BROADCAST ENGINEERING®
March, 1974/75 cents

NAB convention issue

Exhibitor Locator Guide
New Products Special
Recent NAB Activity

At last count... More than 150 broadcast managers had seen the light.

Seen the light, that is, from our new CEI 280 lightweight/heavyweight broadcast color camera.

Directors and cameramen who have used the CEI 280 NTSC Broadcast Color camera have knowledgeably dubbed it "the Owl." The CEI 280 will pick up and broadcast at extremely low-end production light levels that at first seem absolutely ridiculous until you've watched it happen.

Plus, when you compare its relatively low cost and the smartly packaged operating and camera control units to any other broadcast color camera system, you have to concede it's more likely to be called . . . the "wise old owl."

Another plus, the CEI 280 weighs only 50 pounds which accounts for its other nickname, "the one man gang" studio camera.

To sum up, the CEI 280 features:

- Full remote control—all operating engineering controls located at the remote set-up panel.
- High performance at low level with state-of-the-art FET preamplifiers.
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However, there's lots more to this camera than meets the eye. Why not contact us and we'll provide full details and some interesting notes about how color broadcasters are putting "the owl" to work, day and night.

CEI

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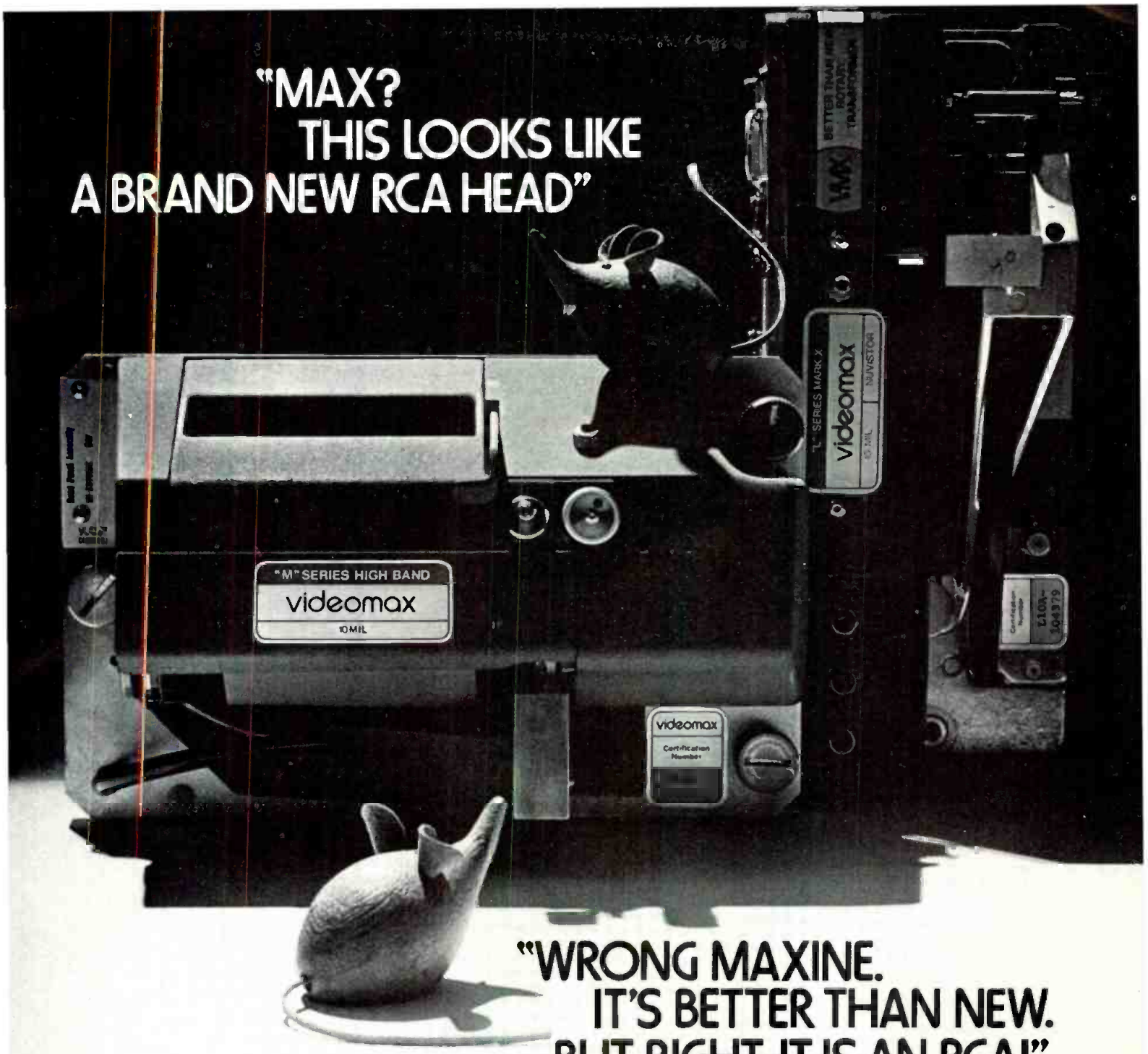
Telephone: (415) 969-1910

For More Details Circle (1) on Reply Card

"MAX? THIS LOOKS LIKE A BRAND NEW RCA HEAD"



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Maxine and Max are announcing the second "world's greatest mouse trap"—Videomax "M" Series refurbished RCA High Band and Low Band quad heads. The first was, of course, the highly successful Mark X and Mark III, "L" & "M" Series.

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Our refurbished RCA heads carry the same **"no risk" guarantee** as featured with all Videomax heads, heads which for years have been delivered to the major networks, broadcast stations and production houses. We'll continue the same fast service—ten working days or less—and we have the only field force dedicated to this business.

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SEE YOU AT THE NAB-BOOTH 620

March, 1974 • Volume 16, No. 3

BROADCAST engineering®

The technical journal of the broadcast-communications industry

in this issue...

About The Cover

Our cover photo was taken at WCVB. Their story is told in two articles this month. Photo courtesy of WCVB-TV and Philips Broadcast Equip. Co.

Departments

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Robert E. Hertel, Publish

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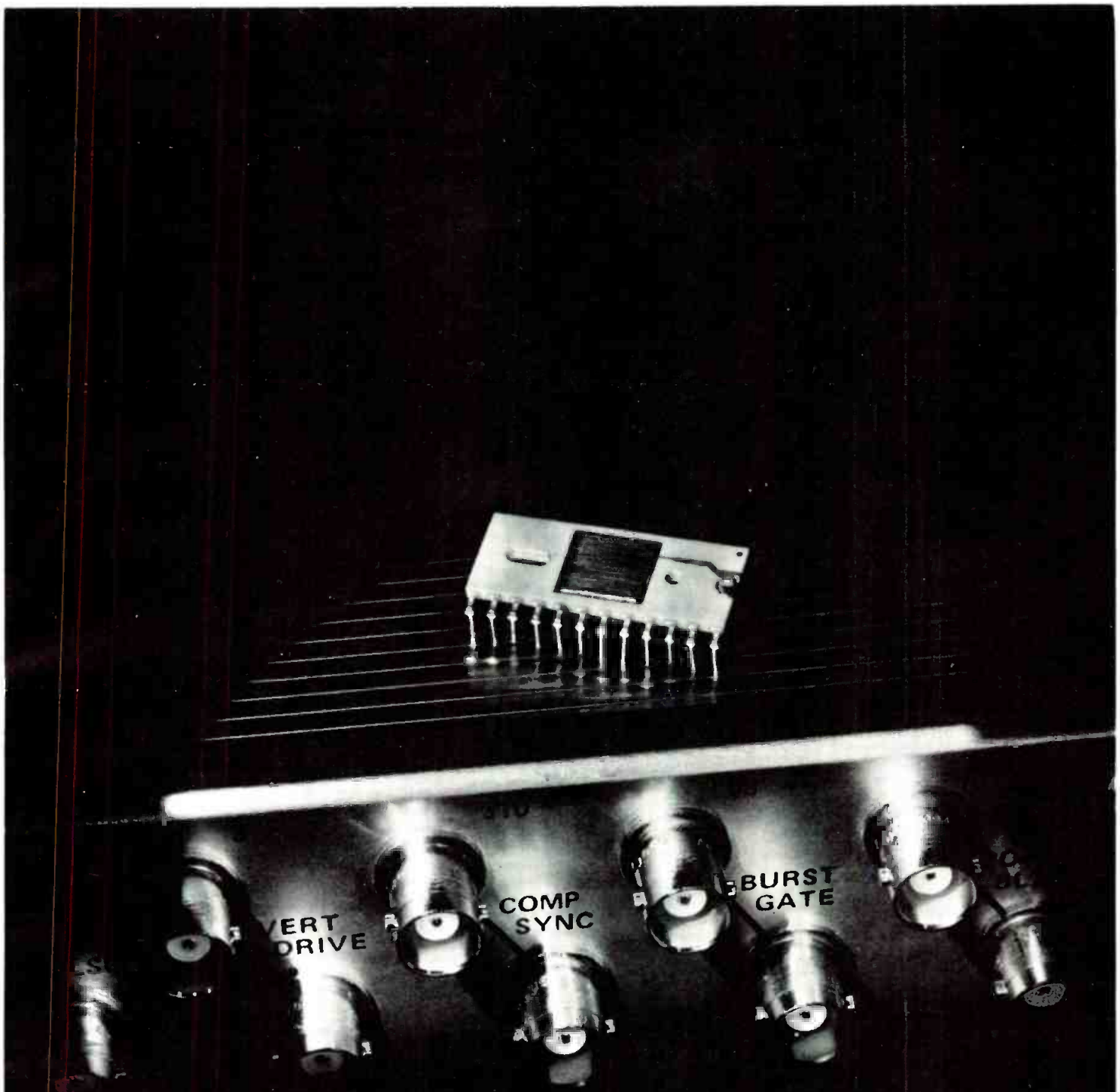


A newly developed custom LSI circuit provides the basis for a series of all digital synchronizing pulse generation equipment. These sync generators are designed expressly for single line pulse distribution systems and employ a unique encoded reference signal for slaved generators. All models maintain color frame identity and have digital front panel phase controls with a continuous fine phase vernier. Models are available for both NTSC and PAL color television standards. See us at NAB – Booth 406.

THE GRASS VALLEY GROUP, INC.

For More Details Circle (5) on Reply Card

DIRECT CURRENT FROM D. C.

March, 1974

by Howard T. Head

Every year it gets harder and harder to predict what the FCC and other agencies are about to do, because everytime we think that they might take up urgent technical matters, we find priority going to the Fairness Doctrine and other Polish jokes. However, we stick our necks out once again on the occasion of the NAB Convention to forecast what will or will not happen during the coming year. Our past record has been pretty good and let's hope we don't spoil it this year.

POMPOUS PREDICTIONS

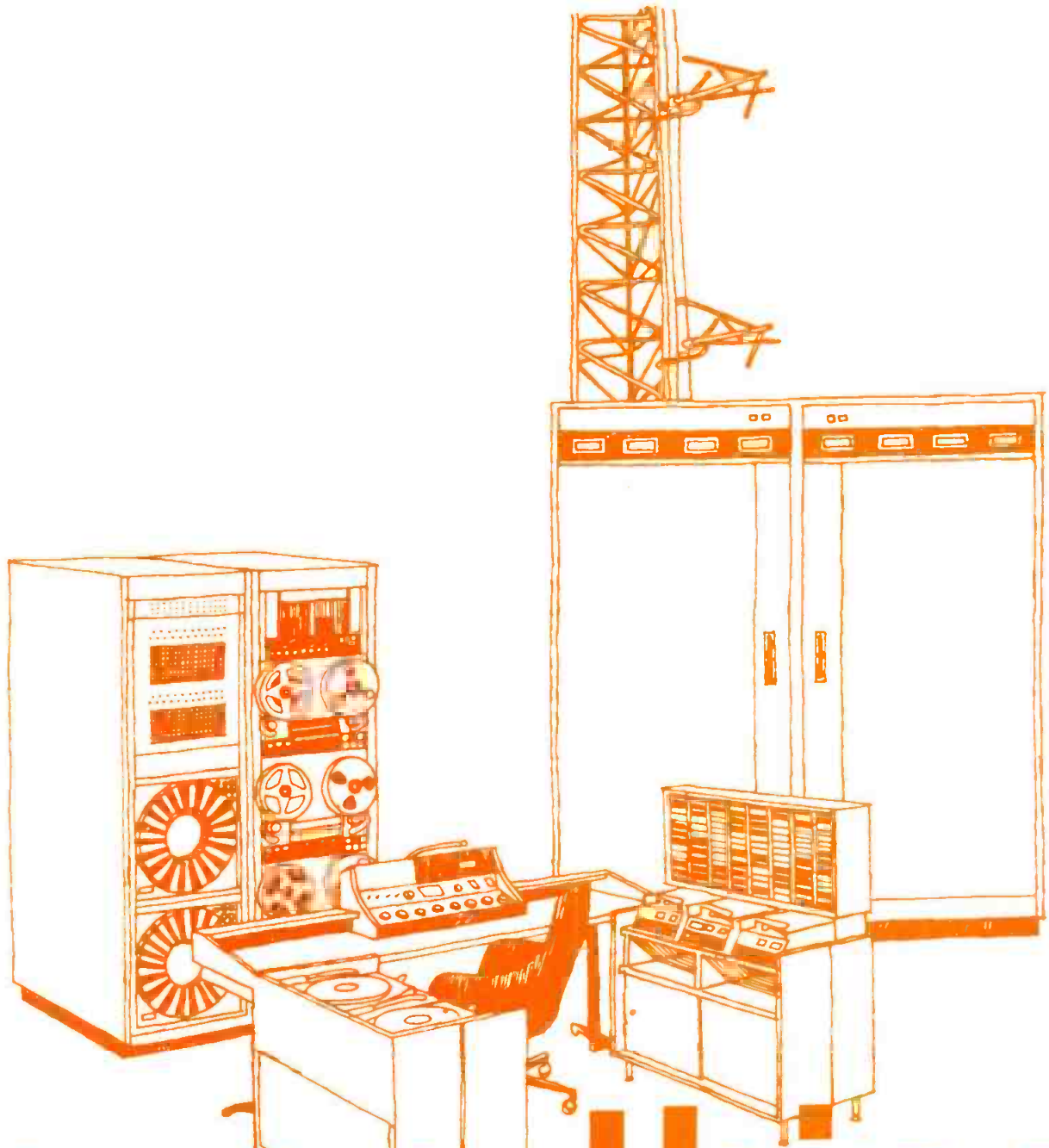
FCC Backlog--A great many of the Commission's ruling affecting the broadcasting industry come out of the Rules and Standards Division of the FCC Broadcast Bureau. This division has been badly understaffed for years, and its backlog is so bad that if it accepted no more work starting tomorrow, it would take three years to clean all pending matters off the books.

The Commission's new appropriation, however, already signed into law by the President, permits a modest expansion of the Rules and Standards Division. Although this expansion is not going to help things overnight, look for a gradual speeding up of the Commission's rule-making actions in the broadcast area.

New FM Allocation Table--One of the highest priority items confronting the Rules and Standards Division is the production of a new table of FM broadcast channel allocations, which will reflect the recently-signed agreement with Mexico, and which will be expanded to include channel allocations and reservations in the noncommercial educational portion of the FM band (88-92 MHz, Channels 201-220). Pressures continue for the expansion and construction of new public radio stations, and the Commission feels that making provisions for these stations is a "must" item.

VHF Television Drop-ins--There will be no Commission action which is likely to result in a general stampede for the drop-in of VHF television broadcast channels at short spacings. Although the Office of Telecommunications Policy (OTP) attracted a considerable amount of attention last fall with a suggestion for adding more VHF television assignments, the OTP action is in no way binding on the Commission, and there is considerable reason to believe that the OTP "plan" can't live up to its advance billing.

Daylight Saving Time--Every broadcaster who operates in different modes day and night is griping about the effects of Daylight Saving Time during the winter hours of early morning darkness. The Commission's most pressing problem, however, is what to do about two hundred daytime-only stations on clear channels. About half of these, on American clear channels, were allowed 50 Watts power for



everything

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BOOTH 211 EAST HALL, 1974 NAB IN HOUSTON

For More Details Circle (6) on Reply Card

(Continued from page 4)

one hour prior to sunrise, while the others can be allowed no relief at all because of treaty commitments to other countries. The Commission is already negotiating with the governments of Canada and the Bahamas, and these negotiations may lead to some relief for the daytimers on the foreign clear channels. The Commission has also asked for comments on the 50-Watt limit on the U.S. clear channels, which has been variously characterized as (a) ruinous to the service of the clear channel stations, (b) inadequate to serve local communities, and (c) unfair to stations already holding PSA's for lesser power, some in large cities with as little as 5 Watts. Unless Congress acts to repeal the legislation authorizing winter Daylight Saving Time, the Commission will need the wisdom of Solomon to come up with a satisfactory answer to this one.

Incidentally, the various proposals for curtailing hours of operation of radio and television stations as an energy economy measure now appear to have little chance of prevailing.

CATV Technical Standards and Non-Duplication

The various committees working on CATV Technical Standards will show promising results during the year. The FCC/Industry Cable Television Technical Advisory Committee (CTAC) will release several useful reports during the year, and the Electronic Industries Association (EIA) Cable Television System Committee (CTSC) will issue a draft of an engineering bulletin recommending requirements for cable television receivers and cable systems.

The Commission must also grapple with pending petitions asking for relief from the present non-duplication requirements. Notwithstanding considerable pressures for favorable Commission action, it does not appear likely during the coming year.

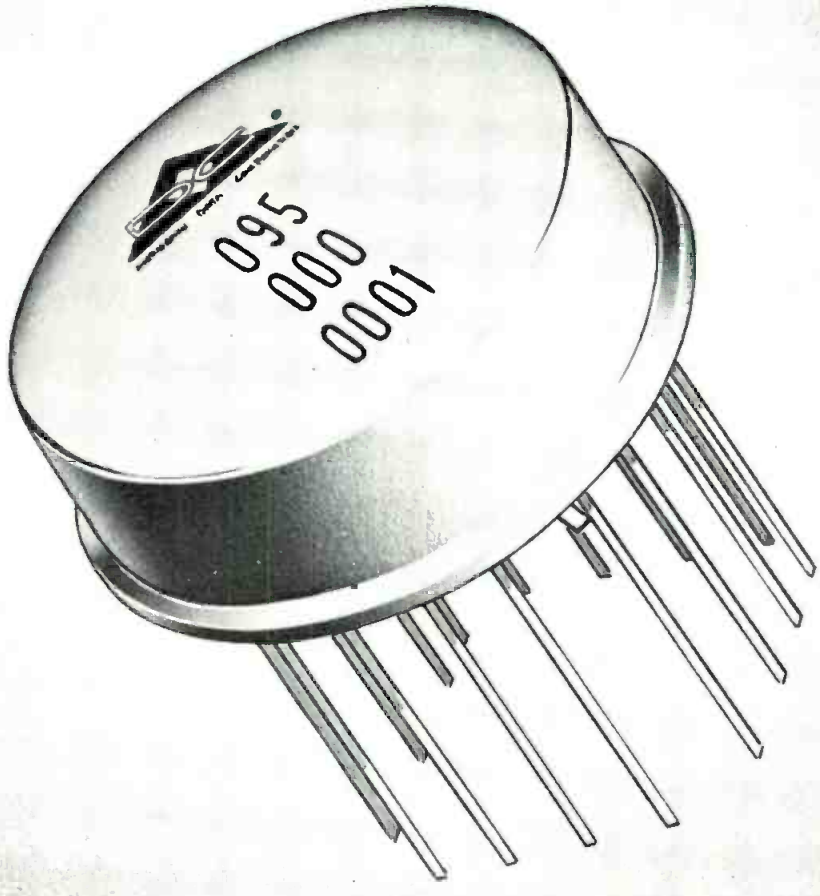
Equal Opportunity Employment

Are you an Equal Opportunity Employer? Whether you are or not, be prepared to cope with an increasing burden of paper work explaining not only your willingness to hire minority group members, but also the affirmative efforts which you have taken to bring about a more equal "balance" in the make-up of your staff.

Even the Commission is being stuck with this one, with EOE people on the FCC premises looking over the Commission's own shoulder.

Satellite Broadcasting

The long-delayed launch of the ATS-F satellite will take place during the coming year. Transmission of educational television programs in the 2 GHz band will take place over the Rocky Mountain area and the satellite will later be drifted over India to provide a regular instructional service to that country using frequencies in the UHF television band.



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LETTERS TO THE EDITOR

What Phase Deviation Specs?

Dear Editor:

When are the manufacturers of professional reel-to-reel audio tape recorders going to start listing "phase deviation" in their specifications?

We own 11 stereo decks; they are absolutely **lousy** at recording/reproducing stereo tapes with unwavering phase accuracy. The result is poor stereo reproduction, but even more significant is the impossibility of mixing to mono without unacceptable high frequency rolloff.

The manufacturer told us they are completely aware of the problem, and made certain improvements on their new model in this area. Many discussions with other broadcasters has given us the impression, however, that no one has **completely** solved the problem.

Perhaps the various manufacturers feel their present "head-in-the-sand" no-specs-we-hope-it-goes-away policy will keep most people happy, since very few engineering people in broadcasting know what's going on anyway.

It certainly is fodder for a most important article your fine magazine could run...or for a letter or two from a concerned manufacturer.

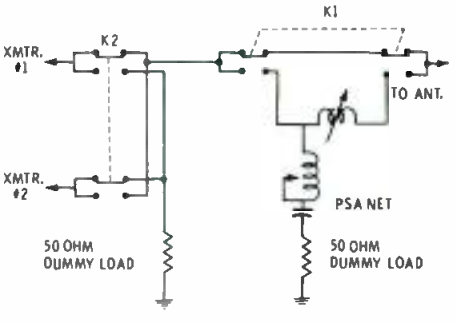
John H. Garabedian
Pres./Gen. Mgr.
Natick, Mass. WGTR

Editor's Note: These columns are always **open**. After all, **Broadcast Engineering** magazine is a crossroads magazine: everyone has an opportunity to speak up. Any takers on answering this one?

Switching With "Equal Time"

Dear Editor:

We certainly are in full accord with Mr. Massey (Station to Station —December 1973) that an RF Contactor can be used to reduce time for transmitter switching. However, we request "equal time" to remind readers that the Multronics 160-220-1 DPDT, 24KV, 40A; 160-220-3 SPDT, 24 KV, 80A; 161-220-1 DPDT, 40 KV, 40A and 161-220-3 SPDT, 40 KV, 80A are available in both 110V and 220V models to achieve the same result with competitive features.



The schematic is a typical application of two Multronics RF Contactors as used in our Phasing and Antenna Branching Systems incorporating Transmitter and PSA Switching.

John F. Watter
V.P. & Gen. Mgr.
Multronics, Inc.
Rockville, Md.

FM Pre-emphasis

Dear Editor:

The 75 microsecond pre-emphasis used in FM broadcasting results in very high gain in the transmitter at high audio frequencies, so that the transmitter can be over-modulated by the high frequencies present in many modern recordings even when the low and mid frequencies are well below the 100 percent modulation level. This pre-emphasis gives a boost of 17 dB at 15 kHz, and the gain may be even greater at higher modulating frequencies in some transmitters, particularly those which use an RC pre-emphasis network.

Records or tapes which have a high background noise level can over-modulate the transmitter, producing a very audible noise in the receiver, even when the program material is well below the 100 percent level. In some cases, the transmitter does not incorporate low pass filters to attenuate frequencies above 15 kHz. The addition of such a filter will at least reduce the intensity of the problem.

Another method for controlling the high-frequency modulation is to use pre-emphasis ahead of the limiter, thus reducing the gain at all audio frequencies in accordance with the high frequency content. While this approach will correct the problem, I consider it only as a means for correcting a basic deficiency of the system. That is, I believe that the amount of pre-emphasis be cut in half: that is, to 37.5 microseconds. Such a change would, in most cases, require changing the value of one resistor or capacitor in existing transmitters and receivers by a factor of two.

Stanley R. Swanson
Life Radio-FM Stereo
Panama

INDUSTRY NEWS

Top NAB Award To Richard Chapin

Richard W. Chapin, president of Stuart Enterprises, Lincoln, Neb., and immediate past Board Chairman of the National Association of Broadcasters, has been named to receive NAB's 1974 Distinguished Service Award.

Chapin's selection was announced by NAB's Convention Committee at a meeting held in conjunction with the four-day meeting of the NAB Board of Directors.

The award — highest honor of the broadcasting industry — will be presented to Chapin at the opening General Assembly at NAB's 52nd annual convention in Houston, Tex., on Monday, March 18.

Established in 1953, the award is presented to individuals who make "a significant and lasting contribution to the American system of broadcasting by virtue of singular achievement or continuing service for or in behalf of the industry in any or all phases."

Chapin, a 50-year old veteran of 20 years in broadcasting, began his career at KFOR, Lincoln, Neb., in 1953, as an account executive. While he came up through the business side of broadcasting, he has an equally solid background in news, programming and engineering.

He quickly became general sales manager for KFOR Radio and Television and a year later was named general manager of both stations.

In 1958, Chapin was elected vice president and assistant secretary-treasurer of Stuart Investment Company, parent company of Stuart Broadcasting Company, which, at the time owned KFOR and KRGI, Grand Island, Nebraska.

Under Chapin's direction, the company acquired KMNS, Sioux City, Iowa; KSAL, Salina, Kans.; KOEL, Oelwein, Iowa; and WMAY, Springfield, Ill. These stations represent market populations ranging from 7,000 to 150,000.

After Chapin became executive vice president of Stuart Investment, the company was re-organized as Stuart Enterprises in 1966. He was named president of the firm in 1970.

He's a director of the National Bank of Commerce in Lincoln and holds the same position with the Bank of Papillion, also in Nebraska, and is a trustee of the University of Nebraska Foundation.

Be Sure To Take Our Convention Locator Guide To The Convention?

NAB Pledges Energy Crisis Cooperation

The Board of Directors of the NAB has pledged the Association to coordinate and assist campaigns to help the public understand the energy crisis.

NAB President Vincent T. Wasilewski said a reduction of broadcast hours to conserve electricity "would not be in the national interest" because it would deprive the public of a vital service.

Wasilewski, at the invitation of President Nixon, joined other key trade association executives at a White House meeting on the energy crisis January 25. William Simon, Federal Energy Administrator and other administration officials also were in attendance.

In a resolution adopted at its meeting in St. Maarten, Netherlands Antilles, the Board said broadcasters "are uniquely positioned to provide essential and accurate information as well as to promote a spirit of cooperation among the American people."

It pointed out that since efforts to inform the public through radio and television are so extensive, NAB "will seek 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."

New President At CEI

Rodney R. Maddison has been elected president of Commercial Electronics Inc. The move was announced by the board of directors after a late January meeting. Maddison moves up from his post as director of Marketing.

Before joining CEI, Maddison was vice president and general manager at Kaar Electronics. Has also worked with Canadian Marconi in marketing management.

SMPTE Names Chairmen For April Conference

Fred J. Scobey, Program Chairman and Robert Gustafson, Local Arrangements Chairman head the list of recent appointments to committee chairmanships for SMPTE's 115th Conference to be held in Los Angeles' Century Plaza Hotel April 21-26.

SMPTE Editorial Vice-President Gerald G. Graham, National Film Board of Canada, announced the appointment of Scobey of DeLuxe General, Inc., to Program Chairman. Graham is responsible for overall supervision of SMPTE Papers Programs. Graham also announced the appointment of Julian Hopkinson, Agfa-Gevaert, as Associate Program Chairman. Additional appointments to the Program Committee include these Topic Chairmen: Edward H. Reichard, Consolidated Film Industries, for Laboratory Practices; Petro Vlahos, Association of Motion Picture and Television Producers, for Sound; Robert Kreiman, DeLuxe General, for Video Discs; and Don V. Kloepfel, DeLuxe General, for Projection.

Gustafson, Consolidated Film Industries, was appointed by SMPTE Conference Vice-President Harry Teitelbaum, Hollywood Film Co., to take charge of all non-program arrangements at the Conference. Other appointments announced by Teitelbaum are: Warren Strang, Hollywood Film Co., Equipment Exhibit Chairman; John Lakotas, Eastman Kodak Co., and Harold Hinkle, Movielab, Assistant Local Arrangements Chairmen; Edward J. Burns, Eastman Kodak Co., Hotel and Motel Arrangements Chairman; C. Carroll Adams III, Public Address and Recording Chairman; and Philip Singer, Agfa-Gevaert, Opening Film Chairman.

The Conference will feature five days of technical sessions in which papers by leading experts in the covered fields will be presented. In conjunction with the technical sessions will be a 92 booth equipment exhibition with the latest in professional motion-picture and television equipment on display.

Malarkey, Taylor, Assoc. Expand

Martin Malarkey, president of Malarkey, Taylor and Associates, announced that the Robert E. L. Kennedy broadcast engineering firm has been expanded and reorganized under the name of Kear and Kennedy Associates.

Since Kennedy's untimely death, the Malarkey, Taylor organization has provided the Kennedy firm with management and professional engineering support. The new firm will consist of Bob Kennedy's staff and Dr. Frank G. Gear, Kennedy's original partner who, as a consultant to the new firm, will assist in special client projects. Archer S. Taylor, of Malarkey, Taylor and Associates, will act as the supervising engineer of the new firm.

NAB Hits Percentages

The NAB has opposed as absurd a proposal by two citizens groups that the FCC establish multiple percentage guidelines for television programs with "subgroup" percentages for minorities.

It said in comments filed with the Commission that recommendations of the National Citizens Committee for Broadcasting (NCCB) and the National Black Media Coalition (NBMC) reflect "an alarming dependency upon government intrusion" into programming and "exemplify the very dangers and pitfalls" that could result.

NAB took sharp issue with NCCB's request for special percentage guidelines for such "subgroup" programming as that aimed at "minorities, women, children, and the poor."

"Why stop there?" its comments asked. "What about the aged, the middle class, the lower middle class, homosexuals, lesbians, the mentally retarted, the mentally gifted, obese people, handicapped, urban dwellers, rural dwellers, suburbanites, and blue color workers?

"These subgroups need programming responsive to their needs just as much as minorities, women, children and the poor. Once having established a precedent as to the latter subgroups, on what grounds could the FCC refuse to extend that precedent to the former?"

NAB's alternate proposal calls for adoption of one percentage figure that would apply to all non-entertainment programming broadcast between 6 a.m. and midnight, with ensured renewal on programming grounds for stations that met the standards.

Its NCCB-NBMC filing said recommendations by the two citizen groups "exemplify the very dangers and pitfalls NAB envisioned must result from reliance upon a quantitative concept of substantial service."

"They would impute a perpetual 'Catch 22' into the comparative renewal proceeding wherein standards set early in the license term may be raised by the time of the comparative hearings," the comments said. "The licensee who lacks a crystal ball would necessarily attempt to exceed existing percentages as a safety measure in anticipation of rising standards. The surplus programming would then be used as a guide by the FCC in actually increasing the minimum percentages...

"The comments we have discussed herein offer a vivid picture of where program percentages will lead if the Commission seeks to involve itself too deeply in programming."

Missing The Convention?
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SOCIETY OF BROADCAST ENGINEERS, INC
P. O. Box 88123 Indianapolis, Indiana 46208

10th Anniversary For SBE

This year, the Society of Broadcast Engineers is observing its 10th year anniversary. The idea for a separate association to represent broadcast engineers and technicians was reportedly first proposed by the editor of a broadcast engineering magazine in 1961. Due to the marked response and the growth of interest that continued to build, this same person, John Battison, a consulting broadcast engineer, formed the IBE (Institute of Broadcast Engineers).

Battison became its first president and its first meeting was held during the NAB convention in Chicago, in April 1964. Ambrose Kramer was the first vice president. At that meeting, the name was changed to the Society of Broadcast Engineers (SBE). In a following election, Battison was picked to serve another term, with Charles Hallinan, WKOP, Binghamton, N.Y. as executive vice president.

A year later, Hallinan was nominated and elected to the presidency, and Joseph Risse of ICS and WUSV FM Scranton was executive vice president. Al Browdy of KCOP, Los Angeles, was elected Western Vice President. The next executive officers of the SBE were Al Chismark, director of engineering, Meridith Corporation, as presi-

dent, and Lewis D. Wetzel, assistant director of engineering WFIL-TV, Triangle, as vice president. Later, Wetzel was elected to the presidency, and Robert Flanders, director of engineering for WFBM AM FM TV, became vice president. Two terms later, Flanders became president, and the elected vice president was Richard T. Monroe, vice president engineering, Group W, Westinghouse. Both served two terms. These were followed by James C. Wulliman, manager of engineering for WTMJ, Milwaukee, as president, and Glenn C. Lahmann, engineering manager of KDKA, Pittsburgh, as vice president, both of whom presently hold those respective offices.

The first SBE Journal was published in June 1964; 6 chapters were listed. There are now more than 32 chapters across the country. New chapters are coming into existence regularly as required by the needs of the membership in various geographical areas.

The SBE serves the broadcast engineering membership in a variety of ways. Among the objectives of the SBE are the following:

1. To enable the broadcast engineer and technician to increase his importance to his employer, to himself, to his fellow engineers, and to his profession.
2. To provide a forum for the exchange of professional discussion of broadcast engineering problems.
3. To enhance and maintain profession recognition of members.
4. To group together broadcast engineers generally in a professional body for educational purposes and for improving technical standards.
5. To advance the broadcast technician and the novice.
6. To encourage a continuing interest in broadcast engineering by students of technical and engineering courses relating to broadcasting.

Convention Dates Are Set At Rice Hotel

The Annual Meeting of the Society of Broadcast Engineers, Inc., will be held on the first Sunday of the NAB Convention in Houston, Texas, on March 17th, according to James C. Wulliman, Manager of Engineer, WTMJ-TV, Milwaukee, and president of the Society. The meeting, which all members are urged to attend is set for 3 PM.

The SBE Board of Directors will meet earlier the same day. Newly elected officers and directors begin their terms with the conclusion of the Annual meeting.

The meeting will take place in the Colorado Room of the Rice Hotel. An open bar will be available at 2:30, with the meeting due to start at 3:00.

(More...)

Chapter Activities

Chapter 1—Binghampton, N.Y.
Chairman: Douglas S. Colborn, Horseheads, N.Y. 14845

Dinner preceded the January 8th meeting at the Treadway Inn, Owego, N.Y., at which Bill Sitxman spoke on AM Towers and Ground Systems. The chapter meets the second Tuesday of every month at the Treadway, except in July and August, and unless members are notified otherwise. For further information, contact chairman Colborn at (607) 739-7901.

Chapter 2—Northeastern Pa.
Chairman: Paul Evanosky, Pittston, Pa. 18640

On January 4th, at the studios of WVIA-TV-FM, George Graham, WVIA-FM engineer, provided a comprehensive description and demonstration of the 16-input/16-output audio console that he recently installed in the station's production facilities. The complex console provides mixing and processing for each channel separately. Chairman Evanosky presided at the meeting. Charles Morgan, national SBE director, invited recommendations on the Fellowship project and nominations for national office for upcoming elections.

Chapter 9—Phoenix, Ariz.
Chairman: Charles Deen, Phoenix, Arix. 85001

The Phoenix chapter held its annual Christmas party at Rod Hundley's Cornucopia Room on December 12th. Attendance was over 50 members and guests.

Chapter 11—Boston, Mass.
Chairman: Ross B. Kauffman, Needham, Mass. 02192

Peter Fasciano of Channel 27 engineering staff described video tape animation techniques with emphasis on two types of editing procedures, time-code and benchmark editing. Chairman Kauffman presided at the session which was held at WSMW-TV studios in Worcester.

Chapter 15—New York, N.Y.
Chairman: John M. Lyons, Woodside, N.Y. 11377

The January 10th meeting at WQXR Presentation Studios, 229 W. 43rd St., was presented by John Cammarta, Sales Engineering, CBS Laboratories, on Audio and Video Processing Equipment. The December meeting featured Arno Meyer, President, Belar Labs, who discussed monitoring equipment for AM, FM, and TV. Results of annual election are: John Lyons, WWRL, chairman; Larry Strasser, WTFM, vice chairman; Phil Harper, Gates Radio, secretary-treasurer; Art Silver, Gates Radio, program chairman. The chapter officially thanked Doc Masoomiam of WQXR and Bob Woerner of WNEW-TV for services during 1973.

Members, and guests, who are always welcome, may make use of the **New York Times** Cafeteria for dinner of excellent fare, costing

300 TV stations use it... The Gates PE-245 color film camera.

Accepted by five networks . . . in the United States, Canada and Mexico . . . as the finest quality film camera available.

The PE-245 color film camera together with the Kodak CT-500 TV projector with rapid channel threading film handling feature and the PF-12 multiplexer makes up the most modern, most dependable telecine system available anywhere. In addition, you get four-color projector inputs. Two color camera outputs. And split-island operation.

When you consider investing in a color TV film island, you want the system that'll provide the greatest versatility, the best performance and unquestionable dependability.

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a. Employer b. Address				
1 a. _____ b. _____				
2 a. _____ b. _____				

Total Years of Responsible Engineering Experience: _____ Field of Activity: Radio _____ Television _____ Other _____

EDUCATION:

TYPE OF SCHOOL	NAME AND ADDRESS OF SCHOOL	COURSE	NUMBER OF YRS. COMPLETED	GRADUATE? DEGREES?	LAST YEAR ATTENDED
College					
Trade or Mechanical					
Corresp. or Night					

Two references familiar with your work:

	Name	Address	Occupation
1.			
2.			

Be Sure To Sign

Enclose $10.00 (or $5.00 for bona fide students). No action taken without Dues.

Signed _____ Date _____ 19 ___

I agree to abide by the Constitution and By-Laws of the Society if admitted.

ADMISSIONS COMMITTEE ACTION: Date _____ Approved for Grade _____

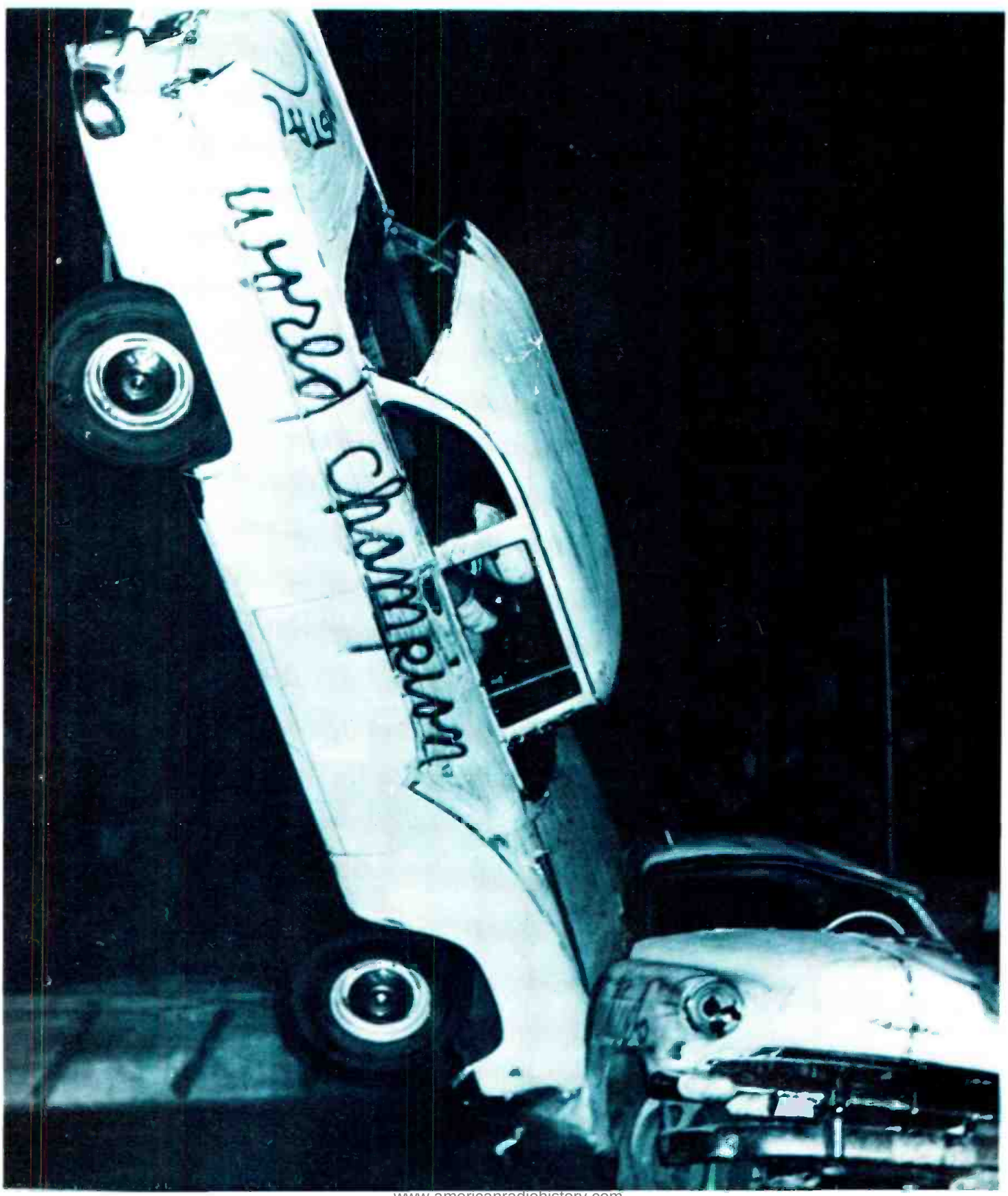
Action Deferred for More Information _____ Candidate Notified _____

Chairman's Signature _____ Entered in Records _____

March, 1974

CABLE engineering

In This Issue...



