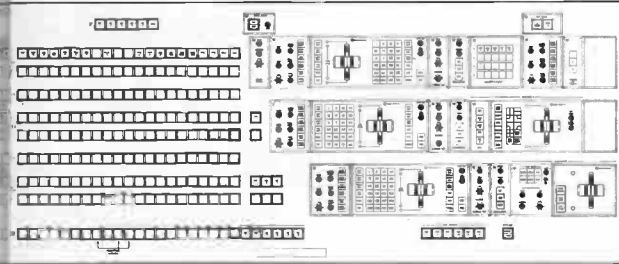
continued on page 8

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VP, Tech. Dir.



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with Tarzian Switching



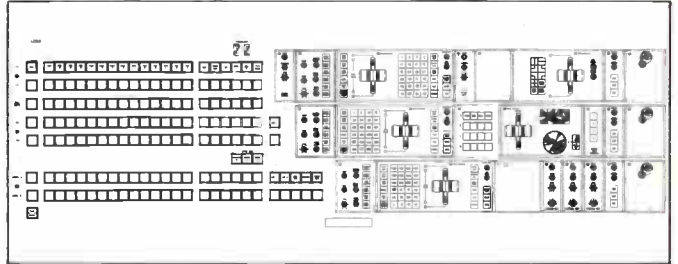
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F. A. Bibeau
Chief Engr.



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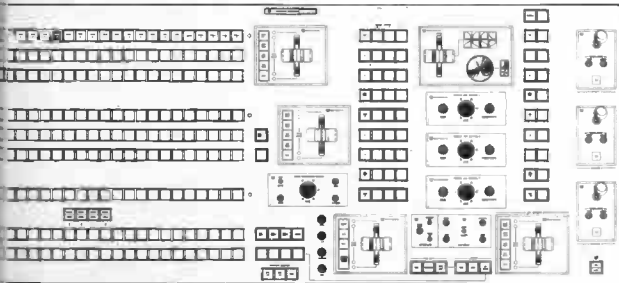
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Bill Kessel
Chief Engineer



leads in Dallas—Fort Worth
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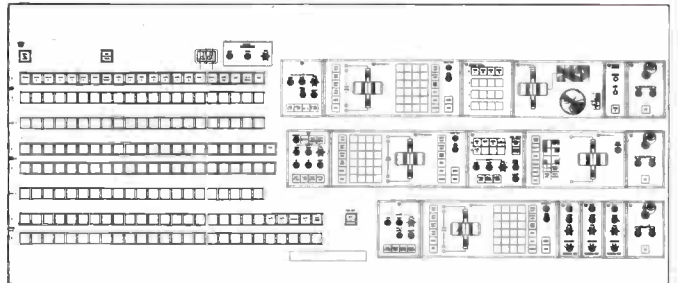
SARKES TARZIAN INC.

Al Hillstrom
VP, Engr.



KOOL-TV

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GREAT IDEAS

19. Finding the Short on a Transmission Line.

C.R. Swanson, Chief Engineer, KLVV, Houston, Texas.

Problem: A rigid transmission line was shorted by lightning; resistance measurements put the short near the middle but not precisely enough to spot where to open the line.

Solution: We have the old style Andrews rigid transmission lines, $\frac{3}{8}$ " dia. center conductor held by spaced ceramic insulators and impedance of 64.7 ohms.

Lightning is always a plague to this business. I have learned a lot about what it can do and, in some cases, I have been able to eliminate the hazard. However, about three months ago following a severe storm, I found that my transmission line to the directional tower was shorted and badly: It measured about .10 ohms from end and

about .12 ohms from the other end. Yes, that put it about in the middle but hardly told me where to apply the backsaw. I decided to try to burn off the short with a husky power transformer. I finally got about 20 amperes through it for awhile and beat on it with a short length of 1 by 4 lumber. No luck. It did not even warm the outer jacket. All of our lines are supported on posts about four feet above ground. Then I thought about a pick-up coil, amplifier, and phones while the A.C. power was on it. Of course, regular phones are not so good at 60 Hz and a suitable amp was not handy, but I did not want to take time to design and build the equipment.

So then I had the "great" idea—I thought of "Ma Bell's" boys who use such a gadget to find their shorted lines. I went to their maintenance barn and after a few minutes with the proper supervisor, two men followed me over here, hooked their generator on the "shack" end, and we started out the proper line. I told them it would be approximately in the middle

and sure enough, they put two pencil marks on the line—between here and here. They continued to listen on the generator side while I unbound the line and flexed it outward. They said, "You just fixed it." It was true. Whatever was there (residue of lightning arc) was completely gone.

20. Producing Program Tapes in the Station for an Automated Program System.

C. Donald Rees, V.P. and Chief Engineer, WAMX-FM, Ashland, Kentucky.

Problem: To produce audio programs on tape that can be used on an automation system; to save money and increase the variety of programs available.

Solution: The "Brain" described here solved the problem. The unit will produce a tape of high quality completely compatible with most standard

continued on page 70

Rules for BM/E's Great Idea Contest

- 1. Eligibility:** All station personnel are eligible. Consultants to the industry may enter if the entry indicates the specific station or stations using the idea or concept. Manufacturers of equipment or their representatives are not eligible.
- 2. How to Enter:** Use the Official Entry Form on this page or simply send BM/E a description of your work. State the

objective or problem and your solution. Include diagrams, drawings, or glossy photos, as appropriate. Material must be legible but need not be directly reproducible—although camera-reproducible material is preferred. Length can vary, but should not exceed 1000 words. BM/E reserves the right to edit material. Entry should include: Name, title, station affiliation, and the class of station—TV, FM, AM (Class I or II), or AM (Class III or IV). Indicate if idea is completely original with you.

3. Material Accepted for Publication: BM/E editors will make all decisions regarding acceptability for publication. If duplicative or similar ideas are received, BM/E editors will judge which entry or entries to accept. A \$10 honorarium will be paid for each item published.

4. Voting. Every reader of BM/E is entitled to rank the ideas published. This can be done on the ballot in the magazine or by letters or cards sent to the BM/E office. A reader can judge one or all ideas published. Readers must assign a point score to each idea on a scale of 0 to 10: e.g., if you think an idea is excellent, score it 10; if you think it is without merit, score it 0; if you like it but want to discriminate, pick the appropriate number between 1 and 9.

5. Winners. Relative ranking of each month's entries will be published after 60 days. Top-rated entries for various categories will be republished in December 1974 for a second and final round of scoring. Final winners will be picked in February 1975 and notified by mail. Winners will be published in the March 1975 issue of BM/E.

6. Prizes and Awards. Four top prizes will be awarded—each a six-day cruise for two on a Windjammer in the Caribbean.* Cruise awards will be one each in categories of TV, FM, AM (Class I and II), AM (Class III and IV). In addition, highest ranking entries will receive a BM/E Certificate of Merit award, one each for the following nine categories: TV, RF; TV, Video; TV, Audio; FM, RF; FM, Audio; Class I and II Radio, RF; Class I and II Radio, Audio; Class III and IV Radio, RF; Class III and IV Radio, Audio.

*Between months of May to November, choice of cruises: Bahamas, Virgin Islands, West Indies. Deck Cabin accommodations. Travel to and from port cities of Miami, San Juan, or Virgin Islands not included. Authors of top-ranked items will receive Windjammer Cruise information in November 1974.

Entry Form for BM/E Great Idea Contest—1974

Mail to: Editors, BM/E
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New York, New York 10016

Name _____ Title _____

Station Call Letters _____

Address _____

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Licensee _____

Class of Station: TV _____ AM (Class I or II) _____
FM _____ AM (Class III or IV) _____

Title of Entry _____

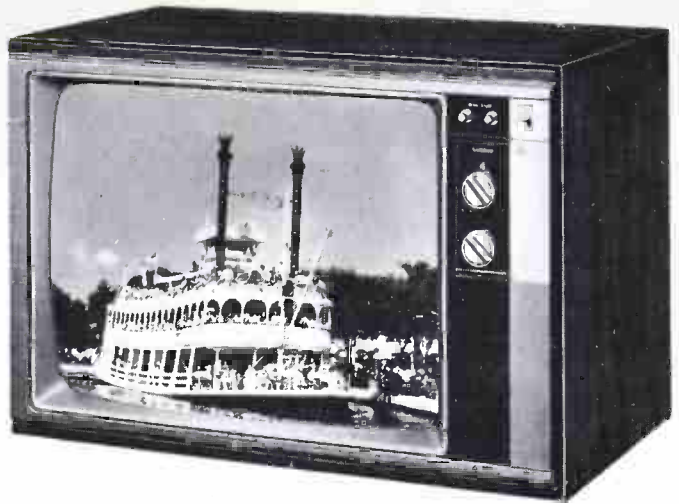
Objective or Problem: (in few words; use separate sheet for details) _____

Solution: (use separate sheet)

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

Signed _____ Date _____

*If you feel credit for prior work or antecedents should be given to someone outside of the station, indicate to whom and when.



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GREAT IDEAS

automation systems. (We use the IGM 500 Series.) The unit, with a tape recorder (we use a 1028 Maggie) and the proof-of-performance audio oscillator (a B & W 210) pulled out at proof time, will automatically place a 25Hz tone on the tape, time the tone duration, and stop the recorder at the end of the sequence. It also contains a very simple but quite acceptable high-pass filter in the left audio channel. For our operation we use a Dual I229 cable with a Shure M9IE pickup, Shure equalized preamp, and a monitor amp for mastering facility. The recording room is a home-made screen room (this will be another submission as we did it for \$400). We are a combined studio-Xmtr operation with the bottom antenna 65 feet above the roof (50Kw ERP, which explains why we undertook a screen room).