Profitable sports originations

By Ron Merrell

Last month **Cable Engineering** included an article on selling FM to the cable subscriber. And in that article the author, Kenneth Wayne, talked about what is practical and what is "blue sky".

Continuing on that theme, good conscience should make us wonder who's watching (and listening). What about those who are not on the cable or are on but never listen or watch local origination. What do they really want.

Anything you put into local origination must compete with commercial programs. This being true, let's take a look at how we can develop interest in our other channels.

Let's Go Racing

One of the dullest sports attractions on TV today is the high-bank asphalt stock car races. You see these races often enough on TV during the peak of the racing season. And what you see are three or four cars racing up to 300 miles. On and on it goes, without ever knowing what is happening to all those other cars. Why, the picture would lead you to believe there are no other cars on the track!

Well let's get down to the local level. I mean local stock car racing. Your subscribers will know most of these drivers. And that will breed more interest. Think of the shorts you could do on top drivers at the track. And all this could be either live or on tape.

You may personally thumb your nose at racing events, but gate receipts show you subscribers don't.

Don't Strike Out

In just a few short weeks after you read this article, baseball teams will begin their training for 1974. And this is the time you should be considering how you can cover the little leagues or your high school teams.

Who needs it? Nobody. But then, of course, there are a great many things we don't **need**, but we still buy . . . . even to the exclusion of more important things.

For example, let's say we have a choice of offering a film, tape or live coverage of the local little leagues or covering the City Council meetings. In the long run, the City Council meeting is far more important. But what would your subscribers choose?

Striking out in local origination means failing to understand what the subscribers want. You may not be sports oriented, but that shouldn't keep you from making money out of it.

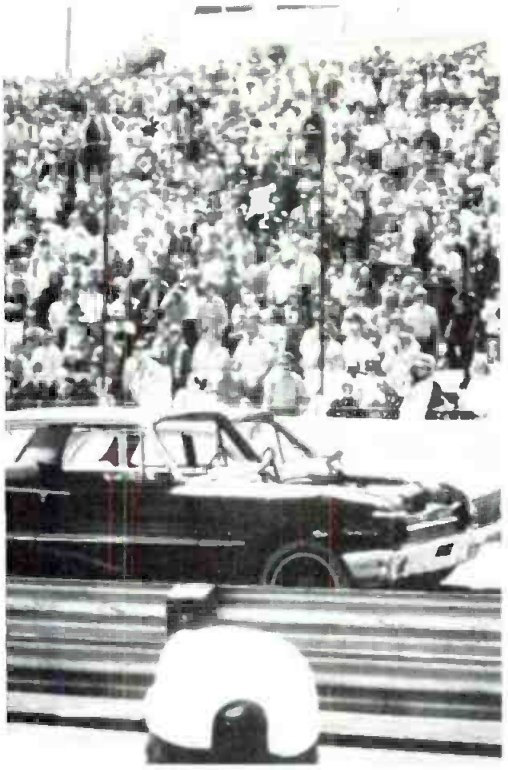
Free Throws

You probably already missed covering local basketball this year, right? It might have been free to you if you had run a tape or film of the game(s) the following day. (School officials may balk at live coverage of home games because it could hurt attendance.)

Coaching Cooperation

Some schools take movies of their games, especially football games. This would make an interesting weekly show. Run the game film and have one of the coaches (or coaches and players) discuss the game as it is shown. By taking this approach, you don't have to invest in a camera or be concerned with film processing.

Another approach that should be of interest is to have coaches clinics on the cable. You go to a practice field (or gym) and have the coaches and a few players demonstrate basic practice drills and basic moves. But to get maximum interest, the clinic must include explanations that par-



Look at that crowd! It may help you to personally be interested in a sport you might cover. But don't forget that the community interest is the key to profits.
(Photos by Tom Conroy)

ents understand. In this way you help their understanding of the game, which will help them enjoy the next game even more.

Keeping It Close To Home

There are a great many offerings on local events covered on cable TV these days. Obviously, many lose in the battle of competition for the viewer's time and attention. If Council meetings are so interesting, why are they so seldom well attended? You might offer that the community should know what goes on in those meetings, and your coverage is a community service. We won't argue that one. But what we are saying here is that cable TV is a business. And it't just good business to know what your purchaser (subscriber) needs and what he wants.

In Johnson County, Kansas, we have one of the most highly developed sports programs in the country. On any given Saturday, more than 10,000 spectators come to the YMCA sports complex to watch games that start at 9 in the morning and end at 5 in the afternoon. And just as sure as they pay to watch those games, they would be glued to their TV sets the following day looking at those same teams

playing . . . . if they were only covered.

It's just human nature that people want to see themselves on TV, in magazines, or in newspapers. And they are even more anxious when their son or daughter is covered.

A good photographer could make a nice profit from taking action shots at the games. When people are involved, they want to see it one more time. But most photographers have limited their profitability by selling pictures only to local newspapers.

My youngest son was playing in a little league baseball game last summer. A photographer set up his camera near home plate and took action shots of each boy as he came to bat. Later, he offered color shots to the parents for a modest profit-allowing price. They went like hotcakes! And that same day he covered several other games with similar success.

This is not to suggest you work on the side as a local sports photographer. This is just one more case of landing directly on local interest and involvement.

How About Cable Profit?

Before we can make any money out of local origination, we've got to have the subscriber's attention. He must be drawn away from commercial TV for at least part of his viewing day.

If you have a sports active community, your prospects are good for getting his attention. But . . . . how about making a profit?

If your local origination were really wanted, it would help sell new subscribers. And that sale is the base of all profits. Fortunately, it doesn't end there. It goes into remembering that little league teams have sponsors. They have sponsors because the merchant wants their names in front of the public and because they want to contribute something to local youth through sports. Then consider this: will their desire (wants) end on the field of play? Probably not. They are logical sponsors for your coverage. They provide a ready-made advertising prospect list.

How they are advertised before, during, or after programs is up to your imagination. It can go from anything like slides or cards to voice-over at appropriate intervals during the showing.

This is one area of business in cable TV where creative genuis has not shown through. After all, selling is not all that easy. It's based upon belief in the product, understanding the would-be buyer and his connection with the product, and how to use your equipment for maximum profit.

In the smaller market areas, it is not necessary to locally originate programs. It would suffice to deliver good quality programs not available off-the-air. So if you consider local origination, it must be with profit and service as motives. The whole approach must be made with an eye on the bottom line. So, the approach must be positive. It starts with a survey of desires, never includes pleas for support, and goes on the line with imagination. □

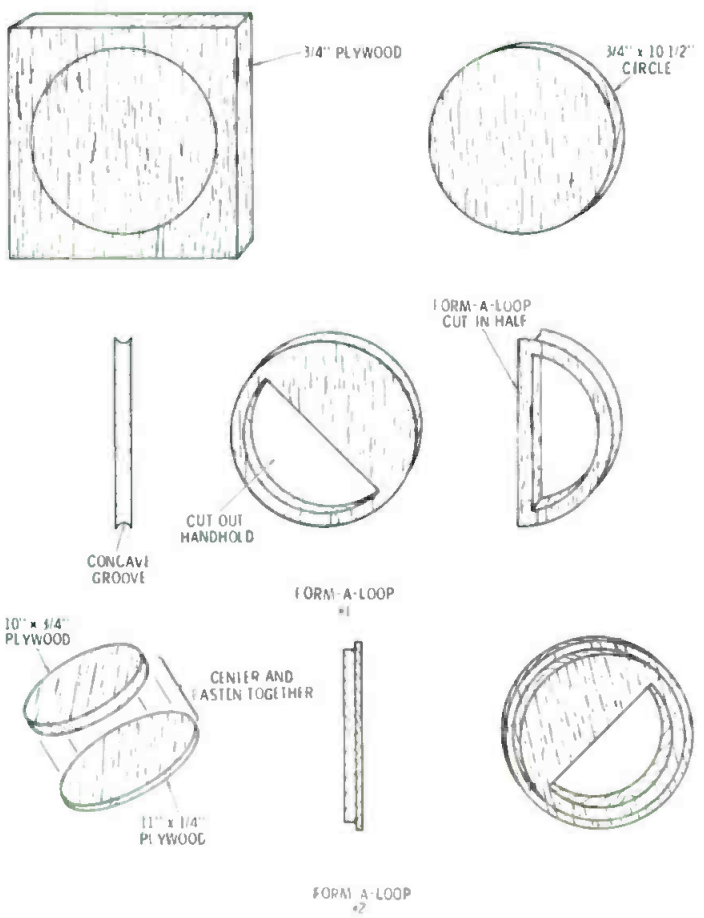
How To Make Your Own Loop Tool

By Kenneth Wayne

Most contractors supply their cable splicers with tools to form expansion loops. Usually they are purchased from a tool manufacturer and though there are numerous types of loop forming devices available they all serve the same purpose. Of course, they also cost dollars and along with everything else dollars are in short supply.

When the contractor completes his job he leaves taking his equipment with him, including his loop forming tools. So, why not make our own tool? After all, we have made all sorts of innovations in our field and consequently we started the manufacturers in business in the first place!

There are two very simple loop forming tools that can be made in a matter of minutes. From either method you can produce two "Form-a-Loops" if you desire, simply by cutting the tool in half. The half "Form-a-Loop" tool is a bit easier to work with.



To make a "Form-a-Loop" tool for the bending of cable into a 10" expansion loop, the only material that is required is a piece of ¾" exterior plywood. Cut out a 10½" diameter circle. Set the plywood circle in a vise, and using a sure-form wood rasp (or equivalent),

remove the center of the plywood forming a concave groove around the complete circumference. Make certain there are no burrs and that the groove is smooth. Cut out a hand hold and you have a completed "Form-a-Loop". To have another, simply cut it in half and cut out a hand hold in the second half.

The second method requires a 10" circle of ¾ inch plywood, and a 11" circle of ¼ inch plywood. Center the smaller circle on top of the larger and fasten together small nails, screws, or glue. Cut out a hand hold and you have made your second handy "Form-a-Loop". This tool can also be cut in half.

The sizes of the forming loops can be varied to meet your own particular specifications. However, cable bends in expansion loops should not exceed these minimums with most coaxial cable.

.412" Cable—minimum bend—8 inches
.500" Cable—minimum bend—10 inches
.750" Cable—minimum bend—15 inches

These are the minimum bends recommended before distortion will occur in the dielectric of most aluminum coaxial cable. I prefer to add 2 inches to the minimums, thus, giving a larger loop and affording increased friction between the center conductor, the dielectric, and the aluminum sheath. □

Reviewing The International Conference On Cassettes

By Joe Roizen

The third international conference on video cassettes was held in the south of France in late 1973. Some 1,446 participants representing 626 companies from 32 countries attended. For the first time, an industry suffering from an acute case of publicitis and recuperating from some deep wounds (EVR, INSTAVIDEO, Cartrivision) could finally point to a growing field of hardware users and software producers who were actually doing something with the medium.

The long heralded "Cassette Revolution" has been more like an evolution and the "standards war" is becoming a de facto situation with Sony sweeping North America and Philips penetrating Europe. With the conflict of the cassettes hardly started, a new duel of the discs has had its first main round in Cannes. The three major contestants for the moment are the Teldec player from Telefunken/Decca, the VLP from Philips, and MCA's Discovision. In the wings with promises of picture players are Thomson (France), RCA, Zenith, and a few Japanese firms.

Elaborate or lengthy French menus are referred to by locals as a "confusion of choice". To round out our video player menu, there are also a few film devices that offer interesting alternative means of parading a program on a home color TV receiver. Both Kodak and Fuji Film have super-eight players that use flying spot scanners to transform the mini movies for the tinted tube, and, of course, EVR uses film, and was being displayed and promoted at VIDCA by the EVR partnership, a consortium of Mitsubishi, Bosch, Decca, and Thomson who claim that the CBS format is alive and well outside of the USA where it was developed. At VIDCA at least six stands had EVR players in operation.

The major hardware producers had booths displaying the latest in mechanical and electronic gadgetry while the software suppliers similarly showed their programs of entertaining or educational content. Sixty-two companies representing the best known names in the United Kingdom, Europe, Japan, and North America had active exhibits.

The most significant trend in the cassette hardware at VIDCA was toward multi-standard exchange of tapes. The video tape or film equipment was all adaptable to NTSC, PAL or SECAM and was being shown with playback units and monitors operating on those color standards.

Hardware Statistics

The cassette industry is especially subject to the chicken and egg numbers game. No one wants to buy hardware if there are no programs to play on it, and producers are reluctant to generate software if there are no players out in the field.

It was obvious from the figures quoted that significant statistics are beginning to accumulate on the number of units and their most prominent applications. A survey by the **London Financial Times**, which printed a special supplement about video cassettes and video discs, reports 75,000 Philips VCR units would be delivered by the end of 1973, with about 10 percent being absorbed in the United Kingdom. By comparison, the Sony U-Matic format has only about 500 machines in the European market place.

A spokesman for the Electronic Industries Association of Japan stated that 110,000 VTR and video cassette units had been delivered during 1972 while 200,000 units would be supplied in calendar 1973. Half of this production was exported and 40 percent of that went to the United States. This tied in reasonably well with an estimate of at least 50,000 three-quarter inch Sony U-Matic format players that have been sold in the U.S., with less than 10,000 players of all other formats combined.

The projections for the near future are also very optimistic and expert opinion regarding the growth of the video cassette market predicted that hundreds of millions of dollars in equipment and program

sales would occur before video discs hit the market with any impact.

The concensus among the media experts in Cannes was that the proliferation of non-standardized formats should be of no concern to the industrial or institutional end-user. Their argument was that the available equipment was reasonably priced and worked well, and whatever the selection by the end-user, program material could be duplicated and distributed in that format. This was not a particularly popular stand with delegates or attendees representing uncommitted educational or industrial groups who kept asking why manufacturers did not pre-agree on a single interchangeable format.

The major users who presently have active programs in operation presented examples of their software at a company workshop. These included the Ford Motor Company, Coca Cola, Japan Airlines, and Polymedia. The programs spanned a wide range, including internal training, corporate communications, and sales promotion.

1973 is now being referred to as the "baby year of video cassettes". The potential for any given format to sweep the market will obviously increase with the speed at which a given market penetration can be achieved to the exclusion of a competing system. Considering the strong positions already established by the two giants in the industry, Philips and Sony, it would seem that we will have at least these two formats widely proliferated throughout the world.

The Disc Dilemma

Notwithstanding the reams of publicity to the contrary including full page advertisements in widely circulated newspapers and magazines, no one at VIDCA really considers the video cassette as a consumer product. The fundamental limitations against public acceptance and use is the inherently high cost of the medium itself and the difficulty of mass duplication. While the magnetic medium is the only one that provides an easy record capability, that feature is likely to be more beneficial to a professional user than to a normal lay consumer.

To put video in the hands of a mass audience requires a device which parallels the function of an audio/record player at about the same levels of price and complexity. The race to the market place with video disc is now in full swing. Three contenders, Teledec, VLP, and Discovision, have already shown working prototypes and are promising the moon on a rotating platter. Not far behind are a few other not so small companies like RCA, Zenith, Thomson-CSF, etc. perfecting similar platter players in their laboratories.

Philips Disc

By far the most significant product display at VIDCA as far as its potential impact in the audio/vidēo world was the VLP. Several elaborately staged press conferences and public demonstrations were held in the main theatre of the Palais de Festivals.

The presentations of the two admittedly prototype units were well done and well attended. Multiple 25" monitors operating on the PAL standard displayed good color images coming from players. Discs were claimed to be pressings rather than masters, and were exchanged between the two units with good results. Manipulation of the replay units is easy and it is possible to obtain TV pictures in normal, fast, slow, stop, and reverse motion.

Still framing is non-destructive because the read-out is by a non-contact laser light beam. A digital read-out permits access to any selected track and there are two channels of sound with the color image. Philips claims that the raw material to produce the plastic video disc is only a little more expensive than an audio LP and that the player should retail eventually at the price of a home receiver.

The disc, which is approximately the size of a normal LP, spins at 1500 rpm and reproduces one frame per rotation. The recording is in the form of concentric circles containing small pits in which the edge deformation carries the desired signal information. A low power helium-neon laser beam is sharply focused at the plane of the recording on the disc. Light reflected from the coating on the disc is picked up by photo diodes sensors and converted into the video/audio and address information.

The recording displayed contained 45,000 groves and gave a 30 minute play time. Philips expects to increase this to 45 minutes on the production models which are now predicted to be available in late 1975.

The most impressive part of the demonstration was the ability of the operating engineer to index the machine to a precisely selected numerical track. Emphasis of this capability was displayed by having a large character read-out unit mounted on a pedestal above the VLP player which the audience could easily see. Request for specific track playback were achieved by manual positioning to the approximate area and then frame-by-frame advance by push button until the selected track appeared on the digital display and the TV screen. For some unexplained reason, the tracks at the beginning of the disc could not be indexed.

It is evident that the VLP will sharply affect the credibility of other disc systems since it seems to offer good performance, flexibility, and long playing time. The only question is whether the unit and the recordings can be commercially produced at an attractive consumer price level.

Teldec

A new version of the Teldec player which was on display last year was again being demonstrated by the Telefunken/Decca combination. The Teldec system produces lower quality images on a disc which has only about 10 minutes of playing time and which must be protected from surface deterioration because it uses a stylus that requires disc contact in order to read-out the signal. A further disadvantage is that the recording cannot be accomplished in real time. As a result, all video material that is transferred to the disc must be put on film and slow scanned in order to produce a Teldec master.

MCA Et Al

The MCA booth at VIDCA leaned heavily on the huge software library that this company has in its back pocket. Since they had no working model to display, their major pitch was presented (ironical-

ly enough) by a Sony U-Matic unit that repeated continuously the claims for their system. In addition, a series of photographs attested to successful U.S. demonstrations of actual hardware that have already been made. Discovision depends on the same general technology that was shown on the VLP, however, there are differences in disc geometry and other factors sufficient to make the two systems incompatible. Both Philips and MCA admit to some discussion about the likelihood of similarizing the systems sufficiently to make their records interchangeable. At the least, since both systems use light beam readouts, it is likely that an ambidextrous player could handle either disc at the flip of a lever, much as record turn-tables now accommodate 33 ⅓ and 45.

Not far behind MCA are a few other major companies who admit to laboratory efforts in the pursuit of a practical video disc. Thomson-CSF (France), a giant French corporation, held a press conference at which executives and engineers of their audio/visual division discussed their company's efforts in the development of a laser scanned disc. RCA and Zenith both have publicly announced the development of this type of product and the commitment of considerable research money to achieve it. In particular, Zenith is even reported to have some joint-agreement with Thomson to maximize their mutual effort. Several Japanese companies are also in the race.

Programs & Philosophies

The major complaint of both hardware manufacturers and the potential users of video cassettes is the dearth of adequate program material to make the overall package attractive as a new educational tool or communication medium. The most practical approach taken by some educators is to simply transfer available film or video tape programs to the cassette format so that the distribution and display of this material is streamlined. Examples of this were given by representatives of the Granite School District of Utah and Harvard University who described utterly different projects aimed at dissimilar goals with interesting results.

The Granite School District employs dubbing centers to maximize the availability of audio/visual material to classroom teachers. Film and tape programs meeting curricular requirements are obtained under special copyright agreements which have been worked out by the school district and then copies in appropriate numbers to feed the system. The emphasis is on availability to the teacher of what he or she needs in the classroom, when they need it. The claim was made that a twenty-four hour notice was sufficient to copy and supply a tape from a vast library of material. The ease of use and reliability of the U-Matic format was credited with making this project successful.

Dr. Lasker of Harvard described a totally different approach where television was being used to assess the impact of programs oriented towards children or groups that had never been exposed to television. His project was called "Jiminy"; it consisted of a Japanese version of a Land Rover equipped with Sony U-Matics and color television monitors that were sent into the jungles of Jamaica where rural children in villages devoid of electricity were shown the Electric Company and Sesame Street while their reactions were being observed and recorded.

An American representative of the advertising department of a large pharmaceutical house blatantly described a scheme whereby cassette units placed in maternity wards could carry well camouflaged commercial messages for products connected with the care of infants as supposedly instructional programs that were being shown to the recuperating mothers.

Considering the lengths to which various world governments have gone to prohibit subliminal advertising and to require clear identification of a commercial message in television programs, there appears here to be an overt attempt to usurp these protective devices. Will the cassette industry merely be a vehicle for the most hideous hucksterism to flourish on a new front? Surely, the purpose of this medium must be something better than the promotion of baby bottom ointment to a semi-anaesthetized mother whose resistance to suggestion is at a low point.

The hardware displayed at VIDCA showed an unbelievable ingenuity towards the simplification and price reduction of the delivery of a color image to the ultimate user. It is hard to believe that only fifteen years ago a black and white VTR, in the only model available, cost more than $50,000. Instead, the exhibit hall at Cannes was full of small inexpensive devices that produced acceptable color pictures from tape, disc, or film. What seems to be still lacking is an equivalent creativity in the use of these magical gadgets to enhance human communications with material truly worthy of the medium. □

NAEB Moves To Action Programs

The new board of the National Association of Educational Broadcasters has taken specific steps to insure that NAEB will move ahead with affirmative action programs on behalf of minorities and women.

At its January 28 meeting in Washington, the board directed the NAEB staff to complete within 90 days an affirmative action plan for the association, spelling out steps to increase the participation of minorities and women in NAEB membership, services and programs. The plan, which has been drafted by the staff, is to be presented to the NAEB executive committee in April for approval.

In its final form, the plan sought by the board must not only provide for affirmative action within NAEB as an institution, but also open up ways for the association to foster the development of affirmative action programs throughout public telecommunications.

The plan is to be carried out through NAEB staff involvement and through committees of the membership. At present, NAEB has a coordinator for women's activities, Mary Lynn Moody; an interim minority affairs coordinator, Denese V. Fisher; and a Committee on Women in Public Communication, headed by Dr. Florence Monroe who is assistant administrative director of WNYE-TV-FM New York, and is a member of NAEB's executive committee.

about $2.00; dinner is normally about 6 PM with the meeting following at 7:30 PM. For further info, call John M. Lyons, (212) 335-1600.

Chapter 16—Seattle, Wash.
Chairman: John A. Maxson, Seattle, Washington

On January 11th, the chapter met with the Pacific Northwest chapter of the SMPTE jointly at The Grove in Seattle, to hear Charles Rhodes, manager of television products engineering, Tektronix, Inc. Communications Div., on The Need For Phosphor Colorimetry Correction by Means of a Color Matrix. Also, Clive Tobin, Alpha Cine Laboratory, discussed How to Make Films for Television; and Robert McAll, product manager, CBS Laboratories, presented a paper, Dynamic Television Transmitter Measurements.

Chapter 18—Philadelphia, Pa.
Chairman: Jack Jones, Philadelphia, Pa. 19131

Jack Jones, former chapter chairman and assistant chief engineer of WCAU-TV described the technical aspects of the latest electronic techniques in visual news journalist including mobile, hand-held, battery-operated, color TV cameras and microwave systems. This was a joint meeting of the SBE chapter, the IEEE PGBTR, and the Society for Information Display. Dinner at the Presidential Dining Room, at Williamsons preceded the meeting. The SBE business session was presided over by new Chairman Larry Will.

Chapter 20—Pittsburgh, Pa.
Chairman: Henry R. Kaiser, Pittsburgh, Pa. 15212

On December 20th, at Buddies Restaurant, John Romick, Tektronix sales engineer covered the history of the oscilloscope, and demonstrated several Tektronix's latest items of test equipment. In a separate part of the meeting, the new AT&T rates were discussed. On January 17th, at Buddies, Jerry Grever, manager of electronic recording equipment engineering for RCA, talked on Quad II Video Tape Recording, a new format proposed by RCA.

(Continued on page 76)

CONSOLIDATED VIDEO SYSTEMS TOTALLY WIPES OUT THE LANGUAGE BARRIER BETWEEN HELICALS AND QUADS.

INTRODUCING THE CVS 504. A SINGLE "UNIVERSAL" DIGITAL VIDEO SIGNAL CORRECTOR FOR ALL REASONS.

We know it sounds wild, but the new CVS 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 U-matic* 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.

Or, how about taking an EIAJ ½" recorder and using it as a camera source locked to house sync. It's easy with the CVS 504 if the recorder has a capstan servo. 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

CVS

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For More Details Circle (22) on Reply Card

Early morning meeting is a daily occurence during which the previous 24 hours' air time is thrashed over. WCVB-TV is on the air around the clock except for two hours off in the early a.m. on Monday and Tuesday. Left to right: Valdo Conte, Director of Commercial Operation; Larry Pickard, Director of News & Public Affairs; Ed Moore, Production Manager; Tom Maney, VP and Asst. General Manager; and the author and Director of Engineering, Steve de Satnick.

WCVB takes advantage of the

By Steve de Satnick
Director of Engineering, WCVB, Boston.

At many TV and radio stations, the Chief Engineer has become something more than an engineer in charge of engineering assistants and technicians. Because of the changes that have taken place at the station and because of the changes in the technology, he is unique. He stands with one foot on the engineering side and one on the management side.

It is his responsibility to close the gap every time he sees it opening. Show me a station where he is not allowed to operate in this manner, and I'll show you a station far from operating either technically or economically near its potential.

With this in mind, let's take a walk through the facilities of WCVB with their Director of Engineering and see how it works during a typical day. The Editor

A Chief Engineer's day is far different now from what it was fifteen years ago, and indeed, even five years ago. This is particularly true at an all-digital station like WCVB-TV where the entire system is so sophisticated that most of the equipment is automated so that it makes its own adjustments.

Significantly, with the new technologies establishing wholly revised operational procedures along with new and higher standards, the Chief Engineer now has the opportunity to get out of the strict engineering environment and become truly a management person involved in management decisions. Thanks largely to advanced technology, it is now true that the Chief Engineer—along with a change in title to Director of Engineering—has won an opportunity for responsibility which is reflected in his greater role in decision-making areas affecting the future course of the station in a broad sense.

From the starting bell in the morning when we hold a daily discrepancy meeting on the previous 24 hours' air operation, I find myself participating in a chain of formal and informal exchanges with individuals and groups spanning virtually every aspect of making a major-market television station go. Also involved in the discrepancy

The author checks the manpower assignments board with Engineering Operations Supervisor Steve Marchetti.

Subcarrier frequency is checked on his way to another engineering area.

state of the art

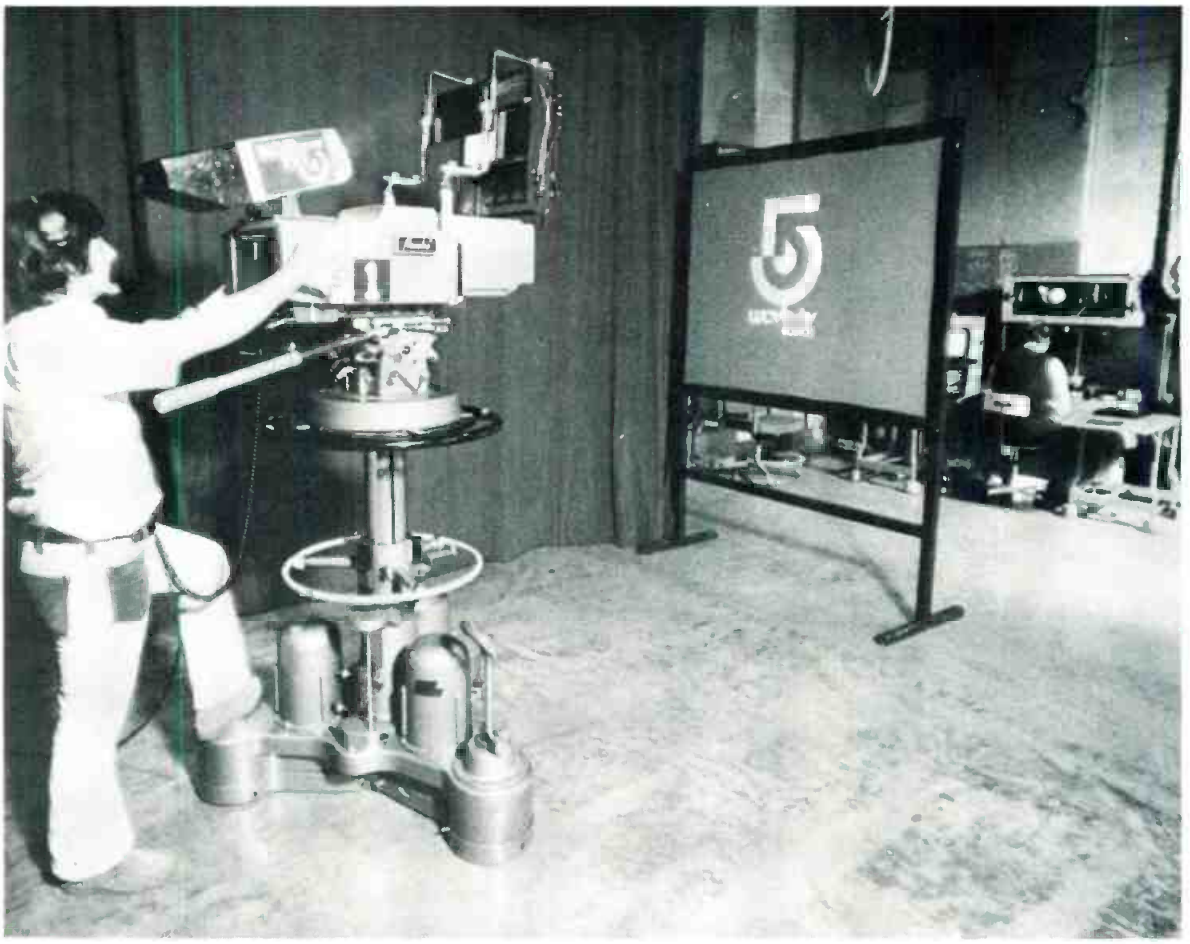
meeting are the Assistant General Manager, Production Manager, Commercial Operations Manager, and the Director of News and Public Affairs.

Here at WCVB-TV, capital equipment purchases are by no means the result of a single individual making a choice. Such a decision brings into play an equation comprised of production factors, engineering factors, cost factors, programming factors—all of which require inputs from the various management sectors of the company.

The influence of modern solid state techniques using integrated circuits and transistors extends all the way to the design and layout of the station itself. Control electronics for our Norelco PC-100A cameras, for example, take a few square feet of floor space. The camera patch panel is a few inches in a 19-inch control console. There was a day, and not too many years ago, when the associated electronics for a half-dozen cameras would fill a room. The miniaturized concept extends of course through tape machines, audio equipment and transmitters as well, freeing vast amounts of square footage for studios, offices, storage, and so on.

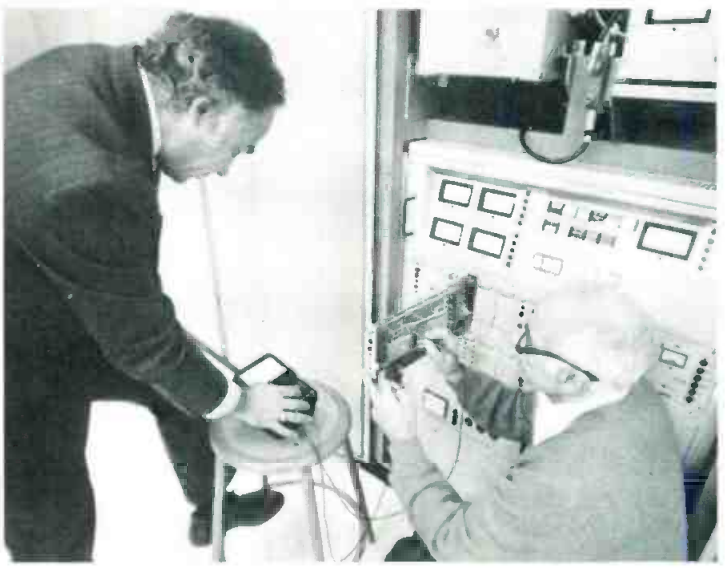
Even wiring of studios and technical centers in the station is simplified by virtue of digitalized systems using all triaxial cable. Our cameras are, of course, all triax. New equipment like these cameras brings with it distinct virtues, such as stability, higher resolution and the obvious small-triax advantages.

In the camera control area the author discusses switching routine. He is shown here checking burst, amplitude and phase with (L. to R.) Chief Engineer Joe Blake, maintenance tech Stan Macie, and Ross Kauffman, assistant Chief Engineer.



Rear screen projection system is used in news and sports shows to provide chroma-key backgrounds. The author checks out the system with the projection system operator.

de Satnick stops by the telecine system area to chat with Transmitter Supervisor George Jawdy.



Here Jawdy and de Satnick check a module in the transmitter control cabinet.

At the same time it demands more of other disciplines even beyond engineering and maintenance. Lighting, for example.

Today you may not need as much light as you once did, but what you do have is critical—it must be right. (Incidentally, less light means less of an air-conditioning burden.) We consider lighting of utmost importance; thus our Lighting Directors' talents are directed 100 per cent toward the art of lighting to help produce really superb pictures. While on the subject of digital cameras and lighting, it's appropriate to mention the anti-comet-tail Plumbicon tubes with which our cameras are equipped. We simply don't have lag problems any more, even at low light levels.

It is only with the development of digital technology and the reduction of equipment circuit size that it is possible to build a completely automatic camera system capable of doing so many additional functions and handling them so well. Because they are packaged so simply—modular, interchangeable, compact—it becomes feasible to do the kind of maintenance that's necessary for peak day-in, day-out performance.

And, with the increased stability of equipment, it has become possible and practical to automate parts

One of TV broadcasting's crucial components is, as usual, readily available from stock and its operating cost is lower than ever.

There is only one Plumbicon*

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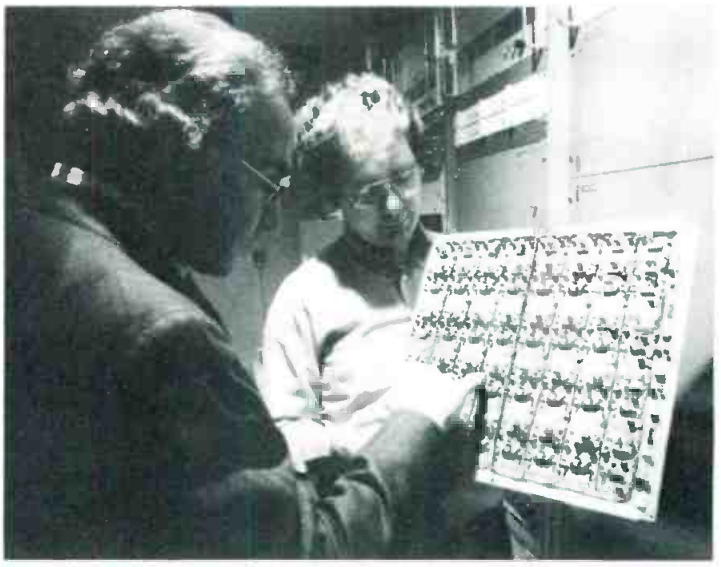
North American Philips Electronic Component Corporation

On to the maintenance shop. Stan Macie (seated) discusses a monitor problem with Blake and de Satnick.



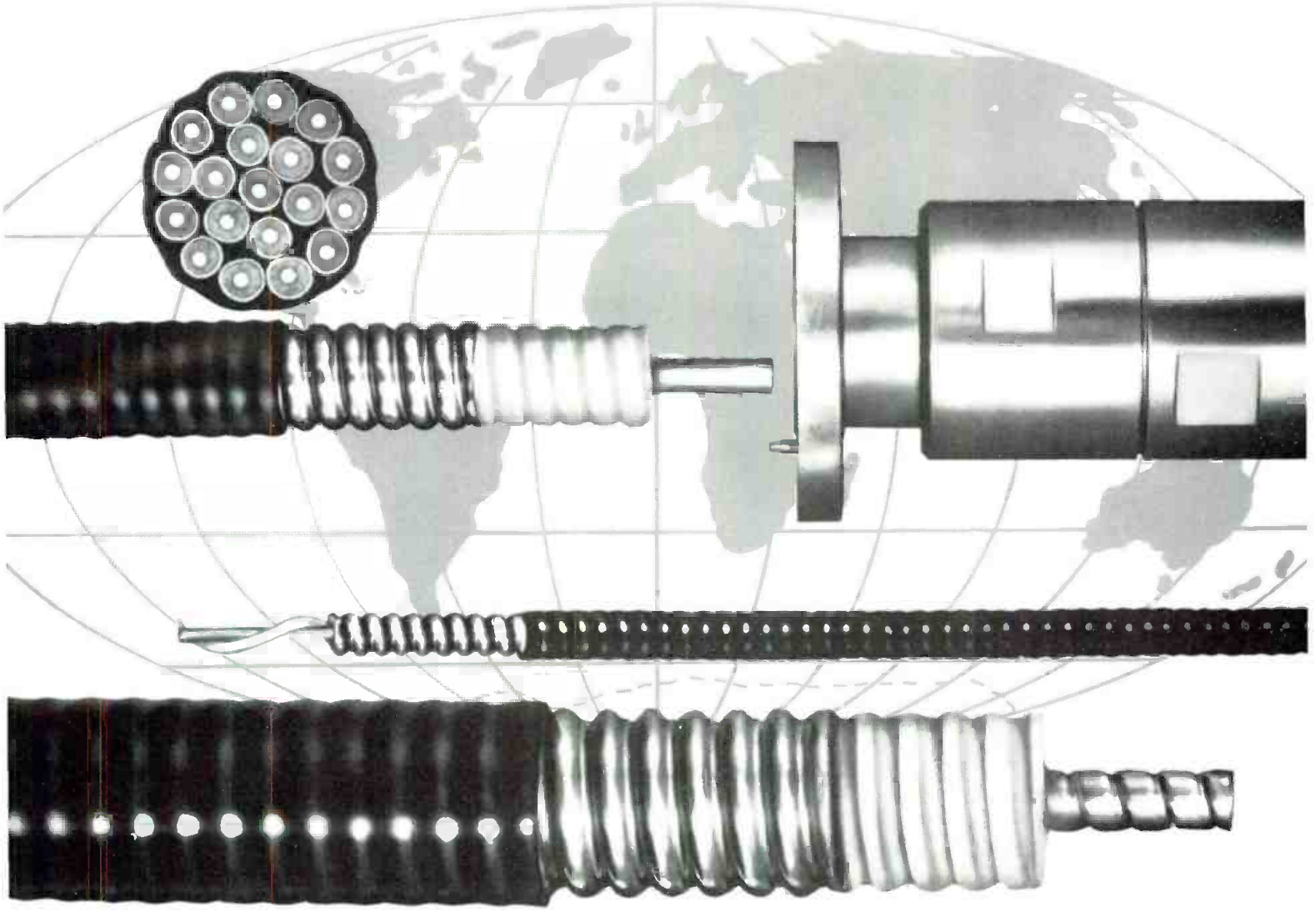
Technician Ira Goldstone and de Satnick inspect a board out of the studio switcher.

Working his way through another day, de Satnick is called in to take part in a capital budget meeting. Involved in the discussion are (L. to R.) Dr. Leo Beranek, President; Robert Bennet, VP & General Manager; James Miller, Director of Business Affairs & Controller; and de Satnick. In other words, WCVB takes the team approach right into the decision-making process.

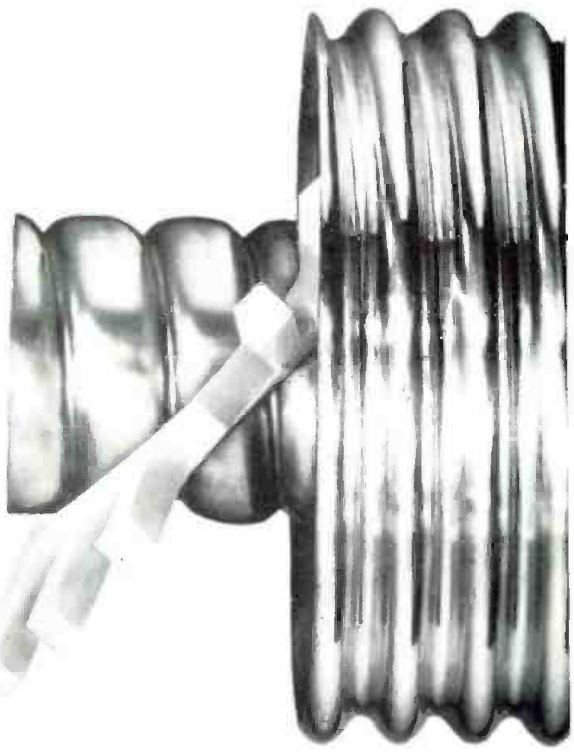
of the operation which affect cost/economy without sacrificing performance. A prime example of this is the industry trend to transmitter automation. Here at WCVB-TV, our people who work at the transmitter site are engaged in maintenance, while the actual day-to-day operation and control of transmitter parameters is carried on from our Master Control location at the station itself.

In the course of the day I will meet—sometimes in depth, sometimes "touching base"—with all key engineering personnel, filling in for them input from other areas of management which might influence their own decisions. I speak with the people who are scheduling technical personnel and facilities, maintenance people, operations people, production people, lighting people, etc.

All these daily verbal contacts are necessary for the Director of Engineering in order to keep himself informed, and to make sure that his people are informed of everything they need to know about this very complex business of producing 51 hours of locally produced television programming each week. (A figure, by the way, which we believe to be the greatest in the country.) □



WORLD LEADERSHIP IN COAXIAL CABLES AND WAVEGUIDES



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FCC explains frequency measurements

John M. Taff
Rules and Standards Division,
FCC Broadcast Bureau

In mid-1973, the Commission amended its rules concerning the use of frequency monitors at broadcast stations. The rules were amended by: deleting the requirement that AM and FM broadcasting stations be equipped with a type approved frequency monitor; deleting the requirement that frequency monitor readings be entered in the station Operating Log at three-hour intervals; deleting the requirement that SCA and stereo pilot subcarrier frequencies be checked daily; deleting the requirement that TV stations make daily checks of the visual carrier frequency and the difference between this frequency and the center frequency of the aural transmitter; and, prescribing new requirements that carrier and subcarrier frequencies of AM and FM stations be measured periodically. Originally it was required that frequency measurements be made at intervals not exceeding 31 days; later, the interval was extended to 40 days.

Aura Of Confusion

A steady flow of inquiries concerning the new requirements has led the Commission to conclude that an "aura of confusion" exists regarding the proper interpretation of the new rules. The opportunity is taken here to set matters straight.

In its continuing program concerning the "re-regulation" of broadcasting (see Dec. 1972 Broadcast Engineering), the Commission is striving to update its rules to reflect current technology. Accordingly, frequency monitors and transmitter frequency stability came under scrutiny. Commission experience, and observations from sources outside the Commission, suggested that automatic frequency control technology has resulted in transmitter frequency-stability performance which brings into question the need for requiring that frequencies be continuously monitored. The Commission thus proposed to delete the requirement that AM and FM stations be equipped with frequency monitors, and to provide instead that such stations make frequency measurements at specified intervals. (These proposed rules were very closely in line with comparable TV rules which had been adopted in 1964.) On the basis of the record established in the proceeding the Commission amended its rules, essentially in accordance with the proposal.

What The New Rules Require

AM and FM stations are no longer required to install a type-approved frequency monitor. However, although frequency monitors are no longer required, there is indeed no prohibition against using such devices. The point is worth emphasizing: Frequency monitors are valuable tools and licensees may, at their option, use them.

One further point must be made, however. In general, a frequency monitor will provide an indication in terms of deviation from an authorized frequency. Simply logging a reading of frequency deviation will **not** meet the new rule requirement, which calls for entering frequency measurement results in the maintenance log. Actual carrier and subcarrier frequencies must be logged. Thus, a frequency monitor reading given in terms of deviation from an authorized frequency can serve in meeting the new rule requirements only insofar as it provides a basis for determining the actual carrier or subcarrier frequency. In other words, an accurate indication of frequency deviation may be used to make an accurate determination of the actual operating frequency, but it is the actual operating frequency that is to be entered in the maintenance log.

40-Day Standard

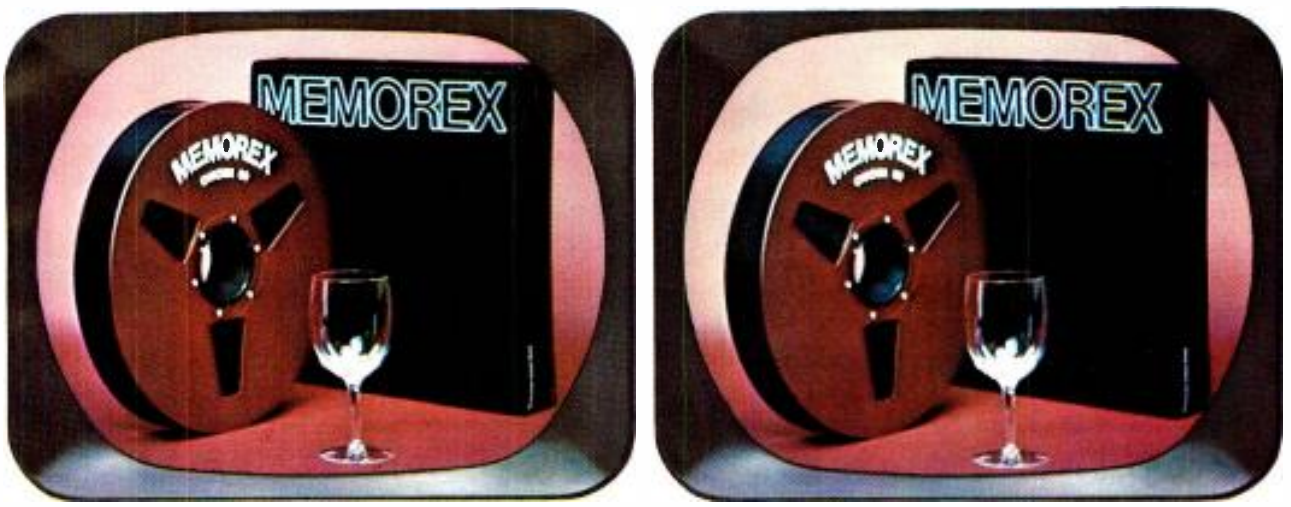
In regard to making the required frequency measurement, the new rules specify that carrier and subcarrier frequencies of AM and FM stations must be measured as often as necessary to insure that operation is maintained within prescribed frequency tolerances. In any event, however, the frequencies must be measured at least once in each calendar month and the interval between successive measurements shall not exceed 40 days. This 40-day standard was adopted partly as an accommodation to licensees

Management Highlights

It matters little that this is another Broadcast Engineering exclusive. What really matters is that your engineering staff reads this article from beginning to end, because it's both our understanding and that of the Commission that there certainly is confusion in the field concerning frequency measurements in lieu of frequency monitor readings.

The difference it makes is that you will be operating in accordance with the Rules, and that will keep you from violations that result in fines.

Is it live or is it Memorex?



(All unretouched photos.)

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Here's the test.

First we put Jack in front of a closed circuit TV monitor. Then we alternated between a live picture and a Memorex Chroma 90 Video Tape picture.

After Jack had studied both for several minutes, we asked him which was live and which was Memorex.

His answer: "I really thought I could tell the difference . . . but I can't."

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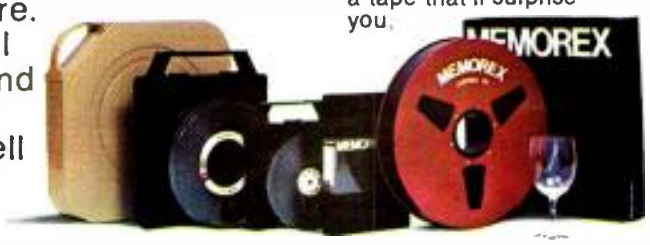

MEMOREX VIDEO TAPE.

Reproduction so true we can ask, "Is it live or is it Memorex?"

For More Details Circle (25) on Reply Card

who are parties to contracts with frequency measuring services, and such contracts call for making frequency measurements on a particular day (not date) of the month. Pursuant to such a schedule the interval between successive measurements may be as much as 35 days. The Commission adopted the 40-day standard with the thought that licensees will schedule their frequency measurements at some shorter interval, but when circumstances require, the schedule may be stretched a bit without running afoul of the rule requirement.

The rules do **not** require that any particular frequency-measuring technique be employed. The Commission has left the licensee the choice of method to be used for measuring frequencies. Many stations will undoubtedly employ the services of a frequency measuring organization but many others will elect to make their own measurements. **The Commission's concern with "methods" goes no farther than being assured that accurate results are obtained. This consideration should also be the licensee primary concern.**

In regard to selecting a method for measuring frequencies, the question which the Commission hears most often is: "Can I use my frequency monitor to measure frequency?" The direct answer is "yes!"—but there are qualifications. What the Commission requires is that frequencies be accurately measured. If the licensee is confident that his frequency monitor will give accurate results, he may use it to make his frequency measurements. If his confidence in the device is ill-founded, he runs a risk.

On the matter of accuracy of results, the new rules refer to the primary frequency standard maintained by the National Bureau of Standards (NBS) and the standard signals of stations WWV, WWVB, WWVH and WWVL operated by the NBS. The purpose of these references is to advise licensees that the identified frequency-standard sources will be the basis for determining accuracy. The fundamental concern of a licensee should therefore be that the frequency measuring technique employed must provide results which will withstand comparison with these standards. While the Commission has not prescribed an allowable tolerance within which compared frequencies must agree, reason demands that it show conclusively that the station frequency is maintained within the frequency tolerance prescribed in the rules.

Frequency measurement results are to be entered in the station's maintenance log. As previously noted, the entry must show the actual frequency. An entry indicating only the measured deviation from an authorized frequency does not comply with the rule. The entry must include the date the measurement was made and a notation describing the method employed. Licensees who subscribe to the services of a frequency measuring organization are frequently notified of the results some few days after the measurement was actually made. Under these circumstances the results are to be entered in the then current page of the maintenance log and the date the measurement was actually made is to be shown.

Television Checks

The new rules, as they relate to television, no longer require that frequencies be checked daily. The existing requirement that the visual carrier frequency and the difference between the visual carrier and the center frequency of the aural transmitter be measured at least once each month is retained. The Commission did not amend the TV rules to specify a maximum allowable 40-day interval between measurements simply because the present rule has been on the books for some 10 years and the Commission has had no reports of any real difficulties in the application of the existing standard.

As a final matter, the Auxiliary Transmitter rules include new requirements that frequency measurements be made. These rules were amended merely to make clear that, if an auxiliary transmitter is used in place of the main transmitter for a period exceeding 40 days, the requirement regarding frequency measurements that would have obtained for the main transmitter shall obtain for the auxiliary transmitter.

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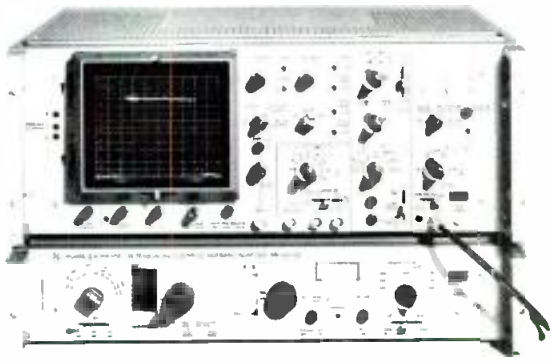

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Pre-NAB convention highlights

The 1974 NAB convention in Houston will certainly be the kind of convention you won't want to miss. It figures to be the biggest yet....in terms of attendees, exhibitors, and vital subjects covered.

The convention will open up Sunday, March 17 at the Albert Thomas Convention and Exhibit Center. The Center should be one of the best the NAB has used in recent years. But one major problem is housing. In this special issue of **Broadcast Engineering,** we've included a pullout exhibitor locator card. On it we have included a list of 147 exhibitors (all that was available to us at press time), floor plans for locating the exhibition booth, a map of hotels near the Center, and a space for writing down exhibitor hospitality suites. This insert can be pulled out and folded over twice, making a small but complete locator guide.

Other hotels for syndicators and attendees are strung out far to the South (from the Convention Center). Fortunately, they at least lay in a straight line in that direction. The exhibitor hotels are within walking distance from the Center.

We know the "super bowl convention" of the broadcast industry will be vital by the very nature of its subject matter. Surely the question of energy conservation will be considered along with renewals, program percentages, Pay/Cable TV, and regulations. But equally important will be the new equipment in the exhibit areas. Later in this issue of BE, we've included some of the equipment you can expect to see. We'll continue the new equipment coverage in our May convention wrap-up issue. Some manufacturers will not release information on their new products until they unveil them at the convention.

NAB Activities

You should be up to date on Association activities, even if you don't attend the convention. So let's

Main entrance view of the exhibit and convention center, the scene of the upcoming annual NAB convention.

take a look at some of their recent actions and proposals.

The Board of Directors of the NAB has pledged the Association to coordinate and assist campaigns to help the public understand the energy crisis.

NAB President Vincent T. Wasilewski said a reduction of broadcast hours to conserve electricity "would not be in the national interest" because it would deprive the public of a vital service.

Wasilewski, at the invitation of President Nixon, joined other key trade association executives at a White House meeting on the energy crisis January 25. William Simon, Federal Energy Administrator and other administration officials also were in attendance.

In a resolution adopted at its current meeting in St. Maarten, Netherlands Antilles, the Board said broadcasters "are uniquely positioned to provide essential and accurate information as well as to promote a spirit of cooperation among the American people."

It pointed out that since efforts to inform the public through radio and television are so extensive, NAB "will seek 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."

Replying to suggestions that broadcasters curtail their services in order to conserve electricity, Wasilewski said the energy crisis "has served to demonstrate that broadcasting constitutes the nation's only instantaneous national and local service for news, information, and emergency alerts. No other medium of communication provides the immediacy possible through broadcasting."

He said that to deny the American public this "vital service during a portion of every day would cut communications between the public and the government itself and could endanger the nation's very security...

"Additionally, the availability of radio and television service will encourage people to restrict other activities, thus saving other more expensive forms of energy."

The NAB president said that "in view of these consequences, measured against an insignificant energy saving amounting to no more than a few hundredths of one percent of energy consumed, reduction of hours by radio and television stations would not be in the national interest."

Radio Board Report

The Radio Board of Directors of the NAB has adopted unanimously a resolution opposing any extension by cable or other means of campus radio and other carrier current systems offering broadcast type services.

The resolution, adopted at the Board's winter meeting in St. Maarten, Netherlands Antilles, was not aimed at campus radio nor intended to inhibit its service to college students. Carrier current

campus systems serve an important role not only in providing students with specialized broadcast services but also constitute a valuable training ground for future broadcasters.

What the resolution does oppose is the expansion of these and other broadcast type carrier current systems into other areas. Such extensions can be accomplished by feeding the broadcasts into cable systems, by rebroadcasting on other stations or by translators, or by interconnecting one carrier current system with another.

In another action, the Board voted to support all-channel radio legislation which would require that all sets costing $15 or more be equipped to receive both AM and FM broadcasts.

The Board also instructed the NAB staff to meet with the Federal Highway Administrator to discuss the relationship between broadcasters and the government in relaying to the public highway safety information on weather, traffic conditions, etc.

It also asked the staff to develop in cooperation with NAB's small market radio and/or membership committee ways and means of increasing management services to member stations.

The Board ratified the appointment of four new members to the Radio Code Board: Jack G. Thayer, vice president and general manager, Nationwide Communications, Columbus, O.; Arthur M. Mortenson, president and general manager, KGIB, Los Angeles, and Carl V. Venters, general manager, WPTF, Raleigh, N.C., who will serve two-year terms beginning after this year's convention in Houston, and Hal J. Davis, vice president, KITE, San Antonio, Tex., who fills the unexpired term of J. C. Stallings (deceased) through the 1975 convention.

Reappointed for second two-year terms through 1976 were Jack Timmons, general manager, KWKH, Shreveport, La., and Jim Ward, vice president and general manager, WLAC, Nashville, Tenn.

William Hansen, general manager, WJOL, Joliet, Ill., was reappointed Code Board Chairman. His term expires with the 1975 convention, along with those of Jerry Fitch, president, KDGO, Durango, Colo., and Robert Harter, vice president and general manager, WHO, Des Moines, Ia.

TV Code Set-up Remains Intact

In response to a proposal that the Television Code Authority be separated from NAB and that non-broadcasters serve on the TV Code Review Board, the Television Board of the National Association of Broadcasters has voted unanimously to continue the Code Authority and TV Code Board as they are now constituted.

The decision was based on the conviction that the vital concept of industry self-regulation should be preserved.

Futher, the Board pointed out that the broadcaster constantly is in touch with members of his community and is attuned to the variety of opinions held by his audience. It reiterated that the Code Review Board always welcomes input from all segments of the public and noted that many Code changes have come about as a result of suggestions by various members of the public.

In another action, the TV Board voted that all NAB member television stations shall be required to be subscribers to the Television Code as of April 1, 1976. (There's that ominous date, again.)

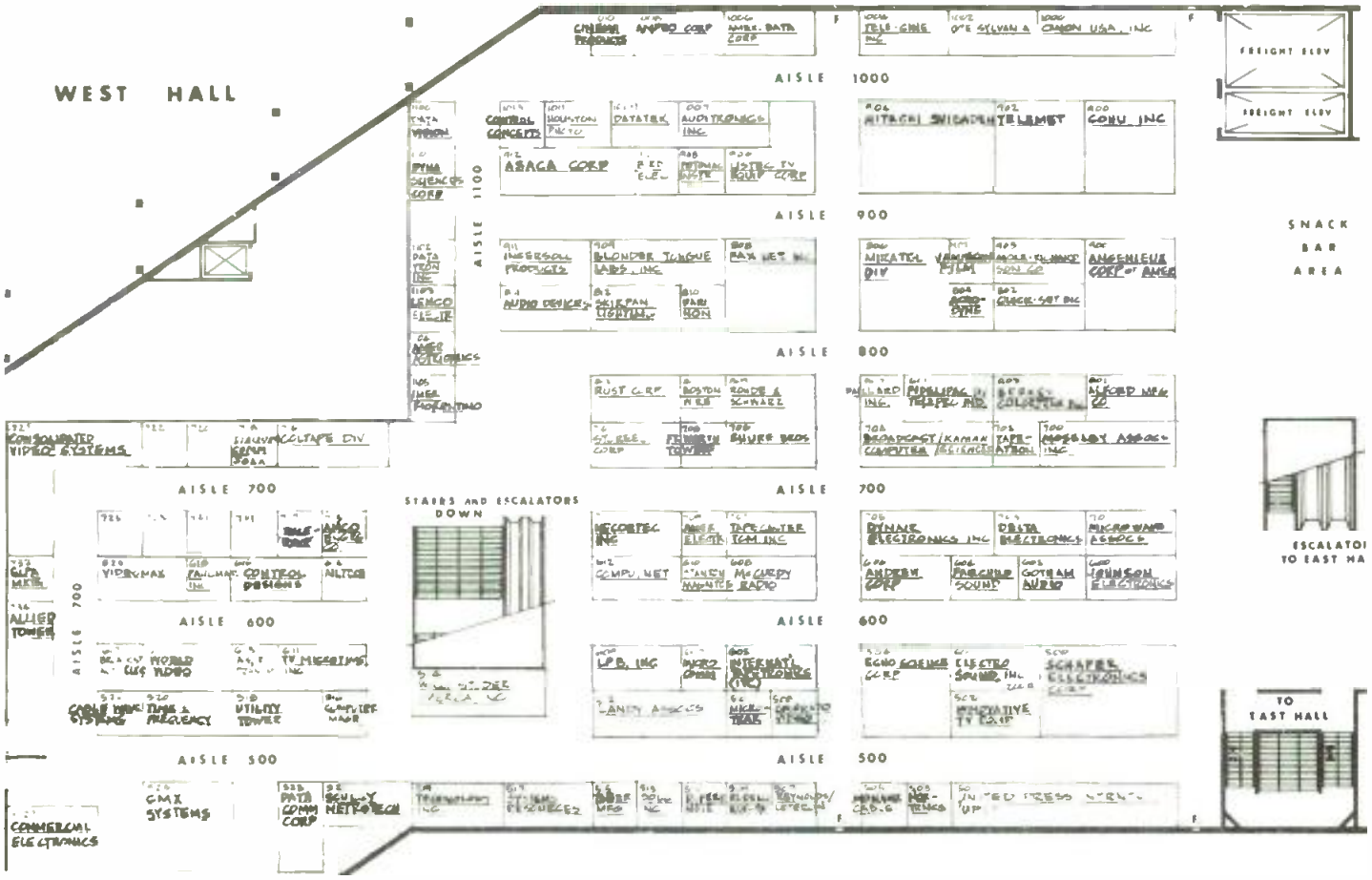
It also voted unanimously to adjust Code fees in a manner that will result in an increase in fees for larger stations and a decrease for smaller stations. The adjustments, to take place in steps over the next two years, recognize differences between network and independent stations, between VHF and UHF stations, and between intermixed and de-intermixed markets.

In other actions, the Board:

- Voted to conduct future elections of TV Board members by mail ballot. The 12 elected Board members now are chosen (six each year) at the annual NAB convention by member station executives in attendance to serve two-year terms. (The three television networks designate their board members, bringing the total to 15).
- Decided against a proposal that nine of the elected members represent nine geographical districts and that the remaining three be elected at-large.
- Vigoriously opposed any change in the non-duplication rules applying to cable television. The rules prohibit the simultaneous duplication on another CATV channel of a program being aired by a local station that must be picked up by the CATV system.

Wayne Kearl, president and general manager, KENS-TV, San Antonio, Tex., was designated Chairman of the Television Code Review Board at the conclusion of

Broadcast Engineering locator guide



Acrodyne Indust., 804 West Hall
Ailtech, 614 West Hall
Alford Mfg. Co., 801 West Hall
Allied Tower, 734 West Hall
Amer. Astrionics, 1104 West Hall
Amer. Data Corp., 1006 West Hall
Amer. Elect., 709 West Hall
Amer. Elect. Labs, Inc., 410 East Hall
Amco Eng. Co., 715 West Hall
Ampex Corp., 202 East Hall
Ampro Corp., 1008 West Hall
Andrew Corp., 606 West Hall
Angenieux Corp. of Amer., 800 West Hall
A & R Transm., 613 West Hall
Asaca Corp., 912 West Hall
Audio Devices, 814 West Hall
Auditronic Inc., 1007 West Hall

Berkey Colortran, Inc., 803 West Hall
Bird Elect., 910 West Hall
Blonder-Tongue Labs, Inc. 709 West Hall
Robert Bosch Corp., 408 East Hall
Boston Wire & Cable, 811 West Hall
Broadcast Auto. Elect., 617 West Hall
Broadcast Computer, 704 West Hall
Broadcast Elect. Inc., 104 East Hall

Cable Wave Systems, 522 West Hall
Canon USA, Inc., 1000 West Hall
CBS Labs, 107 East Hall
CCA Elect. Corp., 112 East Hall
Central Dynamics, 412 East Hall
Cinema Prods., 1010 West Hall
CMX Systems, 525 West Hall
Cohu, Inc., 900 West Hall
Collins Radio, 303 East Hall
Colorado Video, 508 West Hall
Coltape Div., 716 West Hall
Commercial Elect., 527 West Hall
Compu/Net, 612 West Hall
Computer Image, 516 West Hall
Conrac Div., 402 East Hall
Consolidated Video Systems, 727 West Hall
Continental Elect., 413 East Hall
Control Concepts, 1013 West Hall
Control Designs, 616 West Hall

Data Comm. Corp., 523 West Hall
Datatek, 1009 West Hall
Datatron, 1102 West Hall
Datavision, 1100 West Hall
Delta Elect., 703 West Hall
Dialetric Comm., 718 West Hall
Dynair Elect., Inc., 705 West Hall
Dynasciences Corp., 1101 West Hall

Eastman Kodak Co., 110 East Hall
Echo Science Corp., 504 West Hall
Elect. Missiles & Comm., Inc., 208 East Hall
Electro Sound, Inc., 601 West Hall
Elpa Marketing, 732 West Hall

Fairchild Sound, 604 West Hall
Farinon, 810 West Hall
Fax Net, Inc., 808 West Hall
Fidelipac Div., 805 West Hall
Ft. Worth Tower, 708 West Hall

Gates, 200 East Hall
Gotham Audio, 602 West Hall
Grass Valley, 406 East Hall
GTE Sylvania, 1002 West Hall

Hitachi Shibaden, 904 West Hall
Houston Photo, 1011 West Hall

Imero Fiorentino, 1105 West Hall
Ingersoll Prods., 911 West Hall
Innovative TV Equip., 502 West Hall
Internatl. Good Music, 109 East Hall
Internatl. Tapetronics, 605 West Hall
Internatl. Video Corp., 105 East Hall

Jamieson Film, 907 West Hall
Johnson Elect., 600 West Hall

Kaman Sciences, 704 West Hall
Kliegl Bros., 400 East Hall

Landy Assoc., 512 West Hall
Lenco Elect., 1103 West Hall
Listec TV Equip. Corp., 906 West Hall
LPB, Inc., 609 West Hall

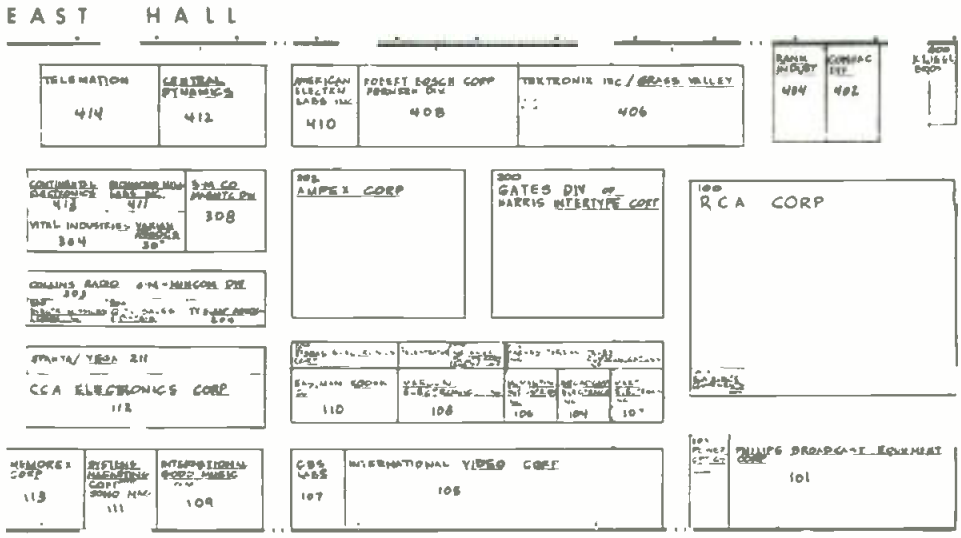
3M Co.-Magnetic Div., 300 East Hall
3M Co.-Mincom Div., 301 East Hall
Marconi Elect., Inc., 108 East Hall
Marti Elect. Inc., 102 East Hall
Memorex Corp., 113 East Hall
McCurdy Radio, 608 West Hall
McMartin Indust. Inc., 106 East Hall
Micro Comm., 607 West Hall
Microtrak, 510 West Hall
Microwave Assoc., 701 West Hall
Miratel Div., 806 West Hall
Mohawk Cable, 505 West Hall
Mole-Richardson Co., 903 West Hall
Moseley Assoc. Inc., 700 West Hall

Rupert Neve, 511 West Hall
No. Amer. Philips Corp., AKG Div., 205 East Hall
Nortronics, 503 West Hall

Paillard Inc., 807 West Hall
Paulmar Inc., 618 West Hall
Philips Bcst. Equip. Corp., 101 East Hall
Potomac Instru., 908 West Hall
Power Optics Inc., 103 East Hall

Q-TV Sales & Distrib., 206 East Hall
Quick-Set, Inc., 802 West Hall

Rank Indust., 404 East Hall
RCA, 100 East Hall
RCA Elect. Components, 100A East Hall
Recortec Indust., 711 West Hall
Reynolds/Leteron, 507 West Hall
Richmond Hill Labs Inc., 411 East Hall
Rodelco Elect., 509 West Hall
Rohde & Schwarz, 809 West Hall
Rust Corp., 813 West Hall



Sarkes-Tarzian, 203 East Hall
Schafer Elect. Corp., 500 West Hall
Scully Metrotech, 523 West Hall
Shure Bros., 706 West Hall
Skirpan Lighting, 812 West Hall
Soll Inc., 513 West Hall
Sono-Mag, 111 East Hall
Sparta, 211 East Hall
Stanton Magnetics, 610 West Hall
Storeel Corp., 710 West Hall
Systems Marketing Corp., 111 East Hall
Systems Resources, 517 West Hall

Taber Mfg., 515 West Hall
Tape-Athon, 702 West Hall
Tapecaster TCM, Inc., 707 West Hall
Technology Inc., 519 West Hall
Tektronix, Inc. 406 East Hall
Tele-Cine Inc., 1004 West Hall
Teledyne, 717 West Hall

TeleMation, 414 East Hall
Telemet, 902 West Hall
Telepro Indust., 805 West Hall
Telestrator, 207 East Hall
Telex Comm. Inc., 201 East Hall
Time & Freq., 520 West Hall
TV Equip. Assoc., 204 East Hall
TV Microtime Inc., 611 West Hall

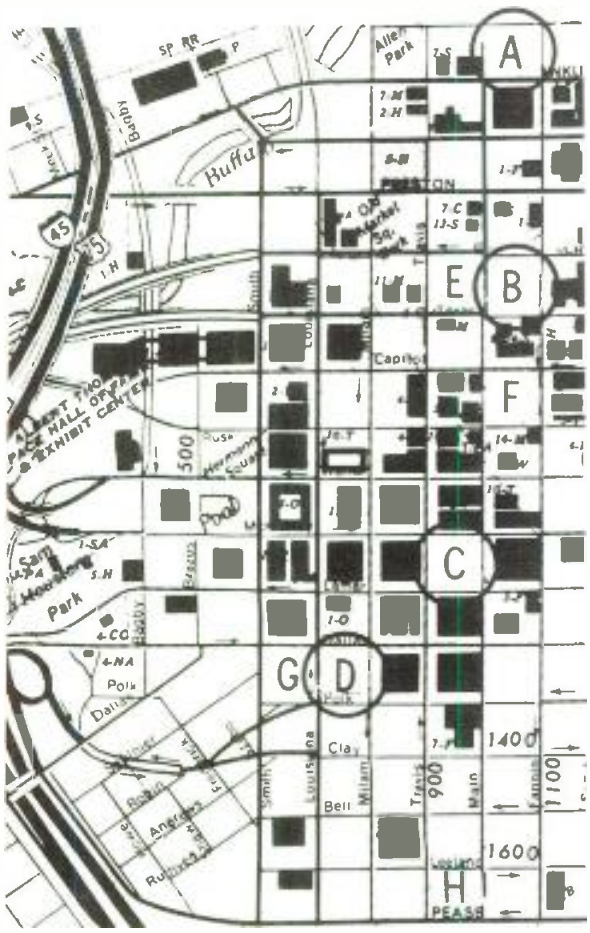
United Press Internatl., 501 West Hall
Utility Tower, 518 West Hall

Varian Assoc., 302 East Hall
Vega, 211 East Hall
Videomax, 620 West Hall
Visual Elect. Corp., 209 East Hall
Vital Indust., 304 East Hall

Willi Studer Amer. Inc., 514 West Hall
World Video, 615 West Hall

Appointments

Exhibitor	Hotel	Suite



Note: All Circled letters indicate exhibitor hotels. The remainder are attendee hotels located close to the Center.

A. Continental Houston
B. Downtowner
C. Lamar Hotel
D. Sheraton Lincoln
E. Rice Hotel
F. Texas State
G. Hyatt Regency
H. Savoy Hotel

this year's NAB Convention in Houston, March 20. He succeeds Charles Batson, president, Cosmos Broadcasting Corp., Columbia, S. C., whose term expires.

The Board ratified the appointment of two new Code Board members — Wallace J. Jorgenson, executive vice president, Jefferson-Pilot Broadcasting Co., Charlotte, N.C., and Robert J. Rich, general manager, WDSM-TV, Duluth, Minn. — to serve two-year terms starting at the end of the Convention.

Kearl and Joseph C. Drilling, president of KJEO-TV, Fresno, Calif., were reappointed for two-year terms from the 1974 to the 1976 convention.

Members whose terms expire after the 1975 convention are Harold Grams, vice president, KSD-TV, St. Louis, Mo., and Roger D. Rice, vice president and general manager, KTVU-TV, Oakland, Calif.

Non-Duplication Rules

The NAB has petitioned the Federal Communications Commission to reject a request by the National Cable Television Association that FCC scrap its rule prohibiting the duplication of network programming by CATV systems.

NAB's 37-page statement in opposition said NCTA's petition is "blatantly inconsistent" with the so-called consensus agreement between broadcasters and cable operators that CATV systems would not duplicate "simultaneously" network programming being aired by a local station.

The NAB statement pointed out that a local station's audience is "fractionalized" when its network programming, which a CATV system must carry, is duplicated by the same network programming which CATV picks up on a distant signal and puts on another channel.

Noting that cable systems so far have failed to accept arbitrated copyright fees as agreed to in the consensus, NAB said the cable association now would "add insult to injury by seeking to do away with the non-duplication protection which it agreed to in the consensus."

NAB new product guide

Audio Console

Broadcast Electronics, Inc. announces the introduction of a full line of SPOTMASTER® audio consoles developed to satisfy the most discriminating Broadcaster and Sound Man. An important feature of these new SPOTMASTER consoles is versatility—allowing the Broadcaster to change program formats without making his console obsolete. Flexibility is enhanced by high and low level inputs for all mixing channels, identical program and audition outputs, and separate mono matrix outputs in stereo consoles.

The SPOTMASTER console product line consists of nine models—a four-channel monophonic console, two five-channel monophonic consoles, two five-channel stereo consoles, two eight-channel headphone driver amplifiers, and cue amplifiers with internal cue speaker. All five and eight-channel models feature electronic switching to mixing channels with FET's.

Construction is fully solid-state with integral power supplies and plug-in modular electronics.

For More Details Circle (75) on Reply Card

Digital Video Signal Corrector

Consolidated Video Systems has introduced the CVS 504—a single digital video signal corrector which will process and correct almost any helical video signal up to braodcastable color standards. The CVS 504 processes signals from all 1/4", 1/2", 3/4", 1" and 2" non-segmented helical VTRs.

This new product follows the successful introduction of the company's line of digital video signal correctors at the 1973 NAB in Washington, D.C.

Interfacing the CVS 504 to any of the various helical formats to produce broadcastable color is accomplished with a combination of three simple function buttons. Add to this capability a full compliment of video output controls and you have a truly "universal" digitized helical video signal perfector.

For example, operators can now take the video output from a Sony U-matic and dub up to a quad. This extraordinary process is made possible by an exclusive CVS "color interlacer" switch. The result is phased interlaced color when played back on a quadraplex recorder. Or, the operator can take an EIJA 1/2" recorder and use it as a camera source locked to house sync. If the recorder does not have a capstan servo, he can still drive a camera from the internal sync generator in the CVS 504 and do special effects between the recorder and the camera.

The CVS 504 is not only a digital video signal corrector but also features a built-in processing amplifier, an EIA sync generator and velocity compensation. The user has the further option of adding a true genlock sync generator which is available in a field installable plug-in board.

For More Details Circle (76) on Reply Card

Tape Care Products

The Recorder Care Division of **Nortronics Company, Inc.**, has introduced two new products.

The head demagnetizer generates a magnetic field from a flexible probe tip that reaches into tight spaces to remove residual magnetism from heads, guides and other metallic parts. Quality Microswitch activates with fingertip pressure and immediately de-activates when the QM-202 is put down for burnout proof operation. It features an attractive, red Cycloac case and convenient coiled AC power cord. The probe tip is covered with a soft plastic sheath that cannot scratch sensitive head faces.

The Nortronics bulk eraser generates a powerful magnetic field (60 Hz) that will erase reels, cassettes and cartridges down to the level of virgin tape. Useable with tapes to ½" width and features the same Microswitch activation and burn-out proof design as QM-202 above.

For More Details Circle (77) on Reply Card

Audio Control Consoles

The emphasis at the Neve booth this year at the NAB will be high quality sound control consoles for the broadcasting industry. Neve manufacturers custom as well as standard sound mixers and switchers.

Complete information will be available on a new radio continuity and DJ console which incorporates the following facilities: 4 microphone inputs with limiters, high quality slide faders pan pots, and reverberation facilities; 6 line stereo channels with high quality slide faders; Telephone input channel; 3 volume indicators; 2 voice-over units; patch panel; and cue and transmission light facility.

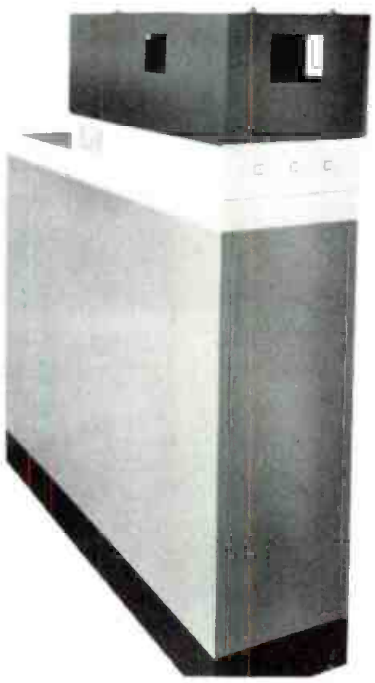
For More Details Circle (78) on Reply Card

Optical Multiplexer

The new Model M-3 Optical Multiplexer from **Cohu** is designed for the specific demands of today's broadcasters.

The M-3 was intended from it's conception to be the natural film chain mate to Cohu's "Performer" the Model 1500 Color Film Camera. Together they deliver the finest in color

film reproduction as well as operational benefits and cost related advantages.



A selection of any of three projector inputs is available for a single TV film camera output. Distortion free, optically flat mirrors with high efficiency coatings for maximum reflectance are each positioned by a scotch yoke mechanism and move in a vertical direction at a speed of 50 milliseconds. A total of five solid-state servo amplifiers are provided; two to position mirrors and three to operate neutral density filter wheels. The filter wheels used in the M-3 have a continuous range of light transmittances from 1% to nearly 100% and have a rapid response time of 200 milliseconds.

For More Details Circle (79) on Reply Card

16mm 400-Foot Magazine

Cinema Products Corporation announces the availability of a completely new type of 400 ft. magazine, designed and manufactured by Cinema Products, for all 16mm cameras that presently utilize the Mitchell-type magazine.

The new PLC-4 magazine is made of high impact glass-filled Lexan® (an extremely rugged material used in the manufacture of hard hats and football helmets), which completely eliminates the problem of film spotting caused by particles of magnesium adhering to the film emulsion and then reacting in the developing bath.

The new PLC-4 is a compartment-type magazine, permitting the use of

either 200 or 400 ft. darkroom cores or daylight load spools. It utilizes hinged doors which provide quick access for loading and unloading. The doors have a triple step light trap to insure against light leaks. Two thumb activated latches on each door guarantee positive safe closure. If a latch is not fully secured, a bright luminescent orange band is visible to alert the camera operator. The toe of the magazine is a removable aluminum insert which makes repair and replacement of the toe a simple matter.

For More Details Circle (80) on Reply Card

TV Automation System

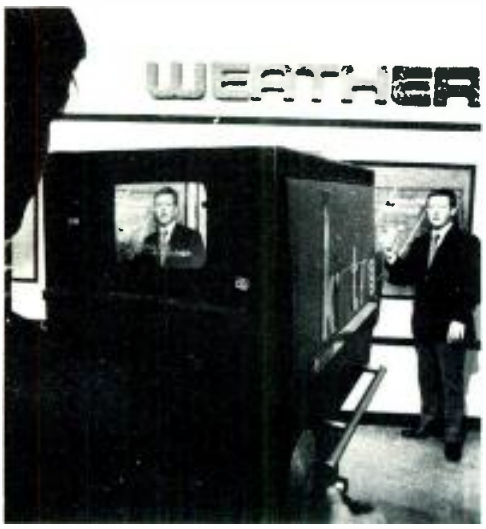
Vital automation for television will be on display in the Vital booth. And this system uses the new modular

(*Continued on page 84*)

ENTERPRISE ELECTRONICS CORPORATION

ANNOUNCES ITS NEW

WR50



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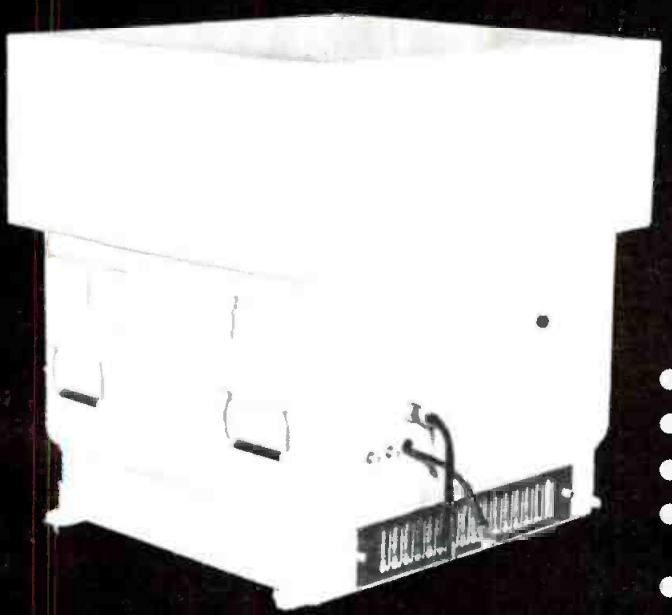

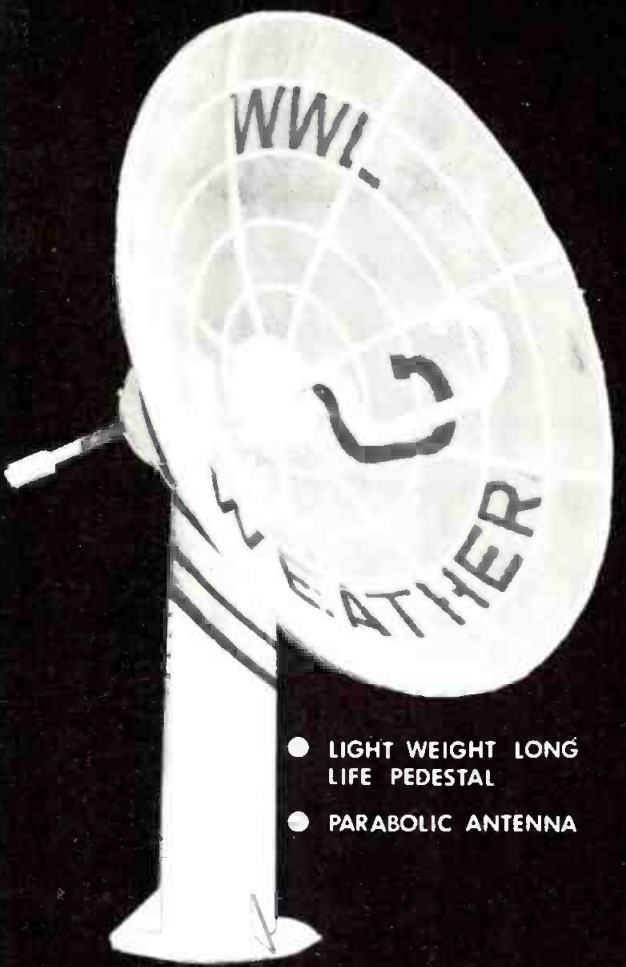

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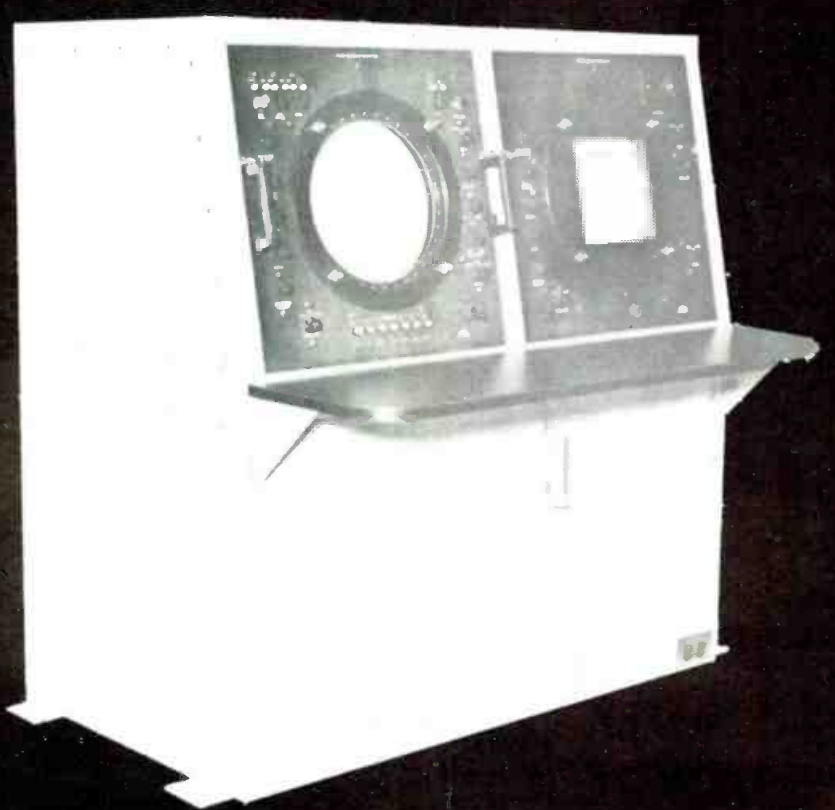

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For More Details Circle (28) on Reply Card

Who cares about image?