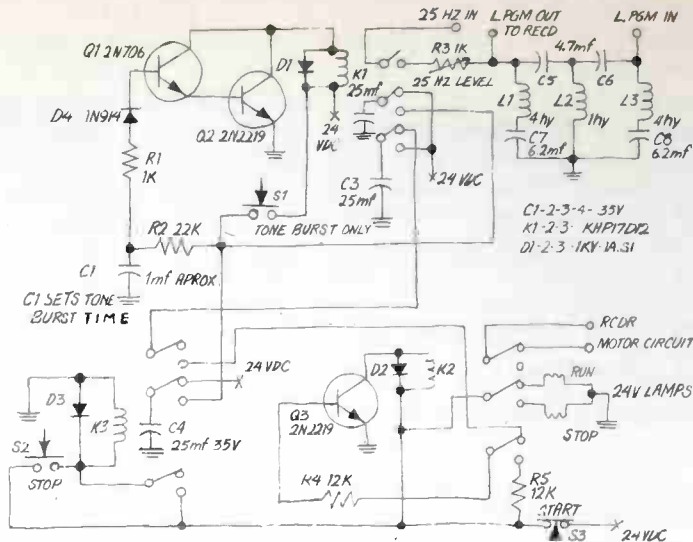
For our announcers to record a tape for the automation system, it is only necessary to slip cue the records while pushing the "start," "stop," or "tone burst only" buttons.

Now for the circuit: The combination of C5, 6, 7, and 8 plus L1, 2, and

3 form a high-pass filter (approximately 40 Hz cut-off). The circuit values were taken from tables in "Passive Audio Network Design"—Tremaine-Howard Sams. (This book is a gem for other useful information also.) The 25 Hz signal from the oscillator is fed to the left audio channel through relay KI for timing the pulse, and R3 which sets the tone level (25 to 50% of program peak). The size of C1 in the

Darlington connected Q1-Q2 sub-circuit will determine tone length (1 mf was OK for us, but play around with other values: You can go from half a second to about 15 seconds). Switch I, the "tone burst only" switch, does what it says: its primary function is between two turntables. It will not stop the recorder between selections.

continued on page 92



Engineer Rees produces programs on tape for automation system with help of this circuit. Cue tones at 25 Hz are put on left channel; left-channel program feeds through a 40-Hz high-pass filter (upper right on diagram). Tone burst time is set by adjusting C1.

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Ms. Gladys Hopkowitz, Recording Engineer
Mastertone Recording Studio, Inc., New York

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QUADRAHEDRAL™ This is the first American designed and manufactured stylus developed for discrete four-channel records. It was especially engineered for the Stanton 780/4DQ cartridge which is already the first choice of professional record reviewers, anxious to evaluate the new discrete 4-channel discs coming on the market.

A totally revolutionary stylus design concept proves to be the best solution for discrete playback. It's the Quadrahedral—all tests and in-use demonstrations authenticate the value of the discovery. Stanton has this new stylus in its four channel cartridge.

The performance of the stylus (and cartridge) fulfills all the extensive demands and sophisticated requirements necessary for playback and review of all the material recorded on discrete discs. And while performing brilliantly, it is actually very kind to records in terms of wear. Stanton's own engineers, whose professional products are the standards of the industry, tested and proved its characteristics, and report that it functions with total reliability in every measurable aspect.

This new cartridge, the 780/4DQ is available at your franchised Stanton dealer.



For further information, write: Stanton Magnetics, Inc. Terminal Drive, Plainview, N.Y. 11803.

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GREAT IDEAS

For poor folk like us with one table, the start and stop switches S3 and S2 will see the most use. By pushing "stop" you'll get a burst of 25 Hz

tone; then the recorder will stop. The two lamps marked "run" and "stop" will follow the action. While it's not shown on the circuit, we did later add an L.E.D. on the collector of Q2 to give an indication of tone burst.

There is nothing supercritical about

the entire assembly. The diodes D1, 2, and 3 are silicon power units (600v to 1Kv, lamp). The relays are Potter & Brumfield KHP 17DI2's. Any supply with about an amp at 24 volts will run it nicely. The inductors in the high-pass filter were the most costly items in the whole thing (about \$8 each last year but still a lot less than the \$125 commercial jobs).

For the automation tapes themselves, we buy 10½" blank fiberglass reels in quantity and recording tape the same way. We can load about 30 songs or about 90 minutes on each one. The only involved step in the process is putting the little strip of foil at the end of the last tone on the tape to set up the transfer process.

By doing our own tapes we are able to realize two major benefits: First, a cost reduction from commercial services and the ability to build a record library (a la RSI) from the savings. Second we get more varied programming that meets our needs better. Side benefits include better control over sound, better fidelity (compared with high speed dub), and no more trips to the post office with 75 pounds of tape in a blinding snowstorm. BM/E

Rank each idea on a 0 to 10 scale on the form below, or write your ranking on the Reader Service Card in the back of the magazine in the space "Tell us what you like . . ."

Great Idea Contest

BM/E

274 Madison Avenue
New York, N.Y. 10016

Here's my ranking on a 0 to 10 scale of the March Great Ideas.

- | | | |
|--|---|---|
| 15. Replacing harmonic shunt | [|] |
| 16. Quick cartridge clean-up | [|] |
| 17. Stepperless remote control | [|] |
| 18. Meter for relay contact resistance | [|] |
| 19. Finding transmission line short | [|] |
| 20. Producing programs for automation | [|] |

Name _____ Title _____

Station or Company _____

Enter Your Own Great Idea Now. You May Win a Windjammer Cruise. See Contest Rules.

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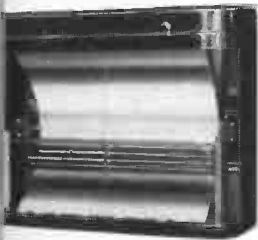
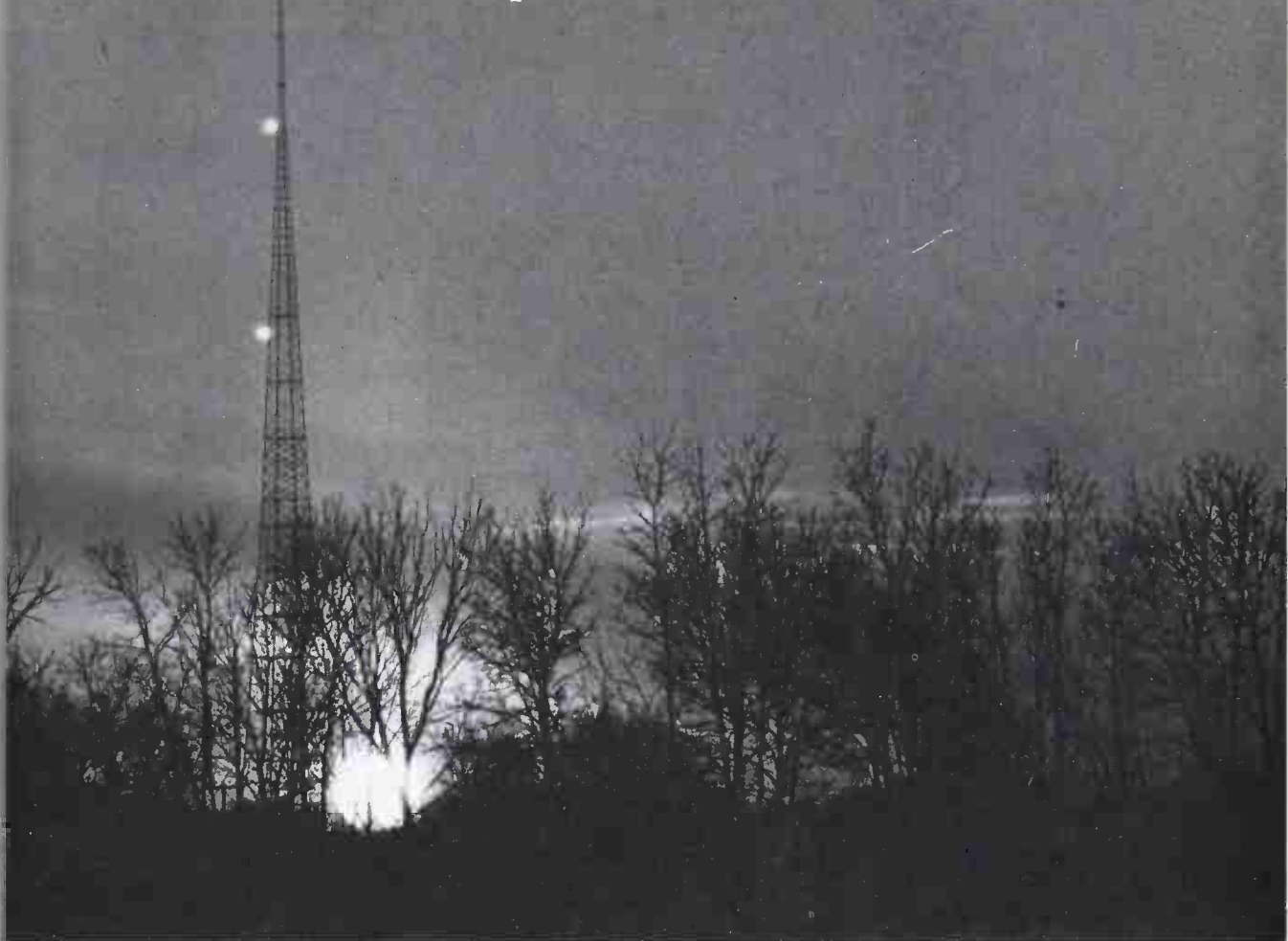
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Our control panel and power supply is in a convenient

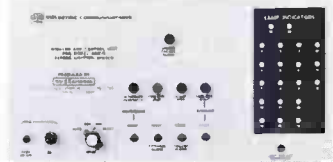
cabinet at ground level. All circuitry is solid state of course, and is protected by lightweight but rugged and weather-proof housings.

We include a stand-by power supply and a stand-by timer with automatic switch-over in case of failure.

An optional remote control panel can be located at the studio which will indicate the mode of operation (daylight, twilight, night) as well as the type of failure, should there be one.

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NEWS

Continued from page 18

major New York banks also had significant voting rights in Metromedia, Pacific and Southern Broadcasting, Capital Cities Broadcasting, and 14 other broadcasting groups. The study also lists a large number of broadcast companies which are subsidiaries of industrial or other non-broadcasting corporation giants.

Senators Muskie and Metcalf said that banks had violated FCC rules on concentration of ownership, and that "the FCC did not know that the banks were in gross violation of regulations until the banks told the Commission about it."

The Metcalf-Muskie study cited a major problem as being "inadequate and misleading corporate disclosure to Federal agencies. The Federal Government does not have sufficient information upon which to base reasoned public policy. Neither companies nor ordinary stockholders have information which they need to protect their own interests regarding stock ownership and the personnel and business relationships between banks and their portfolio companies."

Shildhouse Honored

Sol Shildhouse, former head of the FCC's cable bureau, was honored at a dinner given by the NCTA during the organization's board meeting, held in Washington, D.C. in January.

The dinner, held in the Mayflower Hotel, was attended by several former FCC chairmen and commissioners as well as NCTA's Board of Directors and other to total about 130 people. Dean Burch, present FCC chairman, presented Shildhouse with a bound copy of the FCC cable rules—Shildhouse's original working copy with marginal notes. From the NCTA, Shildhouse received an electric watch which Wally Briscoes calls "interesting, convenient, and probably even necessary."

At the dinner Shildhouse announced that he was joining as a partner with the Washington law firm of Farrow, Cahill, Kaswell, Segura & Rader.

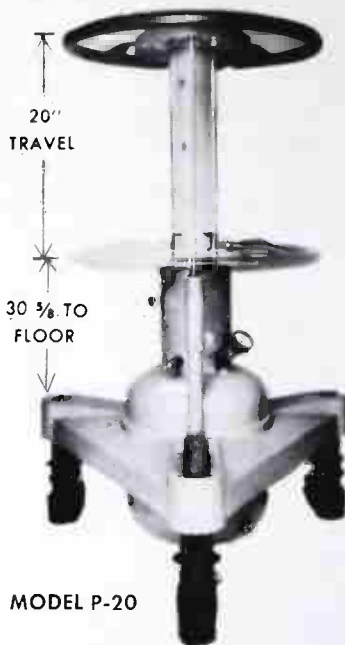
Color TV Test Signal Transmission Proposed

The FCC has proposed revised rules to permit transmission of a test signal to be used to monitor color quality of TV programs. The signal would be received only by station technicians and not by home audiences. The amendment would mean that a single line, in both fields, in the vertical blanking interval of the signal may be desig-

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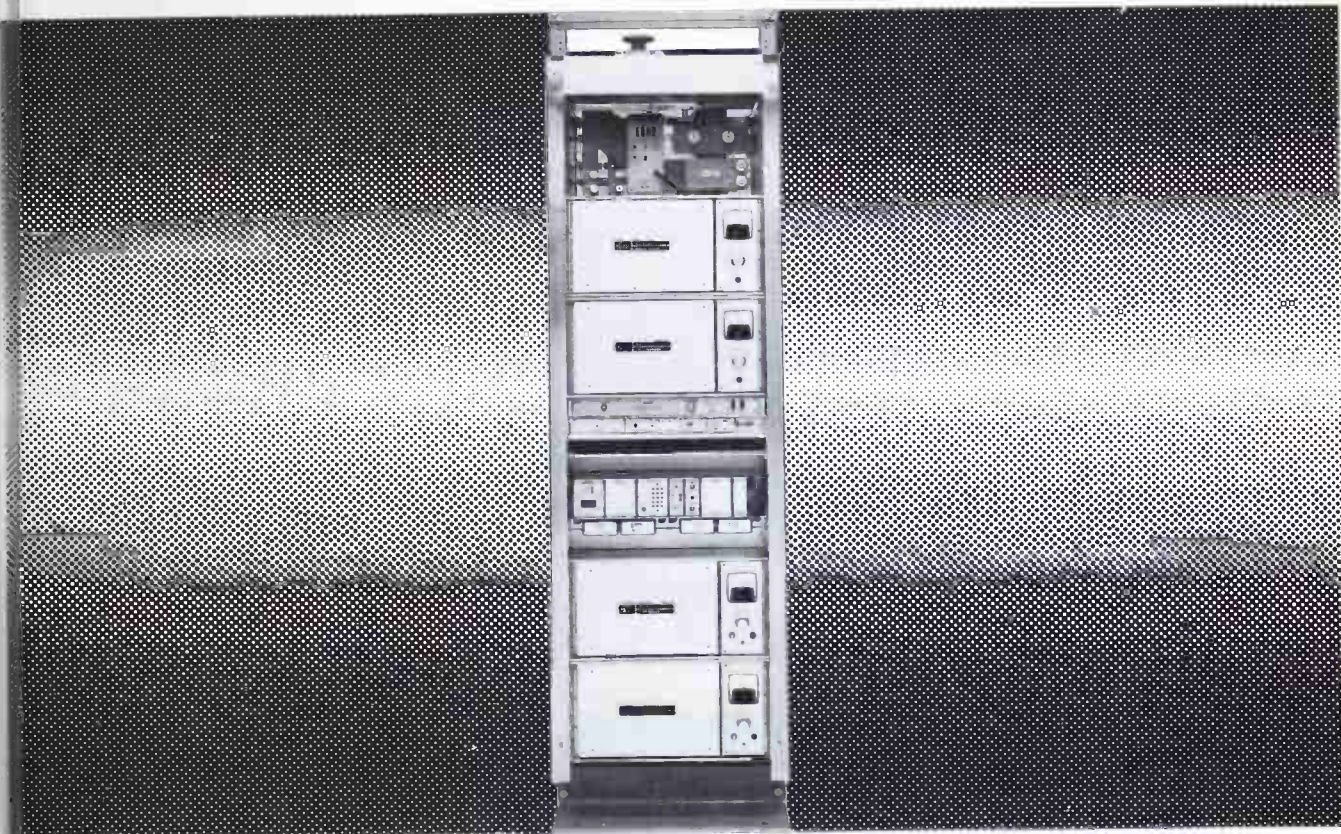
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nated for exclusive use in the transmission of a Vertical Interval Reference (VIR) Signal.

Proposal was prompted by a petition by groups within the Electronic Industries Association (EIA). EIA developed the test signal.

The Commission stated that this proposed amendment would be an important step in promoting and standardizing VIR use, thus resulting in greater uniformity in color characteristics from program to program, in the viewer's receiver.

Members Elect Directors To Board of New NAEB

The individual members of the National Association of Educational Broadcasters elected, in a mail balloting, nine persons to the first board of directors of the reconstituted organization. They are George Bair, director of educational television, University of North Carolina, David Crippens, director of special educational services, KCET(TV) Los Angeles; Virginia Fox, director of education, Kentucky Authority for Educational Television; Shirley B. Gillette, director, education division, Educational Broadcasting Corp. (WNET) New York; Jack McBride, director of television and general manager, KUON(TV) University of Nebraska, and special assistant to the president and executive director, State University of Nebraska; Florence Monroe, assistant administrative director, WNYE(TV)FM, New York; Clyde Robinson, chief engineer, KUOP(FM) Stockton, California; Thomas Skinner, vice president, KQED(TV)FM Pittsburgh; Charles Woodliff, professor and director, instructional communications, Western Michigan University.

Under the new NAEB constitution, these nine will select the remaining six members of the board.

Radio Revenues Increased In 1972

According to FCC's annual summary of radio broadcast financial data, radio revenue increased by 11.8 percent in 1972 and profits before taxes increased by 30.6 percent.

Revenues of the seven nationwide radio networks were \$45.9 million, an increase of 18.7 percent over 1971, thus resulting in profits of \$3.9 million in contrast to the loss of \$1.7 million in 1971. Of the other 4251 AM and AM-FM stations, about 72 percent re-

continued on page 106

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

Brochure on **CATV Management Information Service** discusses service featuring extensive accounts receivable processing capabilities and options, plus detailed installer-maintenance and marketing analyses. GTE Data Services. **250**

Completely automatic **Splice Finder & Eraser** is described in new data sheet. Describes operating instructions and explains warranty.) Senstrol Division, WMC Electronics Co. **251**

Complete **Ailtech line of Hi Power R.F. Sources** is subject of brochure which includes application data. Ailtech. **254**

The **Magnavox Company, CATV Division**, has published a new brochure that describes the firm's history, facilities and capabilities within the CATV industry. Key functions of CATV Division as well as support operation locations are described in detail. Magnavox. **255**

Calibrated Field-Measurement Antennas are covered in new set of data sheets. They measure electric and magnetic fields in conjunction with field intensity meters at frequencies as low as 10KHz and as high as 10GHz. Binger Instrumentation. **256**

Faulttrack is a 16-page booklet describing a universal method of digital troubleshooting for field service, production testing, and development engineering. Request Bulletin 122 from Fluke Trendar Corp., 500 Clyde Ave., Mountain View, Calif. 94043.

New 12-page pamphlet describes ten useful instruments for rf and microwave applications. Includes bridges, slotted lines, reflectometers, and more. General Radio. **257**

Illustrated in a 10-page full-color brochure are a new **VSP-1200 Series Switcher** and new **Mix & Effects Amplifier**. Detailed specification brochures also available. Central Dynamics. **258**

Microwave components catalog provides complete tech. specs., product features, and applications info. on more than 4000 coaxial and waveguide microwave components and subsystems. Systron-Donner. **259**

Canon 34x LONG RANGE ZOOM

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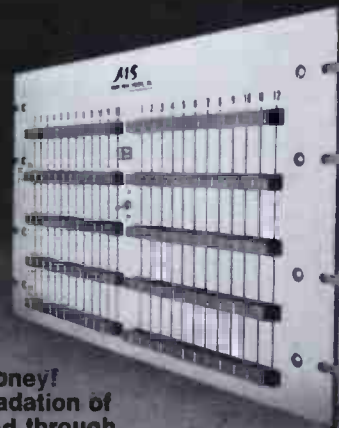
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"HP Video Tapes: A Better Way to Learn" is a catalog describing instructional video tapes which provide technical training and information—includes electrical instruments, lasers, and video products. Also offered is a special 15-tape Practical Transistor course. Hewlett-Packard. 260

Filters for telephone message circuit noise measurement is subject of an article which describes the history of the development of C-message and bandpass related notch filters. Gives detailed specs. and includes listing of various other filters for that measurement. Kinetic Technology, Inc. 261

The 1973-74 edition of the **Electronic Industry Telephone Directory** is a comprehensive compilation of manufacturers, distributors, and representatives in the industry. \$10.00 from Harris Publishing Co., 33140 Aurora Rd., Cleveland Ohio 44139.