By E. Carlton Winckler

Senior Production Consultant, Imero Fiorentino Associates, New York City.

In an industry so largely devoted to promoting "image" — product image, sponsor image, station image, personality image, company image — it is truly remarkable to find so little attention being paid to the image our own facilities and production services present to our clients. There are, of course, many plants where attention has been given to this image factor (to the benefit of their sales effort), but unfortunately these smart operations are not in the majority.

In the highly competitive world of advertising and sales, tremendous amounts of time, energy and money are expended in ideal product packaging, knowing that attractive containers receive extra consideration. In the making of television commercials, unlimited effort goes into making sure that the sleek surrounds of the package enhance its image. Obviously the advertiser and his agency people demanding such service are extremely image conscious.

Yet, those of us who wish to sell our production facilities to these image conscious people for the making of their commercials or programs often neglect our own approach. We allow our facilities to become cluttered, patchy-looking and uncomfortable. Smart, well-appointed premises can afford production houses a genuine sales advantage, the good housekeeping inducing in the clients' mind a feeling of quality, assurance and interest in their project. Let's take a hard, critical look at our stages, control rooms, editing spaces, our viewing and conference rooms, to see how they appear to our customers.

Enter, Stage Right

Start with the stage because most often that is the area where ap-

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

- **Fully Digital**
  - ☐ **Telemetry**
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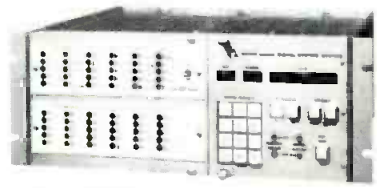


Model DCS-2
Digital Control System

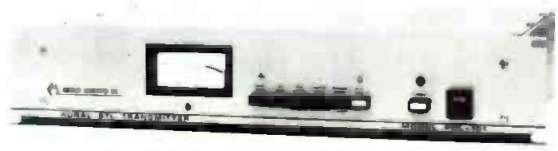
Fully digital remote control of transmitter plants is provided by the Model DCS-2 Digital Control System. Large numbers of telemetry, control and status channels can be accommodated as well as multiple transmitter sites. With the addition of the Computer Option, totally automated operation is possible. Up to 30 parameters are simultaneously displayed on the CRT Terminal provided with this option. Tolerances for all parameters, automatic and fault parameter logging and status/alarm functions are just some of the other features of the DCS-2 Digital Control System.

OTHER MOSELEY ASSOCIATES PRODUCTS

New MODEL SCG-8 SUBCARRIER GENERATOR AND MODEL SCD-8 SUBCARRIER DEMODULATOR

All new circuitry in the Model SCG-8 Subcarrier Generator and SCD-8 Subcarrier Demodulator results in superior performance for an FM subcarrier system. The SCG-8/SCD-8 makes an ideal SCA subcarrier system. Systems are available on all commonly used frequencies in the 25 kHz to 200 kHz spectrum. Only 1¾" of rack space is required for each unit. Unique audio filter mounting enables tailoring response to the intended application.

AURAL STUDIO-TRANSMITTER LINKS SYSTEMS FOR ALL STL BANDS



Monaural and composite systems for all domestic and international aural STL bands are available from Moseley Associates — the pioneers of solid-state STL's, the pioneers of the dual configuration, and the pioneers of the composite STL.

SECOND GENERATION SOLID-STATE REMOTE PICKUP LINKS

Models RPL-3 and RPL-4 Systems provide outstanding performance in the 160 MHz and 450 MHz bands. The transmitters are small-sized and include audio mixing, audio limiting, and operate from AC or DC power sources. Microstripline RF power amplifiers are available for extended coverage . . . from the pioneers in solid-state remote pickup equipment.

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For More Details Circle (29) on Reply Card

. . . at 8:20 this morning our production manager left for New York. While there he reviewed a set of blueprints, saw an old friend, and looked out the window at the skyline of the city. He was back in Boulder at 8:23.

Actually, our man stayed in Boulder while his ears, voice, and eyes traveled. In this case, a phone call made a picture worth about 2000 miles and two days. An ordinary CCTV camera, monitor, and CVI's video conversion equipment gave him the ability to transmit or receive an image of nearly anything over ordinary telephone lines.

It's not facsimile — no paper is involved. The CVI Model 260 Video Compressor actually "squeezes" a TV signal to the point where it occupies no more electronic "space" than your voice. Dial a number virtually anywhere and send pictures. At the receiver, our 261 Video Expander sorts out a series of tones and constructs a big, bright picture on a conventional TV set. It takes about 30 seconds — or one minute if you'd like more detail. Each new image automatically erases the old, or you can retain a scene for as long as you want.

We can do many things with electronic pictures — save time, money, gasoline, jet fuel, and nerves. Give us a call and find out.

cvi Colorado Video Incorporated

NAB Booth #508

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(COLO.VIDEO BDR)

Video instruments for data acquisition, processing, transmission, and display.

For More Details Circle (30) on Reply Card

Management Highlights

You may have ample confidence in your staff and facility, but that's because of your familiarity with the operation at your station. Now enter the client. He probably is not familiar with your staff or facility. What image does he see? And isn't that important? Won't that image affect your business?

It should be explained that as the business profits, so do the employees. The entire team must be aware of the station image. How to develop pride is another subject, but this article will tell you why it's important to work in that direction.

pearance is apt to slip. Are there rarely used devices, scenery, battons, props, tables and left-over graphics stacked in corners, or along the walls just collecting dust? Are uncoiled electric cables left on the floor? How about the lighting equipment.

Applying a coat of paint to doors, frames, rails and racks is a productive slack time activity for stage personal. Brushing down and patching accoustical material will produce striking changes in studio appearance.

Lighting equipment is a fertile field for our image upgrading. Luminaires in most studios are found in various colors, marked with numbers, names and symbols — a paint job on their exterior to make them all alike will probably provide the most spectacular appearance improvement of all.

Incidentally, there is nothing that says luminaires must be black — one studio visited had painted theirs an attractive forest green, giving a very smart modern image to that studio! While speaking of lighting equipment, clean lenses, reflectors and focus mechanisms save time and do a better job in every way, more than repaying the slight effort of keeping these things in shape.

Neatly coiled cables, hung on wall pegs in order of length, are time savers as well as good image.

Look Professional

With the studio clean, neat and looking well organized, there are several other things we can do to further our efficiency image. A simple rack and cabinet arrangement near the set area in a studio to contain color frames, screens, diffusion frames, bulbs, barndoors, lash line, blocks for raising furniture and other small but essential items, saves those irritating client waits while someone rushes to another area of the building to find this material. Having this cabinet on casters to permit placement adjacent to the current shooting area is an even better image builder.

One or two rigid stands to support graphic material at camera lens height waiting in the studio will delight your client, and again save time while strengthening the impression of preparedness. Comfortable chairs for artists and essential guests, with the one for the agency supervisor having an accompanying small table for his script or notes, is a soothing touch. All this indicates your awareness of the participant's hard task in getting the screen image the sponsor demands.

It is very likely that the scuff marks and finger prints on the scenery and the scratched wood and slightly dusty upholstery on the furniture used as props will not show on camera. To those on the set, this tacky look is quite apparent. Talent appreciates having a nice clean fresh atmosphere, equal to a well kept home to work in. And there are many instances where a casual "It's a pleasure to work in this studio," remark by the talent has affected the agency's outlook, and resulted in additional production contracts with the good housekeepers.

On Looking Sharp

Another fine image maker, perhaps the greatest, is crew who are not only attentive to production needs, but who look neatly alert. After all, our stage personnel, regardless of their particular assignment, are to some degree creative artists providing a specialized service — an impression it is nearly impossible to convey while dressed in a dirty shirt and torn pants.

The stage is the area where our clients spend most of the time while using our services. You are justly proud of your production service, so shouldn't your studio reflect this pride, confidence and professionalism? After all, we know from experience that convincing our client of our ability is half the job. A smart stage operation is an easy and inexpensive way toward achieving this conviction.

In The Control Room

Control rooms seem less prone to disorder than stages — I guess because electronic equipment just won't function if it isn't spotless. However, attention to the paint job, comfortable chairs or upholstered stools which allow the producer to see monitors over the heads of the operating personnel, and very careful lighting spells the difference between slick and sloppy.

Carefully placed lights should illuminate strategic operating areas (including the one where your agency man will make notes), without spilling onto monitors or reflecting into occupant's eyes. You are striving to provide the finest production expertise in your area, so let the control room reassure your client that this is indeed the case.

Viewing Room Guidelines

It would be interesting to know how many times, that extremely fine work by a skilled production crew has gone right down the drain by being shown to the client in a bad viewing room. Here is where critical judgements are made, where the seeds of your future business are planted, yet far too often the viewing room hurts your image rather than supports it. Many articles have been devoted to the importance of viewing rooms and how to assure their effectiveness, but I guess another repitition of the guidelines can't hurt — it is certainly an important image area.

(Continued on page 74)

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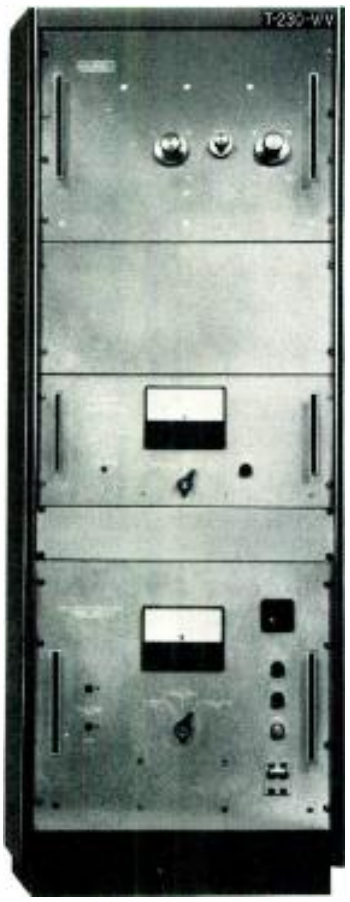

T-230

See the new T-200 Series — Booth 717, NAB '74

New Solid State T-200 Series

T-210

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- performance exceeding all FCC requirements
- true color rebroadcast fidelity
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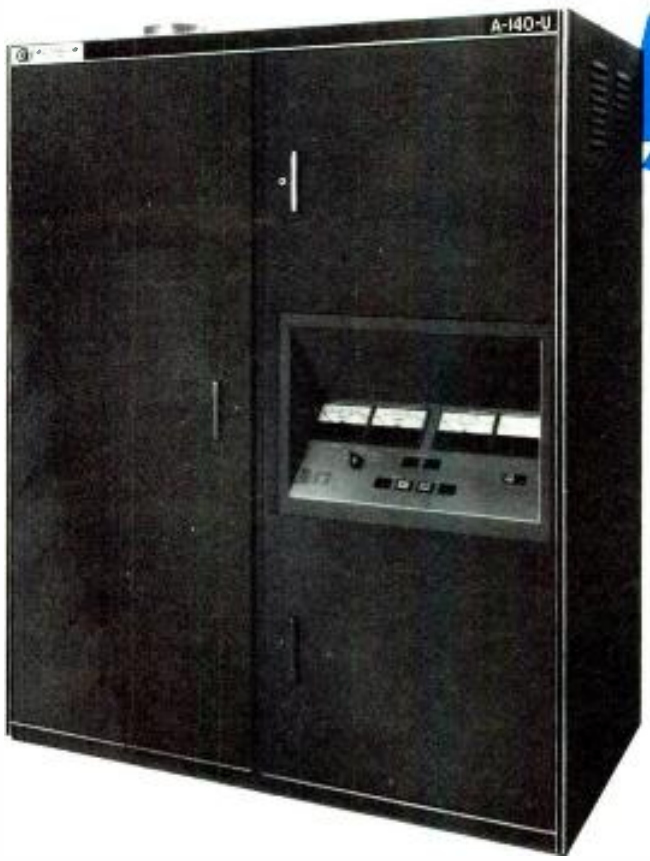
THE BIG ONES



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BIG IN TV POWER

Only Acrodyne offers the ***1 kW Amplifier*** that provides the benefits you have been waiting for.

BIG IN TV BENEFITS

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- RCA-tube and cavity proved in TV service.
- Automatic Status Center monitors and displays all amplifier control functions.
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- Unattended operation.
- Automatic recycling.
- Doors to high voltage areas fully interlocked . . . grounding rod built-in.

BIG IN TV SAVINGS

- High reliability design means ***reduced operational and maintenance costs.***

BIG IN TV RELIABILITY

- Acrodyne's A-140U Series of Amplifiers ***are in use now*** . . . not just on the drawing boards.

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For More Details Circle (32) on Reply Card

WCVB goes with Electronic Journalism

By Ross Kaufman
Asst. CE, WCVB-TV, Boston.

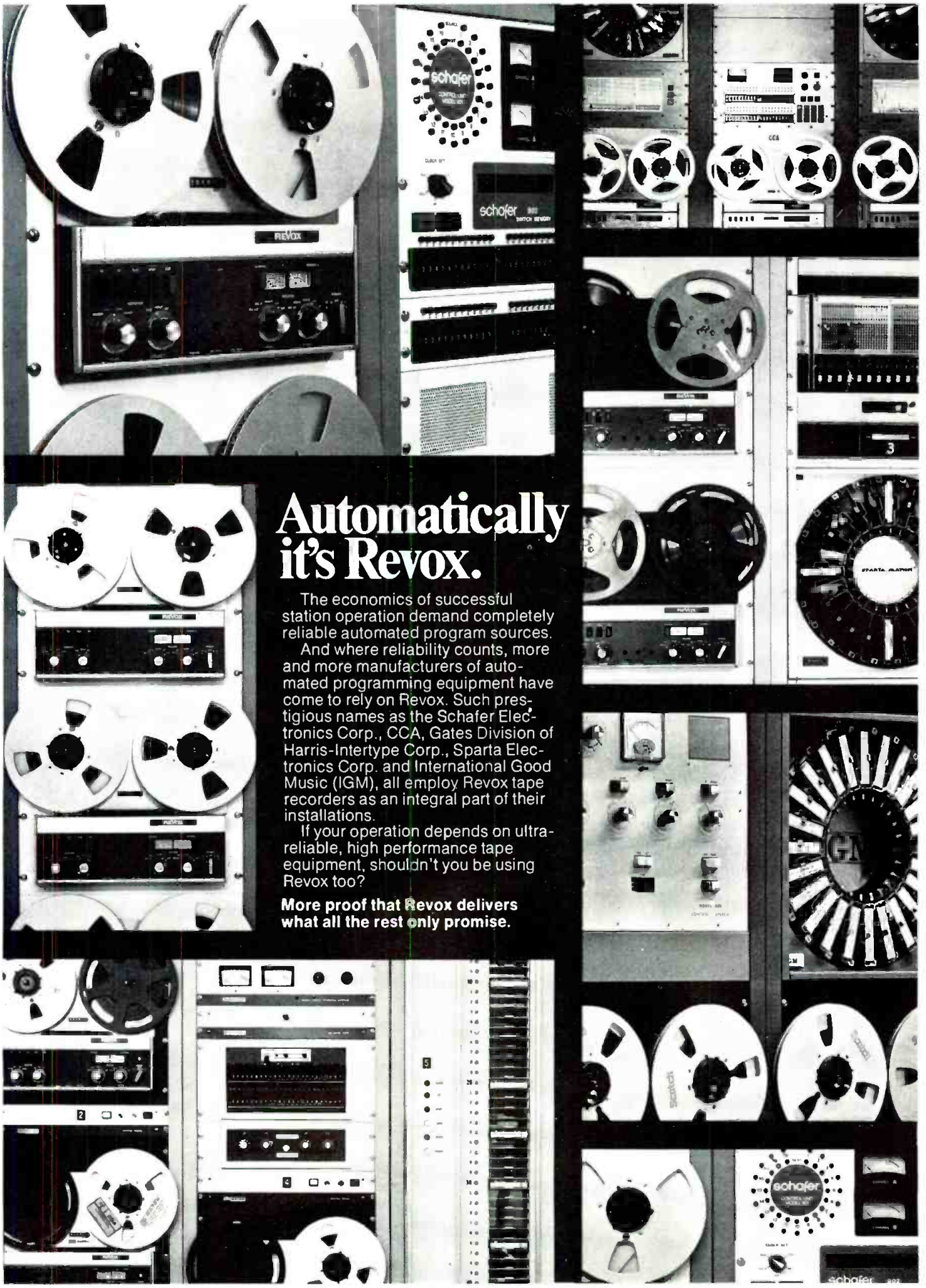
As high winds swept across the Northeast seaboard last Thanksgiving, a horrifying conflagration ignited in some turn-of-the-century warehouses, reducing to ashes miles and miles of city blocks in Chelsea, Massachusetts, creating one of the worst fires in the history of New England. Thousands of people were left homeless as disaster calls for help went out to surrounding cities and towns. Every fire truck and emergency piece of equipment available was rushed to the scene.

Boston's WCVB-TV Channel 5 News Team was also on the disaster site, instantaneously transmitting pictures of the charcoaled ruins by instant live electronic journalism.

The microwave technology, equipment, installation, and operation which brings live journalism into people's living rooms is an interesting story in itself.

WCVB-TV went on the air in March of 1972. From that time it has had a mobile remote van in operation. A single camera unit is

Fig. 1 WCVB on the scene coverage, despite ice and snow, improves on the time factor in electronic journalism.



Automatically it's Revox.

The economics of successful station operation demand completely reliable automated program sources.

And where reliability counts, more and more manufacturers of automated programming equipment have come to rely on Revox. Such prestigious names as the Schafer Electronics Corp., CCA, Gates Division of Harris-Intertype Corp., Sparta Electronics Corp. and International Good Music (IGM), all employ Revox tape recorders as an integral part of their installations.

If your operation depends on ultra-reliable, high performance tape equipment, shouldn't you be using Revox too?

More proof that Revox delivers what all the rest only promise.

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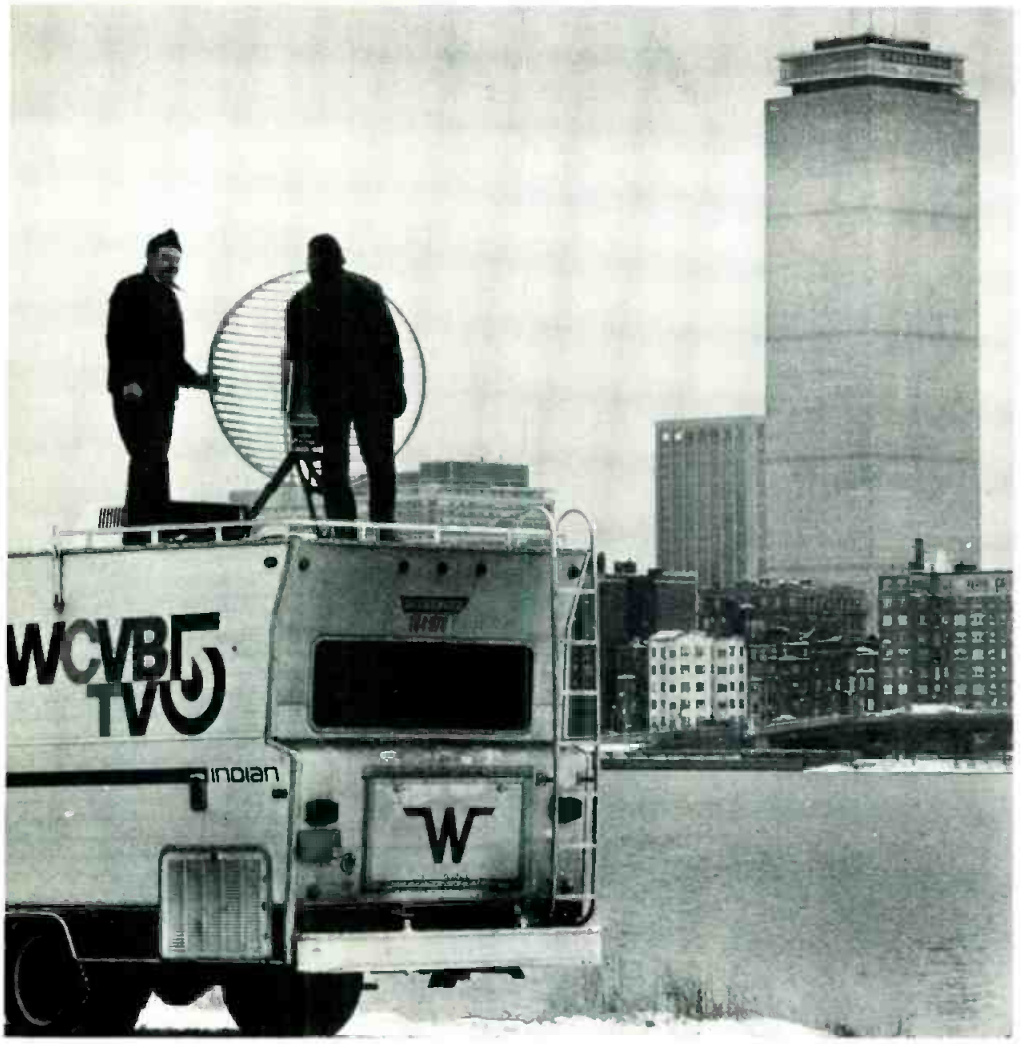

Fig. 2 Scott Obreza and Cal Hoyle align the microwave antenna before coverage of another live news story. The receiving antenna is mounted on the tall building at right.

used to provide on-the-scene material for the 50 hours weekly of locally produced programs at Channel 5.

The news team utilizes equipment manufactured by Microwave Associates of Burlington, Massachusetts. The MA portable B-line telecommunications equipment is a total solid-state, frequency-modulated microwave system. The compactness and virtually trouble-free operation of the portable B-line System enhances its suitability as a communication link for color television transmission. The unit also includes a Norelco PCP-90 camera with control unit, and an Ampex VR-300 quadraplex videotape recorder.

The equipment and support gear is carried in a modified Winnebago recreation vehicle. Modification consisted of mounting storage compartments and equipment racks in the vehicle, which was ordered with only heating, air conditioning, and a 7.5W AC generator. The camera and VTR can be used as a portable, battery powered system, or can operate in a conventional manner by using the Camera Control Unit operating on AC power.

In June of 1973, when it was decided to transmit live electronic journalism, Channel 5 initiated a live 90-minute studio program that would require live inserts from remote locations.

Investigation revealed that several broadcasters around the country were using (or experimenting with) instant electronic journalism. Their experience indicated that operation in the 2GHz TV remote pickup band was the most effective, and equipment was available on that frequency band at a power output of 10 Watts. A frequency search of the Boston area revealed that the 2.093-2.110 GHz channel was available; subsequently WCVB-TV applied for and received FCC authorization to use this channel.

The search for a suitable receiving site was relatively simple, since the WCVB-TV studios are located about eight miles from Boston and the ABC-TV network interconnect to the studio is provided by an intercity microwave relay system.

The transmitter for this system is mounted on the 52nd floor of the Prudential Building in downtown Boston. This was a choice location for the remote microwave receiving site as it provided unobstructed coverage of most of the greater Boston area. It was a simple task to provide remote switching to the input of the intercity relay system so that either ABC-TV or WCVB-TV remote feed could be returned to the WCVB-TV studio.

Rather than resort to complicated steerable antenna combinations, a pair of fixed wide-angle corner reflectors oriented to provide 360° azimuth coverage was used. The gain of the corner reflector is 12dB. It is vertically polorized and has a beam width in the vertical plane of approximately 5° at the 3dB points. These antennas are mounted atop the Prudential Building on the tower supporting the WBCN-FM antenna.

Each antenna is fed by 7/8" Heliax transmission line to a coaxial relay at the receiver antenna input terminal. This relay permits the antenna with the best signal to be selected by remote control for the receiver input. The receiver, videoswitching, audio demodulator, coaxial antenna switch and remote control are housed in a wall-mounted cabinet located on the 52nd floor equipment room of the Prudential Building.

The transmitter for the remote pickup unit is housed in a small portable cabinet and contains a 2 Watt 2GHz transmitter, followed by a solid state 10 Watt power amplifier. The output of the system is fed to a four foot parabolic dish or horn antenna, depending on the length of the transmission path. A 15 kHz audio channel is diplexed

Fig. 3 Inside the van, Cal Hoyle mans the audio-video operator's position.

on the system, using a 7.5 MHz sub-carrier. Microwave Associates' help was invaluable in the system design.

The mobile remote unit is equipped with a mobile radio-telephone (telco), and with a radio remote pickup on the WCVB-TV News Frequency. These units provide the necessary communications for setup and program airing purposes.

Operation of the Microwave system is quite simple because no tuning adjustments are required by either the transmitter or receiver. The remote crew sets up the transmitter antenna and aligns it in the approximate direction of the receiving antenna site. A call to the studio then is made, and a technician selects one of the two receiving antennas by remote control for the best signal. He then talks the remote crew into optimum alignment of the transmitting antenna. The signal is aligned for maximum signal-to-noise using a video waveform monitor. Generally, a window signal is best for this purpose, as it provides indication of multipath reception. WCVB-TV has very few problems due to multipath reception.

Obviously, in some areas of the city, buildings and terrain preclude line-of-site transmission. At a few of these sites usable signals were obtained by reflecting off large building surfaces.

Problems have occurred in obtaining a usable signal close to the base of the building on which the receiving antennas are located. It is anticipated that this problem will be corrected by the addition of small dipole receiving antennas mounted just over the edge of the building.

WCVB-TV has used the system live on the air since October, 1973, and has had excellent results with the unit. Normal use is five days per 6A-4P with three technicians doing inserts into live entertainment and news programs. The News Department has used the unit for coverage of major news events. Only a few times has a problem with the microwave system occurred; those were due to pickups where marginal signal strengths were obtained. As a bonus, the Microwave system is used to provide WCVB-TV the capability of transmit facilities to Telco from the WCVB-TV studios.

Plans for the future include adding another complete Instant Live Journalism mobile unit and the use of a 13GHz microwave relay system to overcome shadowed areas. Feasibility studies are being made to provide live helicopter video feeds, using existing equipment. WCVB-TV will continue the use of its remote facilities on a live basis and anticipates expanded use of the constant live journalism concept in the near future. □

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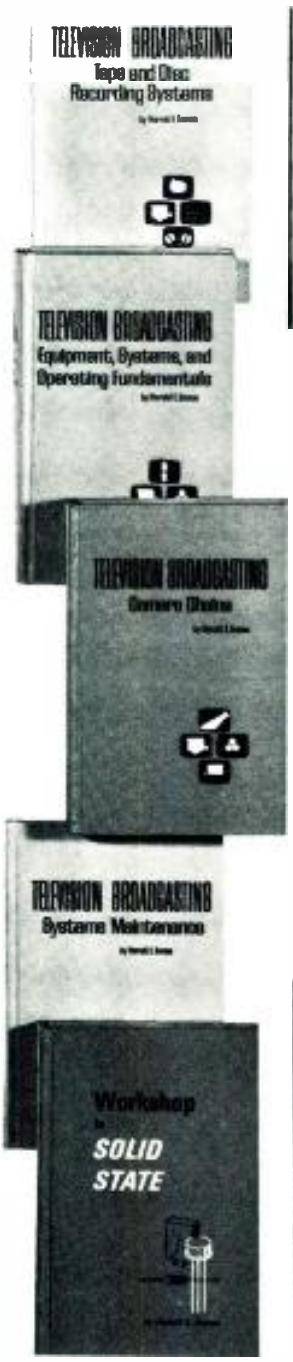

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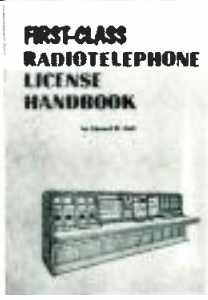

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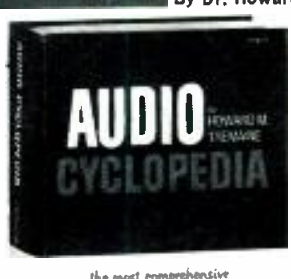

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Operating practices are keys to controlling costs

By Pat Finnegan

Engineering expenses constitute a sizable share of the station's operating expenses. There is a tendency to think of expense only in terms of large component replacements, such as a transmitter power tube or a camera tube, but the mundane, everyday operating practices actually make up the largest portion of the engineering expenses. Rather than think only in terms of expense, perhaps it would be more appropriate to consider expense as the efficient or inefficient use of funds.

Daily engineering activities will not only include equipment operation and maintenance, but will also be expressed: in personnel scheduling, in routine parts purchases and stocking, in dealings with salesmen, distributors and outside services, such as the telephone company and others. All these activities fall within the jurisdictional responsibility of the chief engineer, so the manner in which he performs these activities will be reflected in the engineering expense picture. The efficient use of funds concept, should be a regular factor in all daily decisions.

Maintenance Practices

Keeping technical equipment in an operating condition at all times is a basic function of the engineering department. Those practices which fail to achieve some reasonable degree of success in this area will contribute to expenses. Equipment that is constantly in the shop for repairs is failing in its primary role as a product producer.

A lack of any regularized preventative maintenance program will do just that—allow the equipment to fail. This is really a "fireman's" approach to maintenance. That is, put out fires after they have started. A preventative maintenance program will not prevent all failures, but it will head off small problems before they can become large failures. Needless to say, this depends upon attitudes towards maintenance, both from inside and outside the department. Those who see preventative maintenance only as wasted time and effort simply do not understand the meaning of true costs.

Neglect of small problems can very often lead to larger, more costlier problems. For example, a resistor is overheating on a PC board in a power supply. The equipment appears to be working normally otherwise, so investigation for the heating is put off and then forgotten. Component failures have a way of compounding when neglected, so the resistor, some transistors and other components may not only overheat, but burn up and the PC board along with them, so that all is beyond repair. What may have started out as a 50¢ resistor and a $1.00 transistor has snowballed into a new $35.00 PC board, plus equipment down time.

Time lost is almost always a cost factor, even though it may not always be easy to pinpoint. This time can be both for equipment and for personnel. It is easy to pinpoint the actual expense for repair parts, and it is often that expense can be directly pinpointed in the loss of revenue. For example, a main equipment item fails and a

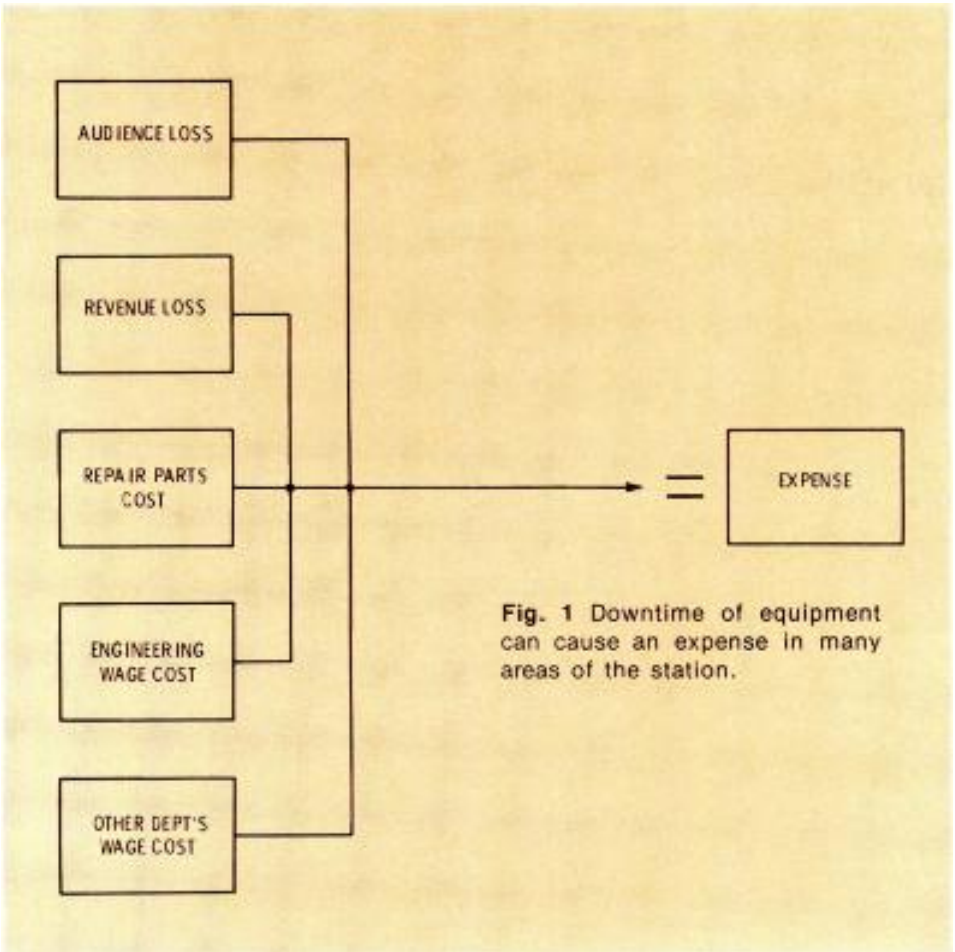

Fig. 1 Downtime of equipment can cause an expense in many areas of the station.

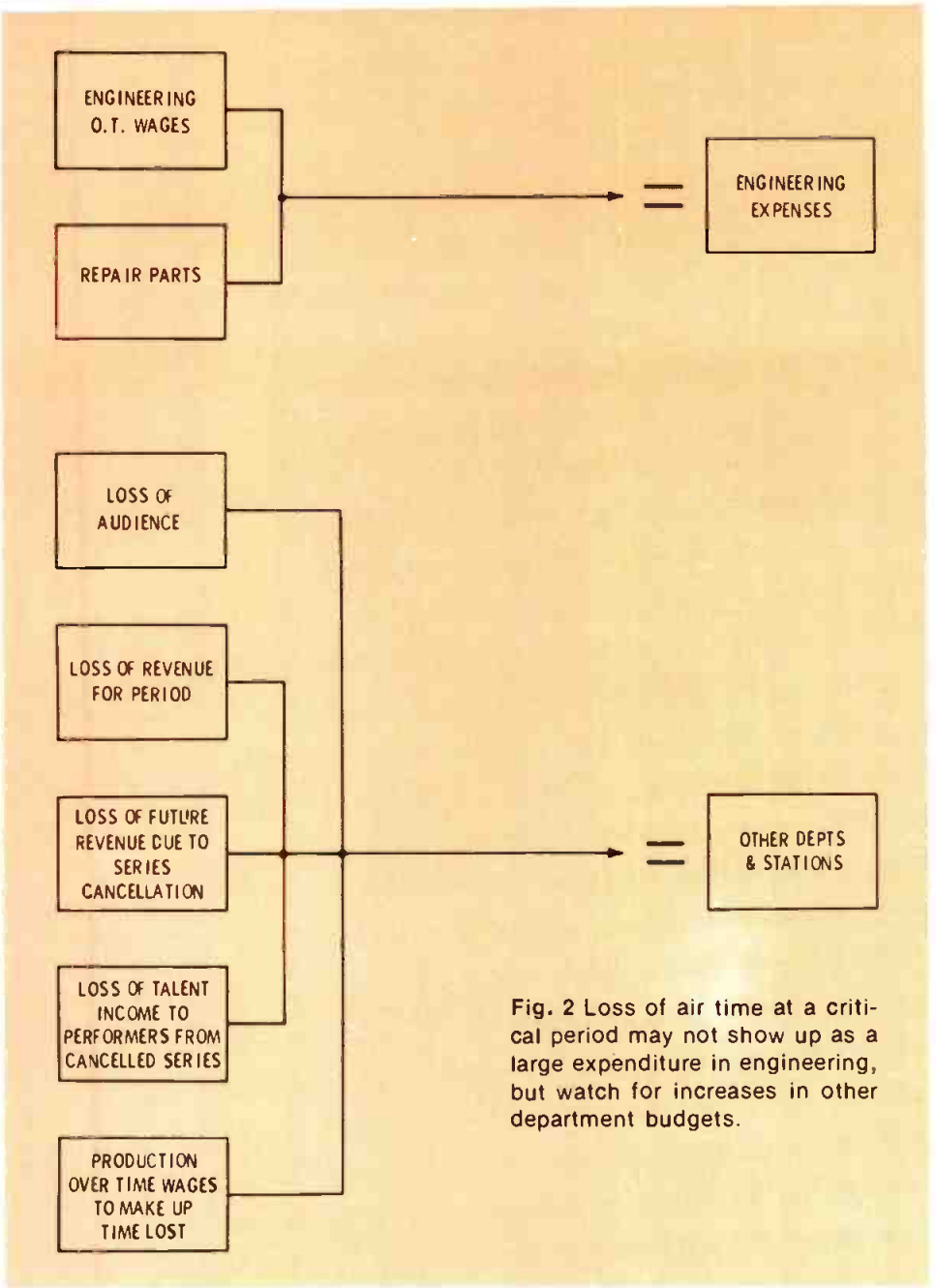

Fig. 2 Loss of air time at a critical period may not show up as a large expenditure in engineering, but watch for increases in other department budgets.

special show or event is lost, and this loss cannot be made up.

Time loss of personnel may not always be so directly realized, because equipment failures can directly affect other departments with a loss that would not show up as engineering expenses. Consider a recording booth failure and there is no alternative location, and a full recording schedule must be done that day. Perhaps the booth was down for two hours, and since the work must be done that day, production people must now work overtime for 2 hours. This expense is also at premium wages.

Personnel Scheduling

Operation of station equipment will require a variety of people and most of these work for an hourly wage. Many of these may also work under a union contract, which will contain many provisions that will require penalties in the form of premium wages when these provisions are violated.

Scheduling personnel without due consideration for these contract penalty provisions can increase the wage expense far more than may be anticipated. When a special event is planned, any increased costs due to penalties should be a part of that decision. This is not to say that special events should not be planned simply because there will be overtime wages involved. On the contrary, many such special program events can be very profitable for the station. But, when due consideration is made during the planning process, proper scheduling will make the most efficient use of wages that are spent.

For example, a special program is planned for a certain time and will require one additional engineer during that period. You may choose to have an engineer already on duty work over the two additional hours, or schedule in another man. In straight terms, the overtime will be equivalent of 3 hours. The contract may require that a man scheduled in must be scheduled for a minimum of 8 hours straight time. In this instance, it would be less costly to work the one man on overtime

Management Highlights

You'll note that **Broadcast Engineering** constantly seeks to improve signal quality, operational practices, and profit figures. In this article, we're talking about engineering expenses. But once you've read it, don't rush off too fast to show it to the engineering department. There's more here than meets the eye.

Most engineers will tell you that even more could be saved if more were spent. Contradictory? Not really. What they mean is that outdated equipment and test gear is—in the long run— much more expensive to use than up-to-date equipment and test gear.

Unfortunately, it doesn't end there. It gets to be an attitude problem. The Chief and his engineering crew will get the feeling that no one really cares what goes on as long as the station stays on the air. Once engineering thinks no one cares, it will be a task to keep engineering caring.

Fig. 3 Storage space and neat, logical stock are important. Otherwise, you waste valuable time scrounging around in parts boxes, saying "I know it's here somewhere". What's more, the arrangement pictured here will reveal shortages at a glance.

for 2 hours than to bring in another man for 8 hours.