New switch and keyboard Catalog has four divisions: snapaction switches, leverwheel/thumbwheel switches, matrix selector switches, and keyboards in 72-page handbook. Other info. on company is included. Cherry Electrical Products. 262

Comprehensive technical information on panel meters, meter relays, controllers, recorders, digital instruments and test equipment contained in new Master Catalog. In loose leaf form, the catalog is bound in a hard cover, 3-ring binder. Simpson Electric Company. 263

Return-Loss Test Set Specifications Sheet gives technical data and specs. literature on two sets which measure both Echo Return Loss and Singing Point Return Loss. Model 481A is the AC-powered, portable version for two- and four-wire system measurement, and Model 481B is the DC-powered, rack-mounted four-wire system test set. Bowmar Instrument Division. 264

Calculations is the title of a new quarterly publication that will deal with the relationship between calculators and software, with each issue based on a particular application area. Subscriptions or sample copies are free by writing to Jim Buchanan, *Calculations Magazine*, P.O. Box 500, Beaverton, Ore. 97005. A Tektronix, Inc. publication.

A "Dual Cue" Mag Tape Controller, the new BF460, is detailed in a brochure which also includes specifications for BF450-1 Capstan Motor Drive used in systems with AC-driven ATR's. Electronic Engineering Co. (EECO). 265

Line of cable ties, clamps, marker ties, push mount ties and lashing ties are described in a newly updated brochure, bulletin PF-2. Panduit Corp. 266

COMMONLY UNCOMMON

At Richmond Hill Labs, we take pride in the outstanding specifications we built into every one of our products. This is reflected in the performance of our equipment – equipment like the AVM 8000 Routing Switcher – our newest product – which offers you a –60 db crosstalk figure and, like all RHL products, is backed by our three-year warranty.



The AVM 8000's separate video and separate audio matrix provides the capability of married or unmarried modes of operation. The complete 25 in x 25 out video and audio matrix, with power supply, is a real space saver, occupying only 43½ inches of rack space.

The "8000" will interface with any control system, providing total flexibility and it can be integrated with any existing systems – single pushbutton, X-Y control, thumb-wheel, touch tone, automation, etc. – thereby keeping your costs down – and RHL can also provide the control of your choice.

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Other features? Low rumble; $\pm 0.035\%$ rms ANSI flutter; and you can cue to any beat or syllable with a wow-free start from the world's only remote-controlled turntable.

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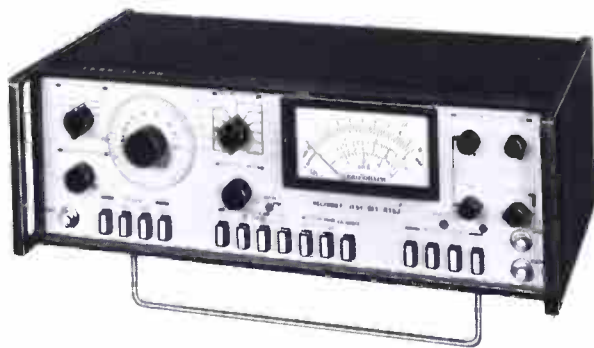
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Everything you need for complete tape recorder testing. Ferrograph RTS-2 with Auxiliary Unit

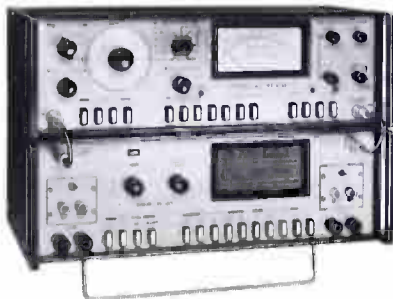


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ladder networks with R, L, C; six Fourier coefficients for any number of data points.

In addition to these built-in programs, special programs can be developed on small magnetic boards insertable into the calculator (picture). The user can make up his own programs, using a set of five keys on the machine; there is a quantity of programs available from Hewlett-Packard.

This marvel of integrated circuit technology has an announced price of \$795, and is now being delivered. 319

Effective microvoltmeter uses a frequency synthesizer in the local oscillator for a resolution of about 2 Hz. Model USH-1 covers the range 0.3 microvolt to 3 volts, and 10 KHz to 60 Hz. It has four selectable bandwidths, 200 Hz to 20 KHz; automatic sweep tuning; selectable input impedance; can be remotely controlled. \$4,815. ROHDE AND SCHWARZ.

300

Premium audio cartridge has a loop-mounting rear guide that increases play capability. Model AudioPak 2 is designed for stations recording their music programming on cartridges and wanting very high performance. PARTA ELECTRONIC CORP. 301

Family of microwave frequency synthesizers uses octave band signal

sources for high spectral purity. The series 1600 programmable synthesizers use signal sources with levelled outputs over the range 500 MHz to 12.4 GHz. Frequency selection is to 1 Hz and stability as high as 3×10^{-9} per 24 hours. FM, AM, and pulsed modulation is available. \$12,000 to \$18,000. SYSTRON-DONNER. 302

Color framer 15 Hz system for VR-2000s and VR-1200s provides in-phase color edits. Model AF/103 eliminates 140 nanosecond horizontal video shift in playback. A.F. ASSOCIATES, INC. 303

"Hop-up" kit for Models 409 and 509 neutral density light control units increases response speed three times. \$300. BESTON ELECTRONICS, INC.

304

Tower light kit provides inductive sampling of any AC current, 2 amperes to 30 amperes. Model TIK-2 need only have sampling loop installed around one side of AC line—no direct connection is needed to the AC tower circuit. MOSELEY ASSOCIATES, INC. 305

Servo-controlled four-channel tape deck has continuous automatic reverse. Model GX-400DSS has a closed-loop dual capstan, glass and crystal heads, reverse in both record and playback using sensing foil. \$1495. AKAI AMERICA, LTD. 306

Pre-insulated female disconnects have vinyl over wire and barrel. Pan-Term disconnects are protected against shorts on exposed terminal. PANDUIT CORP. 307

"Note-pad transmitter" sends handwritten or drawn material over telephone lines, in conjunction with "Telepen" systems. Pad is 5x7 inches,



weighs less than 5 pounds, enters any handwritten material into system for immediate delivery at other end. TELEAUTOGRAPH CORP. 309

High-voltage variable vacuum capacitors are rated for 15 KV peak voltage at 60 Hz. Models CVC10/1K and

CVC08/1C have integral mounting flanges that supply simple electrical connection, have an internal movable bearing that eliminates need for external housing. CVC10 tunes 10 pf to 1000 pf; CVC08, 8 pf to 200 pf. \$398. AMPEREX. 311

Coaxial cables include both air and foam dielectric types. Construction types include aluminum and copper



corrugated sheeting, helix for dielectric, and others. CABLEWAVE SYSTEMS, INC. 312

Microwave sweep oscillators put out 40 mw levelled from 1.8 to 4.2 GHz. Model 86330B with new solid-state module replaces backward-wave oscillator units; the latter can be retrofitted. \$3500. HEWLETT-PACKARD.

313

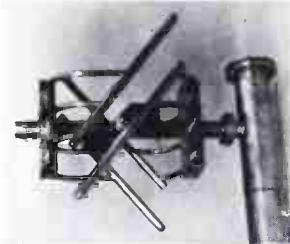
Telephone answering machine uses standard 60-minute cassettes to record incoming calls automatically. Ansa-phone 610 uses Hi-Pak cartridges for outgoing messages, which can be changed instantly by changing cartridge. Separation of incoming and outgoing recording allows caller to record instantly. \$169. DICTAPHONE CORP. 314

YIG-tuned oscillators cover 6 to 12.4 GHz. Model AV-7700M has 10 mW output, 7 to 11 GHz; model AV-7800M, 5 mW, 8 to 12.4 GHz; and model AV-7600M, 5 mW, 6 to 12.4 GHz. \$1160 to \$1195. AVANTEK, INC. 315

Miniature welding tool produces a flame with temperature as high as 6300 F, but small enough to go through needle's eye. The "Little Torch" operates on oxygen and fuel gas, has interchangeable tips for application to job, can be used for soldering or brazing in extremely close quarters. TESCOM CORP. 316

Cable amplifier assembly for 6-48 MHz sub-band includes four units, each capable of carrying the seven channels. Subnova 4 amplifiers; each has operating gain of 25 dB, noise figure 7.5 dB

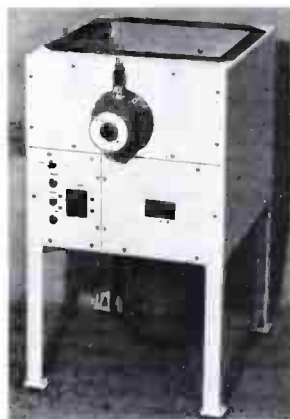
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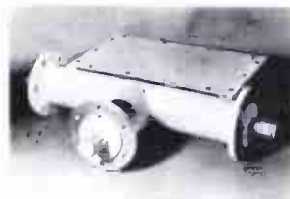
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Type 2030-25C Filter-Coupler 25 kw rating



Type 8130 SPDT Switch

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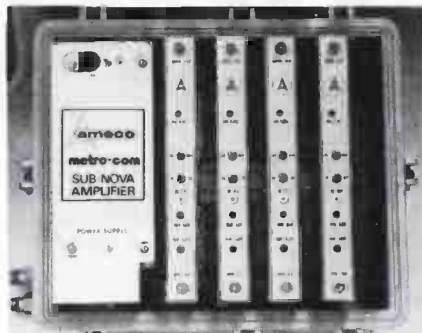
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PRODUCTS



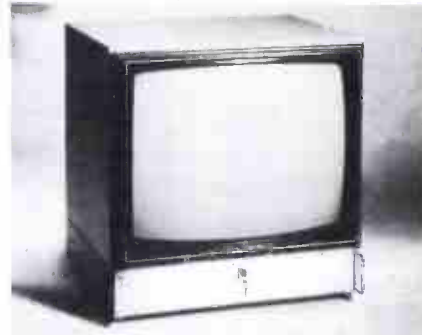
w/o equalizer, cross modulation with 7-channel operation down 85dB. AMECO. 317

Frequency counter covers 1 Hz to 40 MHz in two ranges. Model SC-1A reads to 8-digit accuracy, has crystal 10 MHz



time base generator, 50 mV input sensitivity. \$185. SCARPA LABORATORIES. 318

Color video monitor has 25-in. screen, input sensitivity of 0.25 v to 4 v p-p for full contrast picture. Model ECV-25N has video gain of 50 dB, s/n ratio



above 37 dB, differential gain 5% or less, differential phase 2% or less. ELECTRO-HOME LTD. 320

Dry, convection-cooled loads for the FM and TV rf bands require no water or line power for operation. Models DACT-FM and DACT-TV come in two sizes, for 2 kW and 5 kW respectively. ELECTRO IMPULSE, INC. 321

Turret-type concentric attenuator operates over the range DC to 2000 MHz. Model 5080 has a total of 80 dB attenuation in 1 dB steps, is direct reading, has 0.5 dB insertion loss, handles up to 0.5 watt. WAVETEK. 323



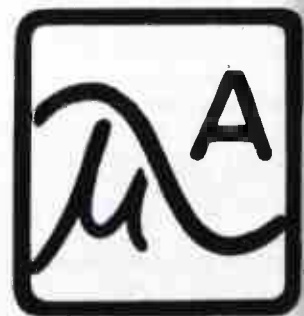
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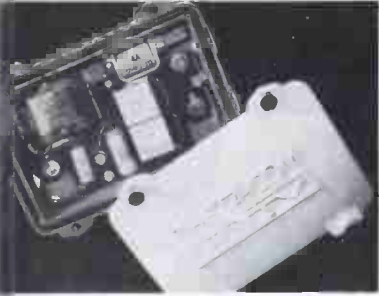


MICROWAVE ASSOCIATES

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PRODUCTS

amplifier for cable can be used as mini-bridger, line extender or two-splitter with gain. Model XRLG-2



gain of 16 dB at 300 MHz, re-
se ± 0.5 dB over the range, and
figure of 13 dB. THETA-COM. 322

ational amplifier is designed for
imum power audio applications.
el 2731 has two complete ampli-
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s continuous output. \$39. MODU-
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ater/timer has autoranging for
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measurements. Model 5500A (an up-
d version) now reads to 90 MHz,
with optional "mod" to 110 MHz.
olution is selectable in 4, 5, 6, 7 or
igits. It has an oven-stabilized
ntal-controlled 10 MHz clock.
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S. 325

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o cameras supplies up to 30 volts
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automatic charger with auto cut
and full-charge indicator. Battery
be supplied in many shapes to fit
ous cameras. FREZZOLINI ELEC-
ONICS INC. 326

ning system for electronic equip-
nt includes closed cabinet in which
s get a water-based cleaning spray,
s a drying oven. San-Del 1646
em has oven control to keep tem-
ature below dangerous level, and air
ulator. M.P. ODELL CO. 327

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ver supplies include models for up
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e 28 vdc input; each includes ad-
ability over full voltage range, is
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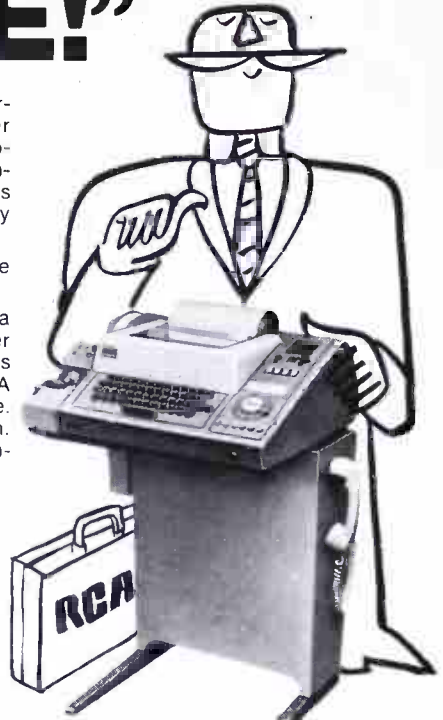
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PRODUCTS

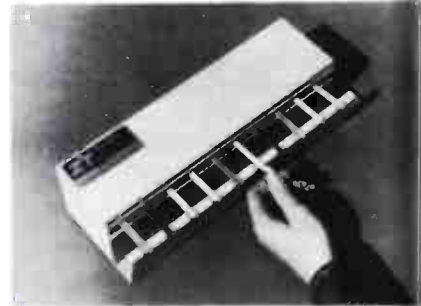
ing in interior. VICON INDUSTRIES 328

Shoulder pod for all CP-16 news 16mm cameras is made of fiberglass with a cushioned foam pad. Pod has



17-degree slope to fit shoulder, is adjustable front to back and side to side \$60. CINEMA PRODUCTS CO. 330

Program audio multiplex unit for 5 KHz and 8 KHz is for radio stations receiving network feeds on voice-grade



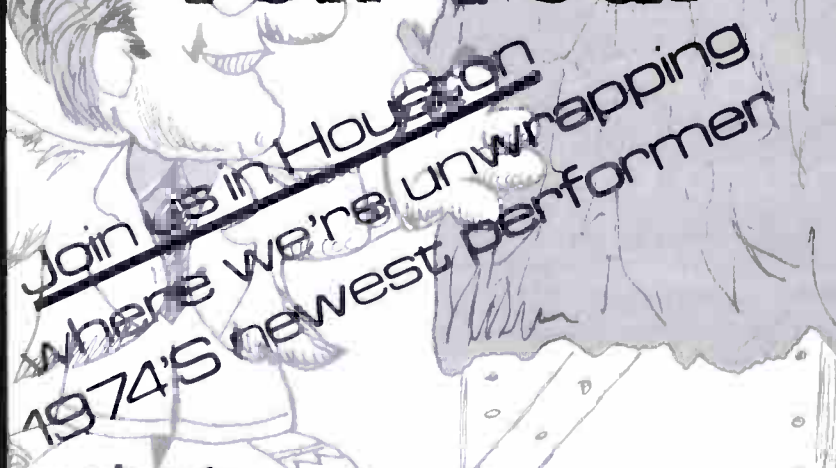
telco lines. Model SBC 502C (equivalent of Bell C-1 Program Terminal) supplies broadcast-quality material to station. COASTCOM-SCOTT BUTNER CORP. 331

Encapsulating compound forms flexible material totally eliminating moisture entry, but easily re-entered. "Echo Gel" can be simply broken



open with the hands or any light tool. It is poured directly into area to be protected. COMMUNICATIONS TECHNOLOGY CORP. 33

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Electron color picture tube has a new cathode that supplies full color picture 10 seconds after set is turned on. It will eliminate need for constant-current circuits, saves energy. GTE ELECTRONICS COMPANY, PITTSBURGH, PENNSYLVANIA. 333

Electronic stop watch has one integrated circuit, it's accurate to 1/100 second. Model 1000. SPLIT-1 runs on four C-type batteries. 334



Time Machine will supply partial or lap times in addition to cumulative. \$99.50. HARPER TIME AND ELECTRONICS, INC., CHICAGO, ILL. 335

Audio signal delay unit supplies up to 100 milliseconds of quantized audio delay, deliverable to five outputs. TM Model 1000. "Time Machine" has 12-bit digital delay. 336



Audio processing, pre- and de-emphasis control, integral compressor, 82 dB of dynamic range, distortion less than 0.1%, noise under -90 dBm. QUAD ELECTRONICS, WALTHAM, MASS. 337

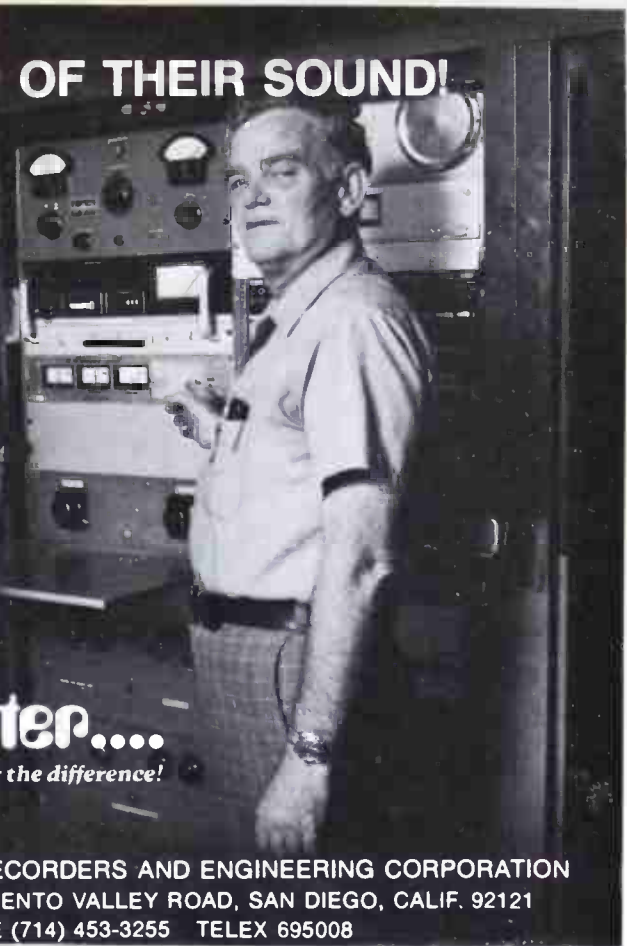
Color marker tapes are available in the complete NEMA code of colors. "Color Tape" comes in cartridges holding 1000 inches of tape, and can be used in bench dispenser with cut-off blade (Model ZTLB). ZIPPERTUBING COMPANY, CHICAGO, ILL. 338

Coaxial contacts allow rack and panel connector connectors to transmit rf up to 100 MHz. "Multi-Coax" connectors act as 50-ohm matched impedance connectors, have 500 v peak rating and SWR of less than 1.4 for a matched load. AMPHENOL CORPORATION, PITTSBURGH, PENNSYLVANIA. 339

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ported a profit in 1972 compared with about 68 percent in 1971. FM revenues went to \$151.9 million in 1972, an increase of 32.1 percent over 1970.