Union contracts contain many overtime provisions, such as call backs, work on scheduled days off, rest periods, etc. When scheduling, give proper consideration and schedule accordingly and you will be making the most efficient use of funds in terms of wage expense.

Buying Practices

Regular routine small replacement parts and "consumable" items are a respectable part of the cost picture. Consumable items would be such things as audio and video tape, splicing tape, electrical tape, log sheets, etc. In other words, items that are used up at a fairly consistent rate. Some reasonable estimates of use should be made so that purchases may be made in large enough quantities to take advantage of price breaks or discounts.

Penny ante stuff, you say? Perhaps, but it is the consistent attitude across the board in obtaining the most efficient use of funds that will keep the operating expenses at acceptable levels. And besides, where quantities of large reel audio tape or video tape are concerned, the savings may not be peanuts!

Establishing good relationships with parts distributors can go a long way in the area of services and discounts. Here, we are not discussing fair trade prices or normal wholesale prices. This takes in special items that no other conceivable user within his service area will need. For example, the distributor may sell you camera tubes at his cost. He makes no profit in money, but does in goodwill and other repeat business. At the same time, his annual volume will enhance the standing of his franchise with the manufacturer.

There are also some cases when a distributor can give you a better price for some item than can be obtained from the manufacturer of the equipment. A few years ago, I was attempting to set up a second source for a particularly large solid state diode used in a new transmitter (24 in all). The distributor was able to quote a price of $14.00 each, while the equipment manufacturer was quoting $28.00 each. Needless to say, the distributor became the prime rather than the second source supplier. Price differentials are not always this great, but these are possibilities that should not be overlooked.

Good relationships will sometimes obtain extra special help from distributors that can be a time saver. In another instance, a component failed during maintenance on the transmitter in the "wee hours" of the morning. It was an important part and no replacement was available. The distributor got out of bed, went to the store and picked up the part and then delivered it to the transmitter site, and there was only the normal billing for the item. This action saved considerable air time that would have been lost otherwise. Of course, such activity is "above and beyond the call of duty".

Stocking

It isn't possible to stock 100 percent replacement parts for everything used at the station. However, a representative assembly of parts "most likely to fail" will often save considerably in lost air time or lost shows, and it will save travel time of personnel. Even so, the stock should be arranged in a logical, easy-to-find layout, so that, when a part is needed, time will not be wasted searching for a part that you "know is around here somewhere"!

If the equipment down is so important that the restoration must be done quickly, it is often less expensive in time to run to the parts store and pick up a new part than to rummage through heaps of parts scattered around the station. Station money is invested in those spare parts, and unless they can be found and used when needed, the money spent on them is actually wasted.

Outside Services

A station may do many remote broadcasts and order Telco circuits and telephones for these occasions. These circuits usually are ordered at base weekly or monthly rates, and there are installation charges each time they are ordered. Know the base period, and if more than one occasion will occur within this period. Keep the circuit ordered for that full base period (which you pay for anyway) and thus avoid additional installation charges. This won't work in all cases, but when it can be used properly, you will cut off needless expenses.

All the circuits that are ordered should be recorded in some logical manner and retained until after the season is over. Check the bills as they come in against the actual equipment or circuits. When the circuits are ordered, also give date you want them removed. It is possible that paperwork goes astray, and the out order doesn't pass. To the Telco billing department, the circuit is still active and you are charged for it. However, if this is

(Continued on page 76)

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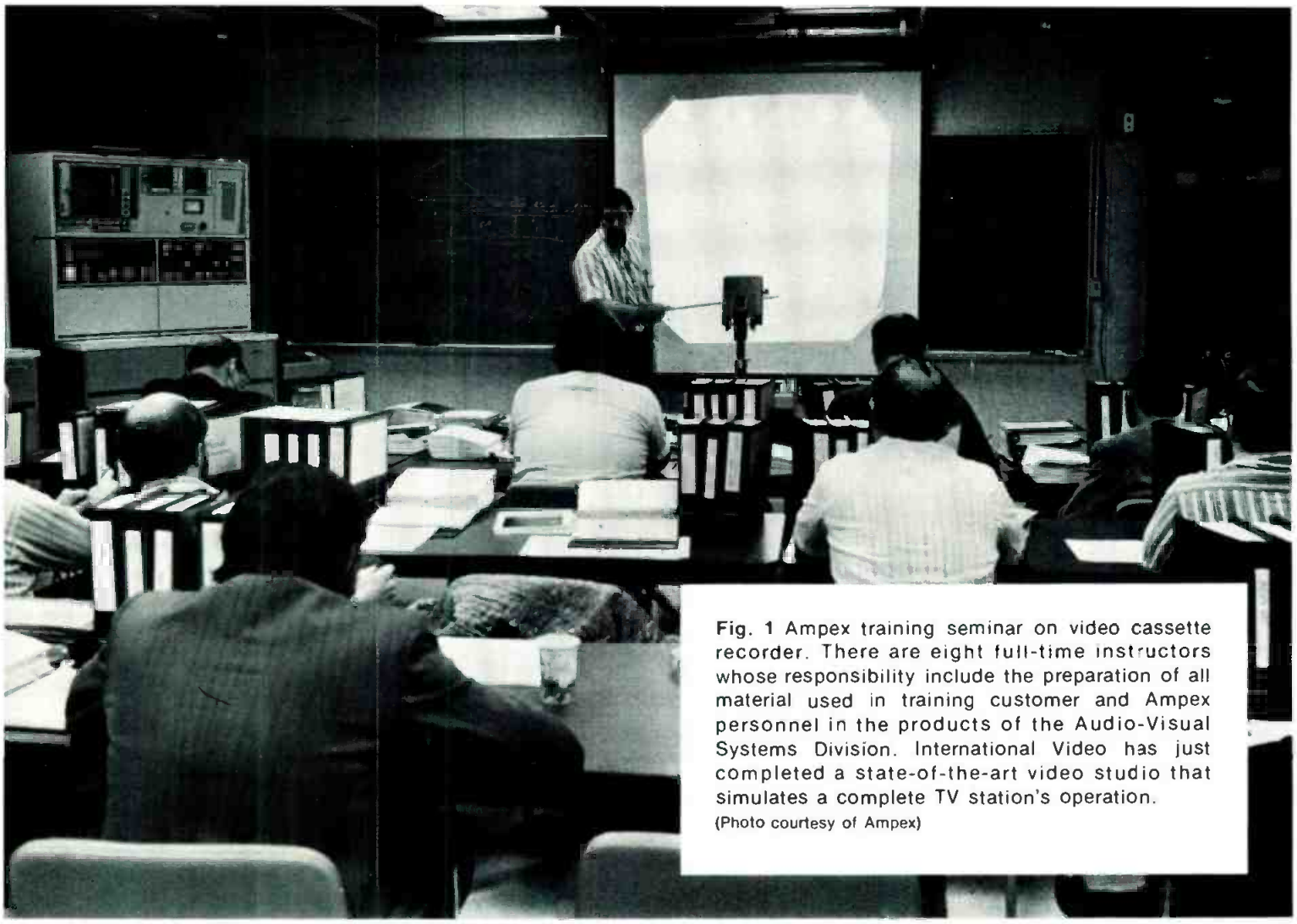

Fig. 1 Ampex training seminar on video cassette recorder. There are eight full-time instructors whose responsibility include the preparation of all material used in training customer and Ampex personnel in the products of the Audio-Visual Systems Division. International Video has just completed a state-of-the-art video studio that simulates a complete TV station's operation.
(Photo courtesy of Ampex)

Is There Really A Choice?

Upgrading your staff

By Harold Ennes

Consulting Electronics Writer, author of broadcast maintenance manuals and texts, and former Chief Engineer.

I am not a giver of knowledge, but try to be a communicator of knowledge. The subject of upgrading your technical staff concerns **not** something that I know and you don't. **Rather**, it concerns a fact of life many of us try to dodge, and this is the crux of the matter.

We often refer to modern broadcast equipment as being "highly sophisticated." This is not in the sense of being wordly, or sensuous, or carnal; but as being knowledgeable, precocious and subtle with inner functions and interconnections. This new breed of gear was designed and developed by a new breed of men and women with no particular concern for the existing technical level of broadcast personnel. Life is like that, and it's a healthy condition when treated with the proper "know-how."

Updating Or Upgrading?

Factory training seminars are, as a rule, for **updating** rather than **upgrading**. Those on your staff who need only continual updating are your leaders and potential instructors.

Upgrading starts from going back to basics and applying these basics to specific equipment used by your individual station. Even here we must assume at least some prior exposure and understanding of fundamental electronics.

The following is somewhat in the form of open letters to three main departments: Management, the Chief Engineer and Supervisors, and Engineering Technicians. Whatever department you are in, read it all. To be effective, everything applies to everybody, demanding respectful communication between all.

To Management

You hear a lot about "images" nowadays (especially if you're a telecaster!), and you are concerned about the image of your station presented to your public and your clients. You certainly realize that some percentage of this burden lies with your engineering staff. Why then, you might ask, since the chief engineer is part of the management team, is this not left entirely up to him?

In many cases this happy condition is possible. However, there are scores of competent heads of engineering departments (from a technical standpoint) who do not have the inclination to inspire their men into undertaking an upgrading program. Management as a whole can and must exercise the very imagination

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and business sense that qualifies as management in instituting an effective upgrading program for staff engineers and technicians. An inspired training program creates **dedication** not always existent otherwise. **The better image you want results from the sum of the effectiveness and dedication of the individuals. In television, a good, average, or bad image (on the screen) is a result of the combined efforts of all departments.**

It is pertinent that management today consider an engineering improvement program for their technical staff, either partially or completely company sponsored.

Your reply might be "But we must make money, and that's too expensive. After all, it's up to individual engineers to practice a continuous improvement program."

The first part of your answer ("but we must make money") is the best existing argument for instilling in your technical personnel the **incentive** to improve. Competition is growing. not diminishing. To meet competitive engineering practices is a must to stay afloat. You are exactly right in assuming it's up to the individual whether he sinks or swims in this sea of electronic information and entertainment. You are wrong if you think you have no influence in instilling that willingness to improve himself, albeit most of this influence can be psychological rather than costly.

To The Chief Engineer And Supervisors

After many years of being associated in some way with training broadcast personnel, I realize the wide gamut of knowledge and know-how that exists in this field. Any one particular "Training Course" will be too fundamental to some, and too advanced for others. This is the basic problem. Any program initiated must be highly flexible and tailored to your special needs, to be effective, and to inspire your own staff to become more dedicated in creating the better image.

Supervisory personnel, normally also a part of management, shares the responsibility along with the chief engineer in initiating suggestions along these lines.

Every technical staff has its own general level of "know-how." But there are definite signs that appear which serve as "warning flags" of impending **down-grading** that should be heeded. Following are examples of dangerous thinking:

"The sound? So what! Everybody at home listens to cheap four-inch speakers." (Lamentably true in the TV field, but it's still not **everybody).**

"Don't worry about those imperfections. Nobody sees them at home."

"Why try to keep up with all the new stuff coming out? If I did, nothing else would get done."

"What do I want to review all that math for? I don't use it now."

What we must realize (and we are all prone to such thinking at times) is that the danger is not so much in the facts (?) of such statements, it's in the state of mind we fall into that will eventually be instilled in the men under us. This state of mind shows in the station image in spite of ourselves.

It is essential for you as the chief engineer to listen to your men responsible for operation, maintenance and repair of equipment as to limitations of that equipment. When this differs from what the salesman sold you, go to bat for your men until the manufacturer can **prove** your personnel did not have the right answer. If and when this occurs, place immediate emphasis on additional training required to "customize" your training program.

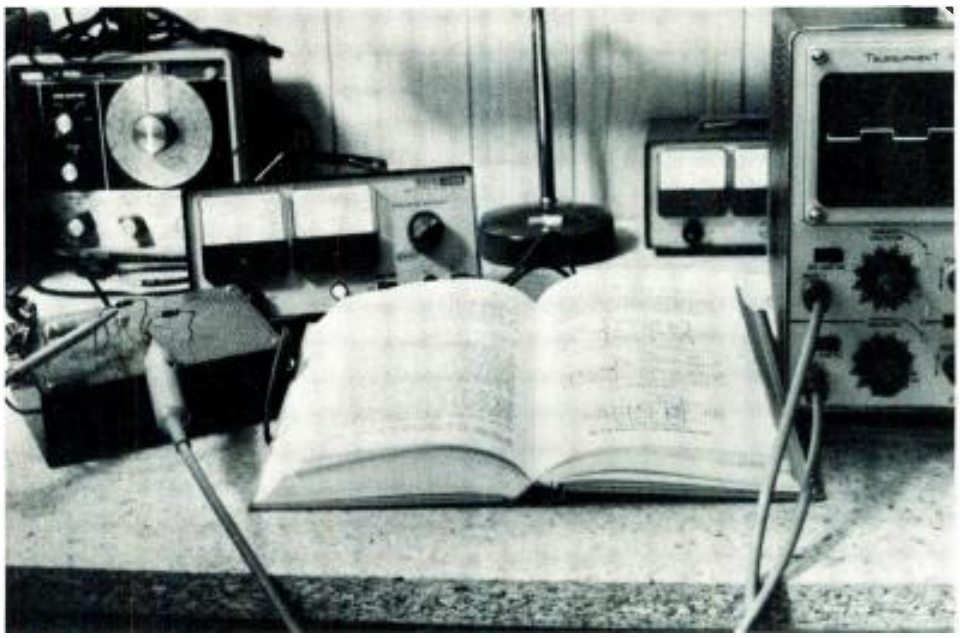


Fig. 2 A scope, variable power supply, breadboard and text make up essentials that should be available to the engineering staff for practical training on solid state circuits and, especially, IC's and IC logic.

To Engineering Technicians

All of you who have spent much time **behind** the microphones and/or cameras and controls can immediately spot the difference between a "pro" and an amateur in **front** of the camera and microphones.

What you might forget is that your boss and fellow workers will have **you** catalogued as either a pro, an amateur, or just somewhere in between.

Out of every 100 broadcast engineer-technicians who start even, statistics indicate that forty years later by the time they are 65, one is "fairly wealthy", four are "financially independent", five are still working at mediocre jobs, fifty-four are "flat broke", and thirty six have died.

This small minority group of 5 percent who became outstanding and quite successful in broadcast engineering, what is so drastically different about their lives, as com-

pared to the "big group" who never make the grade? Are they just lucky and get breaks that the majority never get? Although some find it comforting to assume this, searching out the facts indicate otherwise. The pattern of the lives of each one of these successes is the same:

Do they have an above average IQ? Facts indicate otherwise.

Do they spend a lot of time studying? If so, when do they find the time? What do they study?

The outstanding men in this trade had two things in common. Each had a plan of upgrading himself, and he had the ability to get along with people without always "agreeing" with them.

An interesting point comes up here. The ability to get along with people is greatly enhanced by the confidence born only from knowledge—in your chosen work. When you feel at home in your everyday and often unusual problems, everyone recognizes the "pro" qualities —this is inevitable.

Statistics will also try to prove that 9 out of 10 readers of this article will have neither the incentive or the "time" for aggressive study and application to leave the "average" category. I hope this material can be sufficiently effective to prove these statistics wrong. But if you are already this one out of ten, you have little competition. Most of your fellow employees are "busily engaged" elsewhere!

Broadcast-telecast circuits and techniques are changing and improving constantly. You have got to bring yourself up to date every month to be an authority among your associates. Techniques and know-how are being presented constantly which you ought to know about.

Broadcast Engineering helps to fill that need. In the words of Editorial Director Ron Merrell: "This is a crossroads magazine that tries to focus on signal quality, improving engineering conditions and standards, moving toward a better communications industry." Read it. Study it when required. Keep **updated**.

A recent "Occupational Outlook Handbook" (U.S. Dept of Labor, Bulletin No. 1375) reveals an important message for all of us. Despite the inroads of automation (automatic switching, logging, and all remote control of AM-FM-TV transmitters) "the talented individual will have many opportunities to advance—the future belongs almost entirely to the EDUCATED, the TRAINED, and the SKILLED. . ."

Television growth in the next decade lies in expansion of UHF as well as VHF, in increasing numbers of non-commercial educational stations, greatly expanded use of closed-circuit pickups for school and industrial training, CATV, and in more widespread use of color in these fields. In the words of the above-mentioned Bulletin: "The color TV pickup and transmitting equipment . . . is much more complicated than black-and-white and requires more maintenance and technical 'know-how'."

The Ways And Means Committee

What are the ways and means of upgrading your technical staff? Here are some practical suggestions for your station.

1. Have you chief engineer and/or your supervisor(s) attend training seminars conducted at intervals by manufacturers, service organizations, semiconductor manufacturers, etc. (Figure 1). Assign these men to organize training sessions for their engineers and technicians on the subject covered by the seminar. It is axiomatic that we learn by teaching. You can safely bet that when you assign a man to run a training session he will, in turn, benefit by "boning up" on associated details he might otherwise miss.

2. Make a special study of technical books and pamphlets available, and start a Technical Library available to all technical personnel. For example, purchase training books on transistor and logic circuit fundamentals and advanced theory. Assign the chief engineer or supervisor (or for that matter any technician who may be more qualified from a teaching experience standpoint) to train those needing more exposure to semiconductors using

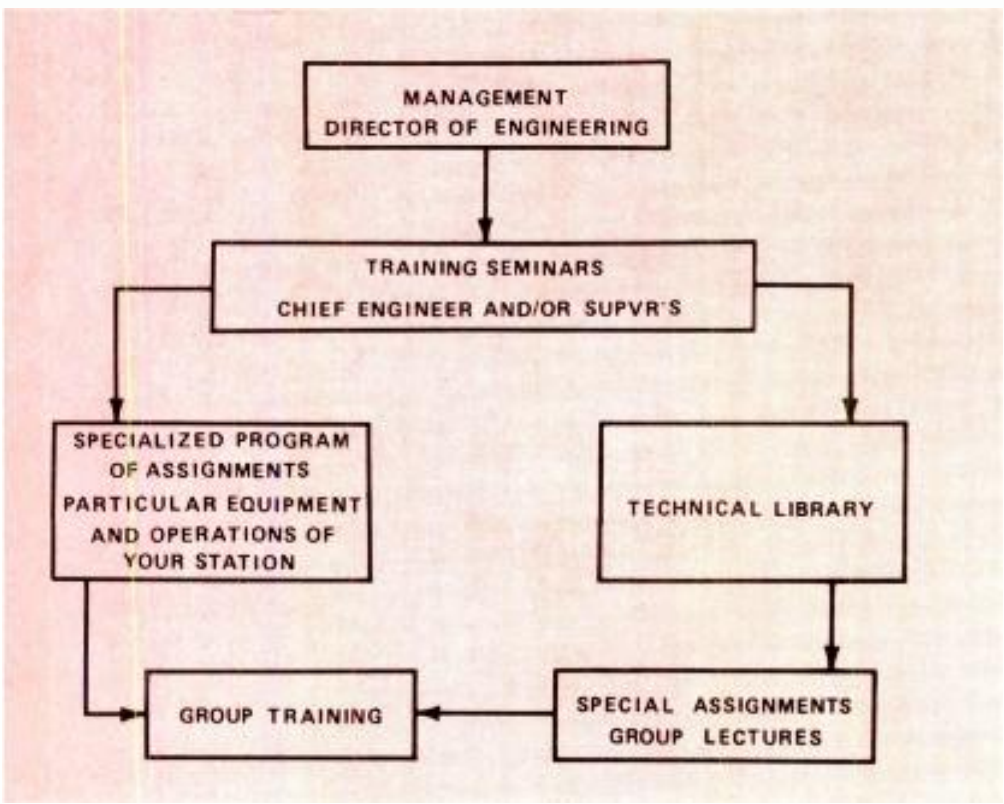
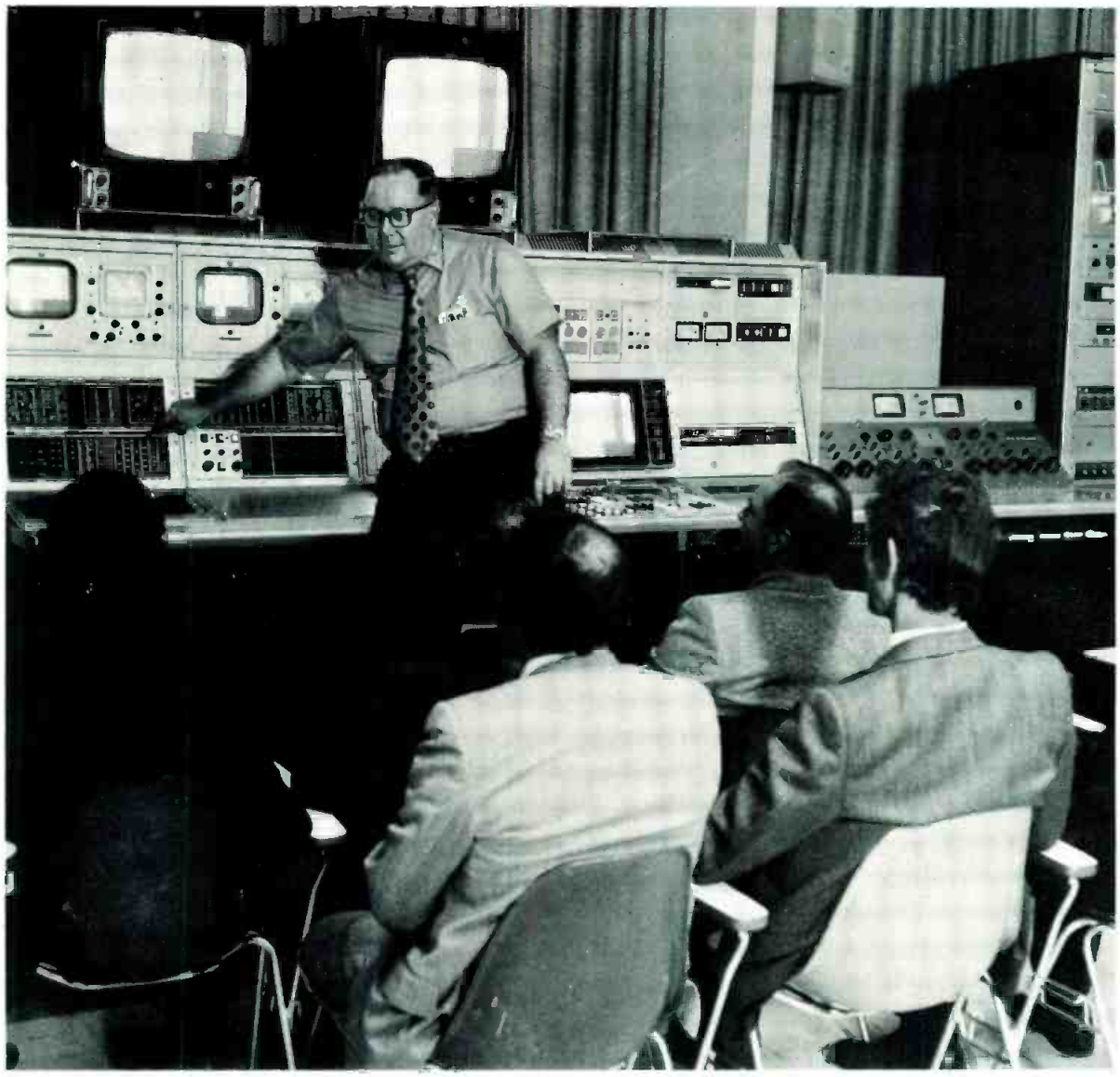


Fig. 3 Simplified block diagram for attacking training on a specialized basis.



The sophisiticated and complicated become a lot less cumbersome when they are covered in a seminar. This is an RCA seminar in session on a color chain. No tuition is charged, but you must pay your own transportation. It's a good idea to check with manufacturers of equipment you use to see if they offer seminars for both updating and upgrading.

(Photo courtesy of RCA)

one of the books as a text. (Figure 2.) A suggested list of texts to serve as a basic technical library is included at the close of this article.

3. Organize a specialized program on the particular equipment used by your station (video or audio tape recorders, switching gear, etc) and conduct group training on one subject at a time. Special construction projects can come under this heading, such as experimental breadboarding of solid state amplifiers (audio and video) with performance measurements, logic circuitry, etc., as exemplified in Figure 2.

The simplified block diagram of Figure 3 illustrates the basic pattern of organization for this program. Whether or not the program is 100 percent successful, you can bet that the time and effort spent will improve both the capability and the mental attitude of your technical staff.

Suggested Reference Material

NOTE: There are many suitable books in addition to those in the following list, some possibly more fitting to your specific needs. Keep updated by getting on the mailing list of all trade book publishers, and watching for new book notices and advertisement in trade publications. Examine the books put out by RCA, GE, Motorola, Signetics and others for suitability. Also, look for book review columns in **Broadcast Engineering** and association journals.

<u>Howard W. Sams & Co., Inc.</u>
Workshop In Solid State (Ennes), AM-FM-TV
TV Broadcasting: Equipment, Systems & Operating Fundamentals (Ennes), TV
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TV Broadcasting: Tape And Disc Recording Systems (Ennes), TV
To be released in 1974: AM-FM Broadcasting: Engineering, Operations And Maintenance (Ennes), AM-FM
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The IC Op Amp Story

Part 2

By Walt Jung

Now that we have laid out the basic facts of life for IC op amps last month, we can progress into the real world, the use of different devices in a variety of circuits. This month we'll take signal processing circuits using op amps.

As a natural prerequisite to circuits using IC op amps, let's also lay down some ground rules which will help clarify things. Figure 1 is the IC op amp symbol as we will generally be using it. The pinout shown is standard for the greatest percentage of IC op amps using 8 pin packages (either the round can or mini-dip).

Power supplies used are ±15V unless otherwise stated, and are connected to the pins shown. For clarity and simplicity, power pins will be omitted on the schematics, if they follow the ±15V norm. Nonstandard pinouts or power supply voltages will be shown in detail. Compensation pins and offset adjustments (when used) are unique to the specific device, therefore, these will also be detailed as necessary.

Comparators

A very simple op amp circuit which can be used to monitor voltage levels is the voltage comparator, shown in Figure 2. A comparator is simply a very high gain differential amplifier which is used to indicate the relative state (high or low) of two inputs. An uncompensated op amp such as a 101 or 748 type makes a good comparator because of the high gain and low offset voltage. Its input threshold (trip point) can be predicted to within a couple of millivolts. Apply a signal to one input, a reference voltage to the second, and the output will change states when the input signal crosses the reference level.

The important thing is the precision of the comparison. By noting the point where the input just causes the output to switch, the

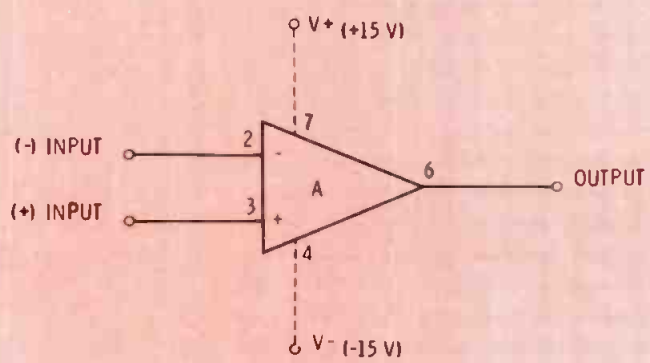

Fig. 1 Op Amp symbol with standard IC pinout.

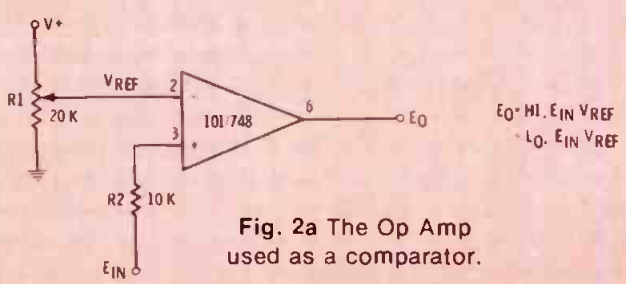

Fig. 2a The Op Amp used as a comparator.

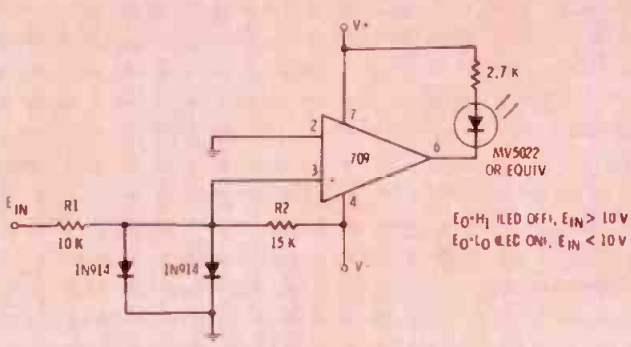

Fig. 2b Comparator driving an LED indicator.

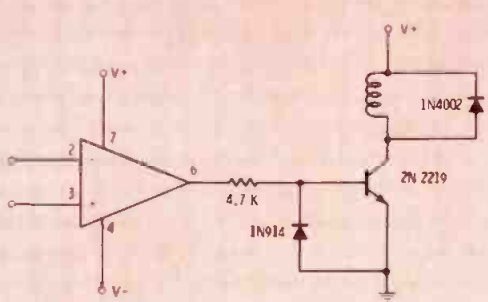

Fig. 2c Comparator driving a relay with power buffer.

Walt Jung, author of Op Amp Cookbook (Howard W. Sams Co.) and Solid State Devices Editor of Broadcast Engineering.

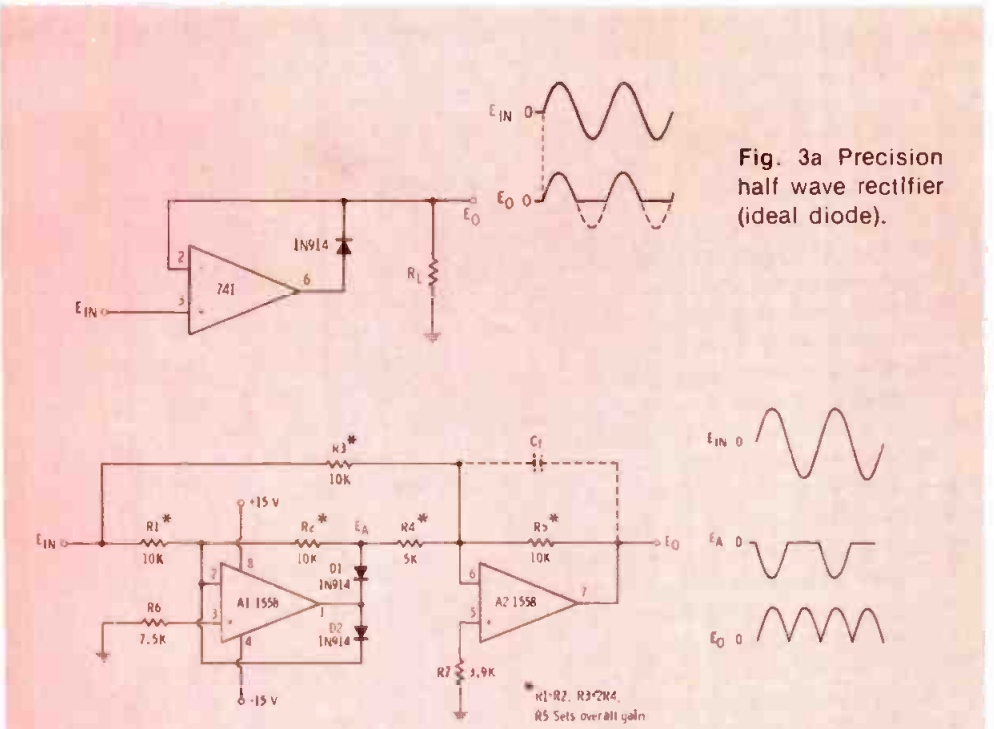

Fig. 3a Precision half wave rectifier (ideal diode).

Fig. 3b Precision full wave rectifier.

input is then known to be equal to the reference voltage.

The circuit in Figure 2a is a basic example of a comparator. The output is simply high when the input is greater than Vref, low when the input is lower. If desired, this sense can be reversed simply by reversing the inputs. The output as shown will swing from the negative to positive amplifier saturation voltage, about ±12V or more. Comparators often are used to drive logic stages, for example TTL. In such cases a series resistor and 3-5V zener diode can clamp the output to a drive level suitable for TTL logic.

Since comparators are often used for control or monitoring functions, their outputs may be required to drive unusual loads. Figure 2b illustrates a comparator driving an LED indicator. With the (-) op amp input grounded, the input threshold of the op amp will be zero volts

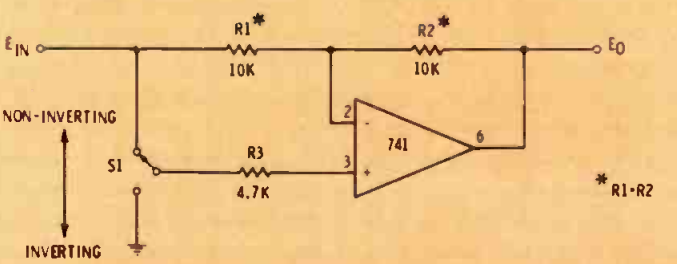

Fig. 4 Op Amp sign changer.

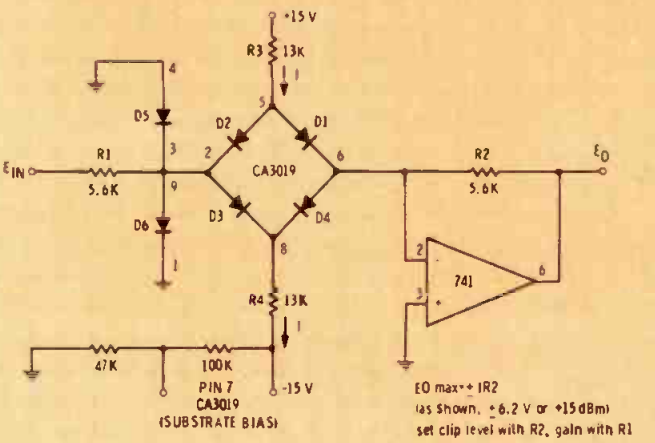

Fig. 5 Op Amp signal limiter.

(because of its infinite gain). R1 and R2 establish a bias which crosses zero when the voltage at Ein is $\frac{R1}{R2}$ x 15V or 10V. So, when Ein is greater than 10V, the output is high and the LED is off. When Ein drops below 10V, the op amp sees a (-) input, and the output goes negative turning the LED on. The 1N914 diodes clamp the differential input of the 709 to a safe level. They are also necessary if Ein is scaled greater than V- or V+ (with any op amp), which can be achieved by making R1 larger. For instance, if R1=100K, the threshold is 100V rather than 10V.

To drive higher current loads, use a power buffer stage as in 2C. The transistor type is not critical and a 2219 can handle about 100mA. The relay voltage, can of course be unregulated-it need not be V+ as shown. This general circuit can be used with any comparator.

Precision Diode Circuits

Ever need a circuit for a low level rectification function and found out you didn't have enough signal to overcome the diode threshold? By placing a rectifying diode within an op amp's negative feedback loop, it's non-linearity and threshold can be removed, with operation extended down into the millivolt region.

Figure 3A is a basic precision half wave recitifier, sometimes called an "ideal diode" circuit. When a positive input signal is applied to the op amp's (+) input, the op amp drives the diode on to maintain the (-) input at the same potential. When the input goes negative, the diode is driven off as the op amp attempts (unsuccessfully) to drive the (-) input in step. During negative half cycles the output rests at a OV baseline, if R_L is returned to ground. Because of the high op amp gain and feedback, the diode is driven to produce a quite precise half wave rectified output, even at millivolt input levels.

A 741 works well up to about a few kHz, but for better accuracy at 10 kHz and above, use a high speed type. For negative outputs, simply reverse the diode.

A useful modification to this cir-

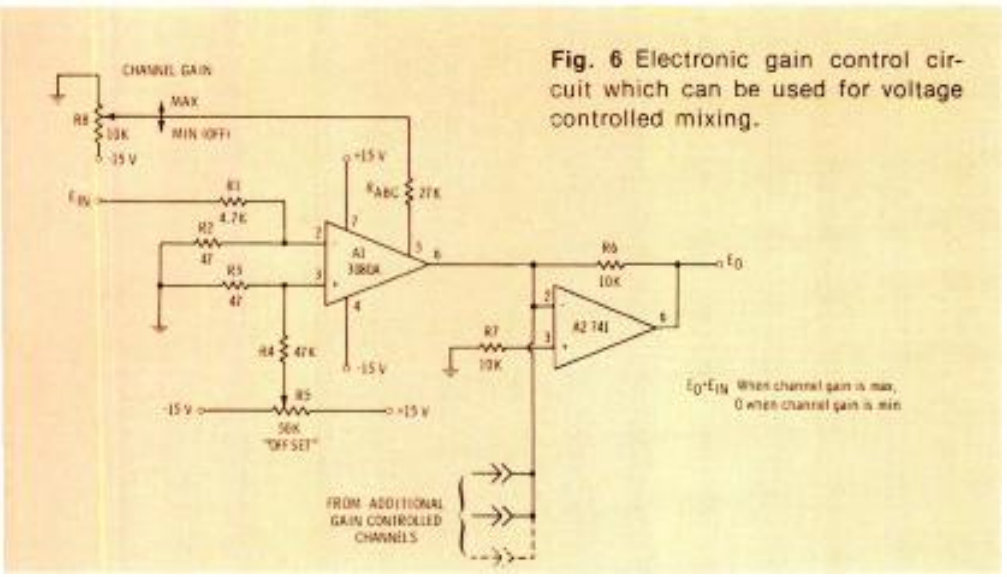

Fig. 6 Electronic gain control circuit which can be used for voltage controlled mixing.

cuit is the peak detector, achieved simply by adding a storage capacitor across R_L. The RC time constant governs discharge rate in the usual manner, but it has the same "ideal" rectification properties.

A version of precision rectifier which provides full wave rectification is shown in Figure 3b. Here A1 is an inverting version of the ideal diode circuit, producing unity gain half wave rectified pulses at Ea. A2 is an inverting amplifier with two input paths, R3 and R4. Since the gain is $\frac{R5}{R3}$ and $\frac{R5}{R4}$, and R3= 2R4, the gain from Ea to the output is twice that through R3 (the input path). This causes the **net** input current to A2 to be always negative, and the output Eo is a full wave rectified signal.

For proper rectification, use the R1-R4 ratios shown. R5 can be used for gain scaling, and opposite polarity rectification is obtained just by reversing D1-D2. The output can be filtered easily by connecting a capacitor across R5 if desired, and the time constant is simply R5Cf. Remember to observe polarity on Cf for large values.

Sign Changer

Ever need a circuit to electronically control the signal phase in a transmission path? Try the scheme of Figure 4, an op amp "sign changer" circuit. When R3 is connected to Ein, the circuit is a follower with a gain of one. When R3 is grounded, it becomes an inverting amp with a gain of one. S1 can be a relay or all solid state if FET switches are used. If you carry this line of thinking a step further and consider driving the FET switches with a synchronous signal, the circuit becomes a synchronous modulator or demodulator!

Limiter

Often it is necessary to "limit" or

"bound" the output of an op amp in a predictable manner. This may be needed to prevent overdrive later in the signal chain. There are many ways to do this with op amps, but one of the best is shown in Figure 5.

Ignoring the diode bridge for the moment, this circuit may be recognized as a unity gain inverting amplifier, if R1 is visualized connected directly to pin 2. However, placing the bridge in series with R1 allows the peak input current to be controlled by controlling the DC bias in the bridge (the bias current in R3 and R4). Actually this current, I, is the maximum input current the op amp can receive, for when the input current in R1 exceeds the bias current I, either D2 or D3 turn off, which limits the input current to the amplifier. Since the input current is the same as the current in R2, this limits the output voltage at $\pm IR2$. For best results, the bridge's (+) and (-) bias currents must be equal, otherwise you'll get a DC shift at the output. This means the $\pm 15V$ supplies should track and R3-R4 be matched.

You can set the clip level with R2, however, this also affects gain. Gain can best be trimmed with R1 after the desired clip level is established. As shown, gain is unity, and the output limits at $\pm 6.2V$.

Electronic Gain Control

A very useful form of circuit using op amps is the multiplier. The two quadrant type is a natural electronic gain control. Electronic gain controls are an integral part of AGC and compression amplifiers, and are generally used where signal levels must be controlled by voltages or currents.

Figure 6 is an electronic gain control circuit which utilizes a specialized type of amplifier, A1, a 3080A. The 3080A is an **operational transconductance amplifier,** a device whose gain can be controlled by varying the current applied to pin 5. In the circuit here, the circuit from Ein to A2's (-) input may be considered, in effect, a variable resistor - the variation of which controls the gain, as A2 is an inverting amplifier.

R1 and R2 divide the input signal to A1 down to a level where linearity is improved. At full gain, the loss of this network is made up by A1, and the overall circuit has a maximum gain of unity. As R8 is moved towards -15V, the current into pin of the 3080A is reduced, and its gain is reduced in proportion. Gain control is effective over an 80 to 100 dB range. The R5 offset control centers the output for O VDC at full gain.

You can also mix with this circuit by simply adding on more circuits and controls similar to A1, with their outputs connected in parallel and feeding A2. Gain of each channel is still a maximum of unity, and there is no interaction or crosstalk. Since there is no audio on the level controls (R8 + others) of this type of gain controller, it is much less susceptible to noise pick-up.

Station Applications

While the above is far from all of the possible signal processing circuits using op amps, it may hopefully solve a problem or two for you sometime.