Advertisers spent \$1,547.7 million on radio in 1972, an increase of 11.5 percent from 1971, for commissions to advertising agencies, representatives, brokers and others (not including advertiser-supplied commercials or programs). Spending was up 18.0 percent for network advertising, up 1.7 percent for national and regional spot advertising, and up 15.1 percent for local advertising.

COMING SOON

The 6th National Meeting of the Information Industry Association will be held March 18-21, 1974, at the Sheraton Park Hotel in Washington, D.C. Theme: The Information Marketplace; Putting Information At Your Fingertips. Sharing Keynote responsibilities of the meeting will be Congressman William Moorhead (D.-Pa.) and Dr. Betsy Anchker-Johnson, Assistant Secretary of Commerce for Science and Technology.

The 23rd Annual National Cable Television Association Convention & Exposition will be held at the Conrad Hilton Hotel, Chicago, Ill., April 21-24, 1974.

The Educational Broadcasting Institute of the NAEB will have William M. Klages, noted TV lighting consultant and vice president of Imero Fiorentino Associates, give a three-day course on "Lighting for Television" on March 24-26 at the Maryland Center for Public Broadcasting. Non-members of the NAEB are welcome to attend this advanced course.

SONEX '74, the London high fidelity audio equipment show, is scheduled for March 29-31 at the new Post House Hotel near Heathrow Airport. The two days before the show will be reserved for the press and overseas visitors. Admission is free.

National Electronics Conference, Inc. will feature "Signal Processing," "Minicomputer" and "Microcomputers" Institutes in its Professional Growth in Engineering Spring Program of seminars. First seminars will be held March 31-April 3, with others to be held in April. The programs will be presented at Pheasant Run Lodge, St. Charles, Ill.

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C Operator Exam Schedule Now Available

A new schedule for commercial, amateur radiotelephone and radioteleoperator examinations for the period Jan. 1 through Dec. 31, 1974, is available from the FCC. Copies may be obtained in Room 216, 1919 M St., Washington, D.C. 20554, or at any of the field offices.

NAB vs. NCTA On Non-duplication Rules

NAB petitioned the FCC to reject NCTA's request that the Commission rescind its rule prohibiting duplication of network programming by CATV systems. NAB's opposition statement said NCTA's petition "blatantly inconsistent" with long-argued-over consensus agreement and argued that a station's audience would be fragmented with abandonment of non-duplication rules.

Protecting The Rights Of Public In Broadcasting

An Ad Hoc Invitation Committee decided up representatives of more than 100 regional and local organizations from every aspect of American life to come to Washington in January to express their views on regulation of radio stations, TV station license renewal, and application of the FCC's Fairness Doctrine. The meeting was headed by an informal committee in response to an invitation from FCC Chairman Dean Burch, for citizens to express their views on the proposed new regulations.

The morning meeting was held in the Caucus Room in the Cannon House Office Building, where the participants heard speakers explain proposed FCC and congressional action from a "public interest" viewpoint. Broadcasters were lambasted by participants after participant coming up to the mike in the audience to say his piece. Congress was not in session, and legislators were present.

In the afternoon, participants went over to the FCC, where they met with the Commissioners to express their views and ask questions.

Among the complaints were the following:

Reports that the FCC is planning to eliminate "Counter-Ads."
Strong pressures for "de-regulation" of radio, particularly elimination of Community Ascertainment, a move which public interest spokesmen said would mean "reduced or no obligations to carry news or public affairs programs in certain categories such as religion, education, agriculture, chil-

dren's programming, etc." FCC Commissioners said that nothing in the work toward re-regulation of radio so far indicated loss of public interest provisions.

3. Planned Congressional legislation to amend the Communications Act to extend the TV license period to four years instead of three, legislation which would also force a heavier burden on all petitions to deny. Additionally, monopoly ownership would be removed as a ground for challenge.

Representatives to the meeting generally expressed the feeling that broadcasters are, frankly, money monsters, with no concern whatsoever for the

public it serves. "Public interest" spokesmen are becoming more vocal and are gathering support.

Daytime-only Stations Allowed Early Sign On

Year-round Daylight Savings Time has caused daytime-only radio stations to have to go on the air an hour later than previously. Accordingly, the FCC issued an emergency order to allow those stations which are issued Pre-sunrise Service Authorization (PSA) to begin operating at 6:00 a.m. local time with reduced power.



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Also, the Commission is proposing a rule-making, to issue temporary PSA's (TPSA) to certain other classes of daytime-only stations, which would be permitted an extra hour of pre-sunrise operation with power of 50 watts.

Business Briefs

Videx Corp., a new company for transferring videotape to motion picture film, began operation in Dec. in Chicago . . . By May 1974, **TeleMation's** \$300,000 contract with Cable Video Communications Inc., North Charleston, S.C., will make North Charleston the most complete local origination studio in the southeast, consisting of four channels of local origination and one complete color production studio.

AEL Communications Corp. has completed the turnkey installation of CATV plant in Alpena, Mich., expanding and rebuilding the system there. **AELCC** has also completed a turnkey installation in Logan/Man, W.Va. . . **Pioneer-Standard Electronics, Inc.**, Cleveland-based regional distributor of industrial and consumer electronic components, has opened a stocking branch in Indianapolis . . . **BKP Radio** has announced new service of Bob Kramer's 50's, 60's and Now radio show, available in either announced or unannounced versions.

Corning International Corp., a subsidiary of Corning Glass Works, and **Samsung Electronics Co., Ltd.**, of the Republic of Korea, announced jointly the establishment of a company in Korea to manufacture glass bulbs for TV picture tubes . . . **Channel Master** has announced the 1974 version of the promotion contest, "Radio Reaches Everywhere," in which the participating local radio station invites its listeners to write in describing the most unusual place they've ever listened to one of its broadcasts.

"This Thing Called Multi-Image," a three-screen production from **Spindler & Sauppe, Inc.**, which traces the evolution of multi-image presentation premiered at the recent convention of NAVA . . . **Coastcom, Inc.**, was recently awarded a major contract from ITT Space Communications for a voice-over-video FM subcarrier multiplex system to be used in connection with American Satellite Earth Stations. **RCA** is entering the closed-circuit video equipment market with a line of black-and-white CCTV cameras, first models to be available in March . . . **Eclair Corporation of America** will now assume all marketing, distribution, and service functions on all Eclair products for the entire western hemisphere . . . **GTE Sylvania** will furnish the CATV equipment for a 650-mile

system on the island of Oahu, Hawaii. It has also been awarded contract from Cablevision S.A. to furnish transmission equipment for cable TV system in the suburbs of Mexico City.

Ampex Corp. announced price creases of six to 15 percent on many video and audio products, reflecting increased materials and labor costs. **Ampex** recently got a contract over \$300,000 with **Laclede Communication Services, Inc.** of St. Louis to deliver broadcast teleproduction equipment to the newly-formed subsidiary of Laclede Gas Co.

Scientific-Atlanta will be providing the distribution electronics and head end equipment for the Lexington and Thomasville, N.C., CATV system. **Triangle Broadcasting Corp.**, Winston-Salem . . . **WBEN-FM**, Buffalo's pioneer FM station, is replacing its entire transmitting facility with a net two-transmitter RCA system.

Chamba Productions' film "Let Church Say Amen!" was awarded a Bronze Medal in the International Film and Television Festival of New York in the documentary film category . . . **Montana CableVision, Inc.** has purchased the Glasgow and Sidney, Montana cable systems from Stan Stephens and Lyle Leeds of Havre, Mont.



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TASCAM Series 70 recorder/reproducers were designed for people who've outgrown high-end consumer audio products but can't afford full professional studio gear.

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The versatile Series 70 electronics come in two versions, one for direct recording and one for use with a mixing console like our Model 10. Whichever you need you'll get uncommon quality and reliability. But this time you can afford it.

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V of Canada Ltd., a subsidiary of tro-Voice Inc., Buchanan, Mich., is exclusive sales agent for Canada **McMartin Industries** . . . **Great is National** (Instructional TV ary) has a new college-level series h examines the roles of major rican institutions and their rela- ship to the total structure of rican society for lease/purchase color video tape/video cassette.

Abson Electronic Enterprises, San onio, Tex., plans to serve the over- Texas area. **GEE** handles **Spot- ser**, **Fidelipac**, and **QRK-Rek-O- products** . . . **J.H. Thal Associates** been reappointed audio sales repre- tive for **AKAI America, Ltd.**, in opolitan N.Y. and northern N.J. **Liberty Electronics'** Los Angeles ch has been franchised to sell the line of integrated circuits manu- factured by **Signetics Corp.**

KET-Channel 8, PTV station in ope, Ariz., received **Rocky Moun- in Center on Environment's 1973** al for the station's multi-media en- vironmental series, "Earthline." . . . **TV Oklahoma City** has placed an ke for ten **Marconi Mark VIII** auto- color television cameras, a major sales success for **Marconi**.

approximately \$4.3 million in **RCA** and outside broadcast equip- is being installed in two TV sta- in Yugoslavia, in preparation for crease in color programming.

Cablecom-General, Inc. terminated reement to sell its interest in the TV system operating in the city of eado Springs and adjacent com- munities to **Cablevision Projects, Inc.**, provisions increasing **Cablecom's** rship to 100% remain in effect in a separate transaction, **Daniels erties, Inc.**, will still acquire at **com's** cost, **Cablecom's** interest companies which hold **CATV** fran- chises in the Denver vicinity.

People

W. Cantor has been named as or vice president-administration, a ny created post of **Warner Cable** . . . **Mary Lynn Moody**, **NAEB** xam officer, has been appointed to dional new position of coordinator omen's activities . . .

Eugene C. Walding has been ap- ited vice president of engineering he **CATV** Division of **Oak Indus-** . . . **Henry B. Marron** has joined ntific-Atlanta, Inc., as director of geering for the **Cable Communica-** s Division . . . In the **Kalart Victor** o., **Robert L. (Bob) Schwartz** was oted to regional sales manager for **Mid-West Territory**.