Actually these circuits were selected as good potential candidates for usefulness around the station. Here are some ideas for them which I'm sure you can expand upon. You could use the comparator as a monitor of a critical transmitter voltage, with a relay operated alarm. The precision full wave rectifier can monitor an audio line output, and feed a comparator driven LED which gives a single flash when the audio level exceeds the comparison (reference) voltage. Just set a DC reference to correspond to the maximum desired peak level.

The peak limiter can be used just as it is or calibrated for whatever level you desire. Finally, the gain control could be used in a console or adapted easily for a small remote mixer. It could even be battery operated, since it's a fairly low power circuit. Sound interesting? Try your luck, and we'll have some more circuits next month on **signal generation.** □

Aaron Shelton
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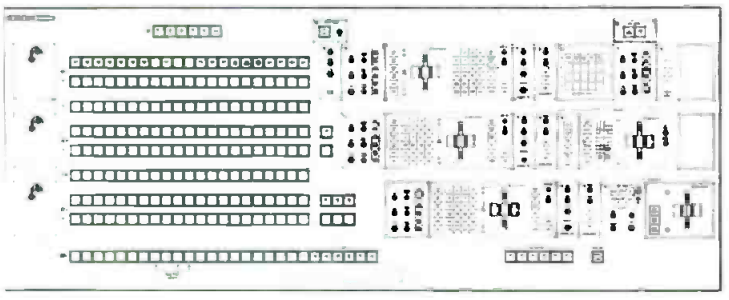

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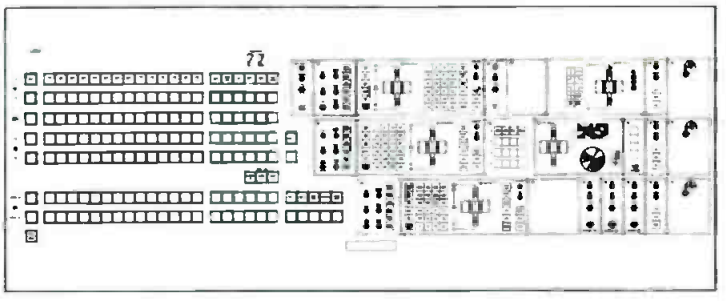

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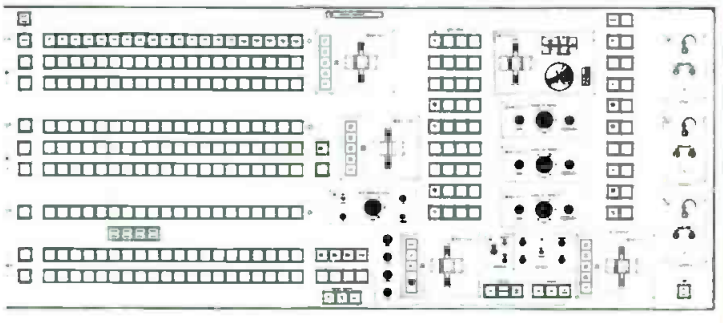

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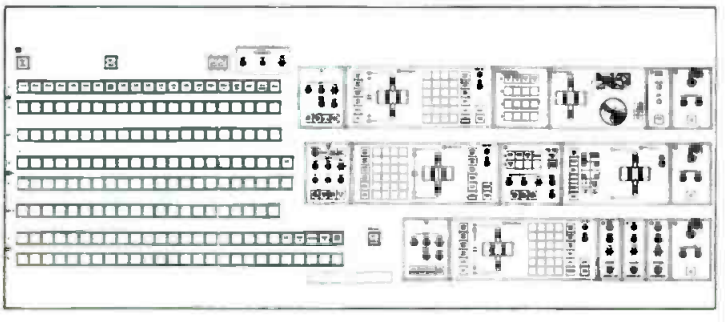

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MONITORING SYSTEMS: Ivan T. Lorenzen, Chief, Room 728, Phone: 632-6345. **Methods & Review:** Carl T. Nuhn, Chief, Room 728, Phone: 632-6345.

Common Carrier Bureau

INTERNATIONAL & SATELLITE: Abbott C. Roseman, Chief, Room 502, Phone: 632-6415. **Cable, Radio & Satellite Facilities:** Vacancy, Chief, Room 502, Phone: 632-7265.

Office Of The Executive Dir.
John M. Torbet, Executive Dir.
Room 852, Phone: 632-6390

BUDGET & FISCAL: Richard F. Solan, Chief, Room 846, Phone: 632-7194. **Finance Branch:** Michael Leibowitz, Chief, Room 548, Phone: 632-6900.

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 band widths are a very flat ± 2dB, 30Hz to 18 KHz. It all adds up to greater performance than you've ever been used to.

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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.

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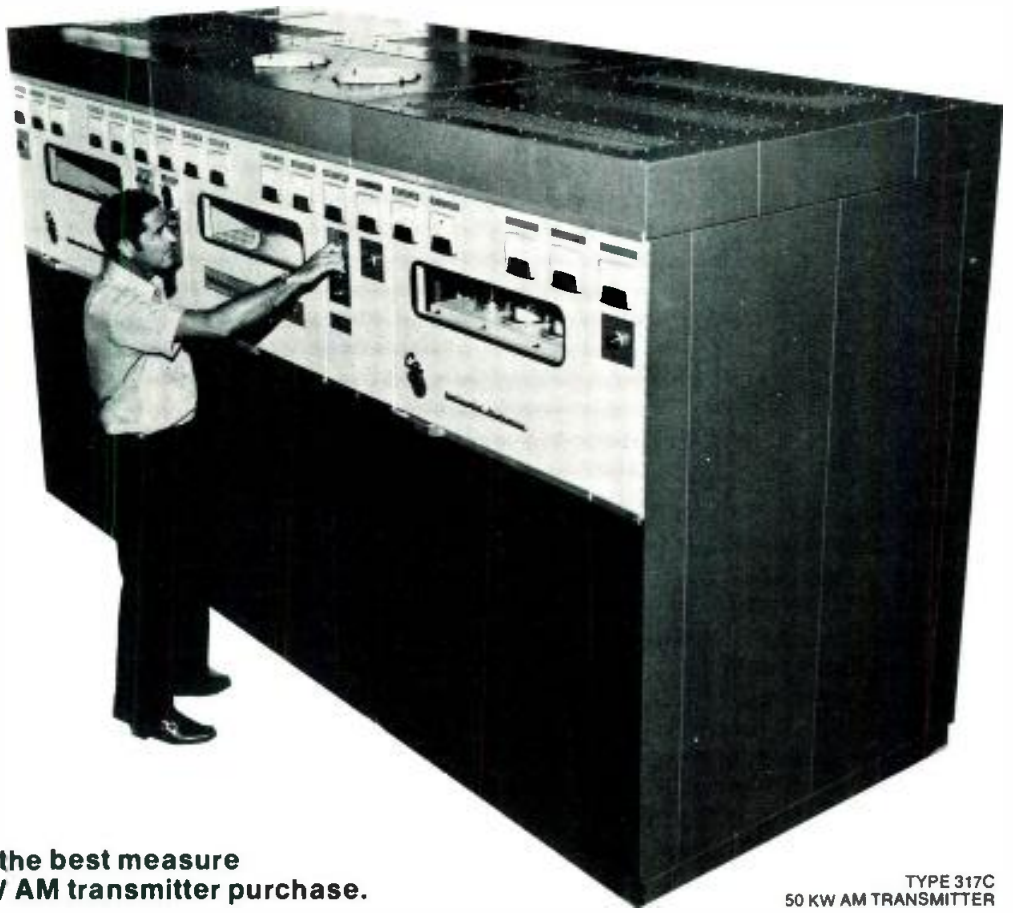
Quality shows & tells.



TYPE 317C
50 KW AM TRANSMITTER

BOOTH 413
NAB SHOW

Continental Quality: the best measure for any 5, 10 or 50 KW AM transmitter purchase.

Continental Quality shows: you can see it on the inside in the selection of components and careful, thoughtful finish work. You can see it on the outside in the solid construction; the well thought out and easy to use control panels. Continental Quality tells: you can hear the difference on-the-air, and that's where it counts.

It adds up to Continental Quality performance: few tubes; 125% positive modulation; reserve power capabilities; efficient, reliable operation without the limitations of high power audio iron core components or the high voltages associated with series modulation.

Continental Quality comes from experience: Continental has built more than 300 broadcast transmitters with a combined carrier power exceeding 25,000,000 watts. Continental Quality shows and tells in 5, 10 and 50 KW AM transmitters.

Get the facts and see for yourself. Contact:

TYPE 315/316F
5/10 KW AM TRANSMITTER

Continental Electronics

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TELEPHONE (214) 381-7161 CABLE: CONTRONICS TELEX: 73-398

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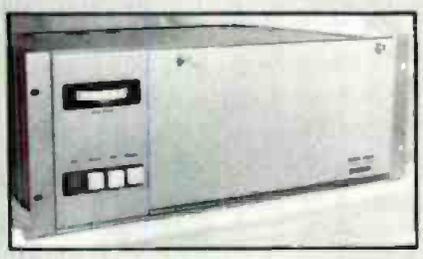
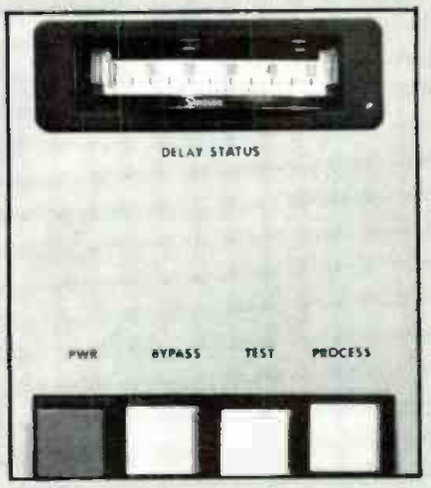
ABOUT A LOW COST TIME BASE CORRECTOR FOR THE WHOLE SPECTRUM OF VTR'S

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 ½" 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.

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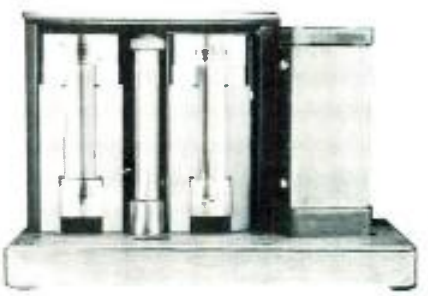

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CMC customers have a special appreciation for **quality** and **service.** Stations throughout the U.S.—both large and small—have found that Computer Magnetics Corporation is thoroughly dedicated to providing technically superior products and refurbishing services, and offering a delivery schedule that's simply unmatched in the industry.

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We invite you to make a careful comparison of test data, specifications, prices—and our unduplicated delivery schedule. It's very convincing data.

But the first time you do business with CMC will probably provide all the convincing you need. Because, so far, our first-time customers have all become regular customers.

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Computer Magnetics Corp.

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In Canada, contact:
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160 Duncan Mill Road
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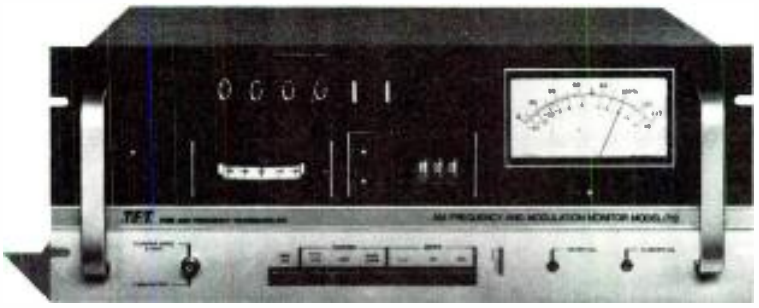
Satisfy the FCC and your monitor budget ...and still get the best

TV (UHF&VHF)

Model 701: Frequency and Modulation
(FCC Type Approval 3 187)

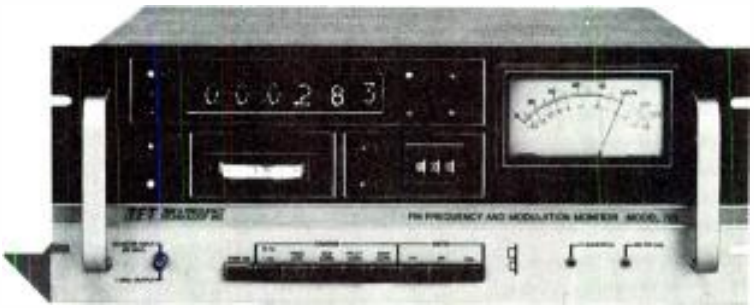
Model 702: Modulation only
(FCC Type Approval 3 189)



AM

Model 713: Frequency and Modulation
(FCC Type Approval 3-195)

Model 732: Modulation only
(FCC Type Approval 3 209)



FM/STEREO

Model 723: Frequency and Modulation
(FCC Type Approval 3-202)

Model 734: Modulation only
(FCC Type Approval 3-214)

Model 724: Stereo
(FCC Type Approval 3-217)

TV, AM and FM monitors that measure both frequency and modulation. Or modulation only. Plus full compliance with all applicable FCC regulations. Those are the choices you get from TFT.

And no matter which monitor you choose, you get all the advanced features that make TFT monitors the standards for accuracy, convenience, and reliability.

For example, frequency synthesized design allows you to calibrate frequency directly against the National Bureau of Standards. You can use either a TFT Model 735 WWV Receiver or any standard receiver.

What's more, all TFT instruments have a built-in off-the-air capability that doesn't require an RF amplifier. Result? Intermodulation interference is eliminated.

You also get digitally settable plus and minus peak flashers—a TFT exclusive. They eliminate ambiguities and allow you to set the peak limit up to 129 percent, in one percent steps. So, you can operate at the maximum allowable modulation, without fear of exceeding FCC limits.

Other TFT features you won't find in conventional monitors include digital readouts and a proportional-controlled oven master oscillator for exceptional frequency stability.

So for precise, accurate and reliable monitoring, and guaranteed satisfaction, make your choice TFT. To arrange a demonstration on your frequency, contact your local TFT representative, or call us collect.

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New generation Strobe-Beacon meets all the latest FAA requirements...and then some.

The Dielectric Strobe-Beacon provides more than 200,000 candelas during the daytime, 20,000 candelas at twilight and 4,000 candelas at night, with automatic switching from one to the other guided by an extremely accurate and reliable calibrated photo cell.

These amounts of luminous intensity conform exactly to the newest FAA standards.

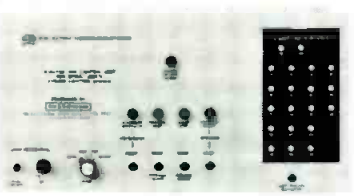
For night-time operation, a special multi-flash "burst" mode gives maximum visibility to approaching aircraft. Precise focusing to a 4-degree vertical beam width and accurate aiming of the luminaires prevents direct light from reaching the ground in surrounding neighborhoods. This has been confirmed by field tests.

Here are some of the extras you get from Dielectric—the people who specialize in high intensity warning systems for tall structures:

☐ 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.



☐ Free Brochure: We've just updated all technical literature. Like a copy? Circle our key number. Or, for a recommendation for your installation, including specifications and a price quote write to Dielectric Communications, Raymond, Maine 04071 or phone (207) 655-4555. In Canada, write to M.S.C. Electronics Ltd., 254 Wildcat Rd., Downsview, Ont. M3J 2N5 or phone (416) 661-4180.

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MASTERS OF VERSATILITY

Why MASTERS OF VERSATILITY? Because they're the full capability consoles from SPOTMASTER. They've been developed for the most discriminating Broadcaster — and they allow programming changes without console obsolescence. They're not loaded with options. All important features are built-in — and at a reasonable price. Features like switchable input levels, push button input preselection, identical program and audition outputs, built-in monitor, headphone and cue amps, internal cue speaker and separate mono matrix outputs in stereo models.

There are nine SPOTMASTERS OF VERSATILITY to choose from — including five and eight channel mono and stereo models. Construction features integral power supplies, plug-in modular electronics, and electronic switching with field effect transistors.

Spotmaster®

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Image

(Continued from page 43)

Viewing rooms seem to come in two basic types: The ones that were originally designed with great care, but where advances in equipment and the need for supplementary uses have caused alterations and rearrangements that are less than ideal, and the rooms which are really unused space equipped with a monitor on a too-high pedestal, and some extraordinarily hard chairs.

If one of these types is your problem, you should know that its use as a showcase for your product is working against you.

The ideal viewing room/showcase is tastefully but quietly decorated, with no attention-attracting decor placed to compete with the monitor screen. It is softly lighted from location behind the viewer so that no lighting fixture intrudes into their angle of vision. The monitor is placed at a comfortable height, making it unnecessary to crane the neck for clear vision, and is set against a neutral background softly illuminated from a concealed source at about 4 foot candles.

Naturally, all should be in readiness to roll tape before the arrival of the client. This admonition brings to mind an often overlooked but vitally important component: adequate and reliable communication with the tape or projection room.

Nothing tears down an image of competence faster than inability to start, stop or adjust instantly. As a footnote, no reliable support can be found for the theory that hard and uncomfortable chairs promote attention or cause the clients to rush through the viewing to get out even at the cost of passing by a few unsatisfactory points. So why not also make your viewers comfortable — that can be more apt to help their attitude, I'm sure.

You've done a lot of commercials, and programs too. You know your facilities are the best your area's circumstances permit — probably your client knows this too, but take that extra step, make that

77 models ready to go!
Shipped in 72 hours or less!
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THE OFF-THE-SHELF MODULAR CABINETRY

Vertical frames . . . slope front . . . turret . . . instrument . . . desk and counter height . . . work/writing top . . . low silhouette. Whatever your urgent enclosure need, chances are one of our 77 in-stock assemblies will serve the purpose. Adequately. Efficiently. And quickly —we ship completely assembled in 72 hours or less.

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Ingersoll Products

BORG WARNER

little effort that provides your whole operation with a polished image that removes any shadow of doubt in his mind. Let your image state firmly, "We are a quality house, and your reputation is safe with us". □

Costs

(Continued from page 54)

the case and the station accounting department pays the bills without your approval first, it is possible to be paying for this circuit for months before the error is discovered!

Keeping Tabs

All invoices for services or equipment associated with the engineering department should be approved by the chief engineer before the accounting department pays them. Paperwork can move faster than deliveries, so if an invoice is paid without checking, the equipment may never show up because it was lost somewhere. There have been other cases where the invoice was sent to the wrong station and the station may pay for some other station's purchase if the invoices aren't checked against delivery. It could happen to you.

Summary

The everyday practices in the engineering department make up a large share of station expenses. By constantly attempting to obtain the most efficient use of funds in all these activities, those needed expenses can be kept within reasonable limits. □

SBE
SOCIETY OF BROADCAST ENGINEERS, INC
P O Box 88123 Indianapolis, Indiana 46208

(Continued from page 19)

Chapter 22—Central New York
Chairman: Hugh Cleland, Liverpool, N.Y. 13088

On January 17th, dinner at the Northway Inn preceded the technical meeting at Newhouse II Communications Center, Syracuse University, Studio 3, where Bill Cooper, supervisor, Audio Services, provided the program, including a tour of the recording studio, audio laboratories, and radio stations. The studio, of super modern design, includes suspended floors. The Audio Services portion of the center consists of nine control rooms.

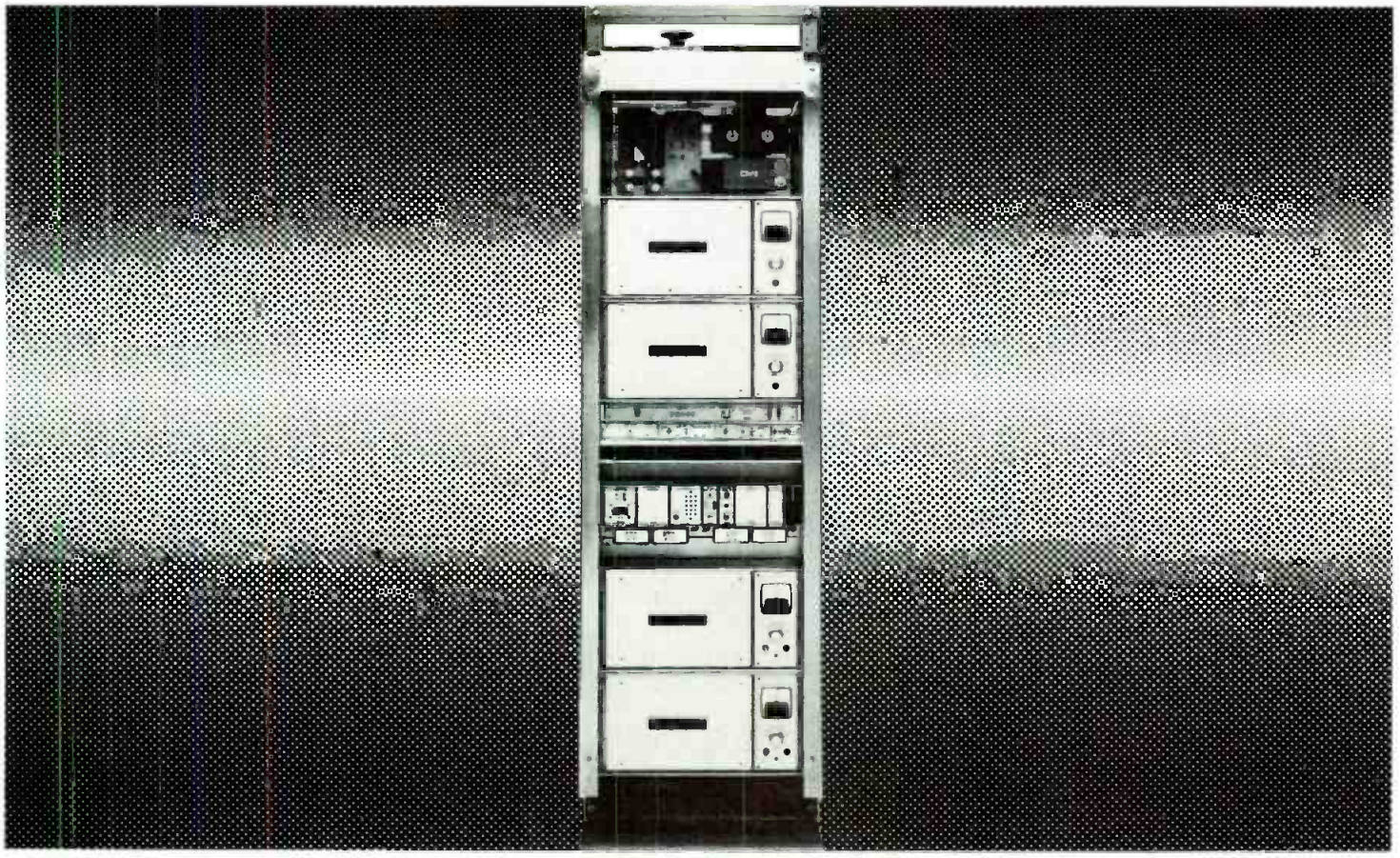
Chapter 25—Indianapolis, Ind.
Chairman: Joe Missick, Indianapolis, Ind. 46202

The January 8th meeting of the chapter was held at the IUPUI University Hospital Cafeteria; the technical session was provided by Dwight McPherson, chief engineer of the TV department of the IUPUI Dental school, who provided a tour of the facilities.

Chapter 26—Chicago, Ill.
Chairman: Bradley Anderson, Univ. of Ill., Chicago, Ill. 60680

On January 22nd, at the facilities of NBC's WMAQ-TV, Merchandise Mart, Peter Birnstein, manager of commercial engineering for Amperex, covered the development of various transmitter tubes, and the

Uniquely-Protected Microwave for Video Transmission in the 7 GHz Band



One of the Farinon Remodulating-Baseband and Heterodyne Systems for the 2, 7 and 13 GHz Bands.

This Farinon SS6000 Microwave Radio System provides 2-watt output from combined phase-locked transmitters (with Farinon's patented On-Line Protection), 9dB receiver noise figure and excellent video performance.

The FV41 Program Channel Transmission System, versatile wideband channels above the video, occupies one rack space midway in the rack.

The FV40 Video Subsystem, a highly-flexible assembly of 70-MHz modulators and demodulators, clamper amplifiers, distribution amplifiers, AM and FM channels, order wire and protection units, also is available.

Farinon solid-state microwave systems and related equipment are in use throughout the United States and in 60 other countries.

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(408) 732-3921

Farinon Electric of Canada, Ltd.
657 Orly Avenue, Dorval, 760, P.Q.
(514) 636-0974

Farinon

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Plumbicon. The program was coordinated by Ralph Johnson, regional salesmanager for Amperex. Sustaining members of the Chicago Chapter include Rich Electronics, Dyer Electronic Distributor, Telemation Productions, Swiderski Electronics, and NABET.

Chapter 28—Milwaukee, Wisc.
Chairman: Ed Wille,
Milwaukee, Wisc. 53218

Dick Elliott and John Robinson of 3M Magnetic Products provided a program on "Magnetic Tape" at Radio City Auditorium on January 22nd. Elliott is a 15-year KSTP, St. Paul, veteran, plus 10 years with Magnetic Production Division of 3M Company; he covered quad video tape including noise characteristics. Robinson, also an audio specialist, covered general purpose, lubricated, and music-mastered tapes. Question and answer periods followed each session.

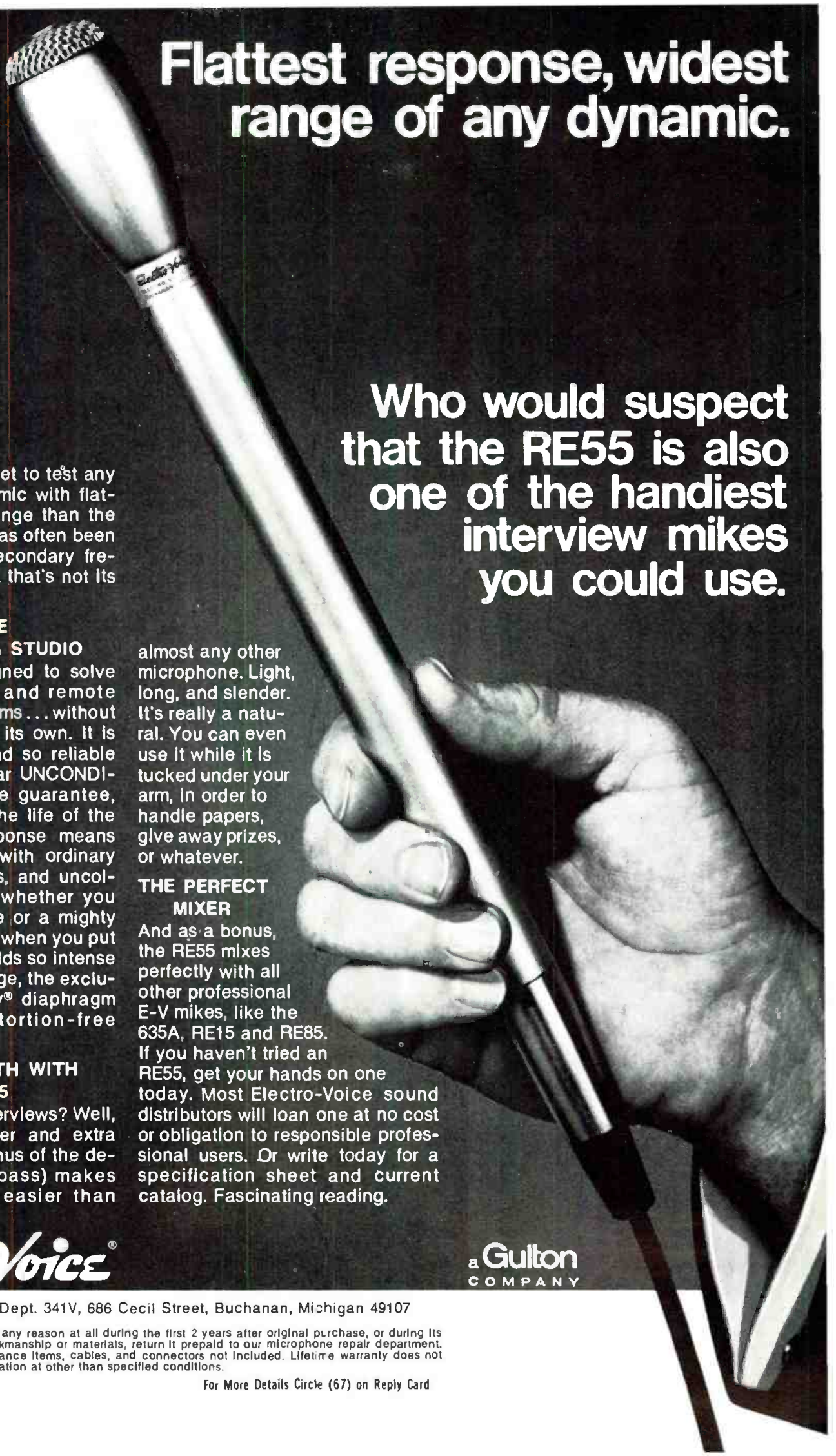
Chapter 32—Southern Ariz.
Chairman: Hobart J. Paine,
Tucson, Ariz. 85717

The December 20th meeting was in the form of a Christmas party combined with a business session, held at Shakey's Pizza Parlor. Mrs. Jimmy Novak won a raffled 8-track stereo with amp and speakers, donated by Inland Electronics; Eugene Stough won a Sony radio, donated by Roh's, Inc. On January 14th, the chapter met at KZAZ-TV studios in Tucson.

Quincy, Ill.
Lynd J. Carter, Chairman Pro Tem
Tektronix, Inc., 3028 Lawrence Rd.
Quincy, Ill. 62301

On January 30th, engineers, technicians, and students associated with broadcasting met at the Holiday Inn, Quincy, to hear C. I. Kring, manager, TV sales, Gates Division, Harris Intertype, speak on "Electronic Communications - Today and Yesterday". This was also an organizational meeting, coordinated by Lynd J. Carter of Tektronix. Members and others interested in attending future meetings of the Quincy chapter may contact Lynd Carter at Tektronix, or by telephone, (314) 731-4696.

Flattest response, widest range of any dynamic.



Who would suspect that the RE55 is also one of the handiest interview mikes you could use.

It's a fact. We have yet to test any omnidirectional dynamic with flatter, more extended range than the RE55. It's so good it has often been used in labs as a secondary frequency standard. But that's not its real purpose in life.

FOR THE HARD-WORKING STUDIO

The RE55 was designed to solve day-to-day studio and remote sound pickup problems... without creating problems of its own. It is extremely rugged, and so reliable we can offer a 2-year UNCONDITIONAL performance guarantee, plus a warranty for the life of the RE55*. The flat response means less feedback than with ordinary omnidirectional mikes, and uncolored sound pickup, whether you are listening to voice or a mighty pipe organ. And even when you put the RE55 in sound fields so intense as to cause ear damage, the exclusive E-V Acoustalloy® diaphragm responds with distortion-free equanimity.

HAND-TO-MOUTH WITH THE RE55

What, then, about interviews? Well, the 3/4-inch diameter and extra length (which is a bonus of the design for extended bass) makes handling an RE55 easier than almost any other microphone. Light, long, and slender. It's really a natural. You can even use it while it is tucked under your arm, in order to handle papers, give away prizes, or whatever.

THE PERFECT MIXER

And as a bonus, the RE55 mixes perfectly with all other professional E-V mikes, like the 635A, RE15 and RE85. If you haven't tried an RE55, get your hands on one today. Most Electro-Voice sound distributors will loan one at no cost or obligation to responsible professional users. Or write today for a specification sheet and current catalog. Fascinating reading.

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ELECTRO-VOICE, INC., Dept. 341V, 686 Cecil Street, Buchanan, Michigan 49107

*If the RE55 fails to perform for any reason at all during the first 2 years after original purchase, or during its lifetime due to a defect in workmanship or materials, return it prepaid to our microphone repair department. We'll fix it free. Finish, appearance items, cables, and connectors not included. Lifetime warranty does not cover things like abuse or operation at other than specified conditions.

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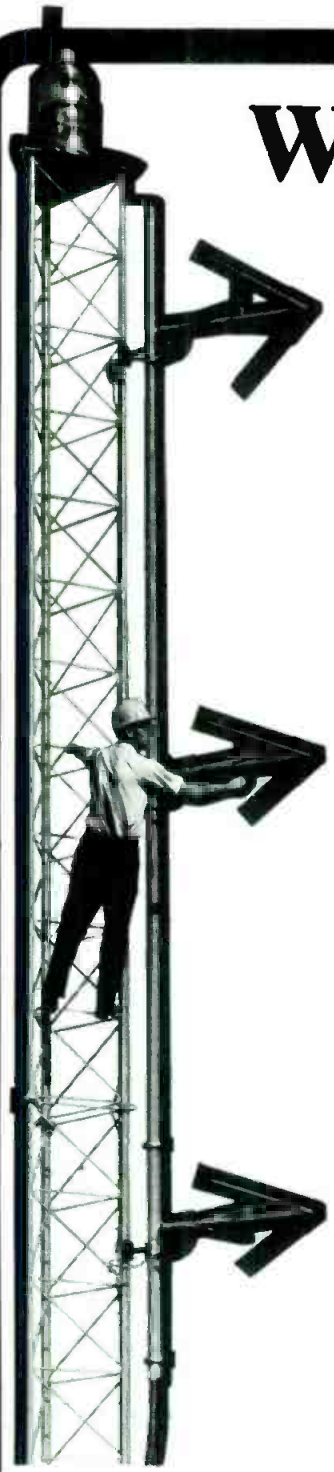
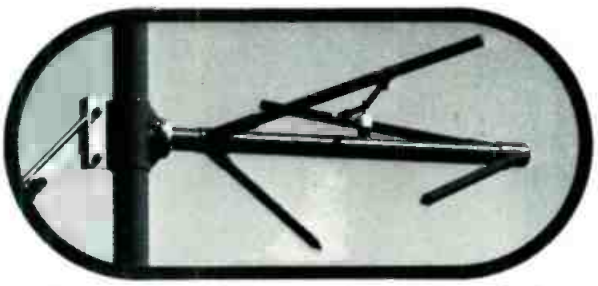


We penetrate the San Francisco Bay Area

27 of the 39 San Francisco Bay Area FM stations have purchased Jampro FM antennas. Of the top 9 stations with 50 KW or more ERP, 8 have Jampro antennas. And for many good reasons! Better stereo performance due to lower VSWR. High power corona-free operation in foggy San Francisco mountain top transmitter locations. Join the majority of FM broadcasters in the 5th largest market in the country, serving over 1.6 million homes, with 3.3 million adults*. Buy a JAMPRO antenna, if you don't already have one! Choose from four different types to meet your particular power and coverage requirements. Phone or write us. Our experienced antenna engineers will be happy to discuss your requirements.

**Statistics available upon request*



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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 cuing 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:

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

For More Details Circle (69) on Reply Card

Swiss Performance

Our new Electro Sound ES-505 Professional Recorder Reproducer has what it took the Swiss centuries to develop. A heritage of classic design and precision performance. The ES-505's essential mechanical and electronic specifications compare favorably to Studer's A-80. And at ½ the price! □ European or American—no other professional machine has more significant "Operator Engineered" features. A disappearing headgate for easy editing or cleaning. A built-in reference audio oscillator that supplies test frequencies 50 through 15K for instant alignment. An optical motion sensing system prevents tape damage during control sequencing. And differential disc brakes for ultra smooth tape stops. □ Operator simplification. Our ES-505's "Record" indicator light also continuously monitors bias. There are two calibrate positions: one for record and one for reproduce. Our optional third reel is the ultimate in convenience for those heavier editing jobs. Operating modes are instantly recognized with fully illuminated transport controls or optional remote controls. □ Operator satisfaction. Electro Sound's unique viscous damped idler fly wheel lowers flutter up to 25%. The ES-505's non-slip capstan improves playback timing accuracy to ±1.8 seconds in 30 minutes recording. □ The ES-505 is available in console, portable, and unmounted configurations in ¼" or ½" versions, with 1, 2 or 4 channels of electronics. □ The Electro Sound ES-505 comes with the world's only 1½ year extended parts warranty. The American machine to match Swiss excellence.

Performance	Electro Sound ES-505	Studer A-80
Mechanical		
Timing Accuracy	±0.1%	±0.1%
Wow and Flutter 7½ ips	−0.08 rms	−0.07 rms
Electronic		
Frequency Response 15 ips	30-18K Hz ± 2dB	30-18K Hz ± 2dB
Signal-to-Noise 15 ips— Two Track	63 dB Unweighted	62 dB
Distortion	0.4% 2 HD @ 500 Hz. Peak Record	−1.0% @ 1K Hz. Operating Level
Price	$3,395	$6,670

Electro Sound, Inc.
725 Kifer Road, Sunnyvale, CA 94086
(408) 245-6600 Telex: 34-6324 LECTROSND SUVL

American Prices

For More Details Circle (70) on Reply Card

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:

MICROTIME
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.

Television Microtime, Inc.
1280 Blue Hills Avenue, Bloomfield, Conn. 06002
(203) 242-0761

Available from leading television distributors throughout the United States and Canada

For More Details Circle (71) on Reply Card

Product Guide

(Continued from page 37)

computer concept that is designed for versatility and ease of operation.

The Vimax 27 reads out on a CRT and gives 64 characters per line, with 27 events displayed at one time.

The systems offers full editing capabilities, multiple pre-rolls without time restrictions and full transition capability including fades disolves, pattern wipes and inserts.

Complete logging facilities are included for management and FCC purposes.

The Vimax 27 also includes a manual override that is always "hot" and power failure protection. Complete plant communications with auxiliary monitors is possible. The unit is two systems in one: on-air plus 8 programmable selections for microwave switching, VTR's into record, etc. Optional mass data storage is available for advanced scheduling from 27 events to one year.

For More Details Circle (131) on Reply Card

Remote Control System

The **Delta** Model TMCS-1 Remote Control System was designed to provide the necessary control and meter monitoring functions for the broadcast stations which utilize the Delta Model DAM-1 Antenna Monitor.

The control system provides for complete control and readout of the DAM-1 Antenna Monitor and for the digital readout of up to 15 metering channels. The system also features up to 15 ON/RAISE and OFF/LOWER control circuits. Eight on/off alarm indicators are mounted on the remote unit and an alarm is sounded when one or more alarm signals are present. The entire system is contained in to units with 7" panels for mounting in 19" rack cabinets.

Signaling between units is provided by self-contained FSK modems on a time share basis and requires a single two-way voice grade telephone pair. In cases where the transmitter control and monitoring functions are not desired, the Delta DAML-1 and DAMR-1 units provide all required functions for control and monitoring of the DAM-1 Antenna Monitor.

For More Details Circle (132) on Reply Card

Radio Continuity And DJ Console

The emphasis at the **Neve** booth this year at NAB will be high quality sound control consoles for broadcasting industry. Featured will be a new radio continuity and DJ console which incorporates the following facilities: 4 microphone inputs with limiters, high quality slide faders, pan pots, and reverberation facilities; 6 line stereo channels with high quality slide faders; Telephone input channel; 3 volume indicators; 2 voice-over units; Patch panel; and cue and transmission light facility.

For More Details Circle (133) on Reply Card

TV Translators

Acrodyne Industries, Inc. has announced the introduction of a new, complete line of television translators in ten models in steps from 1 to 1,000 Watts (both VHF and UHF). All ten models in the new T-200 series incorporate the latest solid-state devices to assure long term reliability and to minimize the complexities of periodic maintenance.

This translator series features competitive pricing and specifications meeting or exceeding all FCC requirements. Standard delivery for units to 100 Watts is 45-60 days. The new series T-200 Translators carry a 1 year warranty, the first 90 days of which are covered by an unconditional warranty.

The new Acrodyne T-200 equipment employs a single intermediate frequency conversion scheme making it well suited for single and multihop translator installations.

For More Details Circle (134) on Reply Card

(Continued on page 88)

VIDEO TAPE CONFIDENCE

RECORTEC equipment will relieve your VTR of all time consuming functions not related to revenue production.

Video Tape Conditioner

- Extends tape and head life by removing loose oxide and debris from tape surfaces.
- Improves quality of video recording due to reduced dropouts.
- Minimizes tape damage by improving the tape pack.
- Options such as erase, splice count, audio playback, etc., are also available.

Video Tape Evaluator

- Display total number of edge damages.
- Display total number of surface defects.
- Display total tape time.
- Tape fully cleaned, uniformly packed and degaussed.
- Increases VTR utilization.

Plus additional capabilities

- Audio Playback
- Video Tape Addressing
- Video Tape Tailoring

RECORTEC, INC.

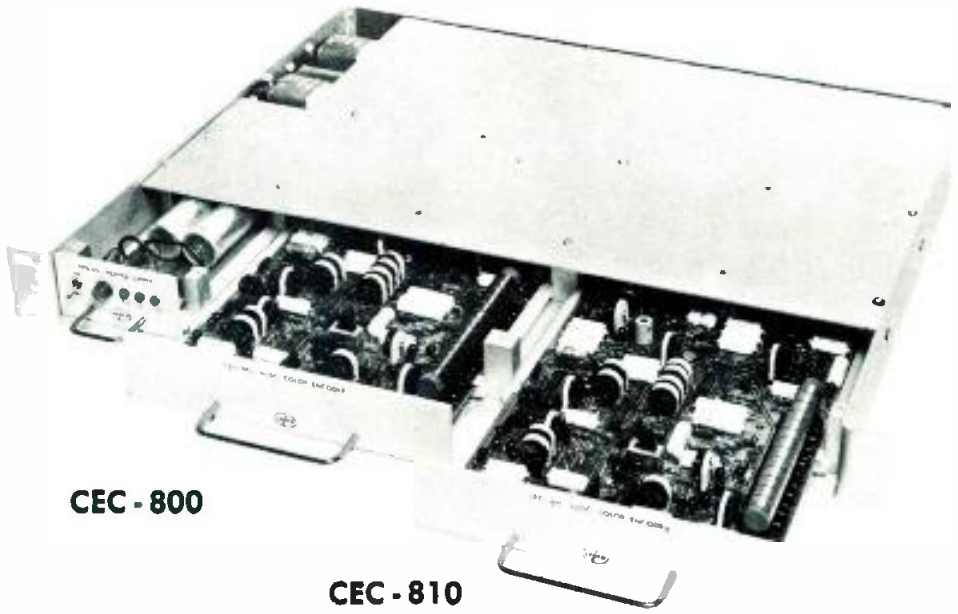
777 Palomar Street
Sunnyvale, California 94086
(408) 735-8821

For More Details Circle (73) on Reply Card

LENCO ELECTRONICS

presents

The winning pair



CEC - 800

CEC - 810

NTSC COLOR ENCODERS

The CEC-800 and CEC-810 Encoders are designed for maximum stability with simplified alignment. They can be used as a plug-in replacement for the R-Y, B-Y Encoder used in IVC's model 90 and model 150 color camera or as pictured, rack mounted in the PFM-801 frame, for use with any make or model R, G, B color camera. A green tie switch is included for alignment or monochrome operation. Horizontal aperture correction is "contours out of green". Chroma can be phased 360°. Encoders operate on RGB, sync, blanking, and subcarrier.

The CEC-800 can be aligned within 5%, using only a waveform monitor.

The CEC-810 has the added feature of an inbuilt color bar generator for internal, as well as monitor alignment.

CEC-800 Plug-In Module $995.00
CEC-810 Plug-In Module $1,195.00
PFM-801 Frame w/Power Supply, holds 2 Encoders $400.00

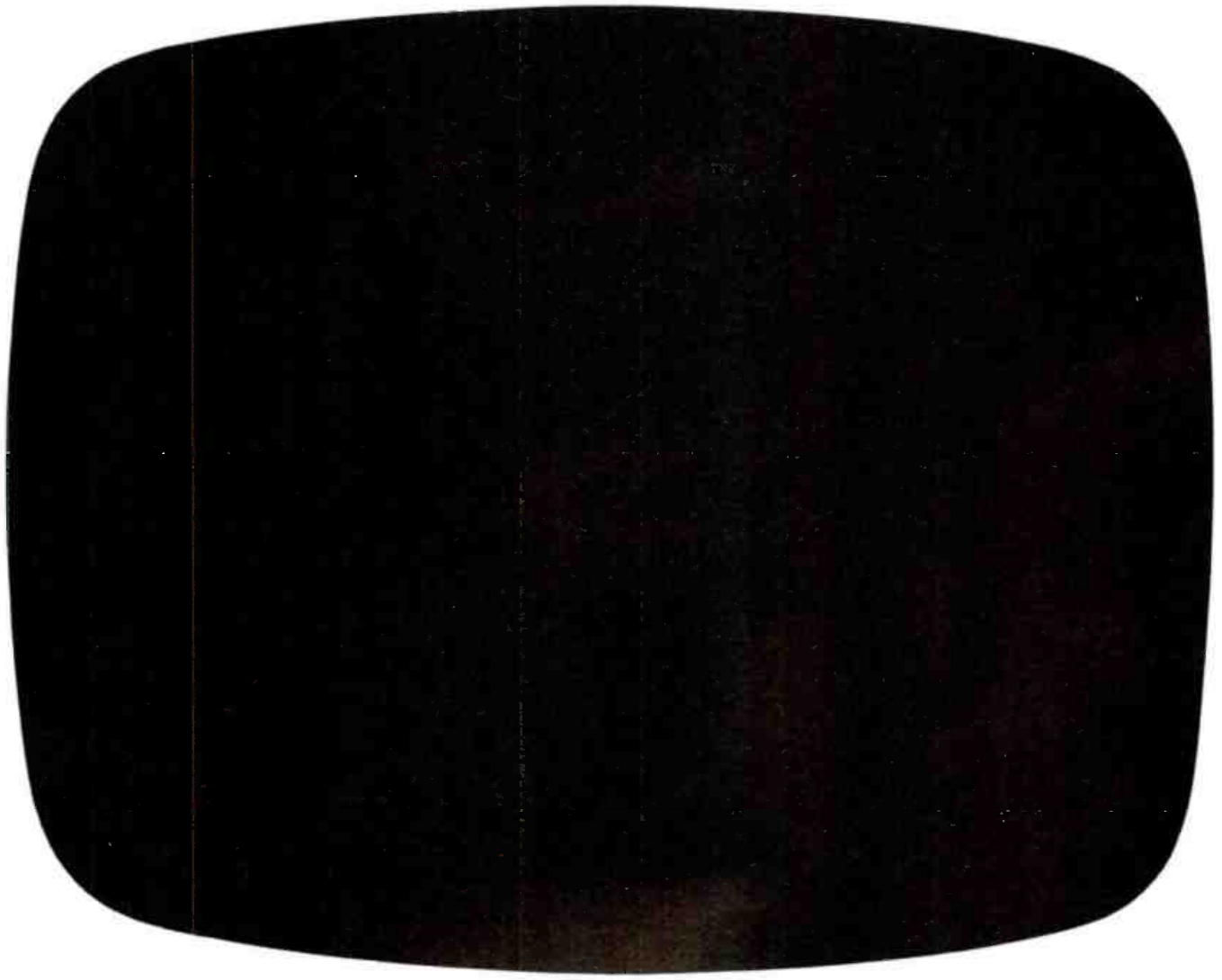
OTHER LENCO PRODUCTS

CSG-700	Color Sync Generator	PVA-100	Video Distribution Amplifier
CSL-710	Gen-Lock Generator	PVA-101	Video D.A. w/Differential Input
CSG-CO-1	Sync Changeover Switch	PVA-102	Video D.A. w/Breezeway Clamp
BB-500	Black Burst, Pattern Genrator	PPA-110	Pulse Distribution Amplifier
CPA-200	Clamping-AGC Video Amplifier	PPA-111	Pulse D.A. w/Pulse Delay
VP-1	Video Presence Detector	PSA-120	Subcarrier Distribution Amplifier

LENCO ELECTRONICS

A DIVISION OF LENCO, INC.

PHONE [314] 243-2394 OR 243-3141 319 W. MAIN ST., JACKSON, MO. 63755



This is a picture of your picture.

(during a power failure)

Yours may be the finest broadcast facility around. But you aren't transmitting much of a signal when the power is off.

Admittedly, chances of a prolonged power failure aren't great. Yet they do happen.

That's where Onan standby power comes in.

It provides "insurance" against a crippling power outage.

It doesn't have to replace utility power totally. But it can keep you on the air.

It can keep heating and ventilating equipment working. Elevators running. Lighting in critical areas burning.

So when you're ready to talk seriously about standby power for your TV or radio station, remember this:

Onan is the world's number one builder of standby power plants.

Only Onan gives you total system responsibility for the engine, generator and load transfer controls. We build 'em, test 'em, install 'em and certify that they will perform as rated. Only Onan warranties the complete system for 5 years.

Call your local Onan Distributor (in the Yellow Pages under Generators) or send coupon.

FREE STANDBY POWER BOOKLET

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1400 73rd Avenue N.E.
Minneapolis, Minnesota 55432

Please send a copy of "Standby Power . . . who needs it?" to:

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Firm_____

Address_____

City_____ State_____ Zip_____

Onan

ELECTRIC GENERATOR SETS • LOAD TRANSFER CONTROLS • INDUSTRIAL ENGINES

Product Guide

(Continued from page 84)

Time Base Correctors

Television Microtime will be displaying several new products at the NAB, adding to what they'll call their Microtime Family.

Leading off the parade will be their 600 series Digi-Matic TBC. It's designed to work with direct and hetrodyne record one head per field helical VTR's. These VTR's exhibit a number of errors due to their mechanical and tape errors. The Digi-Matic TBC is a unique wide-aperature TBC available in two NTSC color models: The 624 which transforms any capstan servo'd record VTR into a system meeting FCC specs for broadcasting. The model 644 which accepts both direct and hetrodyne record playback is said to upgrade the output of any capstan servo'd VTR from ½-inch to 1 inch, and that means upgrade to broadcast quality.

For More Details Circle (135) on Reply Card

Dynamic Microphone

Electro-Voice will display their line of professional microphones that includes their RE55.

This microphone offers a flat response that helps reduce feedback and sound coloring whether used with voice or muscial pickups.

This lightweight model is designed for rugged use, including taped or on-the-air interviews.

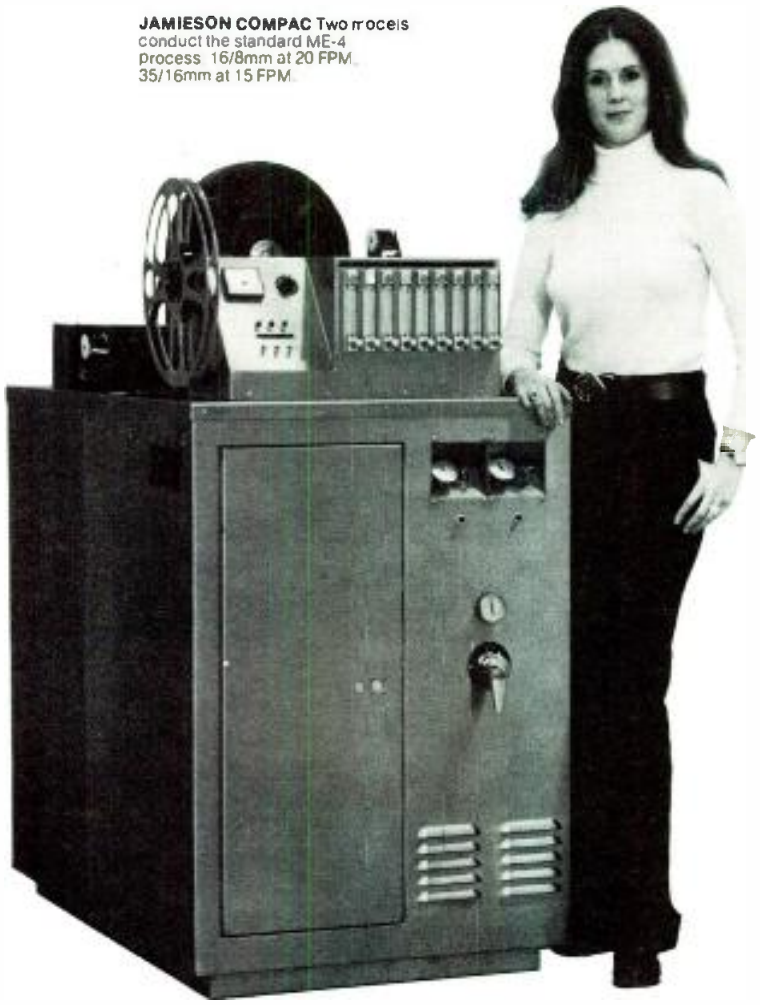
For More Details Circle (136) on Reply Card

Audio Mixer

Russco Electronics will introduce their new stereo broadcast audio-mixer, the STUDIO/MASTER 505S. It's features include 5 mixing channels, 4 channels in stereo including built-in preamps. Each channel is adjustable for mic, phono or hi-level. Channel 5 has 5 hi-level push-button balanced inputs. The 505S has a built-in cue speaker allowing cueing on any channel with Allen-Bradley Mod Pots. A built in headset amplifier and push-button key switching with LED indicators, and FET monitor muting are also featured.

A New companion to the monaural STUDIO/MASTER 505, it's an attractive package with deep maroon panels, and blue-grey cabinets. The 505S also is available in a rack mount model fitting into a 5¼" space. See it in booth 617 at the NAB convention.

For More Details Circle (137) on Reply Card



JAMIESON COMPAC Two models conduct the standard ME-4 process. 16/8mm at 20 FPM. 35/16mm at 15 FPM.

Jamieson Compac

STILL NO.1 IN TV STILL ONLY $6980

We introduced the Compac color film processor three years ago, and since then we've shipped more than one a week.

Now the popularity of this and other Jamieson processors is growing so rapidly that we have moved into a new plant, effectively doubling our manufacturing space.

Why so popular?

Someone you know owns a Compac. Probably a lot of people you know. Why not ask them about it. That's the best way to get an unbiased appraisal of its performance.

Or ask us. We'll be more than happy to tell you about the Compac and give you dozens of references. Just call us or return the coupon.

☐ Please send me your brochure and data sheets on the Compac and other Jamieson processors, along with a list of some users.

Name _____ Title _____

Firm _____ Phone _____

Address _____

City _____ State _____ Zip _____

JAMIESON FILM COMPANY

EQUIPMENT DIVISION 6911 Forest Park Road. Dallas. Texas 75235 Phone: (214) 350-1283

Digital Remote Control

Here's one we weren't expecting—**McBee Laboratories** will introduce a digital remote control, a simple, stable transmitter remote control system incorporating state-of-the-art C-MOS circuitry.

Called the D-144, this system is designed for immunity to interference, noise, and transients. Its power supply is capable of minimizing power line variations. But what is really interesting is that the required calibration can be done by one man at the transmitter location only.

The D-144 uses an autoranging digital voltmeter that the company says is accurate to within .001 percent. LED character displays are used to provide wide angle visibility and long distance viewing.

The transmitter is protected by a fail-safe system that complements the system surveillance approach. What's more, a special TV time protection delay system is available.

For More Details Circle (138) on Reply Card

Chroma Corrector

The **Matthey** Chroma Corrector "puts color in its place". Early or late Chroma due to poor microwave or multi-generation tapes can now be corrected quickly without disturbing the luminants or other video parameters. Manual and automatic by-pass is provided together with remote control. The unit will be demonstrated at Television Equipment Associates' Booth Number 204 in the East Exhibit Hall at NAB.

For More Details Circle (139) on Reply Card

Color Monitors

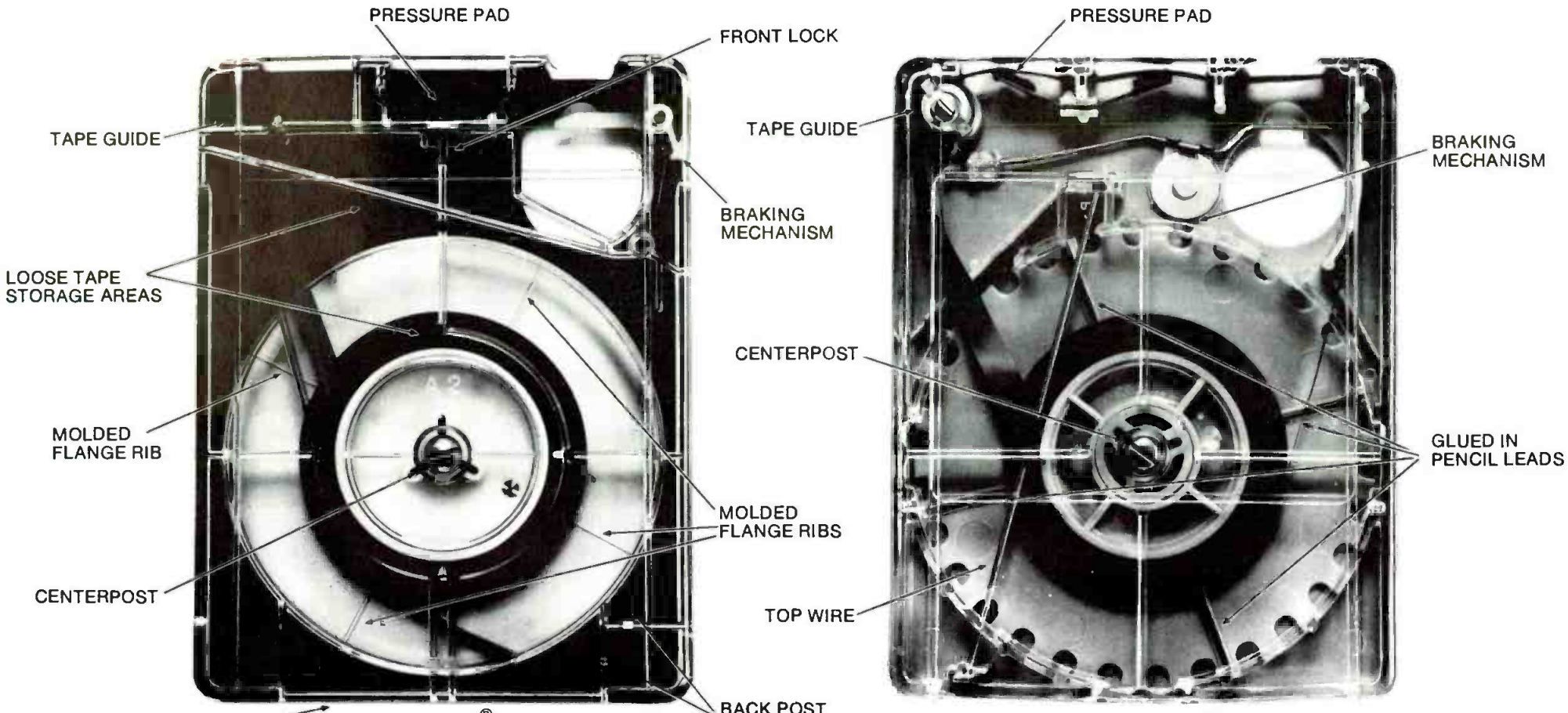
World Video will introduce a number of high interest items at the convention. First on the list is their CP 5002 color video monitor, a unit that truly is portable. It will operate from a self-contained battery pack or from the nearest AC outlet. The CP 5002 has a five-inch diagonal Trinitron picture tube. The unit was designed for field use with the new portable color cameras and VTR's.

They also will show their improved 6210 series professional video color monitor with additional features and improved servicability. Included in their booth will be a new large screen CCTV color monitor, the RV 3901.

For More Details Circle (140) on Reply Card

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.



AUDIO DEVICES, INC., A CAPITOL INDUSTRIES CO., 100 RESEARCH DRIVE, GLENBROOK, CONN. 06906 • MANUFACTURERS OF AUDIOTAPE,® AUDIOFILM® AND AUDIODISCS.®

SEE US AT BOOTH 214

Product Guide

1000 Watt Digital RF Wattmeter

The new **Bird** model 4371 THRU-LINE® directional high-power wattmeter is the first digital insertion instrument for measuring forward or reflected CW power in coaxial transmission lines. It accurately measures power flow under any load condition from 25 to 520 MHz and from 1 - 1000 Watts in six ranges. Insertion VSWR in 50-Ohm systems is a low 1.1 and accuracy is ±5% OFS. Model 4371 is also the first High-Power Directional Wattmeter which the user can calibrate in the field to know RF power standards, eliminating weeks of transit for periodic certifications.

The new multi-range digital THRU-LINE® Wattmeter measures CW, AM, FM and SSB signals. Its digital readout makes it ideal for production testing and continuous service applications, since the information is displayed with the decimal point in place.

For More Details Circle (141) on Reply Card

TV Audio Console

Cetec, Inc., manufacturer of professional audio products, has introduced the Model 1204-TV Audio Control Console aimed at the television broadcasting industry.

This new television console incorporates all the design features of the popular Model 1204 recording studio console, and has many added functions and controls specifically designed for television production and broadcast requirements.

Highlighted features in the Model 1204-TV include the following:

- Eight monitor muting switches which help prevent feedback from studio microphones, assuring program continunity without interruption.
- Direct feed switching which bypasses the bus assignment and output sections of the console, permitting the console to be utilized for production work while the station is on the air.
- Two special input channels each accept 11 line-level pushbutton switchable sources. Inputs may be instantly switched from VTR's, film chains, cassettes, turntables, or remote lines.

For More Details Circle (142) on Reply Card

X-Y Digitizer

The **CVI** Model 622 X-Y Digitizer provides either manual or automatic digitization of the X-Y coordinates of information in a standard video signal. Update rate is 60 times per second and internal calibration is incorporated.

Price of the Model 622 is $4500 and availability is 90 days.

For More Details Circle (143) on Reply Card

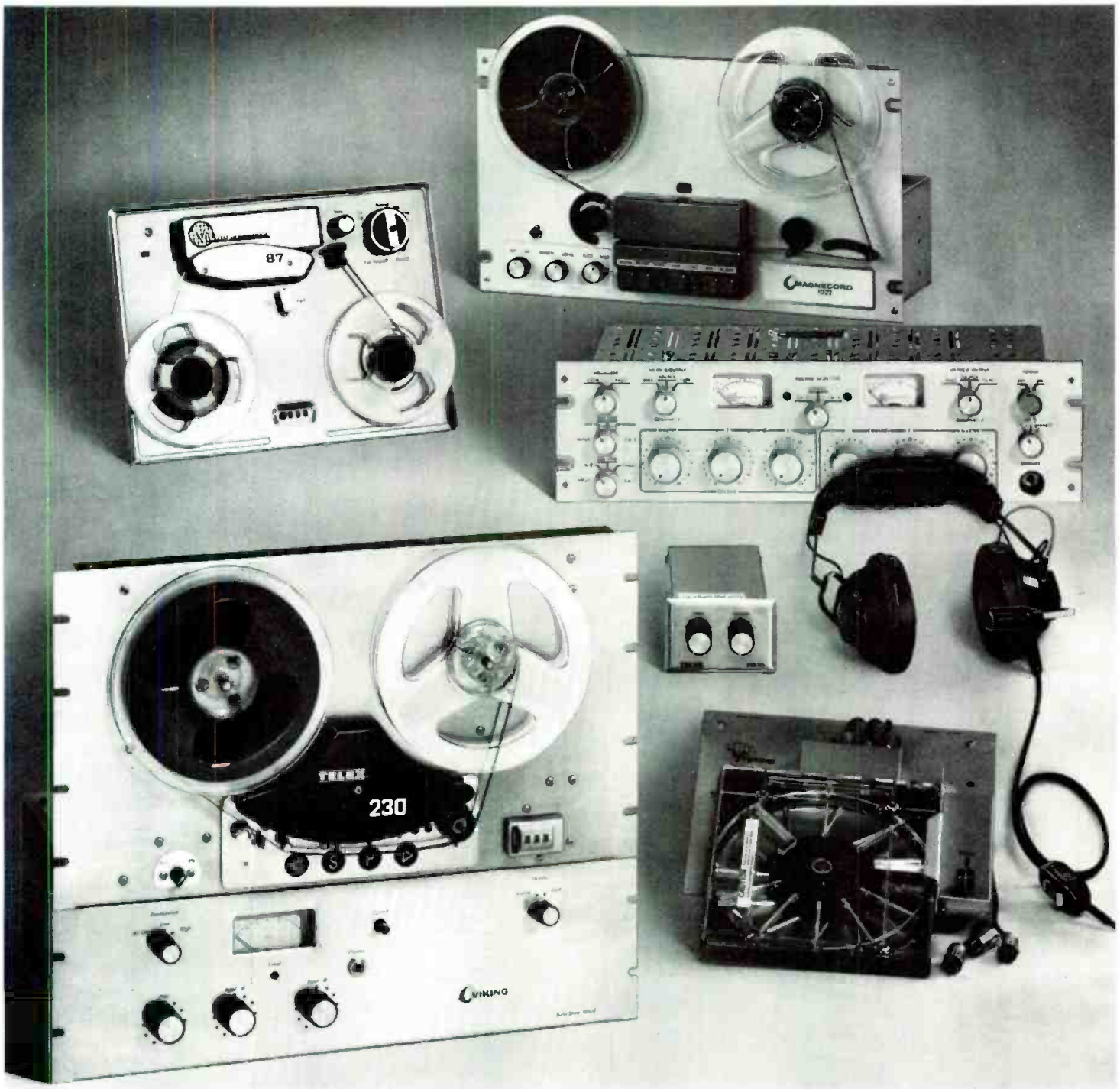
Modular Audio Production Consoles

The **McCurdy** SS7700 series of Modular Audio Production Consoles consists of up to 20 mixer-channels, with expansion capability to 24; submaster and master Program-channels in quantities as required, providing complete professional facilities for the mixing, monitoring and control of audio program material associated with radio and TV production in today's broadcast industry.

In addition to complete program mixing, monitoring and control, the SS7700 series provides P.A. feeds, a comprehensive Cue System, Solo, Echo-Send/Receive, Foldback and Talkback facilities, and a full range of options which include equalizers, compressors and remote D.C. controls. This complete control center is packaged in an attractive, functionally designed, compact floor model of rigid construction, offering performance specifications well within recognized broadcast standards.

For More Details Circle (144) on Reply Card

(Continued on page 101)



For your every broadcast and tape equipment problem or need ...Telex.

You'll find that Telex has both quality and range.

From economical, manually operated tape cartridge transports to heavy duty, commercial/industrial three motor tape transports with hysteresis synchronous capstan drive.

And from compact, monaural tape playback pre-amplifiers to single and dual channel professional magnetic tape record/playback amplifiers.

For recording and reproducing sound of incomparable quality, of course look no further than the standard of the industry Magnecord series.

In fact, look no further than Telex for any and all of your broadcast and tape handling needs, including headphones. For literature, write Telex Communications, Inc., 9600 Aldrich Avenue South, Minneapolis, Minnesota 55420.

PRODUCTS OF SOUND RESEARCH

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COMMUNICATIONS INC

CANADA: Double Diamond Electronics Ltd., Scarborough, Ontario
INTERNATIONAL: Telex Export Dept., 9600 Aldrich Ave. S., Minneapolis, Minn. 55420 U.S.A.

7310

For More Details Circle (89) on Reply Card

To fulfill the requirements of the most critical listening and auditioning... Stanton is the professional standard.

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

in STEREO– The Stanton 681EE

If critical listening is to be unbiased, it must begin with a stereo cartridge whose frequency response characteristics are as flat as possible. One that introduces no extraneous coloration as it reproduces recorded material. For anyone who listens "professionally," the 681EE offers the highest audio quality obtainable at the present 'State of the Art.'

Many record critics do their auditioning with Stanton 681EE. Recording engineers have long used the Stanton 681A to check recording channel calibration. The 681EE provides that logical continuation of the Stanton Calibration Concept. High compliance and low tracking force assure minimum record wear. Its low-mass, moving magnetic system produces virtually straightline frequency response across the entire audio spectrum. Its built-in longhair brush keeps the stylus dust-free, and protects record grooves, thus reducing noise and wear. Each 681EE is individually calibrated, and the results of these calibration tests are included with each cartridge.

The Stanton 681EE—used by recording engineers, broadcasters, critics and audio professionals—the cartridge that sounds like the record sounds, always.

in DISCRETE 4-CHANNEL– The Stanton 780/4DQ

QUADRAHEDRAL

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.

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.

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.

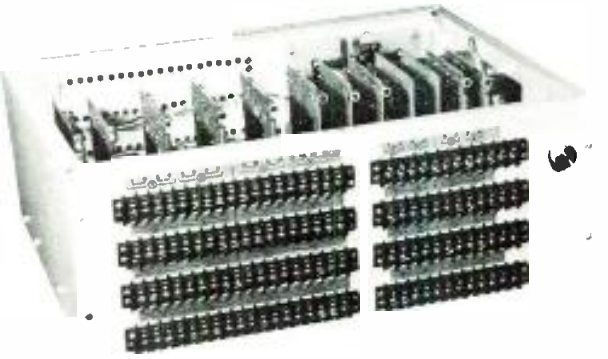
STANTON

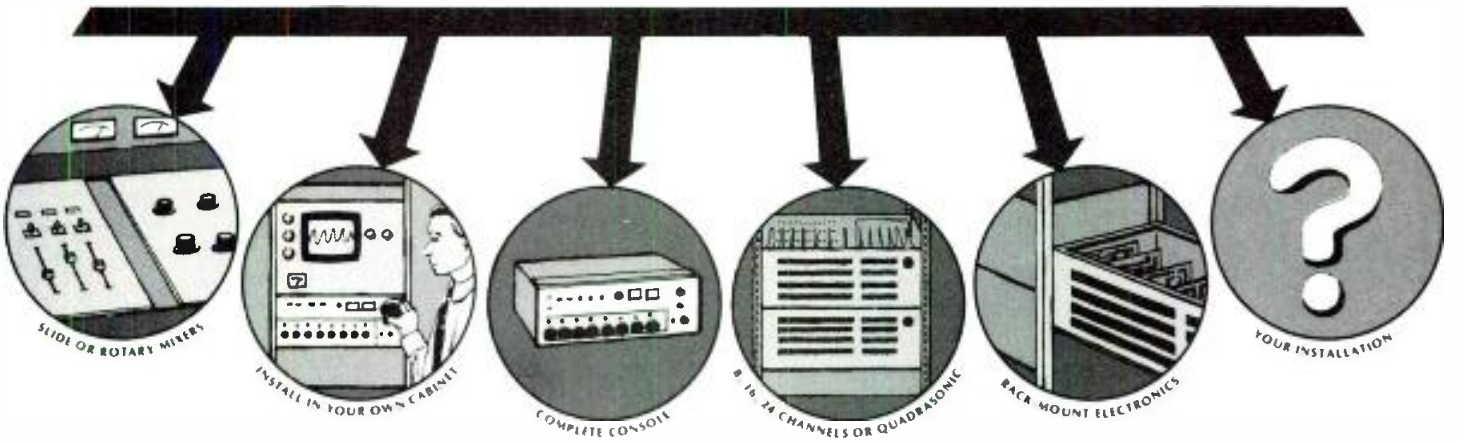
For further information, write: Stanton Magnetics, Inc. Terminal Drive, Plainview, N.Y. 11803.

For More Details Circle (90) on Reply Card

Announcing a new concept in audio control consoles . . .

RAMKO'S ELECTRONICS ARE OUT OF THE BOX OTHER CONSOLES HAVE GOTTEN THEMSELVES INTO





PUT YOUR AUDIO CONTROLS WHERE YOU NEED THEM—ANYWHERE IN THE STUDIO:

Keep the electronics out of the way, where they can be easily serviced.

Ramko's new concept allows separation of console controls from the audio circuit for unrivalled console versatility. You don't have to be compromised by the console cabinet. You can order Ramko Series 35 Audio Controllers for cabinet, rack or custom applications; for automated or manual mixing; with rotary, slide or pushbutton mixers; or your choice of control location. You can save space, expand easily, and service the electronics in a jiffy.

Features of the Series 35 Audio Controller include 8 channels (expandable up to 24); mono, dual mono, stereo, dual stereo or a combination of these; quadrasonic capability; fail-safe internal power supply; plug-in interchangeable cards; and highly reliable mixing pots or attenuators. Of course, performance is the best: 0.1% or less distortion; 128dBm equivalent noise; 25W power consumption; low crosstalk; balanced bridging/matching inputs; and response within ½dB, 20Hz to 20kHz.

Before you get boxed-in, check out Ramko's Series 35 Audio Controller. Our two-year warranty guarantees you get exactly what you want. Our surprisingly low, low prices will let you order what you really need.

RAMKO RESEARCH

PROFESSIONAL AUDIO PRODUCTS

3516-B La Grande Blvd., P.O. Box 6031, Sacramento, CA 95860 (916) 392-2100

For More Details Circle (91) on Reply Card

PEOPLE IN THE NEWS

Stanley B. Shores has been named a senior cost accountant by Nortronics Company, Inc. . . . . **John Eargle** has left his position at Altec to form his own consulting firm. Eargle's new firm, JME Associates, will devote its full efforts to special interests in the quadraphonic hardware and software areas . . . . **Rudloph F. Handel** has been appointed National Sales Manager for JVC Industries, Inc.

Rudolph Handel

Eugene Klumpp

Stephen Yau

Eugene P. Klumpp, who joined WBEN in September, 1944 and was named WBEN-TV Operations Manager in November, 1971, has retired from the station . . . . **Dr. Ryozo Kimihira** has been named vice president of operations for AKAI America, Ltd . . . . **Robert M. Mayflick** has joined Griffiths Electronics, Inc. as Director of Product Development . . . . **Dr. Stephen S. Yau** of Northwestern University has been elected President of the IEEE Computer Society . . . . **Louis Siracusano** has been named broadcast video product sales representative for Ampex Corp. . . . . **Kenneth I. Taylor** has been named vice president, engineering, at International Video Corp.

Ken Taylor

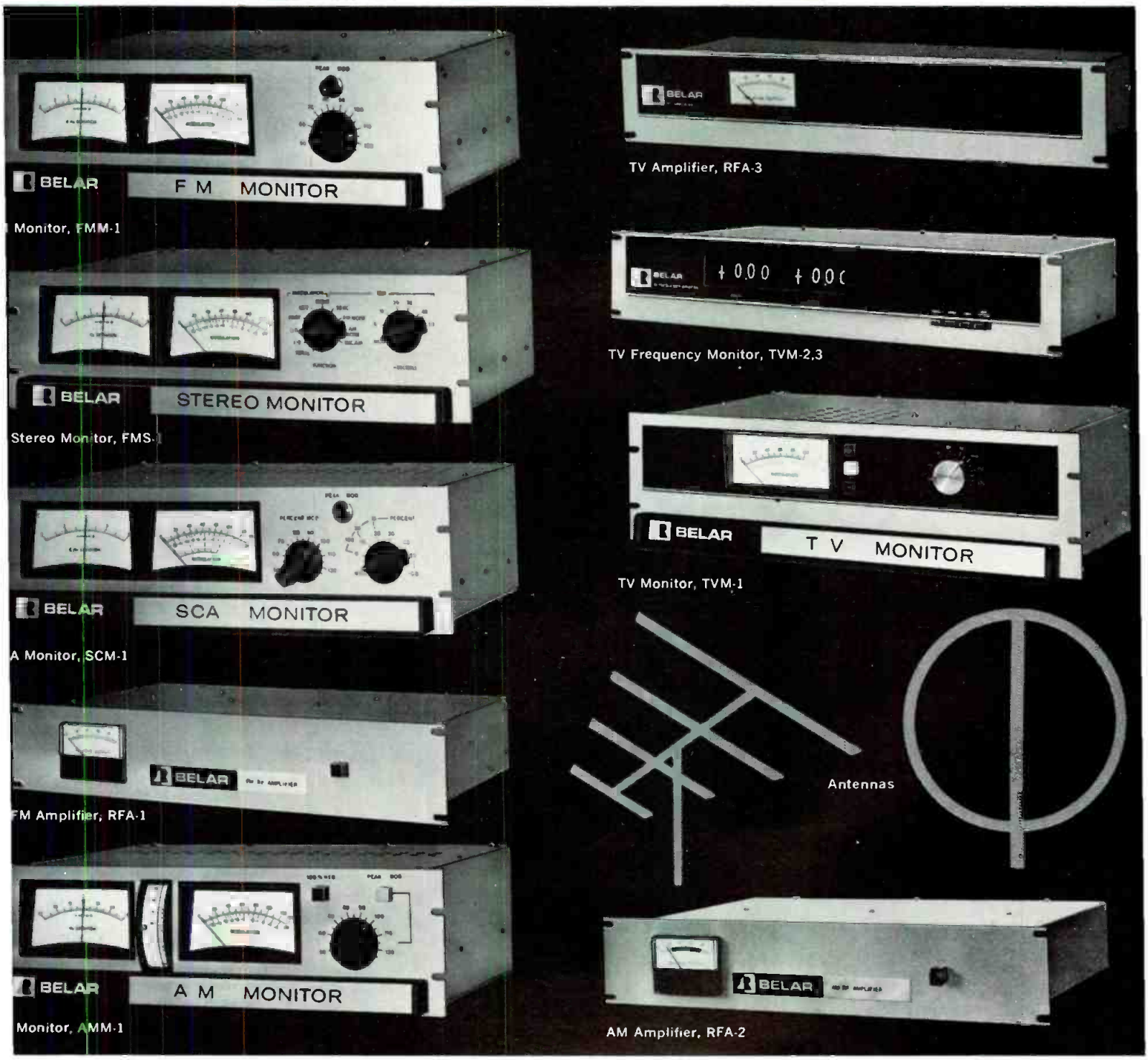
Mike Elovitz

William Amos

United Systems Corporation has announced the appointment of **Mike Elovitz** as Marketing Manager . . . . **Jack Christian** has been appointed Director of International Operations by National Semiconductor Corp. . . . . **William E. Amos** has been appointed a vice president of Philips Broadcast Equipment Corp. in charge of the Audio-Video Systems Division . . . . **Geoffrey M. Langdon** has been appointed to the newly created position of Product Manager for professional equipment for the AKG Division of North American Philips Corp . . . . The appointments of **Charles B. Cohen** and **William J. McCarren** to the positions of Associate Director, CBS Radio, Engineering Department were announced by Ralph E. Green, Director.

Larry G. Alt has joined the staff of WSJV, Channel 28 television, as Administrative Assistant to the Gener-

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



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 of operation, functional checks and unquestionable ACCURACY. And you'll measure all your program material, including the peaks accurately.

Call or write today for more information. We know you'll make the right decision and BUY BELAR.

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NAB Booth #719 West Hall

Where Accuracy Counts . . . Count on Belar

For More Details Circle (93) on Reply Card

Geoffrey Langdon

Larry Alt

Cedric Bastiaans

al Manager . . . . Canon U.S.A., Inc. has appointed **Franklyn R. Beemish** as Marketing Manager of Television Optical Products . . . . **Cedric R. Bastiaans** has joined Koss Corp. as chief engineer . . . . **Dick Tschudin** has been named Vice President in Charge of Commercial Production of Video Cassette Industries . . . . **David T. Farrell** has joined James B. Lansing Sound, Inc. (JBL) as Director of Employee Relations . . . . **Robert C. Trinkle** has been named to fulfill a two-year term as a member of the IEEE Conference Board of Directors.

David Farrell

Ibrahim Khalifa

Anthony Pignoni

Ibrahim Khalifa has been elected Executive Vice President with responsibility for all manufacturing operations of Phelps Dodge Comm. Co. . . . . Robert Bosch Corporation has moved its Fernseh television systems headquarters to the N.Y. area in Ramsey, N.J., and has named **Anthony R. Pignoni** division manager . . . . **James F. Lambert** has been named vice president of the New England region for North American Video Corporation . . . . **Stephen F. Meyer** has been appointed Vice President and General Manager of Clare-Pendar Co.

Stephen Meyer

Ken Lawson

Wallace Hyde

TeleMation, Inc. has announced the appointment of **Kenneth D. Lawson** as Vice President, Marketing . . . . **Wallace E. Hyde** joined the Coastcom Engineering Staff as Senior Development Engineer . . . . **Jim Cavener** has joined Ailtech's West Coast Operations as Applications Manager for the Test Equipment Products.

Sammons Communications, Inc. has announced the appointment of **Henry (Hank) Cicconi** to the position of Manager-Technical Service, and **George O. Beards-**

ley to the position of Director of Purchasing....Triangle Industries, Inc. announced a realignment of executive responsibilities. **Bruce A. Johnson,** Executive Vice President, was appointed to the additional post of Chief Operation Officer; **Dennis M. McCarthy** was elected Senior Vice President-Finance and Treasurer, and, in addition, was designated Chief Financial Officer; **Benjamin J. Wood** was elected Senior Group Vice President; and **William M. DiSisto** was elected Vice President and Controller.

Ernest Blank has been named president of Sammons Enterprises, Inc...Cornell-Dubilier has announced the realignment of CDE International Marketing Operations. **James Kaplan,** VP of Sales, is now responsible for all world wide sales except those in the Orient. **Carl Rode** was named International Sales Manager working out of CDE's Distribution Center in Des Plaines, Ill. A new FPE/CDE company (gmph) has been established in Munich, Germany headed by **Claus Fritz,** General Manager....**Daniel R. Brewer** has been appointed Supervisor of Video Tape Engineering and Development at The Burbank Studios.

Eight people were elected to the Board of Director of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) at the Annual Assembly: **Dr. Frank S. Barnes,** Vice President-Publication Activities; **Arthur P. Stern,** Vice President-Regional activities; **Dr. Robert F. Cotellessa,** Vice President-Technical Activities; **Seymour Cambias, Jr.,** Secretary; **Joseph K. Dillard,** Treasurer; **Dr. Robert M. Saunders,** Chairman, Educational Activities Board; **Harold S. Goldberg,** Vice Chairman, Technical Activities Board; and **Donald G. Fink,** Executiver Director.

John M. Eubanks, Chairman of the Board of Directors of Computer Labs announced the addition of two new directors. **Charles E. Parrish,** formerly Vice-President of Marketing, will replace Eubanks as President of the company and will move onto the Board of Directors. **Bryan F. Smith,** Vice-President of Engineering, will continue in that position and will also become a director. Eubanks will continue to serve as Chairman of the Board, but will surrender the presidency to assume special responsibilities along with **Robert C. Bedingfield,** formerly Executive Vice-President, who will become Vice-Chairman of the Board.

Dr. Lawrence T. Frymire, Executive Director of the New Jersey Public Broadcasting Authority, has been elected to the Public Broadcasting Service (PBS) Board of Managers....**Bob Bushnell** has been named manager of Market Development and Sales Engineering at Pacific Recorders and Engineering Corp.

CATV

George C. Sitts has been promoted to Director of Engineering and **Gerald R. Towan** has been named Director of Programming for TelePrompTer .... **Sal Ammirati** has been appointed Chief Engineer for Cablewave Systems Inc. .... **Joel P. Smith,** executive vice president and member of the Board of Directors of Warner Cable Corp., has announced his resignation from the firm effective January 1, 1974, in order to pursue private business interests .... **Stephen L. Monson** has joined Anixter-Pruzan as CATV sales representative for the upper Midwest region.