Robert Resor, former ad and p.r. cy exec., has been named to ly-created position of executive di-

rector of **NAB's** pay-TV campaign . . . While maintaining his responsibilities held in his previous position of assist- ant to the president of **TeleMation, R. Terry Hoffman** has been appointed vice president, administration . . . **W.C. Wiseman** now heads the **Broadcast Ex- ecutive Recruitment Department** of **VIP Agency, Inc.** of Los Angeles, a nationwide executive search firm . . . **Glenn H. Vought** joined **Coastcom, Inc.** of Concord, Calif., as manager of applications engineering.

Robert J. Dettmann is north eastern regional sales manager for **Blonder- Tongue Laboratories, Inc.**, . . . Elected to the board of directors of the **Catho-**

lic Communications Foundation (CCF) is **Joseph P. Dougherty**, presi- dent of the broadcast division of **Cap- ital Cities Communications, Inc.**

Gerald F. Gaa is director of the **Tele- communication Systems Division**, London, England, for **Collins Radio Company** . . . **AKG Division** of **North American Philips Corp.**'s newly creat- ed position of product manager for professional equipment has been filled by **Geoffrey M. Langdon** . . . Formerly **CATV** systems department manager at **Anaconda Electronics**, **Jeff LeHecka** has been promoted to new position of assistant sales manager-systems.

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- directly read S/N ratio

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AM monitors

People continued

Robert E. Richer became executive vice president of Able Communications, Inc., owner of FM radio stations . . . Daniel J. Yomine accepted post of president, chief executive officer and member of the board of directors of Consolidated Video Systems, Inc., Santa Clara, Calif.

Dennis Christensen has been appointed sales manager of timing and broadcast products for Datatron, Inc. . . . David Gillmore has been named the National Association of Educational Broadcasting's program officer in the area of instructional telecommunications. He replaces William T. Dale, who is joining the Educational Development Center, Boston, Mass.

Stanley D. Becker is director of product development for CMX Systems, Sunnyvale, Calif., which makes and markets computer-controlled video tape editing systems . . . Wallace Warren has been appointed marketing analyst—FM transmitters, for RCA Broadcast Systems. Succeeding Warren in the post of audio products specialist is Eugene L. Bidun.

William L. McNair has joined Anacoda Electronics as southeast regional sales manager for CATV, headquartered at Forest Park, Ga. . . . Robert W. Wirtick is engineer in charge, technical services, CBS Radio Network.

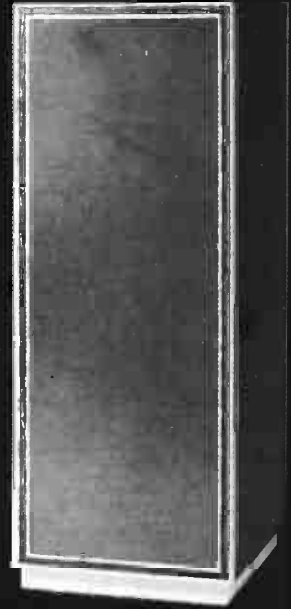
Charles R. O'Reilly has become an outside sales representative serving CATV accounts in New York and the New England states for Anixter-Pruzan, a national distributor of equipment to the CATV, power, and telephone industries . . . David M. Weisbrod was appointed as sales manager for all company products for K'Son Corp., which makes equipment and systems for CATV, hotel pay-TV, and electronics industries.

Solbert (Sol) Green became a district manager for the Audio Division of Audiotronics Corp. He has responsibility for dealer relations and sales in the states of Pa., N.J., Md., Va., W. Va., and in Washington, D.C. . . . Robert J. Brown was promoted to marketing director of the Mincom division, 3M Company.

Willard S. Truckenmiller holds newly established position of customer service manager for both cable television and industrial products for C-COR Electronics, Inc., State College, Pa. . . . Nicholas E. Worth was appointed director of engineering for Telecable Corp.

Dr. Thomas M. Straus has been appointed senior scientist for Theta-Com of California . . . Philip Garnick was elected president of Electro-Voice, Inc., a Gluton Industries subsidiary . . . Richard D. Hanson is vice president and general manager of Collins Inter-

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tional Operations (London), which covers Collins operations in Europe, the Middle East, and Africa.

Richard J. Thorpe was appointed product sales manager for the CATV Equipment & Installation Operation of E Sylvania Inc. . . . **Rudy Hall** was promoted to position of chief technician for Warner Cable of Kingsport (Tenn.). He replaces **Charles (Ben)monds**, who has relocated to Warner Cable of Winter Haven (Fla.) as systems engineer.

L. Leonard Reinsch retired as president of Cox Broadcasting Corp. in December. He will continue to serve as member of the board of directors of the corporation as chairman of the board of Cox Cable Communications, and as chairman of the executive committee of that company. Succeeding him as president of Cox Broadcasting is **Clifford M. Kirtland, Jr.**, formerly executive vice president.

Metro Cable, Inc., (Rosemont, Minn.) has announced the appointment of **Richard Groves** as manager of Highfield Cablevision. He was former program director for the system . . . **Francis J. Murphy** has been appointed manager of computer applications at a CATV Group of Oak Industries in Madison, Wis., Development Laboratories.

Daniel R. Brewer has been appointed supervisor of video tape engineering

and development at The Burbank Studios . . . **William E. Amos** was named a vice president of Philips Broadcast Equipment Corp., in charge of the audio-visual systems division . . . **Donald W. Smith** is commercial microwave sales manager in the Washington, D.C., area for Collins Radio Company.

Rudolph F. Handel is national sales manager for JVC Industries, Inc. He assumes responsibility for sales of the entire line of JVC's video equipment . . . **William D. Brown** has been appointed program director for WCBS/FM, the CBS-owned FM radio station in New York.

Joel P. Smith has resigned as executive vice president and member of the board of directors of Warner Cable Corp. in order to pursue private business interests both within the CATV industry and in outside ventures . . . **Beverly J. Land** has been promoted to the position of assistant to the president for corporate development of TeleCable Corporation.

Kenneth I. Taylor was named vice president, engineering, at International Video Corp., Sunnyvale, Calif. . . . **Gordon Halverson**, a newly-promoted product manager at Anixter-Pruzan, was awarded the Jack Pruzan Market Maker Award for 1973. The award is named for **Jack Pruzan**, Anixter-Pruzan chairman . . . **Louis Siracusano** has been named broadcast video prod-

uct sales representative for Ampex Corp. He is responsible for broadcast video sales activities in Md., Pa., Va., W. Va., and Washington, D.C.

John Patton, Meredith Broadcasting Division vice president and general manager of WHEN-AM, Syracuse, N.Y., has been named general manager of KCMO-AM and KFMU, Kansas City, Mo. He succeeds **Lynn Higbee** who has been named national program director for Meredith's radio stations . . . **Jim Cavener** has new position of applications manager for the test equipment products of AILTECH.

Robert L. Levy has been named assistant chief of telecommunications, and **Albert Richards** has been named associate CATV specialist, to complete the staff of the New York State Commission on Cable Television . . .

John Eargle has left his position of director of new products for Altec Sound Products in Anaheim, Calif., to form his own consulting firm, JME Associates. This new firm will devote its full efforts to special interests in the quadrasonic hardware and software areas . . .

Gerald R. Towan has been promoted to director of programming for TelePrompTer's Cable Television Division. He was formerly southeast regional director of programming for TPT . . . **Dr. Ryoza Kimihira** was appointed vice president of operations

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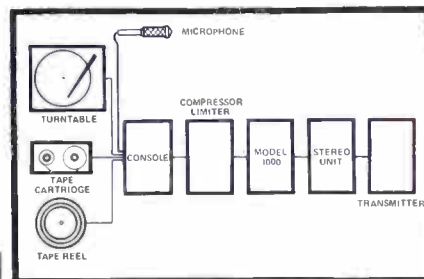
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continued from page 30

a.m. to 10 a.m., (2) 10 a.m. to 2 p.m., and (3) 2 p.m. to 6 p.m.

Again, television stations must exhibit signboards or slides with the licensee's address during the airing of such broadcast.

Finally, a slightly modified licensee obligation announcement must be broadcast beginning on "the first day of the last full calendar month prior to the expiration of a station's license" (i.e., fifteen days after the station broadcasts its last required post-filing announcement), and continuing until the station receives license renewal notification from the Commission.

The suggested text is *identical* to the respective radio and television licensee obligation announcements presented above *except* that the station is not required to include (1) the date of the station's last renewal grant, (2) the license expiration date. Furthermore, the required announcement times are *identical* to those presented directly above.

Conclusion

Radio and television licensees should carefully study the Commission's new license renewal rules and procedures discussed in last month's and this month's column. However, the Commission's rules, and not the column, are the definitive statement regarding new license renewal rules and procedures. For example, stations whose license expire *prior* to December 1, 1977, are governed by a potpourri of "old" and "interim" rules too numerous to adequately treat herein. Furthermore, numerous (but minor) variances apply to "special situation" licensees such as non-commercial educational stations. If any specific questions arise concerning the new rules, licensees should consult with their communications counsel.

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 - F30081 8 Channel Monaural
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Charles S. Warner will be manager of primary vendor relations for Raytheon Co., Lexington, Mass. He will direct the company's affirmative action program through which it is increasing its purchases from minority-owned enterprises ... Stephen L. Johnson has joined Anixter-Pruzan as TV sales representative for the upper midwest region ... Kenneth D. Lawson has been appointed as vice president, marketing, for TeleMation,

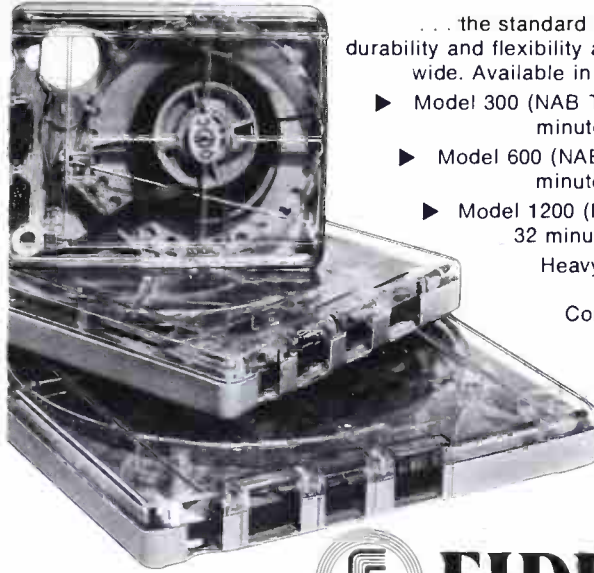
John V. Kenny has been named assistant general counsel for NCTA with primary responsibility for NCTA license work with the FCC ... Dr. Lawrence T. Frymire, executive director of the New Jersey Public Broadcasting Authority, has been elected to the Public Broadcasting Service's (PBS) newly expanded board of managers.