RCA Inaugurates First Domestic Satellite System

A new chapter in communications history got underway when RCA inaugurated the nation's first domestic communications satellite system.

RCA Satcom (Phase I)—employing four earth stations and using leased circuits on Telesat Canada's Anik II satellite — is a forerunner of the much larger system RCA plans to place into operation in 1976, according to Howard R. Hawkins, Executive Vice President of RCA.

"The unique value of the RCA Satcom system is its ability to bridge the continent at low cost, carrying all forms of electronic information in vast quantity — voice or image, message or data," he said. "And it permits us to do this without digging trenches for underground cables or building relay towers."

In dedicating the RCA Satcom, Hawkins was joined by Senator Jacob Javits (R-NY) in New York City; FCC Commissioner Dean Burch in Washington, D. C.; Lt. Gov. Edward Reineke of California in San Francisco; Gov. William Egan of Alaska in Juneau, and Senators Mike Gravel (D-Alaska) and Ted Stevens (R-Alaska).

The RCA Satcom system is operated by RCA Global Communications, Inc., and RCA Alaska Communications, Inc. The four initial earth stations in operation near New York City, San Francisco, Juneau and Anchorage cost approximately $10 million.

Hawkins, who also is Chairman of both RCA Globcom and RCA Alascom, said RCA Satcom's rates for a private line voice circuit between New York and San Francisco are as much as 25 percent below those for a comparable terrestrial circuit.

"In addition," he added, "the RCA Satcom system is meeting critical needs for additional long-distance telephone circuits in Alaska more economically than through the use of international satellite facilities, while overcoming the terrain and weather conditions which make the construction of land-based systems difficult or impractical in that state."

As an example, Hawkins noted that the present monthly rate for a leased voice-grade circuit between New York City and San Francisco is $2,298 for a terrestrial line. Equivalent service via the RCA Satcom system is $1,700 plus local facilities charges.

Product Guide

(continued from page 92)

Modular Automation

The entire line of **Control Design Corporation** modular automation equipment will be shown for the first time publicly at NAB '74.

Highlighting Booth 616 will be an operating automation system using various types of input equipment including a new type of multiple cartridge playback system. The focal point will be the CD28 Modular Automation Controller.

Using the CD28, stations can update their present automation systems to the advanced concept in MOS controllers. The CD28 will allow station engineering personnel to assemble a new system from equipment or an entire system from scratch.

For More Details Circle (147) on Reply Card

Phase And Current Logging

Rust Corporation of Everett, Massachusetts announces a Rust equipment package to automatically log the phase and current readings from a Potomac Instrument AM-19. The Rust "AM19-AL4" system is designed to chart log from the Potomac AM-19. It consists of two extended view chart units. One to display Phase Angles and the second to display Current Magnitudes. The system can record up to four phase angles and four currents of a four tower AM array. Each recorder has sufficient log to last for up to sixty-two (62) days.

To comply with FCC transmitter automatic logging rules the system contains Rust AP-200 magnitude sensor alarm units. The "Alarm" contacts of each AP-200 are designed to be attached to a customer supplied audible alarm.

For More Details Circle (148) on Reply Card

Microwave Relay

Microwave Associates, "oldtimers" in the microwave relay business will be in booth 701 at the show and they'll be exhibiting their line of solid-state microwave systems for broadcast STL, TSL, hetrodyne intercity relay and portable pickup equipment.

Power outputs of this equipment is: 8 Watts (min.) at 2 GHz; 4 Watts (min.) at 7 GHz; and ½ Watt (min.) at 13 GHz.

For More Details Circle (149) on Reply Card

Reel-To-Reel Tape Machines

New reel-to-reel tape machines from **International Tapetronics Corporation** incorporating features most wanted by broadcasters. Examples: motion sensing, multi-function edit mode, automatic tape listers, TTL logic circuitry, capability of handling dissimilar size reels, selective play/record synchronization, 10½" or 14" reels, 3-¾ - 7½ IPS or 7½ - 15 IPS. Sold with 30 day guarantee of satisfaction.

For More Details Circle (150) on Reply Card

Zoom Lens

Canon Broadcast Optics has announced the introduction of a new high-quality 10X zoom lens for one-inch Plumbicon hand-held color cameras. The Canon PV 10X15 B1 is a wide-angle, high-efficiency, close-focusing zoom, with built-in "Macro Focus" capability. The small physical size and light weight are ideally suited to hand-held camera applications. Add-on cable drive controls are available when the lens is used in the studio. The Canon PV 10X15 B1 is available for all one-inch hand-held Plumbicon color cameras.

For More Details Circle (151) on Reply Card

Master Control Switcher

American Data Corporation, has just announced the release of a new master control switcher which is an ideal companion to the 556 production system. The 570.11 is a two bus switcher which features Audio-follow-Video on both busses and four-Auxiliary inputs. The audio mode may be selected between A-F-V, AUX or AUX into AFV mix. Ten Watt monitor amplifiers are utilized to drive 8 Ohm speakers and have remote panel gain controls. The program line amplifier has a maximum output level of +24 dBm into 600 Ohms. Two large VU meters are incorporated into the control panel.

Various methods of machine control may be included as options. A digital "one event" Preset-take/Cutbar-preroll system is one method, another is the use of dedicated start-stop switches for each machine.

For More Details Circle (152) on Reply Card

TV Lighting Equipment

Ianiro television and motion picture lighting equipment, recognized by authorities for its technical and optical achievement, is now available in the United States, Central and South America exclusively from **Strand Century Inc.**, Elmwood Park, N.J. The Ianiro line will be Strand Century's featured presentation at the 1974 NAB convention. Engineered and produced to withstand the most rugged stresses of location performance, Ianiro equipment includes Fresnels, soft lights and cyclorama continuous borderlights.

There are unique 10" - 1250/2500 Watt and 12" - 2500/5000 Watt Fresnels which use a switch-controlled dual filament lamp to provide two wattages in the same unit without requiring lamp changes. The complete Fresnel series ranges from 6" - 1000 Watt to 20" - 10,000 Watt units, all for either manual or pole operation.

Another unusually versatile Ianiro group is the line of "Antares" softlights. These also provide different wattages without lamp changes. The complete softlight series includes indirect lighting units from 1250 to 8000 Watt capacity, a range of open, adjustable beam units from 650 to 2000 Watts, and 6-way and 9-way multiple PAR-36 lamps.

For More Details Circle (153) on Reply Card

Color Special Effects Generator

Professional results in color television production at a modest cost are now possible for industrial, education-

al, medical and cable television studios with **3M** Company's SEG 672 Color Special Effects Generator.

To eliminate video interruption, standard program or preview switching is of the vertical interval type. In the automatic take function, synchronous switching is featured to transfer "set up" (preview) matter to "on air" (program).

Gear driven split-lever "T" bars are used for fades and horizontal and vertical wipes. The Special Effects Amplifier provides wipe functions using a 10 pattern generator including: four corners, diagonal, square, diamond and circle/ellipse.

With the internal/external keying feature, an image or title from "A" buss can be inserted into an image from "B" buss. When used with matte, the keying image or title can be filled with full range color.

A colonized background for matte-keying and color tinting of monochrome signal is provided.

For More Details Circle (163) on Reply Card

Radiotelephone Test Set

The new Schomandl mobile radiotelephone test set was developed to provide a precision, portable test set, capable of measuring all radiotelephone characteristics. The frequency accuracy of the FD 450 is of the order of 10^{-7}. A special feature is that the FD 450 gives an indication of all measured values simultaneously. The unit is offered by **Rohde & Schwarz.**

The signal generator covers the RT hands from 68-512 MHz spectrum, using four plug-in oscillators, which are continuously variable and can be phase-locked in 1 MHz crystal steps. A 30 W output pad protects the output attenuator when the unit is used as a receiver for transmitter measurements.

For More Details Circle (164) on Reply Card

Compact Cartridge Playback System

Although **Gates** has moved into the TV side, they are still concentrating on their audio lines. A new product to be shown at the convention will be their Criterion Compact III. This is an advanced design tape cartridge system combining three playback decks in a single compact unit. Two CC-III's may be mounted side by side in a standard 19-inch rack (with an optional rack adapter) to provide six playback units in only 12¼ inches of rack space.

Each deck of the CC-III operates as

a separate playback unit with separate controls. One deck may be operated alone or two or three decks may be operated at the same time, each feeding a different program input.

The top and center decks slide out for maintenance, and are easily removed by opening the front panel. Only the motor capstan is common to the three decks.

Features include: heavy duty hysteresis synchronous direct capstan drive motor; air damped selinoid assembly; Micro-set precision head assemblies; plug-in cue and amp cards; silicon transistors and IC's; and it's available in mono or stereo.

For More Details Circle (165) on Reply Card

SQ Encoder/Mixer

The SONY SQ Encoder/Mixer SQE-2000, distributed and sold in the United States exclusively by **CBS Laboratories**, provides the broadcaster/producer with full quadraphonic production capability.

While an Encoder is not needed to broadcast SQ quadraphonic records, the SQE-2000 greatly expands the broadcaster's quadraphonic capability by allowing him to transmit 4-channel tapes, and to produce local 4-channel programs. Employing the CBS SQ encoding techniques acclaimed and adopted by the world's major record labels, the SQE-2000 produces signals completely compatible with all stereo and mono receivers and matched to the SQ decoders now offered in virtually every brand line of quadraphonic home receivers.

For More Details Circle (166) on Reply Card

Custom Console

The CENTURION series of custom consoles by **SPARTA** has undergone further development and operational testing since introduction of the CENTURION II stereo (quadraphonic capable) 12-mixer version at NAB 1973.

A monaural 12-mixer version, the CENTURION I, will be introduced at NAB 1974, as will 6-mixer mono (CENTURION III) and 6-mixer stereo (CENTURION IV) models.

Six-mixer mono or stereo extender panels have also been devised for the CENTURION SERIES, giving up to 18-mixer capacity in a single system.

In every model similar options are available: slide or rotary attenuators, interchangeable mixer modules, digital clock, and others.

For More Details Circle (167) on Reply Card

Vectorscope

Each **Tektronix** 1420 Series Vectorscope is a compact, ½ rackwidth instrument designed to display vectors of chrominance and burst components of either a NTSC, PAL or PAL M composite video signal. This series provides a low-cost way to meet vectorscope requirements in CCU's, VTR's and similar applications. This instrument is particularly well suited for side-by-side mounting with the TEKTRONIX 528 Waveform Monitor. The 1420 weighs approximately 15 pounds and is available with a carrying case.

The internal graticule is designed for the vector display of color bars and burst. A special graticule feature allows differential gain or phase errors to be determined to reasonable accuracy for many applications—within 2° and 5%.

Two loop-through inputs accept the signal for display on the CRT or for externally locking the 1420 subcarrier regenerator oscillator. A front panel lever switch selects the signal from either of the inputs for phase locking the subcarrier regenerator. A second front-panel lever-switch selects the signal to be displayed on the CRT and can attenuate one channel to view large signals. A front panel GAIN control varies the size of the CRT display above and below unity. A PHASE control provides continuous 360° rotation of the display.

For More Details Circle (169) on Reply Card

Audio Console

GRANDSON, Model 110, is a new expandable, completely modular professional recording/remixing/on-air audio control console from **Auditronics, Inc.** Designed to accomodate up to 16 track recording and on-air applications, the free standing unit is expandable to 18 mixing positions—36 inputs—in only 36" width. It offers complete metering, two echo send/receive channels, talkback communications, separate control room and studio monitoring, test oscillator, and a full line of matching accessories including a plug-in patch bay.

A unique second generation, full capacity system at a moderate price, GRANDSON, fills the gap between conventional broadcast consoles and sophisticated recording consoles. The most recent integrated circuit designs as proven in the widely accepted Model 501, **SON OF 36 GRAND**, are utilized.

For More Details Circle (170) on Reply Card

Transient Suppressors

Very often, a signal line or telephone line will have coupled to it a

large transient as a result of a lightning storm or perhaps the operation of motors, generators, relays, etc. MCG thinks they have the solution to this recurring problem.

The TSD series of transient suppressors from MCG is a group of low cost, easy to use suppressors that are designed to protect a wide variety of electronic equipment from failure due to transients.

For More Details Circle (171) on Reply Card

Special Effects Systems

VISTA SYSTEMS, Inc., of Palo Alto, California has just introduced a new special effects system consisting of their Type 110 Video Multikeyer, Type 310 Quad Colorizer, and Type 210 Video Mixer.

The system will allow the user to produce visual effects in NTSC color using up to four monochrome inputs. Control of each color output is accomplished by a high quality joystick control on the quad colorizer. The eight level TYPE 110 MULTIKEYER gives the operator wide latitude in the choice of output signal composition.

For More Details Circle (172) on Reply Card

Video Tape Problem Solving Units

Once again **Recortec** will participate in the activities of the NAB Convention. This year they will be showing an expanded line of video tape problem solving equipment.

A new electronic Video Tape Timer and a Video Tape Addressor will be shown for the first time this year. Also, their Video Tape Conditioner and Video Tape Evaluator will be on hand to round out what should be a very interesting demonstration.

Their booth this year is lucky number 711.

For More Details Circle (173) on Reply Card

Program Audio Multiplex

Coastcom, Inc. announces the SBC 502C, 5 and 8 kHz Program Audio Multiplex equivalent of the Bell System C-1 program terminal. The SBC 502C is designed to provide local radio stations, currently receiving voice grade network feeds, with a full broadcast quality service at a nominal cost.

The SBC 502C is fully solid state, completely self-contained in a 3-1/2" rack mount shelf and ideally suited for portable and temporary service applications.

The SBC 502 series of program multiplex channels are impedance and level compatible with most high and low density multiplex systems. Its' ultra linear and highly stable operating characteristics exceed CCITT recommendations and all current applicable ICSC practices for satellite transmission.

For More Details Circle (174) on Reply Card

Refurbished Quad Heads

Videomax announces a new refurbished RCA quad video head line. They'll call it the "M" Series Hi Band Low Band quad heads.

This product follows the successful introduction of the company's "L" "M" series refurbished Ampex quad heads. The RCA heads are offered with a 200-hour warranty for $890. And all Videomax refurbished heads carry a "no risk" guarantee. The Videomax line will be exhibited in booth 620 at the NAB convention.

For More Details Circle (175) on Reply Card

Record/Reproducer

Electro Sound is introducing two new products at the 1974 NAB Convention.

An ES-505 8 channel Record/Reproducer joins the Electro Sound 505 product line. These "Operator Engineered" professional machines incorporate a disappearing headgate, a built-in reference audio oscillator for instant alignment, an optical motion sensing system, differential disc brakes, "RECORD" indicator light continuously monitors bias, two calibrate positions, optional third reel, and fully illuminated transport controls or optional remote controls.

Full information will be available on the ES-2000 high speed, audio tape duplicator for broadcast syndicators. This systems technology is based upon the proven 32-1, 240 IPS, ES-6000 which is widely used throughout the world by major recording companies.

For More Details Circle (176) on Reply Card

Television Monitors

Three new television monitors—two color and one monochrome—will be shown by **Conrac** for the first time at the Conference in Houston. The 1974 NAB Show will mark Conrac's 25th anniversary as a supplier of professional broadcast monitoring equipment.

The first new color monitor is the latest version of Conrac's RH Series, a monitor widely used in control room and other critical applications. The new version of this top-of-the-line color monitor incorporates a number of improvements in color and signal handling performance that provide an even higher quality picture than pre-

vious versions.

A second new color monitor is the Model 6000, an improved version of the 5000 Series. This new monitor features a 12 inch CRT and offers superior picture fidelity at a modest price.

For More Details Circle (177) on Reply Card

Professional Tape Recorder

A completely new, state of the art stereo tape recorder using tomorrows technology to provide ease and simplicity of operation and to be capable of the most demanding performance requirements in recording, broadcasting and audiophile applications will be exhibited by **Revox**.

Some major features include the following: 3 motor, 3 speed (3.¾, 7½, 15 ips); computer type digital control logic with memory circuits. Also, quartz crystal speed control reference; frequency and phase servo system for capstan speed control.

Two tape tension sensors governing servo-controlled reel motors are used, and logic controlled tape tension, automatically maintained even with mixed reel sizes.

The A700 has fail-safe auto stop logic to eliminate possibility of tape breakage, electronic pause control operating on all functions, and instant repeat play control.

For More Details Circle (178) on Reply Card

Tone Generator

Control Design Corporation announces the immediate availability of their CD25G 25Hz Tone Generator. Designed for compatibility with virtually all audio au omation systems presently in the field, this all solid-state unit is intended for production studio use for insertion of the standard 25Hz audio automation actuating tone. It will operate with all audio sources at output levels up to +8dBm.

It's two-step operation can be easily mastered by even the most inexperienced station personal - the start button places the tape transport in motion and the tone button applies the 25Hz tone and stops the transport after a pre-determined adjustable period of tone application. An internal gating circuit mutes the audio to eliminate bias pops and other start/stop noises on the finished tape. Standard on all units is a 25Hz tone filter and bridging input.

For More Details Circle (179) on Reply Card

Coaxial Cables

Cablewave Systems Inc, offers a full series of ciax types, both air dielectric and foam dielectric in smooth wall aluminum as well as copper corrugated constructions.

Foamflex, semi-flexible, aluminum sheathed, foam dielectric coaxial cable consists of a copper inner conductor, a foam polyethylene dielectric and smooth wall outer aluminum conductor. A polyethylene jacket may be supplied for added protection when desired. Foamflex achieves a homogeneous air filled dielectric which retains its normal dielectric strength even at high altitudes without pressurization. The coax also offers low attenuation, good frequency response, good phase stability and no radiation.

Foam Wellflex is a copper corrugated foam coaxial cable designed specifically for long run transmission line application as well as for feeding high frequency transmitting and receiving antennas.

For More Details Circle (180) on Reply Card

1K Transmitter

The **McMartin** BA-1K is a high level plate modulated 1000-watt AM transmitter featuring a built-in cutback to either 500-watt or 250-watt operation.

The BA-1K features excellent audio and RF performance, and has all solid-state, highly stable frequency division RF Exciter, and an all solid-state audio driver. Only a single tube type is used in both the modulator and in the PA—the long-life, low cost 4-500A. A "Pi-T" output circuit is used for optimum harmonic radiation suppression.

Operator convenience is a key note of the BA-1K's design, with a true eye level meter panel, complete easy accessibility to all components and circuits. Both PA tuning and loading are motorized, provision is included for remote control operation, and a built-in dummy load is provided.

For More Details Circle (181) on Reply Card

Automation Systems

Both the **Schafer** 902 and 903 will be displayed. The basic 902 is a 48 event sequential system complete with time insertion capabilities and digital clock. The 903 is an MOS memory system addressed through a keyboard or teletypewriter with weekend programming capability. The 903 will also print a pre-log showing a station's availabilities for twenty-four hours in advance, It will accommodate nineteen audio sources and is addressed both sequentially and by real time.

Featured in the display will be the all new Schafer AUDIOFILE multicartridge playback system, a "system within a system", which features instant spot availability, as well as excellent phasing for stereo music on cart. The multicartridge playback system will be used as an audio source in both the 902 and 903 systems.

The exclusive Schafer PB-720-2 reel/reel playback deck will be shown performing in all of the automation systems.

For More Details Circle (182) on Reply Card

Shoulder Pod For Film Cameras

Cinema Products Corporation, announces the availability of a new shoulder pod especially designed for use with all CP-16 type TV-newsfilm/documentary camera models.

Extremely compact and lightweight, the new shoulder pod is constructed of molded fiberglass and cushioned with a foam pad. Its built-in 17 degree slope is designed to accomodate the normal human shoulder slope and provide the cameraman with an extra measure of comfort and ease in on-the-shoulder operation. The shoulder pod is adjustable front-to-back as well as side-to-side.

Cinema Products' new shoulder pod is priced at $60.00.

For More Details Circle (183) on Reply Card

Counter Balance Pedestal

This is a **Quick-Set** precision counter-balance weight system, providing solid service with outstanding ease of operation. "Feather Touch" steering and elevation controls require minimum effort in all operations. Silent five-inch wheels insure optimum maneuverability; its wide stance maximizes stability. Cable guards are standard.

The Gibralter Counter Balance Pedestal has a load capacity of 120 pounds, operates within a 36" - 54" height range, and can pass through doorways 32" wide. It is designed to accommodate either our Cam-Link or Cradle heads.

Like all Quick-Set products, this pedestal is American made and carries a lifetime guarantee on parts and workmanship.

For More Details Circle (184) on Reply Card

RF Bridge Synthesizer/Detector

The **Potomac Instruments** SD-31 provides signal generation and de-

tection as required for RF impedance measurements in the AM broadcast band with bridges such as General Radio Models 1606 and 916 and Delta Model OIB-1. It is especially suited for antenna impedance measurements in which high interference levels are encountered.

The oscillator consists of a crystal-controlled frequency synthesizer, with frequency selected by front-panel switches in 500 Hz steps over the range 0.4 - 1.8 MHz. The detector consists of a receiver tuned to the RF frequency, and an audio-frequency coherent detector that responds only to the modulation on the oscillator, and thus does not respond to interfering signals.

The SD-31 is powered by rechargeable batteries and has its own charging circuit.

For More Details Circle (185) on Reply Card

Linear Circuit Line

Fairchild Camera & Instrument Corp. has announced it will serve as an alternate source for the 2136 FM IF amplifier and detector.

The 2136 is a three-stage IF amplifier, which incorporates a quadrature detector and a built-in voltage regulator in a single integrated circuit.

Compared with conventional ratio detector designs for FM and TV sound systems, the quadrature detector requires only a single tuning coil. This greatly simplifies alignment procedures, since the coil is adjusted for maximum audible output without using an oscilloscope or signal generator.

Alignment is eliminated if a ceramic filter is used in place of the tuning coil. A complete FM IF strip with no alignment requirements can be constructed by using the 2136 in conjunction with Fairchild's uA753 FM gain block, which uses two ceramic filters as selectivity elements.

For More Details Circle (186) on Reply Card

Airborne TV Systems

Acrodyne Industries, Inc., has announced the introduction of its new AT-100 series of Airborne Television Transmission Systems. These systems provide reliable, true TV fidelity in monochrome and color and high reliability performance in an aircraft environment. An example of volumetric efficiency is the 100-Watt version which weighs only 105 lbs. in less than a 5 cu. ft. volume - they are available in 1-, 10-, and 100-Watt peak sync power levels in VHF TV frequency range.

The AT-100 Series has survived the rigors of airborne environment including shock and vibration and wide operating temperature range (-40°C to +60° C). Acrodyne's modular construction, wherein each discrete circuit is contained in its own housing with appropriate test point assemblies, keeps maintenance procedures to a minimum. Modules can be replaced in a matter of minutes.

For More Details Circle (187) on Reply Card

Switching Systems

Sarkes Tarzian, Inc., will feature a new line of packaged switching systems employing the new concept in linear mix/effects/key electronics providing digital effects and control, at low cost, for broadcast and educational applications.

In addition, a series of "ADD-ON" electronics have been developed to provide users of older switchers (of any manufacture) with state-of-the-art production flexibility.

Other products include digital rotary effects, chromakey keyers, mix/key electronics, audio systems, STAR-COM data processing equipment, Production Switching, & Master Control switching systems.

For More Details Circle (188) on Reply Card

1 kW FM Transmitter

The **SINTRONIC** DFM-1K-A FM transmitter features a solid state direct FM exciter and a GROUNDED GRID final amplifier. The exciter employs a modulated transistor for maximum fidelity and modulation capability to 500 KHz.

The Zero bias grounded grid final amplifier is simple to tune and allows the transmitter to be operated over a wide range of powers. The power control, located in the IPA stage, allows a front panel adjustment in power from 50 Watts to 1,100 Watts. The transmitter is wired for remote control and is housed in a single cabinet 28" wide, 32" deep and 76" high.

For More Details Circle (189) on Reply Card

VTR Audio Replacement Heads

Taber Manufacturing and Engineering Co. will introduce their RCA VTR audio replacement heads, the latest addition to their line of professional audio heads, at the 1974 NAB Convention. They will be on display at booth 515 in the West Hall.

For More Details Circle (190) on Reply Card

Voice-Over-Video

The **Coastcom** SBC 424 Voice-Over-Video subcarrier multiplex puts unused baseband capacity to work. The 424 combines an FM subcarrier and SSB multiplex to provide high quality multiple program audio and voice circuits on a TV intercity microwave or satellite network. The TV sound plus separate broadcast network, cue and data channels can be carried on a single FM subcarrier. The unique interference immunity of the Coastcom Subcarrier permits long-haul transmission and multiple subcarrier systems with minimum interferance.

With the addition of multiple, high quality voice and data channels, a single video microwave link can now handle many applications in business and broadcast with far greater versatility and lower percircuit cost. It also significantly increases the value and capabilities of cable TV systems; voice and data can be placed directly on the CATV cable for city or campus-side distribution.

For More Details Circle (191) on Reply Card

Color Keying Device

Technicolor's **American Astrionics** Division has just announced the availability of Chromatech (tm), a special video processing device for superimposing two sources of NTSC video into one composite TV picture, without the undesireable halo and black outlines usually associated with chromakeyers. Chromatech is a new NTSC version of Technimatte, which has been in use for the past several years at Vidtronics, formerly a division of Technicolor.

Features of Chromatech include: the ability to cast foreground shadows on background scenes; the ability to see thru glass, Saran Wrap (tm) and smoke; and complete freedom from typical dark outlines around foreground objects.

The device will accept two input sources of NTSC video with a common synchronizing signal. The color keying signal that causes transitions between foreground and background is developed from the foreground video source in the form of RBG video. The keying signal can be preset to gate on any desired backdrop color by means of a front panel HUE control. Since Chromatech uses NTSC video for both background and foreground, with RGB required only for keying, it can be directly substituted for existing chromakeyers. Chromatech can be used as a "stand alone"

special effects generator without a swticher, or it can be integrated with most existing switchers. It has remarkable stability and freedom from drift. Setup can be accomplished within minutes by normally experienced operators.

For More Details Circle (192) on Reply Card

AM Broadcast Transmitter

Intended for operation under Part 73 of the FCC Rules, the **AEL** AM-5KD is a high reliability, minimum maintenance commercial broadcast transmitter for service in the 535 kHz to 1600 kHz band.

The transmitter is housed in a single section modern styled cabinet with center line metering and controls. Its design allows for easy access to all transmitter components. Positive cabinet air pressure prevents intrusion of dust and air.

Transmitter control, fault detection, and recycling are accomplished by solid-state logic circuits. Control circuits as well as all interlock and sequence relays operate from a 24 Vdc regulated power supply.

The RF section consists of a 4CX3000A ceramic tetrode driven by a 6DQ5 IPA stage. The power amplifier is high-level modulated by a pair of low distortion 4CX3000A class AB-1 modulators capable of positive modulation peaks to over 125 percent.

For More Details Circle (193) on Reply Card

Studio Furniture

Broadcast Automation Associates/ Russco will display a complete operational broadcast studio featuring a full line of studio furniture and accessories.

The control room will highlight the new Russco models 505 mono and 505-S stereo five channels audio consoles and Russco Studio Pro turntables and preamps. Also featured will be the new L. J. Scully model LJ-10 14" stereo professional tape reproducer. Broadcast Automation Associates staff of broadcast consultants will be available to assist in planning any studio, audio or RF facility.

For More Details Circle (194) on Reply Card

TV Transmitter Monitoring System

Marconi Instruments will be displaying selected instruments from its range of TV measuring equipment on Booth 108.

The major display is the Automatic TV Broadcast Transmitter Monitoring System which assesses the picture quality by measurements on a VIT

signal. This system comprises of two basic units, an Insertion Signal Analyzer Model 2914, and Data Monitor Model 2915. The Analyzer permits the sequential measurement of up to 24 parameters of a previously introduced VIT signal. Some of the basic parameters which may be measured are - the amplitudes of bar, sync and 2T pulses; chrominance/luminance gain, delay and crosstalk; luminance nonlinearity; noise; LF error; bar tilt; differential phase and gain. In the manual mode, these parameters are expressed in units of mV, nSecs, degrees or as a percentage and can be displayed on 3-1/2 digit panel meter. In the automatic mode, the digitized signal is passed to the data monitor.

For More Details Circle (195) on Reply Card

Memory Assisted Lighting System

Berkey Colortran's Memory Assisted Lighting Control System will be shown. This system permits control of over 500 Dimmers, 1000 scenes, 18 assignable submasters, 8 simultaneous cross fades, and automatic storage of fade times. Manual over ride for lighting levels and fade rate functions included. System is provided with integral fault detection to isolate replaceable failed modules.

FAR CYC, a totally new system of illuminating cycloramas will give even illumination of cycloramas 14' to 25' high. The units are normally placed on 6' to 8' centers. A large savings is thus realized in electricity and less dimmers are required for operation.

For More Details Circle (196) on Reply Card

Turntables

Micro-Trak Corporation, producer of the professional standard for tone arms, announces that their Houston NAB Show exhibit will be the most elaborate yet. Tone arms, turntables, audio preamplifiers, antenna heater controls, radio studio furniture, and tape cartridge racks will be featured in a typical studio installation.

Also featured will be an L90 tape cartridge rack full of useful mix of Fidelipac broadcast tape cartridges to be given away to one of Microtrak's show visitors. Stop by and register. In addition Micro-Trak will unveil a brand new visual audio spectrum analyzer of gigantic proportions.

For More Details Circle (197) on Reply Card

TV Production Equipment

Central Dynamics, at Booth 412 (East Hall), will introduce several new products into their professional

For More Details Circle (155) on Reply Card →

line of television broadcast equipment.

Numerous activities in the general booth area will include - Precision, random access, video tape editing with the PEC 102 MKII under control from a totally self-contained edit operations console...APC 610-200 broadcast automation demonstrations under realistic operating conditions...discussions on VSP 1200 and VS10 series switcher applications...exhibitions of peripheral television equipment that include the new Central Dynamics VA 2181 Video Processing Amplifier.

Three of the new Central Dynamics products that will generate interest from broadcasters will be the VSP 1200 Series Production Switchers, the VS-10 Series Mobile Switchers and the VA-2181 Video Processing Amplifier.

For More Details Circle (198) on Reply Card

Zoom Lens

New products from **Canon** to be introduced at this year's NAB are: A new 60°, wide-angle 8X zoom lens (11mm to 90mm, f2.0) for handheld color cameras. A new 24X, close-focusing, double zoom (24mm to 300mm, f2.0) for studio color cameras. A new 34X, double zoom lens (24mm to 800mm,f1.8) for field and sports applications.

Each of these lenses features the Canon "state of the art" developments in high-efficiency coatings a new glass designs for maximum usable light to the tubes. The Canon zoom lenses are designed for maximum operational efficiency and the best possible technical performance.

The new scoopic 16mm, lightweight, hand-held motion picture camera features reflex viewing, a 12.5 mm to 75mm, f1.8 macro zoom lens with automatic exposure and semi-automatic film loading.

Other products on display will feature 1¼-inch Plumbicon zoom lenses for the RCA TK 45, and the Fernseh KCU 40. These include 10X zooms (20mm to 200mm, f2.2) universal zoom, with quick change range extenders and macro focus operation capability. The Canon 17X sports lens (30mm to 510mm, f2.2) will also be on display.

For More Details Circle (199) on Reply Card

TV Sideband Analyser

At the Show **Telemet** will introduce Model #3706A1 all solid state TV transmitter sideband analyser. Outstanding features are, crystal controlled plug-in down converter, 50dB dynamic range display, 7 crystal controlled frequency markers, built-in sweep generator with sync and blanking, and variable pedestal from 10 to 90 IRE units.

Another introduction will be a new solid state A/V routing switcher with audio follow. The maximum capacity will be 12 x 3 but could be purchased in a 12 x 1 or 12 x 2 configuration. The Model #7932-A1 will be self-contained or remote controlled. Vertical interval switching can also be accomplished with the addition of a plug-in board.

For More Details Circle (200) on Reply Card

Video Switcher

The **Visual** booth will display Custom Audio, Video Switching and Garron Electronics products including Rapid Q, Cartrette and Stereo Phase Enhancers.

The Video Switcher on display will feature innovations in its Special Effects system. The chromakey has a "soft edge" which eliminates the annoying noisy heat pattern around keyed inserts. It permits keying of difficult subjects like smoke or cellophane. The Special Effects Positioner can Phase H and V camera drives to permit repositioning of the picture from a slide on a film chain. The special Effects accepts nonsynchronous signals from Remotes and locks to them rather than station sync. This simplifies the process of inserting commercials from a VTR or Character Generator.

For More Details Circle (201) on Reply card

Time Base Corrector

Television Microtime, Inc., of Bloomfield, Conn., has announced the addition of three time base correctors

to the company's diversified product line. Derived from the popular Delta 44-328 HETROCOLOR™ TBC capabilities, the new products are specifically designed to handle various time base errors peculiar to heterodyne record VTRs. They will be identified as MICROTIME™ TBCs.

The three new products are the MICROTIME 188 Monochrome TBC, the MICROTIME 388 NTSC HETROCOLOR TBC, and the MICROTIME 488 PAL-M HETROCOLOR TBC.

The standalone device now offer the user a wider capture range on the typical time base errors arising from VTR mechanical differences and tape tension and stretching problems in 1/2", 3/4", and 1" low-cost open reel and cassette VTRs. The Delta 188 is monochrome only, but will handle either EIA RS-170 or 2:1 industrial sync, and may be adapted to process CCIR 625/50 Signals or SECAM color.

For More Details Circle (202) on Reply Card

Instrument Cabinet

Cabinet appearance does create a strong impression on customers regarding the quality of the equipment mounted within it. That's why Amco stressed design in the new P/D cabinet and backed it up with engineering features, flexibility and quality, making it a truly beautiful cabinet. It's offered by **Amco.**

In addition to the standard sizes, its structural design economically satisfies virtually any desired height, width or depth. The pie section design allows angular arrangements of any specified degree from 0° on. Its hinged handle is always the full depth of the cabinet for perfectly balanced lifting. And, little details, like edge protectors and vinyl cornered paneling are standard. Color selections are available for both paneling and anodized aluminum trim.

For More Details Circle (203) on Reply Card

Distribution Amplifiers

Ramko Research of Sacramento, California, introduces a new line of rack mounted audio distribution amplifiers with up to 32 completely isolated balanced outputs.

These low cost units feature individual output amps for maximum isolation. Other performance characteristics include ±0.5 dB response, 10Hz to 20kHz; 26 dB gain; balanced bridging or matching input, ±20 dBm output maximum; 0.1% or less distortion; 80 dB channel separation; and internal power supply.

This Ramko series includes five models. The DA-6R features six balanced 600 Ohm outputs with level control, pilot light, ON/OFF switch, and fusing and audio input/output barrier strips on the rear. The DA-6BR has in addition six individual front panel level controls. The DA-6RS offers 6 stereo pairs or 12 mono out with 2 inputs.

The DA-16BR and DA-32BR provide 16 and 32 completely isolated balanced outputs with metering, switchable to monitor outputs, balanced bridging/matching inputs for each group of 8 outputs, and individual level controls with headphone monitor jack.

For More Details Circle (204) on Reply Card

Broadcast Color Camera System

Fernseh Division of **Robert Bosch Corporation** has introduced a portable self-contained broadcast color camera system for its KCR 40 hand-held camera.

The battery-operated system is designed for television interviews, up-to-the-minute spot coverage for breaking news stories and adds a new flexibility to the KCR 40. The system can be carried as a back pack for the cameraman, as a back pack for the

cameraman's crewman or on a small mobile cart.

Besides both sports and hard-news coverage, Fernseh has also developed an adaptor mounting bracket to permit operation on a studio tripod or dolly. Also included is high brightness five-inch monitor option with provision for plugging in a standard intercom headset.

This combination allows motion picture techniques to be employed, as the camera operator has his own small viewfinder for framing and focus while allowing the director to view the scene on the larger monitor at the same time and point of action.

For More Details Circle (205) on Reply Card

Custom Quad Console

Dyma Engineering reports the delivery of a new custom quadraphonic console to WSHE-FM, Fort Lauderdale, Florida.

The console boasts seven channels of dual quadraphonic programming and a number of unique features. A single mic channel allows up to four microphones to be used in a mono, stereo, or quadraphonic mode. The microphones have individual trimmer pots. Two channels select three quadraphonic sources and two channels select three stereophonic sources. Each input channel can be selected to the pan buss.

The individual channels can then be dropped or normalled - through to the program buss or pan across the four channels by means of a joy stick. The console also features distribution amplifiers on the four program outputs allowing the simultaneous feeding of eight quadraphonic tape machines or other isolated loads.

The program output has individual trimmer pots and a ganged quadraphonic master fader.

For More Details Circle (206) on Reply Card

Circularly Polarized TV Antenna

Jampro Antenna Co. has announced a circularly polarized antenna for TV broadcasting. CP antennas have been used for years in FM broadcasting.

Several years of research and development have gone into this design which Jampro feels will fill the needs for stronger penetration. Jampro is working with a West Coast UHF station, conducting field tests with a UHF version of the antenna.

The antenna has excellent VSWR bandwidth, even for the lowest VHF TV channel. It will accept 50 kW for channels 2 to 6 and 100 kW for channels 7 to 13, providing full ERP values for VHF TV stations. On UHF channels, 220 kW input power will yield 5 Megawats ERP.

The new antenna has an actual ratio of better than 2 dB, azimuth circularity of better than ± 1 dB. The antenna uses the travelling wave principle around the outside of a vertical cylinder. Radomes or electrical de-icers are available.

Jampro has applied for patents and states this newest development in antennas will improve the state-of-the-art in TV broadcasting. While CP antennas have not yet been accepted by the FCC, the company feels they will be accepted before the end of the year. You'll see more of this one in booth 211.

For More Details Circle (208) on Reply Card

Energy Research Backed by IEEE

The Institute of Electrical and Electronics Engineers, Inc. (IEEE), in cooperation with other technical societies, has sent two statements to Congress supporting legislation that would establish the Energy Research and Development Administration (S. 2744 and H. R. 11510).

This new Administration would have the central responsibility for managing R&D programs pertaining to all energy sources. This includes: the commercial feasibility of energy sources and utilization technologies; the use of energy from fossil, nuclear, solar, geothermal, and other energy sources; safety research related to the development of energy sources and utilization technologies; and distributing information concerning the manufacture or development of energy and its efficient conversion.

Lighting Program Set By NAEB

As part of its continuing program of seminars for educational broadcasters, the Educational Broadcasting Institute of the NAEB has invited William M. Klages, noted television lighting consultant and Vice-President of Imero Fiorentino Associates, to give an intensive 3-day course on "Lighting for Television" March 24-26 at the Maryland Center for Public Broadcasting.

Non-members of the NAEB are welcome to attend. It is emphasized that this is an advanced course, and actual production experience is suggested.

Those interested in attending should call the NAEB at (202) 785-1100.

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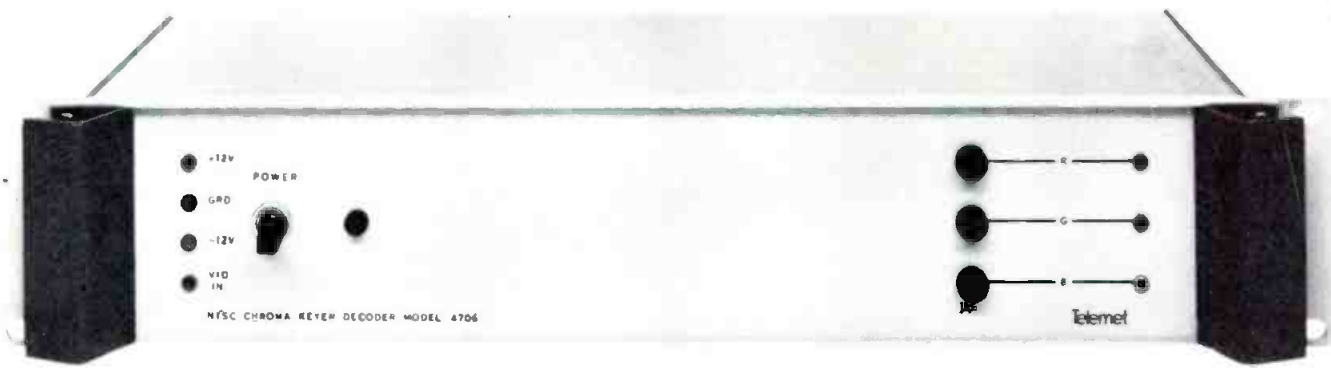

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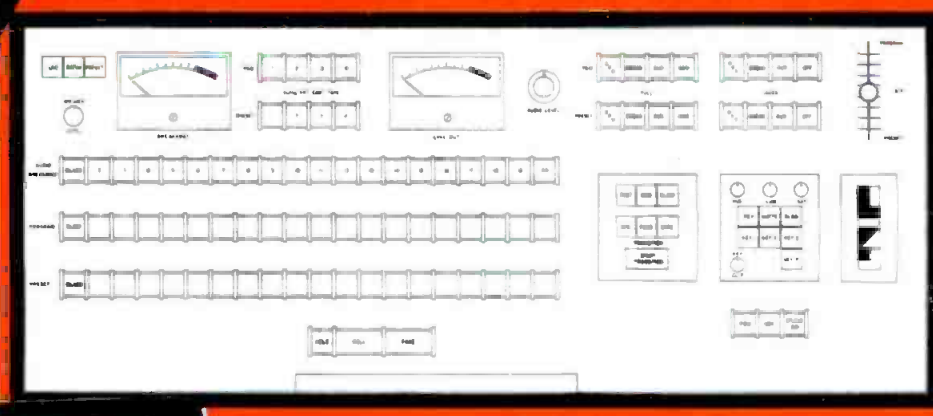

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