Wallace E. Hyde has taken the position of senior development engineer, Westcom engineering staff, Coastcom, Inc., manufacturers of specialized multiplex systems ... Albert L. Galieri, Jr. has been appointed as vice president of AEL Communications Corp. (AELCC), the CATV subsidiary of American Electronic Laboratories, Inc. (AEL). He will be responsible for all of AELCC's engineering efforts.

Richard W. Chapin, president of Hart Enterprises, Lincoln, Neb., and immediate past board chairman of the NAB, receives the NAB's 1974 Distinguished Service Award, highest honor in the broadcasting industry ... Sol Schildhouse, formerly chief of the TV Bureau of the FCC, was honored at a dinner by the California Community Television Association in a place where he was paid tribute for being the man who "more than any other person, in or out of government, [has] fostered the responsible development of cable television."

J.J. Nicholas, Jr., has been named president and chief executive officer of Sterling Manhattan Cable Television, succeeding Richard M. Galkin. Galkin will take a leave of absence from Time Inc., for a long trip around the world ... Rodney R. Maddison, formerly director of marketing for Commercial Electronics Inc., has been named president. George Grasso moves from manager of camera sales to director of marketing.

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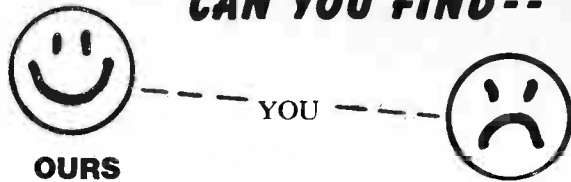
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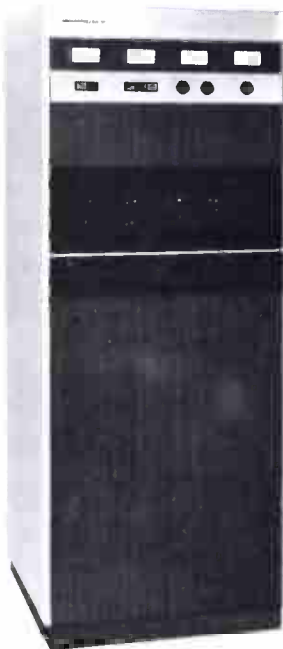
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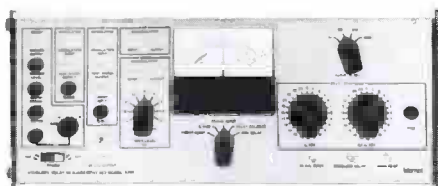
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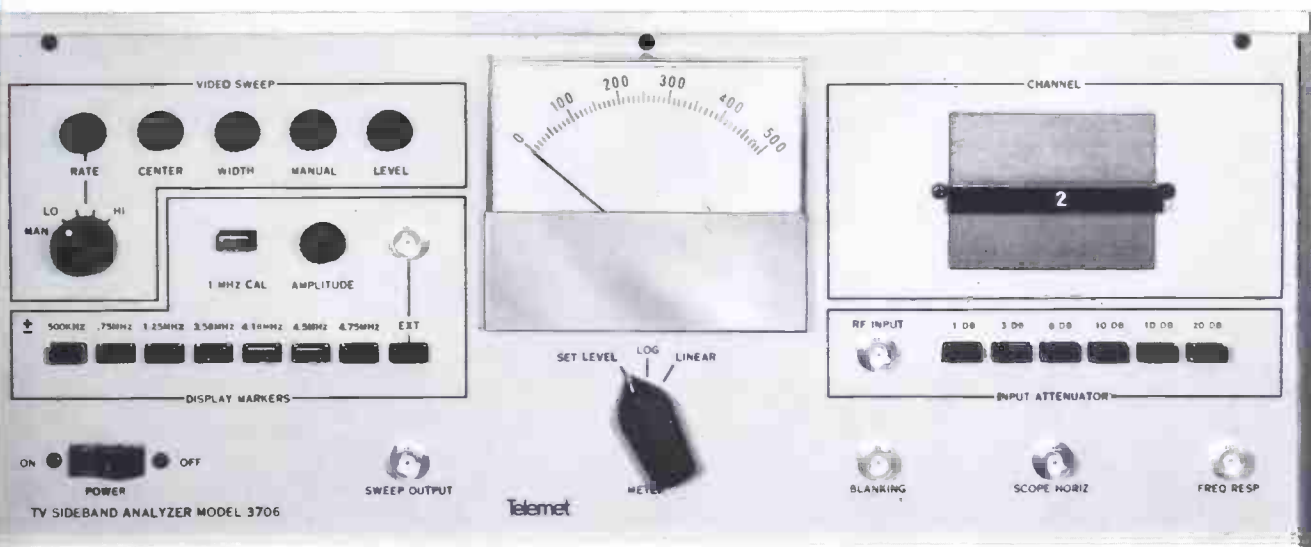
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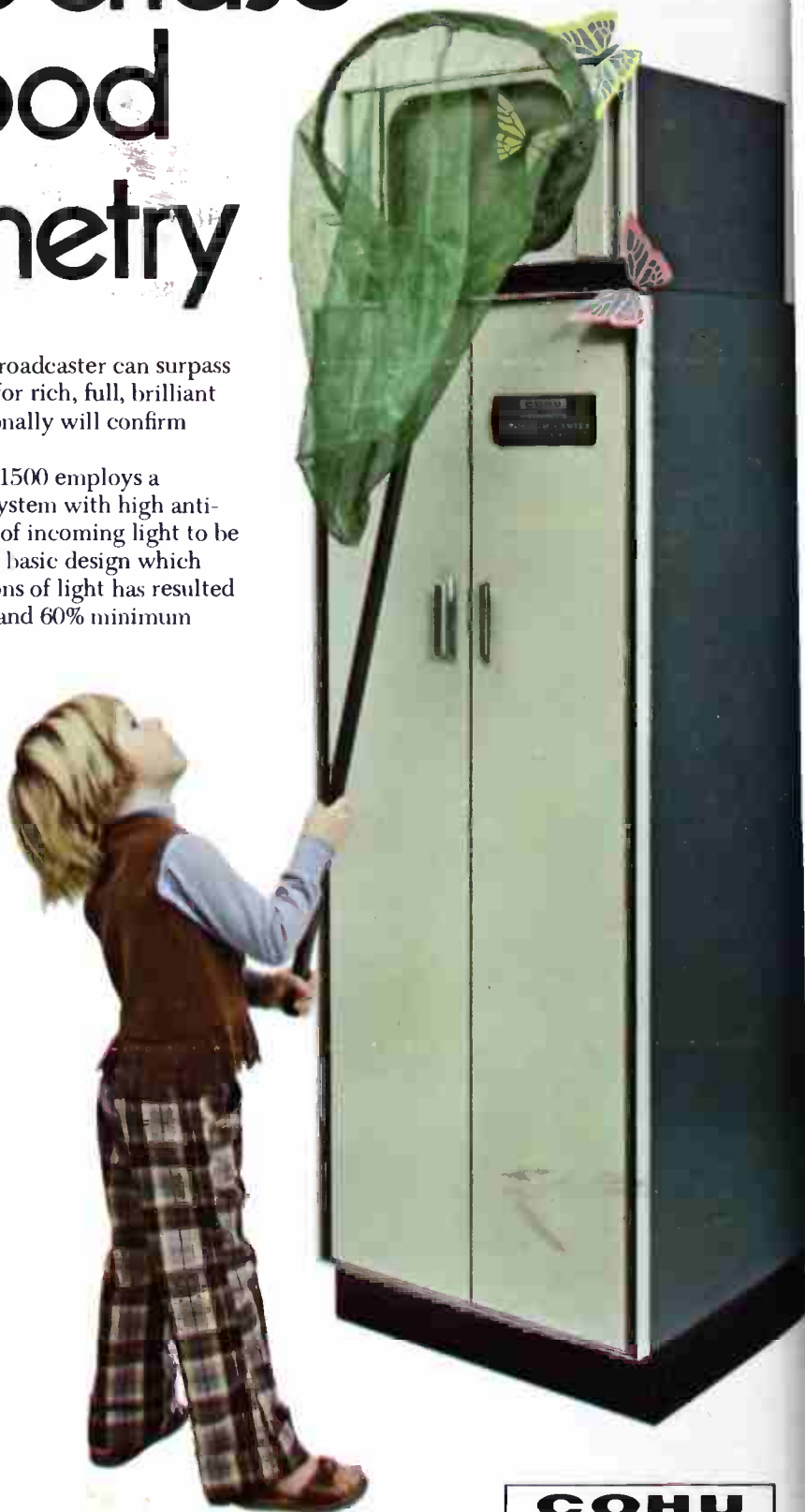
The *new* optical system design of the 1500 employs a dichroic mirror beamsplitter. This type of system with high anti-reflection coatings allows a greater amount of incoming light to be separated and directed to the vidicons. This basic design which minimizes multiple reflections and refractions of light has resulted in an optical system with higher resolution and 60% minimum peak transmission in each channel, thereby virtually eliminating flare and ghosting.

Cohu's "Instant Paint" control further assures top quality color reproduction. Color inconsistencies in the source can be corrected by altering color balance with a quick, simple adjustment.

The 1500's circuitry is designed to accept a wide variety of image pick-up tubes. No circuitry modification is necessary to accommodate type 8507A, 8572A, 8541A, 4809, or 4809B vidicon tube groupings. A plumbicon version is also available.

Combine Cohu's *new* MODEL M-3 OPTICAL MULTIPLEXER with the 1500 and improve your studio color film quality.

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